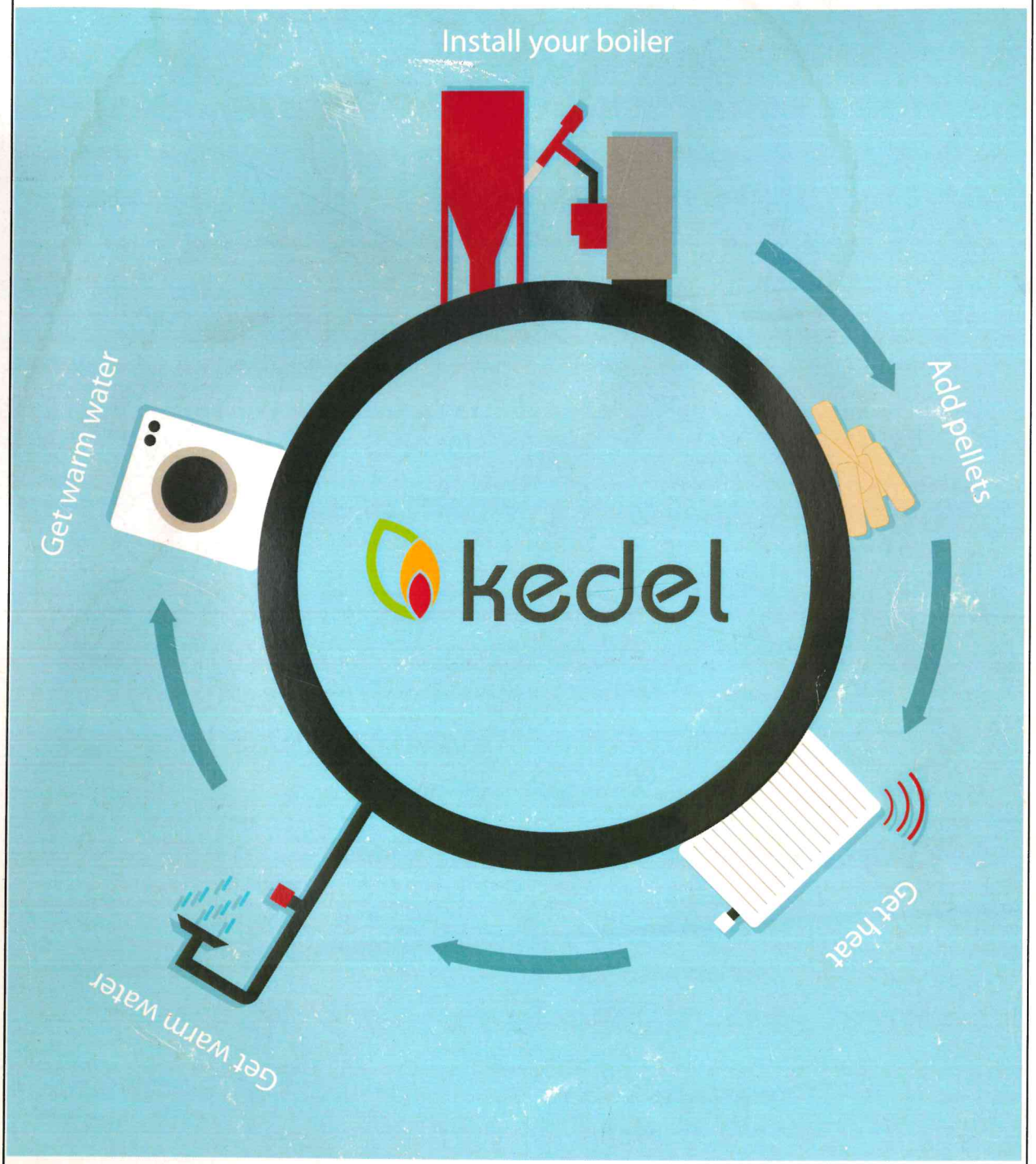
Pellet Stove.

Installation, Operation & Maintenance Manual



Distributed by: Interphase Energy
1053 Forest Ave.
Portland, ME 04106
207.370.2690 → Vince

CE EN303-5, UL391, UL2523, CSA336.1, ETLM 78-1

warranty boiler 30 yrs. w/ annual maintenance

kedel

GUARDIAN FIRE TESTING LABORATORIES, INC.

