



SENTINEL S100 & S150 INSTALLATION AND OPERATION MANUAL

(Version 16 December 2013)

CAN'T SEE IT? CAN'T STEAL IT!

Thank you for purchasing a Concept Smoke Screen system. Your choice to protect your property and premises with this equipment has given you the use of one of the most effective security systems currently available. Concept Smoke Screen systems have been in service for over 35 years and have protected many millions of pounds worth of property, defeating criminals and securing premises on an almost daily basis. Please take the time to read and understand this guide to ensure you achieve the maximum performance from your Smoke Screen. If you have any questions that remain unanswered, please call our experts at Concept Smoke Screen and we will help. Once again, thank you for your decision; we hope that it's one that never needs to be tested.

A handwritten signature in black ink, appearing to read 'Carl Gibbard', with a horizontal line underneath.

Carl Gibbard, Managing Director

HOW DOES YOUR SMOKE SCREEN WORK?

Your Smoke Screen heats a non-toxic fluid under pressure to create smoke, or more accurately a thermally generated fog, that obscures visibility to discourage intruders from entering your premises.

This fog is very persistent and will stay suspended in the room for a significant length of time until it is vented by opening the doors and windows.

The Smoke Screen uses a sophisticated electronic control system to ensure it heats up to, and maintains, its ideal operating temperature using a minimal amount of electricity.

This control system similarly provides a flexible interface with intruder detectors and alarm systems to ensure that you are always protected and free of inadvertent activations.

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INTRODUCTION

Before commencing installation of the Smoke Screen ensure that you have all of the following equipment supplied in the box:

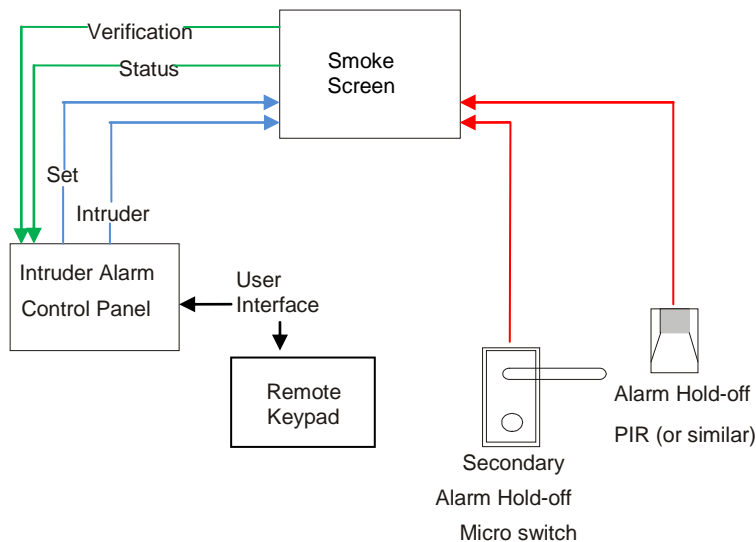
- 1 x Smoke Screen
- 1 x Mounting Wall Bracket
- 1 x Smoke Fluid Bag (Boxed)
- 1 x Literature Pack & Warning Sign

You will also require:

- 230-volt mains supply and connections into the alarm panel or other triggering system.
- PIR (or equivalent) to provide the hold-off where required.

OVERVIEW

The Smoke Screen is designed to form part of an existing intruder alarm system but may also be configured as a 'stand-alone' system. A 'standard' installation is shown in the following schematic:



STANDARD INSTALLATION

A 'standard' installation is configured in the following way:

- **The Smoke Screen** wall or ceiling mounted in the appropriate location;
- **A Hold-off PIR** (or similar device) located within the same area as the Smoke Screen providing a confirmation signal to the Smoke Screen to start 'smoke' production;
- **A Set** command supplied by an Alarm Control Panel, or equivalent, in the form of an N/C (*Normally closed*) relay opening when the Alarm system is set for operation;
- **A Trigger** command supplied by an Alarm Control Panel, or equivalent, in the form of an N/C (*Normally closed*) relay opening when the Alarm system confirms an intruder alert.

POSITIONING

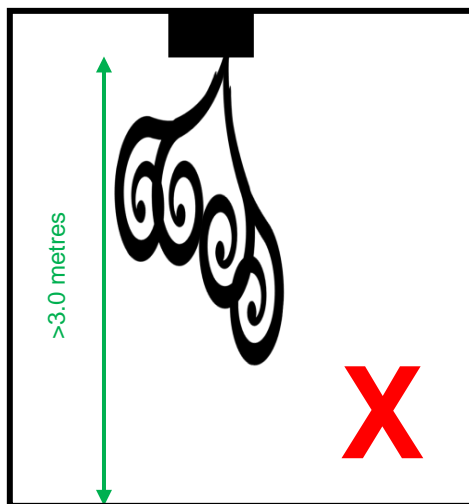
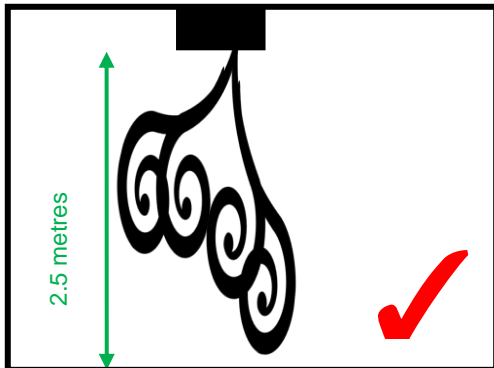
The Smoke Screen should ideally be sited in a covert position away from prying eyes and thereby reducing the possibility of tamper or an attack. The ideal place for the Smoke Screen is above a ceiling from where the smoke plume is used to its best effect, bursting on the ground and spreading outwards and upwards through 360°. If no suitable ceiling location is available then the next best location is a wall mounting as close to ceiling height as possible.

