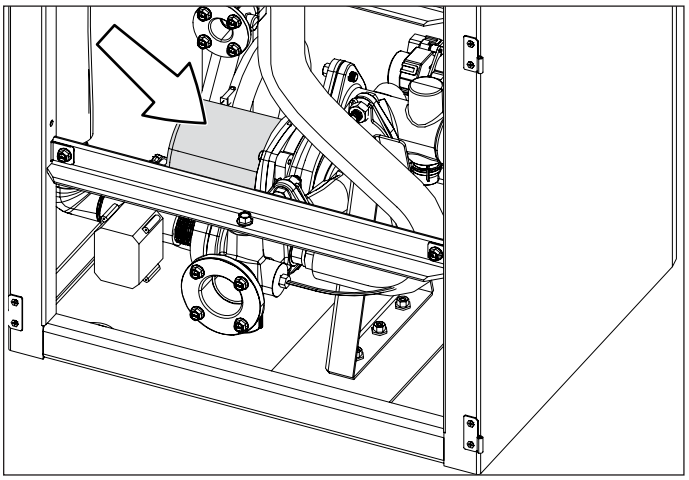
14. Maintenance

14.1 Maintenance-Free Circulation Pump

The circulation pump is maintenance-free and does not require any servicing. The only adjustment is the speed setting, which must be set to Speed 3 (III).



NOTICE

This heater includes an external Wye-Strainer. The Wye strainer must be installed to qualify for unit warranty.

*Clean the Wye strainer every **3 months**.*

*Take out and clean the internal condensate hose. Refill it with fresh water and reconnect it. This needs to be done every **3 months**.*

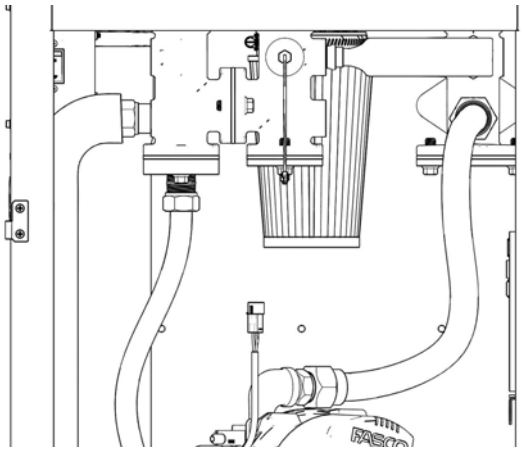
14.2 Air Filter

14.2.1 Inspection

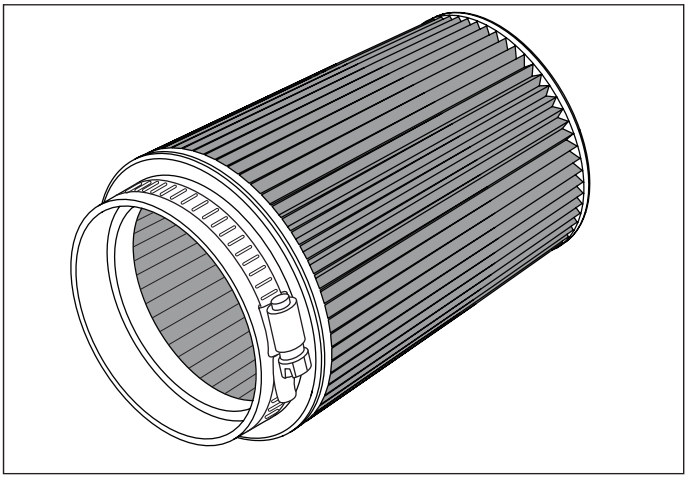
Check the filter every six months for dirt and dust build-up. Clean and re-oil the filter annually. If the filter is dirty, follow the cleaning procedure.

Note: The air filter is manufactured by K&N. Contact K&N at 800-858-3333 or online at www.knfilters.com for the necessary supplies to clean the filter.

1. The filter located at the front top. Loosen the band clamp and remove the air filter.



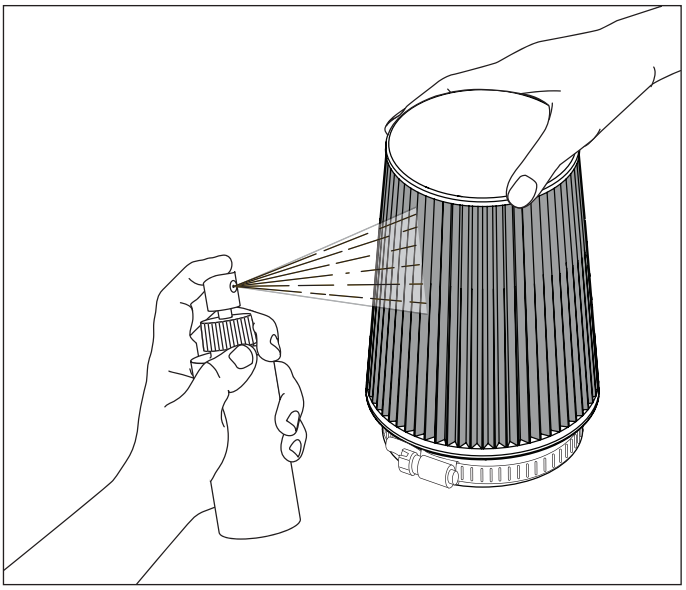
2. Inspect the inside of the filter for dirt and dust build-up. Clean the filter, if needed.



3. After inspection and/or cleaning, replace the air filter and snugly tighten the band clamp.

14.2.2 Cleaning Procedure

1. Liberally spray K&N Air Filter Cleaner and Degreaser (99-0606) onto both sides of filter and allow to soak for 10 minutes to loosen the dirt. Do not allow cleaner to dry on air filter.



NOTICE

K&N Air Filter Cleaner is the only cleaner formulated to safely clean K&N air filters with cotton media. The use of any other cleaning solution could damage the cotton material.

