Installation and Servicing Instructions

Janfire NH/Integral Pellets Burner with External Auger

For heating contractors. Please read carefully prior to installation and servicing.

Due to constant development, Janfire AB reserves the right to change part or parts of this publication at any time without notice.

Contents

1 Safety Instructions

1.1 General Information

Read the safety instructions carefully before installation. Always follow the safety instructions during installation and during maintenance. Follow the safety instructions on the warning signs!

Installation, operation, service and any other work should be carried out by certified and trained personnel and in accordance to local standards and regulations.

When unpacking, the burner should be checked for any damage. If any parts are damaged contact the installing contractor.

The local chimney sweep must be informed, an examination of the existing chimney must be performed per NFPA guidelines and a local building application may be necessary depending on local code requirements.

Before using the system, it must be controlled and fine-tuned. Adjustments and readings are made during start up. These observations should be written into the installation protocol section of this manual.

NOTE: Always follow these instructions for installation, operation and service.

NOTE: For personal and operational safety: Use only spare parts, which have been manufactured or approved by Janfire AB.

1.2 Conventions

These safety instructions use the following protocols:

- DANGER!

The text “DANGER!” is used when there is a risk for personal injury or death.

- WARNING!

The text WARNING! is used when there is a risk for damaging the product, unit or control box etc.

- CAUTION!

The text CAUTION! is used when there is a risk for a system failure, operational stop, or disturbances etc.

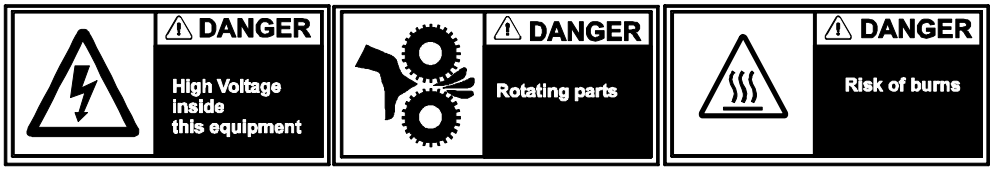
The warning texts are in hierarchical order. The text “DANGER!” also includes the possibility of the events covered by “WARNING!” or “CAUTION!”

1.3 Safety Instructions for Installation and Service

All electrical installation and service should be carried out by qualified personnel and in accordance to local electrical standards and codes.

All plumbing and piping connections should be carried out by qualified personnel and in accordance to local standards and codes.

All boiler cleaning or chimney cleaning should be carried out by qualified personnel and in accordance to local standards and codes.



1.4 Safety Systems

The following safety systems are included in the Janfire NH pellet burner:

- A non-combustible drop shaft protects against reverse combustion.
- A temperature sensor in the drop shaft gives a reading which, if exceeds 158°F (70°C) reduces the burner output. If the temperature exceeds 203°F (95°C), the burner shuts down.
- A flexible tube of special plastic.
  The tube between the external feeding auger and the burner is constructed of a special plastic material, which melts (not burns) at high temperatures and breaks the contact between the pellet feeding auger and burner.
- Circuit breaker/Door switch
  The burner is equipped with a micro-switch circuit breaker, which prevents the burner from operating when detached from the boiler.
- Two electrical fuses to protect electrical components from over current draws.
- A 10 Amp resettable fuse is located above burner wiring terminal to protect internal electronics.
- A 15 Amp fast blow fuse protects the ignition heating coil.
- Speed sensor on the fan monitors fan speed.

NOTE: The Janfire NH pellets burner should have ample clearance in accordance to local codes.

1.5 Compliance Declarations

The Janfire NH burner has been tested and approved for use with the MESys 4000 and 6000 boilers and meets the UL 391-2006 and CAN/CSA B366.1-M91 standards. All electrical components of the Janfire NH burner are UL approved.

2 Technical Data

Janfire NH Pellet Burner	
Burner output capacity	10,000 – 78,000 Btu/hr (3 – 23 kW)
Maintenance output	2,000 Btu/hr (600 W)
Burner power consumption	80 W, 120 V AC, 60 Hz
Automatic ignition coil	1100 W
Pellet storage volume	Internal storage: .75 gal (4 lbs) (3 litre = 1,8 kg)
Internal dosage motor	120 VAC, 60Hz
Combustion fan	Variable speed operation
Self-cleaning burning chamber	120 VAC, 60Hz
Control panel	Touch-button
Fuses	- 10 Amp circuit breaker (reset table) - 15 Amp fast blow fuse
External auger	1-phase 120 V AC, 60 Hz, 250 W, 4 A, External auger cannot exceed 14 ft (4.30 m).
Weight	55 lbs (25 kg)

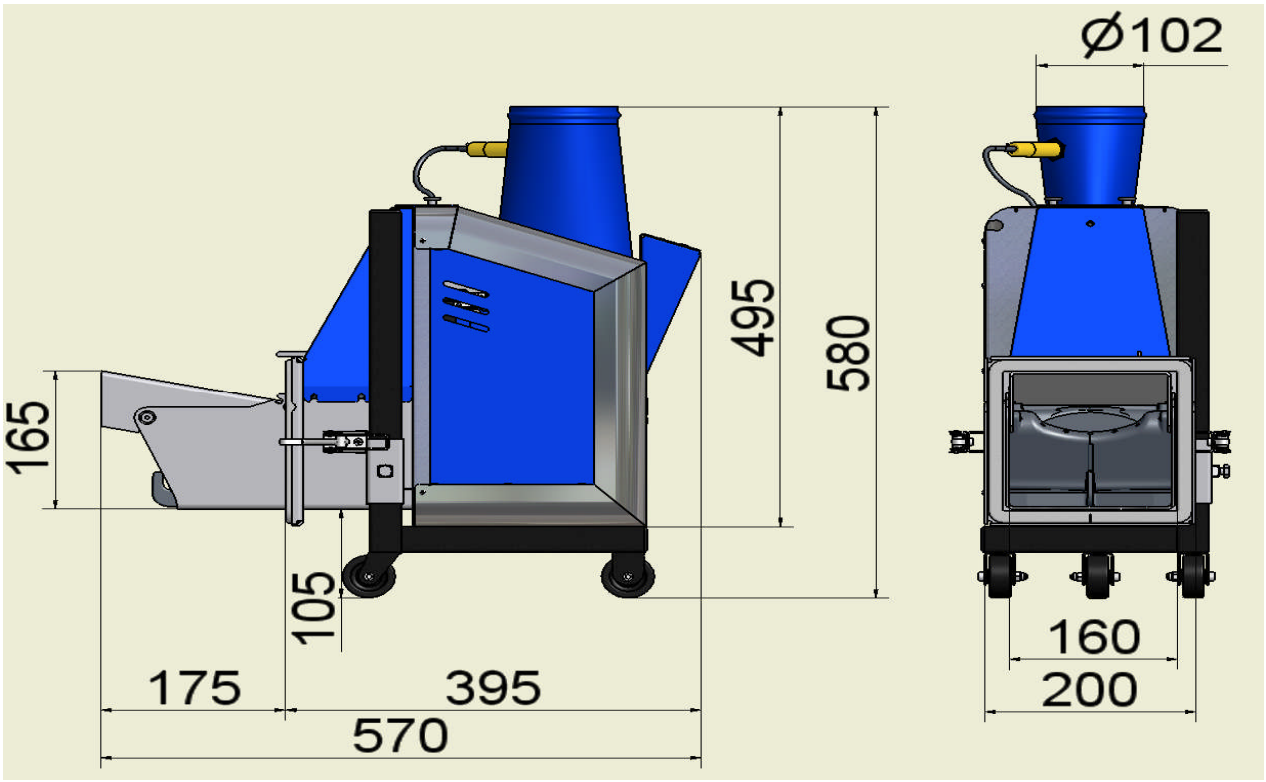


Figure 1. Dimensional drawing NH-burner (All measurements in mm)

3 Operational Description

An external auger feeds pellets from an external storage bin to a receptacle located in the top of the burner (internal hopper). An internal dosage auger then feeds the pellets to a drop shaft where they fall freely into the combustion chamber or burning bowl/cup; this eliminates the possibility of reverse combustion.

A variable speed fan supplies the burner with primary and secondary air. On its way to the burning cup the air cools heat-exposed parts of the burner. The correct amount of air is then fed to the burning cup for primary and secondary combustion. The ignition coil preheats the air for automatic ignition. Burner up sensor (flame guard) detects pellet ignition. If ignition does not take place, then the process repeats itself automatically and a new ignition attempt is made. If ignition still does not take place after a pre-set number of trials, then the burner shuts itself down.

If the draft is insufficient then the hot flue gases will rise into the drop shaft. The temperature sensor in the drop shaft will detect this rise in temperature at **158°F (70°C)**. The burner will compensate by reducing the burner output, thus eliminating the risk for reverse combustion. During this operation, the control lamp changes color to yellow to indicate that the system is running in back-up level and the wording ”low chimney draft” will appear on the display screen.

If the drop shaft temperature rises to the highest allowed level **203°F (95°C)** then the burner will shut down based on this temperature reading from the drop shaft temperature sensor. The control lamp will turn red and the wording “Overheated” will appear on the display screen.

The burner input is controlled by a PID regulator using the boiler water temperature as input. Temperature is measured with a PT-100 sensor placed in the boiler sensing well. The burner input is modulated automatically between adjustable limits. The Min and Max input levels can be set from 10,000 to 78,000 Btu/hr (3 - 23 kW). If no PT-100 sensor is connected to the burner, the burner input is controlled by pre-programmed ouput levels, which are regulated with help of a thermostat. Except for the standby level of about 2,000 Btu/hr (600 W), the burner input can be set between 10,000 to 78,000 Btu/hr (3 – 23 kW) in increments of 3,000 Btu/hr (1 kW). These burner input levels are based on a pellet weight density of 5.77 lbs/gal (= 42.17 lbs/ft3 or 675 g/litre) and an energy content of 7,420 Btu/lbs (4.8 kWh/kg). To adjust for variations in the burner input and combustion levels when using pellets with another weight or energy content the levels can be changed here. The different levels can be fine tuned to produce the best overall combustion result.

High quality pellets produce high efficiency and output. High quality pellets are solid wood pellets ¼” – 3/8” (6-10 mm) in diameter with little sawdust. Moisture levels should be no higher than 10%, ash content no higher than 1% weight, and energy content expressed as European Net Heat Value (ENHV) should be about 7,290 – 7,750 Btu/lbs** (4.7 - 5.0 kWh/kg). Always verify the energy density and weight density values for the pellets upon delivery.

****Note:** Contact your pellet supplier regarding the dry matter energy value, or European Net Heat Value (ENHV), which is discounted for pellet moisture content as the Janfire NH burner requires this specific value. US PFI (Pellet Fuel Institute) pellet standards at this point do NOT record this value and the PFI energy content value can NOT be used directly.

A patented moving base of the burning chamber scrapes away slag and waste material, feeding it into the boiler firebox. The burner automatically cleans itself according to a signal from the boiler thermostat or based on pre-programmed intervals (pellets consumption – 40 lbs.).