Wall mounting.



The optimum wall mounting position for the Smoke Screen is 2.5 metres above the floor facing the area to be protected and using an appropriate angle nozzle. The maximum mounting-height above floor level is 3 metres, the minimum is 1 metre and there should be no obstacle within 1 metre of the smoke output nozzle.

Ceiling mounting.



The optimum ceiling mounting height for the Smoke Screen is 2.5 metres above the floor over the area to be protected and using a straight nozzle. The maximum mounting-height above floor level is 3 metres and there should be no obstacle within 1 metre of the smoke output nozzle.

INSTALLATION PROCEDURE

1. Site the Smoke Screen and fix the bracket to the wall or ceiling as appropriate.
2. For wall mounting leave minimum 150mm clearance to ceiling.
3. Fasten the Smoke Screen to the bracket and open front cover.
4. Make connections as required to the Alarm Panel and Hold-off PIR.
5. Make connection to the Exagon panel (if used) and set the key switch to isolate mode.
6. Connect mains power (230-volt AC, 50Hz).
7. The Smoke Screen will heat up to operating temperature in approximately 20 minutes.
8. Set the parameters required, particularly the smoke timing for the specified room size.
9. **With the power applied** insert a fluid bag and ensure the fluid switch is closed correctly.
10. Make sure all tamper switches are closed and you are ready for test.

ACCESS

To access the PCB connections and fluid bag remove the front cover by unscrewing the 2 set screws on the front. Installation cable entry is through the grommet on the right back of the case next to the mains lead.

MOUNTING

The Smoke Screen can either be ceiling mounted, or wall mounted, using the bracket supplied. If ceiling mounted, it is recommended that the Smoke Screen is suspended on 2 lengths of M8 studding from a Unistrut section (pictured). In all cases, the installer must fit the Smoke Screen using appropriate fasteners.



Box Contents

Smoke Screen

Wall Bracket

Fluid Bag

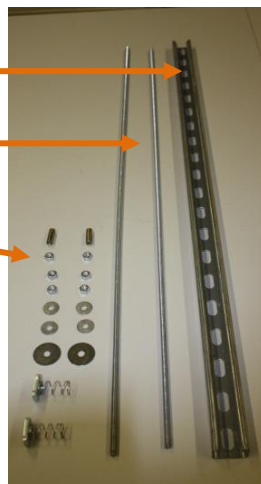
Suspension Kit (All M8)

Uni-strut 1x 1 metre

Threaded bar 2 x 1 metre

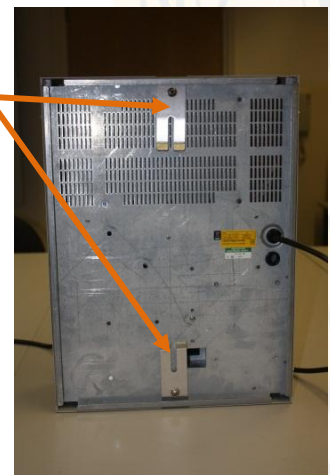
Fixings:

- 2 x 38mm washer
- 4 x 25mm washer
- 6 x full nut
- 2 x drop-in anchor
- 2 x channel nuts



Rear View

Suspension Brackets (shipping position)



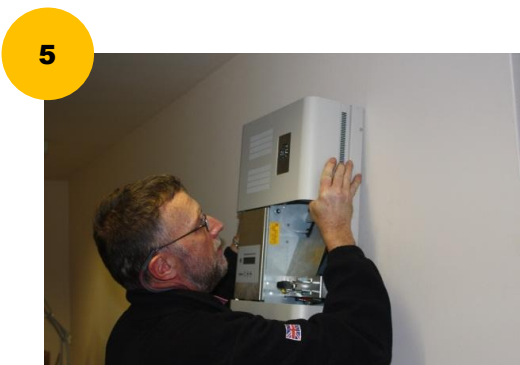
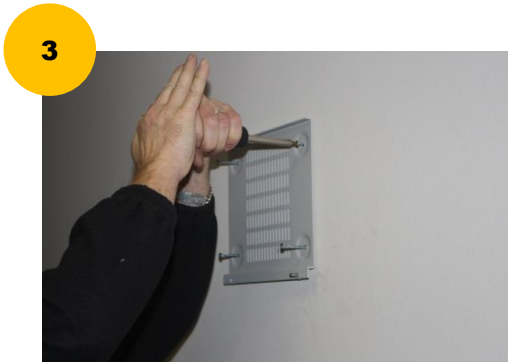
Smoke Screen with front cover removed.



