

Scotte / Opop

Installation and operating
Manual 16, 24 & 30kw



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SECTION 1



Planning requirements.

If you are thinking of making any changes to your property, including installing a form of renewable energy, you must apply to the Building Control Office at your local council for approval.

Planning permission may or may not be required, depending on such factors as: location, individual planning department, nature of scheme, neighbors' opinions, visual impact and proximity to public through roads.

Before beginning any work we recommend that you contact your local planning department to determine whether planning permission is required.



Building regulations.

- Any installation of a heating appliance, or modification to a chimney such as relining, has to be carried out in accordance with. Building Regulations – Republic of Ireland Part F – Ventilation Part J – Heat Producing Appliances (Article 41 in N.Ireland Part J in England and Wales and F in Scotland). Building Control Consent might also be needed for such work unless the work is carried out by a qualified person as stated below. We recommend that all installation or design is completed in accordance with British Standards, including BS 5410 , BS 4543, BS 4876, BS 1181 and BS 715.



Installer expertise.

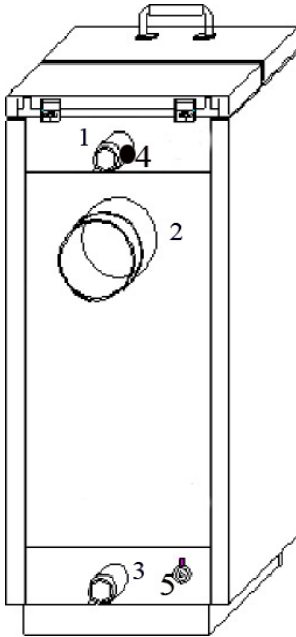
All installation work should be undertaken by a person who is a member of an approved competent person scheme as outlined in the **COMPETENT PERSON SELF-CERTIFICATION SCHEMES IN 2003** which can be found at.

<http://www.odpm.gov.uk/index.asp?id=1131139>

All appliances must be commissioned and failure to do so will invalidate the boiler/burner warranty.

SECTION 2

Description of Boiler.



- 1 Supply to radiators, hot water tank etc.
- 2 Flue pipe/chimney connection.
- 3 Return from the radiators, hot water tank etc
- 4 Thermostat pocket .
- 5 Emptying and filling of water to the system.

Manufacturers plate and serial number.

