

Keeping the 'Old Masters' Cool



Part of the National Gallery's recent refurbishment involved enhancements to its cooling system. Thanks to Moeller's advanced automation technology together with the expertise of integrator Dajo Solutions, a system has been implemented that meets the tough requirements.

The original system employed six chillers in combination with a main and auxiliary control panel for the four 119kW compressors; unfortunately, this arrangement provided poor part-load performance. To overcome this, the auxiliary control panel was split from the main control panel, effectively providing control of individual 700kW chiller units, allowing the National Gallery to match chiller capacity to building load more efficiently.

Any new control system would face an additional challenge in that it would need to integrate with the existing Trend 10251 controlling practically all of the building's functions such as climate control, power distribution and lighting. The solution was to

use a Moeller **PS4 201-MM1 PLC**, matched to each of the six chillers, all networked to a Moeller **PS4 341 MM1**, which provides the integration with the building management system (BMS). Communications with the Trend are through Moeller's **XI/ON I/O** module blocks and the status and control of each chiller is facilitated via a Moeller **MI4** human machine interface panel, connected directly to its respective controller. An MI4 connected to the PLC allows control and monitoring of all six chillers.

The PS4 201-MM1 PLC is also used to provide the monitoring and control of the chillers' auxiliary systems such as the solenoid valves and condenser fans as well as monitoring the system's critical operational points. James Cheesewright, the National Gallery's (M&E) project manager explains: "The Moeller PLCs give us the ability to of control the operating capacity according to demand for individual compressors, so will deliver considerable energy savings over the previous system." He continues: "Using XI/ON communication modules also avoids the need to implement complex protocol conversion software, requiring a specialist programmer. The system is very flexible. To provide the correct input into the BMS simply involves slotting a new module into the expansion rack."

Another benefit of changing to a dedicated PLC is the ability to upgrade the level of monitoring provided back to the Trend BMS. The previous controls only provided digital status of system conditions. With the new Moeller PLCs the National Gallery is able to monitor all the system conditions inputted into the chiller PLC providing analogue feed back to the Trend BMS for such items as temperature, pressure and current of each refrigerant circuit.

"With Moeller's automation we are able to have comprehensive control of the chillers, down to each compressor and evaporator fan, providing us with considerable advantages in terms of energy and maintenance management," Cheesewright concludes.