

# Leisure Line Stove Co

620 Broad St., Berwick PA 18603

## Anthraking 110K, 180K & 220K BTU Furnace Manual

Refer to markings on the appliance for additional information



### **SAFETY NOTICE**

**Please read entire manual before installing your new furnace. Failure to follow these instructions may result in property damage, bodily injury, or even death. Contact your local building and or fire officials about restrictions and inspection and permit requirements in your area.**

## **BURN ANTHRACITE COAL ONLY**

- WARNING - Risk of Fire:- Do not operate with flue draft exceeding -.07 in. Water column.  
Operating at a number above -.07 can cause solid fuel devices to burn back into the hopper.**
- Do on operate with fuel loading or ash removal doors open.
  - Do not store fuel or other combustible material within marked installation clearances.
  - Inspect and clean flues and chimney regularly.

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## **Parts List**

1. Furnace assy w/Jackets and top 110k unit has 20"x 20" standard 220k has 20"x 25" outlet
2. Ship Kit Box with w/ Coal Trol Thermostat, Control box with conduit and wires, High Limit Switch, and jacket filler plate for flue outlet
3. Flue outlet (110k has 6" 220K has 8") w /gasket ( In ash pan)
4. Blank cover for flue outlet w/gasket ( In ash pan)
5. 16-1/4-20 x 1 bolts ( In ash pan)
6. Feeder Assy w/gaskets and feeder motor(s) and convection blower(s) installed

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7. Hopper (200# std on AK110, 320# std on AK180 and AK220)
8. 1800 CFM Convection Blower with duplex plug
9. Ash Pan
10. Owner's Manual ( in Ship kit )
11. Warranty Registration ( in Ship kit )
12. Firestop ring (s) ( in Ship kit )
13. Starter Bag(s) ( in Ship kit )
14. Flame Diffuser ( In ash pan)

## **Options**

1. Filter/cold air return box w/ filter
2. 320Lb hopper for AK110
3. Custom outlet sizes and shapes available for top
4. Custom inlet sizes and shapes available
5. Extra ash pan
6. Ash pan cover
7. Larger ash pan

Additional Info can be found by visiting

<https://www.leisurelinestoves.com/owners/videos/>

And <https://www.leisurelinestoves.com/owners/manuals/>

## **Safety Instructions and Information and Important Warning Statements**

Your Furnace comes with one Carbon Monoxide Detector, It is recommended that there be one outside each sleeping area and at least one per floor, read your CO manual completely before lighting furnace

**IMPORTANT:** This carbon monoxide alarm is designed to detect carbon monoxide from ANY source of combustion. It is NOT designed to detect smoke, fire, or any other gas. **WARNING:** Carbon monoxide alarms are not smoke alarms. This carbon monoxide alarm is not a substitute for installing and maintaining an appropriate number of smoke alarms in your home. This carbon monoxide alarm will not sense smoke, fire, or any poisonous gas other than carbon monoxide even though carbon monoxide can be generated by fire. For this reason you must install smoke alarms to provide early warning of fire and to protect you and your family from fire and its related hazards. **CAUTION:** This

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alarm will only indicate the presence of carbon monoxide at the sensor. Carbon monoxide may be present in other areas.

## **General Carbon Monoxide Information**

Carbon monoxide is a colorless, odorless and tasteless poison gas that can be fatal when inhaled. CO inhibits the blood's capacity to carry oxygen. Periodically review this alarm manual and discuss your CO alarm emergency procedure with all the members of your family. Never ignore a CO alarm. A true alarm is an indication of potentially dangerous levels of CO. CO alarms are designed to alert you to the presence of CO before an emergency – before most people would experience symptoms of CO poisoning, giving you time to resolve the problem calmly. Determine if anyone in the household is experiencing symptoms of CO poisoning. Many cases of reported CO poisoning indicate that while victims are aware they are not well, they become so disoriented they are unable to save themselves by either exiting the building or calling for assistance. Also, young children and household pets may be the first affected. You should take extra precautions to protect high-risk persons from CO exposure because they may experience ill effects from CO at levels that would not ordinarily affect a healthy adult.

