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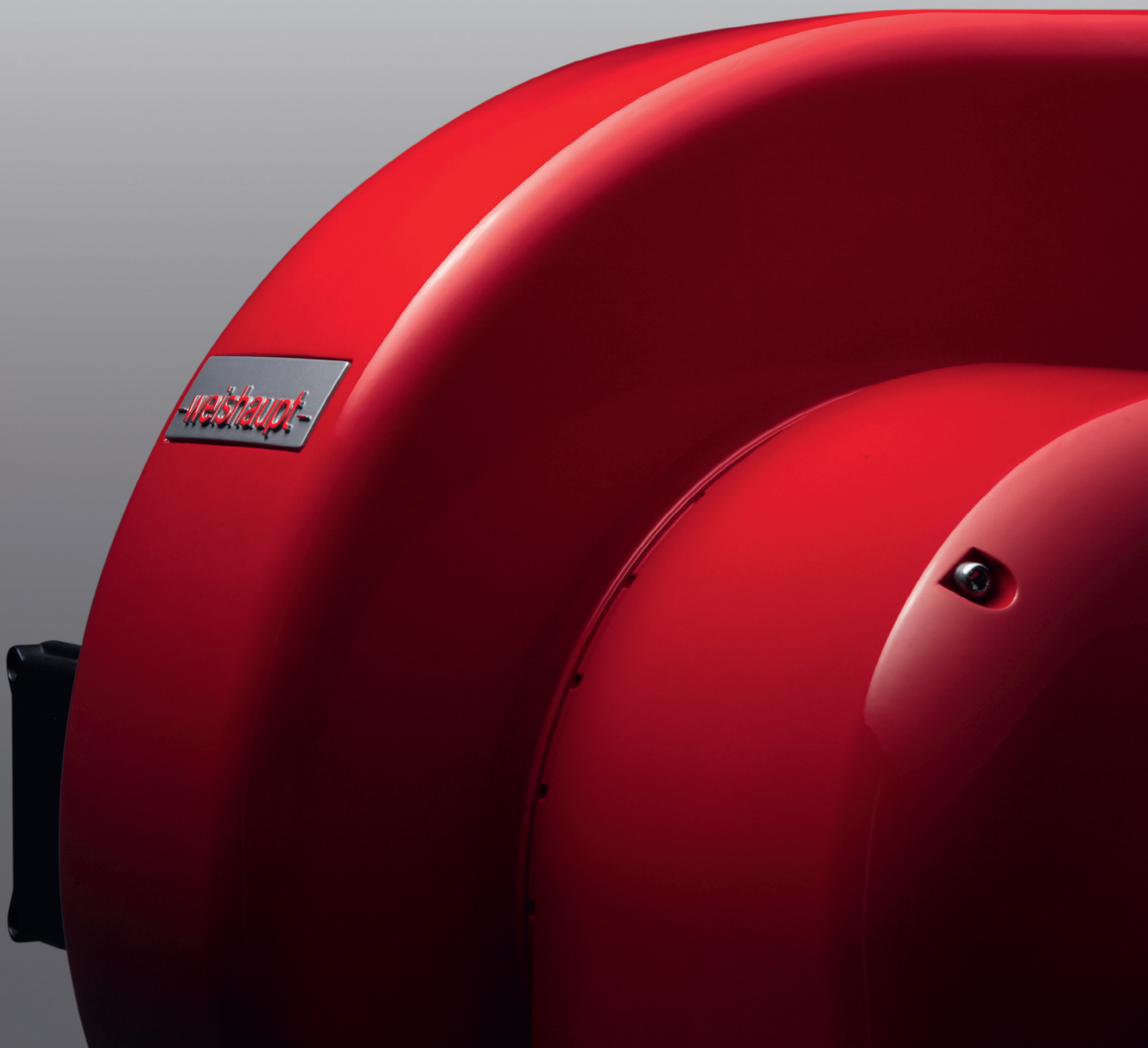
Case study

Low-NO_x multiflam® burners
at Singleton Hospital, Swansea



Reliability and low emissions.

