

ELECTRONIC FLAME SUPERVISION MULTI-BURNER

MODEL: SENS-A-FLAME II

Revision: 0

BULLETIN
7116

DESCRIPTION

Model 7116 Sens-A-Flame II is a second generation solid-state programmable combustion safeguard for supervising multiple burner ovens, furnaces, kilns and lehrs. It includes the standard functions of purge timing, component check, trial period for ignition, proving pilots before energizing main valve and 2-4 second shut down on loss of flame. A range of fixed times for purge and trail for ignition is available. Function times are precisely generated by solid-state circuits.

Optional functions for remotely resetting timers, interrupting pilots and automatic recycle, starting with a repurge, are available. All functions are controlled by plug-in modules.

Indicating lights follow the programming sequence. An alarm terminal is energized if a flame is lost.

The sensor terminals will accept signals from Ultra Vilot Detectors (7150 or 7155) or a rectifying flame rod. Two flame rods, two Ultra Vilot Detectors or one of each may be used, in parallel, to monitor pilot and main flame separately on an interrupted pilot installation.

Model 7116 can be converted to a single burner safeguard by replacing the multiple logic module with a single logic module.

SPECIFICATIONS

Voltages: 120V, 50/60 Hz., + 10, -15%

Current : 0.175A (20VA maximum)

Ambient Temperature : -10 to 125 Degrees F (-23 to 52 Degrees C)

Flame Response : 2 to 4 seconds

Detector : Flame Rod and/or 7150 or 7155 series Ultra Vilot Detector

Mounting : See dimensional information

Output Terminal Rating : 120V, 50/60 Hz.

Maximum Load Terminals 7,8,13,14 one of the following :

Ignition : 360VA

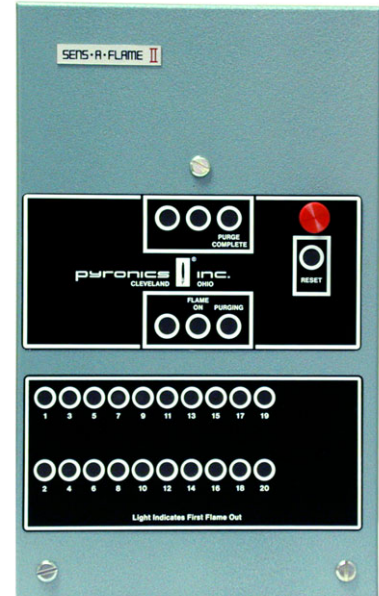
Valves : 125Va (with motorized valves, 1250VA inrush, 400VA running)

Inductive : 5A @ 50% power factor

Maximum Load Terminals 3 & 4 light or alarm : 1A (120VA)

APPROVALS

LR27844



FEATURES

- Monitor 2 to 40 burners
- Solid-state derated circuits for maximum reliability
- Voltage regulated circuits
- Encapsulated modules
- Totally field serviceable with plug-in modules
- Internal circuit overload protection
- Voltage regulated circuits
- Precision solid-state timers
- Sensor terminal accepts UV Detector, or flame rod, or both, for separate pilot and main flame monitoring
- Function indicating lights
- Integrated circuit logic
- Optional timer remote reset module
- Optional automatic recycle program
- Optional interrupted pilot program

CAUTION: Operation of combustion equipment can be hazardous resulting in bodily injury or equipment damage. Each burner should be supervised by a combustion safeguard and only qualified personnel should install, make system adjustments and perform any required service.



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NOTICE: PYRONICS practices a policy of continuous improvement in the design of its products. It reserves the right to change the specifications at any time without prior notice.

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MODULE DESCRIPTION

REGULATED POWER SUPPLY module furnishes all d.c. power and circuit protection for control modules, relay operation and indicating lights.

PURGE TIMER module controls recycle/non-recycle option and purge timing. Select a fixed time which provides at least four changes of air. A switchable time module is available as a service spare. Recycle and non-recycle modules always force a complete new purge cycle.

IGNITION TRIAL TIMER module limits ignition trail and shuts off pilot fuel and ignition if pilots are not proved within specified time, ignition lockout then occurs. Optional remote reset module available.

MULTIPLE LOGIC module checks for component failure during purge and proof of flame at burners during ignition and operation.