## **Symptoms of CO Poisoning**

The following common symptoms are related to CO poisoning and should be discussed with ALL members of the household.

### **Mild Exposure:**

Slight headache, nausea, vomiting, fatigue (often described as “flu-like” symptoms).

### **Medium Exposure:**

Severe throbbing headache, drowsiness, confusion, fast heart rate.

### **Extreme Exposure:**

Unconsciousness, convulsions, cardio-respiratory failure, death. If you experience even mild symptoms of CO poisoning, consult your doctor immediately!

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**AK110 with Optional Filter/Cold Air Return Box**

## **Installation Notes**

**To ensure a safe installation, it is recommended that this furnace be installed by a qualified installer.**

The sheet metal top and sides can be easily removed to reduce the chance of dents or scratches on the painted surfaces.

To remove the sheet metal, first lift off the top section. Now, the sides can be removed by lifting up and out away from the furnace

Place the furnace as close to the chimney as possible while still maintaining the proper clearances. No more than 10 feet of stovepipe should be used, including two or less 90° elbows. All horizontal runs of pipe should have a minimum 1/4 in. rise per foot. All stove pipe must be 24 gauge or thicker black or blued steel. Do not use galvanized or Aluminum pipe! A properly sized barometric damper is also needed. 6" pipe for 110kbtu furnace and 8" pipe for 180kbtu and 220kbtu furnaces (Note that under some circumstances the AK 180 can be vented into a 6" chimney, please contact your dealer for more information). Type HT (was Class A) / or masonry chimney required for exterior pipe. If a liner is needed for a masonry chimney use an insulated or fill insulation. Should be made of Stainless Steel of at least 316 grade. It is recommended to always check with local code and your insurance company for proper installation.

If no chimney is available a Powervent can be used (SWG 5AF) for the AK110/K180/AK220. Power vents can be purchased from a Leisure Line Dealer. Please note that only a Leisure Line labeled Power vent is authorized for use on these units. Instructions will be provided with the Power vent for installation.

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At least 16 inches (400 mm) in front and 8 inches (200 mm) on either side of the fuel-loading and ash-removal doors. Furnace is to be installed on non-combustible surface. Underneath the chimney connector and extending at least 2 inches (50 mm) on either side of the chimney connector. Non-combustible floor must extend to these dimensions as well.

## **Specifications for AK 110**

48" high x 29" wide x 51" deep

Standard hopper capacity 200# optional 320# available

Side flue 6"

Weight assembled 600# empty

## **Specifications for AK 180**

48" high x 29" wide x 58" deep

Hopper capacity 320# standard

Side Flue 8"

Weight assembled 800# empty

## **Specifications for AK 220**

48" high x 29" wide x 58" deep

Hopper capacity 320# standard

Side Flue 8"

Weight assembled 800# empty

## **Assembly Instructions**

Inventory all parts against the parts list in the front of this manual, lay parts out in an organized way so that they will be easily found during the next steps.

After selecting the side for the flue, break out the perforated panel at the bottom of the jacket. Install the gasket provided on the flue out let and blank off plate. Locate the 5/16 bolts for installation and install the flue outlet and outlet blank off plate. Install the bottom jacket filler plate under the flue outlet. Re-install the sheet metal jacket by sliding the groove on the bottom of each side panel over the steel lip on the furnace. The gap around

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the flue outlet can be sealed with fiberglass gasketing such a rope or thick flat gasket. The top sheet metal piece holds the sides in place. Making sure the jacket insulation is properly in place.

Next install the feeder in the back of the unit, the grate(s) can be removed to make this process easier. Using the 4 (or 6) bolts supplied, tighten just past snug about 80in/lbs. Next install the hopper gasket(s) around hopper opening(s) of the feeder. Set the hopper on top of the feeder and locate the angle reinforcement with ¼" carriage bolts and cover plate. Install the ¼-20 carriage bolts into the keyhole slots in the back of the furnace while verifying that the trim plate covers the keyhole slots, the angle support goes inside the hopper, tighten the nuts snug.