Product Certification

Accredited to ISO 17025, ISO 17020 & ISO Guide 65 Through ANSI/ASQ/ACLASS

Manufacturer: NBE Productions A/S
Brinken 6-10, Oester Vraa,
Denmark 9750

Distributor: Interphase Energy Ltd.
1053 Forrest Ave.
Portland, ME

Kedel Wood Pellet Burning Hydronic Heaters—Model Numbers: 54, 68, 102, 136, 170

Standards Tested To: UL 391; ETLM 78-1; CAN/CSA-B366.1; UL 1482; 2523 (applicable section)

Guardian Test Report No. GL 68112, March 15, 2013, Report EER 52913, 7/10/13

Administrator

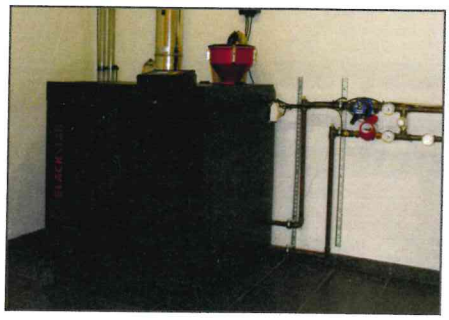
Certifying Product Reliability Against Fire

Revised Date: 11/22/2013

The design of the boiler room and the installation of the wood pellet boiler must be in compliance with the applicable local, state, and federal rules, building and electrical codes, environmental authorities, fire regulations and labor inspectorate. For advice regarding the rules and regulations governing the design, approval, and installation of your wood pellet boiler system it is recommended that you contact a Kedel authorized full service dealer and/or seek advice and guidance from your code enforcement official.

In this section you will you will find the boiler room specifications. This will cover topic areas that include:

1. **Wall and Ceiling Materials**
2. **Distances Surrounding the Boiler**
3. **Flooring Material**
4. **Area and Lighting**
5. **Chimney Requirements**
6. **Ventilation**
7. **Fuel**
8. **Forbidden Chemicals and Materials**
9. **Preventing Chimney Condensation**



1. Wall and Ceiling Materials

As a minimum, ceiling surfaces must consist of Class 1 material. If the ceiling happens to be the underside of the roof, the ceiling material must be non-combustible. As a minimum wall cladding must be made of at least a Class 2 material.

2. Clearances Surrounding the Boiler

The boiler must be installed in such a way that all maintenance points can be easily accessed. No less than 18" to combustibles must be provided around the sides of the boiler. The flue pipe must be atleast 18" from any combustible material unless appropriately covered with a non-combustible material. No less than 36" to combustibles must be left unobstructed in front of the boiler.

3. Flooring Material

Floors must consist of (or be covered with) non-combustible material under and around the boiler. There must be non-combustible flooring or material at a minimum of 12" from the boiler side and 20" from the front of the boiler.

4. Area and Lighting

The area around the heating system must be large enough to allow for effective cleaning and operation of the pellet boiler system. There must also be adequate lighting so that care and maintenance can be performed safely.

5. Chimney Requirements

Chimneys must have a diameter and height that allows for adequate draft. To ensure proper function of the boiler, a draft of atleast .04" of H_2O must be measured at the breach of the boiler when it is cold. If the draft is less than .04" of H_2O, a draft inducing fan that is rated for wood pellet equipment should be installed.

//Warning// If there is not enough draft in the chimney, smoke may linger in the boiler and seep through small cracks allowing toxic fumes to enter into the house and could cause harm or death. It is highly recommended to install a CO alarm and a fire detector in the same room as the boiler.

//Important//It is important that the chimney is high enough above the building to ensure that the smoke does not affect the surrounding buildings. The size of the chimney opening must match the amount of flue gas required to pass.

//Important// It is very important to design or utilize a chimney that is appropriately sized for the Kedel.

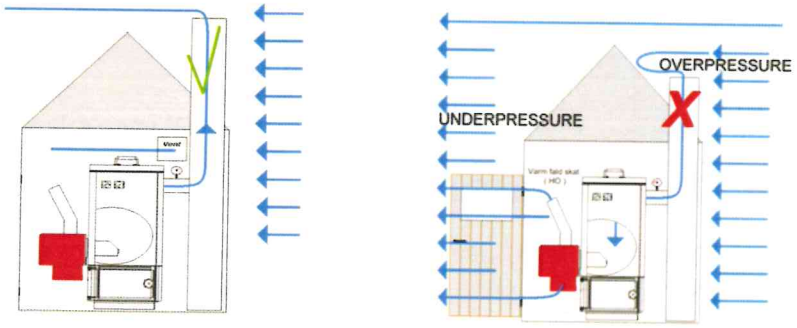
It is permissable to vent this boiler into a common flue with a gas or oil boiler provided the installation conforms with the gudelines provided in NFPA211, state and local code.