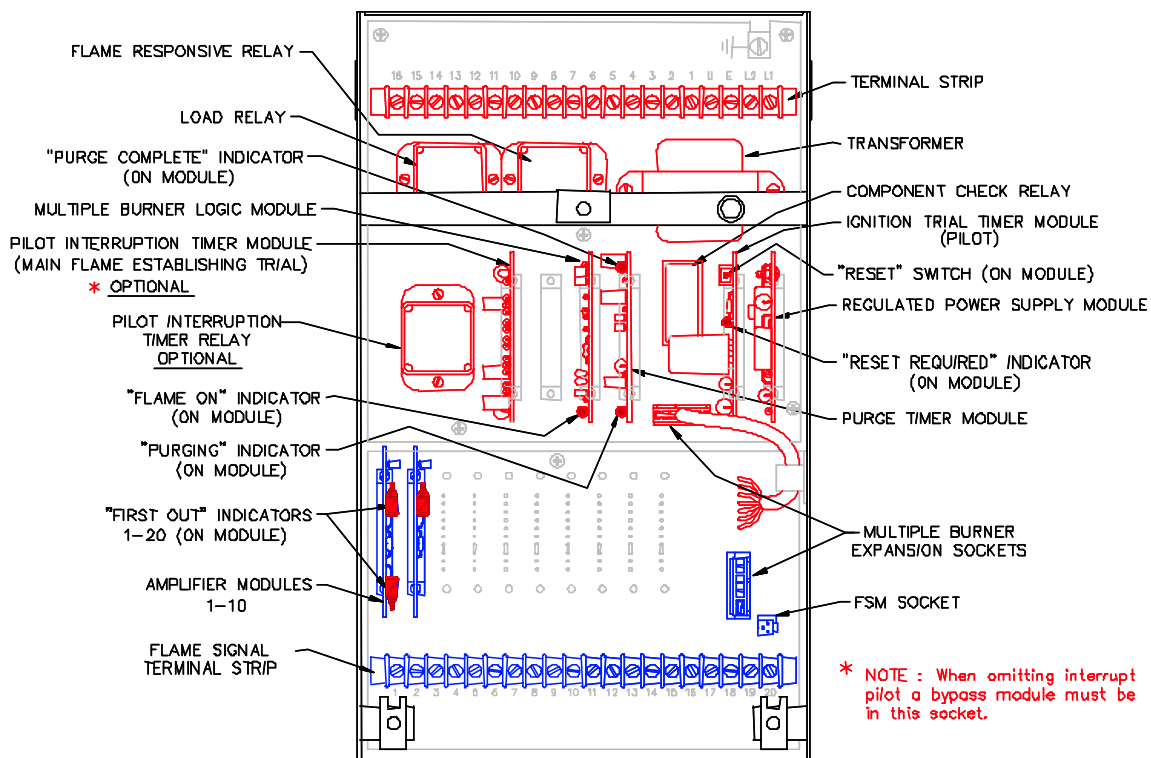
AMPLIFIER MODULE every flame detector is connected to its own amplifier. Two amplifiers are encapsulated in a plug-in module. These solid-state units have a unique, low component count circuit and are easily replaced should it ever be necessary. Each amplifier will operate with either flame rod or Ultra Violet Detectors.

Each amplifier is equipped with a first burner out indicator light. The first burner out light will come on and remain on, even if all burners are shut off by safety controls. Only one first burner out neon light will ever be powered..

PILOT INTERRUPTION TIMER module used only on interrupting pilot systems along with **PILOT INTERRUPTION TIMER RELAY**, provides trail period for lighting main burners, then shuts off pilot fuel.

See note below

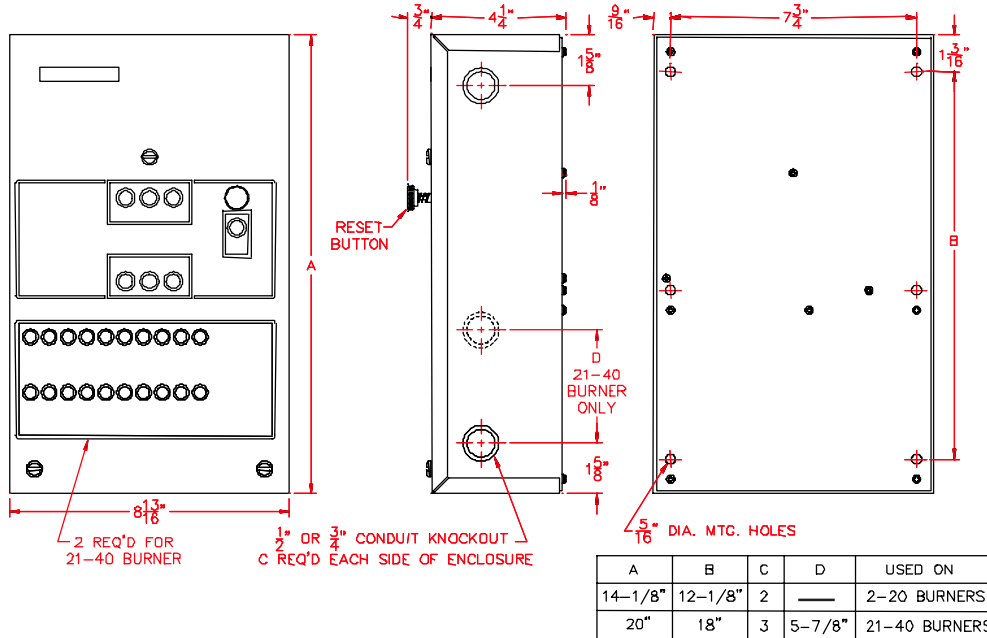
CHASSIS MODULE LOCATION



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DIMENSIONS



ORDERING INFORMATION

Select the proper model number for your application from the list below, then list the number in place of the X's on the top line:

Multiple Burner Model Number 7116 - X XXX - X XX - XX - X - XX

Purge :

Recycle 0

Non-Recycle 1

Purge Time :

Switchable (30,90,180,or 300) 100

0 seconds (fixed)..... 000

30 seconds (fixed)..... 203

60 seconds (fixed)..... 206

90 seconds (fixed)..... 209

120 seconds (fixed)..... 212

180 seconds (fixed)..... 218

240 seconds (fixed)..... 224

300 seconds (fixed)..... 230

Ignition :

Remote Reset (leave blank if not required) R

Ignition time :

Manual System (blank module) 00

5 Seconds 05

10 Seconds 10

15 Seconds 15

30 Seconds 30

45 Seconds 45

60 Seconds 60

Pilot Interrupt :

