EKO-VIMAR ORLAŃSKI®

Operating manual

Pellet boiler

Orlan Pellet

ISO 9001 TÜV CERT CE

Table of Contents

Warning !
There are a number of these Warning Alerts throughout this manual. Be sure that you read, understand and follow each of them.

Boiler Application

Orlan Pellet Boilers are designed to heat water for pressurized hot water (hydronic) heating systems. The boiler must be installed according to all local and national codes and must be equipped with a pressure relief valve and associated piping that complies with current codes. The boiler has a number of safety features built in, including a controller that keeps it operating at the correct temperature by regulating the burner with a blower.

The Orlan Pellet Boiler is designed to burn dry wood pellets 1/4 to 1/3 inches in diameter and 1/2 to 2 inches in length. The pellet hopper should be filled completely. It is designed to operate automatically and provide long times between burns. Bear in mind that the time between fillings will depend upon the outside temperature and nature of the space being heated.

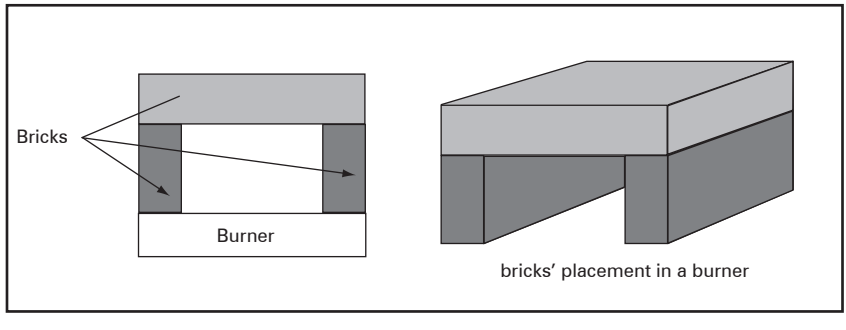
Installation

Your Orlan Pellet Boiler should be installed by a qualified professional (i.e., heating contractor, plumber or other licensed professional familiar with solid fuel appliances). It must be connected to a Class A chimney (stainless steel or ceramic tile) and must not be connected to a chimney serving any other appliance.

Funnel Casing -- ZENON, I'M NOT SURE WHAT THIS IS. I CAN DELETE REFERENCE TO IT OR PROVIDE SOME DETAIL IF YOU CAN HELP ME UNDERSTAND IT.

For ease of installation, the chimney flue connector can be removed by unscrewing eight nuts on the flue block and removing it from the flange. Be sure to reinstall the gasket on the flange when reassembling it, to maintain a tight seal.

The boiler is shipped with three pieces of firebrick shinkwrapped together in the bottom of the combustion chamber. They should be unwrapped and placed around and over the burner as shown in the diagram below. Specifically, the two long bricks should be placed alongside the burner so that the edges of the bricks touch the walls of the combustion chamber. The remaining brick should be set on top of the other two, directly over the burner.



bricks' placement in a burner

Understanding the Controller

Guide to the Controls

1. Fan
2. Auger #1
3. Auger #2
4. Circulator pump
5. Domestic water pump
6. Burner
7. & 8. Warnings (fuel shortage, sensor damage, overheating, etc.

The push-button controls depicted in the diagram above and reproduced below allow you to access the controller menu and for making adjustments or changes to the settings.

The light-emitting diode lights (numbers 1-8) are the system status indicators, as described in the box to the left.

The controller regulates the automatic fuel loading and combustion systems. Its functions are as follows:

- Combustion
- Maintaining boiler temperature
- Overheat protection
- Fuel burn-back protection
- Circulator pump control
- Domestic water pump control
- Exhaust temperature control

Operating the Boiler for the First Time

1. Fill the hopper with pellets and close the cover tightly.

2. Connect the controller to a 120V/60Hz circuit either by plugging it into a dedicated outlet or wiring it directly into the circuit.

Warning !
The controller should be protected with a 4A fuse and circuit breaker (max voltage of 20 mA).

Warning !
The controller must be connected to a dedicated circuit with no other appliances connected to it.

When the controller is powered up, the display panel will show the following information:

3. After loading the fuel and turning on the controller, push the ↵ button for five seconds or more. The display will show the START function, which indicates that the augers are delivering fuel to the starter. This process can take anywhere from 1 to 20 minutes. When the boiler is ready to begin burning the fuel, the display will show the letters “GRZ,” indicating that the fuel has been ignited.

4. When the flue exhaust temperature reaches the setpoint, the controller will begin circulating water through the heating system and maintain the set temperature as long as there is fuel in the hopper.

