



## APPLICATION

A range of electronic semi and fully automatic full sequence flame safeguard controls for gas burners, both atmospheric and forced draught, using either flame rectification (ionisation) or ultra-violet flame detection. They are suitable for both domestic and commercial/industrial purposes and a product selection chart is provided for guidance at the foot of this page. For technical and safety reasons a regulation shutdown must occur every 24 hours (systems for non-permanent operation).

## DESCRIPTION

The semi-automatic control, BA1, utilises either ionisation or U.V. in 230V versions and ionisation only in 110V version. All other controls use ionisation for flame detection exclusively

The BA1 utilises a start and a stop button. When start button is pressed the control energises a relay which in turn simultaneously energises the pilot valve and external spark generator, if fitted. Once the pilot flame is established the flame relay is energised which stops the spark generator and illuminates the 'run' neon. The start button can now be released and the main valve will open. If, during the start cycle, a flame is detected or simulated the relay will be de-energised and will go into lock out condition and the alarm light illuminated.

To shut down the installation, press the stop button, which then de-energises the relays and safely shuts down the operation. Secondary controls such as thermostats etc. should be wired in series with the main gas valve.

Additional safety controls such as emergency cut out switches and thermal fuses should be wired in series with the mains supply to the control.

SM592 is a fully automatic control which, when power is supplied to it energises the Start Delay Timer and checks for a flame or flame simulation and if none is found proceeds at the delay end to simultaneously energise the pilot valve, igniter and Start Safety timer. The control checks for a flame during the safety time and if found resets the timer, de-energises the igniter and energises the main gas valve and continues to monitor the flame. If a flame or simulated flame is found during the start delay period the control passes immediately to a volatile lock out. If during the safety time period and subsequently no flame is detected then the control closes valves and goes to a volatile lock out. Pressing the reset button will recycle the

control once the fault is corrected.

The SE series of controls are fully automatic and upon power up self check all of their own components. During the waiting or pre-purge time the operation of the flame signal amplifier is checked. A spurious flame signal or a fault in the amplifier will cause the control to lock out. The SE-31F (with fan control) also checks the air pressure switch contacts to ensure a 'no air-flow' condition and only if the test is positive does it start the fan and begin its purge time.

At the end of the waiting or purge time the pilot valve and igniter are energised and the safety time begins. If a flame is detected during the safety time the igniter is de-energised and the main gas valve opened. Conversely, if no flame is detected then the control proceeds to volatile lockout and the pilot valve and igniter are de-energised. Flame failure during the safety time causes the igniter to be activated within 1 second.

On both SM592 and SE series controls the reset from safety shut down can only be accomplished by an interruption to the mains power supply and its subsequent restoration. This should be by a manually operated switch and must be made by a conscious action i.e. not automatically by a thermostat, time switch or similar. It is permissible to combine a reset switch together with a main appliance switch but in this case an alarm light should also be fitted to the appliance.

Secondary controls such as thermostats etc. may be fitted either in series with the main gas valve for retaining a pilot flame or in series with the power supply to the control for complete shut down.

Additional safety controls such as emergency cut out switches and thermal fuses should be wired in series with the mains supply to the control.