New WM-GL30/3-A ZM-R-3LN burners in the boiler room at Singleton Hospital

Having been installed in the 1980s and 1990s and still retaining their original burners, it became clear in recent years that the dual-fuel horizontal steam boilers in operation at Singleton Hospital in Swansea needed upgrading to avoid persistent, lengthy, and costly downtime. So having previously specified and worked with Weishaupt on upgrades at smaller sites across its estates, NHS Wales had no hesitation in approaching the burner specialist when looking to upgrade the three steam boilers.

Commenting, Weishaupt (UK) Limited's Simon Howard said: "A reliable and efficient source of heat is of critical importance to sites like Singleton Hospital. We are delighted that the University Health Board and NHS Wales have, when looking for a partner they knew they could depend on, once again turned to Weishaupt, whose name stands for reliability, high quality, and first-rate service."

Singleton Hospital's main boiler house contains three horizontal three-pass steam boilers – two 3.8 MW Robey Lincoln boilers and a 4.7 MW B&E European boiler – all firing on either natural gas or gas oil and raising steam for domestic hot water, heating, and sterilisation purposes. However, the whole site needs only one boiler to service the hospital for 80 to 90% of the calendar year and only in exceptional circumstances, for example when it's particularly cold, are two boilers required. Each of the three boiler is rotated on a weekly basis and if the pressure drops below 3.5 bar at 180 °C or additional steam duty is required, a second boiler will be sequenced to meet demand.

Commenting for Singleton Hospital, estates manager Anthony Wiltshire said: "We have been experiencing numerous issues with the original burners for some time now, including electrical problems with the contactors, firing of the flame, and even getting the flame to ignite. With only two in-demand contractors in the UK that could service and maintain them, we were putting the hospital at risk because we couldn't easily generate the steam required to drive all the systems."

In recent years especially, the burner failure issues at Singleton Hospital have been getting worse with more frequent failures arising; and while they never actually lost their steam supply for any length of time, failures led to usually-redundant boilers being fired whilst failing burners were waiting to be repaired.

A detailed tender document was subsequently raised and supplied to Weishaupt by the Swansea Bay University Health Board, which included the minimum specification for the burners, the scope of installation works, minimum requirements for the burner control panels and additional works required to the existing building management system (BMS).

The tender document stated that each burner should be capable of a turndown ratio of at least 9:1 for natural gas and 5:1 for gas oil; and that the burners must comply with the Medium Combustion Plant Directive on both fuel types, which stipulates maximum NO_x emissions of 100 mg/Nm³ for natural gas and 200 mg/Nm³ for gas oil.

Based on the requirements set out by the Health Board, Weishaupt's latest WM-series monarch® modulating burners were specified, which were subsequently installed by the hospital's third-party heating contractors, with final commissioning of the burners being undertaken by Weishaupt.

The WM-series burners are compact, powerful, and quiet in operation and feature Weishaupt's multiflam® technology that enables large

combustion plant to meet very low emissions. The low-NO_x 3LN versions installed are tested for Class 3 emissions and suitable for use on three-pass boilers for the combustion of natural gas, LPG, and gas oil.

All components, including mixing assembly, air damper, and combustion manager are readily accessible despite the burner's compact form, which enables maintenance and servicing work to be carried out quickly and easily, aided by the standard hinged flange which provides a perfect servicing position. All three burners were delivered with their mixing assembly preset for the required output, with final adjustments made using the menu-controlled commissioning program.

The digital combustion management system employed by each burner facilitates easy communication with the hospital's Modbus-based BMS and enables the burner to conform to industry standards for remote control, monitoring, fault diagnosis, etc.

Each of the three burners was fitted with a optional frequency convertor for variable speed drive (VSD), which reduces electrical consumption and ensures lower noise levels at lower burner ratings. The burners were also equipped with an optional oxygen trim system, which improves the combustion efficiency of the boilers and saves energy by continually measuring the residual oxygen in the flue gases.

Fuel consumption was further reduced thanks to the installation of a boiler sequencing panel at the site to control the three steam boilers. The ground-breaking properties of Weishaupt's sequencing system enables outstanding levels of control and efficient and reliable operation of any size of plant, with the results being measurable benefits compared to typical installations in terms of control precision and energy consumption.

Summarising, Anthony Wiltshire said that what Weishaupt has brought to the Health Board is a fit-and-forget solution. "I didn't realise how bad the previous burners were until we had Weishaupt installed. You simply can't compare it! Now, for example, instead of getting panicked calls at 3am and having to race to work because another burner has failed, and then being faced with the pressure of getting it fixed and wondering if your boiler maintenance contractor is available, we have something we can rely on. It is absolutely fantastic and takes a lot of pressure off!"