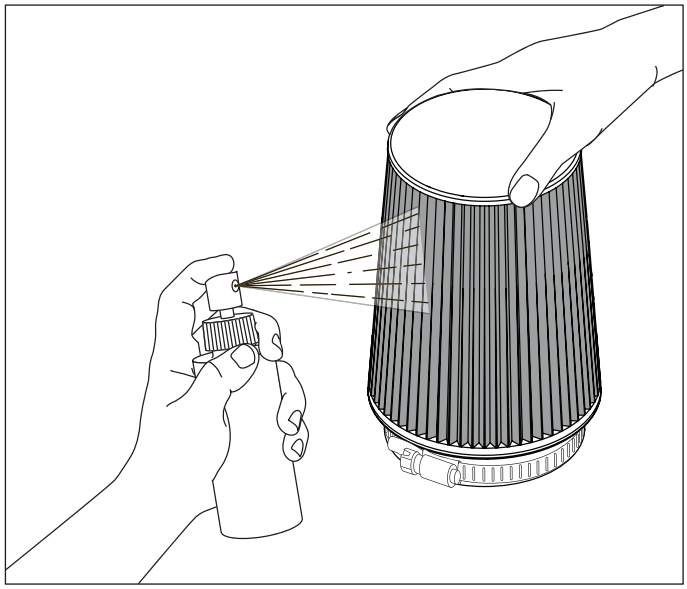
2. Rinse the air filter with cool low-pressure water applied from the outside inward in order to flush the dirt out of the filter. Continue to rinse the filter until all traces of cleaner are gone. It may be necessary to repeat Steps 1 and 2.

3. After rinsing, gently shake off the excess water and air dry the filter.

NOTICE

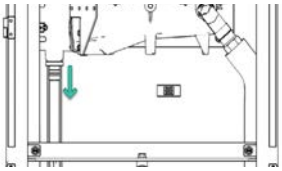
Do not use compressed air to dry the filter. Do not apply oil to the filter until it is completely dry.

4. Spray K&N Aerosol Air Filter Oil (99-0504) evenly along the crown of each pleat holding nozzle about 3" away. Allow oil to wick for approximately 20 minutes. Touch up any light areas on either side of the filter until there is a uniform red color at all areas.

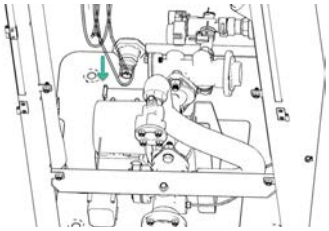


14.3 Condensate Cleaning

1. The condensate is acidic, so please wear gloves. Have a container ready to capture any condensate that may be spilling.
2. Turn off the unit.
3. To remove the condensate hose (top), locate the adapterat the side cast and detach it from the fitting.



4. Drain condensate from the hose into the container.
5. Remove the condensate hose from the fittings at the bottom



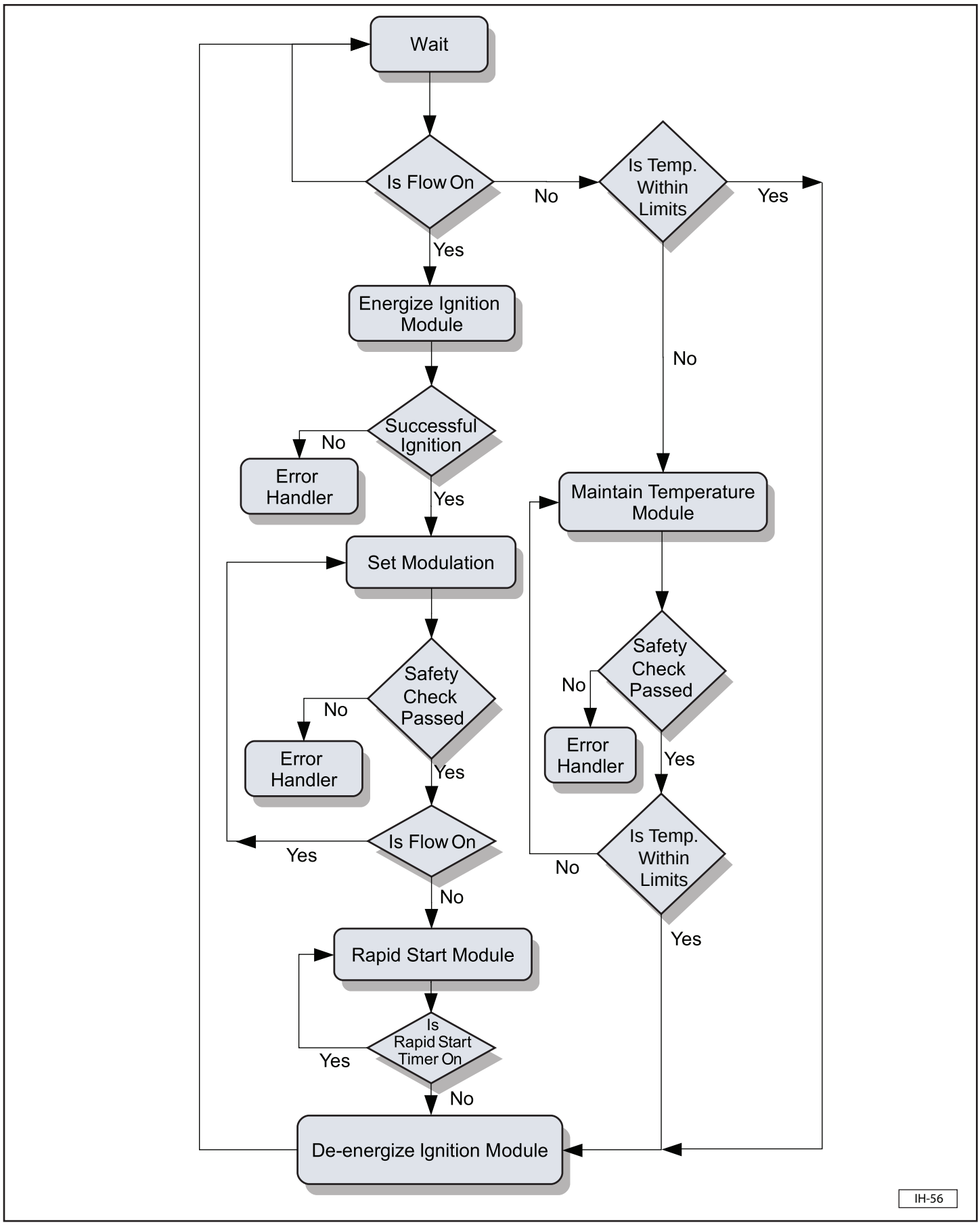
6. Remove the entire condensate hose out of the cabinet.
7. Pour water from the top of the hose and flip it to the drain

