MODEL 1900
FOG MACHINE

Operating Instructions

April, 2007

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ROSCO MODEL 1900
Operations Manual

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INTRODUCTION

This manual offers a detailed explanation of the operation of the ROSCO MODEL 1900 smoke machine. To assure efficient and safe operation, please take a few minutes to read this material.

The ROSCO MODEL 1900 smoke machine is a thermal aerosol generator designed for very high variable fog output. It is part of a system, the other basic component being the full line of Rosco fog fluids, and they should always be used together. These unique fluid formulations are safe when used according to instructions. They are water-based and contain no petroleum distillate. The operating temperature, pump pressure, and output nozzle orifice of the machine have beeen specifically set to maximize aerosolization of the Rosco fluid. When used properly, the system should operate for many years.

IMPORTANT SAFEGUARDS

READ AND UNDERSTAND THESE SAFETY PRECAUTIONS BEFORE OPERATING THE MACHINE. FAILURE TO PROPERLY FOLLOW THESE PRECAUTIONS MAY LEAD TO A FIRE, EXPLOSION, OR ELECTRICAL SHOCK.

FOG FLUID HEALTH CAUTION: VAPOR FROM THIS FLUID, LIKE ANY OTHER COMMON MATERIAL IN A VAPORIZED STATE, MAY BE IRRITATING TO OR CAUSE ALLERGIC SYMPTOMS IN SOME PERSONS WITH ALLERGENIC SENSITIVITY. DO NOT EXPOSE AT CLOSE RANGE TO KNOWN ASTHMATICS.

1. This machine uses electrical power at common commercially available voltages. When directly contacted, such voltages are hazardous to human life. All precautions commonly applicable to the use of electric power generally are applicable to the use of this machine. This machine is designed to operate from three-wire power systems where one of the wires is a safety ground. DO NOT disconnect the safety ground or use extension cords or "cheater" plugs to connect this machine to a two-wire system. Operation without a safety ground may result in a hazardous electrical shock.

2. Check the current and voltage rating of your machine. Extension cords must be properly sized and rated for voltage, current and length. Check your local electrical code for the correct gauge extension cord. If an extension cord shows signs of wear or gets warm to the touch, discontinue its use and obtain a cord with a higher current rating. Improper extension cords are not only hazardous, but may result in poor machine performance due to excessive voltage drop.

3. Never use any machine that shows signs of improper use. Even slight damage may be an indication of a major problem. If the machine looks questionable, use it only under strict observation. If the machine shows any unusual behavior, disconnect machine immediately from power and send machine to a Service Center for repair.

4. Do not operate the machine in a tightly confined space where the ambient temperature might exceed 135° F (57° C). A continuous flow of air is required to maintain temperature within the machine housing. Sensitive electronic components deteriorate rapidly under high heat conditions. Operation of the machine in an enclosure of less than ten cubic feet (one cubic meter) is dangerous, and automatically voids the warranty.

Enclosing any heating device so it is invisible to the operator creates a potential fire hazard, no matter what the ambient temperature of the enclosure. To do so with any high-amperage device is to assume substantial risk. Rosco strongly recommends against it.

5. In any facility, the smoke concentration should be controlled. The smoke should never mask emergency exits, safety signs, staircases or other safety constructions.

6. After long use, or if the machine is not properly set, some liquid droplets or wet area may appear in front of the machine’s outlet. This liquid should be wiped up to prevent a condition where someone might slip and fall.

7. Machines are designed for continuous use over an 8-hour day, but to protect components, it is wise to turn off the machine when it is not in use. In permanent installations, it is advisable to equip the circuit with a night cut-off device.

8. During the warm-up phase and during operations, people should not stand within one meter of the front of the machine. Flammable material like paper, fabric, etc., should never be placed directly on or around this equipment, or any other electrical device with a heating element.

9. The smoke should be blown into an open space and should not be directed at people or objects. Never blow smoke on hot surfaces, into glowing heating elements or into open flames. The normally non-flammable and non-toxic smoke could react on very hot surfaces and be burnt or decomposed.

10. Unauthorized repair or alteration of any safety devices can lead to improper operation and accidents. Repairs should be performed only by an authorized Service Center.

WARNING: USE OF ANY FLUID OTHER THAN ROSCO FOG FLUIDS OR MODIFICATION OR ATTEMPTED UNAUTHORIZED REPAIR OF THE ROSCO MODEL 1900 WILL IMMEDIATELY INVALIDATE THE WARRANTY.

HOW THE MACHINE WORKS

When the heat exchanger has reached proper operating temperature, the operator switches power to the siphoning pump, which draws the fluid from an external reservoir into the heat exchanger. The fluid is rapidly heated and vaporized. The vaporized fluid is then discharged through the nozzle into the atmosphere where, upon mixing with the cooler air, it turns into an aerosol consisting of millions of fine particles.

NOTE: The terms “fog” and “smoke” are used interchangeable. However the ROSCO MODEL 1900 does not produce smoke, but a mist or aerosol.