Mount fan extension box to fan using ¼-20 bolts and nuts supplied . If you are installing the cold air return box assemble to the fan assembly now (instruction sequence video available at <https://www.leisurelinestove.com/owners/videos/> ). Filter is removable by sliding it to the front or rear after removing holding tab.

Select what side of the hopper you want the thermostat relay module to mount. Secure the relay box bracket to the side of the hopper at the bottom using supplied self-drilling screws (The holes can be predrilled to make it easier). Make sure to maintain 1.5"- 2", from back of furnace to the edge of the box. Ensure that no metal shavings from this operation enter the relay module box. Feeder motor(s) and combustion blower(s) can be wired at this time using blue wire nuts supplied. Red wires are for feeder gear motor, Blue wires are for the combustion blowers. If you are wiring a 220kbtu the red w/white trace and blue w/white trace are for 2<sup>nd</sup> feeder Route the conduit neatly and out of the way. Next install the convection fan to the furnace using ¼-20 bolts with fender washers. Plug convection fan into control module. All plenums installed to the furnace to be constructed of metal only. The warm-air supply-duct system to be constructed of materials with a minimum temperature rating of 250°F.

Install the thermostat in the room you want the temperature to be the most consistent run the supplied thermostat cable the best route possible factory cable is 25ft optional cables can be purchased 50' 75' and 100'. Or you can use cat 5 Ethernet cable make sure it is straight through configuration. See Coal-Trol user manual for further information. Or more info can be found at manufactures website, <https://www.automationcorrect.com> .

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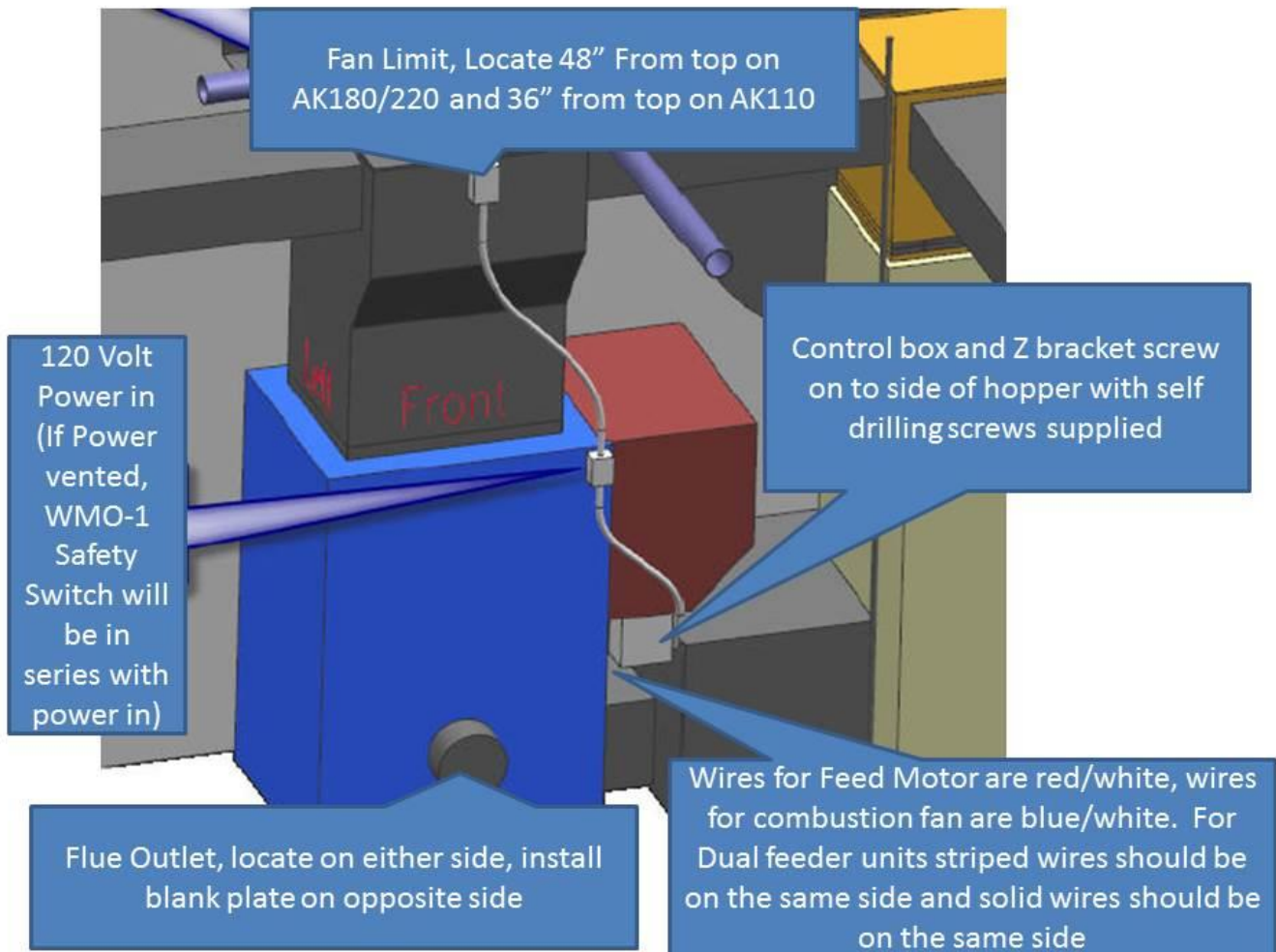
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**Figure 1 Furnace Assembly Overview Diagram**