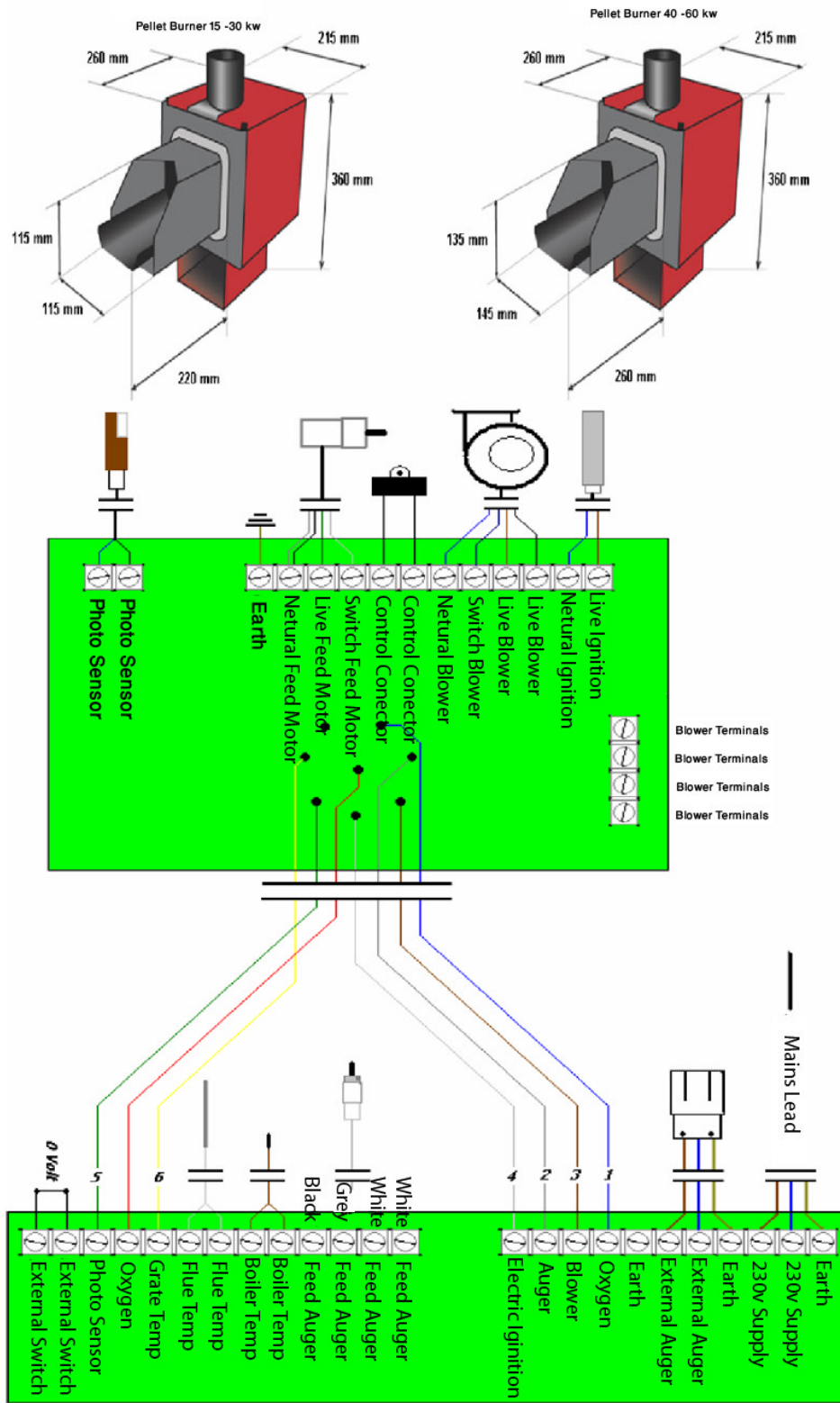
Burner/ boiler type.	Scotte / OPOP
Output	16/24/30 kW
Classification EN 303-5	3
Test pressure	4.0 Bar
Max. operational pressure	2.5 Bar
Water content	26 litres
Boiler weight	160 kg
Exit gas temperature, nominal load	115°C
Exit gas temperature, low load	66°C
Flue gas mass flow rate, nominal load	37.7 kg/h
Flue gas mass flow rate, low load	18 kg/h
Waterside resistance, delta T = 20 °K	1.37 mbar
Waterside resistance, delta T = 10 °K	5.39 mbar
Operating temperature	min. 35°C
Max. temperature	90°C
Efficiency	93.3 %
Power consumption 220 V	35 Watts
Manufacturer:	NBE
	DK 9830 Tårs
Tel.:	0045-98837701
Serial Number	

Dimensions of boiler.

Opop boilers: table 1

Model number:	418	430	460	4120
Power kw	18	30	40 – 60	80 - 120
Height mm	865	865	1005	1305
Width mm	386	490	800	1000
Depth mm	533	533	720	920
Flue mm	130	145	160	180
Water content litres	26	35	56	105
Weight kg	160	200	245	335
Connections	1 ¼”	1 ¼”	1 ½”	2”

Dimensions of burner and wiring diagram.



Section 3

Assembly.

Fitting the burner unit.

1. seal with fire rope or heat resistant gasket sealer to the boiler via the square hole located on side of boiler (left or right depending on requirement).
2. mount the burner unit into flange and secure locking bolts

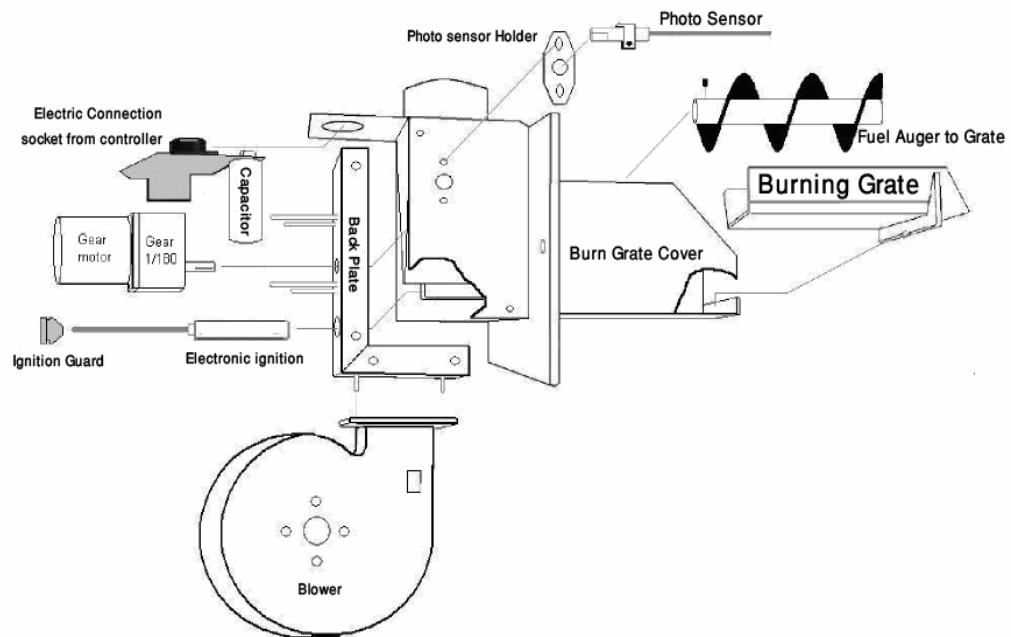
Fitting the feed screw.