8. Pour water from the bottom of the hose and flip it to the drain

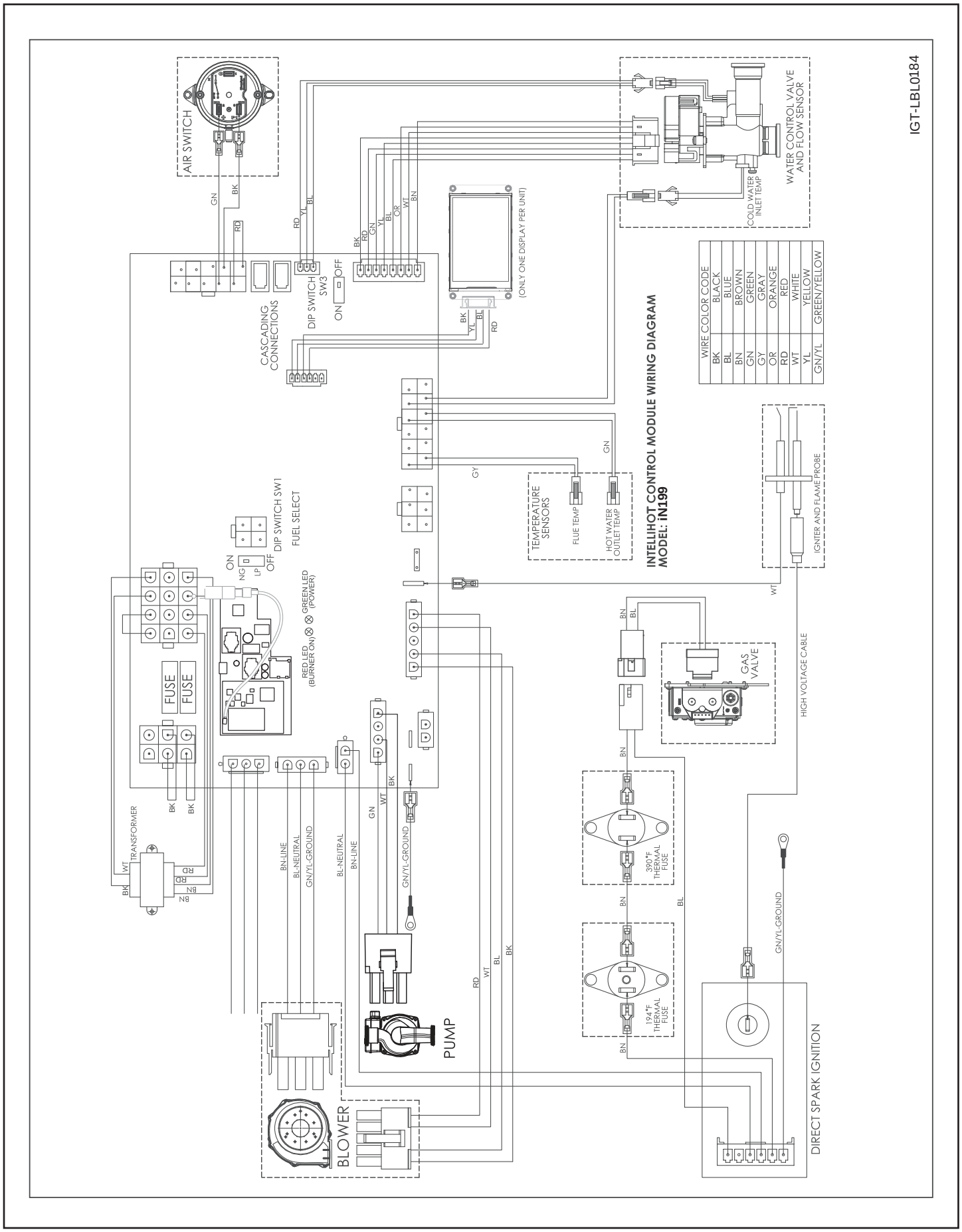
9. Pour water from the top to make sure it comes out from the bottom. Clean the loop
10. Connect the condensate hose to the burp fittings at the bottom
11. Connect the condensate hose to the adapter located at the side cast
12. Turn ON the unit. Make sure there are no leaks coming out of the condensate connections.

