Annual Maintenance Kit Instructions for

THE FT SERIES

Wall-Mounted, Modulating Gas, Condensing, Boilers and Combination Boilers

For Sizes 80 to 140,000 BTU/h

FOR YOUR SAFETY: This product must be installed and serviced by a professional service technician, qualified in hot water boiler and heater installation and maintenance. Improper installation and/or operation could create carbon monoxide gas in flue gases which could cause serious injury, property damage, or death. Improper installation and/or operation will void the warranty.

⚠ WARNING

If the information in this manual is not followed exactly, a fire or explosion may result causing property damage, personal injury or loss of life.

Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other unit.

WHAT TO DO IF YOU SMELL GAS

- Do not try to light any unit.
- Do not touch any electrical switch; do not use any phone in your building.
- Immediately call your gas supplier from a nearby phone. Follow the gas supplier's instructions.
- If you cannot reach your gas supplier, call the fire department.

Installation and service must be performed by a qualified installer, service agency, or gas supplier.

⚠ AVERTISSEMENT

Assurez-vous de bien suivres les instructions données dans cette notice pour réduire au minimum le risque d'incendie ou d'explosion ou pour éviter tout dommage matériel, toute blessure ou la mort.

Ne pas entreposer ni utiliser d'essence ni d'autres vapeurs ou liquides inflammables dans le voisinage de cet appareil ou de tout autre appareil.

QUE FAIRE SI VOUS SENTEZ UNE ODEUR DE GAZ:

- Ne pas tenter d'allumer d'appareils.
- Ne touchez à aucun interrupteur. Ne pas vous servir des téléphones dansle bâtiment où vous êtes.
- Appelez immédiatement votre fournisseur de gaz depuis un voisin. Suivez les instructions du fournisseur.
- Si vous ne pouvez rejoindre le fournisseur de gaz, appelez le service des incendies.

L'installation et l'entretien doivent être assurés par un installateur ou un service d'entretien qualifié ou par le fournisseur de gaz.