1. fit one end of the thermoplastic hose to the top of the inlet tube on the burner unit, and the other end of the thermoplastic hose to the outlet of the feed screw.
2. mount the feed screw over the burner so the pellets can fall into the burner effortlessly. The more the feed screw is mounted at an incline, the less pellets it releases.

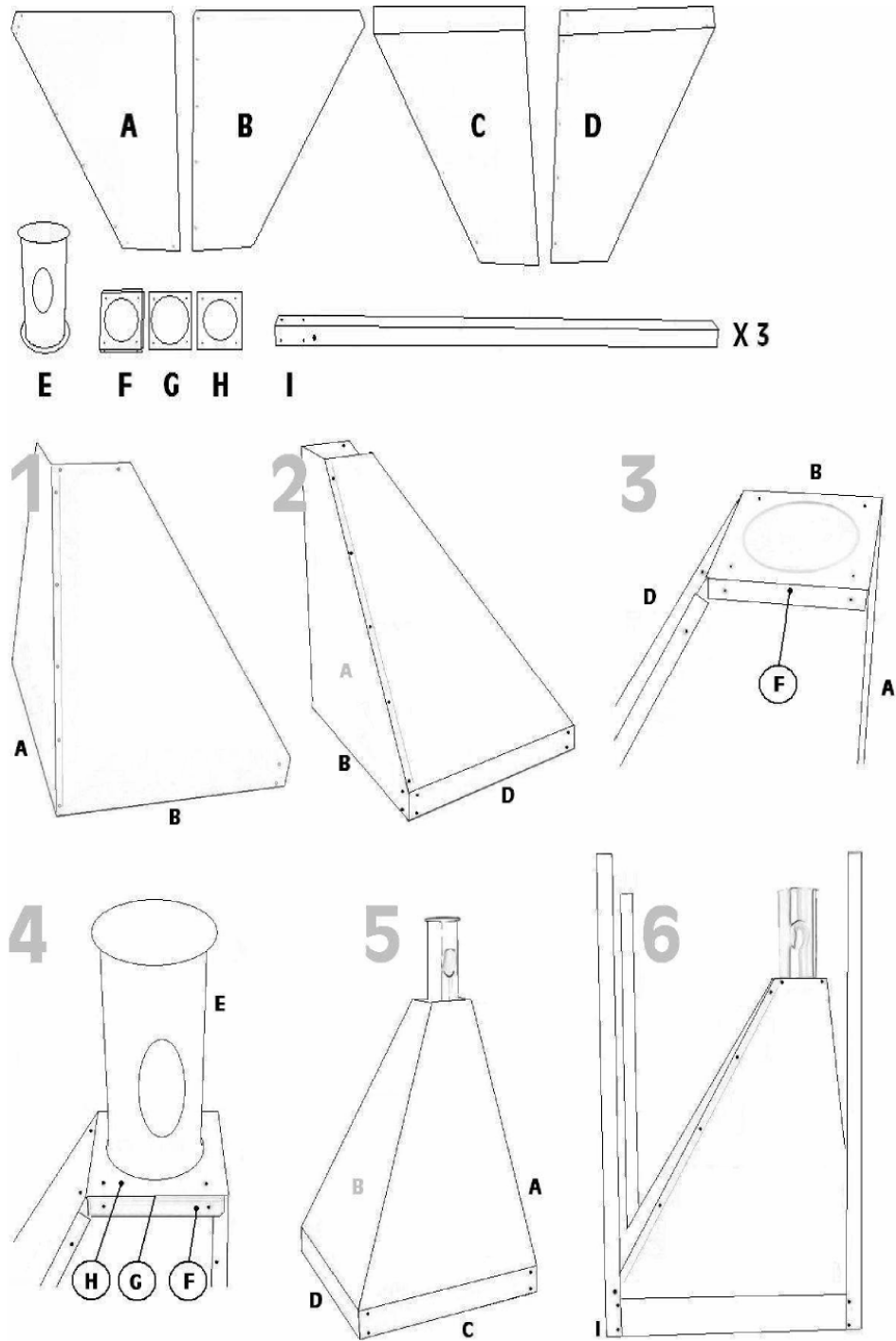


- adjust the control system according to the angle of incline. (see section 5, operating the burner)

3. ensure the thermoplastic hose is angled enough so the pellets end up in the burner, shorten the hose if needed.



Pellet silo assembly.



The pellet silo.....

As the pellets that you put into the silo contain dust, you should empty the silo completely from time to time. The more dust that is in the silo, the less pellets the feed screw will release and the boiler will become unadjusted, leading to inefficiency and possible breakdown.