PCB connections (side view).

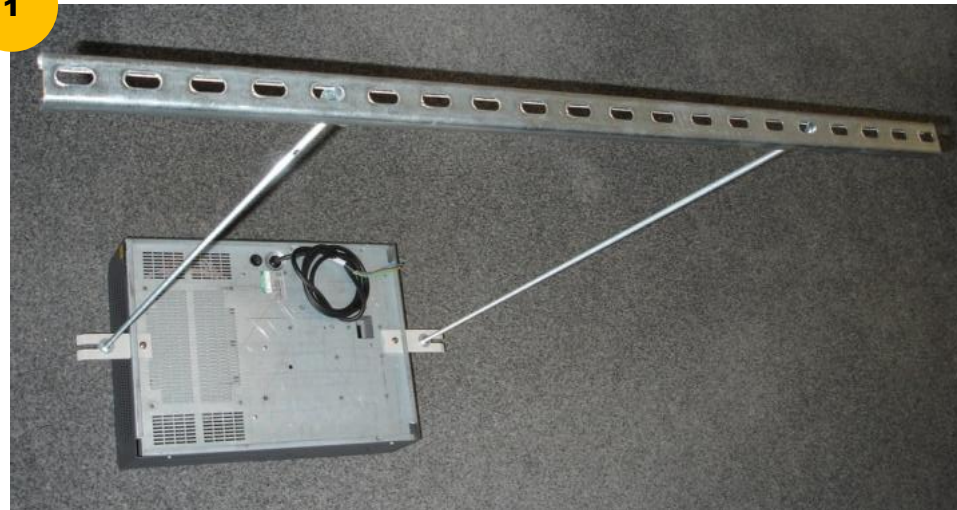
Wall mounting

Wall mounting is achieved using a simple wall bracket (1). The bracket should be attached to a suitable wall. Washers should be used to provide sufficient gap between the wall and the bracket (2). Ensure the locking bolt is in place. Use appropriate fixings to secure the bracket to the wall. We recommend as high a fixing as possible for aesthetic and security/anti-tamper reasons (3). Now remove the Suspension Brackets from the shipping position on the back of the Smoke Screen (4). These are not required for Wall Mounting. Carefully locate the Smoke Screen on the bracket ensuring that the locking bolt lines up with the hole in the fluid compartment (5). Finally, screw on the bracket locating nut to keep the Smoke Screen in the correct position (6).



Suspension mounting

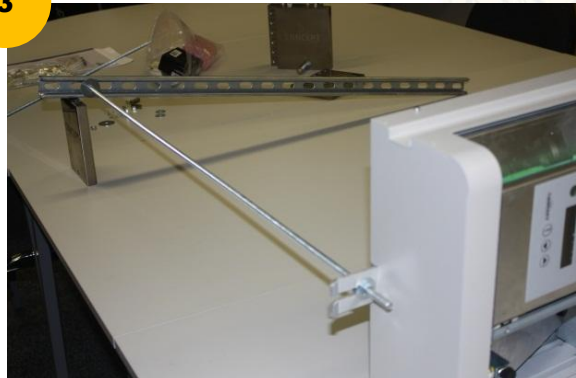
Suspending the Smoke Screen range is achieved using a 'Suspension Kit' comprising a length of Uni-strut, two sections of threaded bar and fixings (1). Prepare the Smoke Screen by removing the suspension brackets from the 'shipping position' and re-fit them so that the brackets protrude and the ends are angled towards the front of the Smoke Screen (2). Fix the Uni-strut into place. There are a range of fixings to accommodate concrete ceiling, girders etc; if in doubt contact the fixing supplier. Attach the threaded bar to the Uni-strut using the Channel nuts (3, 4). Now place the washers and nuts onto the threaded bar. Once this is done the Smoke Screen can be lifted into position and the nuts tightened (5). Any final adjustments to height can be made at this stage as the nuts and the threaded bar will take the weight of the Smoke Screen.