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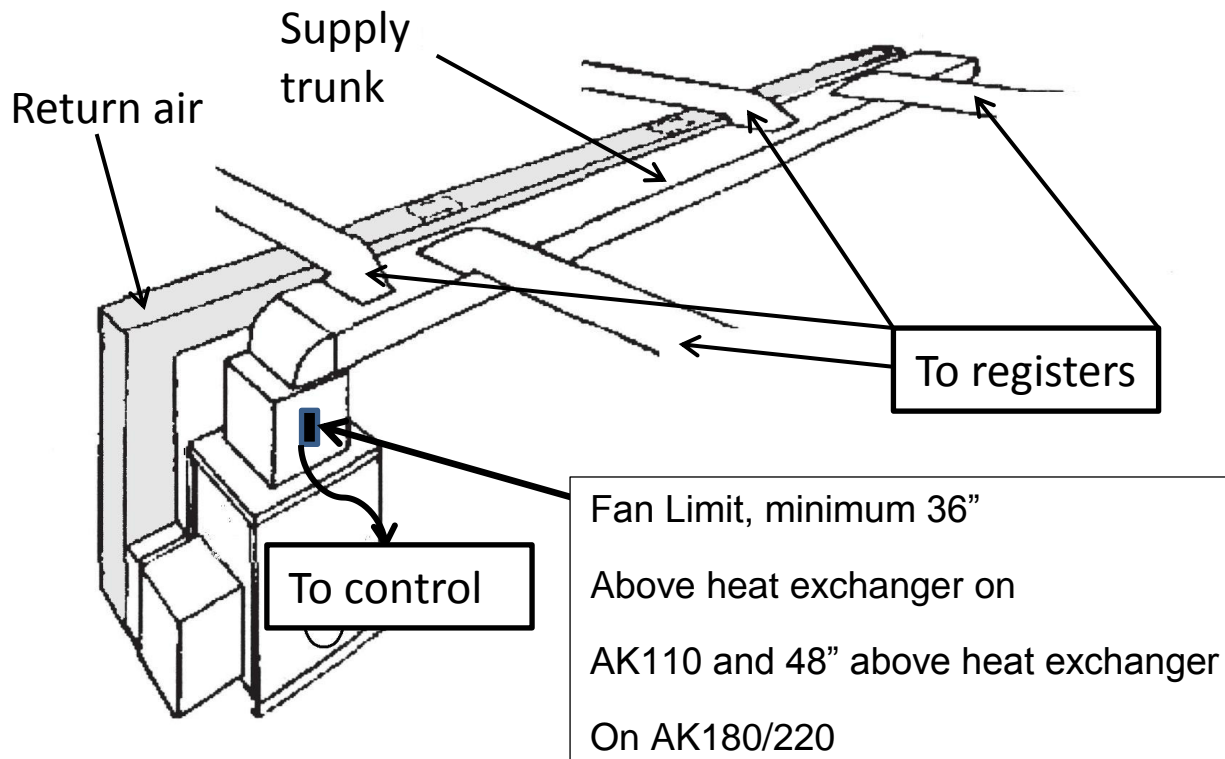
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**Figure 2 Typical Duct Layout and Fan Limit Location (for reference only)**