How often the silo needs emptying completely, depends on the design of the silo and the quality of the pellet fuel used.

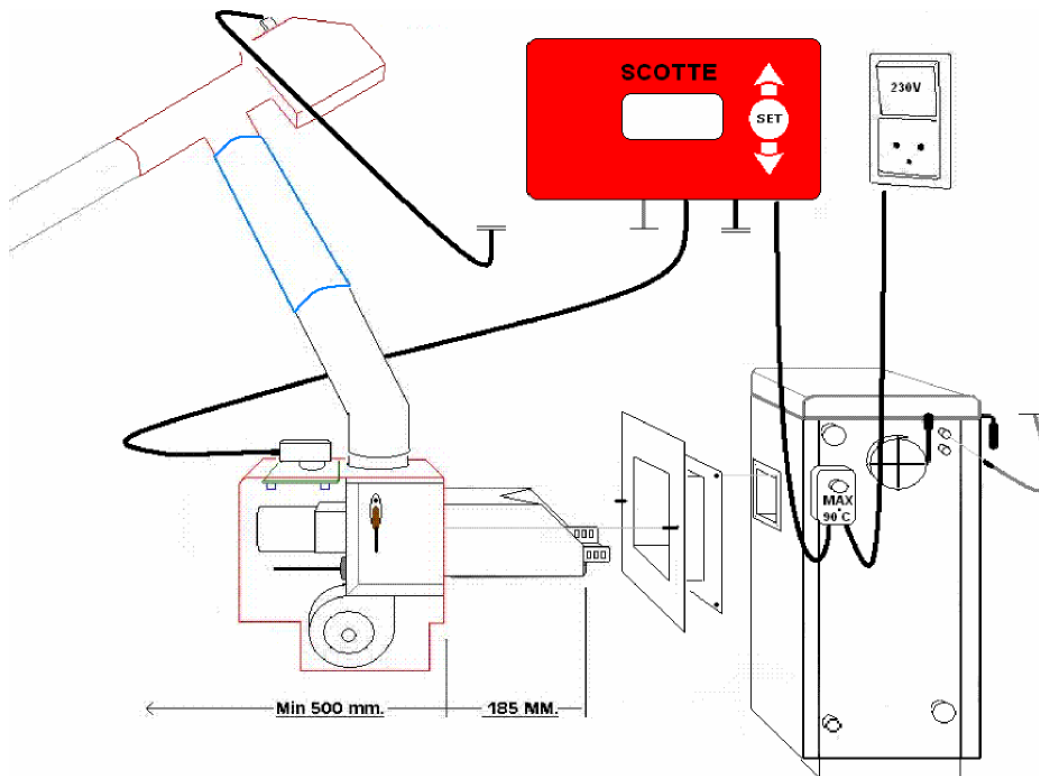
Section 4

Installation.

Power supply and connection.

230 volts 50Hz 10 Amp 60 Watts

Control is supplied via a priming circuit breaker, (high limit safety cutout stat) which is mounted on the rear of the boiler (item 4, page 3). The temperature sensor is mounted in the same immersion pocket as the priming circuit breaker or a suitable place where the boiler temperature can be measured. Mount the power to the control system via the priming circuit breaker so that the power is broken if the temperature of the boiler exceeds 95 degrees in the event of a fault.



Flue pipe and chimney connections.

Use the correct flue size for boiler model (table 1, page 3).