15. Wiring Diagrams and Troubleshooting

15.1 Operational Flow Chart



15.2 Complete Wiring Diagram



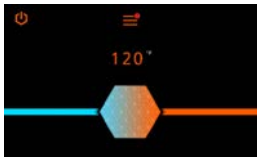
15.3 Troubleshooting Guide

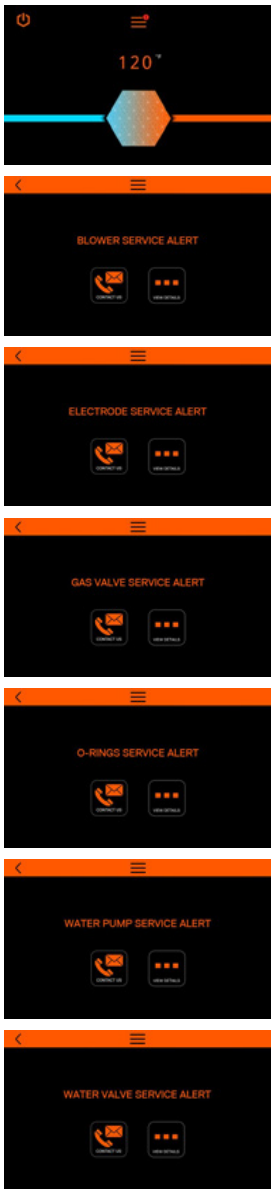
Description	Possible Cause	Remedy
Blower Blower Fault  	• Blower noisy / impeller jammed. • Disconnected signal wire. • Wiring faulty.	• Inspect blower / impeller. Clean and remove any obstructions. • Check PWN signal. Check for loose wires, pins, and repair. • If the problem persists, turn control panel OFF, shut gas valve, disconnect power from unit, and contact an authorized service technician.
Igniter Ignition Fault     	• Water over-heat switch tripped. • Faulty DSI, faulty igniter wire, faulty ignition connection, faulty PCB, bad igniter. • Low gas pressure. • Wiring faulty.	• Check pump, check cross-over solenoid. Electrical noise (DSI). • Replace part. • Adjust gas pressure at regulator, check / increase size of gas line, check for gas line blockage. • If the problem persists, turn control panel OFF, shut gas valve, disconnect power from unit, and contact an authorized service technician.
Open Sensors Inlet / Outlet Sensors  	• Unplugged connectors. • Faulty sensor wiring. • Faulty sensor. • Heat engine water outlet temperature sensor. • Flue temperature sensor. • Inlet water temperature sensor. • Faulty controller.	• Check connectors and ensure they are securely connected. • Check for nicked or broken sensor wiring or connectors. Also check for corroded or wet connectors. • Measure resistance of sensor at connector (18 kΩ at 50°F, 10 kΩ at 77°F, 3 kΩ at 140°F). • Replace controller.

Description	Possible Cause	Remedy
Faulty Sensors Inlet / Outlet Sensors    	• Faulty sensor wiring or faulty sensor. • Inlet water temperature sensor. • Heat engine water outlet temperature sensor. • Faulty controller.	• Check for nicked or broken sensor wiring or connectors. Also check for corroded or wet connectors. • Measure resistance of sensor at connector (18 kΩ at 50°F, 10 kΩ at 77°F, 3 kΩ at 140°F). • Replace controller.
Heat Exchanger Outlet temperature exceeded set limit 	• Flow rate changes excessive. • Faulty sensor wiring. • Faulty sensor. • Faulty controller.	• Ensure the water flow rate does not change faster than 2 GPM every 5 seconds. • Check for nicked or broken sensor wiring or connectors. Also check for corroded or wet connectors. • Measure resistance of sensor at connector (18 kΩ at 50°F, 10 kΩ at 77°F, 3 kΩ at 140°F). • Replace controller.
Flue Temperature Exceeded Set Limit 	• Incorrect vent set up. • High inlet temperature. • Faulty sensor wiring. • Faulty sensor. • Faulty controller.	• If vent pipe material is CPVC or polypropylene, ensure that CPVC is selected in the vent material screen. • Ensure inlet temperature is lower than 150°F if vent pipe material is PVC or lower than 190°F if vent pipe material is CPVC or polypropylene. • Check for nicked or broken sensor wiring and connectors. Also check for corroded or wet connectors. • Measure resistance of sensor at connector (18 kΩ at 50°F, 10 kΩ at 77°F, 3 kΩ at 140°F). • Replace controller.
Blocked Flue Fault 	• Exhaust blocked (bird, etc). • Backed up condensate. • Wiring loose (switch open).	• Check exhaust termination. Check exhaust connection at water heater. Install screens to prevent blockage. • Check slope of drain. Check for double loops, air locks, or debris in loop. • Check wiring.

Description	Possible Cause	Remedy
Flue sensor  	• Unplugged connectors. • Faulty sensor wiring. • Faulty sensor. • Flue temperature sensor. • Inlet water temperature sensor. • Faulty controller.	• Check connectors and ensure they are securely connected. • Check for nicked or broken sensor wiring or connectors. Also check for corroded or wet connectors. • Measure resistance of sensor at connector (18 kΩ at 50°F, 10 kΩ at 77°F, 3 kΩ at 140°F). • Replace controller.
Cascading Alert 	• Loss of communication among units.	• Check for broken or nicked communication cable or loose connector. • Ensure that the communication cable is not bundled or tied to any high voltage lines. • Ensure dip switch (SW3) is ON in first and last units and OFF in all other units. • Ensure each unit numbering is unique.
Water Valve     	• Faulty sensor wiring. • Water valve clogged or damaged.	• Check for nicked or broken sensor wiring or connectors. Also check for corroded or wet connectors. • Replace water valve.

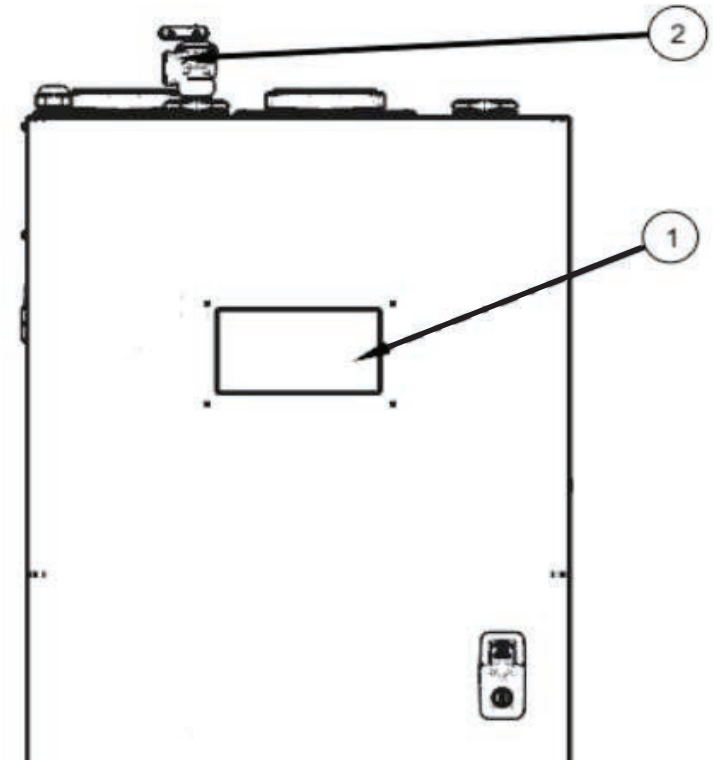
Description	Possible Cause	Remedy
Pump  	• Faulty pump wiring. • Pump fuse blown. • Faulty pump. • Faulty controller.	• Check for nicked or broken sensor wiring or connectors. Also check for corroded or wet connectors. • Replace fuse (5 Amp). • Replace pump. • Replace controller.
Fuel Type 	• Wrong fuel type being used.	•Use correct fuel type.
Software  	• Incorrect settings. • Incompatible settings. • Incorrect software version. • Faulty wiring.	• Review and correct settings. • Review and correct settings. • Update software version. • Check for nicked or broken sensor wiring or connectors. Also check for corroded or wet connectors.