PID regulator – function description

The PID regulator is commonly used to control processes in an efficient way. Here the PID regulates the burner power level to reach the desired water temperature in the boiler. If the needed power is less than the minimum power of the burner the temperature will increase to the upper temperature setting and the burner will go to maintenance fire position.

The regulator works with three factors:

P – Proportional power to temperature difference
I – Integrating power over time due to temperature difference
D – Differential power, due to rapid changes in temperature

For P and I factors, the difference between actual temperature and target temperature is used to calculate the power output. If the actual temperature is 140°F (60°C) and the target temperature is 163°F (73°C), the difference is calculated as 23°F (13°C).

The D-factor compares the actual temperature to the temperature at the last control position. If there is any difference, this will be multiplied with the D-factor and the burner power will change thereafter.

The result from the above values will be added together to calculate the new required power output level for the burner.

Example:
Nominal power, start up power: 20 MBTU
Regulation interval: 1:00 min
Power level min: 20 MBTU
Power level max: 51 MBTU
P-factor: 10000%
I-Factor: 500%
D-factor : 0%
Boiler temperature: 140°F (60°C)
Target temperature: 163°F (73°C)

Temperature difference = 73 – 60 = 13
P = 10000% x 13 = 1300
I = 500% x 13 = 65
D = 0% x 0 = 0

Sum of P + I + D = 1365.
This added to nominal, start up, power 600 (6kW, 20 MBTU) 1365 + 600 = 1965. The output is in units of 10 W so 1965 will be (19.6 kW) 67 MBTU. Since the maximum power level is set to (15kW) 51MBTU, the power will be limited to that. The integrating (I-value) memory starts with nominal power, and will get the new value of 665.

If the boiler temperature is higher than target, the P- and I-factor will decrease power output.

The PID regulator will come in balance when actual and target temperatures are equal. The P factor will then be 0 and the integrating memory will hold the power level.

The P factor determines how much power the burner will provide due to a temperature difference.

The I factor specifies how fast the burner will increase / decrease power over time.

The D factor is often used in fast processes to stop controller from over shooting. It is not very usable in this slow process.

The control interval determines how often calculations and changes in burner output settings are made.

Power modulation

In order to modulate burner output, a PT-100 sensor measuring the boiler water temperature must be connected. PID Control must be activated, “service menu 66”.

The modulation power is used to achieve longer working periods, minimizing the number of starts and stops. The settings should be made so that the burner rapidly reaches target water temperature, and so that burner power will be sufficient to take sudden increase in power consumption. The settings should also be able to decrease power levels fast enough when target temperature is reached so that a balance in power is achieved. The settings should let the burner operate within 10 – 18°F (6-10°C) beyond the target temperature before it stops, as this range is required to handle changes in power output.

Thermostat hysteresis is set in "Service menu 64 –Differential below target" and "Service menu 65 – Differential above target". Default PID factors are P = 20,000%, I = 2,000% and D = 0%. These setting can be used in most cases. If PID is inactivated, OFF in "service menu 66", the burner works with the nominal, start-up, power level. If no PT-100 sensor is connected the service menus 64-70 will be hidden and the burner will be controlled by the thermostat and work on nominal, start-up, power level if "External thermometer – YES" selected.

Outdoor temperature modulation

In order to modulate boiler water setpoint temperature, a second PT-100 sensor measuring outdoor temperature must be connected. (Standard supplied with the burner.)

Outdoor temperature will control boiler water temperature as follows:

68°F (20°C) or higher outdoor temp: Boiler temperature is equal to 140°F (60°C).

-4°F outdoor temperature or below: Boiler temperature equal to 185°F (85°C).

This function is active only if "Outdoor temp controls, service menu 78" is set to "YES" and the "Extra input as", at service menu 77 is set to "Outdoor".

The outdoor temperature is sampled every 5 or 10 minutes, "service menu 79" and an average value is calculated. This value is compared with the last sample, and a new target temperature is set if value has changed. Maximum allowed change for target value is 1.8°F (1°C) each sample period even if calculated change is greater.

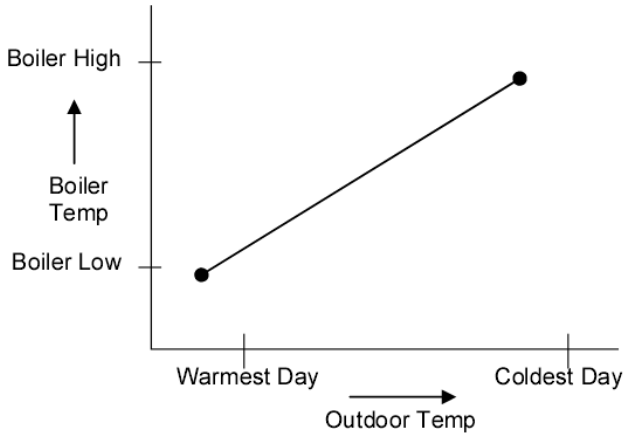


Fig. 2

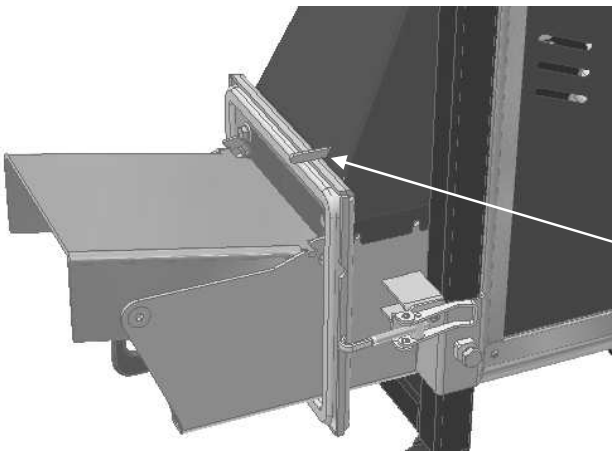
The factor set heating curve is defined by parameters 81 – 84. One defines beginning and end points of the heating curve by listing 2 boiler water and corresponding outdoor temperatures. These 2 data points define the heating curve. Refer to service menu points 81 – 84 for details.

Fitting Instructions for Outdoor temperature sensor

Location: If the rooms which temperature is to be regulated all face the same direction (same cardinal point) the temperature sensor has to be placed on that side.

In any other case, see to it that the temperature sensor is placed on the coldest side of the building (north, northeast).

The temperature sensor is not to be fitted over windows or doors because of outstreaming warm air, neither should it be placed in a recess (niche) in the wall.



A micro switch prevents the burner from operating when detached from the boiler bulk head.

Figure 3. Micro switch

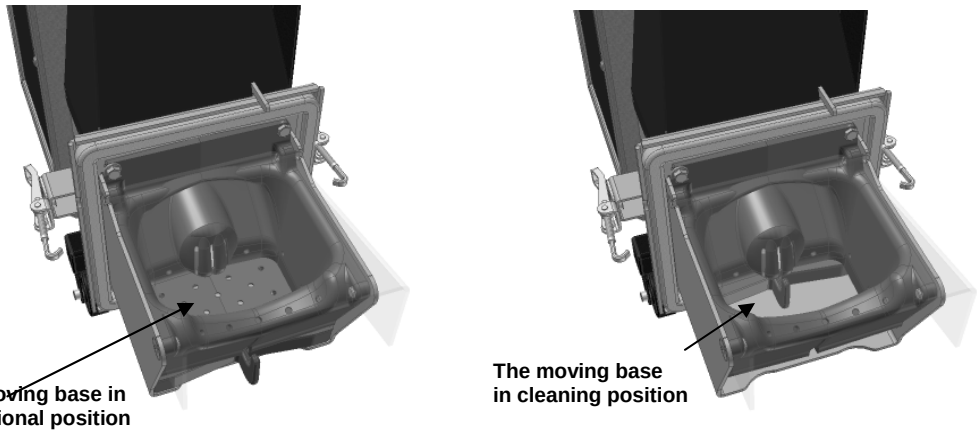


Figure 4. Ash scrape moving base

The moving base of the burning chamber scrapes away slag and waste material, feeding it into the boiler firebox based on pre-programmed pellets consumption.

Pellet boiler and NH pellet burner system complete with fill auger and pellet storage.

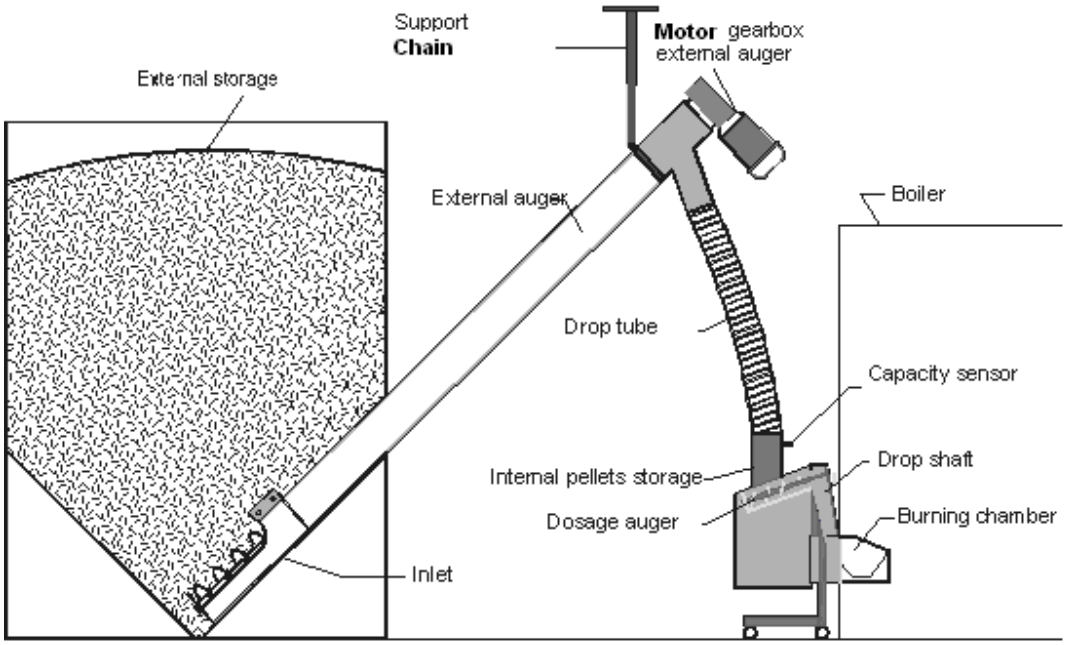


Figure 5. Function description

4 Boiler Installation

4.1 Boiler Evaluation

Before the burner is installed the following aspects should be considered:

- The boiler desired output level
- Premium pellet energy density and volume density

Ash container

Ash is collected at the bottom of the boiler without disturbing the flow of flue gases. The boiler convection areas absorb the heat from the passing flue gases. These areas should periodically be cleaned with a brush. The MESys 4000 – 6000 boiler is a low pressure hot water boiler and the fire box pressure should be about -10 Pa (-.04 inches WC) at full fire operation. An adjustable barometric damper must be used to limit draft.