5. If it becomes necessar to shut the boiler down, press the ↵ button again and hold it for at least five secones. The display will indicate that the boiler is shutting down and no more fuel will be augered into the burner.

Warning !
The controller will shut the burner down if the water temperature in the boiler exceeds 90 degrees centigrade (194 degrees fahrenheit). When this happens, you must determine the cause and fix the problem. To restart the controller, it must be reset. Do this by switching the controller off, then turn it on while depressing all four function buttons at the same time.

Use the 📖 button to access the controller menu.

Press the − button to turn the fan on and off.

The + button turns the feed augers on and off.

Menu levels are navigated by pressing the ↵ button.

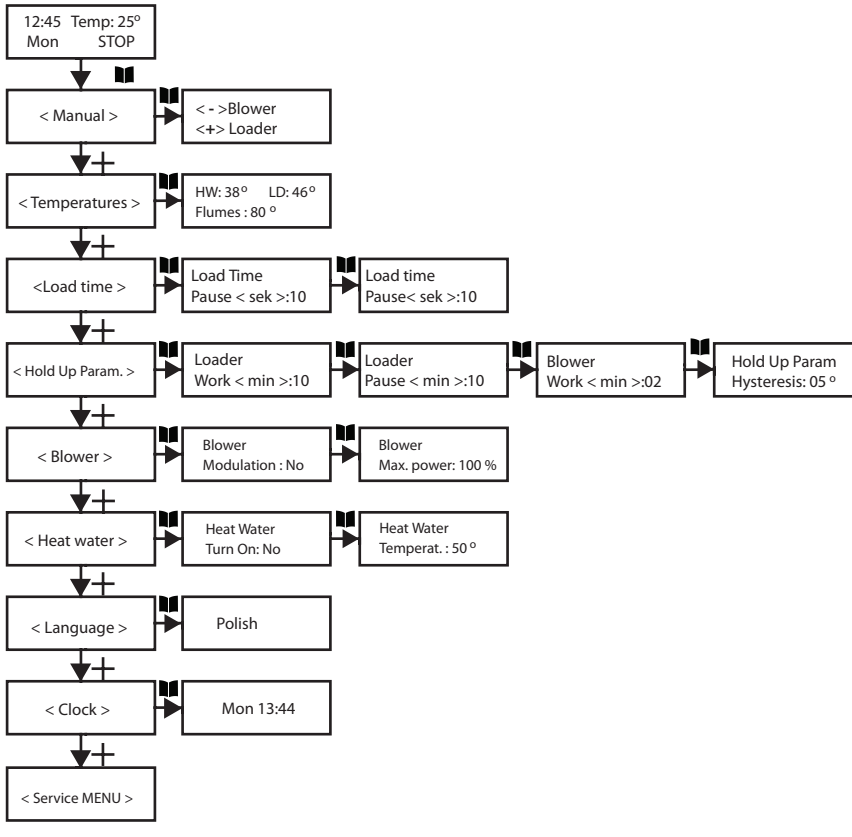
Once the menu is accessed, choices can be made, depending on what you are trying to accomplish. The options are explained below. Their hierarchical position on the menu structure is shown in the diagram below.

<service menu>	For service personnel only.
<digital clock>	Sets the hour and date.
<language>	Use to select “English” as the default language.
<warm water>	Sets the domestic hot water parameters (when installed).
<fan>	Sets the fan parameters.
<sustaining parameters>	Sets operational defaults, including fan.
<feeding time>	Auger control settings.
<temperatures>	Sets temperature sensors.

If you make a change that you don’t want to keep, simply do nothing further for one minute and the controller will return to the previous setting.

When setting the boiler temperature settings, use the + and − buttons to make the change.