Continuous Pilots (blank module) 00

10 Seconds 10

15 Seconds 15

30 Seconds 30

60 Seconds 60

Flame Failure Response Time : 4 seconds 4

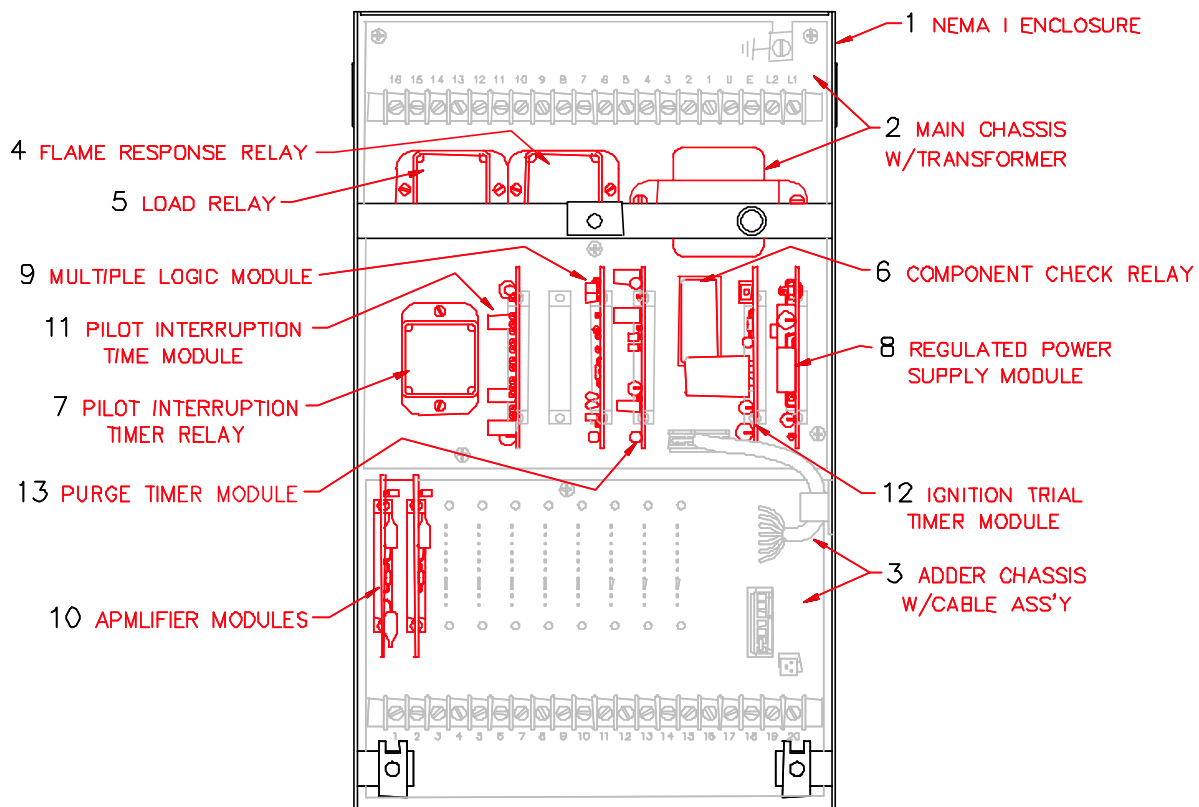
Number of Burners : 02 thru 40

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REPLACEMENT PARTS LIST

- | | | |
|--|-----------|-----------|
| 1) Nema 1 Enclosure : | | |
| 2 through 20 burner | 7187-3020 | |
| 21 through 40 burner | 7187-3040 | |
| 2) Main Chassis w/Transformer | 7187-1001 | |
| 3) Adder Chassis w/Cable Assembly : | | |
| Chassis with 1 Socket | 7187-2002 | |
| Chassis with 2 Sockets | 7187-2004 | |
| Chassis with 3 Sockets | 7187-2006 | |
| Chassis with 4 Sockets | 7187-2008 | |
| Chassis with 5 Sockets | 7187-2010 | |
| Chassis with 6 Sockets | 7187-2012 | |
| Chassis with 7 Sockets | 7187-2014 | |
| Chassis with 8 Sockets | 7187-2016 | |
| Chassis with 9 Sockets | 7187-2018 | |
| Chassis with 10 Sockets | 7187-2020 | |
| 4) Flame Response Relay | 7189-0001 | |
| 5) Load Relay | 7189-0001 | |
| 6) Component Check Relay | 7189-0002 | |
| 7) Pilot Interruption Timer Relay | 7189-0001 | |
| 8) Regulated Power Supply Module | 7181-3000 | |
| 9) Multiple Logic Module | 7186-0002 | |
| 10) Amplifier Module : 4 second Response time | | |
| Single Burner | 7180-1004 | |
| Dual Burner | 7180-2004 | |
| 11) Intermittent Pilot Timer Module | 7184-0000 | |
| Pilot Interruption Timer module : | | |
| 10 Seconds | 7184-0010 | |
| 15 Seconds | 7184-0015 | |
| 30 Seconds | 7184-0030 | |
| 60 Seconds | 7184-0060 | |
| 12) Ignition timer Module : Std. Reset Remote Reset | | |
| Manual | 7183-1000 | |
| 5 Seconds | 7183-1005 | 7183-2005 |
| 10 Seconds | 7183-1010 | 7183-2010 |
| 15 Seconds | 7183-1015 | 7183-2015 |
| 30 Seconds | 7183-1030 | 7183-2030 |
| 45 Seconds | 7183-1045 | 7183-2045 |
| 60 Seconds | 7183-1060 | 7183-2060 |
| 13) Purge Timer Module : Recycle Non-Recycle | | |
| Switchable (30, 90, 180 | | |
| or, 300 sec.s) | 7182-0100 | 7182-1100 |
| 0 Seconds | 7182-0000 | 7182-1000 |
| 30 Seconds | 7182-0203 | 7182-1203 |
| 60 Seconds | 7182-0206 | 7182-1206 |
| 90 Seconds | 7182-0209 | 7182-1209 |
| 120 Seconds | 7182-0212 | 7182-1212 |
| 180 Seconds | 7182-0218 | 7182-1218 |
| 240 Seconds | 7182-0224 | 7182-1224 |
| 300 Seconds | 7182-0230 | 7182-1230 |