Water volume

The water volume of the boiler bears no great importance. Because a thermal storage or DHW tank with heating coil is recommended as it will cause the burner to run more effectively with longer combustion periods and fewer start ups and shut downs.

Manual Reset High limit control and low water cut-off

NOTE: A manual reset high limit temperature control and manual reset low water cut-off must be used as additional safety controls in addition to the PT-100 burner controller. The manual reset high limit control will shut down the electrical supply to the burner in case of a high temperature condition. The low water cut-off shuts down the burner in case of a low water condition.

Combustion Air

The Janfire NH pellet burner requires ample fresh air for combustion to ensure proper operation. Check ventilation openings for blockages.

Ensure required size of free combustion air opening(s) in sq. ft. to be at least equal to three times the cross sectional area of the chimney.

IMPORTANT NOTE: Make sure that the boiler room has adequate combustion air and that this space can NEVER be pulled into a negative pressure condition. Check the following:

- Keep fire place dampers closed at all times to avoid negative pressure.
- Make sure that power venters, exhaust fans, central vac systems and other air moving equipment do NOT interfere with the pellet burner operation.

4.2 Mounting the Burner

The boiler lower front door has a pre-made opening for the burner.

1. Locate the eyelets shipped with the burner.
2. Screw in the eyelets into the tappings directly adjacent to the burner bulkhead opening.

3. Unpack the burner and remove plastic transporter handle. Check the integrity of the burner/ boiler sealing braid.

   NOTE: To achieve the best output from your system the boiler must be airtight. The sealing gasket between boiler and burner must be airtight to stop any extra air from entering the system.

4. Check if flame deflector is in place and place the burner into the boiler; adjust eyelets on the boiler bulkhead then lock burner in place.

   NOTE: Make sure that the burner door insulation remains intact after burner insertion. Add high temperature insulation (not supplied) if necessary between burner flame deflector and burner door insulation.

5. Adjust the burner's height by releasing the locking screw and lowering the support wheels. Tighten the locking screw when the correct height is achieved.
6. Attach the burner electrically to the boiler aquastat according to Fig. 15 electrical wiring diagram.
7. The NH pellet burner is supplied with an outdoor sensor and boiler sensor. Attach the common sensor wiring box to the right side of the boiler. Route the boiler sensor underneath the boiler top jacket panel to the boiler well located in the top of the rear boiler section.
8. Combine the NH burner boiler sensor along with Honeywell capillary and blocking spacer into the immersion well. Make sure all sensors are fully inserted into the well. Screw Honeywell aquastat to top of jacket panel. (see Fig. 6)

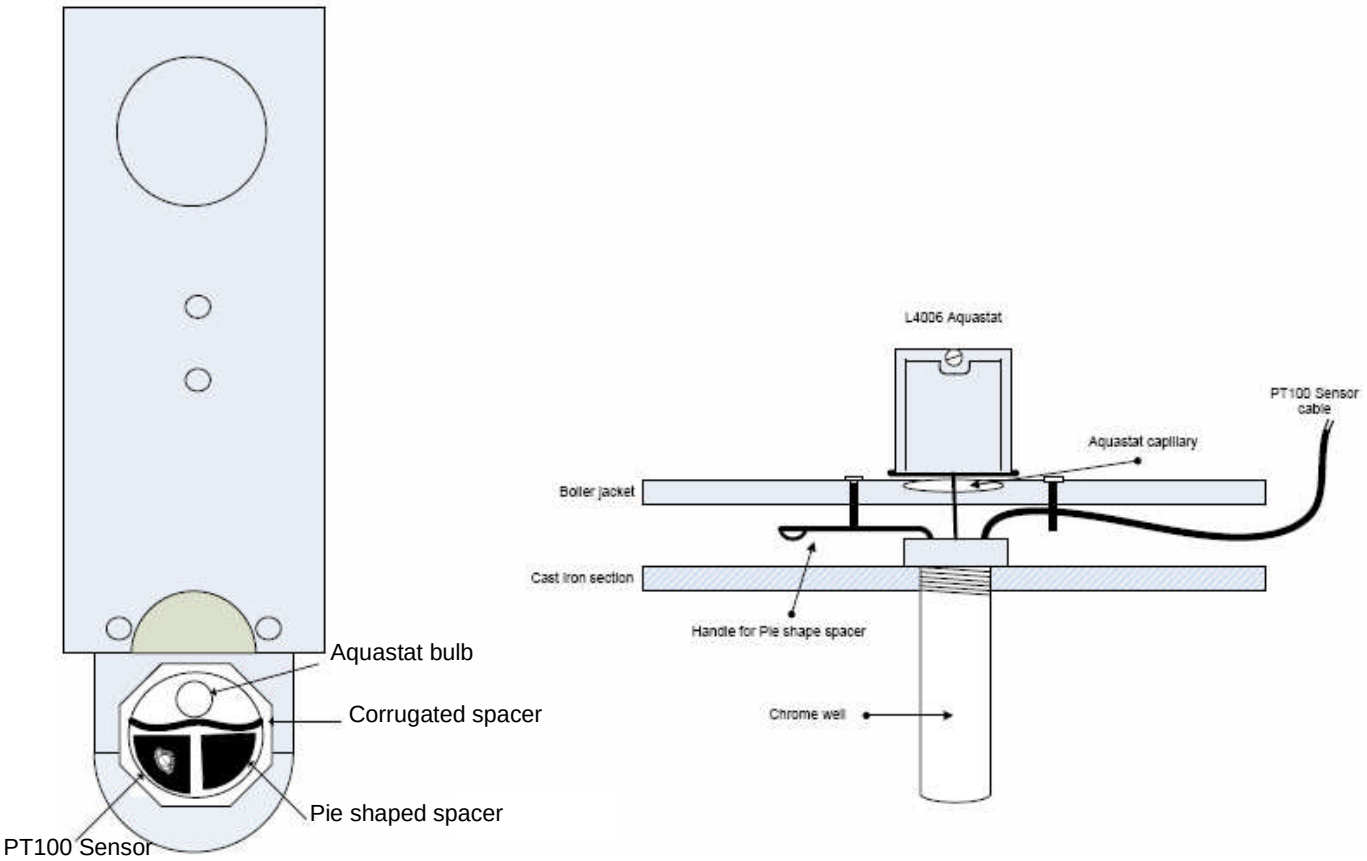


Fig. 6 – Well Assembly

9. Route the outdoor sensor to a location on the north side of the house. Splice in shielded low voltage wire if additional length is required. Make sure to locate the sensing element out of direct sunlight, away from rain and direct weather exposure and well above the snow line.

NOTE: A manual reset high limit temperature control must be used as an additional safety control in addition to the PT-100 burner controller. The manual reset high limit control will shut down the electrical supply to the burner during a high temperature condition. Refer to Fig. 15, pg. 37 for wiring instructions.

All electrical installation and service should be carried out by qualified personnel and in accordance to local standards and codes.

4.3 Mounting and Elongating the Extension Auger

1. Mount the auger according to Figure 7 Auger attachment

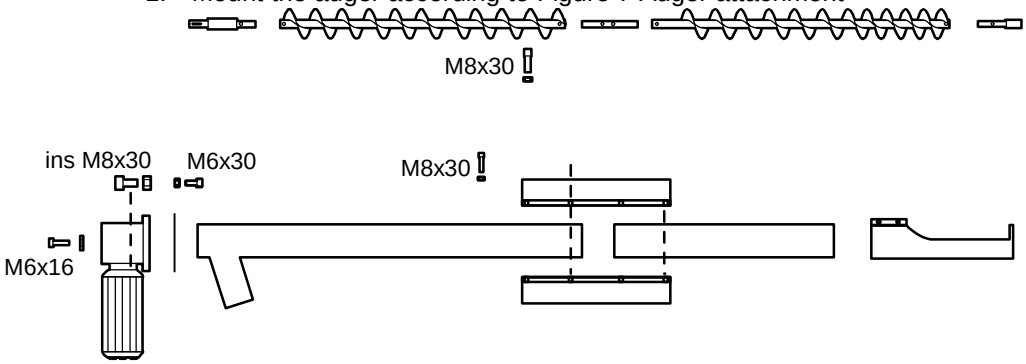


Figure 7 Auger attachment

NOTE: The more compact part of the auger should always be mounted at the end of the external auger.

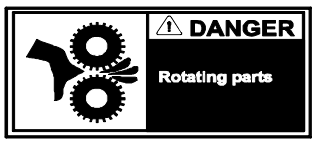
NOTE: In no circumstances shall a vacuum feed pellet delivery system be installed to the burner.

2. Adjust suspension chain of external auger so that auger outlet is only slightly offset above the internal hopper of burner with burner in place (see Figure 5. Function description). Make sure the burner drop tube is nearly vertical.

NOTE: Ensure secure mounting to avoid risk for the auger to fall.

3. To maximize emptying of the external pellet storage, the inlet of the auger should be placed as centrally in the storage bin as possible.

4. Connect the 3-wire cord contact from the burner to the corresponding terminals on the external motor (See Fig. 15 for wiring instructions). Check proper rotating direction of feeding auger; refer to auger motor wiring for rotation reversal.



NOTE: Do not touch the dosage auger or the external augers in or outlet openings when the external feeding motor is connected.

Fasten the drop tube to the external auger outlet and to the burner hopper inlet with the supplied hose clamps, use a little soapy liquid on the inside of the tube to ease the sliding. Avoid sharp bends or slack in the drop tube that can cause a blockage in the external auger. Cut off excess length with a sharp knife.

4.4 Pellet Level Adjustment

The level control for the burner is pre-programmed. Its sensitivity can however be affected during transportation or after operational time (about 2 weeks) and may require adjusting. In all cases, at start-up, perform the steps below to ensure sensor sensitivity compliance.

1. Stop the burner. The main circuit breaker must be turned on so that there is operational power.
2. Loosen and remove the drop tube from the burner inlet.
3. Test with your finger to see if the diode lights up at a distance of 3/8" (8-9 mm), see Figure 8 Level adjustment below.
4. Use a screwdriver and unscrew the cover plug, as you now can reach the adjustment screw. Turn the screw inside the hole until the correct distance is reached 3/8" (8-9 mm). Counter-clockwise rotation reduces sensitivity; the sensor reacts at a shorter or reduced distance. Clockwise rotation increases the sensitivity; the sensor reacts at longer distances.