2



3



4

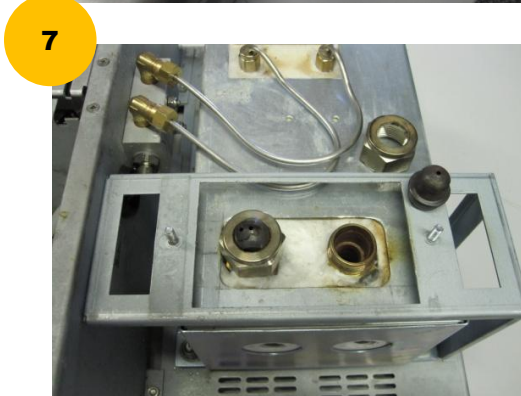
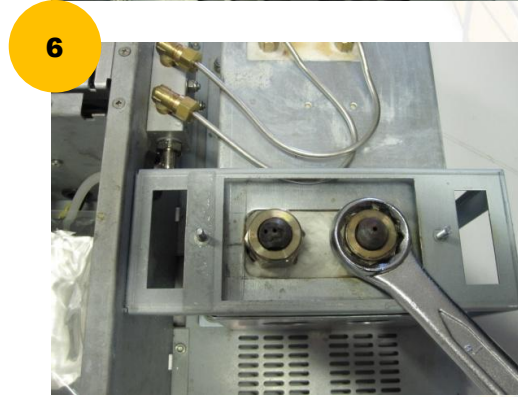
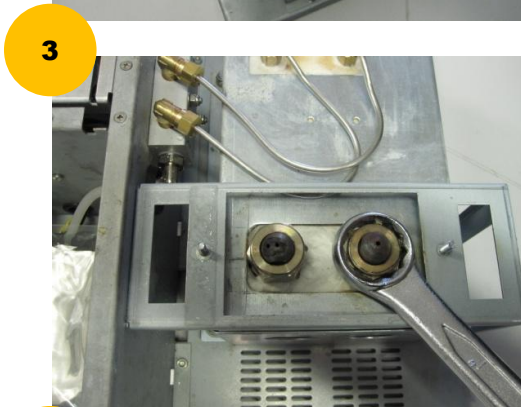


5



CHANGING THE NOZZLE

Remove the cover (1) using a Tamper Hand Driver No 2 – this is available from CSS. Remove the nozzle guard (2). Unscrew the nozzle retaining nut (3). Remove the nozzle (4). Select the appropriate nozzle (5). Replace the nozzle retaining nut, ensuring that the nozzle is set in the required direction (6). Replace the nozzle guard and the outer casing (7).



NOTE

This operation is usually carried out during installation. If the Smoke Screen has been in service the nozzle(s) will be extremely hot and will cause injury if touched. Therefore, the Smoke Screen should be switched off and time should be allowed for the nozzle(s) to cool.

CONTROLLING THE SMOKE

Inputs. There are 3 sets of input connections on the Smoke Screen (Alarm Set, Trigger and Hold Off) that should be connected to clean contacts. For the Smoke Screen to produce 'smoke' all 3 sets of connections must be 'open circuit'. If one set of connections is 'closed circuit' then the Smoke Screen is prevented from producing smoke. Hence the production of smoke is controlled using one or a combination of the following:

- **Alarm Set** – a normally closed volt-free relay connected across the Alarm Panel 'Set' connections, which open when the alarm panel is 'Set' and closing when the panel is 'Unset'.
- **Trigger** – a normally closed volt-free relay connected across the Alarm Panel 'Trigger' or 'Intruder' connections, which open when the alarm panel is in 'alarm'.
- **Hold-off** – usually a PIR or movement sensor connected to the 'Hold-off PIR' connections (N/C), which open when the sensor sees movement. If a 'Hold-off' is not used the connections should be left open or the 'HO Alarm' parameter set to 'Off' in Programming Level 2.
- **Additional Hold-off** – any form of N/C relay or micro switch can be connected to the 'Hold-off' connections. Where fitted in addition to the Hold-off PIR both sets of relays must be 'open' to produce 'smoke'.

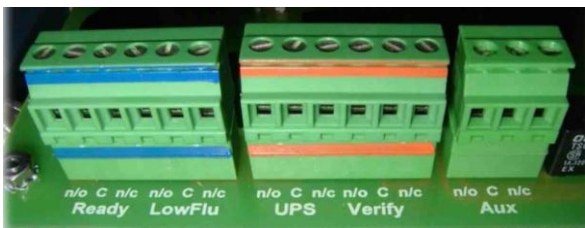
Outputs. The Smoke Screen has the following 5 Low voltage output relays with change over volt free contacts rated at 1 amp max for connection to the Alarm Panel and/or other devices:

- **Ready.** Energised when the Smoke Screen Ready.
- **Low Fluid.** Energised when the Fluid level is OK.
- **UPS.** Energised when the UPS is OK or the UPS Alert is disabled.
- **Verification.** Energises when the Smoke Screen produces smoke.
- **'Auxiliary'.** Provides an extra timer relay initiated by an alarm.

Relay terminology refers to the relay condition in the de-energised state, ie if a relay is Normally Open (NO) the wiring across Common and NO will be open when not energised and closed when energised. All output relays have changeover contacts for flexible configuration.

See the notes on the "Generic Connection Diagram" for the function of these outputs.

