***Boiler commissioning procedure***

Ensure all site, appliance and engineer data is entered onto the commissioning certificate as well as the system data. When completing any item below ensure the actions and / or readings are checked or written on the certificate.

***Pre lighting procedures and checks (Chimney)***

1. Check the chimney system to ensure it meets the requirements of approved Document J this will include, designation, horizontal lengths, number and angle of bends and the termination location.
2. If the above is not correct ensure a copy of the appropriate calculation to BS EN 15287 has been completed and provided and attach a copy to the commissioning certificate.
3. Has the installation been carried out in a domestic premises by a registered competent person and has a certificate of compliance been completed (if so attach a copy to the commissioning certificate). If not ensure appropriate building control permission has been gained and make a note of the application number on the certificate of compliance.
4. Check there is sufficient space around the appliance and chimney to enable access to the chimney for sweeping and cleaning of the flue. Is there sufficient openings into the flue to enable the flue to be swept without the need to disconnect it from the appliance outlet.
5. Carry out smoke test II in accordance with the requirements of ADJ Appendix E.
6. Check the Flue Diameter is in accordance with the table 1 given below;

TABLE 1 – Flue diameters (Minimum in mm)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Output | 18 | 25 | 40 | 60 | 80 | 96 | 130 |
| Orlingo | 200 | 200 | 200 | 210 | 210 | - | - |
| Orlan | 200 | 200 | 200 | 210 | 210 | 250 | 300 |

1. Check the draught regulator operates freely and is set at a heavy starting balance.

 (***Note*** *this should be done with the heat exchanger bypass flap in the open position*)

***Pre lighting procedures and checks (Appliance)***

1. Ensure the appliance has a suitable plinth to act as a hearth, and if not ensure there is a painted or otherwise marked area which extends at least 225mm in front of the boiler and 150mm either side and behind the appliance. This is to identify the area where combustible material must be excluded.
2. Check there is sufficient room around the appliance to provide access for service and maintenance.
3. Ensure the appliance has been installed level and that it is stable with no movement when any of the controls, levers or doors are operated.
4. Remove the front panel that covers the fans from the appliance, then remove the plate which the fans are mounted on and check that the primary air inlets are set to the correct settings as given in table 2 below. To do this loosen the nut from the primary air baffle and slide it to the correct distance open and then secure it in place by tightening the nut again.

TABLE 2 – primary air settings (mm)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Output | 18 | 25 | 40 | 60 | 80 | 96 | 130 |
| Orlingo | 9 | 9 | 16 | 9 | 9 | - | - |
| Orlan | 9 | 9 | 16 | 9 | 9 | 22 | 22 |

1. Replace the fan mounting plate and then close the secondary air adjustment screws until they are lightly against the inlets to the secondary air tubes and then lock it with the nut. Then open the screw for the number of turns given in table three as a starting point for the adjustment of the primary and secondary air ratio (note this is only given as a starting point and will need to be adjusted to match the chimney and location based on the emissions from the chimney and flue gas analysis.

TABLE 3 – secondary air settings (turns open)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Output | 18 | 25 | 40 | 60 | 80 | 96 | 130 |
| Orlingo |  |  |  |  |  |  |  |
| Orlan |  |  |  |  |  |  |  |

1. Adjust the fan shutters on the fan(s) to the settings given in table 4 below

TABLE 4 – fan shutter settings (% open, see pictures)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Output | 18 | 25 | 40 | 60 | 80 | 96 | 130 |
| Orlingo |  |  |  |  |  |  |  |
| Orlan |  |  |  |  |  |  |  |

1. With the appliance log chamber door open switch on the boiler fan and ensure air is being delivered to both the primary air channels and the secondary air holes in the chokes (slots) in the base of the log chamber. This is to check the boiler fan(s) are working and that the channels are clear.
2. Open and close the heat exchanger bypass flap using the lever on the left hand side of the appliance and ensure it seats correctly and shuts of the bypass when closed.
3. Check that all the required “U” firebricks are present (see table 5 below) and that they are in the correct position as described in the installation and operating instructions.