Weishaupt has a range of multiflam® burners from 100 to 23 000 kW

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If you need us, we're there.

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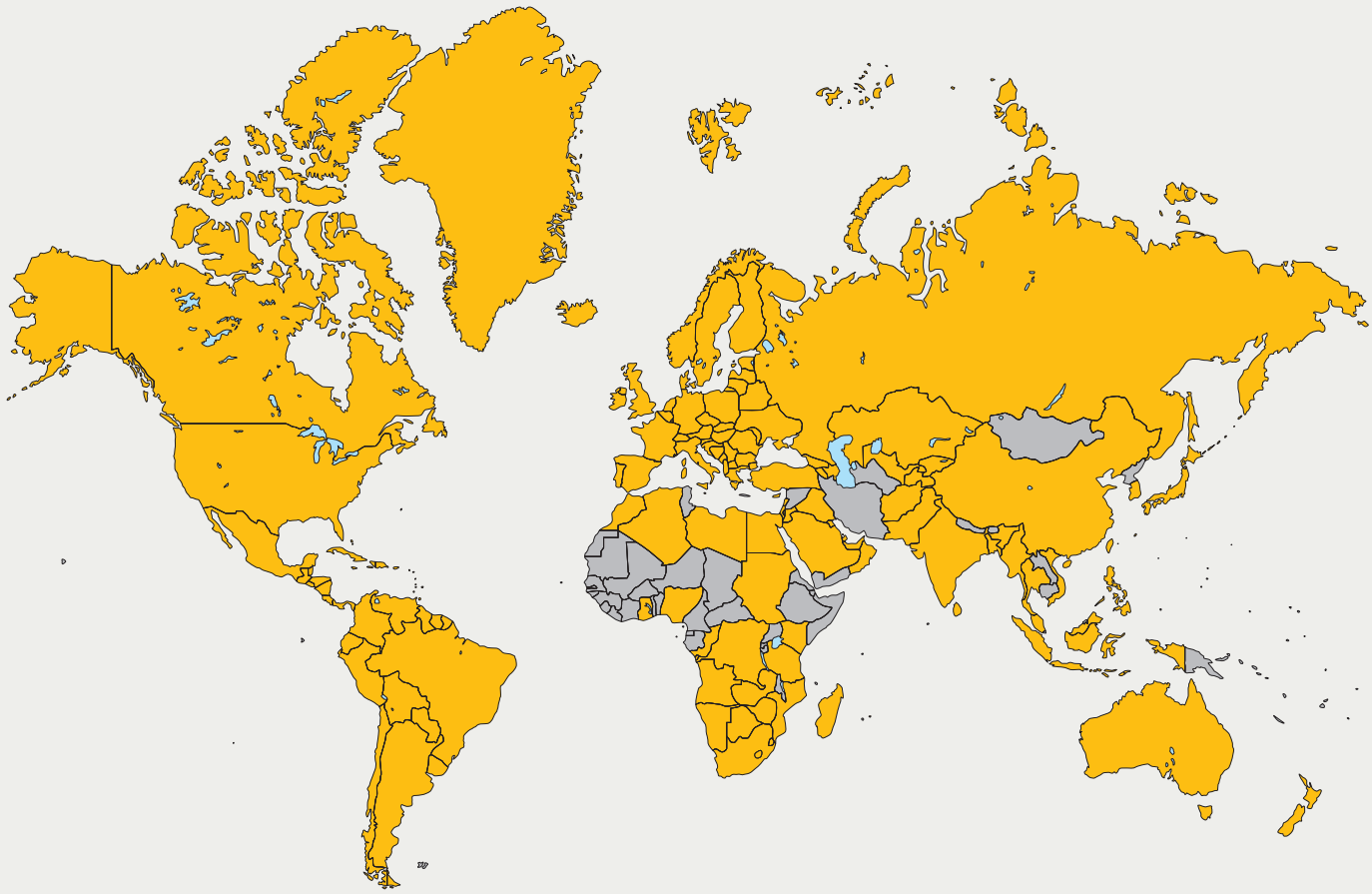

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