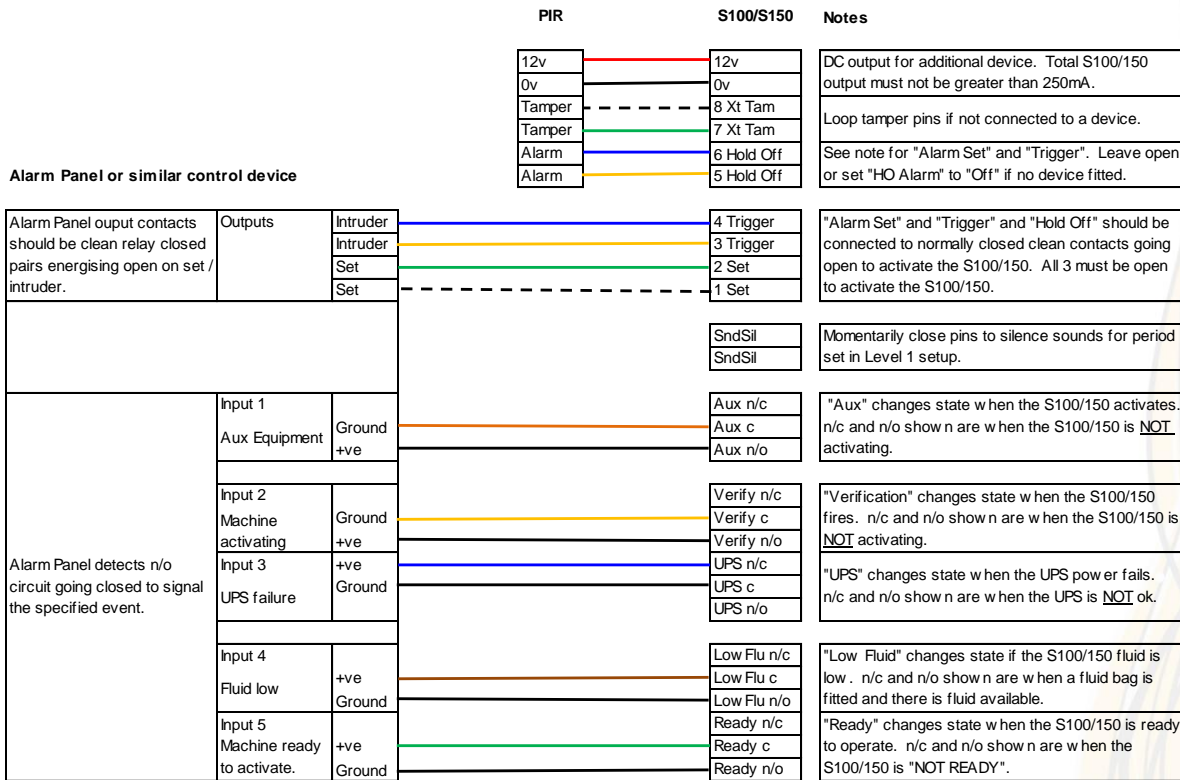
PCB CONNECTIONS



The PCB connections are access by removing the front panel. Cables should be routed into the Smoke Screen through the holes with grommets in the chassis.

GENERIC CONNECTION DIAGRAM

S100 and S150 Generic Connection Diagram



20130418-S100 & S150 Generic Connection Diagram-v2

ENERGY SAVING MODE (ESM)

When ESM is set and the Alarm Panel input to the Smoke Screen is "Unset" the Smoke Screen lowers its running temperature to a standby level to reduce power consumption and cost. When the Smoke Screen receives an 'Alarm Set' input it automatically heats to its normal operating temperature.

UN-INTERRUPTED POWER SUPPLY (UPS)

If required a UPS, or maintained, supply can be incorporated into an installation through the IEC panel plug on the case. When the mains supply fails this will provide power to the electronic circuits and pump but NOT the heaters. This will enable the machine to produce smoke after mains failure until the temperature of the heater block falls below the lower Set Temperature.

A UPS alarm can be enabled in Programming Level 2 so that a 'NO UPS' message alternates with the 'NORMAL' status if the UPS supply is not present. If the UPS supply fails the Smoke Screen operates normally when a mains supply is available.

Mains Power Loss (No UPS connected). When mains power is restored after a temporary power loss the Smoke Screen will be 'Not Ready' for approximately 30 seconds even if it is still up to operating temperature. This is to allow the Hold-off PIR to stabilise and prevent the Smoke Screen from firing in the event of a false panel alarm.

TRIGGER DELAY

The Smoke Screen can be set, in ½ sec steps up to 99.5 sec, to delay its response to an activation command (see “Level 2” in the Programming section). This allows Smoke Screens to activate sequentially in multiple installations or provides a time window to effect disarming in the case of an accidental activation.

FLUID MANAGEMENT

Fluid monitoring. The Smoke Screen uses a transparent bag containing 500ml ‘Smoke Fluid’. The Fluid Level is monitored using an on-board timer that measures the amount of fluid used by timing its use when the Smoke Screen is activated. Each time the bag clamp is unfastened and the fluid bag is removed the micro switch is released which resets the timer and the Smoke Screen will calculate this as a new fluid bag.

Changing a fluid bag. Ensure that power is applied to the Smoke Screen. Open the front access panel. Unscrew the bag neck cradle retaining screw and the bag support screw. Insert the fluid probe into the “out” position in the bag neck.