Ensure adequate height of chimney to gain satisfactory draft and to prevent back draft. A suitable cowl/raincap/anti back draft must be fitted.



We recommend that a draft stabilizer is always mounted to the chimney.

The vent pipe should not be greater than 1 metre in length and should be equipped with an access door.

The flue pressure of the chimney should be a minimum of 10 PA and be stable. A flue fan may be required to assist the draft and secure stability.

Upon condensation of flue gases in the flue, a condensation trap should be installed, or the valve in the rear flue of the boiler be opened, so that the flue gas temperature is increased.

Section 5

Starting the unit for the first time.



1. check all connections on burner, boiler, feed screw, flue, chimney and power supply.
2. ensure that there are pellets at the inlet of the feed screw in the pellet silo.
3. activate the forced feed operation by pressing the UP button on the controller for 10 seconds and turn the mains power on at the same time.
4. when the feed screw has filled with pellets and they are falling into the burner, turn the power off at mains.
5. The burner is started by switching the mains power on again. The control box can be started/stopped by pressing the on/off button for 5 seconds.
6. The alarm is cancelled by pressing the DOWN button 2 times within 5 seconds.



To obtain the optimum efficiency from the burner and boiler, correct adjustment is essential. Please refer to section 5 on adjusting the burner and section 6 on cleaning the burner.

Adjusting the burner.

The outputs for high and low loads are run by the control system in a 100 step modulation and the changes between the different steps are made automatically.

Feed adjustments for high and low loads.

Wood pellets can vary (dust, pellet length etc.) so correct adjustment for fuel economy and boiler efficiency are essential. The feed screw will supply the pellets differently and will have an influence on the burn quality. It is necessary to open the doors to the burner and look at the flame.

If the flame is fat – dark, possibly with black points, or the ash is black with black pellets, fewer pellets are needed. Reduce steps 2 and 3 in the main menu.

If the flame is thin – little flame and like a sparkler, or the ash is light grey, more pellets are needed. Increase steps 2 and 3 in the main menu.

* Correct burning adjustments normally produce a dark grey ash. *

The burner is intended for wood pellets between 6-8mm diameter.

If you are in any doubt then subscribe to a service contract. For further information visit : www.nordjyskbioenergi.noweb.dk

Main menu on controller.

In order to adjust the burner press the SET button on the controller and you will gain access to the main menu.

There are six adjustment options in this main menu.

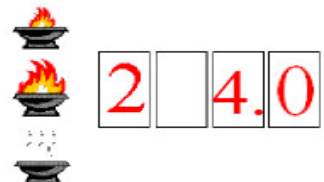
1. Boiler temperature: ***standard 60 degrees***

press the UP or DOWN buttons to reach the required water temperature.



2. Feed screw in low load: ***standard 4.0 ***

press the UP or DOWN buttons to adjust the quantity of pellets that corresponds to the blower speed. It is important that this adjustment is correct in relation to the speed of the blower. In the event of an incorrect adjustment, the boiler will not run as economically and there will also be the risk of a breakdown.



3. Feed screw in high load: ***standard 50.0***

press the UP or DOWN buttons to adjust the quantity of pellets that corresponds to the blower speed. It is important that this adjustment is correct in relation to the speed of the blower. In the event of an incorrect adjustment, the boiler will not run as economically and there will also be the risk of a breakdown.



4. Feed screw in pause firing: ***standard 15.0***

pause firing enables the burner to keep lit and not to have to use the electronic ignition every time more pellets are required. Press the UP or DOWN buttons to adjust the quantity of pellets the burner will use during pause firing. Set as low as possible without the burner going out. The burner fires every 5 minutes.



5. Oxygen in low load: ***standard 12.0 oxygen***

only used if connected to the oxygen program. Press the UP or DOWN buttons to adjust the Oxygen % in low load.



6. Oxygen in high load: ***standard 8.0 oxygen***

only used if connected to the oxygen program. Press the UP or DOWN buttons to adjust the Oxygen % in high load.



Secondary menu on controller.

To gain access to the secondary menu press the UP and DOWN buttons simultaneously for 5 seconds.

The first reading is the current value for the photo sensor, located on the right side of the burner. If it shows 000 there is no fire, and if it shows 400 there is maximum fire. The choices are displayed by pressing the SET button.