Power venting has been tested and approved as an acceptable means of venting the boiler through a side wall. Power vent kit must be a Field Controls SWGAF model or equivalent, supplied by Interphase Energy to meet listing standard. (pt.# IEVENT)

If there is insufficient draft (<.04" WC), a draft inducer can be installed on the flue pipe which will ensure consistent draft. The draft inducer must be approved for use on a solid fuel appliance and must meet applicable state and local code requirements.

//Death and Damage//If the opening in the chimney is too small, the exhaust flow may be restricted. When the resistance of the flue is too large, smoke could back flow causing toxic smoke to enter the house. Simultaneously, the fuel may not be completely burned due to the lack of oxygen required for combustion. This allows smoke to linger in the chimney and potentially form creosote. This build up could increase the risk of a chimney fire. Chimney openings also must not be too great, since cold air could enter from the top of the chimney. When the chimney is cooled, this can also cause condensation and soot inside the chimney. Soot is a problem since it can penetrate through the chimney and cause unsightly brown splotches on the walls inside the house. Thus cosmetic damages could result.

Correct and Incorrect Draft



Indications of poor draft may include but are not limited to: the light sensor becoming sooty or melted; smoke in the hopper; a warm drop shaft; smoke from the fan/boiler at startup. If there are intermittent problems with draft, it is a good idea to keep a log of when the draft problems occur as draft problems are often associated with wind in certain directions. When the wind blows against one side of the house, it creates a higher pressure on the windward side of the house and a lower pressure on the leeward side of the house. The higher pressure and lower pressure will always try to meet wherever possible, including through the chimney and boiler. It is a good idea to ask your chimney sweep about the location and size of the chimney, location of cleaning doors and possible steps to improve the draft.

6. Ventilation

The boiler must be installed in a room with suitable ventilation. This may be achieved via an adjustable air vent from the outside or through a direct fresh air intake to the burner. The diameter of a fresh air valve should have the same internal diameter of the chimney. It should also be mounted on the same side of the house as the chimney, in order to equalize the pressure difference.

//**Note//:** Drum dryers, range hoods, oil burners or other applicances located in the same room using high pressure blower can affect the air flow.

7. Fuel

Wood pellet fuel must be made of clean timber. Wood pellets consisting of glue, paint, or plastic, should not be burned in the system. Pellets should be of super premium quality with an ash content of less than .7%. If pellets with higher ash content are used, the ash box will need to be emptied more frequently and it will possibly create clinkers on the burning grate.The boiler is set up for premium wood pellets Ø 0.2" - 0.3", which do not clinker. (i.e. turn into hard ashes)

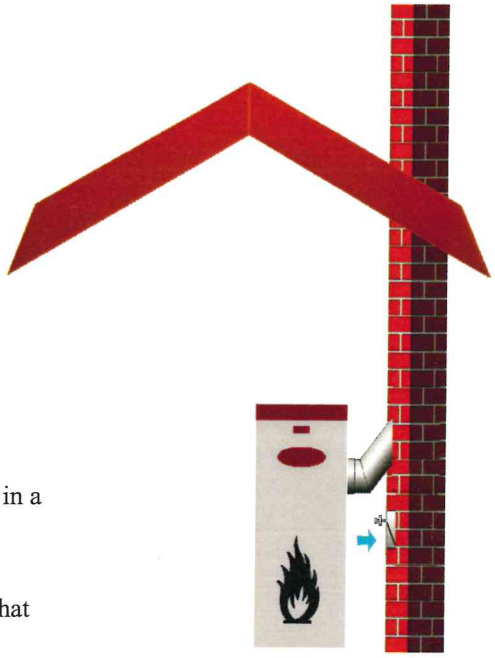
8. Forbidden Chemicals and Materials in the Boiler Room

Boiler room must not contain combustible materials or flammable liquids (except oil for oil burners) and must be kept tidy. The floor must be kept free of spilled fuel, dust and combustible waste, and waste from other activities. Hot coals from the Kedel must be extinguished with water and transported directly to a safe storage location in the open air.