Place the other end of the bag onto the support and insert the retaining screw.

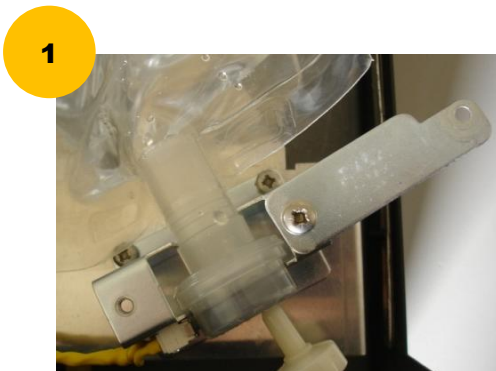
Use this support point for upright or face-down installation

and

this support point for a left-side-down installation.

NB: DO NOT install right-side-down or the fluid flow will be adversely affected

Carefully locate the bag neck in the cradle (1). Close the retaining gate and insert the retaining screw (2). Ensure the bag neck is held correctly and the fluid micro switch is activated properly.

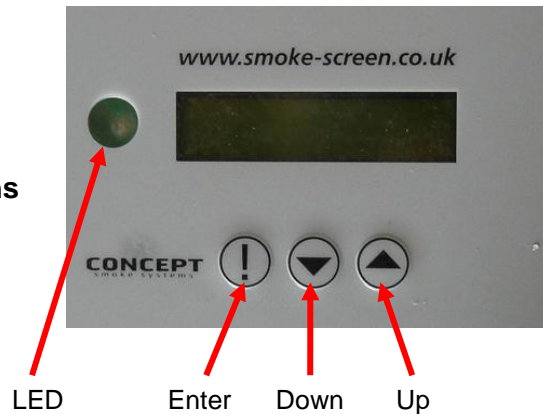


ALWAYS REPLACE A FULL FLUID BAG EVERY TIME THE FLUID BAG HOLDER MICRO SWITCH IS RESET. FAILURE TO DO SO MAY RESULT IN DAMAGE TO THE SMOKE FLUID PUMP.

WHEN A NEW FLUID BAG IS FITTED POWER MUST BE APPLIED TO THE SMOKE SCREEN TO RESET THE FLUID TIMER.

PROGRAMMING

The LCD Display and operating buttons



Engineer access PIN. Access to Programming Levels 1 & 2 is controlled using an Engineer PIN. The Delivery setting is 1993 but it can be changed if required as the last item in Level 2. To enter the PIN:

- On the Display Panel, hold down the ! and ▲ buttons to display “**Access Code: 0 0 0 0**” with a flashing cursor underline on the first digit.
- Press ▼ or ▲ to select the first number.
- Press ! to move to the second digit.
- Repeat the above until the 4th digit is correctly displayed.
- Press ! to enter parameter setting Level 1.
- If the wrong code has been entered the message “**WRONG CODE**” is displayed along with the incorrectly input number.

Once a correct Engineer PIN has been entered it is enabled for 10 minutes although the display will time-out after 10 seconds of inactivity. However, if the ! key is pressed within 10 minutes the display returns to the Access Code input display and Parameter Adjustment Level 1 will be immediately displayed when re-entering the programming function by a second press of the ! key. An enabled Engineer PIN is cancelled if the mains power is turned off.

Parameter changing and delivery settings. Adjustments can be made to many of the SMOKE SCREEN operating parameters by entering the Engineer PIN as above, pressing the ! button to scroll through the adjustable parameters and using the ▼ and ▲ buttons to change the setting.

Level 1 (* = most frequently changed parameters):

Displayed Parameter	Delivery Setting	Settings
Smoke On ???secs*	120 secs	15 sec increments between 0 - 600 sec
Sound Rpt ??mins	5 mins	
Sound Sil ?? hrs	2 hrs	Sound indications silence period (initiate by closing pins)
Aux Run ??mins*	59 mins	Period power supplied to aux connections. 1 min increments between 0 – 59 min
111		Press ! and ▲ to move up a level or ! and ▼ to exit

Level 2:

Displayed Parameter	Delivery Setting	Settings
Smoke Test ???	Off	On/off
En Save ???	Off	On/off
UPS Alarm ???	Off	On/off
HO Alarm ???*	On	On/off
HO Retrig ???	On	On/off
Trigger Delay ?	1	0 to 199 (½ sec increments, 0 to 99.5 secs)
Temp Display ???	Off	On/off
Network Addr ???	001	1 to 999
Engineer ????	1993	Engineer PIN set
222		Press ! and ▼ to exit

OPERATION

Triggering smoke. The Smoke Screen will produce smoke providing it is in a Ready state when the following conditions are met:

- **'Hold-off' attached:** Both 'Set' and 'Trigger' inputs are open and the 'Hold-off' is open providing confirmation.
- **No 'Hold-off' attached:** Both 'Set' and 'Trigger' inputs are open. If no Hold-off is attached the Level 2 parameter "HO Alarm" on/off should be changed to "Off".