- A. The value that the photo sensor shall exceed before there is fire. ***standard 10***
- B. Setting the amount of fuel the burner will use for stoking up. Press the UP or DOWN buttons to adjust. ***standard 30 seconds***
- C. Setting the maximum time allowed for stoking up. Press the UP or DOWN buttons to adjust. ***standard 6 minutes***
- D. Adjustment of the effect of the electric ignition, the lower the setting the better the ignition will last. Press the UP or DOWN buttons to adjust. ***standard 70%***
- E. Adjustment of the amount of time the burner is allowed to run in pause firing. 245 = limitless, 0 = electric ignition every time. Press the UP or DOWN buttons to adjust. ***standard 120 minutes***
- F. Connection of an oxygen control program. Only used if an oxygen sensor fitted. 0 = OFF 1 = MODERATE 2 = ON ***standard 0 (off)***
- G. Calibration of the oxygen sensor (if fitted). When calibrating press the UP button once and wait 20 seconds. ***standard 68***



Oxygen control and sensor only required in Germany.

Other functions on the controller.

Forced feed screw operation – to start hold the UP button when switching on. To stop press the DOWN button.

Resetting the programmer – hold in the SET button when switching on the power and the control system returns to the standard settings.

Shift between temperature and oxygen displays – press DOWN one time (only when connecting the oxygen program).



FI

the burner cannot see flames



P 60

the burner runs in pause firing



- HO

the burner has become too warm



E 60

the burner is about to ignite



- 60

Burner is in High strain



↓ 60

the burner is cleaning the head
It does this for 30 seconds every hour. The blower will increase its speed. Seen as a running light.



- 60

Burner is in Middle strain



- 60

Burner is in Low strain

Section 6

Cleaning the burner.

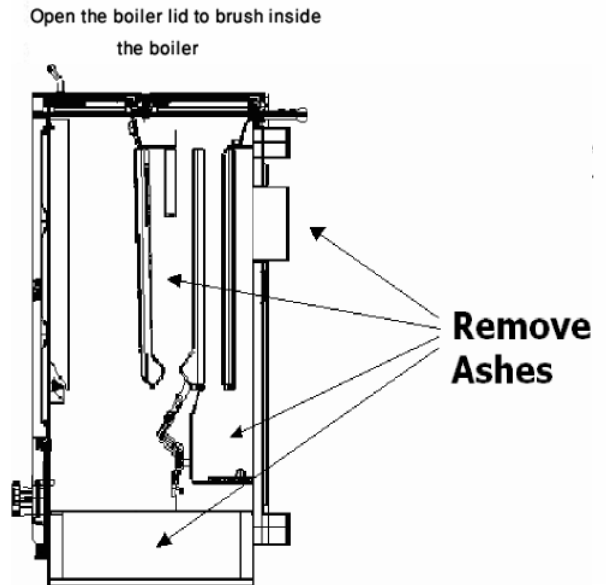
Switch off the control system by pressing the DOWN button for 5 seconds. Wait for approximately **5 minutes** to allow the burner to cool down. When it has cooled down completely it is ready for cleaning. Take the connector off the burner, remove the shield and down pipe, and unscrew the burner unit off the boiler. The parts can now be worked with for cleaning.



To ensure best boiler operation, cleaning should be done frequently. This guarantees the best fuel efficiency. The better the boiler is set up the longer the intervals between cleaning.

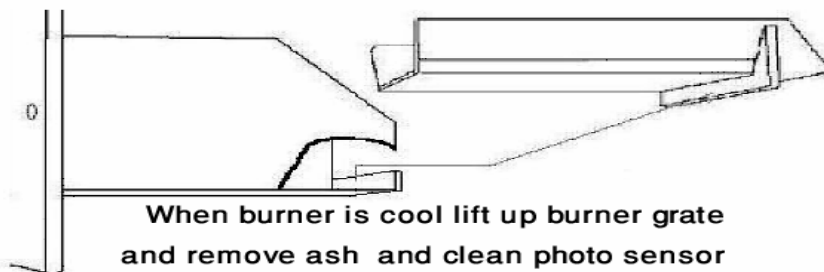
The boiler

The boiler should be emptied from ash and all of the surfaces should be brushed in order to remove soot particles. Pay particular attention to ash in the exhaust deflector and the flue pipe. The flue pipe does NOT clean itself. You must do this yourself. An old vacuum cleaner is the best method for this.



The burner head





Remove the ash and any cinders from the unit. Remove any pellet remains under the unit. Dry off the flame indicator. Ensure that there is nothing in the blower.



