



SMARTPROCESS® HEATER OPTIMIZATION

Get Maximum Value From Your Heaters

Improve plant heater performance

SmartProcess® Heater and HeaterPro Optimizers deliver energy savings and more stable operation of fired process heaters. SmartProcess Heater combines advanced regulatory and combustion control modules to optimize operation of multi-pass process heaters. Combustion controls maintain safe operation while continuously operating closer to maximum efficiency.

Implementation strategy

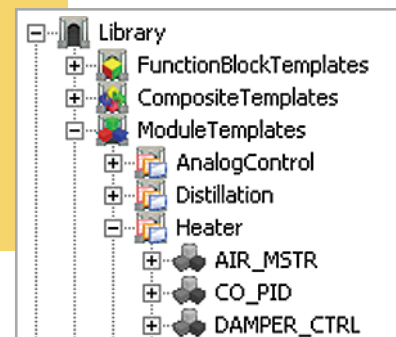
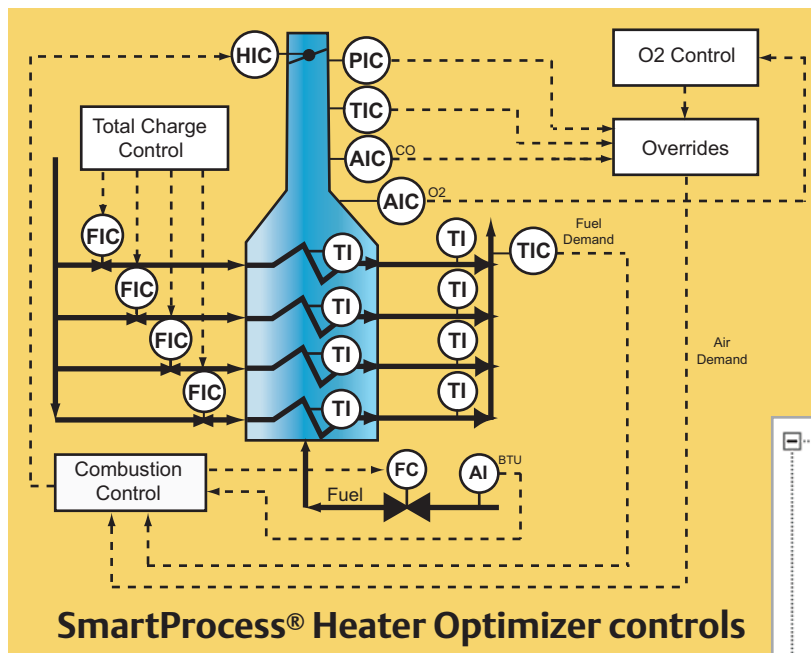
The operator or a higher-level control application sets the total heater charge target, stack O₂ concentration and a desired coil outlet temperature. SmartProcess controls are configured to achieve the following objectives:

- Control total feed to target with allocation for up to 4 passes
- Control outlet temperature to the desired target

- Adjust inlet air and draft dampers to minimize excess air
 - Combustion control including fuel/ air cross limiting
 - Stabilize heater against changes in fuel gas and feed temperature
 - Operate within all heater constraints
- Heater efficiencies are calculated as well as estimated stack gas compositions and emissions.

SmartProcess HeaterPro options

The SmartProcess HeaterPro Optimizer includes all of the modules in the SmartProcess Heater Optimizer plus Model Predictive Control (MPC) which is used to adjust the fuel demand, air demand and pass flows to meet additional process control objectives. Typical constraints include valve and damper limits, fuel pressure, heater temperatures, stack O₂, CO and draft pressure.



These constraints support the additional objectives of:

- Minimizing fuel cost for heaters with multiple fuel options
- Maximization of total feed against any set of heater constraints
- Balancing heater pass outlet temperatures
- Control of a second feed to the individual passes such as steam or an additive

Other optional modules include:

- Estimation of stack gas NO_x emissions based on heater operating conditions
- Overall heater severity control for controlling extent of reaction
- For heaters that operate intermittently or semi-continuously such as cracking and coking furnaces, the heater startup, shutdown and decoke sequences

can be automated for smooth, consistent plant operation during transitions.

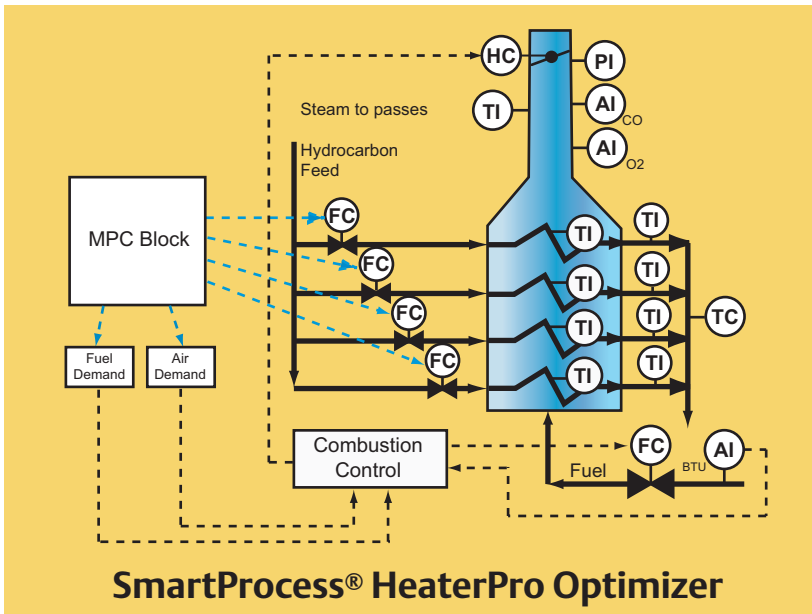
Implementation benefits

SmartProcess Heater technology modules have been used in numerous process heaters worldwide. Benefits include:

- Stabilized Heater temperatures
- Improved efficiency (typical 1-3% efficiency improvement)
- Maximized charge rate (typical > 3-8% additional capacity)

Emerson expertise delivers

Emerson has the APC experts to lead you through the implementation process to ensure operating and business objectives are met. Our consultants have many years of experience implementing APC on many different processes. These experts are available to provide either turn-key implementation services or consulting on an as-needed basis.



Contact:
Emerson Process Management
www.emersonprocess.com/solutions/aat
email: AAT@Emersonprocess.com

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