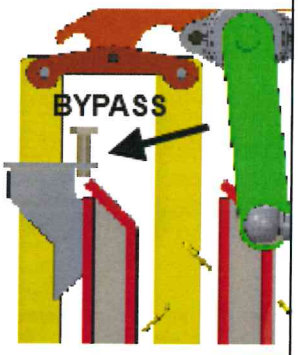
Modern wood pellet boilers maintain high operating efficiency between 88-93%. As a consequence, little heat escapes out the chimney resulting in low chimney temperatures. This creates greater demand on the installer to ensure proper chimney draft and avoid condensation. Below is a guide on how to adapt your existing boiler room for a high efficiency boiler.

/Note// It is important to prevent condensation. Failure to do so may result in soot and corrosion of the chimney as well as possible damage to the boiler. Damage to the boiler resulting from condensation will result in loss of the boiler vessel warranty

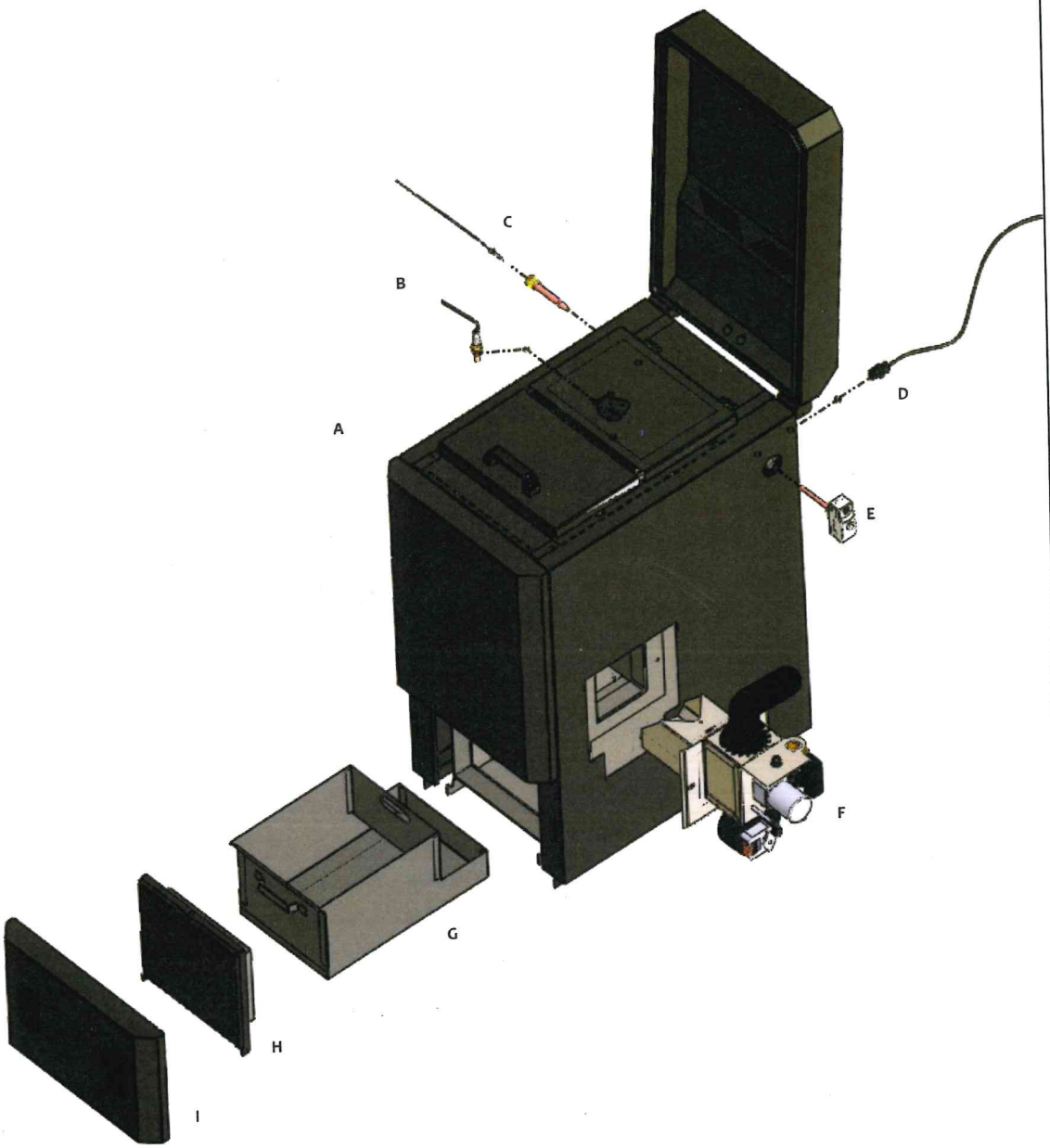
10 things that can prevent condensation in the boiler and chimney