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REMOTE RESET IGNITION TIMER MODULE

PART NUMBER	DESCRIPTION
7183-2005	5 Seconds
7183-2010	10 Seconds
7183-2015	15 Seconds
7183-2030	30 Seconds
7183-2045	45 Seconds
7183-2060	60 Seconds

When a combustion safeguard fails to prove flame on all burners of the combustion system, prior to the end of the limited trail for ignition period, a safety lockout occurs. Before a second attempt at ignition is permitted, the lockout relay must be unlatched and both the purge and ignition timers must be reset.

This ignition timer remote reset module is designed to allow the combustion operator the ability to reset his Sens-A-Flame II timers from a location of his choice.

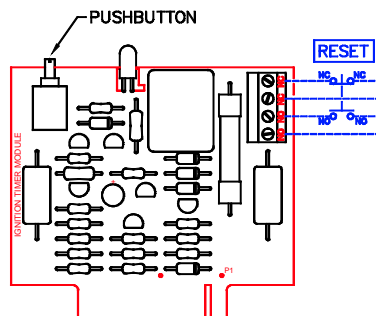
When the remote reset ignition module is properly wired, the Sens-A-Flame II combustion Safeguard may still be reset via the reset pushbutton located on the ignition timer module.

The internal or remote pushbutton may be used to reset a Sens-A-Flame II system that does not automatically begin a new purge cycle after a safety shutdown, caused by loss of flame signal.

This remote reset ignition module may be used as a direct substitute for the standard Sens-A-Flame II ignition module.

INSTALLATION INSTRUCTIONS

- 1) Mount a momentary contact pushbutton to a suitable location within 7.5 meters / 25 feet of the Sens-A-Flame II. The pushbutton should have 1 Normally Open and 1 Normally Closed contact.
 - a) Mounting the pushbutton beyond the distance described above may cause damage to the Sens-A-Flame II internal circuits.(Consult factory)
- 2) Remove the factory installed jumper wire from the NC terminals of the terminal block located on the remote reset ignition module.
 - a) Failure to remove the jumper wire will not damage the Sens-A-Flame II, but will not permit the remote pushbutton to function.
 - b) The remote ignition module can be used without the remote circuit if the jumper is in place between the NC contacts. Reset the ignition by pushing the pushbutton located on top of the Ignition Timer Module
- 3) Connect 4 wires (#18-14 AWG) to the Ignition Module terminal block. The terminals are labeled NC, NC, NO, NO. Connect the corresponding wires to the appropriate remote pushbutton terminals.
 - a) Use caution when wiring the terminal block to the pushbutton, as reversing the connections may cause damage to the Sens-A-Flame II circuits.
 - b) Isolate the reset pushbutton wiring away from all high voltage wiring. Use a (4) conductor shielded cable, with the shield grounded at one end to protect the Sens-A-Flame II control circuits from induced voltage/currents.
 - c) DO NOT connect outside power or any resistive/inductive load to the reset circuit. The reset circuit is internally powered by the Sens-A-Flame II. Any attempted use of this power will damage the Sens-A-Flame II.
- 4) Do not hold in or use a latching type pushbutton in place of a momentary action pushbutton.
- 5) All wiring must conform with electrical codes, regulations and ordinances in force.



Pressing the reset pushbutton at any time resets the purge and ignition timers. When these timers reset, the combustion safeguard, even if in a normal flame monitoring mode, immediately performs a safe shutdown. A complete new prepurge will be required to a relight of the system.

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REGULATED POWER SUPPLY MODULE FUNCTION

Provides regulated -24 volts for logic circuits, solid state amplifiers and relay operation. This supply is protected against short circuit and excessive ambient temperature. A second -24 volt supply, connected to terminal 1, provides power, through external switches to initiate ignition and optional interrupted pilot timing circuits. This supply is protected by a fuse. **NOTE** : 30 VAC for flame rods and 270 VAC for UV detectors is supplied directly from the transformer.

PURGE TIMER MODULE FUNCTION

Models are available providing purge periods from 0 seconds to 5 minutes. The optional recycling function, starting with a second purge period, is determined by the circuits on the purge module. When purge timing is complete and component check is proved, the component check relay closes. A purging light and a purge complete light are mounted on this module. If a flame or a circuit failure, simulating flame, is sensed during purge (component check not proved) the purging light will go off, on non-recycle purge modules the system will lock out. After correcting fault, press reset button to recycle. Recycle purge modules will automatically begin a new purge cycle once the fault is corrected.

IGNITION TRAIL TIMER MODULE FUNCTION

The trail period for ignition is precisely timed by this module and should be selected according to code requirements. Ignition is started by momentary closing of the circuit between terminals 1 and 5, provided component check has been completed. A jumper between terminal 1 and 5 will provide automatic ignition. Pilot valves are opened when ignition is started. Ignition will be interrupted by operation of flame response relay, when all pilots are proven. Failure to prove pilots within trail period will sound alarm and lock out system. The reset required light will be illuminated. Pressing the reset button will recycle the system. Optional remote timer reset module available. (See page 5 for details)

SINGLE LOGIC/AMPLIFIER MODULE FUNCTION

This module plugs into the logic circuitry socket for single burner applications. A sensor current of 1 micro amp (minimum) will prove flame and result in the flame response relay closing, energizing terminal 8 (main fuel valve) and Flame On light. Logic functions are the same as described for the multiple logic module below.