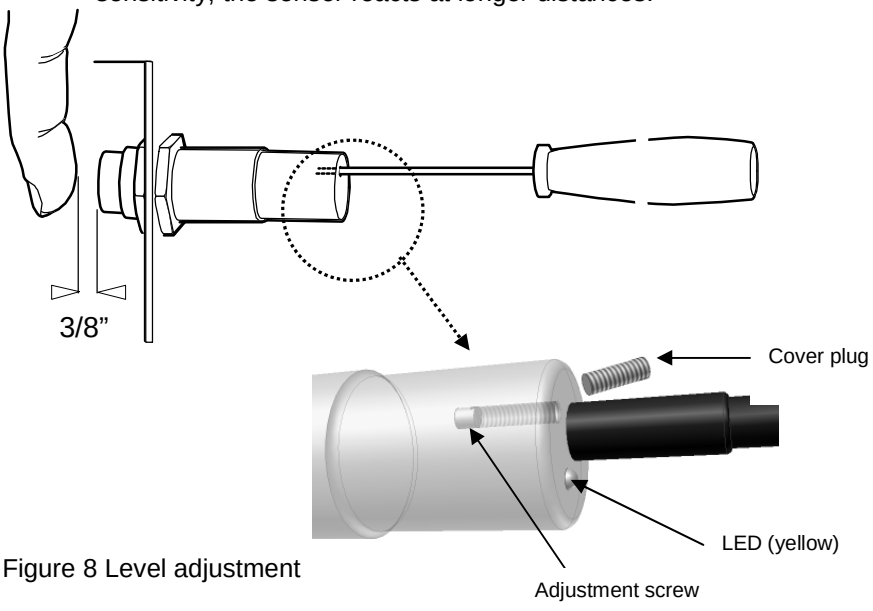


Figure 8 Level adjustment

NOTE: The adjustment screw is very sensitive and requires no more than a few degrees of rotation in either direction. Be very careful not to turn screw too hard.

5. Reinstall the cover plug and drop tube and secure with the furnished clamps.

4.5 Pellet Volume Density Adjustment

To achieve good combustion and the least amount of exhaust products, it is very important to indicate the correct volume density of the pellets. The correct value can be supplied by your pellets supplier or by weighing.

The average weight per litre of pellets is 5.77 lbs/gal (42.17 lbs/ft3 or 675 gr/liter). When adjusting this value, the dosage time is also changed (automatically) to compensate accordingly, resolve discrepancies and to ensure good combustion.

If the weight setting is not correct, poor combustion will occur. Tar can build up in the combustion chamber and burning cup and malfunction could be the result.

To weigh pellet fuel sample: Fill a 5 gal container with pellets and weight it on a scale. Make sure to subtract the empty weight of the container. Compute net weight per gal by dividing by 5. Record net weight in lbs. Multiply now by 7.31 to get lbs/ft3 and program this value into the NH burner.

To change the weight density setting: Scroll or repeatedly push the “menu” button until you come to “Volume Weight xxx lbs/ft3” and change by pushing the “-“ and “+” buttons.

To save the new weight density setting: Press and hold down the “menu” button for 3 seconds.

4.6 Pellet Energy Density Value (ENHV)

To achieve good combustion and reduced exhaust gases, the correct energy density value for the pellets is required and must be inputted into the burner. Your pellet supplier can supply this information.

The European Net Heat Value (ENHV) for a pound of pellets at 100% dry matter is expressed as 7.420 Btu/lbs (4.80 kWh/kg). Always check with your pellet supplier regarding it’s ENHV value! When this value is changed in the burner controller, the dosage auger feeding time is also changed (automatically) to compensate for any deviations in the energy density value and to ensure good combustion.

To change the energy density value: Press the menu button repeatedly until “Energy density xxx Btu/lbs” is shown and change its value by pressing the “-“ or “+” buttons.

To save the energy density value: Press and hold down the “menu” button for 3 seconds.

Selection of NH Burner Output Value.

WITH PT-100 boiler water temperature sensor:
In this mode the burner output will modulate between two preset limits by using the PID regulator. The modulation function can be inactivated in menu step 66. If modulation is inactivated, the NH burner will run at a fixed output level, see text below.

To select the max firing rate: nominal effect level: Press “menu” button repeatedly until “Select powerlevel. Xx Mbtu” is shown. Change its value by pressing the “-“ or “+” buttons. The output can be adjusted between limits for modulating effect in steps of 3,000 Btu (normal 20,000 – 78,000 Btu/hr).
To save new value: Press and hold down the “menu” button for 3 seconds.

The max firing rate is the starting point for the burner when running in modulating mode.

4.7 Pellet Filling Before Starting the NH Burner

The external auger can only feed the pellets to the burner if the external storage tank pellet level is above the external auger’s inlet.

1. Fill the external storage.

2. Fit burner to the boiler by using the quick locking latches on each side. Make sure that the gasket between burner and boiler door is tight when the door has been locked.

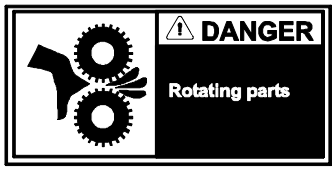
3. Verify power cables from boiler high limit to burner and from external feed motor are connected to their respective inputs on the burner, check status of the drop tube, turn on power (burner power supply must also be turned on). After a few seconds “Waiting for pellets” is displayed on the display screen the external feeding auger starts. This auger stops after 2 minutes if the internal hopper is not filled within that timeframe. Press the “ON/OFF” button and the auger continues to run. Continue this process until the correct level is reached. When the internal hopper is full, the level sensor stops the external auger.

NOTE: The main power switch is usually located on the wall next to the boiler or by the entrance to the boiler room.

Manual Feeding

4. The external auger can be used manually: Press “ON/OFF” to stop. Scroll menu until you come to “manual external auger”, then press and hold the “+” button to start the motor. Fill until the burner internal storage is full. The motor stops when the “+” button is released or when the internal storage sensor is activated.

NOTE: “Manual external auger” is shown only when burner operation is stopped.



NOTE: Do not touch the dosage auger or the external augers in- or outlet when the external motor is connected.

The capacity sensor activates when the pellet level in the internal storage has fallen below the sensor area. Under normal running conditions the external auger runs up to 2 minutes after the capacity sensor has switched on. This control is programmed so that the motor will only run for 2 minutes at a time. If the burner internal storage has not been filled in this time frame, the indication lamp changes color from green to red and the “!!ERROR!!! External feed” appears on the display screen.

4.8 Calibration of temperature sensors

Calibration may need to be done prior to burner start up. Burner will be in the boiler-room so that all parts in burner are at room temperature.

Enter service menu row “75 Offset internal” and see temperature there. It will show room temperature (perhaps 70°F).

Go then to rows: “71 offset burner bowl” and “72 backburn” and with the aid of offset adjust in temperature so that it shows the same as “75 Offset internal”.

To change: briefly press the “menu” button (temperature numbers flashing) and then adjust using the “+” and “-“ buttons until the temperature is correct.

To save: Press and hold down the “menu” button for three seconds.

NOTE: Temperature on 71 (and 72) does not go to set lower than “75 Offset internal”.

“73 Offset Boiler temperature will be adjusted in the same way, But in this case, it must be adjusted to show its actual temperature.

“75 Offset Outdoor” wil be adjusted to the outdoor temperature.

5 Starting and Stopping the NH Burner

5.1 Starting the NH Burner

1. Install the burner into the boiler and lock it in place on both sides with the locking latches.

NOTE: The burner should be secured tightly so that no embers or smoke can be released. A non-airtight connection can lead to a poor combustion and poor burner operation.

2. Verify that there are sufficient pellets in the external storage. The pellet level should never be lower than the external auger inlet.

3. Check that power cables between burner and boiler and between the burner and external auger are connected. Check that the drop tube between the external auger motor and burner internal hopper is securely in place.

4. Turn on main power switch.

NOTE: The main power switch is usually located on the wall next to the boiler or by the entrance to the boiler room.

5. After power is applied, press “ON/OFF” if “Stop waiting” shows in the display. The NH Burner will execute an ashscrape, the external auger will feed pellets for up to two minutes and the ignition process will begin. You may stop the process by pressing on/off once – “Stop waiting”. Press on/off again to resume start up.

6. To change the desired output: Scroll the “menu” button until you come to “Choose output level xx Mbtu”. Change value by pressing the “+” and “-“ buttons. Save the new level by pressing and holding down the “menu” button for 3 seconds, “Saved to memory” will appear on the display screen. The next time the burner starts, it will use the last saved value.

7. To achieve a good combustion with low exhaust temperatures, the value of the pellet weight density and energy density values must be correct. Adjust both as described in sections 4.5 and 4.6.

If the boiler high limit is closed, the internal hopper is filled (approx. 2 min.) then the pellet level is above the sensor. The burning cup is cleaned next. This then starts the ignition sequence of the burner. Pellets are fed into the burner with the dosage auger, the ignition coil is energized and the combustion air fan starts. The start sequence is pre-programmed to deliver a fast ignition and low exhaust levels. The start-up sequence takes about 10 minutes after which the chosen output level is reached.

5.2 Settings for Maintenance Fire

The maintenance fire position is automatically controlled by the burner. The maintenance fire position represents a low fire, small continuous output level of about **2000 Btu/hr** designed to allow burner restart without the ash scrape cleaning function. It allows continued operation without the need to restart the ignition process. Depending on the length of the previous maintenance period, the burner will automatically determine whether to go into this “maintenance” mode. The time limit for this is set in “menu step 56”, default setting 1:00 hour.

* Last maintenance period shorter than time in “menu step 56”, burner will run in maintenance mode.

* Last maintenance period longer than time in “menu step 56”, no maintenance fire mode.
The maintenance mode is specifically designed to keep a very small fire (2000 Btu/hr) in the burner and allow continued burner operation without automatic ignition. The burner operates normally to maintain desired water temperature.

5.3 Stopping the NH Burner

The burner can be stopped in the following ways:

- **Press the "ON/OFF" button to stop the burner"**
  "Stop waiting" is shown in the display and the control lamp turns red. All of the burner functions will stop. This is also standby mode. Pressing the "ON/OFF" button again restarts the burner at the point when it was stopped. (Possible options for operation are now: 1) Continue in stand-by mode, 2) cool down ("Cool down" represents a high fan speed to allow cooling the burner bowl and burning off existing pellets in the burner bowl), 3) scrape and clean the burning cup and initiate a new start-up cycle depending on how long it was turned off). Turn off main power for the burner to remain shut down.

- **"Shut down" in the menu (Ash removal on demand).**
  When it is time to remove the ash, the burner must be cooled and scraped. This function is only activated when the burner is running by scrolling though the menu until you come to "Shut down". Press and hold down the "Menu" button for 3 seconds to activate. Verify the fan has stopped and that the scraping process is completed. This can take up to 10 minutes depending on the program chosen. "Stop waiting" will appear on the display screen and the control lamp will turn red.

- **Turn off main power for the burner to remain shut down.**
  "Stop waiting" is shown in the display and the control lamp turns red. This will ensure that the burner will not start accidentally after a power outage.

NOTE: Do not turn off the main power until the fan has stopped.

NOTE: Always turn off power at the main switch when the burner is to be off for a longer time period or when servicing the burner. The main power switch is usually located on the wall next to the boiler or by the entrance to the boiler room.

NOTE: To restart the burner press the "ON/OFF".

NOTE: Burner will remain stopped after power outage if manually stopped.

6 NH Burner Set-up

6.1 NH Burner Draft Set-up and Control

Allow the burner to run for 15 minutes before performing combustion measurements.

