

Introduction

For 1-stage oil burners with post-purge intermittent operation

Flame detection:

- Photo resistor Brahma FT11

The EOGB24.01 liquid fuel burner safety control boxes are suitable for liquid fuel burners with post purge.

The microprocessor-based programming sequence ensures extremely stable timings independent of voltage variations, ambient temperature and/or switch-on cycles. The built-in information system not only provides a continuous monitoring of the actual state of the box (very helpful especially for monitoring the start-up phase) but also informs about the cause of a possible lock out. The lock out cause is stored in such a way that it can be retrieved even after a power failure.

The control box is designed for maximum safety in case of fluctuations in the voltage supply. If the mains voltage drops below the permitted level, operation is interrupted and the control box automatically prevents the start sequence from being repeated. In this way, the safety of the system is not put at risk by a drop in the mains voltage. This low-voltage protection works not only during start-up but also permanently during operation.

Constructional Features

The control box circuitry is protected by a flame resistant, transparent plug-in type plastic housing. A central fixing screw locks the control box to the wiring base. The plug-in control box incorporates the microprocessor based timer, flame check and reset circuits. Manual reset from lock out and set to lock out is provided by a push button with an integrated seven seg information system. The EOGB24.01 is compatible with the Honeywell S98 wiring base which is equipped with spare and extra terminals and allows, together with a variety of cable entry points, utmost flexibility of electrical wiring.



Technical Data

Operating voltage	24 VDC (-15... +20%)
Fuse rating	10 A fast, 6 A slow
Power consumption	ca. 2.5 W
Max. load per output	
-Term. 3 ignition transformer	3.0 A
-Term. 4 motor	1.0 A
-Term. 5 + 6 solenoid valves	1,0 A
-Term. 7 alarm indicator	1,0 A
Total load	5.0 A
	Max. 16 A during 0,5 sec

Reset time from lock out 60 seconds

Re-cycling after loss of flame during operation

Flame detectors		
Brahma FT11	Side-on and end-on viewing	
Light sensitivity	300-750 nm	
Weight incl. Wiring base	190 g	
Mounting position		Any
Protection class	IP 40	
Approved ambient parameter for control and flame detector	Max.95% bei 30° C	
- for operation	-20° C... +60° C	
- for storage	-20° C... +80° C	
Build-up of ice, penetration of water and condensing water are	Inadmissible	

Table of Timings (sec.)

Model	Pre-purge and pre-ignition time tv1	Stray light monitoring tf	Safety time ts	Post-ignition time after V1 tn	Delay time to V2 tv2	Post-purge time tnb
EOGB24.01	15	5	7	9	22	20

Application Features

1 Information System

The information system is microprocessor based and reports on all aspects of burner control box operation and flame supervision. It informs continuously about the actual programming sequence the unit is performing. Besides monitoring the programming sequence, it also identifies errors during start-up of operation without any additional testing devices. The automatically performed diagnoses is a valuable tool which facilitates service/maintenance work and therefore saves costs. The analysis of the error cause can be done directly on stage or if not possible afterwards as the lock out reason is stored in a non-volatile lock out mode memory

The information system communicates with the outside world using a seven seg display. The messages are optically transmitted by numbered codes. Using an (optional) additional terminal, the messages can be recorded and displayed in easy readable form.

1.2 Programming Sequence Display

The built-in microprocessor controls not only the programming sequence but the information system as well. The individual phases of the programming sequence are displayed as Number Code.

Message	Number Code
Power Up	01
Ready To Start	02
Pre-purge	03
Stray Light Monitoring	04
Ignition	05
Wait Post Ignition Time	06
Burner Running	07
Post Purge	08

1.3 Lock-Out / Ready to Reset Codes

Lock-Out Codes		
Message	Number Code	Possible Fault/Solution
Low Supply Voltage	10	- Check supply voltage
Manual Lock Out	11	- Hold for 3 seconds
Flame Off Test	12	- Photocell sensing light on post purge
Stray Light Test	13	- Photocell sensing light on start up
No Flame	14	- Check air - Photocell not reading light - Fuel solenoid not energising - Transformer not receiving voltage

Ready To Reset Codes	
Message	Number Code
Low Supply Voltage	20
Manual Lock Out	21
Flame Off Test	22
Stray Light Test	23
No Flame	24

2 Flame Control

The following detector can be used for flame supervision:
– Brahma FT11 photocell.