Description	Possible Cause	Remedy
Manifold Sensors      	• Unplugged connectors. • Faulty sensor wiring. • Faulty sensor. • Flue temperature sensor. • Inlet water temperature sensor. • Faulty controller.	• Check connectors and ensure they are securely connected • Check for nicked or broken sensor wiring or connectors. Also check for corroded or wet connectors • Measure resistance of sensor at connector (18 kΩ at 50°F, 10 kΩ at 77°F, 3 kΩ at 140°F) • Replace controller.
System Alert / Fault 	• A system alert or fault is present (main menu screen). • Malfunction of monitored part or system.	• Press the Menu bar and refer to the remedy for indicated part or system.
Alive 	• Shows status of water heater. • Sleep mode.	• Touch display screen to awake.
	• Sleep mode passcode protected.	• Refer to the remedy for indicated part or system.
	• Indicates a fault exists within the monitored parts or system.	• Refer to the remedy for indicated part or system.

Description	Possible Cause	Remedy
Service Alert 	• A system alert or fault is present (main menu screen). • Malfunction of monitored part or system.	• Press the Menu bar and refer to the remedy for indicated part or system.

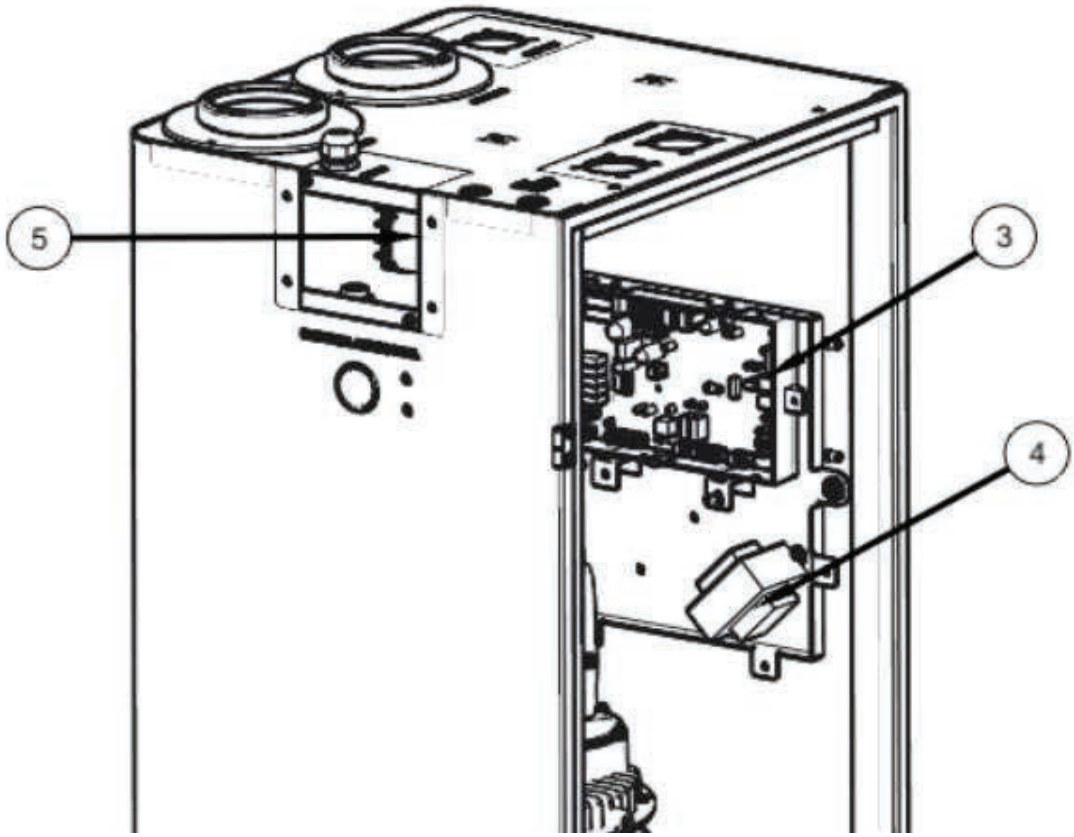
16. Serviceable Parts

16.1 Display



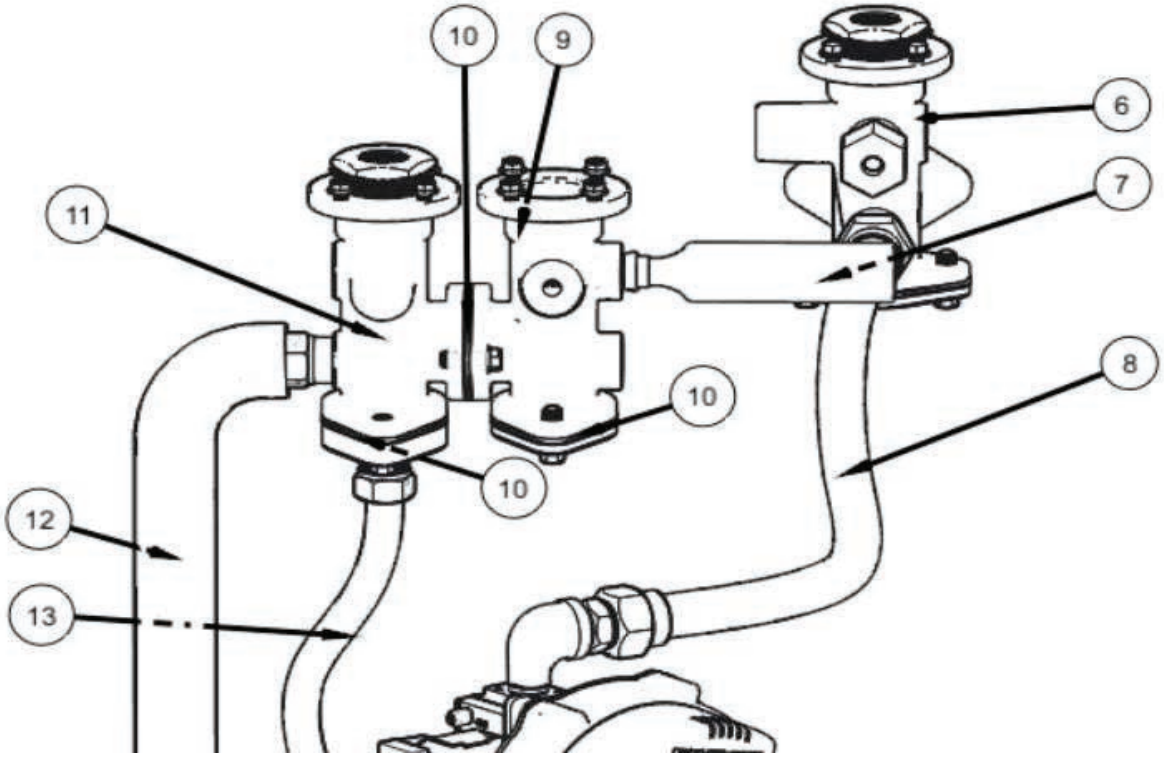
Item	Part Number	Description
1	IGT-SPR0130	Display
2	IGT-VL0043	Pressure Relief Valve

16.2 Control Board



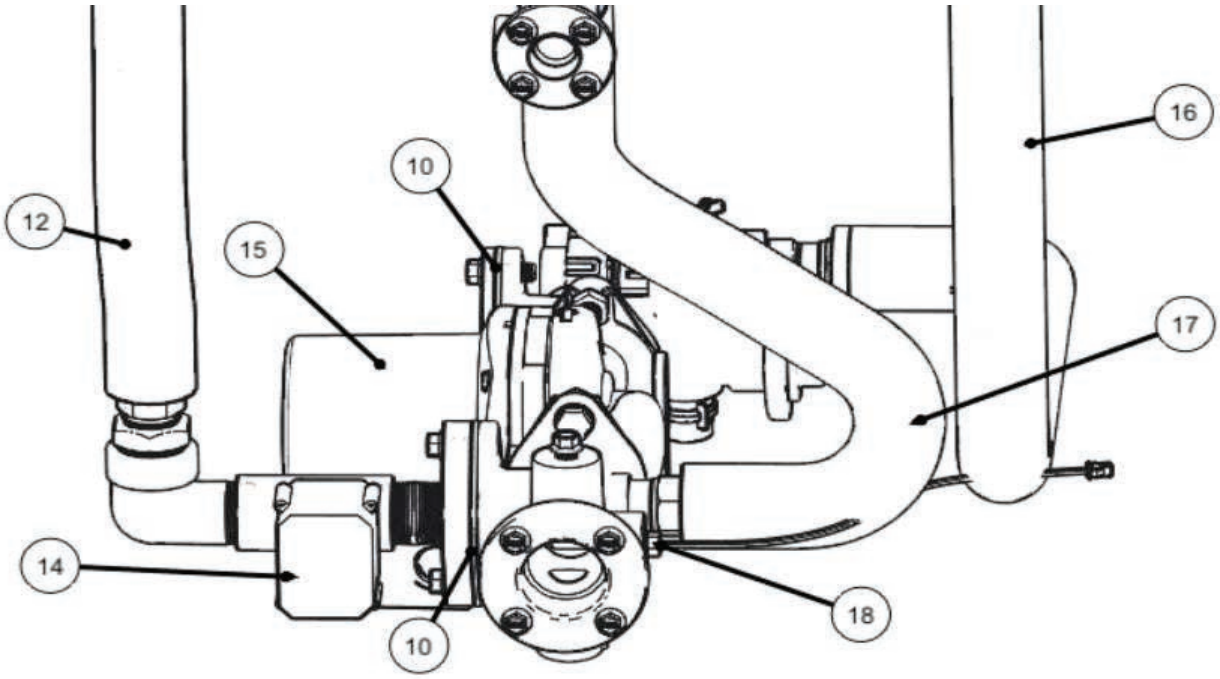
Item	Part Number	Description
3	IGT-SPR0129	Control Board
4	IGT-SPR0065	Transformer Kit
5	IGT-ELC0138	Rocker Switch

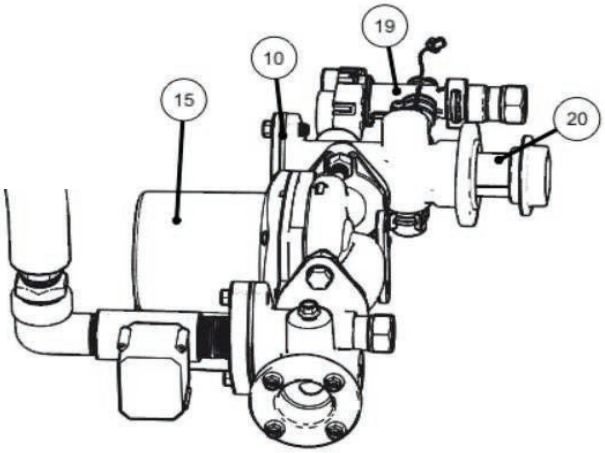
16.3 Water Circuit (top side)



