Thermal Solutions Boiler Control (TSBC)

The Thermal Solutions Boiler Control™ (TSBC) is a complete boiler operating, monitoring and automation control system. The TSBC controls modulation rate, outdoor reset, multiple boiler staging, domestic hot water priority, and provides boiler protection. The TSBC displays boiler operating status, fault history, and alarms in plain text on a 2 line by 16 character alphanumeric screen.

The TSBC truly is an unequalled state-of-the-art control. It's ability to optimize both boiler and system efficiency results in cost savings over the entire life of the boiler.

Outdoor Temperature Reset
Varying the boiler temperature set-point to correspond with the outdoor air temperature can result in higher system efficiency. On mild summer days the boiler temperature setpoint is automatically reduced to correspond to the lower system temperature requirements. On cold winter days the TSBC will adjust the setpoint to allow the boiler to run at the higher temperature setpoint.

Multiple Boiler Staging
Multiple boiler staging is easily accomplished with the TSBC. Each individual TSBC module can be connected using a RJ11 telephone cable. Multiple TSBC modules can be "daisy-chained" together, which makes installation of the TSBC faster and less expensive than other controls. Using multiple small boilers can also increase efficiency compared to a single, or multiple, larger boiler(s). When used in conjunction with outdoor temperature reset (adjusting the temperature setpoint to match the outdoor temperature) the TSBC will turn on only enough boilers necessary to meet the heat demand of the building. Trigger point rate and time delays prevent premature starting and stopping of boilers based on "false" fluctuations in system load.

Maximized System Efficiency and Energy Usage
The TSBC is actually able to optimize the system operating efficiency by using PID (Proportional Integral Derivative) logic to match the building heat load closer than a proportional-only control can. Using PID logic, the TSBC will continually monitor the building heat demand and the boiler operating temperature to match the building load resulting in more efficient system operation.

The Red line shows how a proportional-only control overshoots the target set point, indicated by the dotted gray line. This overshoot, wastes fuel and reduces the operational efficiency of the boiler. The PID control, indicated by the green line reaches the setpoint in the same time without the inefficient overshoot of the proportional-only control.

Peer-to-Peer Networking
The TSBC uses peer-to-peer networking, which means that there is no master/slave relationship between the boilers. The TSBC modules communicate with each other, periodically changing the lead boiler based on a programmable rotation schedule. Using peer-to-peer networking allows multiple TSBC modules to share sensors and exchange information to optimize boiler operating efficiently.

Advanced Communication
When not being used to communicate with other TSBC modules, the TSBC can communicate with building automation systems using Modbus RTU communication protocol. Using Modbus, the TSBC can provide boiler operating status, fault history, and alarm and lockout conditions. On all systems the TSBC can accept a "remote setpoint" signal (0-10vdc) directly from the building automation system to adjust the temperature setpoint.

Multiple Auxiliary Device Control
The TSBC can control system auxiliary components related to the boiler operation such as a mixing valve, boiler circulator and system circulator(s). Setup and control of each device is programmed with user-friendly menu selections.