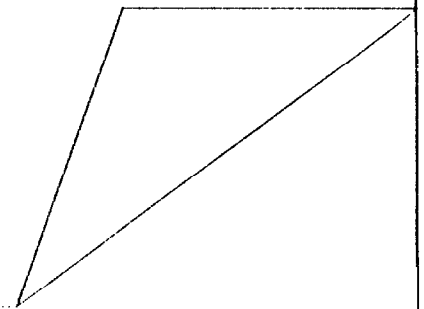


SERIES 428

INSTRUCTIONS FOR USE



INTRODUCTION

The **SERIES 428 MODULAR FOG SYSTEM** comprises of an 8 channel computerized controller that is capable of controlling up to 8 separate fog modules (16 by special order via JEM factory).

As standard, the system is supplied with:-

- 1 8 Channel Controller**
- 1 50 Litre Tank**
- 1 Pumping System fitted with 4 pumps**
- 4 8-way Dispersal Cones**
- 4 20 Metres 6mm Fluid Line for connection of Head to Pump System**
- 4 20 Metres 5 core Low Voltage Cable for connection of Head to Controller**
- 1 5 Metres 5 core Low Voltage cable for connection of Controller to Pump System**

The **SERIES 428** is ideal for venues with large areas to be covered or venues with multiple areas, e.g. clubs with 2, 3 or even 4 dance floors as each channel can be separately programmed. Dance floor #1 may, for example, only require a 1 second burst of smoke every 60 seconds, while dance floor #2 may require a 5 second burst of smoke every 40 seconds. An off-dance floor area may only require a 1 second burst every 3 minutes. The **SERIES 428** Controller is fitted with battery back-up so programmed information is retained in memory even when power is switched off.



Please ensure you read and understand these Instructions for Use before installing and operating this Smoke System

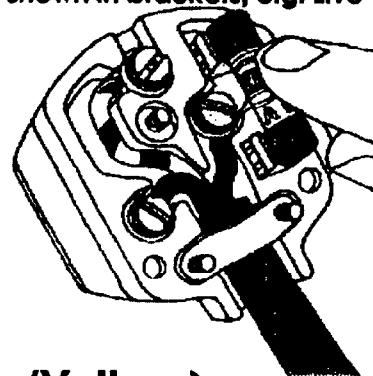
WIRING COLOUR CODE

(N. American conventions and terminology shown in brackets, e.g. Live {Hot})

N Neutral (Blue)

L Live {Hot} (Brown)

E Earth {Ground} (Green/Yellow)



IMPORTANT INSTALLATION NOTES

Although the SERIES 428 Controller has a Stand-by facility to turn the heaters off, we strongly recommend that the overall mains (A.C.) supply to the modules has a suitable switch or isolator within easy reach of the operator.

Each Fog Module has a tri-colour LED on the front right hand corner. This displays the status of each particular module, and provides useful information, should service work be needed. Often, it alleviates the need to dismount the head.

RED MODE * PUMP OFF * HEATERS ON

YELLOW MODE * PUMP ON * HEATERS ON

GREEN MODE * PUMP ON * HEATERS OFF

When installing the Fog Modules, be sure that the front of the module and an area of at least 6 metres (appx. 20 feet) to the front of the module is unobstructed.



Remember that the output nozzle and 8-way dispersal cone at the front of each module reach extremely high temperatures. These high temperatures sustain even after prolonged switch-off. Avoid the risk of burns.

SWITCH ON PROCEDURE

Once the SERIES 428 has been connected to the mains (A.C.) supply and fully installed, press the Mains On switch. The module status LED on each head will light up and the fog modules will begin to heat. As the SERIES 428 is fully electronically controlled, it is quite normal for the modules to switch automatically between yellow and green mode as the temperature control circuits operate from time to time. The SERIES 428 can operate while heating at the same time (except when in red mode, signifying temperature is below minimum levels, e.g. at initial switch-on). If, for any reason, the vapourising chamber is not hot enough, the pump will be automatically shut down while the heaters bring temperatures up to the required level.

INTERCONNECTIONS AND LOW VOLTAGE CABLES

The standard lengths of fluid line supplied are 20 metres (65 feet). These can be extended up to 100 metres (325 feet) from the fluid tank. The electronic cables from the controller can also be extended up to 100 metres (325 feet).

CONTROLLER FUNCTIONS EXPLAINED

MAINS ON/OFF This switch turns on power to the controller and also enables the power to the Smoke Heads.

AUTHORITY Once the controller has been programmed, turning this key switch prevents the controller from being tampered with manually. No access is possible to the memory and only programs already stored will run.

