Linear Systems **Ph/Fax: +91 22 25576002**

BURNER CONTROLLER

(Model 307 – GI - LPD)

GENERAL

This Burner Controller is designed for Multi Fuel Incinerator with Gas (LPG) Pilot. The incinerator is designed to use Furnace Oil (FO) for main combustion. The Controller has the feature of Pilot Retrial at the beginning of the sequence. This Controller has a long pre-purge cycle (2 minutes) and multiple options for turning OFF of Pilot LPG. It also has the option of Lockout or Auto-Restart when Safety Interlock loop is opened.

The Flame sensing is done by means of UV Sensor. The Controller has a built-in UV Amplifier for sensing of the flame.

The Controller uses microprocessor-based design and is housed in a ABS plastic enclosure with over all size of 150(L) x 70(B) x 110(H) mm. The mounting is by means of standard 35 mm DIN rail or on back panel with two screws. The outputs are relay based, with contact ratings of 230V AC, 5 A resistive load. However, the controller is designed for a total output current of 5 A and is protected by a fuse with 5 A rating.

SEQUENCE SPECIFICATIONS

The 230 AC supply is connected to the terminals 1 (Phase) and 2 (Neutral). The following sequence will start, provided Safety Interlock loop (Terminal 5 & 6) is closed.

Step No.	Time in Secs	Operation	Symbol Ref	Term Ref
1	T1 = 0	Comb. Air Damper ON	D	11

The Controller will go to <u>LOCK OUT</u>, if False Flame signal is sensed.

2	T2 = T1 + 120	Comb. Air Damper OFF	D	11
		Ignition ON	I	7
		Pilot LPG ON	PG	8
		Pilot Air ON	PA	9

NOTE: The Operator has to ensure that Pilot Air is ON at the start of Step 2. The Pilot Air ON (Term 9) can be used in future, if required. As per specifications, it will remain continuously ON. Pilot Air is manually operated, as there is no provision of Solenoid at present.

3	T3 = T2 + 3	Ignition OFF	I	7
		Fuel Solenoid ON	FO	10

At beginning of Step 3, the controller will check for the presence of the Pilot flame.

*If the flame is **NOT** sensed, a RETRIAL will be done. The retrial involves in switching OFF the Pilot LPG and opening again after1 second. The sequence re-starts at Step 2.*

If the flame is not present after Retrial; the Controller will go to LOCK OUT.

4	T4 = T3 + 2	Comb Air Damper ON	D	11
5	T5 = T4 + Tx	Pilot LPG OFF	PG	8

The time delay Tx depends on the jumper option selected as below:

Term 30 & 31 Closed and Term 31 & 32 Closed - 15 secs
Term 30 & 31 Closed and Term 31 & 32 Open - 30 secs
Term 30 & 31 Open and Term 31 & 32 Closed - 60 secs
Term 30 & 31 Open and Term 31 & 32 Open - 90 secs

At the end of Step 5, if the Main Flame is not present, then LOCKOUT is initiated. Even during Step 5, LOCKOUT will be initiated, if there is a Pilot Flame failure.

The Controller is now in normal operating condition. However, the controller will continuously monitor the flame and initiate LOCKOUT, if there is a flame failure.

Note: To cater for the unstable flame, a flame recheck of 3 sec is carried out to avoid nuisance tripping / Lockout in the case of intermittent loss of flame.

LOCK OUT CONDITION

The Controller will continuously monitor the presence of Flame. If they are not present, ALL OUTPUTS ARE SWITCHED OFF and LOCKOUT ALARM is initiated by providing supply at Terminal 12.

Operator intervention is necessary to restart the Controller after a Lockout. It is recommended that an investigation of the "Cause" is done before restart.

The Lock Out condition can be cleared by pressing the Reset Push Button, connected across Terminals 3 and 4. The Controller will re-start a new sequence.

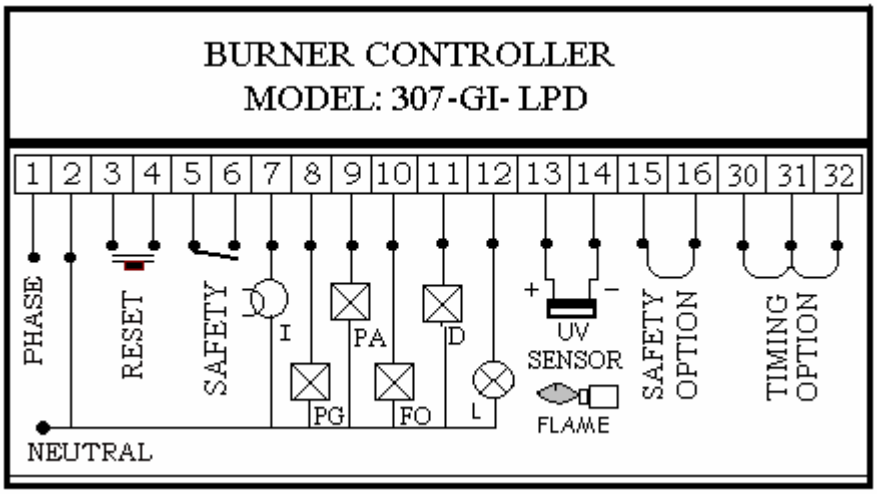
SAFETY INTERLOCK

A Safety Interlock circuit (between Terminals 5 & 6) is typically formed by connecting the pressure/temperature switches and other start / control interlock switches (such as PLC) wired in series. The switches must be potential free. The 230 V AC supply is provided by the Controller.

If at any instant of time during normal firing operation, if the Safety Interlock circuit is opened, the firing is shut off. That is, all Controller outputs are switched OFF. The Controller will now wait for the safety circuit to close again. Upon closure of the safety loop, the Controller will start the firing sequence all over again form Step 1 – **provided SAFETY OPTION terminals (Terminals 15 & 16) is OPEN.**

Alternatively, **if the SAFETY OPTION terminals (Terminals 15 & 16) is CLOSED**, then the Controller will initiate a LOCKOUT. Please refer to **LOCKOUT CONDTION** paragraph for details.

SCHEMATIC DIAGRAM:



IMPORTANT NOTES

1. The line voltage should never be connected at the Safety Option terminals 15 & 16. and also Timing Such a connection will result in damage to the Controller and void the warranty.

2. The Controller Fuse rating is 5A. Do not use a higher rated fuse. Please note that a blown fuse indicates a fault external to the Controller. Hence a thorough investigation of the panel. external wiring must be done before switching on the Controller.

3. A **shielded wire** must be used for UV Sensor connection**.** It is advisable to use a single wire to connect Controller to the UV Sensor. Any joints in the UV Sensor wiring may result in leakage currents, which will be sensed as flame by the Controller. Majority of the flame sensing / flame sensitivity problems at the site are due to improper UV sensor wiring.