Dunkirk

Models
DKVLT-050
DKVLT-075
DKVLT-100
DKVLT-150
DKVLT-200
DKVLT-299

HELIX VLT

WALL MOUNTED
GAS BOILER

CRITICAL INSTALLATION CONSIDERATIONS

Message to professional contractors.

- ★ This guide offers guidelines to help professional installers maintain high levels of craftsmanship and customer satisfaction.
- ★ Super high efficiency boilers require more care during installation.
- ★ This list is not intended to replace the Installation, Operation & Maintenance Manual (IOM) supplied with the boiler. **Heating systems with one or more of these issues do not operate correctly.**
- ★ Read and understand the IOM and this Guide, before starting the lay-out of the heating system. Read this guide again before turning on the boiler.

Failure To Check Or Fix Any Of The Following Considerations Will Result In Boiler And Heating System Not Operating Properly.

1. Vent Pipe

Maintain flue pipe slope greater than ¼ inch per foot (IOM, Section 6.4). This will insure condensate in flue pipe flows back to the boiler. Failure to follow these instructions will result in accumulation of condensate in the flue pipe. Partial blockage of flue pipe leads to noise during boiler operation. Complete blockage will lead to nuisance control lock outs.

2. Primary and Secondary Loops

This boiler offers primary loop option. When heating system **does not** have primary loop (See IOM, Section 5) internal ball valve is left **open**. Primary loop is established within the boiler. Failure to follow these instructions will result in boiler short cycling and possible noise when system flow rate is low (i.e. one or two small zones call for heat).
When system **has** primary loop (See IOM, Section 5) boiler's internal ball valve **must be closed**. Leaving ball valve open results in boiler running at high temperature and short cycling, and the system may not heat properly.

3. Expansion Tank Location

Water expansion tank maintains constant water pressure at installation location. **Install expansion tank upstream** of system pump or zone pumps (See IOM Section 5). Water will boil inside heat exchanger as a result of boiler operating at low water pressure due to expansion tank installed on downstream side of system pump or zone pumps.

4. Flushing The System

Flush system (wash) clean (See IOM, Section 5) after installing all piping. Debris or cutting oils, etc., left inside system will reduce heat transfer in heat exchanger. Small pieces of Teflon tape are eventually trapped in water pump impeller and reduce water flow rate. Non-flushed systems have low energy efficiency and potential boiling noise due to ineffective heat transfer and reduced water flow rate.
Flush all zones one by one, when flushing the system. If internal loop becomes by pass for flushing water flow, close ball valve. **Open ball valve after flushing, if system requires open internal ball valve.**

5. Water Leaking

Fix any boiler water leakage in heating system (See IOM, Section 9). Although the automatic fill maintains water in heating system at a constant pressure added water brings oxygen and minerals. Constantly adding minerals onto the heat exchanger coil surfaces will eventually result in boiling noises.

6. Boiler Water Quality

After flushing all zones, fill system and boiler with **soft water or municipal water** (See IOM Section 9). Well water is a critical concern. Minerals carried by well water are deposited onto the heat transfer surfaces which may lead to boiling noise inside the heat exchanger. Good water quality is essential for proper operation (See IOM, Section 9).

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7. Air in the System

Purge air inside the heating system (See IOM, Section 9) before opening gas valve. Any air left inside the system will result in water boiling, boiler short cycling, or possibly over-heating of the heat exchanger.

Leave gas valve closed when purging air out of the system. Deactivate all calls for heat including CH calls and DHW calls. Activate all zone pumps and DHW pump (jump wires may be necessary). Set boiler into "CH/System Pump" mode, Enter 'Installer's Menu' (accessible by holding down "Enter" and "Manual" keys together for 5 seconds). Air purging may take more than 30 minutes depending on system size and location of system air vent.

If you hear "gurgling" noise (noise of flowing water) system still has air in it. Continue purging.

8. System Air Vent

Supplied air vent, vents air from boiler only. **Install system air vent in heating system** (See IOM, Section 5). A heating system without a system air vent creates air bubbles in boiler water; boiler heat exchanger will operate at higher temperature and lower efficiency. Install system air vent on system pipe before zone pipe, when primary loop inside boiler is used (See IOM, Section 5). When using external primary loop, install system air vent onto external primary loop (See IOM, Section 5). For multi boiler system air vent location see IOM,Section 5.

Install system air vents at high point of near boiler piping, downstream side of pump.

9. Antifreeze Solutions

Use proper **antifreeze solution with stabilizer** (See IOM, Sections 5 & 9). **Do not use automotive antifreeze**. Use antifreeze formulated for heating system with stainless steel heat exchangers.

Do not use antifreeze water solution higher than 50%. Proper antifreeze concentration is critical. Boiling noise can result when concentration is too high. Maximum concentration for boiler depends on actual boiler application conditions. Return water temperature is critical. Humming noise when boiler is operating (flame is on) indicates antifreeze solution concentration is too high for application. Fixing the problem: (1) Reduce concentration. Drain some solution out and fill system with soft water. (2) Replace supplied 30 PSI pressure relief valve with 50 PSI valve and increase system water pressure up to 40 PSI.

Note: Boiler is certified for 150 PSI working pressure.

10. Propane Orifice

Install supplied propane orifice if boiler is to operate on propane. Instruction for Gas Conversion Kit is supplied with boiler. Boiler operating using propane without propane orifice operates at very high firing rate leading to combustion noise and water boiling noise.

11. CH and DHW T-T Connections

Control boiler by CH T-T from room thermostat and DHW T-T from hot water tank (See IOM, Section 8). **Do not jump T-T connections on boiler low voltage connector and leave boiler unattended**. Doing so will put constant demand on boiler, resulting in boiler short cycling and possible overheating of heat exchanger.

12. CH and DHW Thermostat

Boiler control module does not tolerate voltage from CH and DHW thermostat. Check voltage between wires from all thermostats at both thermostat on and off conditions. If there is voltage, use dry contact relay between thermostat and boiler. Failure to follow these instructions will damage the control.

13. Proper Boiler Shut Down

To properly shut down boiler, **do not turn boiler off via the service switch when flame is on** (See IOM, page 34). Turning boiler off via the service switch shuts down the gas valve and water pump. Shut down noise/vibration can be generated due to sudden stop of water flow. Correct procedure: (1) Set thermostats to lowest setting or turn off gas valve (2) Allow boiler a few seconds to dissipate heat, (3) Turn boiler off via service switch to power boiler down.

14. Low Water Cutoff - Tilt When Installing

Verify low water cutoff is tilted upward 5° to 15° , after hanging boiler on the wall. Tilting of less then 5° may result in heat exchanger overheating. See Section 4 of IOM.

15. Heat Exchanger Surface Temperature Switch

Heat exchanger surface temperature switch is additional protection for heat exchanger from overheating. See section 3 of IOM. If boiler does not have a factory installed switch, contact customer service for kit information.

16. Correct Installation of Stoppers and Plugs

Before boiler is hung onto wall, rubber stoppers and plugs supplied in parts bag/box must be installed on back of boiler. Failure to follow these instructions will lead to downward tilting of low water cutoff.

Success in all of your professional installations is our goal.

Hydronic Engineering Team, ECR International