Place the draft gauge in the hole of the boiler top door for combustion readings. Also drill a small pilot hole in the venting system between boiler breeching and barometric damper location for additional combustion measurements.

Adjust over fire and breeching draft by regulating the barometric damper to achieve the following draft settings:

Recorded draft readings at full firing rate:

Test location	Desired values	Measured values	Adjusted values
Boiler door	(-.03 In WC)		
Breeching draft	(-.04 In WC)		

Table 1. Full Fire Draft Readings

6.2 Combustion Adjustments

When adjusting combustion settings make sure that Volumetric weight density (4.5) and Energy density value (4.6) are correct for the pellets used. These two settings control the amount of pellets being fed into the burning cup during each feeding pulse.

It is very important to use the correct pellet data (Volumetric weight density and Energy density data) so the user can easily change these settings depending on particular pellets used and still achieve good combustion.

Non-airtight boiler doors can result in incorrect readings, as the air, which affects combustion, dilutes the flue gases. If you are unsure about the boiler's airtightness, please visually inspect the flames in the firebox. The flames should be yellow in color. Too much air (O2) or too little fuel results in a short flickering flame. Too little air (O2) or too much fuel results in long, dark, sooty flames. The burner default factory settings are usually fine, but small adjustments may be necessary.

Verify that pellet data (volume density and (ENHV) energy density) are correct, else adjust in the software.
Breeching draft measurement procedure:

1. Drill a hole in the boiler breeching, typically use a 3/8" drill.
2. Insert the flue gas analysis probe into the hole.
3. Allow combustion to run at the highest level for a few minutes.
4. Check the readings for CO2 and CO from the flue gas analysis.

Breeching draft	Desired values	Test 1	Test 2	Test 3	Test 4
Dosage adjustment	0.80*				
CO2 value	10 - 12%				
O2 value	9 – 10%				
CO value	< 300 ppm				

Table 2: Breeching combustion measurements: successive dosage adjustments

*The factory setting for dosage feeding time setting (service menu step: 23) is 0.80 sec. Adjust this value to vary CO2 and O2 levels.

To perform adjustments, follow the outline below:

Procedure for adjusting feeding time:

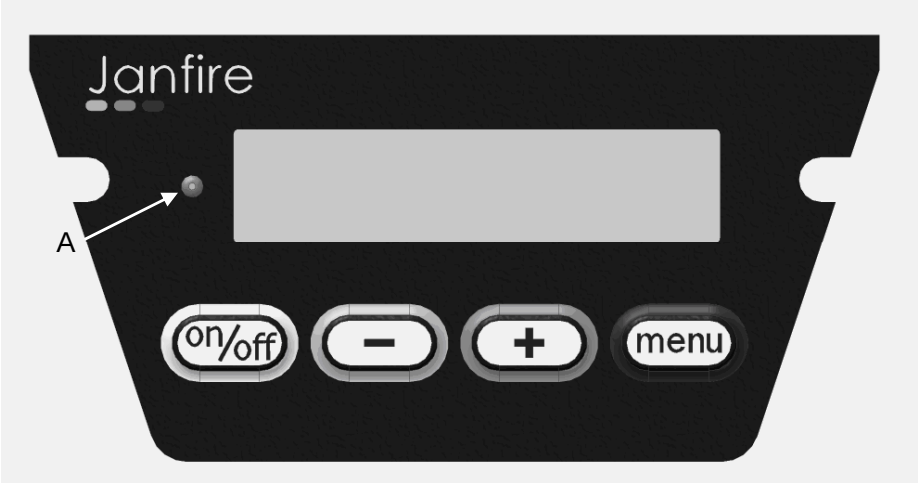
Enter service menu by pressing “+” and “-“ buttons at the same time. Enter service level. Scroll through service level by pressing “+” (up) or “-“ (down) button.

Adjust the basic feeding time: “Menu #23 value” (normally .8 sec. adjustable from 0.5 to 1.5 sec.).

If CO2 level is too high: reduce the feeding time (example: 0.75 sec.); if CO2 level is too low: increase the feeding time (example: .90 sec.). Experiment until you find the correct CO2 and CO levels.

The pellet fuel delivery is adjusted proportionately for all output levels as the fan speed is fine tuned automatically with each output level.

7 NH Burner Menu System



The Janfire NH burner menu system has two levels: a user menu and a service menu.

Janfire NH Menu system	
A	Control lamp: Green = Normal, Yellow = Warning, Red = Error
on/off	One press: shuts down the burner. (Total stop) Press again: continues burner operation where it left off.
−	Reduce value in user and service menus. Scrolling backwards in service menu.
+	Increase value in user and service menus. Scrolling forward in service menu
menu	Scrolling in **user menu** (quick press). Save / Confirm value (press for 3 seconds) and “save to memory” appears on the display. (Valid for user and service levels) One press on the menu button in service menu makes the value editable (numbers flashing). Change value with the ”+” and ”-” buttons.
+ −	Press and hold both buttons at the same time for three seconds (or more) to enter **service menu**. To return to user menu, press and hold both buttons at the same time for three seconds again.
menu +	When Janfire text is shown in the display press the “menu” and “+” buttons when powering on / resetting the burner to restore all settings to factory **default** settings.

Figure 9 Menu system

On start-up status for the user menu will be shown in the display.

NOTE: When not pressing any buttons for 5 minutes, the status mode will automatically appear in the display.

Adjustment of display contrast is done with “+” and “-“ buttons. Change of contrast can only be done when display is showing status or mode information. Press and hold “menu” for three seconds to save.

User Menu

Press “menu” button briefly to scroll through user menu.
Changes are made with “+” and “-“ buttons.
Save changes by pressing and holding “menu” for 3 seconds.

User menu			
Status	Min value	Max value	This shows the present status information, it can show errors or running status.
Target temp. °F	131/136/149	179/185/197	Is only shown when modulating output regulation is activated. If outdoor temp sensor is active, no adjustment is possible. Brackets are then shown around numbers. <Start temp → Target temp ← Stop temp>
Pellets used (x lb) y lb			Shows calculated pellet consumption. The control has two counters, one resettable and a total consumption counter. Use “menu” to reset reset counter to zero.
Select power level xx MBTU	10	78	Select power level. Service menu #60 and #61 specifies maximum power level and lower limit of selected power level. Selection of NH Burner Output Value when running without modulating functions.
Ashscrape each 39 lb (0.000lb)	3	144	Every xx lbs (40 lbs (=18 kg) default value). The second value shows actual consumption.
Volumeweight: 42.1 lb/ft3	31.2	49.9	Correct level (lbs/ft3) is supplied by pellet supplier or by weighing.
Energyvalue: 7.42 MBTU/lb (ENHV)	6.49	7.89	Your pellet supplier must supply the correct value (MBTU/lbs) based on European Net Heat Value.
Shut down? “Menu”@3sec= Yes			Mode is used to remove ashes from the boiler. Running down function runs in three sequences: begin cooling, burning cup scraping and then combustion stop. Press and hold “menu” button for more than 3 seconds activates this mode. This function is shown only when the burner is in operation.
Manual feeding* (dosage auger)			This text is shown only when the burner has stopped operation. Feature is used to manually fill the dosage auger for the initial start-up. Press and hold down the “+” button and the dosage auger will run until the button is released.
Manual feeding* (external auger)			This text is shown only when the burner has stopped operation. Feature allows you to manually fill the feeder auger and burner hopper at initial system operation or after running out of pellets. Press and hold down the “+” button and the external feed auger will run until the button is released or when the level meter in the burner filling tube is affected.

*These two parameters should only be used by the installing contractor at the initial start-up of the system.

Service Menu

The Service Menu contains many values that allow for optimized operation of the NH burner for a variety of pellet conditions. Each menu setting is identified by a number and each setting has a factory default value.

Start / Stop
One press: shuts down the burner. (Total stop).
Press again: continues where it left off.

How to enter the Service Menu:
To enter service level: press and hold down ”+” and ”-” buttons simultaneously for 3 seconds.
To exit service level: repeat this step again.

How to scroll through the Service Menu:

Use “+” and “-“ buttons to scroll through service menu.

How to change values in the Service Menu:

Briefly press menu button to make value editable, use “+” or “-“ to change value.
To save setting, press and hold “menu” for 3 seconds. ”Save to memory” appears on the screen.
To exit without saving, press “menu” briefly.

How to reset all values to factory default values:

Remove main power to burner, wait until display is powered down. Reconnect power. When text “Janfire AB version US” is shown, press and hold “menu” and “+” buttons. When the display shows “Default set…” all settings has been reset to default.

Non listed service menu program steps are factory set and not field adjustable. The table below shows all potentially field adjustable program steps. **The dark shaded menu settings do not require adjustment for the US market and should never be touched or changed.**

DEFAULT FACTORY SETTINGS	RANGE (min – max)	DESCRIPTION
1. N/A		
2. N/A		
3. N/A		
4. N/A		
5. 10 MBTU level fan: **6%**		Fan speed at 3 kW (10 MBH)
6. 20 MBTU level fan: **10%**		Fan speed at 6 kW (20 MBH)
7. 30 MBTU level fan: **24%**		Fan speed at 9 kW (30 MBH)
8. 40 MBTU level fan: **36%**		Fan speed at 12 kW (40 MBH)
9. 51 MBTU level fan: **56%**		Fan speed at 15 kW (51 MBH)
10. 61 MBTU level Fan: **72%**		Fan speed at 18 kW (61 MBH)
11. 78 MBTU level fan: **100%**		Fan speed at 23 kW (78 MBH)
12. N/A		

13. N/A		
16. Cyclus time 10 MBTU **25.0 sec.**		Time cycle at 3 kW = feeding time (dosage time 0.8 sec. See 23) + time between two dosages
17. Cyclus time 20 MBTU **15.0 sec.**		Time cycle at 6 kW = feeding time (dosage time 0.8 sec. See 23) + time between two dosages
18. Cyclus time 30 MBTU **11.0 sec**.		Time cycle at 9 kW = feeding time (dosage time 0.8 sec. See 23) + time between two dosages
19. Cyclus time 40 MBTU **8.2 sec.**		Time cycle at 12 kW = feeding time (dosage time 0.8 sec. See 23) + time between two dosages
20. Cyclus time 51 MBTU **7.0 sec**.		Time cycle at 15 kW = feeding time (dosage time 0.8 sec. See 23) + time between two dosages
21. Cyclus time 61 MBTU **5.8 sec.**		Time cycle at 18 kW = feeding time (dosage time 0.8 sec. See 23) + time between two dosages
22. Cyclus time 78 MBTU **4.8 sec.**		Time cycle at 23 kW = feeding time (dosage time 0.8 sec. See 23) + time between two dosages
23. Feeding time norm: 0**.8 sec**	(.5 – 1.5)	The dosage pulses running time can vary between 0.5 and 1.5 sec.
24. Afterblow 10 MBTU fan: **15%**		The boilers thermostat stops the dosage and the fan after burns at this output level
25. Afterblow 20 MBTU fan: **15%**		The boilers thermostat stops the dosage and the fan after burns at this output level
26. Afterblow 30 MBTU fan: **25%**		The boilers thermostat stops the dosage and the fan after burns at this output level
27. Afterblow 40 MBTU fan: **35%**		The boilers thermostat stops the dosage and the fan after burns at this output level
28. Afterblow 51 MBTU fan: **45%**		The boilers thermostat stops the dosage and the fan after burns at this output level
29. Afterblow 61 MBTU fan: **60%**		The boilers thermostat stops the dosage and the fan after burns at this output level
30. Afterblow 78 MBTU fan: **70%**		The boilers thermostat stops the dosage and the fan after burns at this output level
31. Aft. bl. 10 MBTU time: **0:30**		How long the fan blows at 3 kW (minutes) see 24-30
32. Aft. bl. 20 MBTU time: **0:30**		How long the fan blows at 6 kW (minutes) see 24-30
33. Aft. bl. 30 MBTU time: **0:45**		How long the fan blows at 9 kW (minutes) see 24-30
34. Aft. bl. 40 MBTU time: **0:45**		How long the fan blows at 12 kW (minutes) see 24-30
35. Aft. bl. 51 MBTU time: **1:00**		How long the fan blows at 15 kW (minutes) see 24-30