## PRODUCT SELECTOR GUIDE

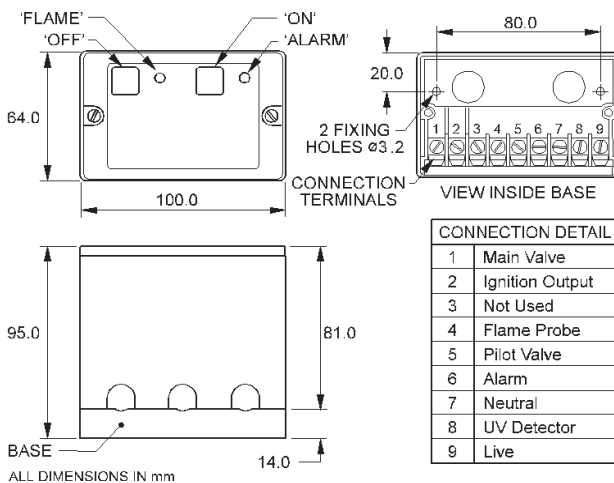
SERIES	OPERATION		BURNER		VALVE OUTPUT		LOCK-OUT		FLAME SENSING		IGNITION				TIMINGS (secs)			
	SEMI AUTOMATIC	AUTOMATIC	ATMOSPHERIC	FORCED DRAUGHT	SINGLE STAGE	DUAL STAGE	ALARM OUTPUT	MANUAL RESET	IONISATION	ULTRA VIOLET	INTEGRAL IGNITER	IGNITION OUTPUT	SINGLE PROBE	DUAL PROBE	RESTORATION	RECYCLING	PURGE/WAITING	SAFETY
BA1	*		*		*	*	*		*	*		*		*				
SM 592		*	*		*	*	*	*	*			*		*			>5	<5
SE11F		*	*		*	*	*		*		*		*		*		<2	<10
SE31F		*	*	*	*	*	*		*		*		*		*		>10	<10

Other models available in OEM quantities

# BA1 SEMI AUTOMATIC BURNER CONTROL

## FEATURES

- \* manual start with automatic flame supervision
- \* for use with atmospheric burners with or without pilot
- \* integral flame detection using ionisation (gas burners) or UV sensor (gas and oil burners), (Not 110V model)
- \* LED indicators for flame sensing and alarm
- \* mains output for alarm
- \* mains output for external igniter
- \* ignition electrode, flame electrode and UV sensor (Part number UV1) available as accessories



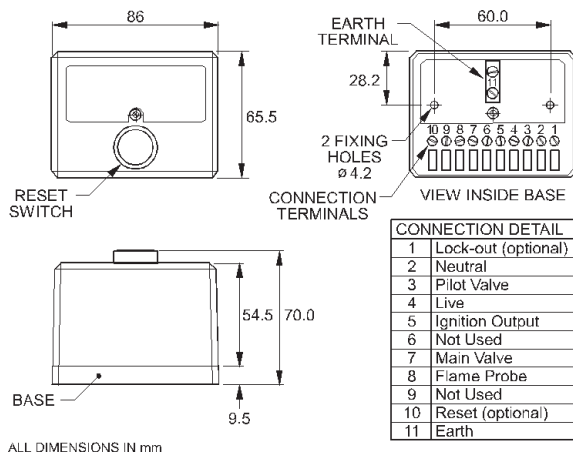
## SPECIFICATION

- Connections:** Screw terminals accessible when top section removed.
- External Conductors:** General - 3 metres maximum  
250V~ 2A minimum rating  
Spark - see INSTALLATION
- Construction:** Polystyrol 456M top section;  
Phenol resin (Type 31) base.  
Protection to IP40
- Classification (EN298):** A.T.L.O.X.N. enclosed
- Flame Sensitivity:** Probe: 0.2µA min. 1µA typ.
- Flame Failure Response Time:** < 1 second
- Temperature Range:** Ambient -10°C to 60°C
- Operating Voltage:** Models available -  
110V 50Hz or 230V 50Hz
- Power Consumption:** 10VA max. (excluding external loads)
- Electrical Ratings:** Pilot valve - Mains voltage output @ 1A max.  
Main valve - Mains voltage output @ 1A max.  
External igniter - Mains voltage output @ 1A max.  
Alarm - Mains voltage output @ 1A max.  
Total output rating - 1A max.
- Mounting Orientation:** Universal
- Weight:** 260g
- Approvals:** EN298

# SM592 FULLY AUTOMATIC BURNER CONTROL

## FEATURES

- \* fully automatic
- \* for use with atmospheric burners with or without pilot
- \* integral ionisation flame detection
- \* recycles on flame failure
- \* neon indicator for alarm
- \* mains output for alarm
- \* reset with push button
- \* mains output for external igniter