1. **High Chimney > 17'**
   Ensures proper draft under normal circumstances
2. **Small chimney diameter 5"**
   Provides better flow
3. **Minimize the use of uninsulated flues to <12"**
   Will prevent unneccesary cooling of flue gasses
4. **Install a Draft Stabilizer**
   Stabilizes the draft and provide dry air to the chimney
5. **Increase the boiler temperature > 160 degrees F**
   Increasing the boiler temperature by 10 degrees results in a 10 degree increase in smoke temperature
6. **Make sure that the return temperature is > 130 degree F**
   If the flue gases comes in contact with boiler surfaces that are below 120 degrees F condensation will occur
7. **Increase flue gas bypass in the boiler**
   Increasing the bypass allowance in the boiler will allow flue gasses to reach higher temperatures. Increasing the smoke temperature by 27 degrees F will result in only 1% efficiency loss
8. **Heated boiler room**
   Reduces cooling of the boiler and flue pipe, as well as providing the draft stabilizer with warm air
9. **Increase the O2 levels during combustion**
   Increases the air flow thus carrying the moisture out. Note that a 1% increase in O2 results in 0.5% loss in efficiency
10. **Remove Heat Exchanger Turbulators**
    Allows for increased heat flow to the chimney (especially effective in the warmer months if the boiler is providing domestic hot water)