36. Aft. bl. 61 MBTU time: **1:00**		How long the fan blows at 18 kW (minutes) see 24-30
37. Aft. bl. 78 MBTU time: **1:00**		How long the fan blows at 23 kW (minutes) see 24-30
38. Interme. blow Interval: **30:00**		After what time intervals (min) shall the fan increase the speed when running for long intervals without the thermostat turning off. Applicable for all steps.
39. Interme. blow fan: **+ 5%**		Fan speed increase in % at output levels (see 38)
40. Interme. blow time: **0:30**		For how long shall the fan medium blow (min) See 38 and 39
41. External feed alarm time: **2:00**	(1:00 – 10:00)	Max run time (in min) for external auger without capacity sensor signalling to stop & subsequent alarm activation.
42. N/A		
43. External feed afterrun: **3:00**	(0 – 10)	The time (seconds) that the external auger continues to run after the capacity sensor is activated.
44. Ashscrape Alarm time: **0:23**	:01 - :30	Maximum time (sec) for the ash scraper to run and activate the capacity sensor.
45. Ashscrape retries: 6 **pcs.**	(0 – 10)	If the ash scraper is stuck when trying to scrape, motor will turn off after 3 sec (according to alarm time see 44) New scraping attempts will be made according to this setting. (6 times)
46. Restart retries: **2 pcs.**	(0 – 10)	Indicates number of retries after burner start-up failure (flame sensor not activated). Number of retries specified by this setting. (1 PCS = one attempt)
47. Flameguard (xxx °F) **302 °F**	50 - 392°F	A temperature from which the burner is switched from the start-up sequence to normal operation. If during normal operation the burner bowl drops 18° below this setting a single restart attempt will be enabled. Flameguard is not applicable during maintenance fire.
48. Cooling to (xxx °F) **248 °F**	68 - 392 °F	When ”shutdown” is selected in the operating level, an ash scrape will be initiated at or below this selected temperature. Actual Burner Bowl temperature shown in brackets.
49. Reduction: (xxx °F) **158 °F**	50 - 194 °F	If temperature in pellet drop shaft exceeds this value, burner output level is reduced and control lamp turns yellow. The temperature must be set at least 8 °F (5°C) below alarm limit (see 50). Actual temperature is shown in brackets.
50. Alarm limit: (xxx °F) **203 °F**	167-284 °F	If temperature in pellet drop shaft exceeds this value in spite of the reduced burner output (see 49), burner will stop with an over heating alarm. Temperature must be set at least 8 °F (5°C) above ’Reduction limit’ (see 49). Actual temperature is shown in brackets.
51. Restart limit (xxx °F) **428 °F**	50 – 842°F	Restart limit is active only after a complete loss of power is restored to the NH Burner such as: The High Limit opens, LWCO opens, loss of grid power or shutting off the service switch. The NH Burner will decide at this setting to either initiate an ash scaping (below) or continue in run mode (above setting). Actual

		burner bowl T^{o} shown in brackets.
52. Keep-alive cyclus: **50.0 s.** (Maintenance mode)	10 – 90 sec.	Maintenance time = Maintenance feeding (see 53) + waiting time between two feedings.
53. Keep-alive feed: **0.80 sec**. (Maintenance mode)	.10 – 5.0 sec.	Dosage feeding time in maintenance mode.
54. Keep-alive fan: **12%** (Maintenance mode)	0 – 100%	Fan speed in maintenance mode.
55. Keep-alive fantime: **10.0 s**. (Maintenance mode)	0 – 60 sec.	The time that the fan runs after each feeding in maintenance mode.
56. Keep-alive max. time: **1:00** (Maintenance mode)	.1 – 2.0 hrs.	Maximum time that the burner may run in maintenance mode after reaching upper temperature value during regular operation.
58. Language **US English**		Select menu language
59. Pellets used (6.61 S/T) xlb		Shows calculated pellet consumption **6.61 S/T (13,200 lbs (6000 kg))** is first service interval, press "menu" 3 sec to reset and set service to 13.22 S/T **(26,440 lbs. (12,000 kg).** Semi-annual maintenance reminder. When this level is achieved, the display will read "Service needed" and red light comes on. Burner continues to operate normally. Contractor should be contacted for burner service.
60. Select power min: 20 MBTU	10 – 78	Sets min power level when running in modulation mode.
61. Select power max: 51 MBTU	10 – 78	Sets max power level when running in modulation mode. Reset list by pressing "menu" for 3 secs.
62. Cold starts **0 pcs**.		Counts number of starts with heater element engaged. Reset link by pressing "menu" for 3 secs.
63. Fault list x saved		List of fault and errors. Briefly press "menu" to show list, scroll through list using "+" and "-" buttons. Most recent error is first in list. Reset link by pressing "menu" for 3 secs.
64. Differential below: Target**- -5°F**	-3 to -32^{o}F	Lower temperature differential below target temperature for burner to start operating.
65. Differential above: Target**+12°F**	+3 to +32^{o}F	Upper temperature differential above target temperature for burner to stop or go to maintenance mode.
66. PID-control ON		Sets whether PID / modulation should be ON or OFF. Set to ON When using PT100 sensors.
67. PID Interval mm:ss **1:00**	1:00 – 30:00	Interval for PID regulator to change power level. Set either to 1:00 or 2:00
68. PID I-factor **2,000%**	0 – 20,000	Regulator integrating factor. Sets how much power level will change over time as a function of temperature difference between actual and target temperature.
69. PID P-factor **20,000%**	0 – 20,000	Regulator proportional factor, difference between actual temperature and target multiplied with factor gives power level. Higher factor, faster response.
70. PID-D-factor 0%	0 – 20,000	Changes the power level when a fast temperature change is detected.
71. Offset **0** Burner bowl XX**°F**	-100 - +100	Temperature calibration for burning cup temperature sensor

72. Offset **0** Backburn XX**°F**	-100 – +100	Temperature calibration for drop shaft temperature sensor
73. Offset 0 Boiler XX**°F**	-100 - +100	Temperature calibration for boiler water temperature sensor
74. Offset 0 Outdoor XX**°F**	-100 - +100	Temperature calibration for outdoor temperature sensor
75. Offset 0 Internal XX**°F**	-100 - +100	Temperature calibration for internal control temperature sensor
76. Offset 0 Lambda 0.0% O2	-100 - +100	Calibration adjustment for signal lambda sensor
77. Extra inp. as Outdoor temp.	Exhaust	Change input sensor. Select: Outdoor or Exhaust
78. Outdoor temp. controls: **YES**	NO-YES	Select boiler temperature controlled by outdoor temperature: Select "YES" when using outdoor sensor.
79. Outdoor Temperature Average 5	5 - 15	Sets time for average outdoor temperature reading frequency (min).
80. External Thermostat? NO	NO/YES	When "YES" is selected, a L4006A operating aquastat can be installed on the brown wire (See pg. 37). When "NO" is selected, a L4006A can not be installed. NO is factory setting.
81. Coldest Day **-4°F**	(-40 – 50°F)	Stops heating curve on coldest day.
82. Warmest Day **+68°F**	(14 – 68°F)	Starts heating curve on the warmest day of the heating season.
83. Boiler Low **140°F**	(140 – 176°F)	Sets boiler temp on the warmest day of the heating season.
84. Boiler High **185°F**	(149 – 194°F)	Sets boiler temp for the coldest day of the heating season.
85. Fall shaft se. PT100	Type K	Defines type of drop shaft sensor. Other option: Type K. (previous version sensor).
Show Full Menu "menu" @ 3 sec = Yes		Allows user to view remaining parameters.

Display status texts

JANFIRE AB Version X.XX	Start text at power up, shows program version
Start-up underway Try 1 **3 min**	Shows that burner start-up try process underway, and time elapsed
Running 51.00 MBTU	Run mode, actual power level
Waiting…	Burner has reached set point
Keep-alive mm:ss	Shows time elapsed in maintenance mode
Defaults set Release buttons	Default values have successfully been reset
Saving in memory	Setting is being saved
Heating up Step 1 mm:ss	Waiting to transition to run mode from maintenance, a manual stop or after power failure.
Stop Waiting.	When burner is stopped with "on/off" button. Restart by pressing on/off button again. If start not possible: replace box.
Shutdown activated…	Burner is shut down via function in User menu, ash scraper will be activated when burner cooled down.
Now shut down waiting	Burner is shut down.
Wait! Cooling down burner	Cooling burner bowl to reach limit value set in service menu 48
Waiting for pellets	Waiting to fill up burner internal pellet hopper

Limit. Run	Running with reduced power, poor chimney draft

ERROR MESSAGES

PROBLEM Warning that something's wrong and burner taking corrective actions. Disappears when issue corrected.

ERROR An alarm message. Burner has stopped operation due to a detected error that burner can not compensate for. Message remains visible on display after shut-down of burner.