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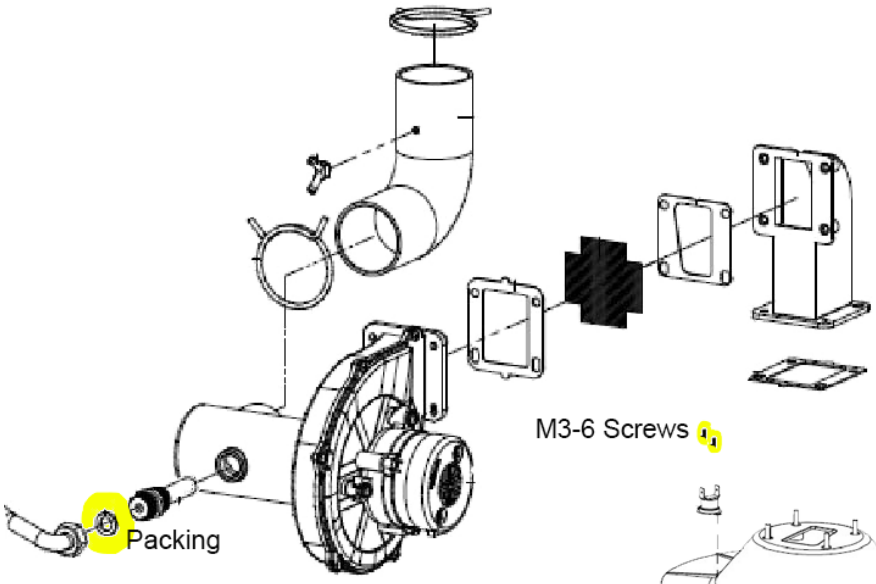
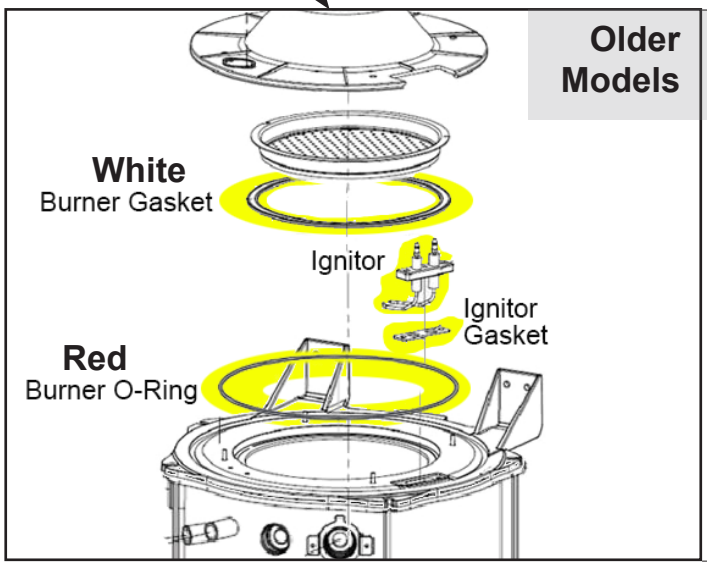
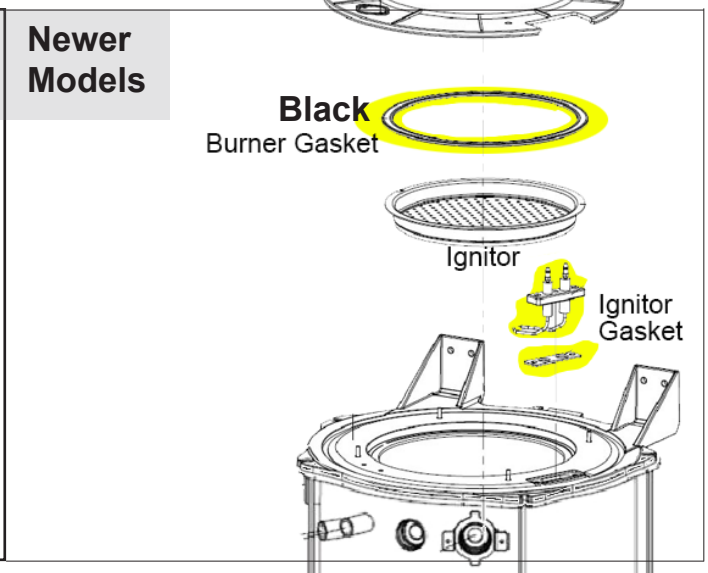
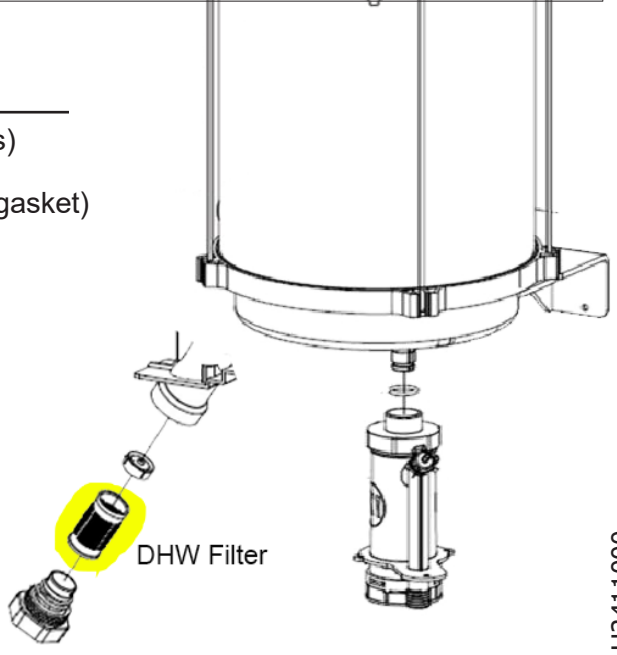
The burner gasket design at the top of the FT's heat exchanger changed in 2018. This annual maintenance kit has the necessary parts for both designs. Use the gaskets that apply to your model and discard the leftover gasket/s.