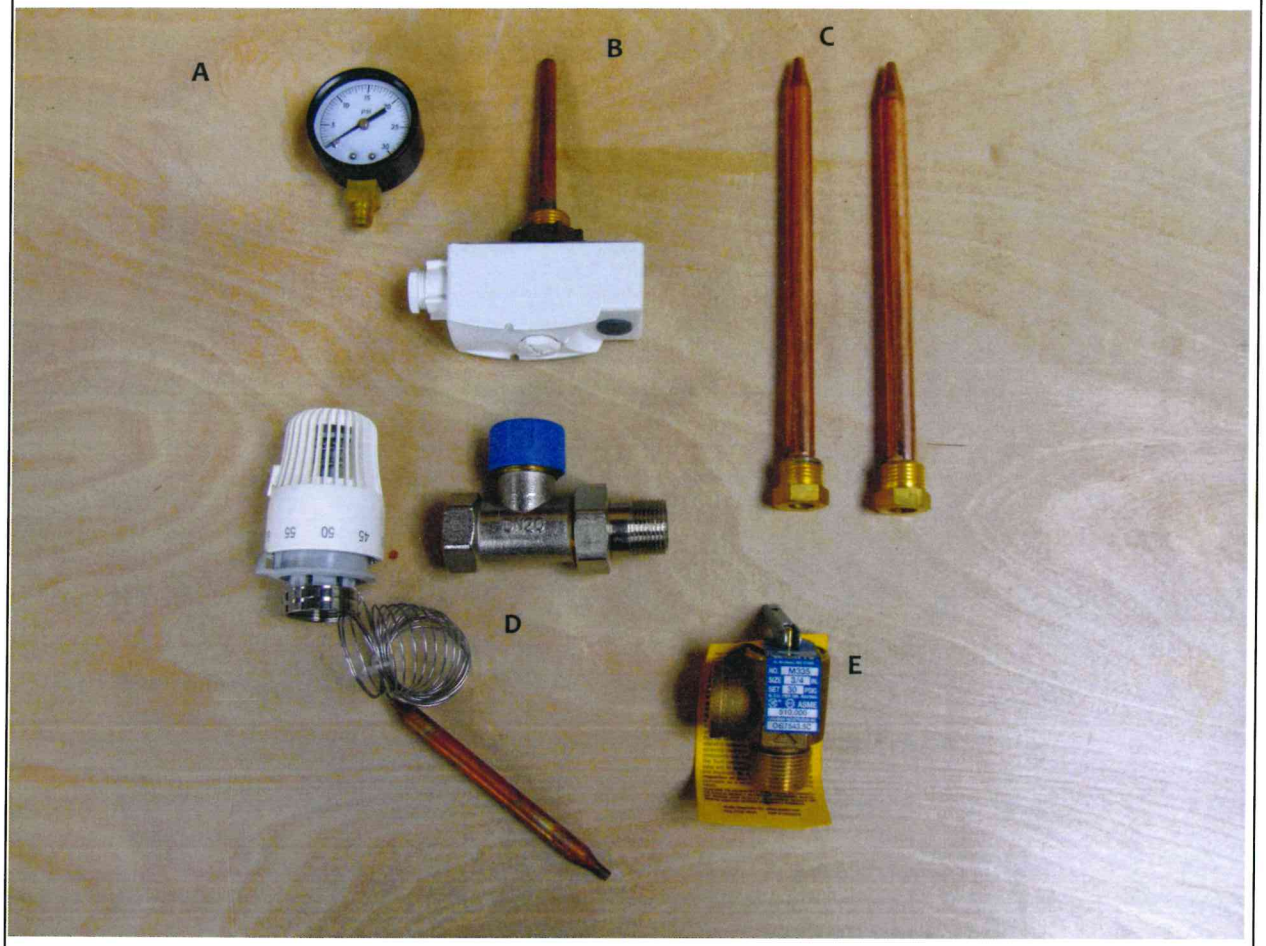


Boiler - Major Assembly



A - Boiler Vessel
B - Oxygen Sensor Kit (See O2 Sensor Kit For All Parts Included)
C - Boiler Temperature Sensor and Thermowell (See Version 10 Controller)
D - Power Cord for Heat Exchanger Cleaner
E - Over Temperature Safety Limit Switch (See Boiler Parts Package For All Parts Included)
F - Burner (See Burner Package For All Parts Included)
G - Ash Bin
H - Ash Chamber Door
I - Ash Chamber Cover

Boiler - Standard Parts Package (Included With Boiler)



Item	Part #	Qty.	Description
A	SHP125-1	1	Pressure Gauge
B	NBE100930	1	Safety cut off single
C	NBE100920	2	Thermowell for Temperature Sensor 1/2" x 200mm
	NOTE		One thermowell may only be 100mm long for the shunt remote sensor
D	NBE300022	1	Shunt Valve 3/4" With Remote Sensor, 20-60C
E	SH3/4M335M1-030	1	Pressure Relief Valve

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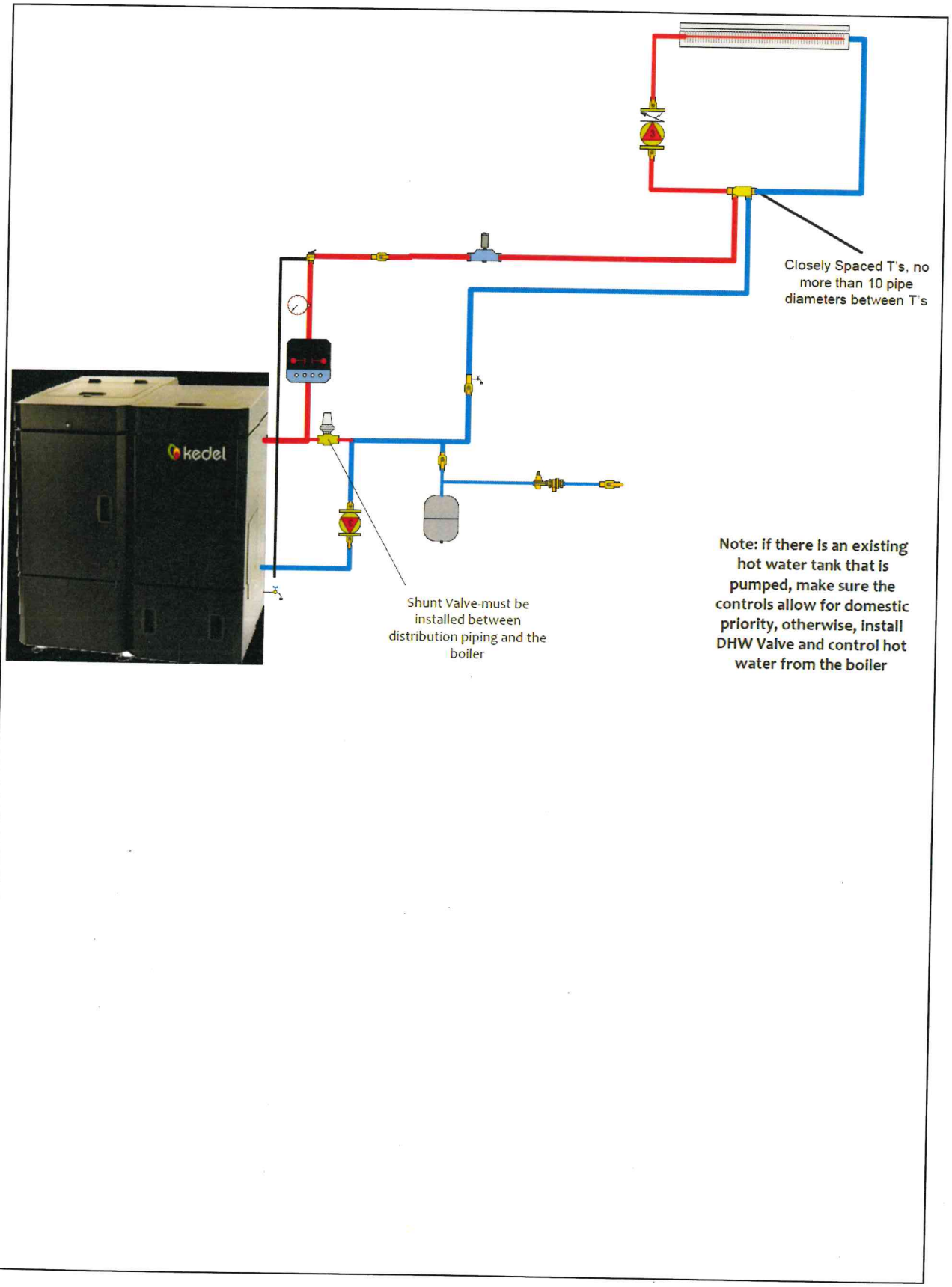
Piping Into Closely Spaced Tees