!!! ERROR !!! Burner Unmounted	The burner is equipped with a micro-switch circuit breaker, which prevents the burner from operating when detached from the boiler.
Ash scraper runs Ash scraper rests	Maximum time elapsed for ash scraper. Scrape cycle finished successfully on most recent attempt. Red warning light returns to green.
!!! ERROR !!! Ash scraper	Ash scraper did not successfully complete scrape cycle despite several attempts.
!!! Problem !!! Starter sequence	Flame sensor did not activate in time, new start attempt. Warning is reset after successful start.
!!! Problem !!! Fan stopped	Tachometer can't sense fan rotation. Any other activity will be stopped until fan runs properly. Warning will be reset when fan starts again.
!!! ERROR !!! Fan stopped	No rotation signal from fan despite several restart attempts.
!!!Problem !!! Flame guard trip.	Burner Bowl temperature too cold (18^{o} below setting). One restart attempt will be made.
Low chimney draft	Temp. too high in pellet drop shaft, "service menu 49". Burner power level reduced until temp. decreases. Acknowledge warning by pressing "on/off" twice" (Stop and start).
!! Problem !!! Service needed	Pellet consumption has exceeds service interval in "service menu 59". Restart service level.
!!! ERROR !!! Not cooled down	Burner cup cooling did not succeed within 20 minutes.
!!! ERROR !!! External feed	Internal burner hopper did not fill within time period.
!!! ERROR !!! Overheated	Drop shaft temperature exceeds maximum level. / Sensor defective.
!!! ERROR !!! Starter sequence	Ignition has not occurred or a faulty ignition coil.
	Bad quality pellet.
	Insufficient draft in the boiler can cause disturbance in augers due to tar (sticky). This will make the dosage auger stop.
	Strange objects in pellets or damp pellets cause dosage auger to stop.
	The fan is not correctly adjusted.
!! ERROR !! ELECTRONIC FAULT	1.) Turn system OFF at main system switch. Turn back ON after 10 seconds. If error still persists, go to the following steps. 2.) Check electrical connections to the internal and external augers. 3.) Check the connection to the heating coil 4.) Check fuse to the heating coil (Pg. 37 – Fast acting fuse) 5.) If error continues after the above steps: Replace the control box.
!! ERROR !!! Temp Sensor The control lamp red	1.) Turn system OFF at main system switch. Turn back ON after 10 seconds. If error still persists, go to the following steps. 2.) Check burner bowl and drop shaft sensor wiring. If insulation damaged replace sensor.
!!! ERROR !!! Bad Thermostat (Service menu "80" = NO.)	1.) Check PT100 boiler sensor wiring connections. Measure resistive value of boiler sensor and compare to Fig. 10, pg. 32. 2.) Replace boiler sensor to correct.
Low Voltage	Burner circuitry detected a low supply voltage and burner shut down. Continued low voltage status.

IF ASH SCRAPER GETS STUCK

Let the burner cool down and shut off the main switch. Remove 2 burner bolts and swing lower door open. (Do NOT detach burner from burner door!). Pour 1 – 2 oz. of water over the ash scraper into the burner bowl. Allow water to dissolve the ash for 3 – 5 minutes. Close the door, tighten both burner door bolts evenly and start the burner. If the above does not work, manually remove ash from the scraper using proper tools.

** NOTE ** DO NOT HIT THE ASH SCRAPER WITH ANY OBJECT
This may damage ash scraper motor gearbox.

To avoid problems of ash scraper getting stuck:

- Properly set and adjust pellet weight and energy density values according to sections 4.5 and 4.6.
- Shorten interval for ash scraping in user menu.
- Control and fine tune combustion, see section 6.2.

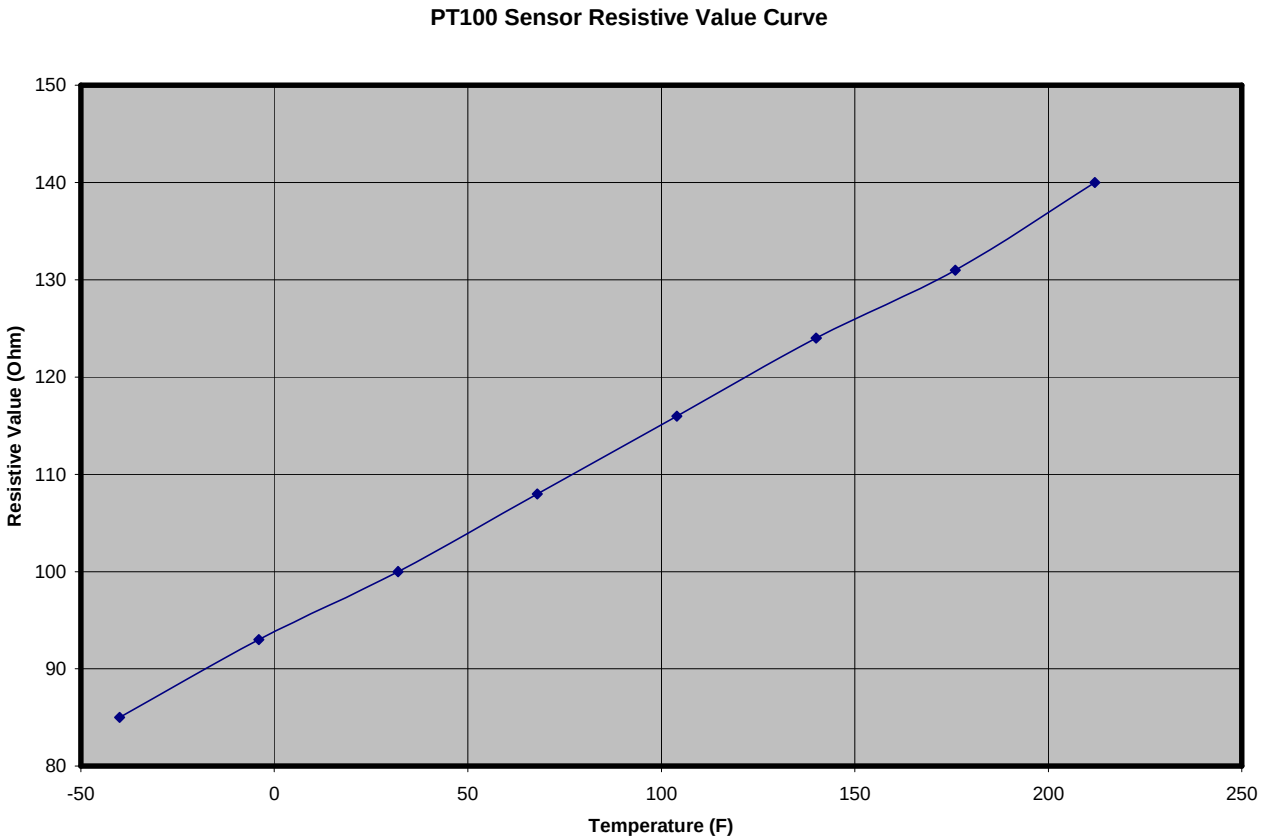


Figure 10. PT Sensor Curve

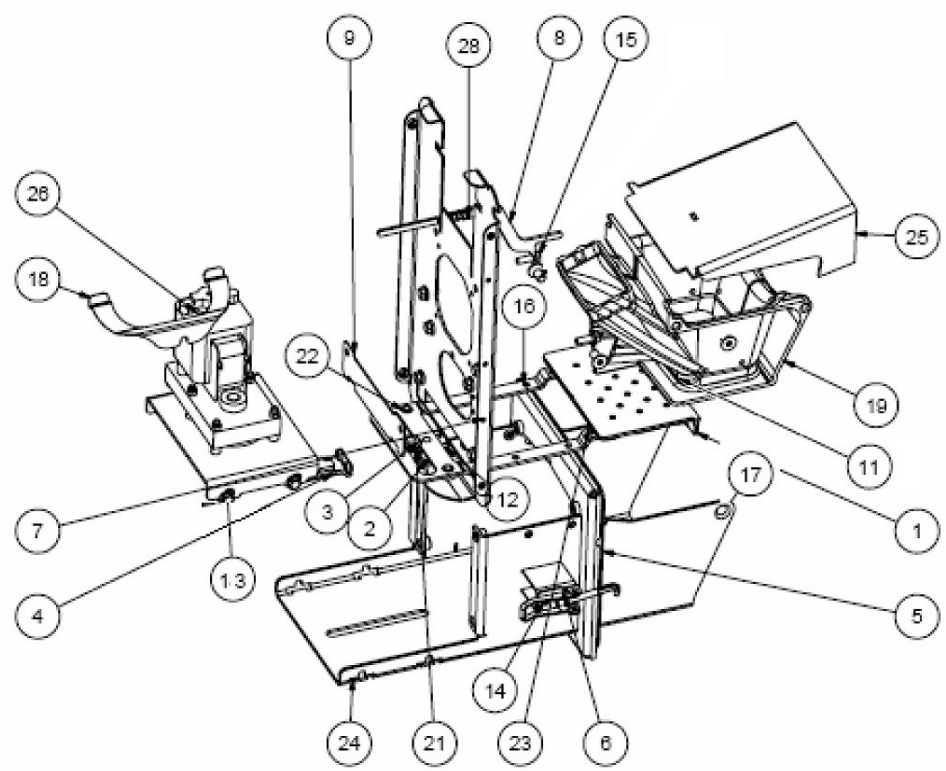


Figure 11. Parts breakdown of NH Burner

	Description	Part No.
1	Scraper Plate	11810001
2	Slide Bearing 8x10x15	11815011
3	Slide Bearing 8/10/15 x 09.5	11815016
4	Scraper Microswitch	71842003
5	Sealing braid	11820003
6	Burner latch	81871001
7	Vertical Chassis	11801020
8	Push arm	11802015
9	Air dam	11801022
10	Micro switch bracket	11801018
11	Type K burner bowl sensor/sensor cover	71842048/11802023
12	Allen head screw M4x10	80463005
13	(Not shown) Flange Screw M6x12	80661003
14	Latch screw M4x10	80460002
15	NA	80662003
16	Glide Bushings 4x4x3	11815006
17	NA Burning cup screws (countersink)	80863001
18	Spring clip	11801024
19	Burning cup	11810001
21	Blade wheel	11801032
22	Glide bushing 6x10x8	11815007
23	Drag arms	11802017
24	Bottom chassis	11802014
25	Flame deflector	11802006
26	Scraper motor assembly	See Fig. 14
28	Arm spring	11865002

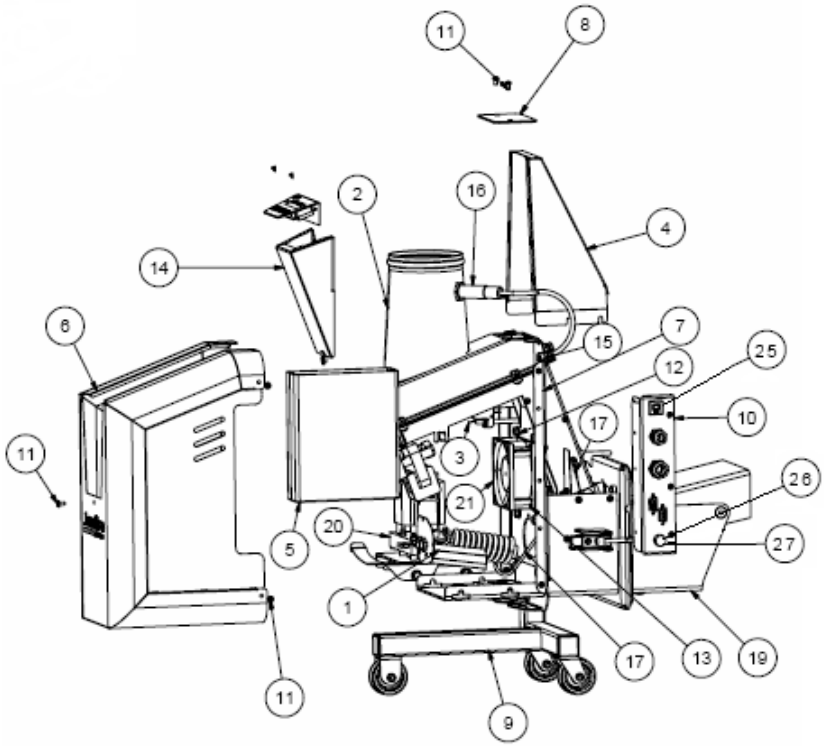


Figure 12. Parts breakdown of NH Burner

	Description	Part No.
1	Heating element	11802007 11842004
2	Internal Hopper	See Fig. 13
3	Microswitch	71842003
4	Drop shaft shroud	11801333
5	Control box	71843009
6	Cover	11802011 11802019 11802013
7	Frame	11801020
8	Drop shaft inspection cover	11801025
9	Trolley	11801017 11815001 11815002
10	Connection plate	71842042
11	Allen screws M4x10	80463005
12	Flange screw M6x12	80661003
13	Allen screw M3x12	80363003
14	LCD assembly	11801021 71843018
15	Grommet	11815009
16	Capacity sensor	70046003
17	PT100 Dropshaft sensor	71842047
19	Burning cup frame	11802014
20	Element Backer	11842004
21	Fan	11835002
25	10 Amp circuit breaker	71842045
26	Fuse Holder	71842046
27	Fuses (15 Amp fast blow)	71842043