2.1 Stray Light Monitoring

The stray light check is performed at the end of the pre purge time for the duration as mentioned in the table of timings.

2.2 Post-purge/flame-off-test

The post-purge takes place if the control thermostat opens. During the post-purge the flame will be checked. If there is a flame signal the controller goes to the lockout position.

- Please note: If a lock out occurs during operation no post purge will be carried out.

3 Lock out and reset

The unit can be reset or brought into lock out mode in two different ways:

Internal

In the lock out case the unit can be reset by pushing the built in button meaning a new start-up cycle is performed.

External

Instead of using the built-in lock out button the same function can be achieved by using an external button which connects terminal 9 with A (see also circuit and block diagram).

If the push button (internal or external) is pressed during normal operation or during the start sequence for more than 3 sec. and afterwards released, the control box will perform a shutdown.

- Please note: The unit can only be brought to lockout mode or be reset if power is applied to the unit.

4 Low-Voltage Protection

The supply voltage has to be more than 19,5 V in order to allow the unit to perform a start-up. The supply voltage is not only monitored in the start-up phase but also permanently during operation. If the voltage drops below 16,5 V during start-up or run time the control box goes into lock out mode. If the voltage rises again, the control box automatically performs a start-up as soon as the supply voltage is above 19,5 V.

5 Mounting and electrical wiring

Wiring base:

- 3 earth terminals with additional terminal for burner earthing
- 3 neutral terminals with internal permanent connection to neutral terminal 8
- 2 independent spare terminals (S1 and S2)
- 2 slide-in plates and 2 easy knock out holes plus 2 knock out holes in the base bottom facilitate the base wiring

- Please note: To assist trouble-free operation the main neutral connection terminal in the wiring base must be fully tightened. The terminal screws are already in the undone position. To connect a wire to the terminal, the screw only needs to be fastened.

General: The control box and detector probes should not be subjected to excessive vibration.

Installation Instructions and Maintenance

1 Important notes

- The controls must be installed by qualified personnel only. The relevant national regulations have to be observed.
- On commissioning, the wiring has to be carefully checked according the appropriate diagram, incorrect wiring can damage the unit and endanger the safety of the installation.
- The fuse rating has to ensure that the limits specified in TECHNICAL DATA will not be exceeded. If these precautions are not observed, the effect of a short circuit can cause severe damage to the control and installation.
- For safety reasons a minimum of one control shutdown every 24 hours has to be observed.
- Disconnect the power supply before the control box is plugged in or out.
- The control box is a safety device and must not be opened!

2 Function control

For safety reasons the flame detection system should be tested on commissioning the installation as well as after a service or longer shut-down.

a) Start-up with covered flame detector

- After lock out safety time is over the unit has to go into lock out mode.

b) Start-up with exposed flame detector

- After 10 sec pre purge time the unit has to go into lock out mode.

c) Normal start-up with burner in the normal position, cover up the flame detector

- After start-up, and end of lock out safety time the unit has to go into lock out mode.

