

Acoustic Chamber Heater Control System

Case History

Opportunity

An aerospace manufacturer needs to control air temperature into a low speed acoustic chamber. The system presently consists of eight each 77 kW duct heaters running on 480Vac which are manually controlled with switches. The customer wants to change to automatic control and have data logging via a computer.

Problem

A new air filtration system installed down flow from the duct heaters will require the maximum air temperature to be controlled. Testing has shown that the heaters will exceed the maximum temperature on start up. Heat up time needs to be as short as possible. In addition, all eight heaters are to be controlled as a single zone and the customer wants to use solid state power controls. The controls need to be provided in a UL listed panel.

Watlow Products Utilized

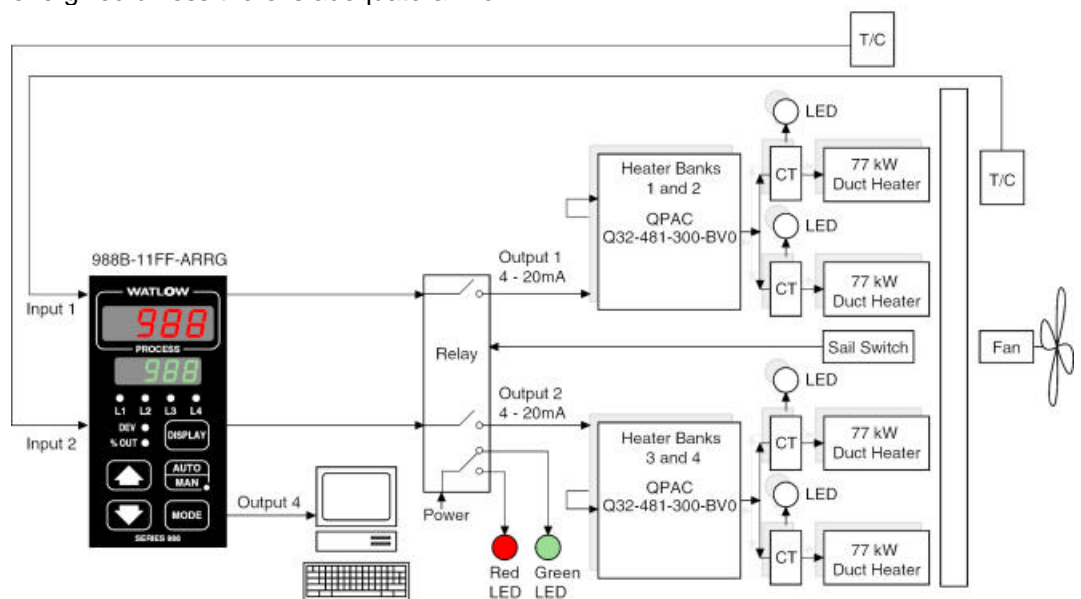
- Series 988
- QPAC

Solution

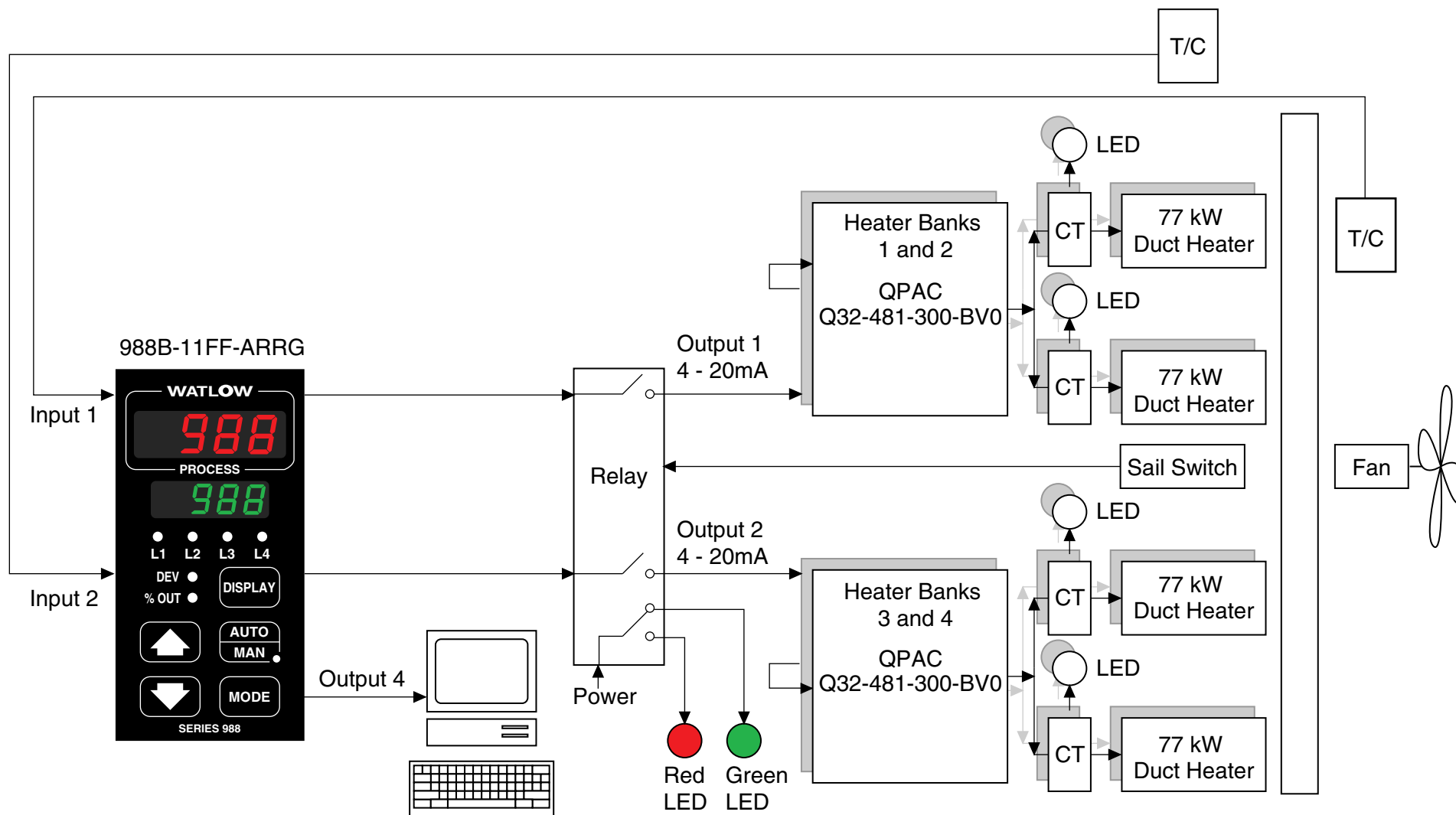
The control of the process was accomplished by a 988B-11FF-ARRG in conjunction with four each of Q32-481-300-BVO SCR power controls. Two QPACs are wired to Output 1 and two are wired to Output 2. This was necessary because each output of the 988 can only drive two process inputs of the QPAC. Both Output 1 and Output 2 were programmed as "heat."

To limit air temperature at the filter, the 988 was configured for cascade control. One thermocouple is mounted in the duct before the filter and the other is located in the chamber. Previously, an operator stood by the manual controls and watched an indicator to determine how many duct heaters to energize. This new system will eliminate the need for that operator and allow the use of the new filtration system.

EIA/TIA-232 communications on Output 4 of the 988 will allow connections to a computer for data logging. Current transformers with LED indicators will allow operators to tell if any heaters fail. A sail switch in the duct will prevent the heaters from being energized unless there is adequate air flow.



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Series 988 and QPACs in single-zone, four-bank acoustic chamber heater control system