CHANNELS 1 TO 8 The SERIES 428 controller has eight channels, each one of which can be separately programmed with up to 254 seconds of memory, giving a total system memory capacity of 2,040 seconds of controlled fog on all of its 8 channels. *34 minutes of fog is a lot of fog!*

MEMORY BANK This is a digital readout of the memory bank number currently selected.

MEMORY BANK SELECTOR Allows the user to select up to 8 separate memory banks, numbered 0 to 7. The Auto Run position runs through all memory in each memory bank - a total of 2,040 seconds of memory.

PROGRAMME TIME Gives a digital readout of the programme time. You can programme a maximum of 254 seconds of memory on each memory bank only.

ENTER This button is used to enter memory into the memory bank. Pressing it once represents 1 second of time. Each subsequent press represents another second, i.e. 60 presses represent 1 minute. This system thus allows very accurate smoke on/off times for theatrical and/or television cues etc. If a long period of smoke is required, holding the button down continuously will speed up the operation.



When entering memory, ALWAYS programme the OFF time first

RESET The programme time should be reset when starting a new programme.

PROGRAMME/RUN To enter a programme into a memory bank, PROG/RUN should be depressed into the latching position. To operate the programmed channel, the PROG/Run button should be depressed again into the non-latching position.

MANUAL The MANUAL button should be depressed into the latching position when the MANUAL/PROG button on each channel is going to be used.

MANUAL PROGRAMME The MANUAL PROGRAMME button on each channel should be depressed into the latching position for programming in conjunction with PROG/RUN. Alternatively, for manual operation of fog modules, it should be in the non-latching position and used in conjunction with the manual button.

HOLD FOG Hold Fog can be used at any time as an override to stop the modules from operating.

HEATING LED Each channel has a tri-colour LED that indicates which mode of operation the module is in:-

RED * HEATERS ON * PUMP OFF

YELLOW * HEATERS ON * PUMP ON * O.K. TO OPERATE

GREEN * HEATERS OFF * PUMP ON * O.K. TO OPERATE

MEMORY The memory LED mimics what is in the memory.

FOG This green LED illuminates when the modules are operating.

PROGRAMMING THE CONTROLLER - EXAMPLE 1

1. Decide what programme you wish to enter.
2. Make sure that none of the red LED's are illuminated, with the exception of the module status LED.
3. Make sure that the Authority Switch is in the correct position to obtain access to the memory.
4. Select a memory bank.
5. Depress PROG/RUN into latching position. Both the PROG/RUN LED and the HOLD FOG LED will illuminate.
6. Depress the reset button for FIVE SECONDS.
7. In this instance, the programme we suggest you enter as an example will control all 8 fog modules on a 1 second of fog every 9 seconds basis, making a 10 SECOND programme.



Remember - always enter OFF periods FIRST!

8. Press the "ENTER" button and set digital timer display to 9 seconds of OFF time. This is done by holding down the ENTER button until the programme timer reads 9 seconds.

9. Press the "MANUAL PROGRAMME" button on each of the desired Channels to set it to the latching position. This is shown by the Memory LED on each channel illuminating.
10. Press the "ENTER" button once only. The programme is now entered.
11. Press "PROG/RUN" and "HOLD FOG" and the programme will now run.

PROGRAMMING THE CONTROLLER - EXAMPLE 2

Let's assume a discotheque has 4 dance floors, all of which require differing amounts of fog throughout the evening.

- AREA 1 1 second of fog every 9 seconds**
- AREA 2 4 seconds of fog every 36 seconds**
- AREA 3 6 seconds of fog every 74 seconds**
- AREA 4 8 seconds of fog every 152 seconds**

Each AREA has TWO Fog Modules:-

- AREA 1 has channels 1 and 2**
- AREA 2 has channels 3 and 4**
- AREA 3 has channels 5 and 6**
- AREA 4 has channels 7 and 8**

The TOTAL PROGRAMME TIME for all 4 areas will be 160 SECONDS

PROGRAMME AS FOLLOWS:-

Select a Memory Bank. Check that all red LED's are off with the exception of the Module Status LED.

1. Press PROGRAMME RUN to set it in the latching position. Both the Programme Run LED and the Hold Fog LED will illuminate.
2. Press RESET for 5 seconds.
3. Press ENTER button until programme time reads 9 seconds.
4. Press MANUAL PROGRAMME buttons on Channel 1 & 2 (the two yellow memory LED's will illuminate).
5. Press ENTER button until the programme time reads 10 seconds (on time plus off time added up).
6. Press MANUAL PROGRAMME buttons on Channel 1 & 2 (the two yellow memory LED's will go out).
7. Press ENTER button until programme time reads 36 seconds.