Included Parts

Part #	Qty	Description
FT1927	1	Burner Gasket (Black, all newer models)
FT1659	1	Burner Gasket (White, flat ceramic felt gasket)
FT1661	1	Burner O-Ring (Red)
FT1315	1	Ignitor
FT1316	1	Ignitor Gasket
FT1710	1	Packing
FT1062	2	M3-6 Screws for Overheat Sensor
FT1120	1	DHW Filter Mesh
H2415700	1	Label, Annual Maintenance

Included Tools

M00079	1	T-15 Torx T Handle
M00080	1	2.5mm Allen Key
M00078	1	Pouch C5-1 Anti-Seize

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Maintenance Item Checklist	✓
Check the power source. Follow all 'Lock-Out and Tag Procedures' (if required) prior to turning off power. Then make sure that the power is off before you visually and physically inspect all power connections. Check that the main power is installed per all local requirements. If there are any incorrect installation issues, or wear, or damage to the power supply, make all needed repairs or replacements.	
Check the vent pipe. Visually inspect the flue gas vent pipe and screen for any signs of blockage, leakage or deterioration of the piping. Make all needed repairs or replacements.	
Check the air inlet pipe. Visually inspect the air inlet to be sure it is unobstructed. Inspect entire length of air piping for ensuring that piping is intact, and all joints are properly sealed. Make all needed repairs or replacements.	
Check the vent & intake terminal screens (rodent screen). Visually inspect the terminal screen and clean any debris from the terminals. Make all needed repairs or replacements.	
Check the pressure relief valve(s). Inspect and test the boiler relief valve(s). Also check the pipes for any signs of weeping or leakage. Make all needed repairs or replacements.	
Clean / check the condensate outlet. Clean the condensate trap regularly. While the boiler is running, check the discharge end of the condensate drain tubing. Make sure that no flue gas is escaping from the condensate drain tubing. Condensate trap needs to be refilled to prevent flue gas leaking. Make all needed repairs or replacements.	
Check the boiler piping (gas and water). Visually inspect for leaks around internal water piping. Also inspect external water piping, circulators, relief valve and fittings. Repair any leaks found. Test repair for leaks, put boiler back in service.	

Combustion System Checks & Maintenance

• Dust and deposits in the FT's airway, burner, and combustion chamber can affect the combustion system and reliability of the unit. An important part of the annual service procedure for the FT is to confirm the heat exchanger is clean, and the combustion system is properly calibrated. The procedure below describes how to disassemble the airway, burner and combustion chamber to ensure it is clean, and not restricted by dust or deposits. Once properly cleaned the combustion system should be re-calibrated to ensure proper performance.

Boiler Firing Mode	Recommended CO_2 – **Natural Gas**	Recommended CO_2 – **LP Gas**	Record Actual CO_2 Readings
Low Fire	8% - 10%	9% - 10.5%	
High Fire	8.5% - 10.5%	9.5% - 11%	

Following the steps in Section 4.13 of the FT Series Installation and Operating Instructions. Perform a combustion test and record the results in the table above. The combustion test requires a flue gas analyzer to measure combustion quality. Flue gas analyzers require periodic maintenance and calibration to provide accurate readings. If you do not have flue gas analyzer, or if your flue gas analyzer has not been properly maintained do not attempt to calibrate the boiler!

NOTE: Allow the boiler to fire for at least 90 seconds before performing a combustion test! Combustion readings may vary between start-up and steady state operation. Performing a combustion test at steady state operation provides the most accurate readings is essential to proper calibration of the boiler!