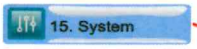


	IN	OUT	
POWER	PE-N-L		Power to control box
EXTERNAL AUGER		PE-N-L1	External Auger
BLOWER		PE-N-L2	Blower
INTERNAL AUGER		PE-N-L3	Internal Auger
IGNINTION		PE-N-L4	Ignition
EKSTRA 1		PE-N-L5	Pump, hotwater valve , compressor cleaning
EKSTRA 2		PE-N-L6	Pump, hotwater valve , compressor cleaning
EKSTRA 3		PE-N-L7	Pump, hotwater valve , compressor cleaning
EKSTRA 4		PE-N-L8	Pump, hotwater valve , compressor cleaning
EKSTRA 5		PE-N-L9	Pump, hotwater valve , compressor cleaning
EKSTRA 6		PE-N-L10	Pump, hotwater valve , compressor cleaning
PULS	P P1		Flow Meter
EKST	K1 K		External off / on
BOILER Temp.	T1 - T		Boiler temperature
SMOKE Temp.	T2 - T		Smoke temperature
BOILER return Temp.	T3 - T		Boiler return temperature
HOT WATER Temp.	T4 - T		DHW temperature
EXTERNAL Temp.	T5 - T		Outside temperature
EXTRA Temp.	T6 - T		
EXTRA Temp.	T7-T		
DISTANCE SENSOR	Wire -T8 –GND		Distance Sensor for Hopper
BURNER Temp.	T9- T		Motor print Burner Temperature
PHOTO Sensor	T10- T		Motor print Photo Sensor

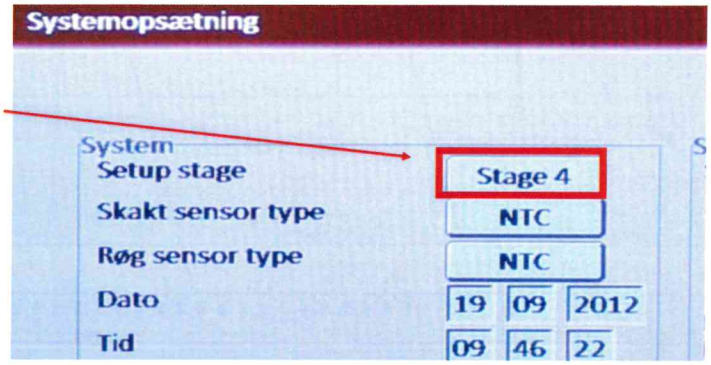
TEXT IN DISPLAY	
WAIT	Updating temperature sensor
IGNITION 1	First ignition
IGNITION 2	Second ignition
POWER	Regular mode
HOT WATER	Hot Water mode
PAUSE	Pause firing
COLD BOILER	Boiler temperature has been to low and has entered alarm mode
STOP	Pellet burner has stopped and waiting for the temperature to drop
SUMMER STOP	Outside temperature is high and the burner has stopped
SUN STOP	Watt / m2 is to high and the burner has stopped
HOT BURNER	The burner has been to high and is in an alarm
PLUG DISCONNECTED	Plug on the burner is disconnected or drop shaft sensor faulty
FAULT IGNITION	The burner couldn't ignite and got in to an alarm
OFF	The burner is turned off
FAULT BOILER TEMP.	The boiler temperature sensor is out of range
FAULT PHOTO SENSOR	The photo sensor is out of range
FAULT BURNER TEMP.	The burner temperature sensor is out of range
FAULT OUTPUT	A relay is broken
NO LIGHT	Flashing when light sensor can't see light, after 5 minutes it is an alarm
FORCE RUNNING AUGER	Force running auger
CLEANING	The burner is cleaning, with more fan speed
WOOD FIRING	O2 % has been 2% under the allowed level for more than X minutes
COMPRESSOR CLEANING	The burner is in a compressor cleaning cycle