8. Press MANUAL PROGRAMME buttons on Channel 3 & 4 (the two yellow memory LED's will illuminate).
9. Press ENTER button until programme time reads 40 seconds (Off time plus on time added up).
10. Press MANUAL PROGRAMME buttons on Channel 3 & 4 (the two yellow memory LED's will go out).
11. Press ENTER button until programme time reads 74 seconds.
12. Press MANUAL PROGRAMME buttons on Channel 5 & 6 (the yellow memory LED's will illuminate).
13. Press ENTER button until programme reads 80 seconds (Off time plus on time added up).
14. Press MANUAL PROGRAMME buttons on Channel 5 & 6 (the two yellow memory LED's will go out).
15. Press ENTER button until programme time reads 152 seconds.
16. Press MANUAL PROGRAMME buttons on Channel 7 & 8 (the yellow memory LED's will illuminate).
17. Press ENTER button until programme time reads 160 seconds (Off time plus on time added up).
18. Press MANUAL PROGRAMME buttons on Channel 7 & 8 (the two yellow memory LED's will go out).
19. Press PROGRAMME RUN - the programme is now complete.
20. Press HOLD FOG to the non-latching position and the programme will run.



Remember to turn the AUTHORITY KEY to OFF so only the key holder can obtain access to alter the programmed information!

PROGRAMMES LONGER THAN 254 SECONDS

If a programme needs to be longer than 254 seconds, use additional memory banks and run the programme in the auto run mode (e.g. 1 second of fog every 2,040 seconds uses all 8 memory banks).



It is very important that before making the final fluid line connection to each head that the line is fully primed and that no air bubbles are present. We suggest pumping through 1/2 litre of JEM fluid through the line before making the final connection. The fluid can be pumped back into the bottle for subsequent re-use.

8-WAY DISPERSAL CONE

Fitting the 8-way Dispersal Cone is done using a suitable box spanner (wrench). Ensure that the cone is fitted such that the jets of smoke are not impeded by the cowling. Never attempt to fit cones to modules unless they are cold. Do not over-tighten the fittings.

TEMPERATURE LIMITERS

The fog modules are thermally protected by a temperature limiter. In the unlikely event of a failure causing the heaters to jam on, the limiter will shut the power off to the heater. The limiters used are approved by VDE, DEMCO, KEMA, SEMCO, SEV, BSI, NEMKO, UL, VTE and OVE.

PUMP RESET

In the event of the pump overheating there is an automatic or resetable type thermal switch. On all metal pumps the auto/reset thermal switch can be found on the coil of the pump. On pumps that have encapsulated coils, the temperature switch is mounted on the pump and will need to be re-set by simply pushing in the red rubber cap, thus restoring power to the pump.



Excessive prolonged use or allowing the machine to run dry are the only events likely to cause a pump to trip out. Allowing the pump to run dry continuously, however, may also damage the pump.



Always ensure that there is plenty of JEM Fog Fluid in the machine. Do not allow foreign bodies to contaminate the fluid and never dilute the fluid with tap water. Use only genuine JEM fluid. Some cheap imitations on the market are known to cause serious damage to machines and their use will void all warranties.

QUICK-RELEASE PIPE FITTINGS

The SERIES 428 system uses some push-in compression fittings that can be easily pulled apart by hand. To release a nylon pipe, simply press the brass ring at the base of the pipe inwards with your thumbnail and pull the nylon pipe out. To re-assemble, simply push the pipe firmly back into the fitting. The joint automatically seals itself. Other compression joints use a brass nut and olive joint, and should be dismantled by an engineer. A sealing compound will be needed to properly re-seal these types of joints.

PLATINUM FILM SENSOR

The platinum film sensor is extremely fragile and so great care must be taken when replacing this piece of equipment. It is located under an aluminium plate on the top of the heater block. There is a 20 micron film of glass covering the platinum in the sensor. Be very careful not to scratch the glass and also make sure the small strip of mica is fitted over the glass screen. This protects the glass from being scratched by the aluminium protective plate. Once replaced and before re-connecting the wires, use a suitable test meter and check for a resistance of 100 ohms across the wires, with the aluminium block at room temperature. Also check to see that there is no reading between either sensor wire and the chassis. A reading between wire and chassis is a fault condition and indicates an insulation breakdown or possibly a broken sensor.