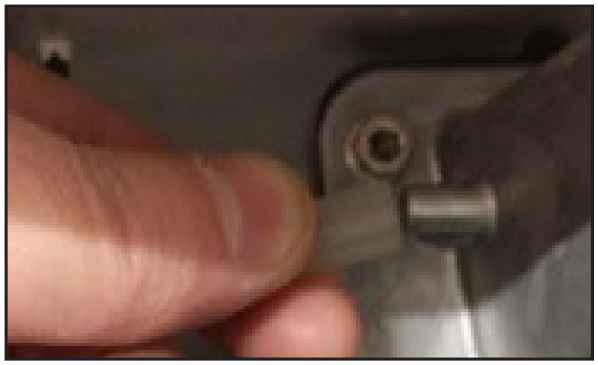
If the CO_2 readings are outside the recommended ranges, do not attempt to adjust the boiler until the airway and combustion chamber have been fully cleaned!

Disassembly / cleaning the boiler

Step 1. Remove the front panel by unscrewing the four screws that hold the front panel to the boiler casing.

Step 2. Turn off power to the FT by switching the black rocker switch to the “Off” position. Unplug the power cord to ensure the unit is powered down and turn off the gas supply to the boiler before beginning work. Close isolation valves on the boiler supply and return piping to seal off the boiler from the hydronic system. Place a bucket under the boiler relief valve outlet. Lift the handle on the boiler relief valve to vent off boiler pressure. When servicing combi boilers close the isolation valves on the DHW inlet and DHW outlet. Place a bucket under the DHW relief valve outlet. Lift the handle on the relief valve to vent off DHW pressure.

Step 3. Loosen the nut where the gas line connects to the gas valve outlet by ½ turn. Remove the nut connecting the gas line to the fan venturi and rotate the gas line away from the fan.



Step 4. Disconnect vacuum hose from the fan or air intake pipe. Units with serial number F1800309 and after, the vacuum hose connects to a tee in the air intake pipe.

Models prior to that serial number connect directly to the fan housing. (these will be reassembled later)

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Step 5. Using a 4mm hex key, remove the four hex screws to release the combustion fan from the 90-degree air tube. Inspect and clean the air screen mounted to the fan outlet to ensure air flow is not restricted by debris. Take note of how the air screen is sandwiched between the gaskets, and how the gaskets are oriented to the combustion fan and the 90-degree air tube.

Step 6. Remove the 8mm nuts that secure the 90-degree Air Tube to the Upper Burner Case. If the studs remain in the Upper Burner Case, use the supplied 2.5mm Allen Wrench to remove the studs, so the 90-degree Air Tube can be removed.

Step 7. Unplug and remove the Overheat Sensor from the Upper Burner Case.

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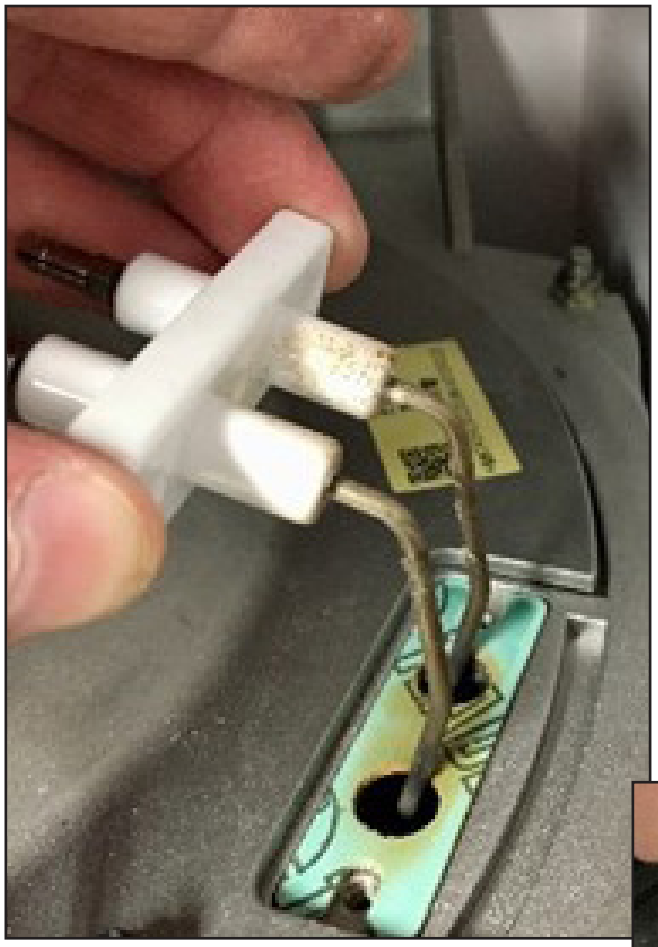