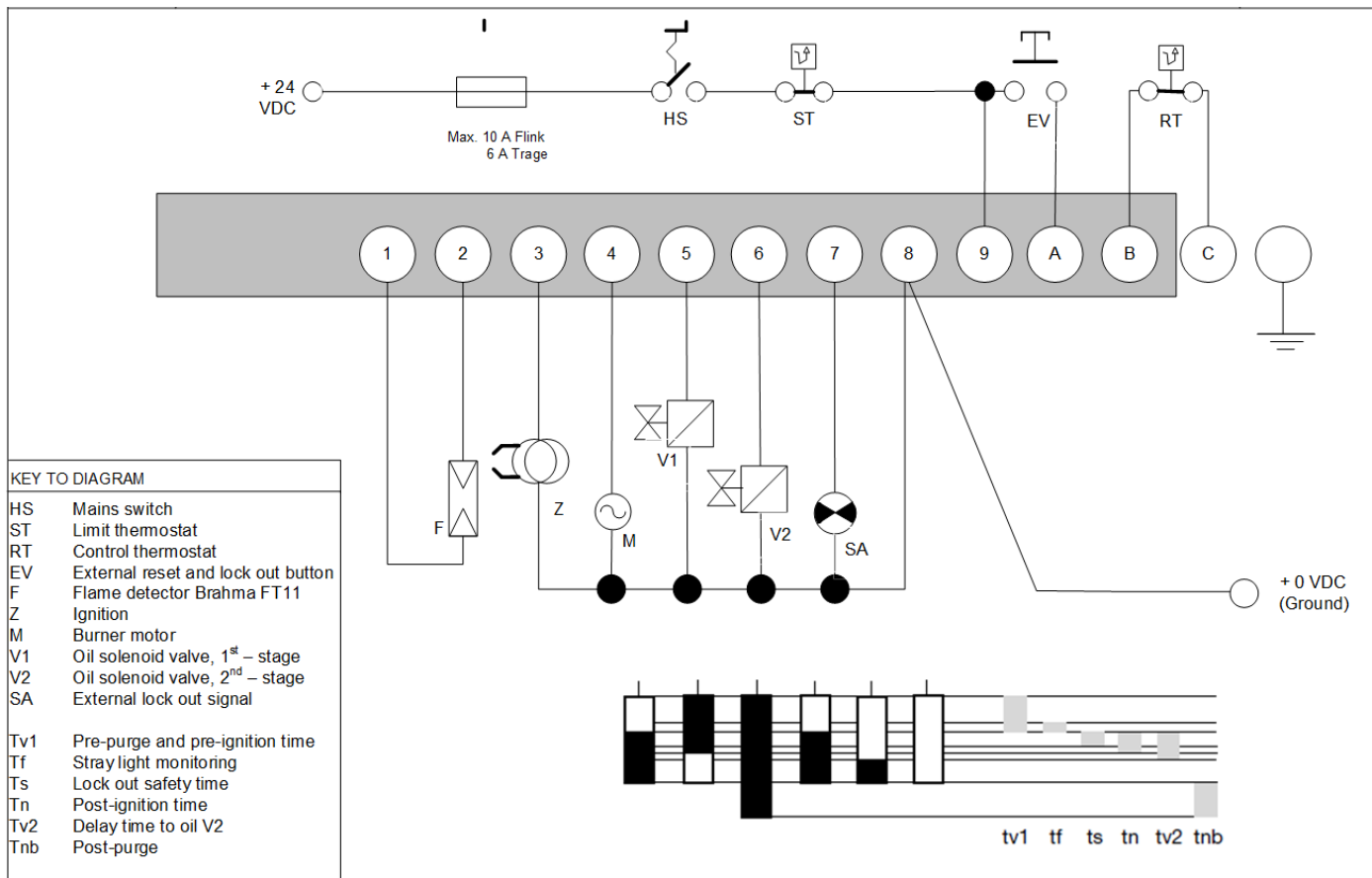
3 Fault finding

The built-in information system facilitates the trouble shooting in the case of problems occurring during start-up or during operation. A list of possible lock out messages can be found in "Application features"

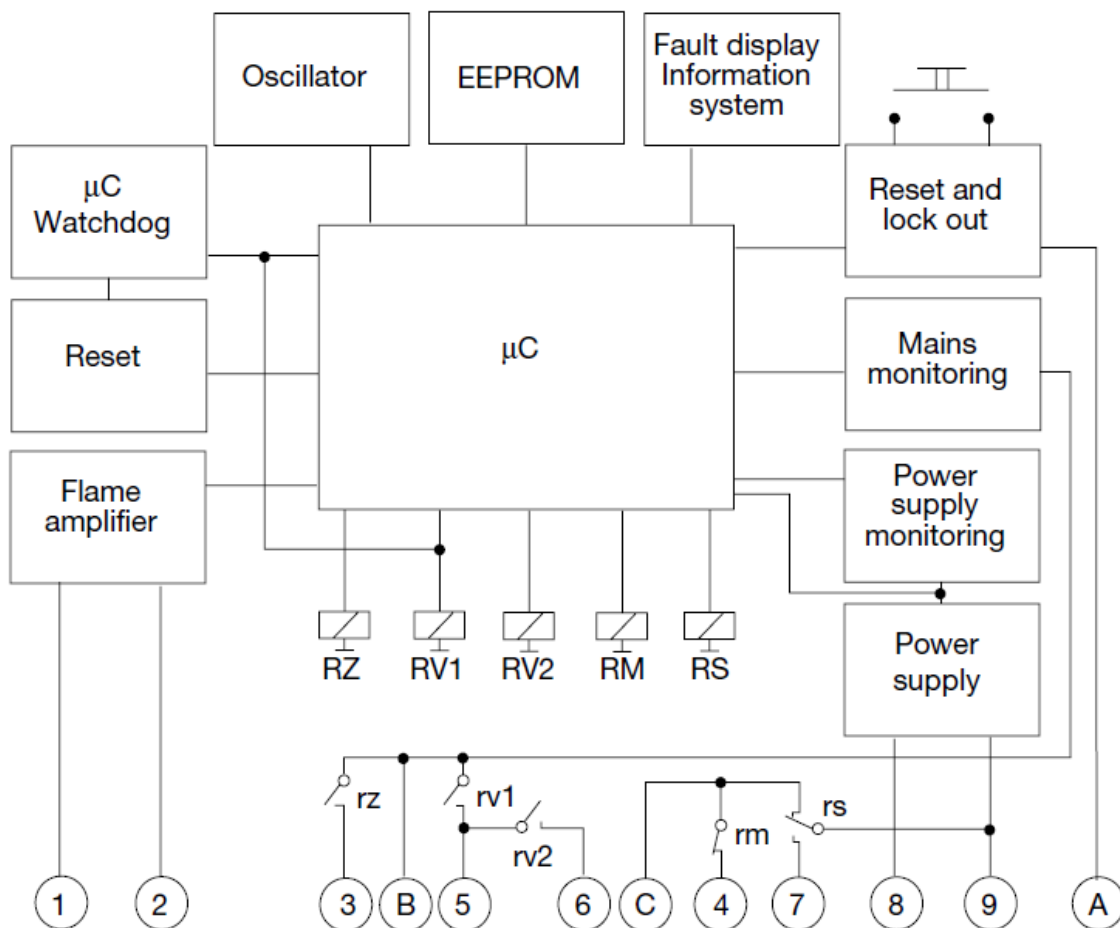
Please note: The control box is locked in lock out mode and the reason for the lock out is displayed until the control box is reset, either by an internal or external reset see also subject "3. Lock out and reset".

Error	Possible Fault
Burner not working	<ul style="list-style-type: none"> - Thermostat circuit open - Faulty electrical wiring - PCB fuse defective - Power supply < 19.5 VDC - Terminal A continuously on power (e.g. terminal A is used as a support terminal)
Burner starts, flame not established, lock out	<ul style="list-style-type: none"> - Stray light on flame detector - No ignition or no fuel
Burner starts, flame established, after safety time, lock out	<ul style="list-style-type: none"> - Dirty or faulty flame detector - Insufficient light on detector
Lock-out after post-purge	<ul style="list-style-type: none"> - Flame signal during post-purge (leaking valve or defective flame detector)

Circuit and Timing Diagram E80-EOGB24.01



Block Diagram E80-EOGB24.01



Photoresistor "Brahma FT11"