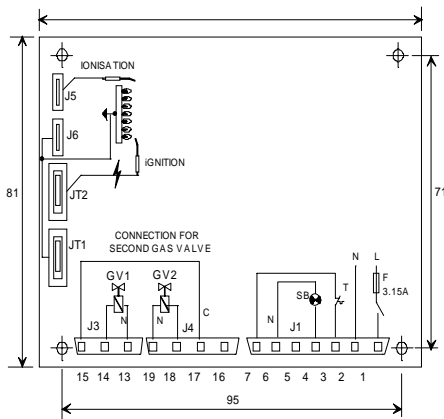
## SPECIFICATION

- Connections:** Screw terminals accessible when top section removed.
- External Conductors:** General - 3 metres maximum  
250V~ 2A minimum rating  
Spark - see INSTALLATION
- Construction:** Polycarbonate enclosure  
Protection to IP40
- Classification (EN298):** A.T.C.V.X.N. enclosed
- Waiting Time:** 5 seconds (minimum)
- Safety (Ignition) Time:** 5 seconds (maximum)
- Flame Sensitivity:** 1µA typical
- Flame Failure Response Time:** < 1 second
- Temperature Range:** Ambient -20°C to 60°C
- Operating Voltage:** 110V 50Hz or 230V 50Hz
- Power Consumption:** 10VA max. (excluding external loads)
- Electrical Ratings:** Pilot valve - 125VA max.  
Main valve - 125VA max.  
External igniter - 1.5A max.  
Alarm - 125VA max.
- Mounting Orientation:** Universal
- Weight:** 250g
- Approvals:** EN298

# SE-11F FULLY AUTOMATIC BURNER CONTROL

## FEATURES

- fully automatic
- for use with atmospheric burners with or without pilot
- integral spark igniter
- integral ionisation flame detection
- dual probe operation
- recycles on flame failure
- reset by mains interruption



CONNECTION DETAIL	
1	Live in
2	Neutral in
3	Thermostat *
4	Lockout Signal L*
6	Lockout Signal N*
7	Thermostat *
13	Gas Valve 1 N
14	Gas Valve 1L
15	Link to 17 for GV2
17	Link to 15 for GV2
18	Gas Valve 2 L
19	Gas Valve 2 N
J5	Ionisation Probe
J6	Earth
JT1	Earth
JT2	Ignition Electrode

Note \*\* = Optional

## SPECIFICATION

**Connections:** Non reversible multi-pole connectors with one way fast on connectors for probe connection

**External Conductors:** General 1m  
maximum 230V, 3.15A  
Spark 2m

**Construction:** Plastic housing with varnished PCB  
Protection to IP00

**Classification (EN298):** F M C V X N

**Waiting Time:** 10 seconds

**Safety (Ignition) Time:** 10 seconds

**Flame Sensitivity:** 0.5  $\mu$ A

**Flame Failure Response Time:** < 1 second

**Temperature Range:** -20°C to +60°C

**Operating Voltage:** 230V 50Hz

**Power Consumption:** 10VA max (excluding external loads)

**Electrical Ratings:** Pilot Valve - 0.5A  
Main Valve - 0.5A  
Alarm - 1A

**Mounting Orientation:** Universal

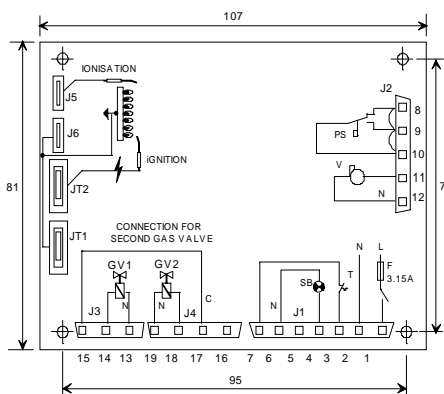
**Weight:** 170g

**Approvals:** EN298

# SE-31F FULLY AUTOMATIC BURNER CONTROL

## FEATURES

- fully automatic
- for use with forced draught burners with or without pilot
- integral spark igniter
- integral ionisation flame detection
- dual probe operation
- recycles on flame failure
- reset by mains interruption



