Pre-commissioning/site details

Hot Water Boilers checklist

(All items must be completed and ready for when our engineer arrives on site. If any items on the list are not ready or site conditions dictate, we cannot complete, Hoval reserve the right to abort the visit and make a charge for revisiting the site to complete commissioning).		
Name (person who filled in this form).		
Site name		
Site address		
Post code		
Details of primary site contact	Name	
	Email	
	Phone	
Details of secondary site contact	Name	
	Email	
	Phone	
Email for reports to be sent		
Boiler type		
No. of appliances		
Boiler ID No. **(1200+ 6 digits): If known**		
Proposed date of visit if given:		
Company name of installer		
Gas Safe Company number if applicable (Required)		
Site Information required		
Is a site induction required?		
What are the site induction requirements, e.g. time, place, duration?		
Is there parking on site, if not where is the closest?		
Is there any documentation required?		
What type of documentation?		

CHECKLIST	**Checked**	**Date**

Electrical work complete up to Hoval control panel including any associated external sensors **(Note: a separate enable and safety circuit must be installed to each boiler/appliance).**	☐	
AAV fitted in the appropriate position and system filled and fully vented. **FOR ULTRAGAS BOILERS** (OUR ENGINEERS WILL NOT COMMISSION IF AN AAV IS NOT FITTED ON THE TOP CALORIFIER/SAFETY VALVE CONNECTION PIPE)	☐	
For UltraGas above UG400 and above a gas filter is supplied loose for fitting by the installer. **Please Note: if the filter is not fitted no commissioning will take place.**	☐	
Correct water pressure available to meet minimum requirements (UltraGas and TopGas 1.2bar minimum and connected to a sealed system).	☐	
Is the heating system filled and vented?	☐	
Is the heating system water quality checked and in line with Hoval's recommendations (see enclosed water quality guidance)	☐	
The condensate drain from the boiler flue gas collector box is piped to drain with the correct trap fitted. **Please Note: On UltraGas and TopGas boilers the supplied trap MUST be used.**	☐	
Suitable safety valve(s) fitted at correct point, together with associated discharge pipe work, discharging to a safe place.	☐	
High and low level ventilation fitted and to current standard (no fly mesh and correctly positioned) Must meet BS6644, IGME/UP/10	☐	
The flue system fitted with the correct ID plate and is commissioned, certificates available for inspection	☐	
All flue components fitted and sealed correctly including any drain off points being trapped and piped to drain.	☐	
Flue manufacture sample points are fitted in the correct location and can be sealed on completion of works.	☐	
Sufficient gas / oil available to meet the capacity of all available equipment at full output. Gas/oil line tightness/strength tested and purged in line with current regulations. All completed certificates to be shown to commissioning engineer.	☐	
If fitted, gas boosters interlocked to the boiler/burner in accordance with manufactures instructions. **Please Note: no interlocks, commissioning will not take place.**	☐	
Sufficient lighting in boiler house fitted and working	☐	
Plant room clear and safe environment to work in	☐	
Sufficient heat load to run boilers at part and full load for the duration of the commissioning period. (minimum of one hour at full output). This will be on both fuels if dual fuel burners are fitted	☐	
Sufficient wood pellets in bunker/hopper for the duration of the commissioning period (Biomass boilers)	☐	
Spirals/Retarders fitted into boiler flue tubes	☐	
Other manufacturers equipment has been installed and commissioned as necessary i.e. Pressure units, pumps and B.M.S	☐	

Please Note:

The engineer will instruct the person(s) responsible for the day-to-day operation of the boiler(s) as part of the commissioning. If no-one is available at the time of commissioning the boilers will be set up and then switched off. Any further visits to site for training will be chargeable.

Hoval Service Engineers when commissioning will check the following:

The boiler is filled with water and vented. If required, the correct safety valve and AAV is fittd

The boiler is fitted with the correct condensate trap.

An independent pressurized system is operating correctly. Suppliers of the equipment should adjust their equipment during boiler commissioning.

Any dampers fitted in the flue system between the boiler and the flue, are set and locked in the correct position (Manual type damper), if electrically operated dampers, the correct interlocks operate to show the damper is open before allowing the boiler to fire.

That the boilers/burners and boosters (where fitted), have been wired correctly in accordance to the manufactures wiring instructions. (a separate enable/0-10v control with a safety circuit must be installed), all interlocks are functioning.

Correct operation of the gas booster (if fitted). If run and standby units are fitted, the correct non-return valves are installed correctly.
All gas boosters are installed with the correct anti-vibration kits mounts.

On oil burners that a filter and flexible oil supply pipeline is fitted.

The boiler/burner has not been damaged in transit or during installation and that it is a suitable type for the fuel available on site. The nameplate on the burner indicates for which type of fuel it is designed. All damage will be noted.

Excessive space in the refractory opening around the burner has been sealed with the supplied ceramic material.

All items packed in transit are removed from combustion chamber.

Boiler controls thermostats are adjusted to suit system design flow temperature.

The limit and high/low stats are set in accordance with control details.

The boiler pressure relief valve setting is suitable for the system (the setting should be 0.7 bar above the system pressure).

The automatic air vent is fitted in the appropriate position.

Oil supply pressure and temperature is suitable.

Commissioning is in accordance with burner makers requirements.

Controls are provided and stats are adjusted in line with temperature indicated on the boiler thermometer.

The boiler is fired at a rate allowing the door refractory to reach a uniform temperature through its thickness thereby preventing any damage.

Burner is adjusted to give optimum combustion, together with flame shape and penetration.
The heating engineer will have the opportunity to receive instruction on the correct operation of the plant during Commissioning.