**NOTE:** This is to be used as example only, if necessary consult an HVAC professional for correct install instruction

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## **Important Warning Statement**

Improper installation, adjustments, alterations, service, or maintenance of your Leisure Line Furnace or Power Venter can cause property damage, personal injury or loss of life.

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

Proper permits and inspections should always be obtained.

If applicable, please make sure you notify your insurance company before placing your stove into service.

Stove must be placed on a non-combustible surface.

UL ratings on all Leisure Line stoves and Power Venters are dependent on sufficient clearance as defined on the label on the rear of your stove and in this manual.

All stoves must utilize a Barometric Draft Control such as the Field Controls Type RC Barometric Damper, the weights should be adjusted to obtain a -.03" to -.05" water column negative pressure in the flue pipe at the stove outlet. Draft should be checked using a draft meter or manometer. Over fire pressure can be checked by drilling a small 1/4" hole in front of furnace usually below the top door and just above the bottom door. It should be -.02 to -.03 water column no lower than -.01. Combustion air is pre-determined by blower size and should be correct from the factory, if it is necessary combustion air can be reduced by adjusting the block off plate covering part of the intake side of the combustion blower. Caution!! Do not increase blower size for increased firing for any reason

Utilize a magnetic thermometer to ensure that furnace body temperature does not exceed 500\* F.

If fans are installed in the storage area they should not create negative pressures in the room where the solid fuel-burning appliance is located.

Outside combustion air may be necessary if:

1. The solid-fuel-fired appliance does not draw steadily, smell, experiences smoke roll-out, burns poorly, or back-drafts whether or not there is combustion present.
2. Any of the above symptoms are alleviated by opening a window slightly on a calm day.
3. The house is equipped with a well-sealed vapor barrier and tight fitting windows and/or has any powered devices which exhaust house air.
4. There is excessive condensation on windows in the winter.
5. A ventilation system is installed in the house.

There are kits available from many suppliers run duct from outside air source as close to combustion blowers as possible. Kits are available from most hearth shops and HVAC companies.

## **Operating Instructions**

### **Lighting the furnace for the first time**

Use only quality anthracite coal. Rice size is recommended, buckwheat can be substituted if rice is not available. **Do not use wood pellets or any other fuel besides Anthracite coal of proper size.**

1. **Caution there will be situations where there will be hot temperatures capable of causing severe burns. Please wear a good heavy pair of gloves when necessary. Leather welder gloves work well. Also there will be**

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**fumes and some smoke while the paint cures it should be minimal but may be necessary to open doors or windows while this happens.**