CONNECTION DETAIL	
1	Live in
2	Neutral in
3	Thermostat *
4	Lockout Signal L*
6	Lockout Signal N*
7	Thermostat *
8	Air Press. Switch
9	Air Press. Switch
10	Air Press. Switch
11	Fan L
12	Fan N
13	Gas Valve 1 N
14	Gas Valve 1L
15	Link to 17 for GV2
17	Link to 15 for GV2
18	Gas Valve 2 L
19	Gas Valve 2 N
J5	Ionisation Probe
J6	Earth
JT1	Earth
JT2	Ignition Electrode

Note \*\* = Optional

## SPECIFICATION

**Connections:** Non reversible multi-pole connectors with one way fast on connectors for probe connection

**External Conductors:** General 1m  
maximum 230V, 3.15A  
Spark 2m

**Construction:** Plastic housing with varnished PCB  
Protection to IP00

**Classification (EN298):** A T C V X N

**Waiting Time:** < 2 seconds, minimum

**Safety (Ignition) Time:** 10 seconds

**Flame Sensitivity:** 0.5  $\mu$ A

**Flame Failure Response Time:** < 1 second

**Temperature Range:** -20°C to +60°C

**Operating Voltage:** 230V 50Hz

**Power Consumption:** 12VA max (excluding external loads)

**Electrical Ratings:** Pilot Valve - 0.5A  
Main Valve - 0.5A  
Alarm - 1A

**Mounting Orientation:** Universal

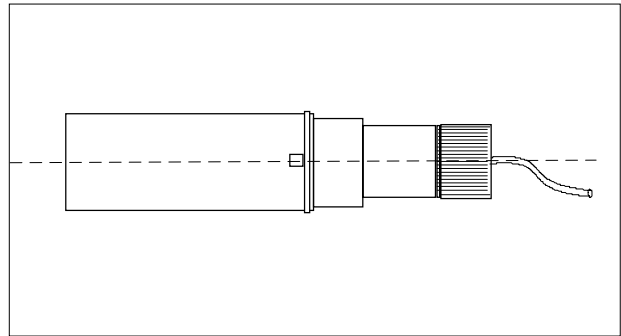
**Weight:** 170g

# ACCESSORIES

## ULTRA VIOLET DETECTOR - TYPE UV1

The UV1 Ultra Violet Detector is designed to work with the BA1 Semi-automatic Burner Control providing an alternative method of flame detection to flame rectification (ionisation).

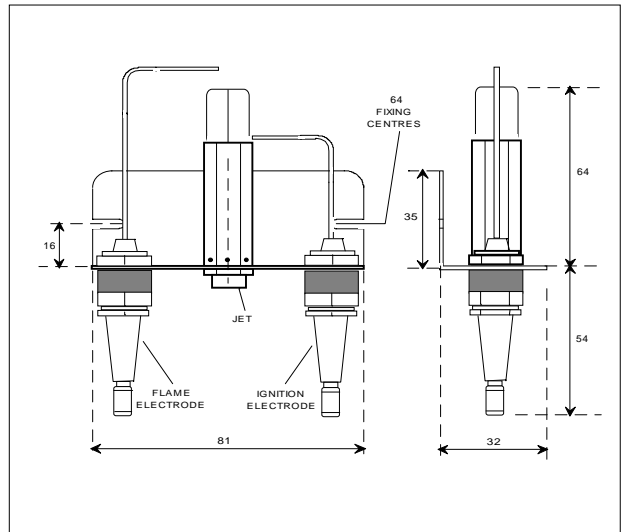
Diameter - 22mm  
 Length - 85mm  
 Lead Length 600mm  
 UV Tube - Plug in type