MULTIPLE LOGIC MODULE FUNCTION

During purge, sensing a flame or flame simulating failure will energize the flame responsive relay and lock out the system. The purging light will go off and the Flame On light will light. When no flame is sensed during purging, and trail for ignition has started, the logic module checks for flame proof at every burner. Upon sensing flame at all burners, the flame responsive relay closes, energizes terminal 8 (main fuel valve) and Flame On light.

MULTIPLE BURNER AMPLIFIER MODULE FUNCTION

These amplifiers, one for each burner, are packaged two to a module. To accommodate an odd number of burners, the last module will contain a single amplifier. A module containing a single amplifier is identified by electronic components on one half of the module only.

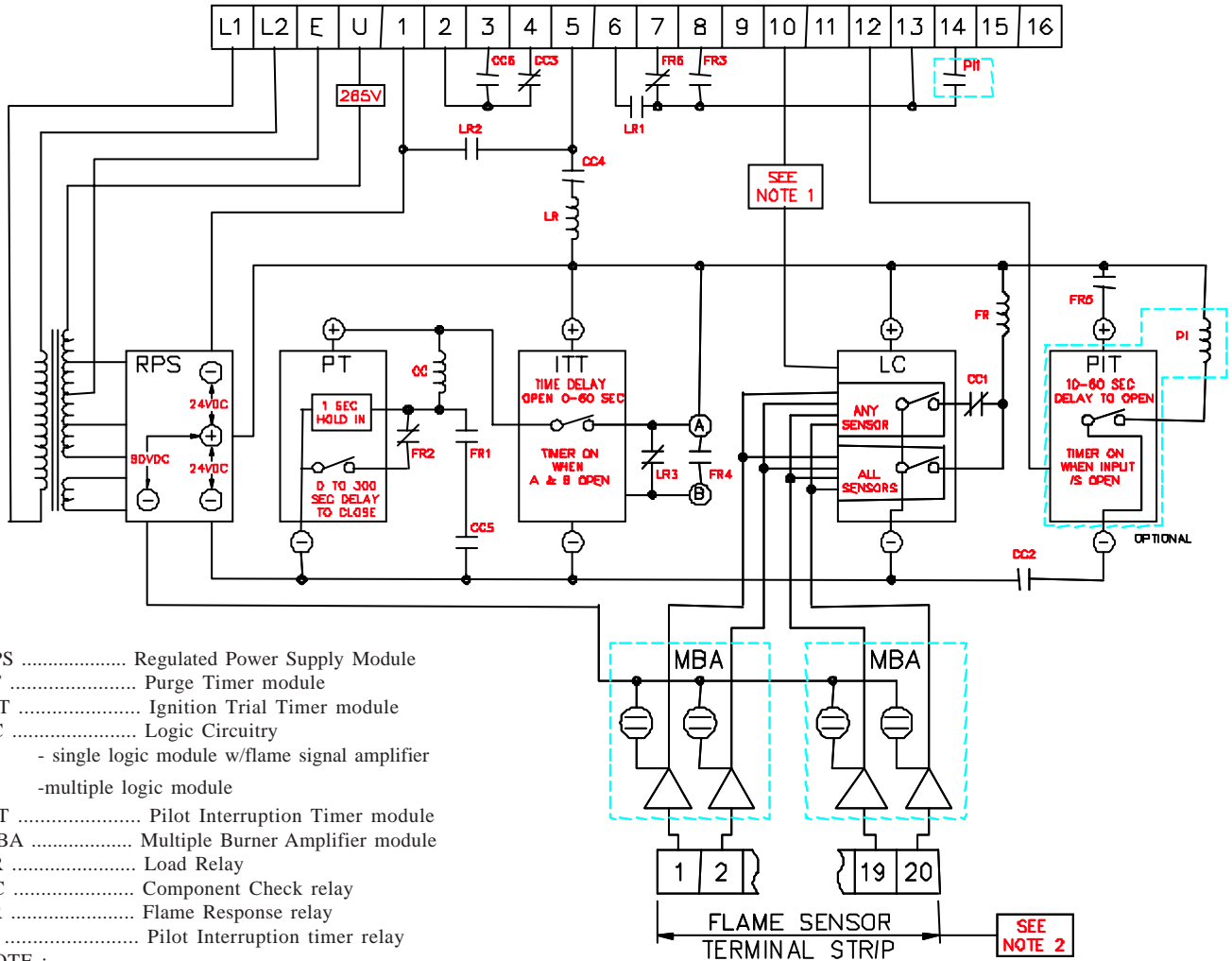
PILOT INTERRUPTION TIMER MODULE FUNCTION

Sockets for a Pilot Interruption module and the Pilot Interruption relay are on all chassis but the function is optional. Typically, a normally closed auxiliary switch on the main fuel valve is used to interrupt a circuit between terminals 1 and 12, starting the timing function. At completion of timing, power is removed from the interrupted pilot terminal.