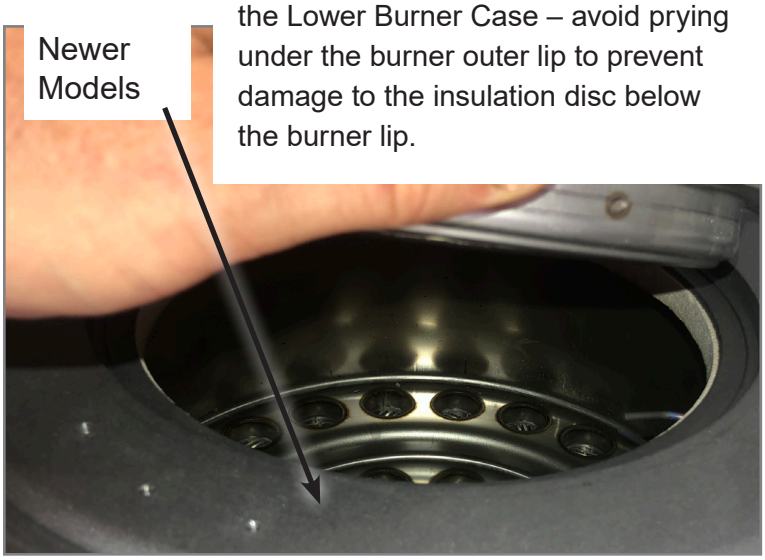
Step 8. Remove the igniter and igniter gasket. Remove the four 7mm nuts from the burner plate. The studs may back out of the Lower Burner Case when loosening the nuts. Remove the Upper Burner Case and the white Ceramic Burner Gasket.

Step 9. Lift the burner upper case up and off of the burner.

Older Models

Newer Models

Step 10. Gently lift the burner out of the Lower Burner Case – avoid prying under the burner outer lip to prevent damage to the insulation disc below the burner lip.



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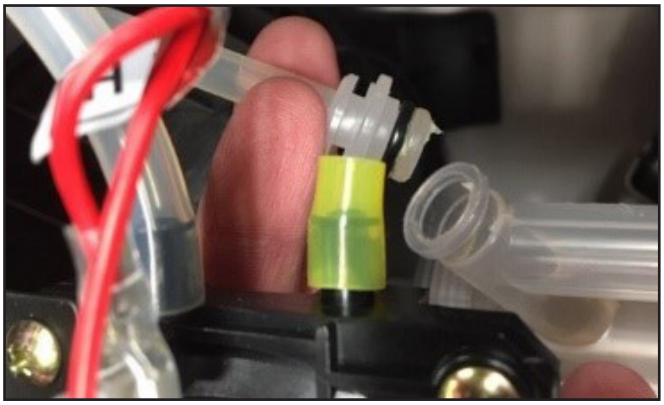
Step 11. Inspect the combustion chamber for deposits and debris. Remove deposits in the combustion chamber with a damp rag – DO NOT use metallic brushes or any type of detergent inside the heat exchanger. Be sure to clean the inside surfaces of the combustion chamber observation window and the flame sensor window.

Shown is an older model. Newer models will not have the red gasket

Step 12. If the tube sheet or tubes appear dirty or fouled, flush the heat exchanger with water. Begin by removing the condensate trap from the flue collector. Remove the four Philips head screws

and air hose connected to the blocked condensate switch. Install a short piece of 1” ID hose to the condensate outlet connection on the flue collector. Run the hose to a bucket or drain to catch water while flushing the heat exchanger. Spray water into the fire tubes to flush any deposits through the tubes into the condensate trap. DO NOT use any type of detergent inside the heat exchanger.



Step 13. Place a bucket under the boiler and remove the clip from the CH return filter. Position the bucket to catch water that drains from the filter housing. Twist and pull the filter straight down to remove it from boiler.

Step 14. Clean any debris with a small brush and water and re-install the filter.
Disassemble and clean any debris or build-up from the condensate trap. Ensure the check ball moves freely up and down inside the trap and the clear tube between the condensate trap and air pressure switch is clean and dry.

Step 15. Reassemble and re-install the trap once it is clean and the boiler heat exchanger has been flushed.

Additionally, for Combi Models:

Step 16. Locate the DHW filter below the boiler, and behind the condensate trap outlet. Remove the clips from the DHW filter. Position the bucket to catch water that drains from the filter housing. Twist the filter and then pull it straight down to remove it from boiler. Hold the screen upright and gently twist it counterclockwise to remove it from the filter cap. Use a blunt tool to push the flow restricter from the top of the screen. Clean the flow restricter with a rag or soft brush and install it gasket-side up in the top of the new screen. Install the new screen on the filter cap and twist it clockwise to lock it in place. Install the DHW filter ensuring it is fully seated in the filter body before inserting the clips. (FT140 combi only).

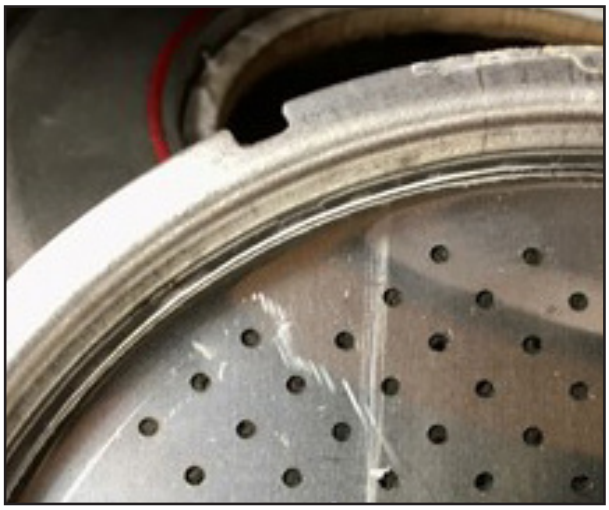
Flushing the DHW heat exchanger is not a routine maintenance item under normal conditions. If DHW performance is not restored after the DHW filter has been cleaned and properly re-installed, refer to the cleaning procedure in Section 8.2 of the FT Series Installation and Operating Instruction.

Step 17. Clean the burner before re-installing it in the heat exchanger by wiping the top (shiny) surface with a damp rag to remove any debris or build up. Do not wipe or brush the bottom surface of the burner. Use a blower to blow any debris off the bottom surface of the burner.

Reassembling the boiler:

Step 18. Align the notch in the burner flange with the insert in the upper burner case, and gently press the burner into the case. Replace the white ceramic burner gasket and the red O-ring at the top of the case, with the gaskets included with the kit (replace the gasket only on models that included the gasket originally. Do Not install a replacement gasket if the boiler did not originally include one!).


Shown is an older model. Newer models will not have the red gasket



Step 19. Install the upper burner case. Apply a small amount of high-temp anti-seize paste on the bolts / studs to simplify removal during future service. Prepare the new igniter for installation by confirming the gap between the tips is approximately 1/8".

Step 20. Install the igniter with the gasket supplied with the kit. Apply a small amount of high temperature anti-seize paste on the bolts / studs

Step 21. Install the air arm and gasket on the upper burner case. Apply a small amount of high-temp anti-seize paste on the nuts to simplify removal during future service.

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Step 22. Clean any dust or debris from the combustion air screen fan and 90-degree air tube. Reassemble the components by sandwiching the combustion air screen between the two rubber gaskets. The gasket with the rectangular opening should be on the air arm side of the screen. The gasket with the uneven opening should be on the blower side of the screen and aligned with the uneven port on the blower (i.e. the smaller end of the rectangle opening should be at the bottom). Make sure the slotted holes in both gaskets are at the bottom. Install the fan using the four Allen head screws.

Step 23. Reconnect the combustion air pipe to the venturi and confirm the spring clamp or hose clamp holds the pipe tightly to the venturi. Reconnect the tubing that terminates at the fan housing or air intake pipe. Making sure the connections are also good to the pressure switch and or the gas valve.

Step 24. Re-install the overheat temperature sensor using the new M6 screws included with the kit.

Step 25. Reconnect the orange wires to the sensor. Plug the Molex connectors into the blower and the blocked vent switch. Connect the red ignition leads to the igniter.

Step 26. Using the green paper packing included with the kit, reconnect the gas line to the venturi. Be sure the green paper packing is seated between the fuel orifice and the gas pipe. Tighten both ends of the gas pipe.

Step 27. Re-confirm that all gas, wiring, and air line connections are complete.

Step 28. Check the cap on the air vent at the top of the boiler to confirm it is open one turn. Open the isolation valves on the CH Supply and CH Return so the boiler can fill with water. Check the CH filter at the bottom of the boiler for leaks.

Step 29. Additionally for Combi Models:
Open the isolation valves on the DHW inlet and outlet piping. Open a hot water faucet and allow the water to run until all of the air has been bled from the boiler. Check the DHW filter at the bottom of the boiler for leaks.

Step 30. Once the boiler is filled and bled, turn the boiler on.

Step 31. Final Combustion Test and Calibration:

- The combustion test requires a manometer to measure incoming fuel pressure and a flue gas analyzer to measure combustion quality. Flue gas analyzers require periodic maintenance and calibration to provide accurate readings. If you do not have flue gas analyzer, or if your flue gas analyzer has not been properly maintained do not attempt to calibrate the boiler!
- Following the steps in Section 4.13 of the FT Series Installation and Operating Instructions, perform a combustion test and record the results below. The combustion test requires a flue gas analyzer to measure combustion quality.
  NOTE: Allow the boiler to fire for at least 90 seconds before performing a combustion test! Combustion readings may vary between start-up and steady state operation. Performing a combustion test at steady state operation provides the most accurate readings is essential to proper calibration of the boiler!

- If the CO_2 readings are below the recommended ranges turn the gas valve fine adjustment screw clockwise to increase CO_2 levels, counterclockwise to decrease CO_2 levels.

NOTE: The gas valve fine adjustment screw is precise and should only be adjusted in very small increments! A good rule of thumb is one degree of rotation (there are 360 degrees in a full turn) should equate to an increase or decrease in the CO2 level of approximately 1/10 of a percent (.1%). It is better to make several small adjustments re-testing the flue products after each adjustment to bring the CO2 into the recommended range, than to attempt a single large adjustment.

If the boiler was operating at or near the recommend CO2 levels before cleaning, it should require only very minor adjustments after cleaning.

Boiler Firing Mode	Recommended CO_2 – **Natural Gas**	Recommended CO_2 – **LP Gas**	Record Actual CO_2 Readings
Low Fire	8% - 10%	9% - 10.5%	
High Fire	8.5% - 10.5%	9.5% - 11%	

Step 32. Look for the Annual Service & Calibration' label on the unit and fill it out with the Date, CO_2 readings and the name of the service technician. If a label is not already on the unit, use the label that is included with this annual service kit.

THE FT SERIES

Annual Service & Calibration

Date:	Low Fire CO2:	High Fire CO2:	Performed By:
	%	%	
	%	%	
	%	%	
	%	%	
	%	%	

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