## 1300 SERIES PILOT BURNER

Specifically designed for reliability of operation with the Tekni range of flame rectification controls. A feature of the burner head is large flame/earth contact area ensuring a high constant signal current. Available for Natural Gas and LPG

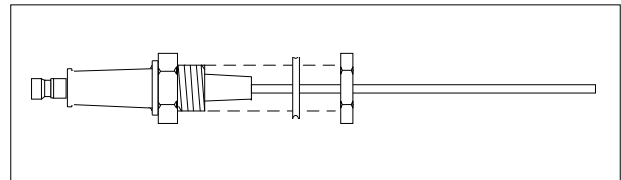
Flame and Ignition Probe Preset  
 Gas Connection - 1/8" BSP  
 Natural Gas Model - 1300/N  
 LPG Model - 1300/LPG



## 1201 SERIES SPARK GENERATOR

Spark generator housed in a 110x110x50mm plastic housing complete with a 2m ignition lead.

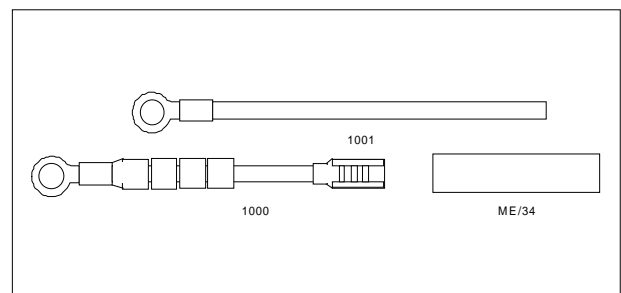
Output Rating - 15Kv into 30pF  
 Operating Voltages - 230 & 110, 50Hz  
 Spark Energy - 40 mJ



## FLAME DETECTION/IGNITION PROBES

Heavy duty Kanthal wire probes with ceramic body. Supplied complete with 14mm securing nut. Electrical connection can be made by either push on or ring terminals.

6" model - ME39/FS  
 12" model - ME239/FS



## IGNITION/FLAME PROBE LEADS

**Type 0030 flame probe lead**, normal duty. Connecting directly from probe to control box.

**Type 1001 ignition lead**, normal duty. General purpose lead for connecting between spark generator and electrode.

**Type 1000 Ignition lead**, high temperature. Ceramic lead for extreme heat applications. May be used in place of types 0300 and 1001 and connecting via **ME34** adaptor to normal leads as soon as possible.

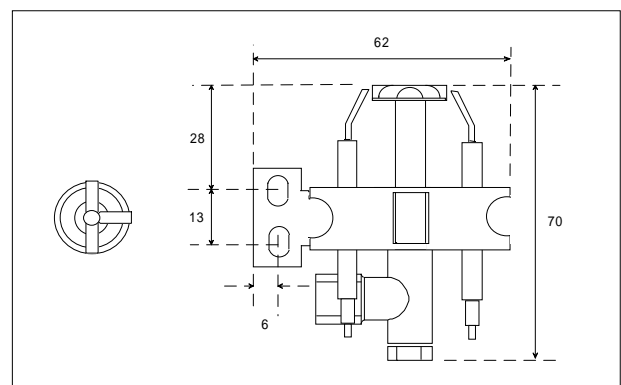
## CTB SERIES PILOTS

Passivated mild steel bracket with brass body and jet and chromised mild steel flame ports Available as monogas vertical (MV) or Universal (U). Suitable for domestic, catering and commercial applications

Part No's CTB/MV\*/3/EXT. \* = subst 'U' as required. If monogas ordered for LPG it should have LPG suffix