2. Set set-point temp on thermostat to 5 or 10 degrees below room temp to get the FR to 0
3. Install ashpan
4. Install firestop ring at the end of the grate
5. Place starter bag on grate
6. Put desired amount of coal in the hopper
7. Make sure to cover the starter bag with coal
8. Light starter bag, not important to get a flame just as long as it has embers.
9. Close fire door
10. Turn on switch to Coal-Trol module
11. After about 10 minutes knock starter ring into ashpan it can be removed later after it cools
12. Refer to Coal-Trol manual for further setup, now is the best time to set the Min and Max fire
13. Check the furnace to make sure things is operating as they should.
14. Adjust the fan limit per the next paragraph
15. Check draft with draft meter. Or use instructions supplied with barometric damper if type with calibrated scale. Draft should be set to between -0.03 to -0.05 between barometric damper and unit.
16. Combustion air if found necessary to adjust is done by limiting the inlet air to the combustion blower(s). If the blower is equipped with a block off plate use it as a shutter and block off as necessary to see desired readings on the gauge. If not already equipped with a block off plate foil tape can be used as an alternative.
17. Enjoy the heat while saving money and using an American fuel burned in an American Product



**Typical block off plate on fan to clarify action in step 16 above.**

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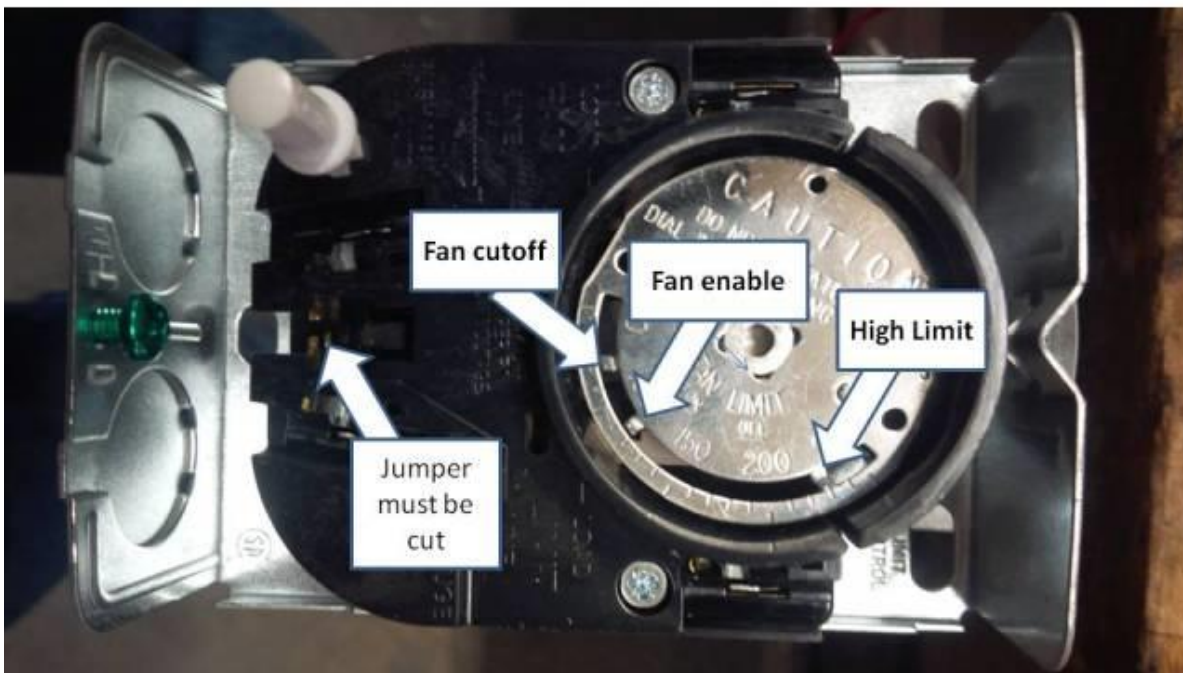
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## **Adjusting the Fan Limit**

The following guidelines are general recommendations and not always the best for your particular setup. You can start here but be prepared to adjust as needed to get the most out of your furnace.

1. Adjust fan cutoff to between 80 and 90°F
2. Adjust fan enable to between 95 and 110°F
3. Verify/adjust high limit to match your ductwork max temperature (we set at 250°F during assembly)

: Fan cutoff is the point the fan is no longer enabled usually set 80\* or 90\* < Fan will stop  
: Fan enable is the point the fan is enabled usually set 90\* to 110\* > Fan is allowed to start  
: High Limit is the safety. If the plenum exceeds setpoint the feeders are disabled and convection fan will run in high speed. Usually set at 225\* or higher.



