



**PRODUCT GUIDE
SPECIFICATION**

**FIREYE BurnerLogix
FLAME SAFEGUARD
BURNER MANAGEMENT**

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 (AUTO), and post purge. (2) flame proving and lockout on flame failure during PTFI, MTFI, and AUTO.

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

1.2 CODES AND STANDARDS

1.2.1 The control shall be listed by Underwriters Laboratories in accordance with US and Canadian standards and Factory Mutual for its intended purposes.

1.2.2 The control shall be in compliance with ASME/CSD-1.

1.2.3 The control shall be in compliance with NFPA 85, Boiler and Combustion Systems Hazards code.

2. SYSTEM HARDWARE

2.1 FLAME SAFEGUARD CONTROL

Major functions of the boiler management system shall have the following capabilities to provide:

2.1.1 User selectable burner operating parameters such as purge time, PTFI & MTFI time, post purge time, and specific operation of the various interlocks.

2.1.2 All burner operating parameters become permanent after 8 hours of main burner on time.

2.1.3 An adaptive Infrared flame scanning detection system where the characteristics of the pilot and main flames are separately learned in order to set the on/off thresholds and optimizing safety.

2.1.4 Flame proving and lockout on flame failure during PTFI, MTFI and AUTO.

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

2.1.6 The control shall provide a check-run switch to allow a qualified service technician to halt the burner sequence in any of five different positions:

- High fire purge
- Low fire purge
- Pilot trial for ignition
- Main trial for ignition
- Low fire (burner on)

2.1.7 Alpha-numeric multi-line LCD or VFD display to continually indicate operating parameters as well as first out annunciation.



- 2.1.8 SMART light emitting diodes (LED's) to provide operating status as well as lockout code identification.
- 2.1.9 Damper motor high and low fire damper motor position proving.
- 2.1.10 Non-volatile lockout and history files with the last 10 lockouts readable through the optional display.
- 2.1.11 Field replaceable 10 amp fuse in the fuel valve and ignition circuit for short circuit protection.
- 2.1.12 The control system shall operate within the following limits:
 - Temperature: -40°F to 140°F (-40°C to 60°C)
 - Humidity: 0% to 85% Non-condensing
 - Voltage: 120 VAC (+10%, -15%) 50/60 Hz
 - Power Consumption: 20 VA maximum
 - 2000 VA maximum connected load
 - 0.5G continuous vibration
- 2.1.13 The control shall have the following storage temperature limits:
 - Temperature: -40°F to 158°F (-40°C to 70°C)
 - Humidity: 0% to 85% Non-condensing

2.2 DISPLAY MODULE

The Display Module shall consist of a two (2) line with sixteen (16) characters per line liquid crystal (LCD) or vacuum fluorescent (VFD) display and multi-functional 4-key, positive action keypad.

- 2.2.1 The display module will provide the user the option of displaying messages in one (1) of six (6) languages.
- 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 four (4) 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 ten 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.

- 2.2.5 The LCD keypad/display module shall operate within the following temperature limits: -4°F to 140°F (-20°C to 60°C).
- 2.2.6 The VFD keypad/display module shall operate within the following temperature limits: -40°F to 140°F (-40°C to 60°C).
- 2.2.7 The keypad/display module shall have the capability to be remotely mounted to a distance of 8 feet (2.43 meters).
- 2.2.8 When remotely mounted, both the LCD and VFD display modules shall provide NEMA 4 protection.

2.3 WIRING BASE

A pre-wired or terminal block 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.
- 2.3.2 The pre-wired wiring base shall be provided with 4 foot leads sufficiently sized to carry the load currents and each wired is labeled in accordance with its function.
- 2.3.3 The terminal block wiring base shall allow the user to measure the voltages and signals on any of the terminals without having to remove the control from the wiring base.

3. SYSTEM SOFTWARE

3.1 PROGRAMMER PARAMETERS

The control shall provide to the user a range of keypad selectable operational parameters that will allow the control to be properly suited to meet the application requirement. These parameters shall include purge time, PTFI/MTFI timings, post purge time, terminal 6 operation, M-8 prove open, M-D prove open, 3-P prove open, prove M-D during TFI, baud rate and unit address.

- 3.1.1 User programmable safety parameters become permanent after 8 hours of main burner operation.

3.2 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.

3.2.1 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.

3.2.2 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.

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

3.2.4 A post purge of 15 seconds following a shutdown.

3.2.5 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.

3.2.6 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
- Main trial for ignition
- Low fire (burner on)

3.3 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 chassis section is malfunctioning, the Display module will display the message "LOCKOUT CHECK CHASSIS"

3.3.1 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.

4. ANNUNCIATION AND DIAGNOSTICS

4.1 First out annunciation with burner sequence position indication.

4.2 Indication of failures at start up or during normal sequence operation.

4.3 Test itself for failure, detect and isolate an alarm, and report internal circuit faults.

4.4 Multiple language text description of system fault.

4.5 Maintain the last 10 faults with burner hour and burner cycle stamp in historical memory, accessible through the display or remote communications.

5. REMOTE COMMUNICATIONS

5.1 The burner management system shall operate either as an independent stand alone control, or as part of a distributed system network. In a distributed system network, multiple controllers are connected via a data link (a single twisted shielded pair wire) to a Supervisory Master Controller (eg: personal computer, PLC, building management system).

5.2 Up to 31 burner management controls can be connected together in a multi-drop configuration on a single data link.

5.3 The communication protocol for the distributed system network shall be MODBUS-RTU.

5.4 The distributed network shall offer selectable baud rates, 4800, 9600 or 19200 bits per second.

6. WIRING

6.1 All wiring shall be in accordance with National Electrical Code and local electrical codes.

6.2 The installing contractor shall be responsible for insuring that the conduit size and wire size, type and quantities are applicable for the installation and equipment supplied.



7. PRODUCT INFORMATION

Part Number	Description:
YB110**	Flame Safeguard Chassis and Amplifier type. (Specify IR for AutoCheck Infrared, UV for non self-check UV, UVSC for self-check UV).
YP1**	Programmer Module for Flame Safeguard Control. (Specify YP100, YP102, YP138 or YP113 to meet application requirements).
60-2810-1	Pre-wired wiring base for Flame Safeguard Control (surface mounted - UL listed).
60-2812-1	Closed Terminal block wiring base for Flame Safeguard Control (cabinet mounted - UL recognized).
60-2814-1	Open Terminal block wiring base for Flame Safeguard Control (cabinet mounted - UL recognized).
BLL510	LCD Keypad/Display Module.
BLV512	VFD Keypad/Display Module.
48PT2	Infrared scanner
UV1A	Ultra-violet (UV) scanner, non-self-check
45UV5-1009	Ultra-violet (UV) scanner, self-check
55UV5-1009	Ultra-violet (UV) scanner, self-check for hazardous locations