Jet Orifice - NG - 0.4mm  
 LPG - 0.21mm

Connection size - 6mm O/D Comp. as std  
 4mm O/D Comp on req

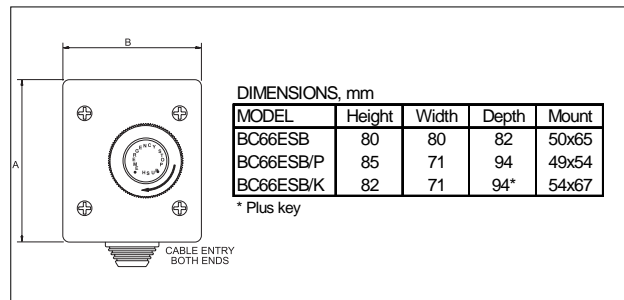


## ACCESSORIES - cont'd

### EMERGENCY CUT OUT SWITCHES

Remote mounted push to break/twist to reset switches for emergency use. Available in metal or plastic wall mounting box and with key operated reset

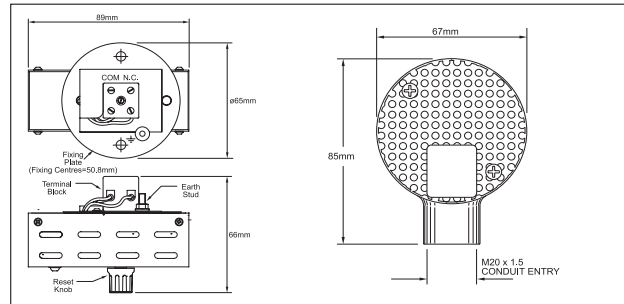
Product Code BC66ESB - Metal Box  
 BC66ESB/P - Plastic Box  
 BC66ESB/K - Plastic Box  
 Key Operated



### THERMAL FUSES

Remote mounted Thermal Fuses, Manually resettable type and non resetting type. Wired in series with valves or control boxes, will go open circuit at a pre set temperature.

Product Code - BC66MRF - resettable  
 - BC66ETF - fuse type  
 Rating - 5A, 230V a.c. (BC66MRF)  
 - 15A 230V a.c. (BC66ETF)



### GAS SAFETY SHUT OFF VALVES

Electro-Hydraulic (*Powerseat*) and Solenoid operated gas safety Shut off valves all approved to EN161 ranging from 1/8 inch screwed to 10 inch (250mm) Flanged. All valves are suitable for use with Gas families 1, 2 and 3 (Natural Gas, manufactured gas and LPG) and are constructed to class A or class B. Suitable for the widest range of Industrial, Commercial, Catering and Domestic applications.



## INSTALLATION

Observe local codes of practice e.g. use of CORGI registered installers. Mount the control using the fixing holes provided. Where the control is classified as unenclosed, it should be mounted inside an enclosure which requires the use of a tool to gain access to the control. Ensure the spark lead is not accessible without the use of a tool.

Electrical connections to the control should be made in accordance with the relevant connection details. Where the control is classified as enclosed a suitable cable gland must be used if external conductors are accessible. External wiring should be suitably secured to prevent loose conductors accidentally shorting to surrounding metalwork.

To isolate the control when not in use, an external switch and an m.c.b. or a fuse marginally rated above the maximum running current should be mounted in the mains supply to the control.

Where applicable, the spark electrode gap should be between 3 and 4mm, with the length of the lead not exceeding 2 metres. PTFE insulated stranded copper wire is preferred for the spark lead. To reduce spark attenuation, route the spark lead at least 10mm away from surrounding metalwork, whilst keeping its length as short as possible. To minimise E.M.I. emissions, earth the burner control directly to the burner close to the spark electrode holder.

Both flame and spark electrodes must be rigidly mounted; the flame electrode should be mounted in the edge of the flame for maximum sensitivity. Where an UV tube is used for flame detection, it must be mounted such that it is not affected by ambient light or excess temperature.

In order for the flame detector to function correctly, the burner must be earthed.

## MAINTENANCE

### ISOLATE CONTROL BEFORE REMOVING COVER

The correct operation of the control should be checked periodically. Check the control goes to lock-out when the gas

supply is turned off. Check electrical connections and spark/flame probe mountings.

The controls contain no user serviceable parts.

**BLACK  
TEKNIGAS**

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