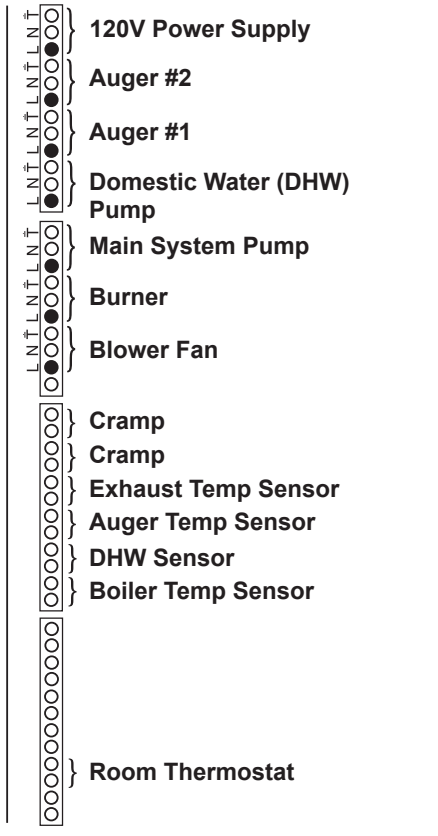
Controller Menu Hierarchy

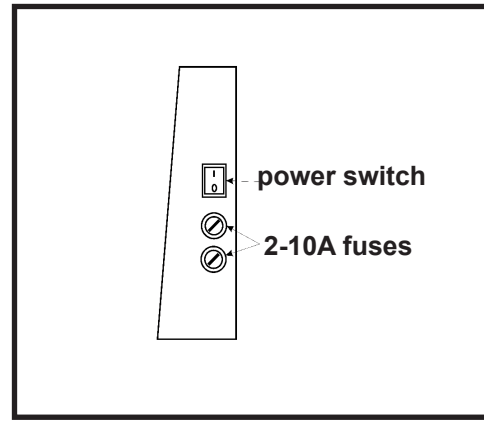


Controller Power Connections

There are 34 electrical connections located at the back of the controller that power various boiler components, as indicated in the table below:

1	power	PE	14	system pump	N
2	power	N	15	system pump	L
3	power	L	16	burner	PE
4	auger 2	PE	17	burner	N
5	auger 2	N	18	burner	L
6	auger 2	L	19	fan	PE
7	auger 1	PE	20	fan	N
8	auger 1	N	21	fan	L
9	auger 1	L	24-25 cramp		
10	DHW pump	PE	25-26 cramp		
11	DHW pump	N	27-28 exhaust temp sensor		
12	DHW pump	L	31-32 DHW temp sensor		
13	system pump	PE	33-34 boiler temp sensor		