Starting up after cleaning

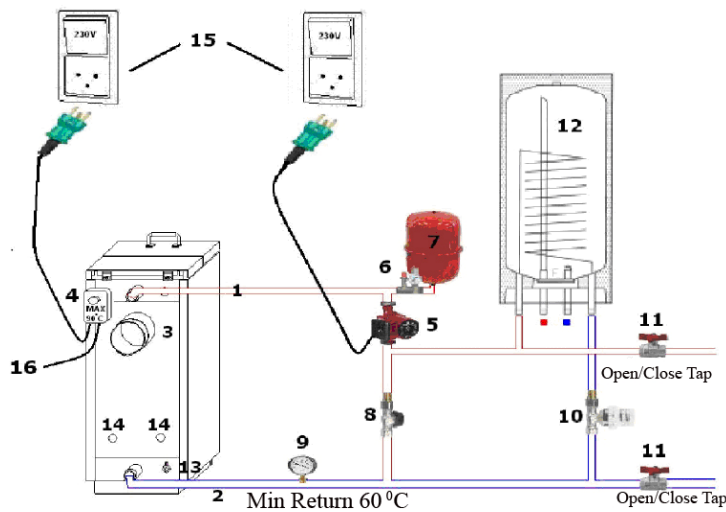
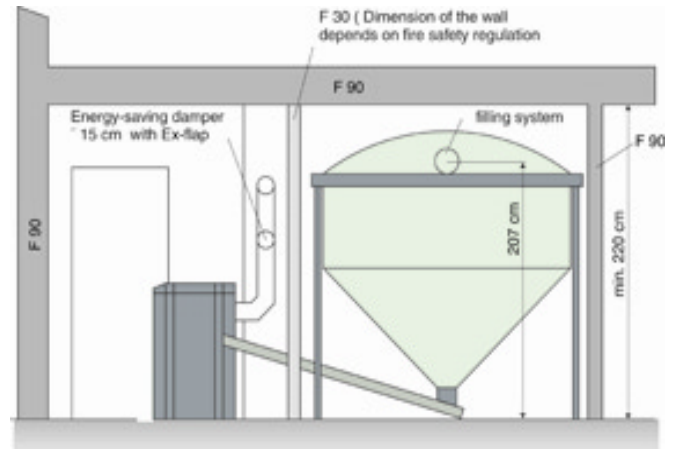
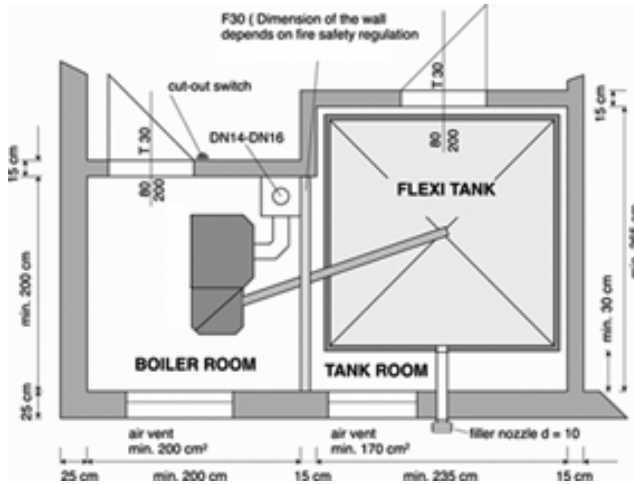
Reassemble the burner and fit into boiler. Start the boiler by pressing the DOWN button for 5 seconds and the system will start itself. Remember to put the shield back into place so that the burner temperature will be measured correctly.

Trouble shooting.