INSTALLER PRINT

SIGNED

GAS SAFE MANAGER (if gas installation) PRINT

SIGNED

NOTE: IF THIS CHECKLIST IS NOT RETURNED FULLY COMPLETED, THEN COMMISSIONING WILL BE DELAYED UNTIL IT IS RECEIVED.

Hoval UK Fill and Replacement Water Quality

IMPORTANT. Reference should be made to the following.

BSRIA BG29/2020 Pre-Commission Cleaning of Pipework Systems 6th Edition.

BSRIA BG50/2021 Water Treatment for Closed Heating and Cooling Systems. 2nd Edition.

VDI 2035 part 1, Scale formation in drinking water and water heating systems.

VDI 2035 part 2, Prevention of damage in water heating installations water-side corrosion.

BS EN 14868 2005, Protection of metallic materials against corrosion – Guidance on the assessment of corrosion likelihood in closed water circulation systems.

CIBSE Heat Networks Code of Practise for the UK **CP1 2020 Annex E**

CIBSE Design Guide Heat Networks 2021

From the Introduction of BG50 edition2.
"In closed heating and cooling systems, problems with corrosion, scale, sedimentation and biofouling can result in energy wastage, poor system performance, and the need for early replacement of plant and components. It is therefore essential to prevent such problems by eliminating the root causes of such phenomena through proper design, construction, maintenance and monitoring. In particular, minimising oxygen ingress is essential"

The above emphasises the absolute necessity for the correct management of all fill and replacement water used in closed heating systems. The documents referenced set out the methods that can be adopted to avoid damaging the heating equipment along with all the other system components.

In the instance of a heating boiler, usually the boiler surfaces are the hottest part of the closed system and so a prime location for damage when necessary precautions are not undertaken.

It is therefore vital that the design, installation and on-going maintenance of closed heating systems account for the quality of the initial fill water, and any make up that, from time to time, may be necessary.

Installers and operators must ensure appropriate measures are taken to limit any scaling, corrosion, or biofouling that may occur within the system. Additionally, it is important that Oxygen ingress is, wherever possible, prevented. Dissolved Oxygen must be closely monitored so that the correct water chemistry can be managed on an ongoing basis.

Raw water is unlikely to be suitable for use in a commercial heating system in the UK, it will need to be treated either physically or chemically to eliminate the potential for corrosion and scaling on boiler and system surfaces and to prevent any biological fouling caused by bacteria.

We suggest that installers refer to the advice set out in the Reference documents indicated and follow the procedures outlined in these documents in relation to the water quality used for both initial fill and any subsequent make up that might be introduced into the system and Hoval boilers.

A Water Treatment specialist should be consulted to advise on the most appropriate methods to be undertaken prior to filling the system.

Where the local water hardness dictates, a level of pre-treatment may be necessary to either partially soften or demineralise (or deionise) the water. This to limit the mineral content that might then go on to form scale on the boiler surfaces. The Water Treatment specialist should review the quality of the proposed fill water at an early stage and advise.

In the UK chemical inhibitors are commonly used to restrict dissolved Oxygen in the water – to limit its impact and reduce potential corrosion - and may also prevent any mineral hardness precipitating and forming a scale on hotter surfaces. Scaling can lead to localised overheating and potential subsequent damage.

An alternate approach is to continually remove dissolved oxygen from the circulating water.
This does not address possible mineral content and some pre-treatment or inhibiting chemicals of the fill water may still be necessary. Fully demineralising may be necessary depending on the method adapted.

In both cases it is important to limit the introduction of fresh make up water as this can impact on the concentration of any inhibitors and will re-introduce mineral hardness along with dissolved Oxygen and/or Carbon Dioxide into the circulating water. If left unchecked this can lead to damage.

It is normal to ensure careful control of the pH of the system water, **for steel and stainless- steel** boilers this would be a **pH of 8.2 to 10** (after 10-12 weeks of operation) but a **lower pH of 8.0 to 8.5** is necessary if there are **Aluminium alloys** in contact with the water.

Only the Hoval TopGas boiler models have an Aluminium Heat Exchanger.

Hoval UltraGas, UltraOil, Max3plus, Max3, SRplus, STplus, THW, STU and BioLyt boilers are all fabricated from either steel or stainless steel.

The electrical conductivity is also commonly used as an indicator of water quality. The measure and any limits that should be observed will depend on the quality of the fill water, and the level of minerals it contains, along with the methods adopted to control the water chemistry. Sudden changes in conductivity can indicate changes in system water quality, so continuous monitoring is advised.

Monitoring for changes will of course flag potential issues. Investigation and remedial action to correct any imbalance should then be made in this event.

The quality of the heating water must be checked and documented periodically.

Our trade association ICOM (Industrial and Commercial Energy Association) produced a water

treatment guide for systems like your own and they recommended monitoring frequencies as follows.

- Within 14 days of first fill and pressure test.
- Within 14 days of pre commissioning cleaning.
- Whenever the make- up supply water quality is changed – good practise to include a water meter on the supply to detect any unexpected additions.
- In line with the recommendation of the water treatment expert.
- The water quality should be checked **at least** quarterly - records of results, tests and procedures should be properly logged to monitor any changes or trends.

Example frameworks for water sampling record keeping are detailed in the BG29/2020 document.

The water treatment provider should be able to confirm that either the inhibitor(s) and biocide(s) products are correctly applied to be able to maintain the water quality on an ongoing basis, or that the system water is being correctly managed to ensure compliance with the installation design.

A site's water treatment regime must be in place prior to the first equipment commissioning visit.

In systems with ongoing oxygen ingress or where regular make up water is anticipated then isolating the boilers from the rest of the system, by utilising a plate heat exchanger, will offer the greatest protection to the boilers.

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