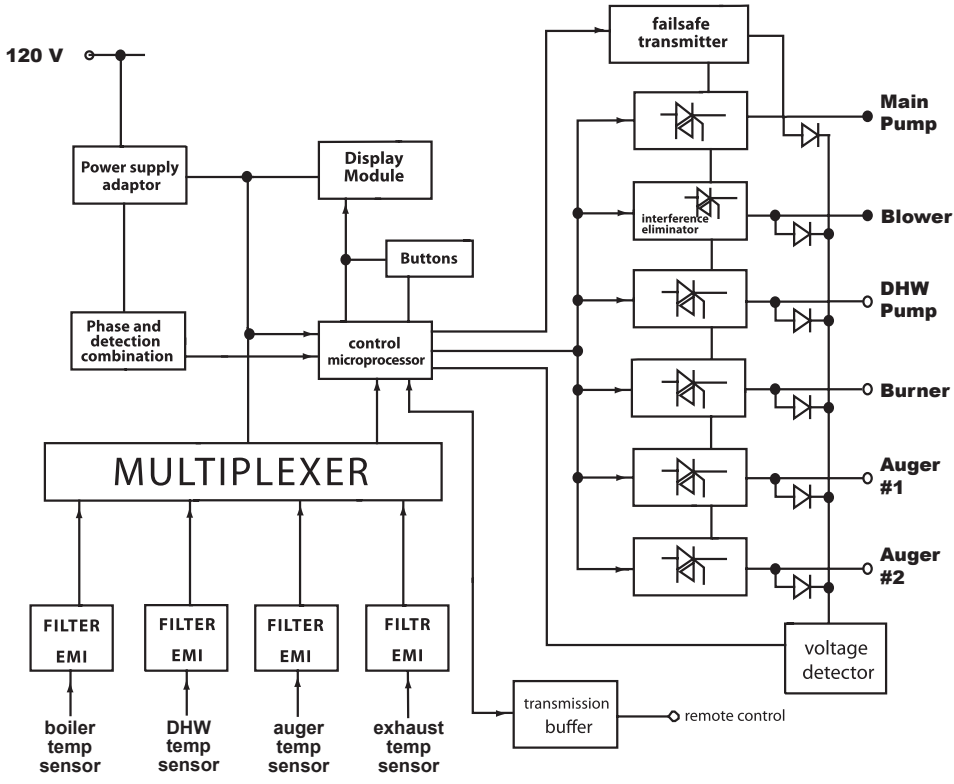


Controller Error Codes

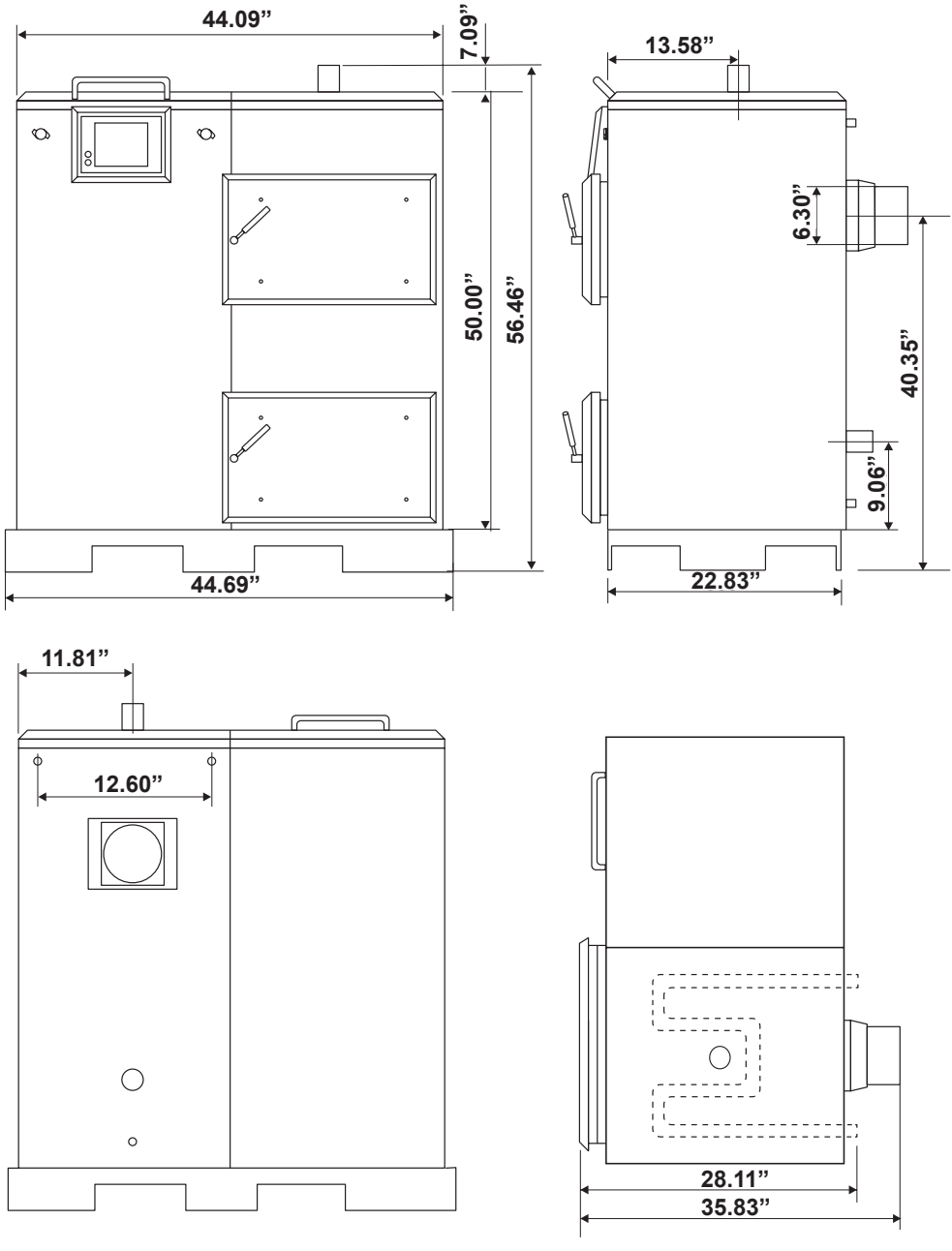
The Orlan Pellet Boiler controller has a total of 15 error codes that display when a problem is detected. They are explained in the following list:

Error: 01 Boiler temp sensor failure
Error: 02 Auger temp sensor failure
Error: 03 Exhaust temp sensor failure
Error: 04 Domestic hot water (DHW) temp sensor failure
Error: 05 Controller short circuit
Error: 06 No power to controller
Error: 07 No power to blower fan
Error: 08 No power to main system pump
Error: 09 No power to DHW pump
Error: 10 No power to auger #1
Error: 11 No power to auger #2
Error: 12 No power to burner
Error: 13 Boiler overheating
Error: 14 Auger overheating
Error: 15 Exhaust maximum temp exceeded