PROBLEM	CAUSE	SOLUTION
<p>ALARM, WARM DOWNPIPE, SMOKE BLOW BACK</p> 	<ol style="list-style-type: none"> 1. cinders/ash in the burner head 2. ash in the boiler, flue pipe and chimney 3. flue deflector incorrectly mounted 4. lack of draught in the chimney 5. output kw to boiler is too high 6. thermal sensor defect 7. unfavorable draught 	<p>Clean the burner Clean the boiler, flue pipe and chimney Correct or remove the exhaust deflector plate in the boiler Insulate and raise the chimney Decrease the output in HIGH LOAD Change the thermal sensor Change/correct your flue</p>
<p>ALARM, FAULT WITH ELECTRIC IGNITION</p> 	<ol style="list-style-type: none"> 1. flue grate is not positioned correctly 2. ash/cinders in the burn head 3. damp pellets 4. too few/many pellets for electric ignition 5. electric ignition incorrectly positioned 6. defective electric ignition 7. chimney draught too high 8. photo sensor defective/sooty 9. blower stopped 	<p>Check fitting of burner to boiler Clean the burner Change supplier/increase maintenance Adjust the amount by approx + or - 1% Place in the square holder Change the electric ignition/lignite manually Mount a draught regulator on the chimney Clean/change the sensor Clean the blower and check if it runs</p>
<p>ALARM, LOW BOILER TEMPERATURE</p> 	<p>The boiler temperature has not been above 35 degrees after 2 hours or has gone below 35 degrees during operation</p>	<p>Too little output on the burner, adjust output Check the feed / pellet supply and blower Check the temperature sensor is on the boiler</p>
<p>ALARM CONNECTOR IS NOT MOUNTED</p> 	<ol style="list-style-type: none"> 1. the connector is not mounted correctly 2. dirt in the connector 3. sensor defective 	<p>Check the connector on the burner Clean pellet debris/dust from the connector Change the sensor (photo/thermal sensor)</p>
<p>No/ black display in the control panel</p>	<ol style="list-style-type: none"> 1. the over-temperature safeguard on the boiler has been knocked out 2. fuse blown in the control system 	<p>Reconnect the over-temperature safeguard Change the fuse. Check for short circuits</p>
<p>The boiler triggers the mains trip knockout switch</p>	<ol style="list-style-type: none"> 1. electric ignition defective 2. cables defective 	<p>Change the electric ignition/ignite manually Check the cables and plug. Note the state the boiler is in when the trip is engaged</p>
<p>The boiler goes out during LOW LOAD/PAUSE and has a thin flame</p>	<ol style="list-style-type: none"> 1. fuel supply unstable 2. pellets hang in the thermoplastic hose 	<p>Check the feed inlet for dust Check the pellets for dust / moisture Check the feed screw incline Check the fall from feed screw to burner</p>
<p>Pellet consumption too high / desired boiler temperature not being reached</p>	<ol style="list-style-type: none"> 1. burn incorrectly adjusted 2. chimney draught too high 3. flue deflector incorrectly adjusted 4. poor boiler efficiency and adjustment 5. burner output too high 	<p>Check that the ash is dark grey Measure the chimney draught / mount a draught regulator Check boiler and flue deflector Measure flue temperature and fix deflector Decrease output on burner</p>
<p>Boiler and burner are sooty/black</p>	<ol style="list-style-type: none"> 1. feed times too high 2. pause firing incorrectly adjusted 3. blower stopped 	<p>Adjust feed levels Adjust flue deflector and chimney pressure Clean blower</p>

Cancel the alarm, turn off power then on again and hold DOWN button for 5 seconds on controller.

Installation Design Examples



- 1: Forward movement.
- 2: Return.
- 3: Flue connection.
- 4: Over-temperature safeguard with sensors.
- 5: Pump.
- 6: Safeguards set 2.5 bars.
- 7: Pressure expansion.
- 8: Return valve with remote sensors/
Tap.
- 9: Thermometer.
- 10: Return valve.
- 11: Taps.
- 12: Hot water containers.
- 13: Feed.
- 14: Cooling circuits intern.
- 15: Power 220 V 50 Hz 10 Amps.
- 16: Connector to pellet burner

Health and Safety.



Pellet storage and supply

Hoppers installed inside buildings must be built with one hour fire containment.

In case of an accident

If you find a person ill or unconscious near any fuel burning appliance, be careful in case you also become a casualty. Open windows and doors immediately and remove the casualty to fresh air.

If the casualty is unconscious, open their airway and check breathing. If breathing has stopped, give artificial ventilation until breathing restarts and then place in the recovery position. Seek medical advice immediately. If you cannot give artificial ventilation, get help really quickly - seconds could be vital. Remove casualty to hospital.



Service and safety

Service Engineers are trained to ensure that your woodpellet burning equipment works safely and efficiently. A list of Service Engineers in your area is available from Green Energy Solutions. They will check that the burner is properly adjusted, that there is a sufficient air supply, that the flue is working properly. Regular cleaning and de ashing must be carried out otherwise the warranty will be null and void.

Scotte burners have been tested and approved for use in 28 EU countries and have been awarded DS/EN 303.5 recognition and CE approval.

All these matters are important to ensure that your boiler operates safely and efficiently.



In the unlikely event of a failure, refer to the trouble shooting section of this manual. If fault persists turn all power from mains off and contact your dealer for advice. Never attempt to disassemble or repair the burner yourself. Any unauthorised repairs will invalidate the warranty.