Smoke production time. The 'Smoke On' time can be set in 15 second increments up to a maximum of 10 minutes (parameter Level 1). If the Smoke Screen goes 'Not Ready' during alarm the system does not include the 'Not Ready' time in the 'Smoke On' time total. When the Smoke Screen goes 'Ready' again the smoke production restarts until elapsed time reaches the pre-set figure or the 'Set' contact is closed.

Stopping smoke. Closing the 'Trigger' relay will **not** stop the production of smoke, which will continue for the preset time. Close the 'Set' relay to stop the smoke output instantly. Note that if the 'Set' and 'Trigger' inputs are connected together in parallel and operated by one set of NC relay contacts opening the Smoke Screen will stop producing smoke when the contact is closed.

Re-triggering smoke (Hold-off attached). If, after it has made smoke for the preset time, the Smoke Screen receives another HO alarm with an open 'Set' input it will 're-trigger' and make smoke again. To prevent this set the Level 2 parameter "HO Retrig" to "Off" and the Panel Alarm has to then re-arm before the system can produce Smoke.

TESTING

Full alarm test. Where possible a full alarm test should be conducted to check that all inputs, outputs and wiring connections to the Smoke Screen are correct. If a PIR or other detector is fitted the Smoke Screen will fire for the designated Smoke Time period once the 'Alarm Set', 'Trigger' and 'Hold Off' (if fitted) contacts are open. It will stop producing smoke if the 'Alarm' contact is closed.

Smoke Screen stand-alone test. The Smoke Screen can make a 3-second smoke test if the Smoke Screen is 'Ready' and the 'Set' contact is open by:

- Setting Smoke Test parameter in Level 2 to "On" (this is reset to 'Off' when the engineer PIN is entered or times out).
- Pressing and holding all 3 buttons (! ▼ ▲).

The 'On' time is set by the manufacturer to 3 seconds in Level 3 "Smk Test". NB: this does not check that the inputs and connections to the Smoke Screen are correct.

LCD, LED AND SOUND INDICATIONS

The Smoke Screen provides onboard status monitoring via an LCD, an LED and a sounder. The Smoke Screen 'beeps' during the 'alert' conditions detailed below and, if the condition persists, the sounder repeats at an interval set in Level 1 parameter "Sound Rpt". The sounder can be silenced for a period set in Level 1 parameter "Sound Sil" by a momentary contact closure on the sounder silence connections. Indications displayed are:

Smoke Screen 'Ready'

Displayed Status	LED Flash	Beep	Meaning / Comment
hh:mmSet READY	-	-	Alarm 'Set'.
hh:mmUns READY	-	-	Alarm 'Unset'.
hh:mmSet SMOKE	-	-	Smoke is being produced.

If any of the following conditions exist the display will alternate between the 'Ready/Smoke' display above and the 'Conditions' displays (if more than one condition exists they will display in order):

Displayed Condition	LED Flash	Beep	Meaning / Comment
Panel Alarm	✓	-	'Trigger' contact is open.
Low Fluid	✓	x 1	Fluid level is low.
Smoke Gen Tamper	✓	-	A cover is not fitted.
External Tamper	✓	-	The PCB tamper pins are open (used for the hold-off tamper).
HO Alarm*	✓	-	Hold-off contact is open.
Mains Fail	✓	-	Mains power failure.
No UPS	✓	-	No UPS fitted or not providing power.

Smoke Screen 'Not Ready'

Displayed Conditions	LED Flash	Beep	Meaning / Comment
hh:mmSetNotReady	✓	x 2	Alarm 'Set'.
hh:mmUnsNotReady	✓	x 2	Alarm 'Unset'.

If any of the following conditions exist the display will alternate between the 'Not Ready' display above and the 'Conditions' displays (if more than one condition exists they will display in order):

Displayed Condition	LED Flash	Beep	Meaning / Comment
Fluid Empty	✓	x 2	Fluid bag empty. Makes Smoke Screen 'Not Ready'.
Temp Low	✓	x 2	Temperature too low. Makes Smoke Screen 'Not Ready'.
Temp High	✓	x 2	Temperature too high. Makes Smoke Screen 'Not Ready'.
Low Fluid	✓	-	Fluid contents low.
Smoke Gen Tamper	✓	-	A cover is not fitted.
External Tamper	✓	-	The PCB tamper pins are open (used for the hold-off tamper).
HO Alarm	✓	-	Hold-off contact is open.
No UPS	✓	-	No UPS fitted or not providing power.
Fluid Emp Fault	✓	-	No fluid flow during activation. Makes Smoke Screen 'Not Ready'.

Temperature indication. When the Level 2 parameter 'Temp Display' is set to "On" the actual temperature and the set temperature alternate with the Ready' or 'Not Ready' display as follows:

Displayed Indication	Meaning
Temp=nnn°C S=nnn	Current temperature and operating temperature.
Temp<240	Temperature low or sensor fault.
Temp Over	Temperature too high or sensor fault.