Wiring Diagram



Boiler Dimensions



Technical Specifications

No	Description	Units	Value
1.	Power	kW/KBtu-hr	30/100
2.	Power range	kW/KBtu-hr	8-30/ 27.3-100
3.	Boiler class	wg. EN303-5	3
4.	Boiler efficiency	%	92
5.	Fuel type: pellet Length diameter moisture content	 in. in. %	 .39-2.00 .24-.31 8-12
6.	Fuel consumption at power: nominal minimal	Lb/hr	 7.5 2.5
7.	Space to be heated	Sq. ft.	3,200
8.	Max working pressure	psi	30
9.	Max water temperature	°F	195
10.	Min return temperature	°F	140
11.	Smoke exhaust diameter	in	6.3
12.	Chimney flue size	in. of H2O	.04-.08
13.	Exhaust temp under normal operation nominal minimal	°F	 320 265
14.	Chimney draft under normal operation nominal minimal	kg/s	 0.02 0.01
15.	Boiler weight	lbs	660
16.	Boiler water capacity	gallons	15.85
17.	Hopper capacity	gallons	35.5
18.	Combustion slot size; width/length	In.	10.25/17.0
19.	Cold water temperature heat exchanger	°F	50
20.	Normal operating pressure	psi	30
21.	Cooling water minimal pressure	psi	30
22.	Voltage/Frequency	V/Hz	120/60
23.	Additional power	W	250
24.	Recommended size of hot water storage tank	gallons	400
25.	Hydraulic resistance of a boiler	mbar ΔT=20K mbar ΔT=10K	4 17

Controller Technical Data

No	Description	Units	Value
1.	Temperature regulation range	°F	140-350
2.	Water temperature measurement range	°F	16-250
3.	Exhaust temperature measurement range	°F	32-430
4.	Information Display		Large, readable, alfa-numeric LCD readout
5.	Burner regulator duration	min.	1-60
6.	Demister regulation		Smooth (possibility of service mode turning off)
7.	Fumes' temperature control		Exhaust temp control sensor allows for more economic and safer operation.
8.	Room temp operating range	°F	32-120
9.	Power outage protection		During a power outage, the controller will retain the clock and memory settings for 50 minutes.

Motor Electrical Data

	Description	Value	
1.	Type	Commutator motor with a gear	
2.	Voltage	120VAC 60 Hz	
3.	Number of fields	2P	
4.	No charge engine characteristics	Current Initial power Rotation velocity Voltage	0.65 A +/- 15% 72W +/- 15% 5.4 rotation/min +- 10% 161V MAX
5.	Loading characteristic - 1 min after the motor starts working	5.1. Limit load	33 Nm MIN.
		5.2. Acceptable load	25 Nm MIN.
		5.3. Start loading	20 Nm MIN.
6.	Max power	1.2 A MAX.	
7.	Dialectic stamina	A motor takes 1500V RMS voltage in 1 minute time (1800V RMS by 1 sec) measured between motor's coil and its core. (trial current 3 mA)	
8.	Insulation constant	100 MΩ min at 500V constant equivalent measured between a coil and casing.	
9.	Thermal protection	Thermally protected motor (up to 250 degrees F.)	
10.	Insulation category	Category "E"	

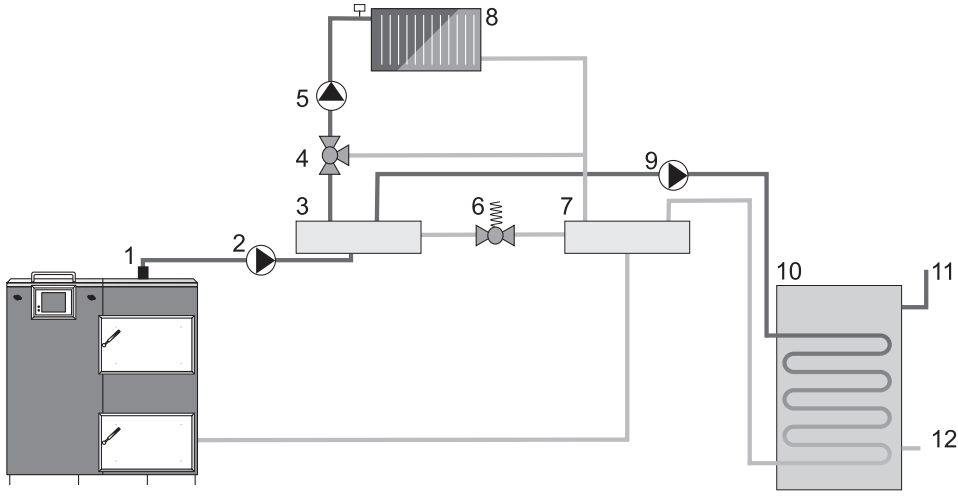
Gear Motor Mechanical Data

	Description	Value
1.	Lubrication	Mineral oil and grease
2.	Volume	25 dB MAX.
3.	Weight	4.85 lb.
4.	Driveshaft orientation	horizontal
5.	Ratio	1:532
6.	Bearings	ball bearings

