



Due to BACnet MS/TP communication the operating personnel can react quickly and optimally provide support to the technical systems within the hospital.



BACnet data communication enables energy efficient operation of pumps

A building management system is helping operation personnel at the new 65,000 m² Pembury Hospital to optimise the duty point of the installed dry running E-pumps and MAGNA circulators by using the CIM & CIU 300 BACnet MS/TP communication interfaces from Grundfos.

These units control, monitor and optimise the pumps and the related pump data – all controlled via a central PC. This offers a lot of benefits on a day to day basis and allows for a sustainable operation of the technical systems. Reliability is absolutely key in many applications such as in this instance in a hospital project, and this system offers some distinct advantages due to the CIU 300 BACnet MS/TP interfaces. The hospital now has a complete solution comprising pumps, controllers and communication interfaces with each component fully integrated and optimised to work in harmony.

Pembury Hospital serves the Maidstone and Tunbridge Wells National Health Service Trust. The new hospital is a 512-bedded facility that will provide in-patient accommodation in single en-suite bedrooms; making it the first NHS acute hospital of its kind in

the UK. The hospital design incorporates the concept of a hospital within a hospital.

Grundfos supplied

- Product sizing and selection expertise
- Pump installation and commissioning
- BACnet interfaces and communication expertise
- Personal service and professional support

The Pembury Hospital has been uniquely designed to incorporate features for patient safety and effective infection control. Design elements include separate planned and emergency areas to reduce the risk of infection, in-patient bedrooms designed to minimise falls and the separation of inpatient and outpatient facilities to address issues of patient privacy and dignity.

The new hospital has been developed to fit in with the local rural setting, with patient accommodation placed to take advantage of the woodland views and southerly aspects.

The children's wards, special care baby unit and maternity opened in January 2011 with other facilities opening on a phased basis over an 18 month period.

The Grundfos solution

From a Grundfos perspective we have provided the entire pump solution including CIM 300 & CIU 300 BACnet MS/TP communication interfaces that is used to communicate with all E-pumps above 1kW and the MAGNA circulators on the following applications:

LTHW: The LTHW system is primary a single flow & return type system which is designed to run at 85° flow and 65° return. The system is fed via a spillback type pressurisation unit within the Energy Centre in the lowest part of the hospital. The system is primary fed by 3 dual fuelled boilers which each have shunt pumps feeding to a low loss header, from this main primary pumps feed 7 secondary plant rooms. There is also a Bio-mass boiler which also has its own shunt pump that feeds a 20,000 l buffer tank, this in turn has a shunt pump which feeds the stored hot water to the low loss header. The LTHW Primary water also feeds the HWS systems in three roof top plant rooms.

Constant and variable temperature pumps feed the terminal plant. The constant temperature pumps also feed AHU's, fan coil units, door curtains and heater batteries, these batteries are within the supply ductwork as a secondary downstream heat source throughout the hospital. The variable temperature pumps feed radiant panels, chilled beams with heating coils throughout the hospitals departments. Re-claimed heated water produced by the extract ventilation systems is separately pumped to each AHU unit via a R.A.C. pump.

CHW: The Chilled water system is fed by 4 roof mounted chillers. Each chiller has its own shunt pump which in turn feeds a low loss header and the system is fed via a pressurisation unit situated within a roof plant room. Primary pumps then feed high grade water fan coil units, AHU's and CM cooling units. Low grade water feeds FCU's and chilled beams throughout the hospitals various departments.

Domestic Water: The domestic supply is via two 65 l storage tanks. A booster pump set supplies the whole hospital with hot & cold water. The booster set consists of a manifold 5 pump set plus a slave change over control panel. The cold water boosters also feed the HWS plant of which there are three storage tanks within the roof plant rooms. Pumps on a secondary hot water return system maintain the correct HWS temperatures.

The Pathology department has its own water storage and booster pump set consisting of 3 pumps. This pump set feeds the whole of this department including a dedicated HWS plant, as well as a pumped secondary system.



The outcome

The project is running well and all the pumps have been performing as expected. The consulting engineers, installers, system integrators and the end user are happy with the performance of this solution.

The commissioning process identified certain tuning issues that meant some pump adjustment to optimise performance. This was only possible because of the critical information received from the CIM & CIU 300 BACnet MS/TP units. Due to the BACnet communication the operating personnel can react quickly and optimally provide support to the technical systems within the hospital.