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## **In Season Maintenance**

Ashes should be placed in a metal container with a tight fitting lid. The closed container of ashes should be placed on a noncombustible floor or on the ground, well away from all combustible materials, pending final disposal. If the ashes are disposed of by burial in soil or otherwise locally dispersed, they should be retained in the closed container until all cinders have thoroughly cooled."

Lubricate combustion fan (view "where are my oil holes" in video section) once or twice during season.

Inspect flue pipes, Joints and seals regularly to ensure flue gases are not drawing into and circulated by the air circulation system. Also check the pipe for fly ash blockage where it meets the combustion chamber. A Sulphur smell or moisture under the hopper lid is indication of a draft issue likely caused by blocked flue pipes.

If equipped with a power vent follow the manual provided with the power vent for lubrication and cleaning of the unit.

## **End of Season Maintenance**

Cleaning of the heat exchanger, flue pipe, and chimney / powervent system must be done at the end of every season to prevent corrosion during the summer months caused by accumulated ash.

Remove grate and clean fines under

Additional Maintenance Info can be found by visiting:

<https://www.leisurelinestoves.com/owners/videos/>

And <https://www.leisurelinestoves.com/owners/manuals/>

## **Spare parts**

Generally speaking the motors on your furnace are the first items to fail, the feeder motor is the most common failure point and should be purchased as a spare item. Next on the list is the combustion fan which runs 24-7 and is located in one of the dirtiest places on the furnace. The next item to keep as a spare would be the convection fan motor, these generally last in excess of 10 years with proper cleaning and oiling.

Spare fuses for the Coal-trol are a must and should be kept near the black box that attaches to the hopper for easy access. In the case of a blown fuse the motors should be individually checked in a power outlet before the fuse is replaced to help determine the cause.

Purchase of these parts can be accomplished through your local dealer. If you do not have a dealer near by or your dealer does not stock the parts you can purchase them directly from the factory at suggested retail plus shipping and handling on our web site: <https://www.leisurelinestove.com/parts-accessories/> . Warranty items will be credited at the time the old part is received and warranty coverage is verified. The form to return parts is located here <https://www.leisurelinestove.com/owners/warranty-information/> .

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## **Troubleshooting**

The electrical schematics for your furnace are located here:

<https://www.leisurelinestoves.com/owners/manuals/>

The coal-trol flow chart for diagnostics is available at the above web page and there is also a video on the video page showing how to put the unit in the test mode to check outputs. The most common issues are listed below:

Problem	Cause	Solution
Unit shuts off coal feed and runs fan on high	High limit exceeded	Locate high limit per figure 1 and/or check adjustment of high limit
Sulphur smell or moisture under hopper lid	Draft issue	Check flue pipe for blockage, adjust combustion fan block off plate if weather is warm
Power switch on control does not illuminate	Fuse open or switch is bad on CM-2 Module	Check for 120 VAC at fuse and to circuit board, replace parts as needed
Red Coals are falling off grate at high feed rate	Max too high on Coal-Trol or combustion air blocked	Adjust max feed in TS-2 thermostat set-up menu, check combustion air block off plate, open if closed more than half,
Fire goes out when feed rate is zero	Min too low on Coal-Trol or blockage in hopper	Adjust min feed in TS-2 thermostat set-up menu, check hopper outlet to feeder
Feed Motor runs continuously	Coal-Trol CM-2 Module relay is stuck closed	Replace feed gear motor and CM-2 module
Feed gear motor, combustion fan, and convection fan or any of them are not working	Faulty motors or faulty thermostat cord	Test each motor individually with power, use a short ether net cord to test outputs using the test mode on the TS-2 thermostat

NOTE: Check the website before starting any troubleshooting activity for the latest version of the manual and any updates.

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