Ceramic Burner Specifications

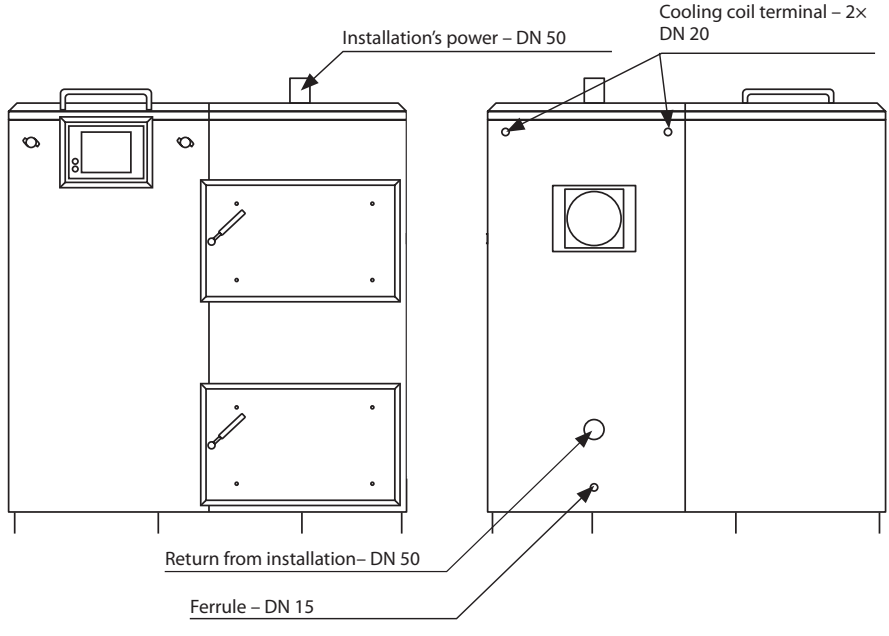
	Description	Value
1.	Type	GLO 120 - 400
2.	Input voltage range	Compatible with 230/120 A adapter
3.	Current	3.3-4.2 A 120 VAC
4.	Power	400-500W for one burner. 800W serial combination of two burners.
6.	Burner temp	2,200°F
9.	Heating time	>12s up to 2,200°F
10.	Burner construction	recrystallizary ceramic Si3N4
11.	Safety rules	CSA

Boiler Piping Diagram



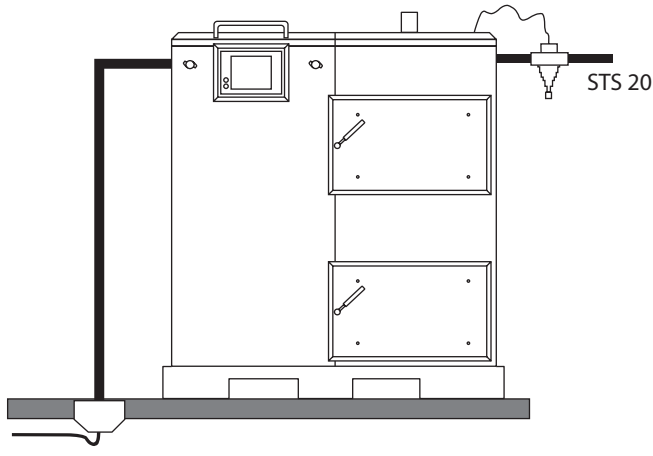
1. Boiler with hopper	7. Return water distributor
2. Main system pump	8. Burner
3. Supply water distributor	9. DHW loading pump
4. Three-way mixing valve	10. DHW tank
5. Circulating pump	11. DHW outlet
6. Differential valve	12. Cold water inlet

