

TECHNICAL BULLETIN

PRODUCT: GAS AND OIL CONDENSING BOILERS

CONDENSING BOILERS AND FREEZING CONDENSATE DISCHARGE PIPES:

In the recent winters, the Heating Industry as a whole has experienced an increasing amount of calls from frustrated householders with a condensing boiler that is not working because the condensate discharge pipe has frozen.

When a condensing boiler is in operation it can produce anything between 2 to 3 litres of condensate per hour which needs discharging to waste. British Standards and Building Regulations allow the condensate pipe to be discharged externally or internally. Running the pipe internally will virtually eliminate freezing potential, routing and terminating the pipe externally however opens up the possibility of the condensate freezing in prolonged sub-zero temperatures.

Over the past few winters we have experienced outside temperatures consistently below freezing, sometimes as low as -20°C. The condensate leaves the boiler in discharge quantities around 100ml at temperatures between 10°C and 40°C approx. depending on how long the boiler has been in operation and what temperature the boiler thermostat is set at.

It is strongly advised to run the condensate pipe internally of the building.

If an internal termination is not possible then an external run and termination is acceptable providing precautionary actions are taken to reduce the potential for the condensate to freeze. With this in mind, Worcester have designed an innovative solution to reducing the freezing potential, the CondenseSure.



Fig 1: Image of CondenseSure

CondenseSure can be located locally to the boiler where the condensate will discharge from the boiler in 100ml quantities and get collected by the CondenseSure. This will then discharge the condensate in 500ml amounts through the 32mm discharge pipe to the waste water system outside. It also has the option of being attached to the flow or return pipe of the boiler so the condensate discharge is slightly pre-heated helping further with the prevention of freezing.

With the larger siphon volume, the discharge from the CondenseSure is every 15 to 20 minutes rather than every 2 to 3 minutes with just the boiler siphon, resulting in:

- ▶ **Increased velocity and flow rate**
- ▶ **With only 3 to 4 siphonic actions per hour, the condensate pipework is empty for longer**
- ▶ **Significantly decreased or even eliminated freezing potential**

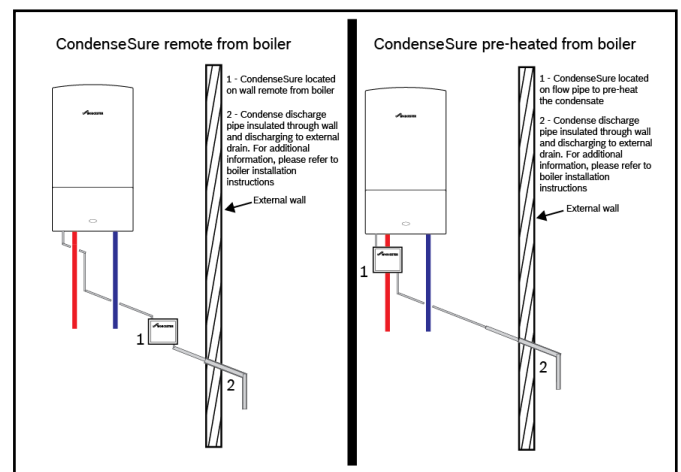


Fig 2: 2 location options for CondenseSure

CondenseSure has been tested under simulated extreme weather conditions and proved its effectiveness in preventing frozen condensate at -15°C for a sustained period of 48 hours.

CondenseSure can be purchased from any reputable plumber's merchants and we have found it can be installed within minutes by following the easy to follow instructions and can be installed on any brand or model of gas or oil condensing boilers.

The Worcester part number for CondenseSure is: 7716 192 746.

Whilst it is always our intention to fully assist, it is essential to recognise that all information given by the company in response to an enquiry of any nature is provided in good faith and based upon the information provided with the enquiry. We recommend that advice should always be checked with your installer or contract partner. Consequently, the company cannot be held responsible for any liability relating to the use or repetition of such information or part thereof. In addition, whilst making every reasonable effort to monitor the performance and quality of our supply, installation and service network, we do not accept responsibility for the workmanship or operation of any third party company that the company may have promoted either in conversation, e-mail or other communication.

Similarly, the views and opinions expressed in communication with individuals within the company may not reflect that of the business as a whole.

TECHNICAL BULLETIN

PRODUCT: GAS AND OIL CONDENSING BOILERS

If there is no alternative and the condensate pipe must be terminated externally then the following must be considered, even when using the CondenseSure;

1. **The pipe must take the shortest and least exposed route**
2. **The pipe must take the most downwards route possible**
3. **Any horizontal run must be run at a downwards angle away from the boiler towards the termination point at least 2.5° (50mm per metre) as a minimum**
4. **The pipe must terminate as close to the drain as possible**
5. **The diameter of the pipe should be increased to 32mm diameter**
6. **The pipe must be insulated with water proof, sealed, weather resistant insulation**
7. **When installing the pipework, the burr from any cuts must be removed and the internal section of the pipe entering a fitting should be as smooth as possible**
8. **The waste system into which the condensate is terminated must be suitable to withstand the mildly corrosive nature of condensate**
9. **Any horizontal sections running through walls are also insulated and sleeved**

Where the condensate pipe work is already run externally, operating the boiler with a higher flow temperature during very cold conditions will reduce the amount of condensate generated by the boiler and therefore help prevent freezing. Turn up the thermostat on the boiler fascia to **maximum** during freezing conditions and back to its original setting when the outside temperature increases.

Operating the heating programme in continuous (24hr) mode (with the thermostat on the boiler fascia set to maximum) will further help keep the condensate temperature higher (typically 20-30°C) during freezing conditions. At night time reduce the room thermostat to 15°C before going to bed.

Finally, if the condensate pipe is frozen the boiler will be making a “gurgling” noise and if your boiler is fitted with a digital display the code **EA / D5** (or **6A** for Buderus) or a flashing light will be showing, this indicates that the condensate pipe is frozen and needs defrosting.

It is likely the pipe is frozen at its most exposed point or at a bend or elbow. We recommend this is defrosted or thawed with a hot water bottle or a heat wrap.

It is possible, that after resetting a Greenstar, that an **F7** fault will be displayed. This could be caused by dampness on the spark electrodes. Resetting the boiler a few times will dry the spark electrodes and clear the fault.