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BLOCK DIAGRAM



- RPS Regulated Power Supply Module
 - PT Purge Timer module
 - ITT Ignition Trial Timer module
 - LC Logic Circuitry
 - single logic module w/flame signal amplifier
 - multiple logic module
 - PIT Pilot Interruption Timer module
 - MBA Multiple Burner Amplifier module
 - LR Load Relay
 - CC Component Check relay
 - FR Flame Response relay
 - PI Pilot Interruption timer relay
- NOTE :

1. Flame detector signal input for single burner system through this connection (terminal 10)
2. Flame detector signal input for multiple burner system through flame sensor terminal strip.

NORMAL OPERATING SEQUENCE

- Close 120V line switch
(Limits satisfied)
- Purge timing starts
Component check is concurrent with purging
 - Purge duration (0 to 300 seconds) controlled by module model
 - Purging light on
 - All relays open
 - Alarm terminal (4) powered
- Failure in component check :
(Correct fault and press Reset button on non-recycle purge models)
 - A flame or circuit fault simulating flame will energize relay FR
 - Purging light off
 - Flame On light on
 - System locks out
 - Alarm terminal (4) powered

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NORMAL OPERATING SEQUENCE

(Continued from page 7)

- Purge complete
Component check OK
 - Purging light off
 - Purge complete light on
 - Relay CC energized
 - Alarm terminal (4) de-energized

- Ignition start
(pushbutton or automatic operation)
 - Purge Complete light on
 - Relay LR and CC energized
 - Terminals 13 (pilot valve), 14 (pilot valve or interrupted pilot), and 7 (ignition) are powered

- * Failure to ignite pilot :
(Press Reset button to reset purge and ignition timers)
 - All relays de-energized
 - Reset light on
 - Alarm terminal (4) powered

- Pilot or pilots proved
 - Relays LR, CC and FR energized
 - Flame On light on
 - Purge Complete light off
 - Terminals 8 (main gas), 13 & 14 (pilot) powered
 - Terminal 7 (ignition) interrupted

- Manually open main valve
 - No change in conditions

- * Loss of flame :
(Correct fault and press Reset button to restart on non-recycle purge models)
 - All relays de-energized
 - Main and pilot valves close
 - Alarm terminal (4) powered
 - Flame On light off
 - On multi-burner, indicator light shows first burner out

OPTIONAL RECYCLE PROGRAM

- * Loss of flame :
 - All relays de-energized
 - Main and pilot valves closed
 - Purge light on
 - All other lights off
 - Alarm terminal (4) powered
 - Recycle starts with purge

OPTIONAL INTERRUPTED PILOT

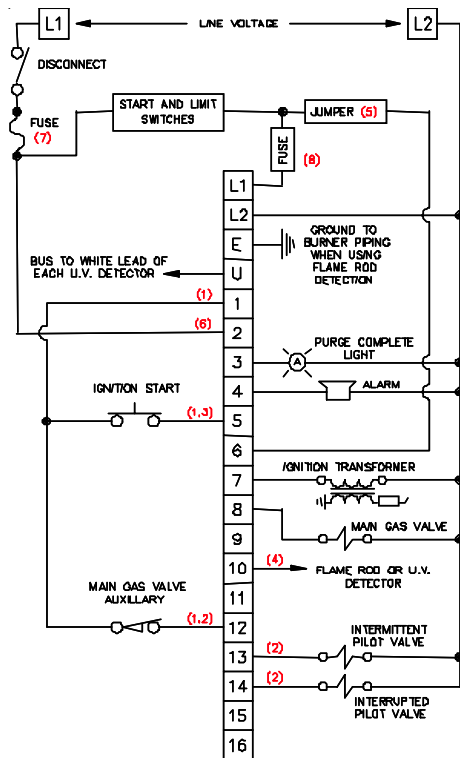
- Pilot interruption starts
 - Timing starts when NC auxillary switch on main fuel valve breaks connection between terminal 1 & terminal 12.
 - PI relay de-energized

- Pilot interruption time complete
 - PI relay de-energized
 - Power to terminal 14 (pilot) interrupted
 - Pilot valve closed

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BASIC EXTERNAL CIRCUIT



NOTES:

- (1) Terminals 1, 5, and 12 are Low Voltage Control circuitry. **Do not connect any other source of power or damage will result.** Wire with NEC Class 1 wiring.
- (2) For interrupted pilots : Terminal 12 starts Pilot Interruption Timing when the connection to terminal 1 is opened. MGV Auxiliary is used only with interrupted Pilots. When auxiliary contact is not available, do not make any connection to terminal 12. Connect Interrupted Pilot Valve to terminal 14. Connect Intermittent Pilot Valve to terminal 13
- (3) For Automatic Ignition, install jumper wire from terminal 1 to terminal 5.
- (4) On a multiple-burner installation, sensors are connected to numbered terminals on adder chassis.
- (5) Install jumper wire from terminal L1 to terminal 6. Operating controls, if used, may be placed in series between terminal L1 and terminal 6. **Terminal 6 must always be powered after limits.**
- (6) Terminal 2 may optionally be powered after limit controls (install jumper wire from terminal L1 to terminal 2). Alarm will not sound when limit opens.
- (7) Fuse supply circuit per total load of combustion circuit.
- (8) Fuse terminal L1 with 1/8 Amp SLO-BLO fuse only. **Unintentional grounding of terminal U without fuse protection of terminal L1 will damage internal control transformer.**