Important Piping Connections

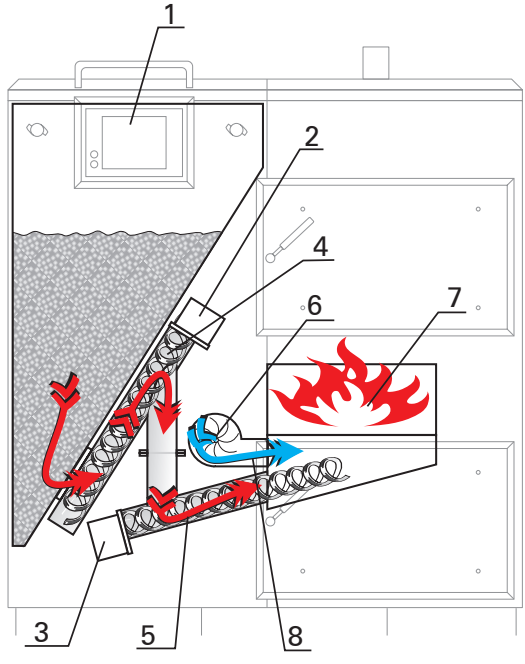


Emergency Overheat Protection

A cooling coil inside the pressure vessel may be connected to a domestic water supply to provide cooling action in the event that the boiler overheats. The water in the coil never mixes with regular boiler water. After passing through the coil, the water exits into a common drain.



How the Boiler Works



1. Pellet hopper
2. Auger #1 motor reducer
3. Auger #2 motor reducer
4. Auger #1
5. Auger #2
6. Exhaust fan
7. Burner
8. Heater

Preventing Burnback

Without adequate protection, it may be possible under certain circumstances for the fire to burn back from the burner and into the pellet hopper. This is prevented in the Orlan Pellet Boiler by a thermostat in the auger pipe which turns the boiler off when the temperature exceeds 200 degrees F. The controller also sounds an alarm when that temperature is detected.

Warning !
The controller must be reset after an overheat condition is detected and the alarm sounds. It is critical that the cause of the problem be identified and fixed before restarting the boiler.

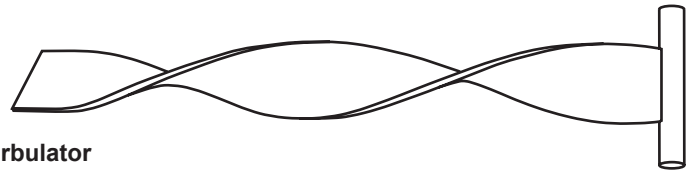
The Orlan Pellet Boiler's dual-auger feeding system is also designed to prevent fire from entering the pellet hopper by burning back up through the auger tube. This is accomplished by connecting both augers to a chute pipe in such a way that burnback is prevented. Essentially, the vertical chute is always empty, thus preventing a path for the fire to follow.

Boiler Maintenance

Ashes produced by burning the pellets fall down into the bottom of the combustion chamber and should be cleaned out once a month. Use the tools provided with the boiler. They include a scraping device and a cleaning shield. At the same time (once monthly) it is also a good idea to clean out the heat exchanger tubes with the cleaning shield.

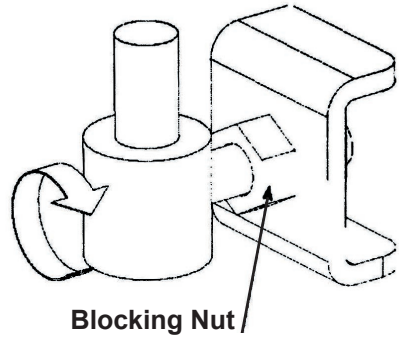
To clean the heat exchanger tubes:

1. Open the top door of the boiler.
2. Unscrew the two nuts with a 13 mm wrench. These nuts hold the plate that seals the heat exchanger tubes.
3. Pull the turbulators out of the heat exchange tubes and scrape the tubes clean with the cleaning shield, allowing the soot, ash and other debris to fall down into the bottom of the combustion chamber.
4. Scrub the turbulators clean with a wire brush.
5. Put the turbulators back into the tubes and bolt the plate back into place.



Turbulator

The turbulators help increase boiler efficiency by slowing down the gasses exiting from the combustion chamber as they pass through the heat exchanger tubes. One sure sign that the tubes need cleaning is if the exhaust temperatures begin to read higher than normal. Accumulated soot and ash work to insulate the tubes from the water in the boiler, and the unabsotbed heat is exhausted to the chimney rather than heating the water in the system.



It is very important to maintain tight seals on the doors of your Orlan Pellet Boiler. Poor seals can result in smoke and gases leaking out of the boiler and lead to uncontrolled burning which may cause the boiler to overheat. The fiberglass rope used to seal the doors should be inspected regularly and treated with graphite or some other lubricant (i.e. motor oil or WD-40) as needed, to keep them flexible.

Over time (typically after one heating season) the rope seals on the doors can become flattened through normal use. When this occurs, the door hinges can be adjusted to compensate for the new shape of the sealing rope, as follows:

1. Remove the door.
2. Loosen the cap.
3. Turn the hinge 360 degrees.
4. Tighten the blocking nut to block the hinge retaining screw.