ROUTINE MAINTENANCE

The fluid filter is located in the bulk-head that is fitted in the plastic cap of the fog liquid bottle. We recommend that these are thoroughly cleaned or replaced once a year. The external case of the machine should be wiped occasionally with a damp cloth and some mild washing-up liquid. Do not use abrasive cleaners or any form of spray cleaners, which can penetrate the grilles. Polishes harden or burn if they come into contact with hot parts. Allow machine to cool before attempting to wipe clean to avoid accidental burns from the nozzle.

DUCTING

The SERIES 428 heads can be fitted with the JEM ducting system consisting of a 5 meter (16.25 feet) x 4" diameter trunking and an adaptor to fit onto the front cowling of one Head. It must be noted that when ducting is used a proportion of the smoke will condense back into fluid in the ducting. A "U" bend can be formed with a suitable container to catch the droplets. Ducting is not recommended for installations where the machine is mounted in the ceiling. For alternative methods of ducting, please ring our technical department.

SERVICING THE MACHINE

In the event of having to do any servicing on the machine, use a JEM authorised dealer who will be qualified to work on this equipment. A preliminary inspection may be carried out by first disconnecting the machine from the mains (A.C.) supply before any attempt is made to gain access to the machine's interior. Remember to carefully retain all screws etc. Do not dismantle pipework joints unless there is a clear need to do so. Problems can arise from air-leaks in the fluid line due to badly re-assembled joints or damaged pipes causing the pump to not prime properly. Look out for tell-tale signs of air bubbles or for signs of escaping fluid if this is suspected. It may be necessary to bleed the system if excess air is trapped in the line.

PARTS AND LABOUR GUARANTEE

The SERIES 428 has a 5 year guarantee:- 1 year parts and labour plus an additional 4 year parts guarantee To qualify for the additional 4 year guarantee, your SERIES 428 must be checked over annually by JEM Smoke Machine Co. Ltd., or an authorised JEM dealer, JEM distributor or JEM qualified personnel. Machines produced from May 1986 are all fitted with fluid filters which can be found on the inlet to the non-return valve. We recommend these are replaced or cleaned once a year by qualified service personnel. ***This guarantee is void if the SERIES 428 is tampered with, misused, repaired by unauthorised personnel, suffers accidental damage or is modified in any way. JEM Smoke Machine Co. Ltd reserve the right to change or alter specifications without notice. JEM Smoke Machine Co. Ltd will not accept liability for freight, carriage, packing or any ancillary charges.***

OPTIONAL EXTRAS

Complete Ducting System Inc. Adaptor * Additional pump kits * Ext. cable kits
Interface for additional Heads * Additional Fog Modules * Ext. fluid line kits

TROUBLE-SHOOTING/DIAGNOSTICS CHART

SYMPTOM

CURE

Green light on machine when machine plugged in. Machine cold.

1. Sensor broken.
2. Wire broken off sensor or pcb.
3. Earth wire off pcb or bad earth connection.

Machine emits fluid when cold. LED red

1. Opto-isolator or pump triac faulty. Replace.
2. Bad earth or earth broken on DIN socket.

Red LED on. Machine not heating.

1. Machine tripped. Reset.
2. Heater open circuit. Replace.
3. Heater wire broken. Re-connect.
4. Bad neutral connection at terminal block.
5. Bad crimp on terminal strip.
6. Thermal trip faulty. Replace.

Red LED on all the time. Machine overheating.

1. Sensor shorting to earth. Carry out sensor test.
2. Faulty triac. Replace.
3. Check if thermal trip by-passed.

Machine operates continuously when Yellow mode reached (remote versions only).

1. Pump triac faulty. Replace.
2. Wires shorting on DIN socket or faulty remote button.
3. Fault in remote lead or plug. Rectify.

Machine stays in Yellow mode and continues heating until trip functions.

1. Sensor wires touching or sleeve pierced by opto-isolator pins on rear of pcb. Rectify.

Poor or no smoke emission.

1. Check for air bubbles in fluid lines. Identify air leak and repair.
2. In-line filters blocked. Clean.
3. Solenoid valve faulty or re-filled wrong way round.
4. Block restricted. Replace.

425 WIRING (NEW MODEL)

IF SOLENOID ISNT PRESENT LEAVE

OUT WIRES BELOW:

- PC 3 NUMBERS ON Rig -
- 3, 2 (NOT REQUIRED WITHOUT SOLENOID)

IF FITTING SOLENOID

FOLLOW DIAGRAM IN FULL, ALSO DIN LINES NEED CHANGING, AND CONTAINER MODIFING (SEE MANUAL)

KEY

- S - SENSOR BL - BLUE (NEUTRAL)
- R - RED BR OR BROWN
- E - EARTH
- O - ORANGE
- P - PINK

