APPLICATION NOTE

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Oil Heater Average Value Control

Industry: Petrochemical
Product: Control and Measurement Station (CX1000/CX2000)

Overview

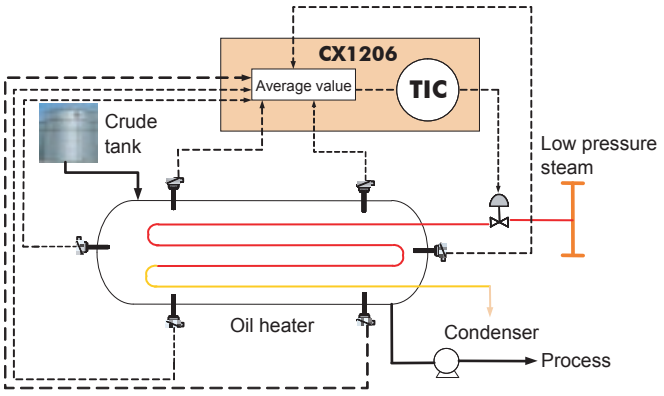
Oil heaters are used in the petrochemical and pharmaceutical industries to control the temperature of crude and reagent inside storage tanks and keep it within a certain range. Since the temperature of each point in the tank varies, you can avoid having to control the temperature of individual points by taking the average temperature and using the result as a control input value. With conventional controllers it was necessary to install several external computing units, but with the CX measuring and control station the averaging is performed with an internal computing function, and the result can be input for controlling temperature.

Customer Needs

- Local controller that provides reliable, 24-hour, 365-day continuous operation
- To compute the average temperature from six varying points, and control temperature by using the results as control input values
- To avoid having to build computations involving complicated programming
- In addition to resultant values of computation and control, to be able to record steam pressure, flow, and other phenomena useful for total system monitoring and quality records.

Process Outline

Input from multiple temperature sensors installed inside the tank are averaged in the CX series instrument. The CX averages the temperature from six varying points and carries out temperature control by using the average as a control input value. Since all you need to do is specify channel numbers for the computation function, the average value settings on the CX are simple, requiring no programming or technical expertise. The CX is also highly reliable; if a temperature sensor becomes disconnected it is detected as a burnout, and the input is automatically excluded from the average.
With conventional systems, several computing units were installed externally for determining the average, and the results were sent to the controller as analog values. With the CX, by executing the computations internally, only one unit is needed, and the cost and space required for installing external units is saved. Furthermore, drastically reducing the number of instruments used reduces wiring labor and increases the reliability of the overall system.



The process shown in the example above formerly required six temperature converters, three computing units, and one controller (ten units in all), but the CX integrates all of these into a single unit for a less expensive, more reliable solution.

YOKOGAWA

Yokogawa's Solution

Includes large display and average value computation function with an integrated digital recorder

CX1000/CX2000

- High performance operating control is also made possible through a wealth of operation monitoring screens such as simultaneous PV/SV, time base, and overview display.
- Up to 10 channels of average value computation corrects fluctuations.
- Unified with a recorder. Measurement, display, and recording of multiple points of analog input available with a single CX.
- Comes standard with networking functions, and facilitates remote monitoring.

Conclusion

The CX1000/CX2000 offers an average value computation function making it ideal for controlling temperature and other fluctuating phenomena. The operating status can be controlled in real time on a large screen, providing operating cost reductions through digitization and high cost-performing operation.