Warning !
The bottom and top doors should be adjusted at the same time. Be sure to adequately lubricate the door hinges and rope seal.

Ventilating the Boiler Room

The room that the boiler is installed in should have a ceiling at least 7 feet above the floor and have adequate ventilation built in, for the sake of both safety and proper boiler performance. Poor ventilation can cause smoky operation and problems reaching and maintaining the desired water temperature. Your Orlan Pellet Boiler requires both supply and exhaust ventilation, as described here:

The supply ventilation vent should consist of a pipe allowing outside air into the boiler room. It should be equal to 50 percent of the cross section diameter of the chimney. The duct should be located about 3 feet above the floor. The intake side of the ventilation pipe should be fitted with an appliance air flow control device. The vent should be made of a non-flammable material, such as aluminum.

The exhaust ventilation vent should be equal to 25 percent of the cross section diameter of the chimney. It should be located under the ceiling and extend at least 5 feet above the roof.

Chimney Requirements

Your Orlan Pellet Boiler requires a 6-inch diameter Class A chimney, which can have either a stainless steel or ceramic tile liner. The chimney must be in good condition and installed in compliance with all applicable codes. A new chimney should be installed by a professional. An existing chimney should be inspected by a qualified professional, such as a chimney sweep. No other appliances may be connected to the chimney being used by the boiler.

It is important for the chimney to be as straight as possible, i.e., with few bends and turns that might restrict the draft. It is always better to use two 45-degree turns rather than one 90-degree turn.The chimney should be fitted with a clean-out located at the boiler chimney vent or exhaust. The installation of a barometric damper is also recommended.

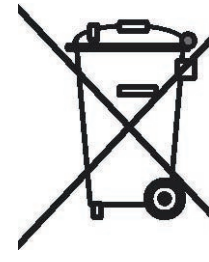
Troubleshooting

Problem	Cause	Action to be taken
STOP indicator ON, tone	fuel shortage	Fill the hopper with pellets.
Boiler doesn't reach the desired temperature	Insufficient fuel	Fill the hopper with pellets.
	pellets too moist	Replace wet pellets with dry fuel.
	primary air vent blocked	Call service – out of warranty
	secondary air vent blocked	Call service – out of warranty
	heat exchanger tubes clogged	Clean the heat exchanger or call service-out of warranty
	Damaged fan plate gasket	Replace it – out of warranty
	fan damaged	Replace it – out of warranty
Smoke coming into the room when the door is opened (a small amount of smoke is normal).	strong wind causing backdraft.	Consider installing a chimney cap designed to prevent backdraft.
	Inadequate chimney or blocked chimney.	Consult chimney sweep.
Smoke and fumes escaping into the boiler room during normal operation.	Leaky door gasket	Replace the gasket – out of warranty.
	Damaged or misadjusted door.	Inspect door and adjust tension.
Regulator doesn't work	No power	Check the fuse, circuit breaker and wiring.
	Fuse blown	Replace the fuse
	Damaged wiring	Inspect and repair
	Regulator damaged	call service
Loud fan operation	Bearings damaged	call service – out of warranty
	condensator damaged	call service – out of warranty
	Loose fan mounting	Inspect and tighten
	Dirty fan blades	Inspect and clean
fault 01	Boiler temp sensor failure	call service/replace sensor
fault 02	Auger temp sensor failure	call service/replace sensor
fault 03	Exhaust temp sensor failure	call service/replace sensor
fault 04	Domestic hot water (DHW) temp sensor failure	call service/replace sensor
fault 05	Controller short circuit	call service

Fault	Cause	Action to be taken
fault 06	No power to the controller	Call service
fault 07	No power to the pump	Call service
fault 08	No power to the pump	Call service
fault 09	No power to the pump	Call service
fault 10	No power to auger #1	Call service
fault 11	No power to auger #2	Call service
fault 12	No power to the burner	Call service
fault 13, tone	Boiler overheating	Determine the reason and fix the problem, then reset the controller.
fault 14	Auger overheating	Determine the reason and fix the problem, then reset the controller.
fault 15	Excess flue gas temp	Determine the reason (such as dirty heat exchanger tubes) and fix the problem, then reset the controller.

Boiler Components Disposal and Recycling

Orlan Pellet Boilers contain steel, electronic components, insulation and other materials that may be subject to local, state or federal regulations as to their proper disposal. When retiring an Orlan Pellet Boiler from service, make sure that all applicable laws, rules and regulations are observed. When in doubt, check with your local regulating authority for scrapping and disposal guidelines.



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