EVENT RECORD

The Smoke Screen records the last 300 events, which can be examined by pressing the '!' button to make the display step through each item automatically. The ▼ and ▲ keys can be used to override the auto-step and manually scroll through the records. The display returns to normal at the end of the list or when the '!' button is pressed again or after a period with no button pressed in manual mode.

The first four characters show the event code, followed by the event time and date in seconds, minutes, hours, day and month. The Event Code meanings are:

Displayed Event Code	Meaning
M on	Mains supply 'On'.
M off	Mains supply 'Off'.
U on	UPS supply 'On'.
U off	UPS supply 'Off'.
SMon	Smoke (Pump/Valve) Output 'On'.
SMof	Smoke (Pump/Valve) Output 'Off'.
ITon	Internal Tamper Alarm 'On'.
ITof	Internal Tamper Alarm 'Off'.
XTon	External Tamper Alarm 'On'.
XTof	External Tamper Alarm 'Off'.
A on	Alarm Panel On (Open Contacts).
Aoff	Alarm Panel Off (Closed Contacts).
P on	Panel Set On (Open Contacts).
Poff	Panel Set Off (Closed Contacts).
HOon	Hold-off On (Open Contacts).
HOof	Hold-off Off (Closed Contacts).
FLow	Low Fluid Warning.
F MT	Empty (No Fluid) Warning.
FEer	Empty (No Fluid) Signal Error.
FRes	Fluid Reset.
SSP	Beeper Silence Button Pressed.
CC O	Clock Change (Old Time).
CC N	Clock Change (New Time).

ACTION AFTER EVERY ACTIVATION

- Wait until the smoke production has ceased. **Do not try to enter the affected area as you will not be able to see through the fog.**
- Look for signs of forced entry. If you find any, or you believe that intruders are on the premises, call the Police and wait for them to arrive. **Take no further action.**
- Where there are no signs of forced entry, open all external doors and wait for the fog to start clearing – this may take 10 to 15 minutes. Keep watch for intruders that may have been screened by the fog.
- As visibility returns open more doors or windows to speed up the venting process.
- Check the fluid level for the Smoke Screen by checking the appropriate LEDs as described above. It is recommended that the installer or Concept Smoke Screen are requested to service/replenish the Smoke Screen if there have been 2 or more activations of the Smoke Screen.

SERVICING AND FLUID REPLENISHMENT

Please note that it is a requirement of the standards relating to security fogging devices the Smoke Screen is serviced/replenished by an engineer certified by the manufacturer. If you are unsure, ask the engineer for his certification ID card. It is recommended that the Smoke Screen is checked and the fluid changed annually by the installer or Concept Smoke Screen. Always ensure that the Smoke Screen has sufficient fluid or it will not produce smoke when needed. It is recommended that the installer or Concept Smoke Screen are requested to service/replenish the Smoke Screen if there have been 2 or more activations of the Smoke Screen.

WARNING - only Smoke Screen fluid should be used as other smoke fluids may cause damage or noxious fumes.

FAQ

Q: The Smoke Screen is indicating it is ready to operate but does not respond to a full alarm test.

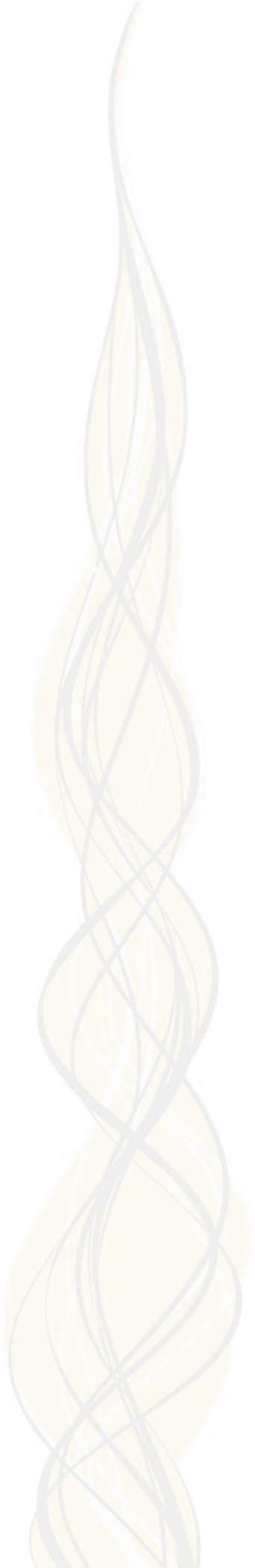
A: Check that the tamper connections on the PCB (XtTam) are not open and are looped together or are connected to an external device tamper circuit that is closed.

A: With power applied, and keeping clear of the smoke nozzle, disconnect the “Alarm”/“Trigger” and “Hold Off” connection plugs from the PCB. If the Smoke Screen produces smoke there is a miss-connection in the system wiring.

Q: The Smoke Screen puffing out smoke whilst heating up.

A: This is the result of very small amounts of air and residual fluid in the heater block being changed into an insignificant volume of smoke and can happen particularly after the Smoke Screen has been moved about when cold.

INSTALLER NOTES



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