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

BURNER CONTROLLER

(MODEL 712 - PR – 24 – P14)

GENERAL

The Burner Controller (Model 712-PR-24-P14) is designed for safe start-up and continuous monitoring of OIL FIRED burners used in Boilers and Furnaces. The Controller uses state of the art microprocessor based design to provide reliable and precise sequence operation, with easy to follow visual indications.

The Controller is housed in an ABS plastic enclosure with over all size of 70 mm (L) x 110 mm (B) x 105 mm (H). The enclosure consists of a Base and a Plug-in Controller module, which facilitates replacement at the site.

The Controller senses the flame using Light Detecting Resistor (LDR). Please note that, LDR based flame sensors essentially detect the light emitted by the flames. Hence, they are only suitable for Oil flames. They are not suitable for gas flames. They are also not suitable for furnace applications, where there is refractory glow from the furnace walls.

NOTE ON COMPATIBILITY

This model has been designed to provide functional compatibility with LOA-24 series Burner Controllers. The timings and features of this model (Model 712-PR-24-P14) are compatible with the Model LOA24.171B27. The replacement of LOA-24 by Linear Systems model 712-PR-24-P14 needs minimal wiring changes, since the order of the connections have been kept same as LOA-24.

For the sake of simplicity, the optional feature of proving the Oil Pre-Heater contact available in LOA-24 has not been provided in 712-PR-24-P14. In most installations such a feature is normally not used. If such a feature is needed, the Oil Pre-Heater contact can be connected in series with supply line of the Controller, as a part of Safety Loop.

SEQUENCE SPECIFICATIONS:

The sequence starts when the power supply (230V AC, 50 Hz) is connected to the Burner Controller across terminals 1 & 2. However, the following Safety / Control contacts are normally connected between the incoming supply and Terminal 1 of the Controller:

- Pressure stat (R)
- Limit Thermostat or Pressure Monitor (W)
- Safety Limit Thermostat (SB)
- Optional Oil Pre-Heater Contact (OW)

All the above contacts must be in CLOSED position for the Controller start. In addition, it is quite common to wire the Start / Reset and Stop Push Buttons in the supply line.

The following sequence will be initiated, when the supply is available at Terminal 1.

Step No.	Time in Seconds	Operation	Symbol Ref	Terminal Ref
1	T1 = 0	Burner Motor ON	B	3
		Ignition ON	I	6
		False Flame Check		

The sequence continues, if a dark signal is sensed during purge period
The Controller goes to LOCK OUT, if the False Flame signal is present.
False Flame LOCKOUT is indicated by Fast Flashing of the Flame LED

2	T2 = T1 + 14	First Solenoid OPEN	V1	4

If Flame is present

3A	T3 = T2 + 14	Ignition OFF	I	6
		Second Solenoid OPEN	V2	5
		Normal Operation		

If Flame is NOT present

3B	T3 = T2 + 8	All Outputs OFF		
		LOCK OUT ON	L	10

LOCK OUT is initiated under following conditions:

1. False Flame in Step 1 - *indicated by Fast Flashing of Flame LED*
   (Possible Causes – Faulty Flame sensor or Leaky valve)

2. Flame Failure in Step 3 - *indicated by Slow Flashing of Flame LED*
   (Possible Causes – Blocked Fuel line, Faulty Ignition Transformer, etc)

The Lockout can be reset by pressing the Reset Push Button on the Controller.
A momentary interruption of the Supply will also Reset the Controller.

SAFETY / CONTROL INTERLOCK

The Safety Control Loop is typically formed by connecting Pressure Switch and Temperature switch contacts. All contacts must be Potential Free NO contacts.
They are connected in series with the Supply Line as shown in the Schematic diagram.
If any contact in Safety Loop is OPEN, both Fuel Valve and Ignition are turned OFF.

This condition is indicated by Slow Flashing of the Safety LED.

When all the Safety Contacts close, the Sequence restarts automatically from Step 1.

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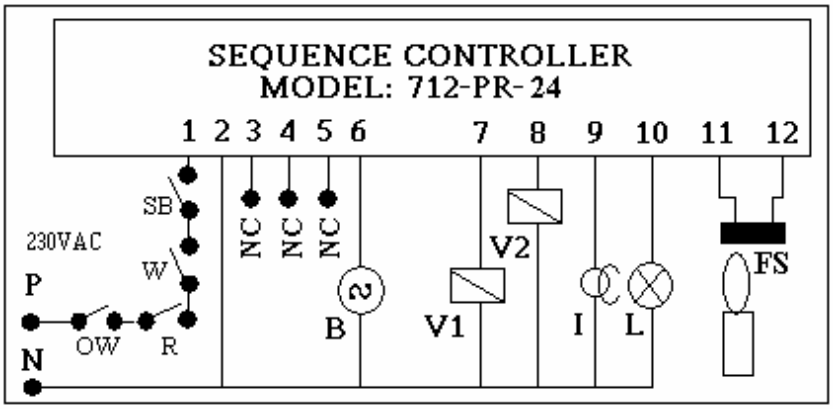
RETRIAL

If a Flame Failure occurs during Normal operating condition, then the Controller switches ON the Ignition again. Then the Retrial sequence is initiated from Step 2. **LOCKOUT** is initiated if the flame is not present after Retrial.

