

Fireye Nexus Burner Control Features

The Nexus burner controller is a product manufactured by Fireye (USA) and installed by IDEKO, the only Authorized NEXUS Installation team In the Middle East.

The system consists of a microprocessor controller connected to the boiler via a pressure sensor (steam boiler) or temperature sensor (hot water boiler).

The Nexus system can be implemented on full modulation burners. It replaces the burner controller and includes all of its features, namely: Burner Management, Flame Detection and Alarm Monitoring and Display.

Moreover it uses the "Parallel positioning" control scheme for the Fuel/Air ratio control. This scheme consists in separating the fuel flow control from the airflow by installing one servomotor on each instead of controlling both with only one motor.

In this way, the Nexus will ensure that the burner will always be firing at its maximum efficiency, throughout its entire modulation range. This yields significant savings in fuel consumption.

The Nexus system also includes the following features:

- PID Load Control (Capacity Regulation)
- Remote Communications and logging
- Sequencing – Lead/ Lag

Other options that can be part of the Nexus system are:

- Oxygen trim assembly that allows to maintain the maximum efficiency regardless of the variations in operating conditions, ambient conditions, and fuel quality.
- Variable Speed Drive on the blower to reduce the electrical power consumption.

Installing NEXUS may also solve other problems such as:

- Ignition and Light-off Problems
- Smoky Combustion
- Excessive Cycling

More details on the Nexus can be found on www.fireye.com. Also, a full-page write-up about the first Nexus in the Middle East (installed by our Team at Beirut Phoenicia Hotel) can be found on the same site, under "Site Reports" section.

Attached are the main energy saving features of the Nexus system and a reference list of Nexus systems installed by Ideko.

IDEKO SARL

Energy saving features of Nexus efficiency systems

Independent servo positioning motors – greatly reducing linkage arrangements and removing mechanical play. The system provides high accuracy positioning to 1/10th of a degree and excellent repeatability, this is key to optimizing combustion performance throughout the firing range.

Fully closing air damper - Independence on fuel and air also allows Nexus to fully close the air damper during an off cycle (instead of closure to low fire air position). This greatly reduces tramp air being pulled through the boiler during the off cycle and the tremendous losses created by that tramp air scrubbing the heat from the boiler.

Independent fuel profiles – characterized fuel curves for each fuel mean no compromise between fuels the best set up specific to the selected fuel or operating requirement. Best set up per fuel equals best efficiency per fuel.

Selectable light off position – each fuel can be set up with it's own optimized light off point. These are independent from low fire to ensure maximum turndown on the burner is possible but still with reliable light off.

High accuracy load control – using precise electronic process sensors and full 3 term P+I+D control loops ensures the minimum input is used at all times to exactly meet the boiler load requirement, reduce cycling and provide smooth and steady outputs

Night setback – switch selectable desired values are programmable to help reduce energy consumption during off peak hours.

Sequencing/ lead – lag – ensures the minimum boiler capacity is used at all times to exactly meet the building load requirements. Ensures that the lagged boilers are isolated from the system to prevent high losses when cycled off, kept warm or banked for steam.

Optional O2 Trim – 24 hour compensation for small fluctuations in fuel pressure and barometric conditions, trim adjustment on fuel or air is selectable. The O2 probe we manufacture is proven to operate for many years without problems.

Optional variable frequency drive – large saving in electrical energy (typically 40%), reduction in acoustic levels and maximizing of the burner turndown.

Optional communications software – graphical mimic panels, remote monitoring, trending, logging, graphing, fault analysis, modem communications option, upload and download of programmed values. Energy savings related to service interval planning, efficiency logging and monitoring and identification of drifting or variation in process.