INSTALLATION INSTRUCTIONS

1. Locate Sen-A-Flame II where ambient temperature is between -10 and 125 degrees F.
2. Enclosure may be mounted in any position. Allow clearance for removing cover.
3. Determine that external electrical loads (valves, ignition transformer, ect.) do not exceed contact ratings listed. Use external heavy duty relays, powered by Sens-A-Flame II, to switch larger loads.
4. Provide a 120V line disconnect switch and proper fusing to interrupt power to the Sens-A-FlameII so it may be tested.
5. Wiring must conform to electrical codes, regulations and ordinances. All wiring to lettered and numbered terminals must be NEC Class 1, Type TW moisture resistant wire is recommended
6. Maximum current in any flame signal wire is 200 micro amps. Any number of flame signal wires may be run in a common metal grounded conduit, **but not with line voltage or ignition wires.** Maximum length of any flame signal wire is 200 feet. Contact factory when longer runs are required. On distances over 20 feet isolate the flame signal wires, from the UV white bus wire. No 14 600V TW wire is recommended. Moisture resisting wire should be used. **Asbestos wire is not acceptable** because it absorbs moisture.
7. Flame rods and Ultra Violet detectors are powered from an AC source (terminal E, 30 Volts for flame rod and terminal U 270 Volts for Ultra Violet detectors) and provide a rectified signal to the amplifier. They can be used interchangeably. They may be connected in parallel if used to monitor pilot and main flame separately. Choice of sensors depends on application.

Follow the burner manufacturer's recommendation when selecting and installing sensors. Consult Pyronics, Inc. Industrial Controls Division when reliable data is not available.

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INSTALLATION INSTRUCTIONS

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8. Flame current fluctuation is normal. The average value should be noted. The Sens-A-Flame II will prove flame at a minimum of 1 micro amp. A higher signal is desirable.
9. Terminal E supplies potential for flame rod operation. Connect terminal E to burner piping ground. Use interconnecting bus to each burner if required. **A direct connection** between terminal E and burner piping is required..
10. Flame rods require :
 - a) An adequate grounding area in contact with the flame. This area should be four times the surface of the flame rod in contact with the flame or greater. Grounding vanes or rods can be attached to pilots to improve the flame grounding ratio. Cut the flame rod length (rod extending beyond the flame centerline) to improve the grounding ratio. This will result in a stronger signal.
 - b) That flame rod insulators be kept clean and rods free of carbon.
 - c) Sensing of the pilot at a point that assures main flame ignition.
 - d) That line and other burners lighted in series have the flame rod installed at the end opposite the pilot.
- 11) Ultra Violet detectors should be installed as recommended by the burner manufacturer. The following considerations should be observed :
 - a) When sighting both pilot and main flame, sight on pilot at a point where main flame ignition is assured.
 - b) Detectors **must not** view ignition spark directly or by reflection.
 - c) Other burners **must not** be within the detectors sight.
 - d) Flame must remain within the UV detectors view at all firing rates.

Greatest UV radiation is in the first third of the flame length. UV emission is blocked by dirt, smoke and moisture (vapor or condensed). Never apply Ultra Violet detectors without a quartz window when sighting through fuel lines or where condensation can be expected. Temperature limit of Ultra Violet detector is 140 degrees F. The use of purge air from the combustion air line will aid in cooling the detector and reduce dirt and moisture problems. A 1/4" NPT connection for purge air is provided on all Pyronics UV detectors except Models 7150-0100, 0101, 0110, 0111 and 7155-0001.The black wire from each UV detector is connected to an amplifier terminal. Isolate these wires away from any line voltage wires.
- 12) When Ultra Violet detectors are used, all white wires are tied to a common bus from terminal U. **Do not ground terminal U or damage will result to the internal transformer.** (See page 9 note 8).

INSTALLATION CHECK OUT

1. Check all wiring for shorts or loose connections. On UV detectors all white wires connect to terminal U, black wires to numbered flame signal terminals.
2. When using flame rods, signal wires connect to numbered flame signal terminals. All burner pipes should be grounded and connected to terminal E.
3. Adjust pilots to provide an adequate signal to the Sens-A-Flame II amplifiers. Check signal over full range of burner operation. Shut down each burner and verify that power to the main valve is interrupted.
4. Perform pilot turndown test. Reduce each pilot separately until Sens-A-Flame II load relay opens. Check that a minimum pilot will light the main burner.
5. A UV detector can be individually tested by holding a match or lighter in front of the detector. **Make sure all manual fuel valves are closed before performing this test.**
6. Indicator light on multiple burner amplifiers can be used to locate marginal sensor signals. They will glow dimly when signal is weak.

Note : System operation should be checked at regular intervals to assure proper performance of Flame Detection System.

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TROUBLE SHOOTING CHART

- 1) No Purge (no "Purge" light)
- A. Input power circuit not complete, check voltage at L1 and L2. [Supply correct power]
 - B. System not reset. [Press "reset" button]
 - C. "Flame On" illuminated : Flame or flame simulating condition during componet check.
 - D. Module not seated in socket [Re-install modules]
 - E. Inoperative Purge Timer [Replace]
 - F. Inoperative Regulated Power Supply [Replace]
 - G. Inoperative Ignition Timer [Replace]
- 2) No light on Any Amplifier (multiple burner system)
- A. "Flame On" illuminated : Flame or flame simulating condition at input (all inputs).
 - B. Incomplete power cicuit [check multiple burner Expansion socket]
 - C. Incomplete power circuit [All amplifiers, relays, modules must be seated in sockets]
 - D. Inoperative Regulated Power Supply [Replace]
- 3) Purge Not Complete ("No Purge Complete" light, no power on terminal 3)
- A. Inoperative Purge timer [Replace]
 - B. Inoperative Regulated Power Supply [Replace]
 - C. Defective Component Check Relay (CC) [Replace]
 - D. Defective Flame Response Relay (FR) [Replace]
- 4) Failure to Recycle (Recycle Models)
or
Failure to Not Recycle (Non-Recycle Models)
- A. Inoperative Purge timer [Replace]
 - B. Defective Flame Response Relay (FR) [Replace]
- 5) Incorrect Ignition trail Time
- A. Incorrect Ignition trial Timer module [Replace]
 - B. Inoperative Ignition trail Timer module [Replace]
- 6) Failure to start Ignition Trial Timer after purge
- A. No initiate signal. [Connect Terminals 1 and 5]
 - B. Inoperative Load Relay (LR) [Replace]
 - C. Inoperative Regulated Power Supply [Replace]
 - D. Defective Ignition Timer module [Replace]
- 7) Component check Lockout ("Flame On" light on)
- A. Sensor (one or more) providing signal to amplifier during Component Check. [Remove flame or replace sensor] [Remove sensor wiring to isolate]
 - B. Component failure in amplifier [Replace amplifier(s) one at a time until fault unit located]
 - C. Inoperative Logic module [Replace]
- 8) Failure to Sense Flame ("Flame On" light off)
- A. No or inadequate signal from sensor (one or more). Disconnect sensors (s) and apply flame simulator(s) [Repair or replace sensor and wiring as needed]
 - B. Inoperative amplifier. Verify with flame simulators 8A [Replace if amplifier does not respond]
 - C. Inoperative Logic module [Replace]
- 9) Ignition Trail times out with Flame Proven ("Flame On" light on)
- A. Defective Flame Response relay (FR) [Replace]
 - B. Inoperative Ignition Trial Timer module [Replace]
 - C. Pilot Interruption Timer module or By-Pass module

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TROUBLE SHOOTING CHART

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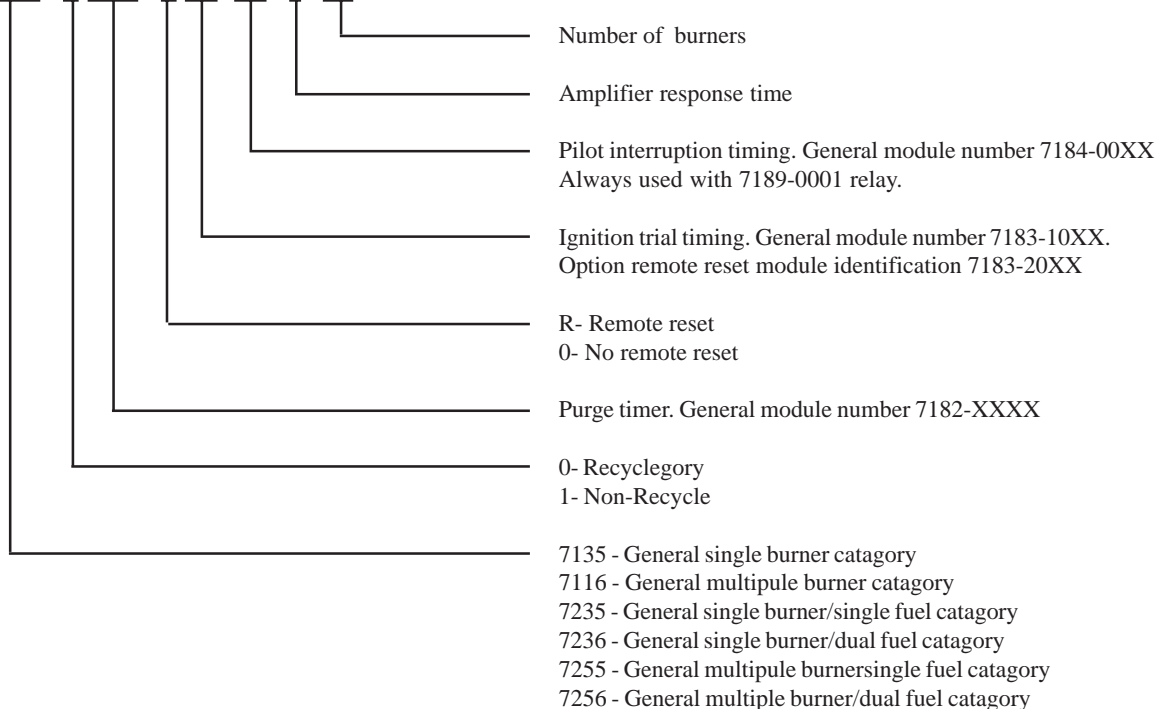
- 10) No power to pilot valve, terminal 14 ———— A. Defective Pilot Interruption Timer relay (PI) [Replace]
B. Inoperative Pilot Interruption Timer [Replace]
- 11) No power to terminals 7, 8, 13, & 14 during cycle ———— A. No initiate signal [Connect terminals 1 & 5]
B. Defective Component Check relay (CC) [Replace]
C. Defective Load Relay (LR) [Replace]
- 12) No power to terminals 3 or 4 ———— A. Defective Component Check relay (CC) [Replace]

GENERAL SYSTEM IDENTIFICATION

All modules are identified by catalog number. The complete system is identified by a composite catalog number. To locate a specific module number from the complete system number, see below (and page 4):

Form of system number

7XXX - X XXX - X XX XX - 4 - XX



CAUTION: Operation of combustion equipment can be hazardous resulting in bodily injury or equipment damage. Each burner should be supervised by a combustion safeguard and only qualified personnel should install, make system adjustments and perform any required service.



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NOTICE: PYRONICS practices a policy of continuous improvement in the design of its products. It reserves the right to change the specifications at any time without prior notice.