TYPICAL SCHEMATIC DIAGRAM



P – Phase **N** – Neutral

R – Pressurestat **W** – Limit Thermostat or Pressure Monitor
SB – Safety Limit Thermostat **OW** – Oil PreHeater Conatct (Optional)

B – Burner Motor / Blower **V1** – First Fuel Sol Valve
V2 – Second Fuel Sol Valve **I** - Ignition Transformer
L - Lockout / Alarm **FS** – LDR Flame Sensor

Note: The Output relay contacts are rated at 3 A. However, the total current from the Controller should not exceed 3 A. A blown Fuse indicates a fault in the panel or in the external wiring. Please check the external wiring before replacing the fuse.

ORDERING INFORMATION

The Standard Model is 712-PR-24-P14. It has a Pre-Purge time of 14 sec (as specified by P14). It also has False Flame check Enabled and Retrial Enabled.

The Customer can specify Purge times of 5, 10, 14 or 20 sec, while ordering.
The Customer can also specify the False Flame and Retrial options while ordering.

For Example:

712-PR-P5-Fn-Ry

specifies Purge time of 5 sec, No False Flame Check and Retrial (yes) Enabled.

The Customer specific models will incur extra charge. Please check the Price List.

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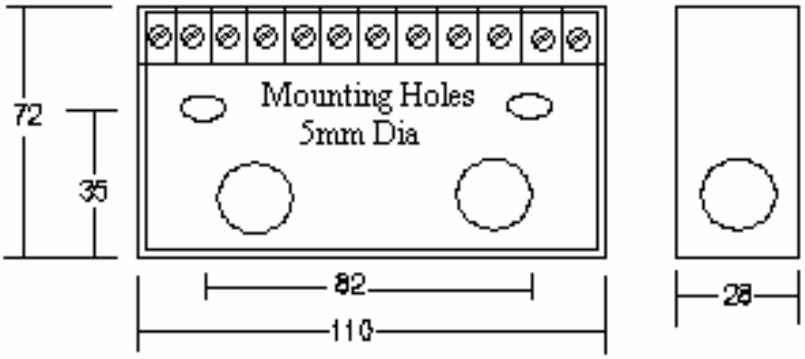
OVER ALL DIMENSIONS

75mm (L) x 110 mm (H) x 105 mm (D)

BASE PLATE & MOUNTING DETAILS



BASE
All Dimensions in mm

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BURNER CONTROLLER

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NOTE ON COMPATIBILITY WITH MODEL LOA-24

The Burner Controller Model 712-PR-24-P14 designed to be fully compatible with LOA-24.171B27. However, Model 712-PR-24-P14 has following additional features.

1. Six LED indications to display the progress of the sequence
2. Fast Flashing of Flame LED for LOCKOUT due to False Flame
3. Slow Flashing of Flame LED for LOCKOUT due to Flame Failure.
4. State of the art and Reliable Microprocessor based design

Minimal changes of field wiring is required. To emhasise the same, the following comparative terminal configuration has been provided.

712-PR-24-P14 Term No	Connection Ref	LOA-24 Term No
1	Phase	1
2	Neutral	2
3	NC	
4	NC	
5	NC	
6	Burner Motor	3
7	First Fuel Sol Valve	4
8	Second Fuel Sol Valve	5
9	Ignition	6
10	Lockout / Alarm	10
11	LDR Flame Sensor	11
12	LDR Flame Sensor	12

The above table shows that, the field wiring of LOA-24 needed to be shifted from terminal 3,4,5 & 6 to Terminals 6,7,8 & 9 respectively. *Since the order of the wiring is the same, it will be quite simple to replace the Controller.* The other terminal numbers are the same. Terminal number 7,8 & 9 of LOA-24 can be ignored.

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BURNER CONTROLLER

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NOTE ON COMPATIBILITY WITH MODEL 137

The Burner Controller Model 712-PR-24-P14 designed to be functionally compatible with Linear Systems Burner Controller Model 137. However, Model 712-PR-24-P14 has following additional features.

1. Six LED indications to display the progress of the sequence
2. Fast Flashing of Flame LED for LOCKOUT due to False Flame
3. Slow Flashing of Flame LED for LOCKOUT due to Flame Failure.
4. State of the art and Reliable Microprocessor based design
5. Plug-in Module for easy replacement.

It is important to note that, there is no terminal compatibility between Model 137 and Model 71-PR-24-P14. Hence, it will require an experienced panel wiring personnel to replace the Controller. Please note that, LDR Flame Sensor is connected between terminals 11 and 12 of the new model.

The following Schematic diagram of Model 137 Controller has been provided, to facilitate change over to the new model.

TERMINAL DIAGRAM: