Sugg Lighting

Flambeaux

Technical Information

The Sugg name has been associated with gas and lighting since 1802, becoming one of the foremost manufacturers of gas equipment and particularly lighting, during the Victorian era. For the coronation of 1911 William Sugg & Go Ltd manufactured 'gas illumination devices', which included Flambeaux, to decorate major public buildings. The re-introduction of Flambeaux had to wait until nearly the end of the 20th century with an entirely new appliance manufactured to modern day requirements with full remote control and capable of running on modern gases. These innovative products offer a unique feature light that has all the safety controls required for today's regulations. but the aesthetic results are a natural living flame that catches the eye. These fittings can be pole or wall mounted and even situated within ponds and ornamental water features.

Gas Considerations

The Sugg Flambeaux is available in 5 different burner sizes to provide a selection of flame heights and spreads. They are designed for use with either natural gas or propane with a factory set gas rate. The larger capacity versions are for special high performance applications. Please contact Sugg Lighting for details.

Gas supply pressure:

The minimum supply pressures for the standard gases used with the flambeaux appliances are as follows:
Natural gas: 8" wg. 19 mbar. Propane gas 14.8" wg. 37 mbar.

Pipe size:

The pipe sizing should be carried out in accordance with standard calculation procedures using the gas rates extracted from the burner chart and any additional appliances on the same supply should also be considered. Whilst the gas supply may not be as critical as for more standard appliances, the performance, including its ability to withstand poor weather conditions, will be affected by an insufficient supply. Each burner is provided with a pressure test point to enable an operating pressure and standing pressures, check to be made on installation. All pipework must be checked for gas soundness.

PLEASE NOTE

THE FLAMBEAUX HAS BEEN DESIGNED TO BURN WITH A COLOURFUL FLAME AND AS A RESULT WILL PRODUCE SOME LEVEL OF SOOT. IT HAS BEEN NOTED THAT THERE IS A HIGHER LEVEL OF SOOT BUILD UP WITH THE USE OF LPG'S SUCH AS PROPANE., WHICH CAN CAUSE SOME DISCOLOURATION TO THE SURROUNDING AREA.

Application Considerations

Location

When considering the location of the flambeaux the following must be considered:
1. Avoid any building or feature with over hangs. **2.** Avoid any location that is over looked by an open window within 2m of the burner. **3.** Avoid locations that require specialist equipment for maintenance access, such as high on a building or close to the roadway. **4.** Keep all drainage holes free. **5.** Keep away from any flammable materials. **6.** Keep out of reach of the general public. **7.** Do not install directly below opening windows, if in any doubt we recommend that a carbon monoxide detector is mounted within the room.

Chart to show the recommended distance from centre of burner to the wall or eaves.

Distance from Wall	Bruner Size	Distance from Wall
Small	20	750mm
Small/Medium	30	1M
Medium	50	1M
Medium	100	Free Standing - 1M
Medium	200	Free standing - 1M

DISCLAIMER: PLEASE READ CAREFULLY

Sugg Lighting specifically takes no responsibility for damage caused by Flambeaux products incorrectly or carelessly installed or used. It is the responsibility of the purchaser to establish that all possible safety precautions have been taken and to obtain, where necessary, both planning and fire department approval and to advise the relevant insurers. Any modification to the burner or controls will automatically negate any product guarantee. Any advice provided by Sugg Lighting is as a result of best practice and experience but cannot be taken as a guarantee for the correct or safe operation of the product due to the nature of the living flame.

Installation and Use

To the installer:

Safety

The Flambeaux appliances are designed for EXTERNAL USE ONLY.
The Flambeaux is an approved gas appliance and must therefore be installed in accordance with the 'Rules in Force" and manufacturer's instructions by a competent person to the current edition of the Gas Safety Regs and the IEE Wiring Regs.
The Flambeaux is supplied with a set of installation instructions which should be followed closely. Each Flambeaux must have its own Unibox controller and solenoid.

Power Requirements:

Each Flambeaux should be powered by an individually switched 5 amp power supply, this can be manually switched, timed or photocell controlled. Power off is important to reset electronics in the event of flame outage, individual switching for multiple installations is important for maintenance purposes.

Gas Requirements:

Each Flambeaux should be fitted to its own gas supply with a pipe size rated to suit the burner capacity, and at the pressure required for the burner rating.

Ducting:

It is important to recognise that the pre-wired looms have a socket that has to reach the burner head, and if ducting is being used please ensure the duct has sufficient diameter to pass the socket and the 20mm diameter flambeaux control cable to the unit.

To the user:

After installation the flambeaux can be controlled by simply manually switching the Unibox on and off – either at the mains, via a time clock, photocell controller or a combination of both. We recommend individual switches for each unit for resetting in the event of flame failure.

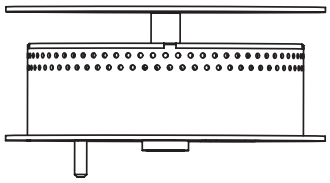
Environmental

The flambeaux has been designed to operate over a wide range of weather conditions.There are, however, extreme conditions where the burner will not work and this should be taken into account in the event of an apparent failure. With a time clock the flambeaux will reset on next switch cycle. It is important to ensure that the flame is not positioned under any building overhangs or planting. Also, as the flame is designed to have plenty of colour, a byproduct will be some sooting, this is more evident with LPG and should be a consideration on light coloured stone building facia's. If this product is fitted within 2m of an opening window we would recommend a carbon monoxide detector is fitted to give peace of mind and in the interest of health and safety.

Wind

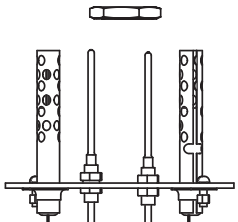
Wind will reduce the performance of the flame.

Layout of Double Device Burner



1 **1** Brurner Can 50 double device P. No. 502049
1a Burner Can 20 double device P. No. 502045

IMPORTANT NOTE:
When ordering spares all information from the data plate should be recorded, as this identifies gas and burner type along with capacity.



2 **2** Mid mounting nut, med 50 M 20 P. No. 800627
Mid mounting 9/16 x 26 nut Sm 20 P. No 832013

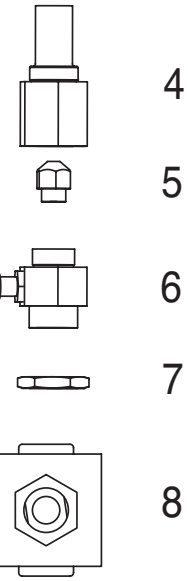
3 **3** Mid 50 Mid mounting plate 2xHSI + 2x TC with plug P. No 832106
Small 20 Mid mounting plate 1xHSI + 2x TC with plug P. No. 832136

4 Aeration chamber assembly c/w gauze
Natural Gas 20>30,000btu, sm 20 burner P .No. 502053
Natural Gas 30>200,000 btu, med 30 burner P. No. 502047
Propane Gas 20>30,000 btu, sm 20 burner P. No. 502053
Propane Gas 30>200,000 btu, med 30 burner P. No. 502047

5 Injection Chambers
Natural Gas 20>30,000 btu, sm 20 burner P .No. 502028
Natural Gas 30>200,000 btu, med 30 burner P. No. 502046
Propane Gas 20>30,000 btu, sm 20 burner P. No. 502028
Propane Gas 30>200,000 btu, med 30 burner P. No. 502046

6 Gas pressure test point and injector holder med P. No. 832014, sm P. No. 500050

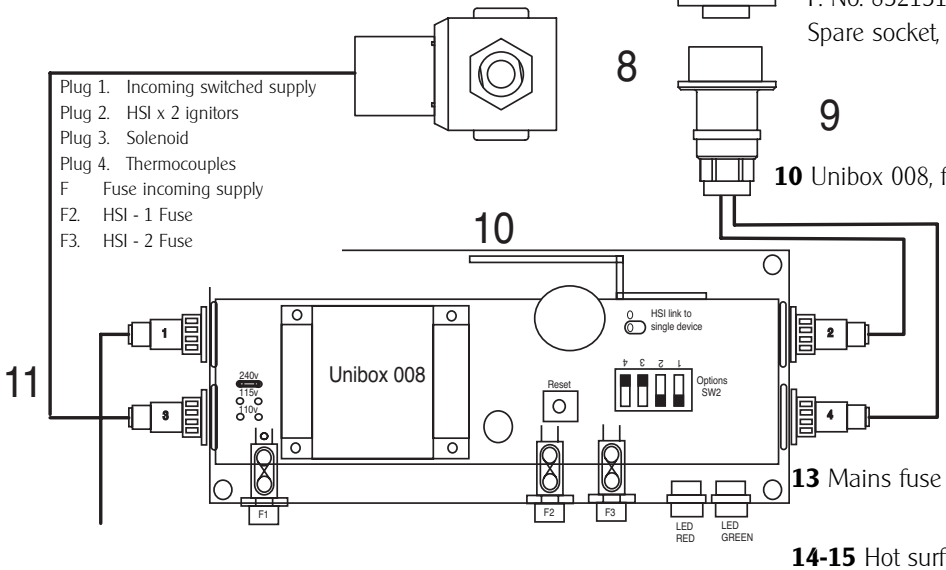
7 Jet assembly locking nut M20 P. No. 800627



8 Solenoids 20>50,000 low voltage 12v, 10mm pipes P. No. 509029
Solenoids 75>100,000 btu, Mains 12v, 15mm pipes P. No. 509030
Solenoids 200,000 btu, Mains 230-240v, 28mm pipes P. No. 509007

9 7 Pin socket and pre-wired loom
10M loom with plugs for sockets 2 & 4 P. No. 832129
5M loom with plugs for sockets 2& 4 P. No. 832128
3M loom with plugs for socket 2 & 4 P. No. 832127
1.5M loom with plugs for sockets 2 & 4 P. No. 832131
Spare socket, 7 pin, P. No. 402032

10 Unibox 008, for required voltage, P. No. 511002



11 Solenoid cable & plug for socket 3, P. No. 832135

12 240v supply cable plug for socket 1 P. No. 832133

13 Mains fuse 230>240v 0.5 Amp P. No. 409007

14-15 Hot surface igniter fuse, 3.15 Amp 250v P. No. 409008

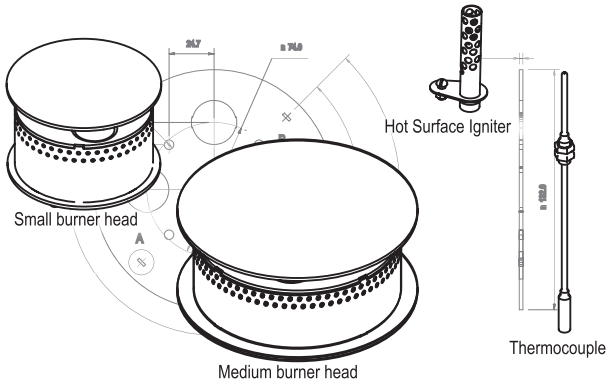
Description of Operation

General

The Flambeaux consists of the appliance bracket, the burner head, 2 thermocouples, a hot surface igniter (1 or 2 depending on the model), a solenoid valve in three sizes, depending on gas consumption, and the electronic Unibox. The burner heads are available in 2 sizes to accommodate the different gas rates and produce varied flame sizes. Different jets are fitted to regulate the gas.

These appliances must be installed in accordance with the "rules in force" and the manufacturers installation instructions by a competent person. In the UK the installation must be in accordance with the current edition of both the gas safety (installation and use) regulations and the IEE wiring regulation.

A5 amp switched power supply is required for each flambeaux.



Operation - General and Unibox 008

When power is turned ON to the control box it provides a test pulse to the solenoid if the solenoid is functioning it then proceeds to supply 12V DC to the hot surface igniters in turn. Following a fixed heating up time, the gas solenoid then opens. After a further 10 seconds (15 seconds for the first cycle) gas ignition will have taken place, (please see fault finding flow chart if ignition does not occur). The thermocouple is monitored to check that ignition has taken place. If the thermocouple has reached a pre-set feedback voltage the device will lock on. If the thermocouple has not reached a pre-set voltage, the unit will stop and re-start the ignition sequence which will be repeated a further 7 times, (i.e. 8 times in total) after which the control box will go to 'lock out' showing a permanent red LED on the control box. **(The system can be reset by switching the mains voltage OFF for 10/15 seconds to allow the capacitor to discharge before switching ON again).**

Should the burner be extinguished during normal operation due to extreme weather or wind, the thermocouple will cool and the electronics will shut the gas valve prior to recycling the ignition sequence to re-establish the flame. If the flame does not re establish then it will go to lock out as above.

Operation - Unibox 008

Green LED on = power on

Red LED slow flash = HSI heat up sequence

Red LED fast flash = solenoid open

Red LED off = lock on flame lit

Permanent red LED = fault

In fault condition check fault finding chart on page 14

Burner Chart

Burner Name	Small 20	Small 30	Med. 30	Med. Dble. 50	Med. Dble. 100	Med. Dble. 200
Burner Dia.mm	75	75	115	115	115	115
Input Btu/h	20,000	30,000	30,000	50,000	100,000	200,000
Input kW	5.9	8.8	8.8	14.6	29.3	58.6

Natural Gas

Injector Size	No.51 1.85mm	No.44 2.18mm	No.44 2.18mm	No.33 2.87mm	No.22 3.99mm	No.2 5.61mm
Aeration	1x3mm	1x3.175mm	1x3.175mm	1x6.35mm	2x6.35mm	2x6.35mm
Gas Rate f^3/h	19.7	29.5	29.5	49.2	98.4	196.85
Gas Rate m^3/h	0.56	0.81	0.81	1.39	2.79	5.57
Bnr.Press mbar	18.5+/-1	18.5+/-1	18.5+/-1	16+/-1	16+/-1	13+/-1

Propane

Injector Size	No.56 1.18mm	No.53 1.51mm	No.53 1.51mm	No.48 1.98mm	No.36 2.87mm	No.22 3.99mm
Aeration	2 x 5mm	2 x 6.35	2 x 6.35	2 x 6.35	4 x 6.35	4 x 6.35
Gas Rate f^3/h	8	12	12	20	40	80
Gas Rate m^3/h	0.23	0.34	0.34	0.57	1.13	2.26
Wt of LPG lbs/h	0.94	1.4	1.4	2.33	4.71	9.42
Wt of LPG kgs/h	0.43	0.64	0.64	1.07	2.14	4.27
Bnr. Press mbar	36+/-1	36+/-1	36+/-1	36+/-1	30+/-1	30+/-1

Approx. flame height – mm	300	425	425	600	750	1200

The British Thermal Unit (Btu) is defined as the heat required to raise 1lb of water by 1 degree Fahrenheit

1 BTU = 1.055KJ

1 KWh = 3600KJ

Unibox Controls

The Unibox controls and monitors the Flambeaux to ensure the flame remains ignited. In the event of the flame being blown out the Unibox will automatically shut off the gas supply.

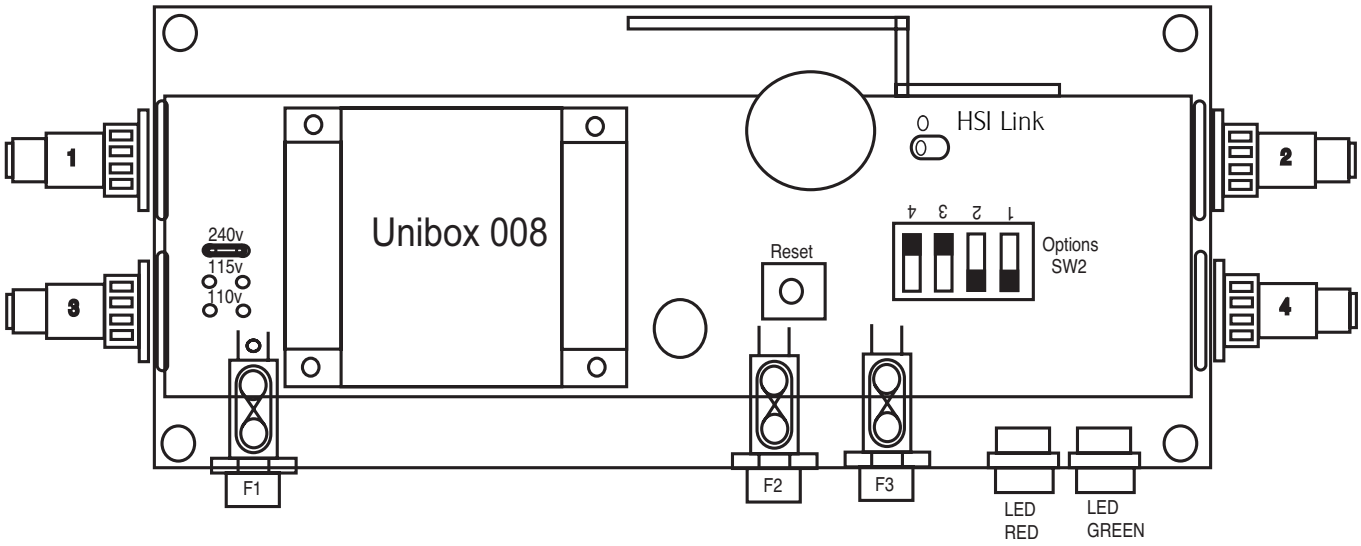
The 110v – 240v transformer is designed for 240 volt 50 AC input and is designed to give a minimum voltage of 11.5 volts DC under full load. The maximum voltage under no load is 15 volts DC. Refer to Sugg Lighting for alternative input voltages.

The transformer is designed for 230 VA output and is intended to operate the two hot surface ignitors and the standard 12 volt solenoid.

The Unibox 008 is cast aluminium and the plugs and sockets are external, as are the LED's and fuses.

Operation – Unibox 008

Green LED on = power on
Red LED slow flash = HSI heat up sequence
Red LED fast flash = solenoid open
Red LED off = lock on flame lit
Permanent red LED = fault



Plug 1. Incoming switched supply
Plug 2 HSI x 2 ignitions
Plug 3 Solenoid
Plug 4 Thermocouples

F1 Fuse incoming supply
F2 HSI - 1 fuse
F3 HSI - 2 fuse

Operation - General and Unibox 008

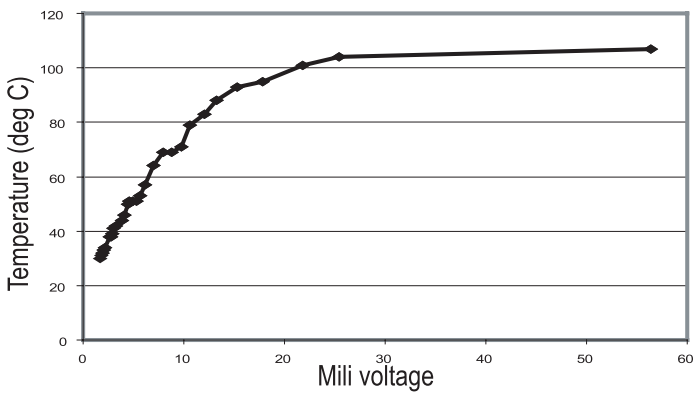
When power is turned ON to the control box it provides a test pulse to the solenoid if the solenoid is functioning it then proceeds to supply 12V DC to the hot surface igniters in turn. Following a fixed heating up time, the gas solenoid then opens. After a further 10 seconds (15 seconds for the first cycle) gas ignition will have taken place, (please see fault finding flow chart if ignition does not occur). The thermocouple is monitored to check that ignition has taken place. If the thermocouple has reached a pre-set feedback voltage the device will lock on. If the thermocouple has not reached a pre-set voltage, the unit will stop and re-start the ignition sequence which will be repeated a further 7 times, (i.e. 8 times in total) after which the control box will go to 'lock out' showing a permanent red LED on the control box.

(The system can be reset by switching the mains voltage OFF for 10/15 seconds to allow the capacitor to discharge before switching ON again).

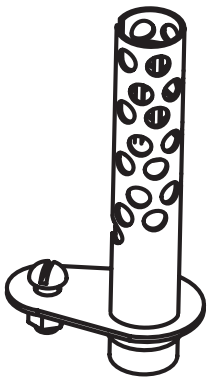
Thermocouple

The operation of the flambeaux is monitored by the thermocouple, the output of which is directly related to the temperature of the flame at its tip.
The normal running temperature of a single T/C will produce a voltage in excess of 6mV.

The millivoltage may be measured across the TC+/TC- terminals of the control box without disconnecting them, on the 007 Unibox. The use of 2 thermocouples provides security for windy conditions. The graph shows the relationship between the Temperature rise and the mV. Pegged burner cans have a small vent to ensure a gas flame plays on the TC tip, with older cans ensure the TC is centralised
within the burner aperture when re-fitting.



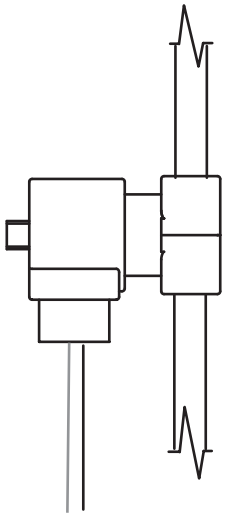
Hot Surface Igniter



Ignition of natural gas requires a temperature of approximately 1200 degrees centigrade.
The hot surface igniter will produce an average temperature of 1450 degrees centigrade at 12 volts DC, -15% +10%. The hot surface igniter draws a variable current between 1.6 and 2.4 amps at 12 volts. The ignition cycle lights individual HSI's in turn through the 8 cycles. If neither light check glass fuses, if fused check for a short circuit within the wiring.

Solenoid

For models up to 14.65kW (50 000 Btu/h) a standard weatherproof IP rated version is provided capable of being fitted in exterior locations.



Standard weatherproof model: type ERA single solenoid gas valve, 1/4" BSP 12v DC normally closed. US spec NEMA IV watertight 24"/600 mm sealed lead connection.

A high capacity solenoid is provided for natural gas applications above 29.3kW (100,000 btu/h).

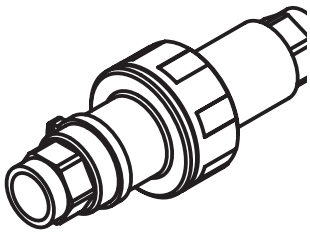
Only the correct replacement Sugg components must be fitted. These can be obtained Sugg Lighting Ltd.

Important Note

The solenoid should be located in a vented space to avoid the possibility of a gas build up in the event of a gas leak.

Plug and Socket

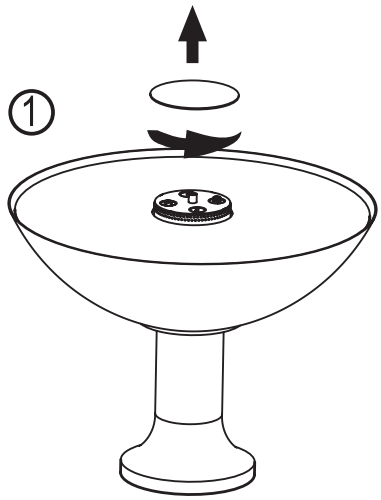
The plug and socket has been chosen for its high weather resistance and ease of use. **It is not heat resistant** and must be located away from any heat source. This should be carefully positioned during commissioning.



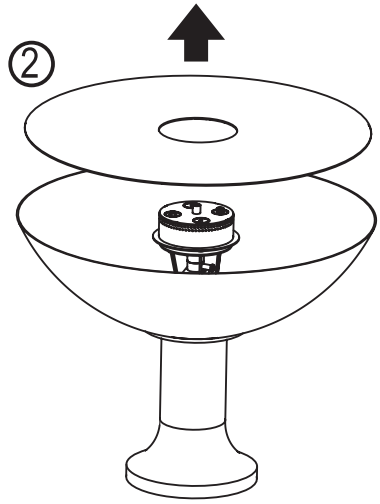
When performing maintenance tasks that require the plug and socket to be removed, please ensure that it is secured tightly back into its original place and that all connections are correctly made with any loose strands trimmed to prevent a short circuit.
Spare sockets are available upon request from Sugg Lighting, as well as pre-wired looms with plugs rewired and sealed against water ingress. Cable lengths must be specified when ordering. Connection methods have to be reused with older units and conversion looms are available upon request.

Instructions For Burner Removal

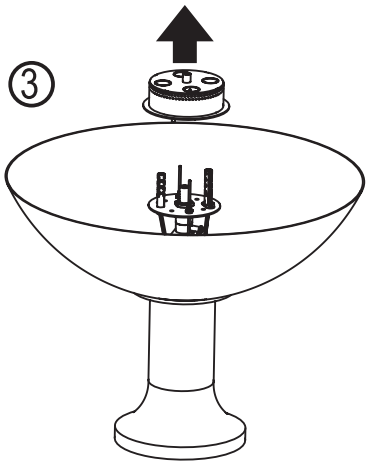
To replace an HSI or thermocouple follow the description below.
First disconnect the mains supply and isolate the gas.
This example uses a Sunderland 550 with a double device burner head.



Unscrew the deflector plate and remove.

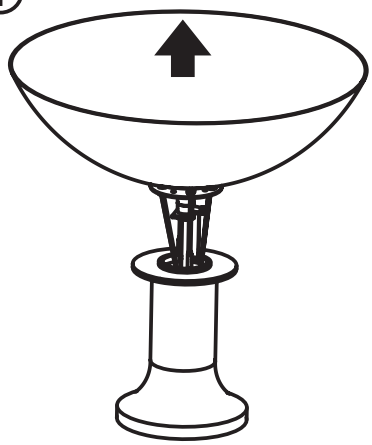


Lift off the anti-roll over plate, if required. remove any screws that may be holding the anti-rollover plate in place, on the larger units.



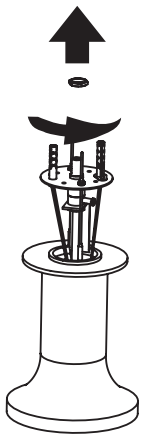
Remove the burner cleaning off any soot that may be present. Be careful not to knock or damage the Hot Surface Igniters. Note the burner can is pegged on later models, if a replacement is required check if the can is pegged or not. When refitting non pegged cans ensure the TC's and HSI's are positioned in the centre of their respective apertures.

④



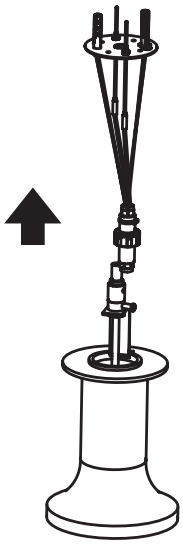
Most burners will allow you to remove the bowl. Remove all screws attached to the bowl then lift off. This will provide easy access to the components.

⑤



Unscrew and remove the central nut holding the mid mounting plate. This will release the plate with all the HSI & T/C's still connected.

⑥



Pull the mid mounting plate up to reveal the plug and socket, unscrew and then re-attach the new complete mid mounting plate and re-connect into the plug, (on earlier models a ceramic terminal block is located in a cast aluminium box). Replacement plug and sockets can be ordered, for future use where applicable. Be sure no loose strands are left to short circuit. The socket will need re-sealing if replaceing the loom end of the cables.

To reassemble follow these instructions in reverse.

Important Please Note

When reassembling, ensure that the plug and socket is placed away from the burner stand in the bowl (or other container) and away from the burner head and excessive heat, drop down into the tube for best results. Also ensure that all screws are screwed back into place ESPECIALLY the anti rollover plate.

If you have any problems with any of the above please contact:

Sugg Technical on +44 (0) 01293 540111

Fault Finding and Maintenance

All our products are tested rigorously to the highest standards prior to being released. But due to the rather extreme nature of the product with rapid temperature fluctuations it is inevitable that some maintenance will be required.

Annual skilled servicing is required to keep your flambeaux operating safely and efficiently throughout its long working life. Servicing should be carried out by a trained service engineer. We would recommend replacing the TC and HSI during annual service. It is suggested that an annual contract be arranged.

Fault finding

Assuming that the flambeaux has been installed and has been operating correctly when a fault occurs the following sequence should be followed to determine the cause.

Turn on the power supply. There are two likely conditions:

Either A: There is no sign of ignition whatsoever or

B: The burner lights for a few seconds then goes out and repeats this lighting/extinguishing phase before finally staying off.

Under condition 'A' either the power supply has failed, a fuse has blown, the ignition device has failed or the solenoid has failed.

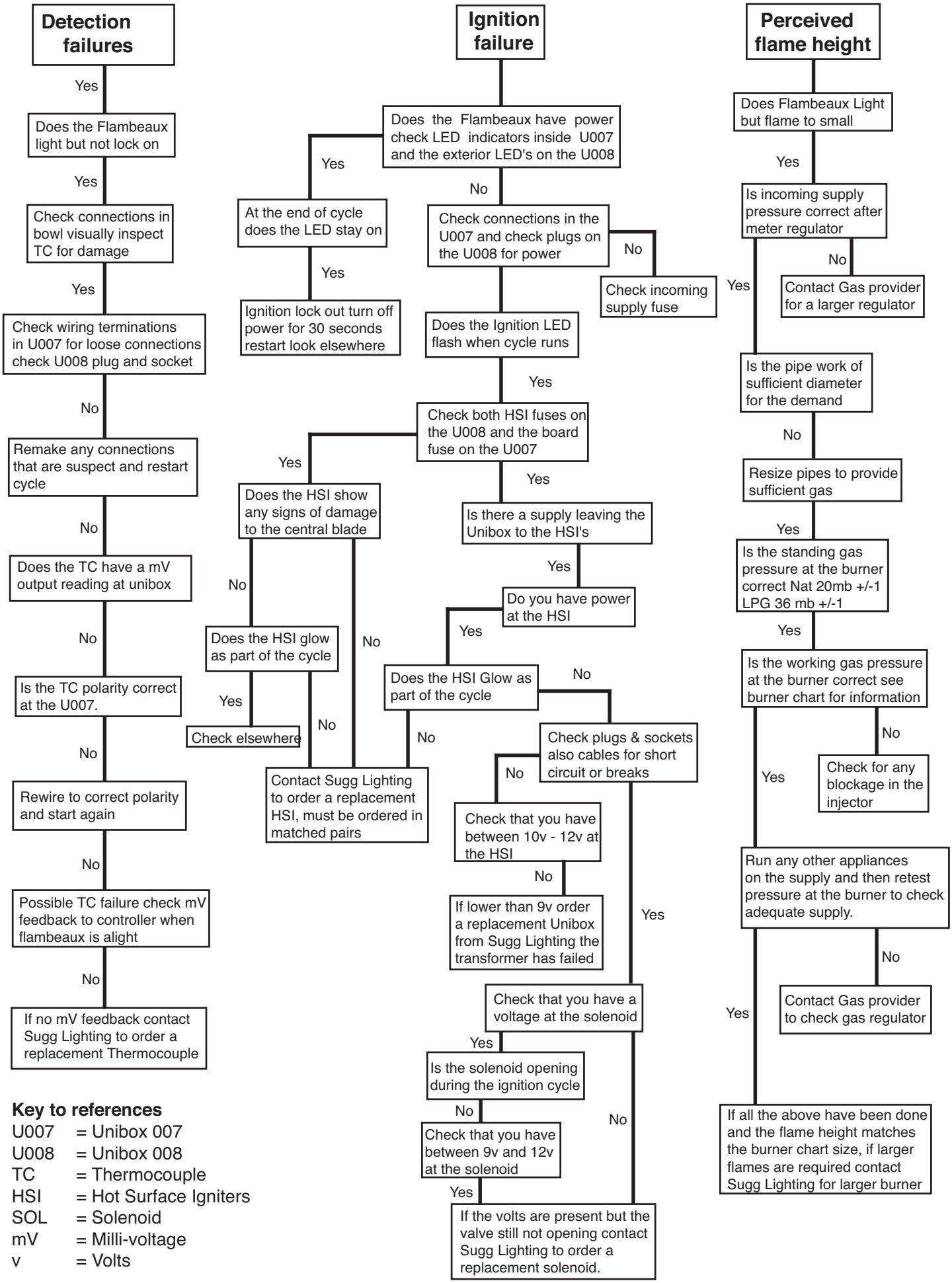
Under condition 'B' the thermocouple has failed and/or the milivoltage feedback is not getting to the control box.

In the occurrence of a fault with the flambeaux please use the Fault Finding chart overleaf to find the exact cause of the problem.

CE Approval

This product has been tested by Advantica. During EMC testing however it was observed that a fast transient burst of approx 1kV in the main supply can cause the control to recycle when it is in the lock out position. This is not considered a hazard as the effect is simply to energise the hot surface igniter which is within normal operating parameters.

Fault Finding Chart for Flambeaux Gas Burners



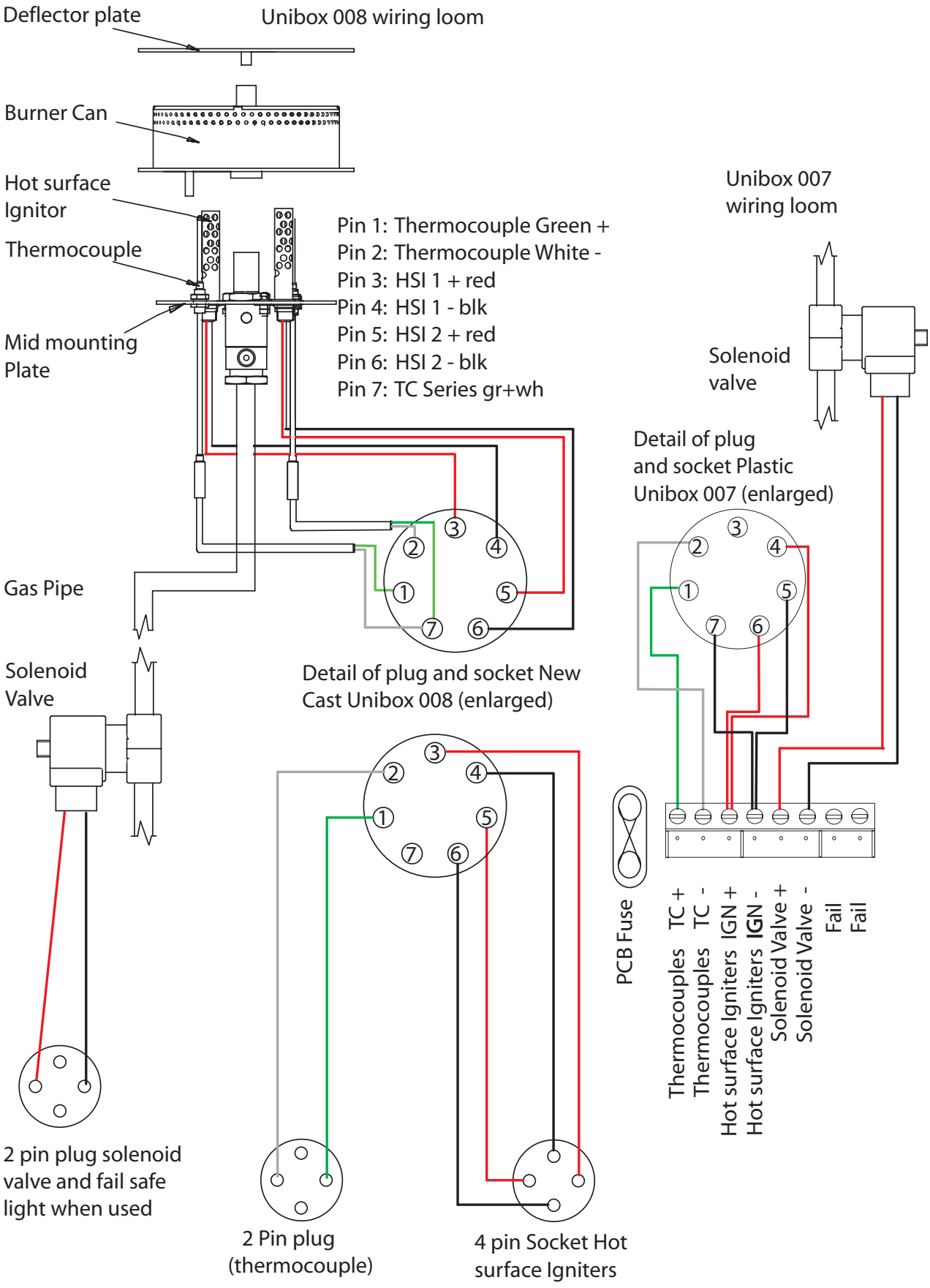
Key to references

U007	= Unibox 007
U008	= Unibox 008
TC	= Thermocouple
HSI	= Hot Surface Igniters
SOL	= Solenoid
mV	= Milli-voltage
v	= Volts

Important Note

Only Sugg parts should be used when maintaining these units as they are specially designed for the Flambeaux. Only qualified Corgi Engineers should be employed to work on Gas Alliances. If you are unsure of the electrical conditions we recomended that an electrician is employed to rectify any faults.

Schematic View of Double Device Burner



Flambeaux/Torchere – Open flame appliance for outside use.

One Unibox and one solenoid to be used for **each** flambeaux.
Power Supply: A 5 amp switched power supply is required for each flambeaux.
Electrical Supply: 230V – 50Hz. (Other voltages available on request).
Operating Voltage: 12 V DC
Moisture Protection: IP 65 rated.
Mounting: Control box to be mounted within 10 metres of the burner head (unless specified by Sugg Lighting) in a dry easily accessible location. DO NOT attempt to increase the cable length as it will negate any Sugg guarantee of the flambeaux igniting.
Fuse Rating: 500 MA fuse for mains supply and a 3 amp fuse for the Hot Surface Ignitor. (Both located within the unibox).
For heat output and gas rate please see page 7
In Great Britain (GB) and Ireland (IE) on natural gas at a supply pressure of 20 mbar, or propane at a supply pressure of 37 mbar.
Note: these appliances are available for the following gas catagories:

Natural gas, category I_{2H} (20)	Austria (AT), Denmark (DK), Finland (i), Greece (GR), Italy (IT), Norway (NO), Portugal (PT), Spain (ES), Sweden (SE), Switzerland (CH).
Natural gas, category I_{2E} (20)	Germany (DE), Luxembourg (LU).
Natural gas, category I_{2Er} (20/25)	France (FR).
Natural gas, category I_{2E+} (20/25)	Belgium (BE).
Propane gas, category I_{3P} (37)	France (FR), Belgium (BE), Spain (ES), Switzerland (CH), Portugal (PT).

This appliance has been assessed by an independent assessor and shown to meet the Essential Requirements of the European Gas Appliance Directive.

Sugg Lighting Limited

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