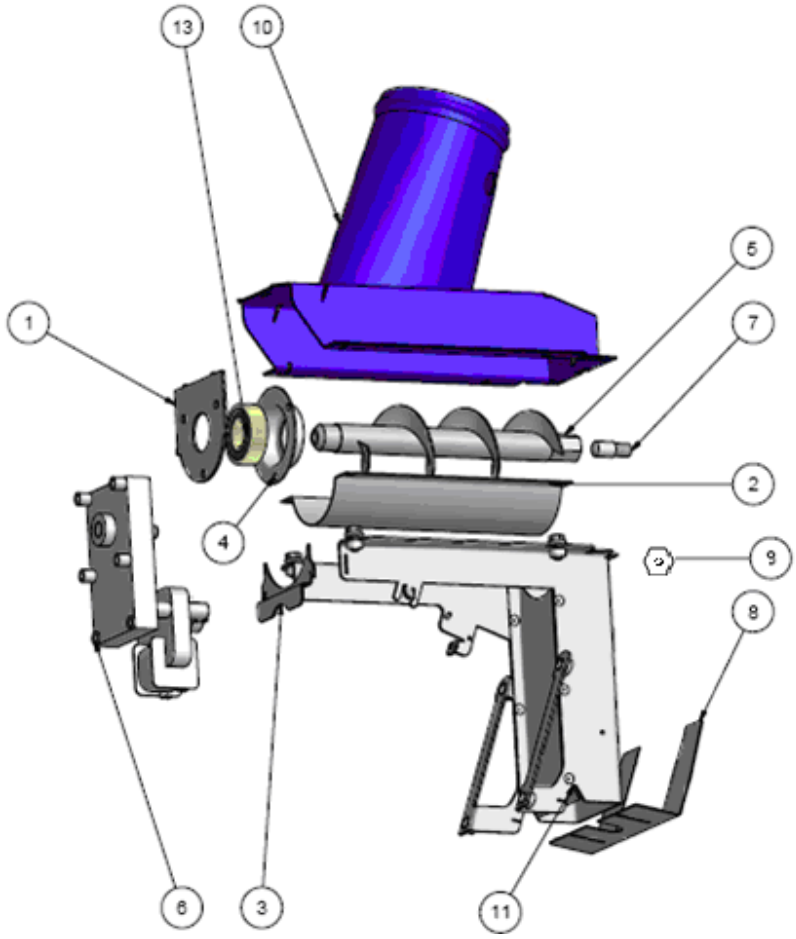


Figure 13. Dosing auger close-up

	Description	Part No.
1	Motor separator	11801027
2	Trough	11801026
3	Half moon support	11801029
4	Bearing guide front	11803001
5	Dosing auger	11801040
6	Dosing motor assembly	51830013
7	Stud	11805001
8	Air guide	11801030
9	Jam Nut	81068005
10	Burner hopper	11801039
11	Drop Shaft	11801038
12	Flange screw M-6 x 10	80661003
13	Auger bearing	51830008

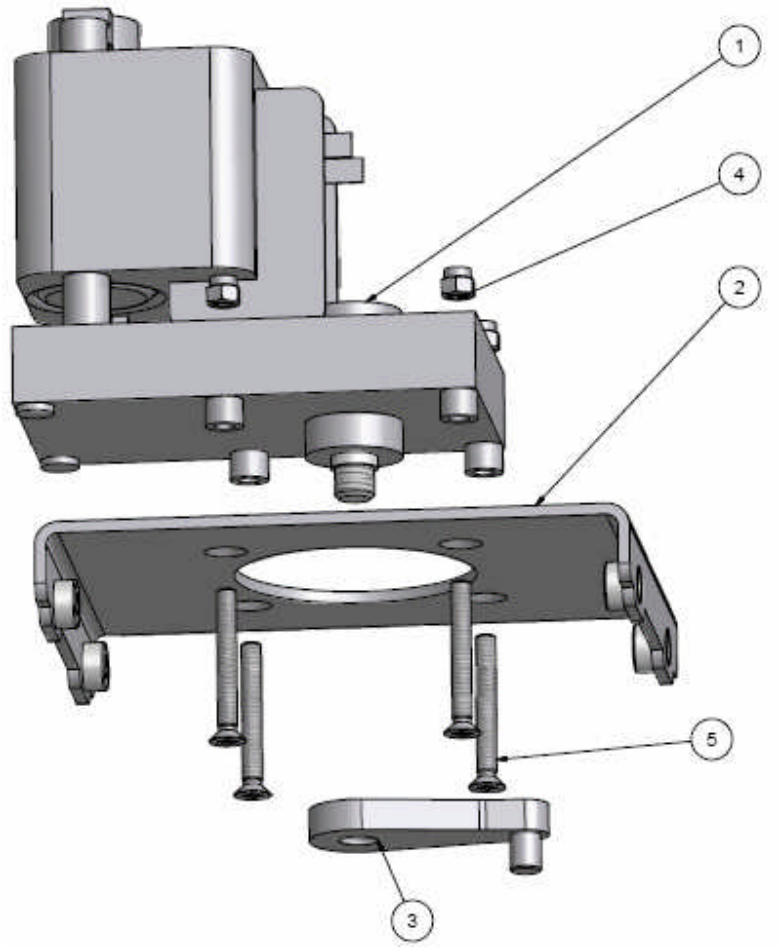


Figure 14. Ash scrape motor close-up

	Description	Part No.
1	Scraper motor assembly	51830012
2	Motor frame	11801019
3	Scraper cam	11801028
4	Lock nut	80567001
5	Allen head screw M5x40	80560001

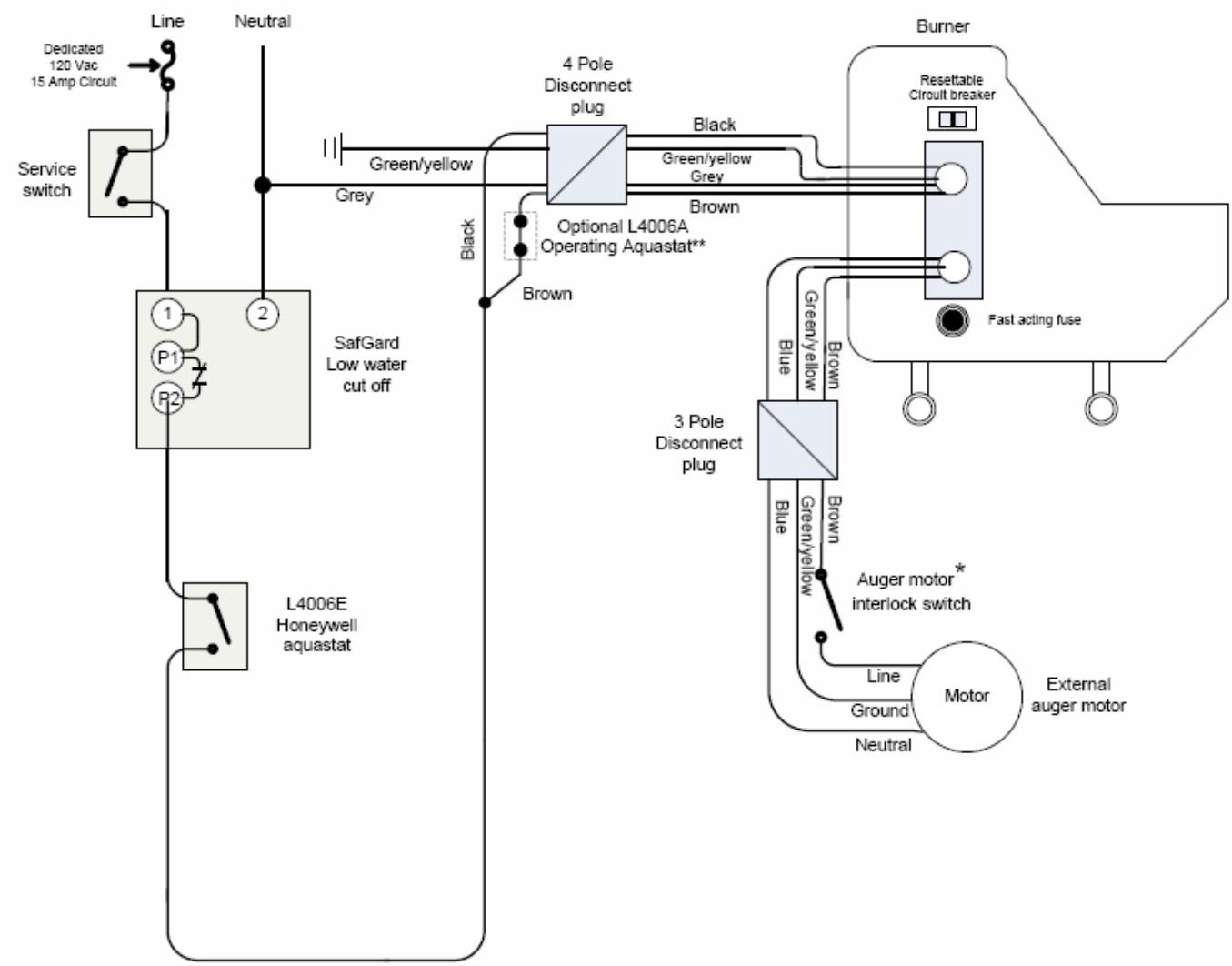


Figure 15. Field wiring instructions
**Required for storage bins with service access.*
***Installation of L4006A requires service menu #80 = YES*

Maine Energy Systems, LLC
One Parkway, P.O. Box 547
Bethel, ME 04217-0547
Phone: 207.824.NRGY (6749)
www.maineenergysystems.com

Products Manufactured by:
Janfire AB
Slättertorpsgatan 3,
Box 194,
662 24 Åmål
Sweden