TABLE 5 – number of “U” Firebricks

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Output | 18 | 25 | 40 | 60 | 80 | 96 | 130 |
| Orlingo | 2 | 2 | 2 | 3 | 4 | - | - |
| Orlan | 2 | 2 | 2 | 3 | 4 | 4 | 4 |

1. Check there is adequate free area of permanent ventilation provided to the room containing the appliance as given in table 6

TABLE 6 – free area of ventilation (cm2)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Output | 18 | 25 | 40 | 60 | 80 | 96 | 130 |
| Orlingo | 126 | 185 | 313 | 483 | 653 | - | - |
| Orlan | 126 | 185 | 313 | 483 | 653 | 789 | 1078 |

***Pre lighting procedures and checks (sealed wet system)***

1. Flush the heating system and ensure it is clean and clear of deposits before starting any commissioning procedures.
2. Fill the hydraulic system, carry out the required pressure tests and ensure the initial charge
3. Measure the flow rate of the water from the mains cold water supply to the heat dump system and record the result on the commissioning certificate.
4. Take a reading of the pressure of the cold water supply to the heat dump system and record the result on the commissioning certificate.
5. Press the heat dump valve to its maximum and ensure it flows and that the discharge system operates and discharges the water correctly and to a safe location

*(****NOTE****; when operating as a safety device the water leaving the discharge pipe will be above 75 degree C and may scald and so the safe discharge is essential)*

1. Check that the pressure relief valve is set to 3 Bar and that it is located so there are no valves that can close between the boiler and the pressure relief valve..
2. Does the discharge pipes from the pressure relief valve conform to the requirements of ADG part 3 and discharge in a safe location

*(****NOTE****; when operating as a safety device the water leaving the discharge pipe will be above 90 degree C and will scald and so the safe discharge is essential)*

1. Operate the pressure relief valve and ensure the discharge is all taken out to the discharge pipe termination with no back flow into the plant room.
2. Check the operation of all heating controls and any control valves, motorized and blending valves.
3. Check there is a heat meter present and that it is installed in accordance with the meter installation instructions, where a meter is not fitted or required ensure the system is meter ready should it be necessary for the Renewable Heat Incentive if it is to be applied for.
4. Light the appliance using the method given in the boiler installation instructions.

***Post lighting procedures and checks (Chimney)***

1. Allow the boiler to establish a good fire bed and begin to raise the temperature of the water in the boiler.
2. Take a draught reading and note this down. Take further draught readings every 5 minutes until three readings have remained the same.
3. Once the maximum stable draught has been achieved adjust the draught regulator until a draught of between 18 and 20 Pa is achieved. Note on the commissioning certificate the actual regulated draught.
4. View the emissions from the terminal of the chimney, are they escaping correctly and not falling to ground.

***Post lighting procedures and checks (Appliance)***

1. Ensure the boiler fan cuts in at the correct temperature.
2. After 45mins check the boiler temperature is rising and then check the chimney emissions as in item 36.
3. Are the emissions Grey smoke, white smoke or clear, adjusting the secondary air setting as given below in each case.
	1. **Grey smoke** –Open the secondary air screw(s) 1 turn at a time allowing 5 minutes between the adjustment and the next observation. Then view the emissions and make the next adjustment based on the observation
	2. **White smoke** – Open the secondary air screw(s) ½ a turn at a time allowing 5 minutes between the adjustment and the next observation. Then view the emissions and make the next adjustment based on the observation.
	3. **Clear emissions** – Use the flue gas analyser to fine tune the secondary air settings, adjusting the secondary air screw(s) only ¼ of a turn at a time and allowing 5 minutes between adjustment and reading. Once the readings are within the parameters given in table 7 then lock all nuts on the adjusters to ensure they will not change due to vibration from the fan.

TABLE 6 – Flue gas analysis reading tolerances.

CO2 = 11 - 14%

O2 = 6 - 10%

CO = 800 - 1300 parts per million (if less this is not an issue)

Flue gas temperature = 180 - 220 degrees C

Excess air = 30 – 60%

Efficiency = Gross = 75 - 82%,

Net = 85 - 90%

***Post lighting procedures and checks (wet system)***

1. Balance the system and the full heating system and note all pump settings and record them on te commissioning certificate.
2. Monitor the boiler temperature and ensure the boiler pump begins to operate at 65 degrees C.
3. Once the buffer / accumulator has reached a working temperature (more than 75 degrees C at the top and more than 60 degrees C at the bottom then note the flow and return temperatures at the boiler tappings or on the heat meter if fitted, record these on the commissioning certificate.
4. Ensure the buffer / accumulator temperature is rising.
5. Reload the boiler with fuel and ensure the boiler temperature reaches 80 degrees C before leaving or handing over the system to the customer.