Item	Part Number	Description
6	IGT-FTT0235-5	Gas Out Casting
7	IGT-PLG0018	Water Hammer Arrestor
8	IGT-PLG0014	Gas Tube
9	IGT-FTT0235-3	Hot Side Water Out Casting
10	IGT-SLS0041	Seal
11	IGT-FTT0235-1	Cold Side Water Out Casting
12	IGT-LNE0064	Corrugated Line
13	IGT-LNE0061	Corrugated Line

16.4 Water Circuit (bottom side)

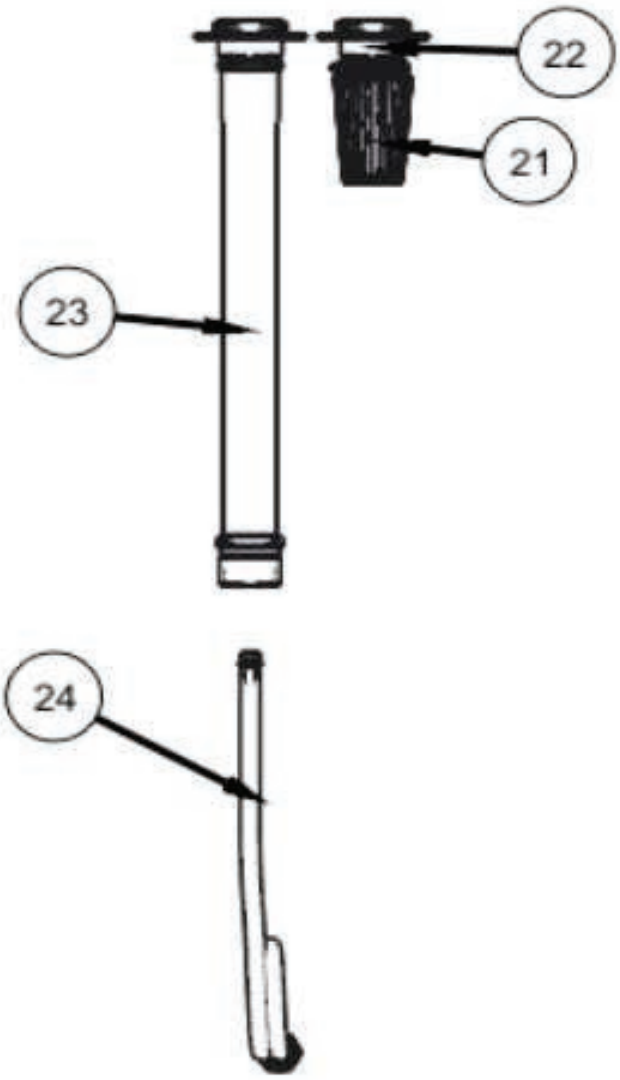




Water Valve View

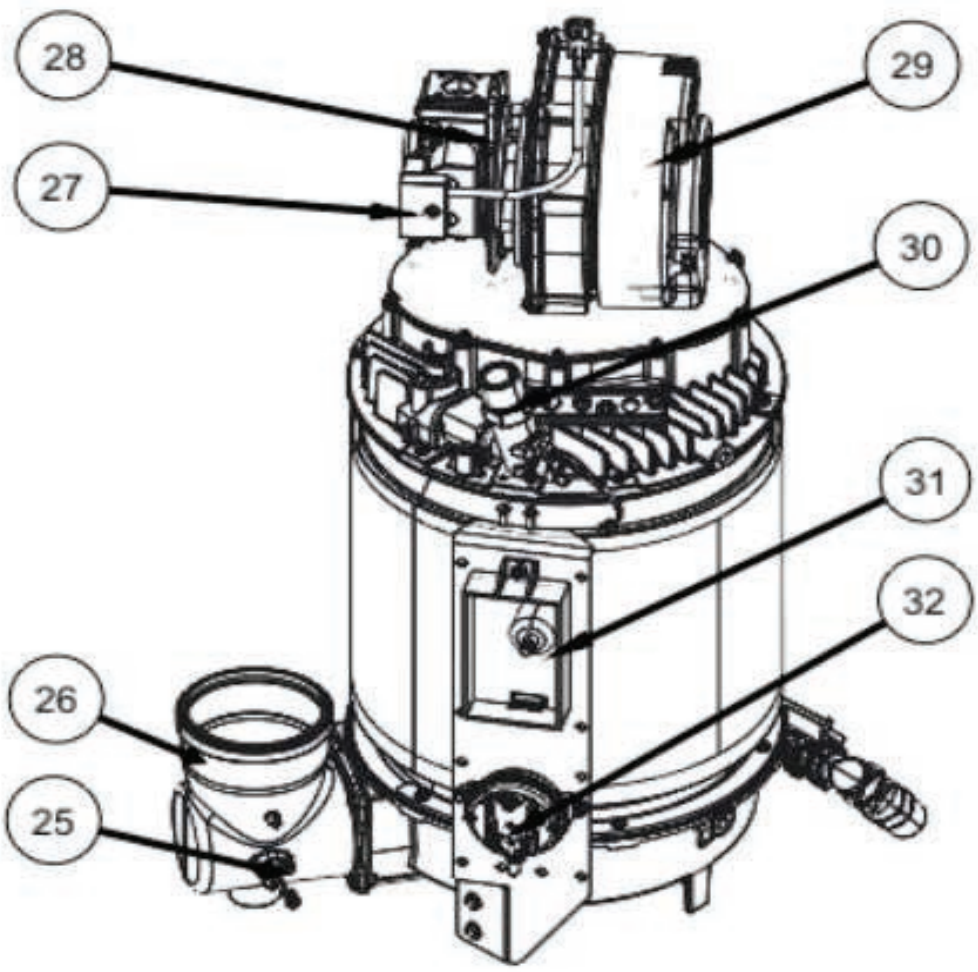
Item	Part Number	Description
12	IGT-LNE0064	Corrugated Line
14	IGT-SPR0087	Bypass Valve
15	IGT-SPR0075	Internal Pump
16	IGT-LNE0063	Corrugated Line
17	IGT-LNE0053	Corrugated Line
18	IGT-ELC0116	Manifold In/Out Sensor
19	IGT-SPR0003	Water Valve
20	IGT-FTT0280	Internal Strainer

