PRODUCT GUIDE SPECIFICATION

FIREYE FLAME-MONITOR FLAME SAFEGUARD CONTROL

1. GENERAL

1.1 OVERVIEW

Each burner shall be equipped with a Micro-processor Based Burner Management Flame Safeguard Control System. The control shall provide: (1) automatic sequencing of the boiler system through prepurge, pilot trial for ignition (PTFI), main trial for ignition (MTFI), run, and post purge. (2) flame proving and lockout on flame failure during PTFI, MTFI, and run.

1.1.1 The control system shall be provided by Fireye or written approved equal.

1.2 CODES AND STANDARDS

The control shall be listed by Underwriters Laboratories, Factory Mutual, and Canadian Standards Associates for its intended purposes.

2. SYSTEM HARDWARE

2.1 FLAME SAFEGUARD CONTROL

The Burner Management Flame Safeguard Control will be a plug-in design, with the Programmer, Amplifier, and Display Module to be separate components.

2.1.1 Each component which plugs into the Chassis shall be keyed to insure that the components may be installed only into their proper location.

2.1.2 A control mounting screw will secure all components into the Chassis. This will prevent tampering while the control is installed in the base. The control must be removed from the base to replace any of the components.

2.1.3 The control shall have a non-volatile memory which allows it to remember burner history and present position, even after a power interruption.

2.2 DISPLAY MODULE

The Display Module shall incorporate a two line by 16 character backlit LCD Display for displaying messages (in English words and phrases) which indicate system function and diagnostic information.

2.2.1 Messages longer than 16 characters in length shall be scrolled across the display.

2.2.2 The messages shall be clear, concise information concerning system timing, present burner sequence position, lockout causes (including wiring base terminal designations) and historical data.

2.2.3 During the firing cycle, a constant read-out of the flame signal will be displayed.

2.2.4 The Display Module shall incorporate a three key keypad to allow the user direct local access to the following information:

- Number of burner operating cycles.
- Number of burner lockouts.
- Number of system hours.
- Reason for the last six lockout along with the burner cycle and burner hour when the lockout occurred.
- Average pilot and main flame signal strength.
- Status of high fire and low fire end switches.

2.3 **WIRING BASE**

A wiring base shall be provided which will allow for all system terminations to be completely wired prior to the installation of the control. The control shall be removable or replaceable without removing any wiring terminations.

2.3.1 The wiring base shall provide line voltage terminal inputs from direct connection of limit and operating controls, fuel valve interlock, damper position interlocks, running interlocks (such as air flow, gas pressure, oil pressure, oil temperature), burner motor, ignition, pilot valves, main fuel valves, firing rate motor, and alarm.

3. SYSTEM SOFTWARE

3.1 **SEQUENCE OF OPERATION**

The control shall accomplish a safe start component check during each start. This shall prevent the burner from firing under any condition which causes the flame relay to assume and hold its energized position due to the presence of an actual flame, a flame simulating component failure, or mechanical failure.

3.1.1 A purge period of not less than 30 seconds with a damper driven to the open position and an interlock circuit provided to prove air flow rate during the purge period. A starting interlock circuit is required to prove that the burner equipment is in the low fire position at the time of ignition, plus an interlock to prove air flow during the purge and firing cycle.

3.1.2 Limited trial-for-ignition of pilot flame restricted to 10 seconds, trial-for-main flame restricted to 10 or 15 seconds (selectable) for oil or gas.

3.1.3 Safety shutdown following flame failure, with fuel and ignition circuits de-energized in not more than 4 seconds.

3.1.4 A post purge of 15 seconds following a shutdown.

3.1.5 The system shall recycle automatically under control of the operating control and when power is restored following a power failure. Manual reset shall be required following any safety lockout, even after a power failure. When in a lockout condition, power interruptions will not recycle the control.

3.1.6 The control shall provide a check-run switch which shall allow a qualified service technician to halt the burner sequence in any of four different positions:
- High fire purge
- Low fire purge
- Pilot trial for ignition
- Low fire (burner on)

3.2 **SAFETY PROVISIONS**

A self diagnostic circuit within the control will identify module failures and an appropriate message will be displayed for servicing. This circuit will cause a safety shutdown should any component in the control fail. For example, if the amplifier module is malfunctioning, the Display module will display the message "LOCKOUT CHECK AMPLIFIER"

3.2.1 The control will continually test the status of all safety critical loads (ignition transformer, pilot fuel valve, main fuel valve) to insure they are operating properly.

3.3 **REMOTE COMMUNICATIONS**

3.3.1 The EP stype programmers shall provide a Modbus communication protocol. Available information via Modbus shall be current status, flame signal, safety lockouts, total burner cycles, burner on time (in minutes), and system on time (in minutes). Up to 16 Flame-Monitors, individually addressed, can be wired in a multi-drop wiring ocnfiguration using an RS485 interface over a twisted, shielded pair wire.

4. PRODUCT INFORMATION

4.1 - The control shall be the Fireye E110.
- The Display Module shall be the ED510
- The Programmer Module shall be the EP160.
- The Amplifier Module shall be the E1R1 auto-check infra-red type.
- The infrared scanner shall be the Fireye 48PT2.