The Control Box has 5 types of menu display modes from Stage 0 to 4 that increase or reduce the display features of the system.

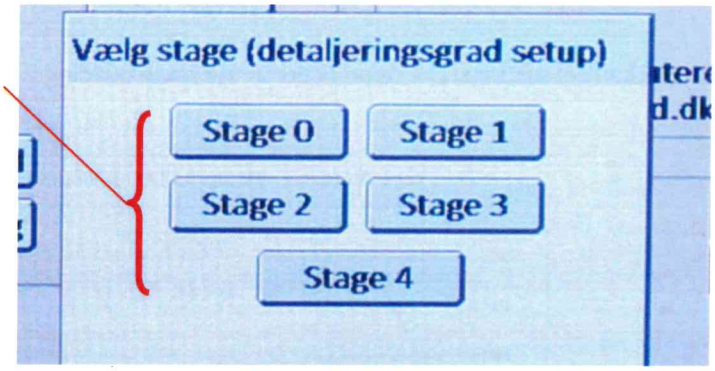
To change what can be adjusted:

Step 1: Go to 

Step 2: Under System> Setup Stage> Choose: Stage



Step 3: Choose desired stage



STAGE 0.	STAGE 1.	STAGE 2.	STAGE 3.	STAGE 4.
1.Temperature 2.Hopper 3.Ignition	1.Temperature 2.Hopper 3.Ignition 4.Auto combustion	1.Temperature 2.Hopper 3.Ignition 4.Auto combustion 5.Boiler Timer 6.DHW Timer 7.Cleaning	1.Temperature 2.Hopper 3.Ignition 4.Auto combustion 5.Boiler Timer 6.DHW Timer 7.Cleaning 8.Oxygen Control	1.Temperature 2.Hopper 3.Ignition 4.Auto combustion 5.Boiler Timer 6.DHW Timer 7.Cleaning 8.Oxygen Control 9.PI regulation 10.Blower 11.Temp. alarm 12.Accessories 13.Manual Control 14.Temp Sensor

ACTIVATING AND MAINTAINING THE WARRANTY

The standard Kedel warranty begins at the point of sale to the customer.

The certified Kedel Partner must activate the Kedel warranty within 2 weeks of a completed installation. The information required to activate the warranty includes:

- ⇒ Date of Sale
- ⇒ Retail purchase amount
- ⇒ Boiler serial number
- ⇒ Model
- ⇒ Conveyance and storage system, including capacity, auger length and extraction method
- ⇒ Customer name, address, phone and email
- ⇒ Web monitoring user name and password
- ⇒ Maintenance plan selected by customer
- ⇒ Installation checklist

Warranty may be activated by email. Please send the above information to:

Jacob@kedelboilers.com.

WARRANTY CLAIMS

NOTE: Warranty claims may only be requested by a Certified Kedel Partner or Dealer. In the event that a Partner or Dealer goes out of business, the Customer may contact IE directly regarding warranty coverage.

⇒ For each service call or annual maintenance visit during the warranty period, please complete the service checklist included with each boiler. A copy of the checklist should remain with the boiler and a copy with the Partner or Dealer.

⇒ For 7 or 10 year extended warranty claims, **Kedel Partners and Dealers must provide consecutive annual service and maintenance checklists** with a warranty claim request. When warranty coverage is requested, please submit by email the following:

- ⇒ Boiler serial number and customer name
- ⇒ All maintenance and annual service checklists as attachments
- ⇒ Annual Maintenance plan, if any
- ⇒ Description of problem
- ⇒ Warranty coverage requested and parts needed