16.5 Exhaust



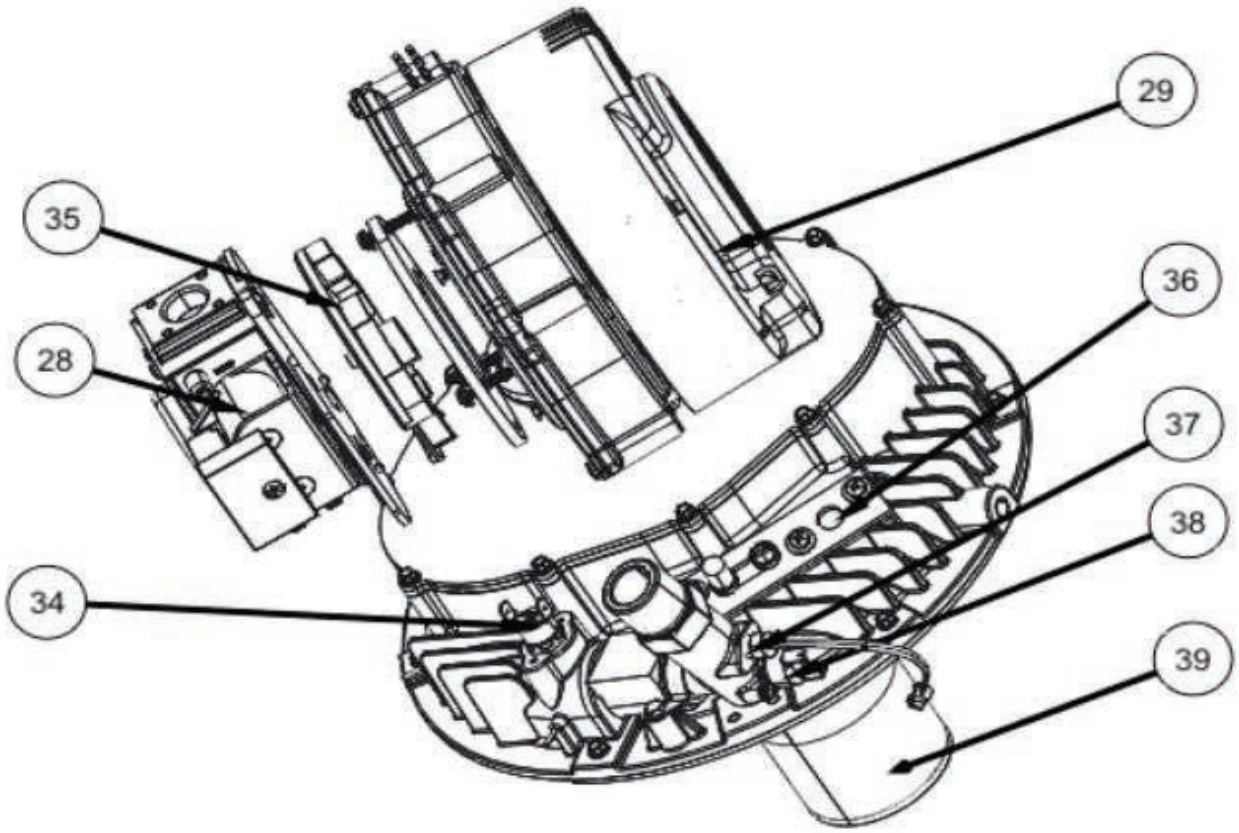
Item	Part Number	Description
21	IGT-FLTR0009	Air Filter
22	IGT-EX0035	Air Intake
23	IGT-EX0034	Exhaust
24	IGT-TB0015	Condensate Hose

16.6 Heat Exchanger



Item	Part Number	Description
25	IGT-ELC0062	Flue Sensor
26	IGT-CST002	Side Cast
27	IGT-ELC0020	Gas Valve Harness
28	IGT-SPR0011	Gas Valve Harness
29	IGT-SPR0127	Blower Kit
30	IGT-SPR0012	Outlet Assembly
31	IGT-SPR0005	DSI
32	IGT-ELC0007	Internal Strainer

16.7 Heat Exchanger (top side)



Item	Part Number	Description
28	IGT-SPR0011	Gas Valve Kit
29	IGT-SPR0127	Blower Kit
34	IGT-SPR0097	Non-Resettable Switch
35	IGT-ELC0147	Gray Swirl Plate
36	IGT-SPR0106	Electrode Kit
37	IGT-ELC0081	Outlet Sensor
38	IGT-SPC0066	Resettable Switch
39	IGT-SPC0111	Burner Kit

16.8 Miscellaneous

Part Number	Description
IGT-ELC0092	25 ft cascading cable
IGT-ELC0232	50 ft cascading cable
IGT-SPR0110	Gen II V 2 Sensors Kit (includes manifold inlet, manifold outlet, flue, and hotwater outlet sensors)
IGT-SPR0109	Gen II V 2 O-Ring kit
IGT-ELC0181	DSI to Electrode HV Cable
IGT-ELC0131	Heat Exchanger to Control Board Harness
IGT-ELC0319	Gas Pressure Sensor
IGT-ELC0320	Water Pressure Sensor
IGT-ELC0349	Water and Gas Pressure Sensors Harness
IGT-ELC0352	Pump to Control Board Harness
IGT-ELC0353	Power Harness, Control Board to Rocker Switch
IGT-ELC0354	Manifold Inlet Wiring Harness
IGT-ELC0355	Manifold Outlet Wiring Harness
IGT-ELC0356	Bypass Valve Wiring Harness
IGT-ELC0319	Gas Pressure Sensor
IGT-ELC0320	Water Pressure Sensor
IGT-ELC0288	Display Wiring Harness
IGT-CST0031	Flapper