LINEAR SYSTEMS

GAS BURNER SEQUENCE CONTROLLER
(Model 307-GP-FS)

1. SALIENT FEATURES

This controller is designed to for automatic start up of Single stage Gas Burner operation with program option for a Pilot flame proven firing sequence. The flame sensing is done by single electrode for both flame sensing and electric Ignition..

The controller senses the flame using flame rectification technique. The Controller provides a high voltage for the Flame electrode. The flame electrode is immersed in the flame to be sensed. The current thus generated by the flow of electrons though the flame to the ground is detected by the controller for presence of flame.

The Ignition Transformer secondary winding should not be connected to ground or earthed. Instead, Terminal (16) of Burner Controller must be connected to Ground.

The Flame electrode must be properly insulated while mounting. Any leakage will also be sensed as flame. The controller will check for such leakage at the beginning of the firing. It will go to lockout if such leakage current is sensed.

2. SEQUENCE SPECIFICATIONS

When the power supply is connected to the Sequence Controller and the Start push button is depressed, the sequence and timings for a NORMAL Startup are as given below:

Step No	Time in Secs*	Operation	Term Ref.
I	t = 0	Run Indicator ON Blower ON	(3) (8)
II	t = 60	Oil Pump ON Ignition ON	(9) (10)
III	t = 60 + 30	Main Solenoid valve OPEN	(11)
IV	t = 60 + 30 + 7	High Flame valve OPEN Ignition OFF	(12) (10)

NOTE: The above timings are factory set.

Prerequisites for the start up:

1. Supply to the controller present.
2. Flame electrode should not be sensing flame either in form of grounding or leakage in insulation.

Note : The controller will go to lockout if the above condition No. 2 is not full filled.

The following table summarises the steps of operation in chronological order. The corresponding timings seconds and the outputs and their respective terminals are indicated.

Program 1

When Loop S1 is not closed, the sequence will not generate pilot flame proving sequence.

Step No.	Time in Seconds	Operation	Terminal No.
1.	T1=0	Run Indicator ON	3
2.	T2=T1+ 2	False flame check	
3.	T3=T2 + 1	Fuel Valve ON Ignition ON	10 11
4.	T4=T3 + 5	Ignition OFF	11
5.	T5= T4 + 6	Flame check Flame ON signal	 12
If flame is not sensed,			
6.	T5= T4 + 6	Fuel valve OFF Lockout ON	10 13

If flame is sensed,

The sequence is complete and continuously monitors the flame there after.

Program 2

When Loop S1 is closed , the sequence will generate pilot flame proving sequence.

Step No.	Time in Seconds	Operation	Terminal No.
1.	T1=0	Run Indicator ON	3
2.	T2=T1+ 2	False flame check	
3.	T3=T2 + 1	Pilot Valve ON Ignition ON	9 11
4.	T4=T3 + 5	Ignition OFF	11
5.	T5= T4 + 6	Flame check Flame ON signal	 12
If flame is not sensed,			
6.	T5= T4 + 6	Pilot valve OFF Lockout ON	9 13
If flame is sensed,			
7.	T6= T4+ 6	Fuel Valve ON	11
8.	T7= T6 + 5	Pilot Valve OFF	9

If the Loop S2 is closed, the pilot valve will not be switched off at the end of STEP 8, instead the pilot valve will remain continuously ON.

Now, the normal Burner start up is complete and the Controller will monitor the existence of flame continuously. Any loss of flame as sensed by the flame sensor will result in lockout.

Lockout condition:

When ever the Controller goes to Lockout state. All the outputs are switched off and Alarm is initiated at terminal No. 13.
When in lockout , the controller can be reset by momentarily pressing the Reset P.B. (R) wired across terminals 4 & 5.
Momentary interruption in power supply the controller will also have the same reset effect on the controller.