OPERATING INSTRUCTIONS

1. POWER HOOK-UP

Connect the power cord into a socket rated at the proper voltage and amperage. The machine requires a dedicated power circuit. Turn on the main power switch (I/O) located at the rear of the machine.

2. REMOTE CONTROL

The remote control fits into a cavity on the rear of the machine. The Model 1900 ships with the remote control already screwed in place and can be removed. If it is not already plugged in, plug the remote control into the socket in the cavity on the back of the machine. Push the grey button marked POWER ON. This will enable the electronics and the unit will start to heat up. The red LED on the Remote Control should light up indicating that the electronics are enabled. The red LED on the top of the machine should light as well indicating that the machine is heating up.

Note: The Rosco Model 1900 Fog Machine will operate either from the Remote Control, from a lighting control console using the optional DMX Remote Control (see below) or as a unit in a daisy chain (see below).

3. WARM UP

Let the machine warm up for about 9.5 minutes until the green LED on the top of the machine turns on. The machine is now ready to use, as long as the green LED remains on and the fluid reservoir contains fluid.

4. FLUID DELIVERY

Place either the 2.5-liter or the 4-liter size bottles of any Rosco fluid in the cavity located at the rear of the machine. Place the end of the tube coming out of the top of the machine into the bottle. A cap is provided that fits on the bottle.

NOTE: The machine only works with uncontaminated Rosco fog fluids. Other manufacturers' fluids may cause spitting and serious clogging problems and could result in the production of an unhealthful aerosol. **The use of other fluids voids the warranty of the Rosco Model 1900 Fog Machine.**

5. PRODUCING FOG

To produce fog, push the red FOG button located on the remote control. Push the switch again to stop producing fog. The volume of the fog can be varied by turning the knob marked FOG LEVEL. **Note:** At higher outputs the machine will give a large burst and then ramp back the volume. This is to allow the machine to run continuously and is normal.

CAUTION: If the fluid bottle is empty, DO NOT run the pump. Running the machine without fog fluid can seriously damage the pump.

6. TIMERS

The Rosco Model 1900 Remote Control is equipped with timers as standard epuipment. To enable the timers, push the grey TIMER ON button on the remote. The green CYCLE LED will be lit. To set the amount of time that the machine will make fog, adjust the FOG ON

knob. To set the delay between bursts, adjust the FOG OFF knob. The range of time for both FOG ON time and FOG OFF time is 2-18 seconds.

NOTE: The numbers indicated by the FOG ON and FOG OFF knobs are relative and should be used for reference only.

7. DAISY CHAIN (OPTIONAL)

The Rosco Model 1900 has the capability to control up to 4 machines from a single controller. In this "Daisy Chain" process, the machine that controls the others is called the MASTER and the others are called SLAVES. Make sure that a Remote Control is attached to the MASTER machine as outlined in Step 2 and all Remote Controls are removed from all the SLAVE machines. Connect a cable with a male 3-pin XLR connector at each end to *the link socket on the top* of the MASTER machine and connect the other end to *the remote connection* on the first SLAVE machine. Repeat the process from the first SLAVE machine to the next. As many as 4 machines may be operated from a single remote. Operate the remote as outlined in Steps 5 and 6 above.

8. DMX CONTROLLER (OPTIONAL)

The Rosco Model 1900 has the option to be operated from a lighting control console that uses a DMX signal. After removing the Remote Control, attach the optional DMX Interface to the remote control connection.

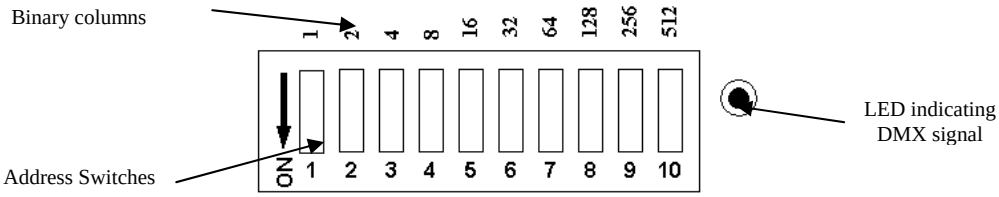
Attaching DMX cable: Plug a standard 5-pin DMX cable in the connection narked DMX IN on the remote. Note that the DMX can pass through to another device by plugging another cable into the DMX OUT plug.

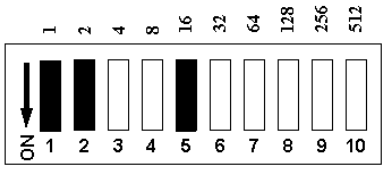
Setting the address: To set the DMX address, use the dip switches located on the DMX interface. The dip switches are based on the binary system, so the channel number must first be converted to a binary number. (See illustration). When the dip switch is in the down position, it is "on". When there is a valid DMX signal, the LED next to the dip switches will light. **NOTE:** The Rosco Model 1900 uses one DMX channel.

Operating the unit: Turn the power switch (I/O) on. If the DMX interface is plugged in the machine will automatically start to heat up. This will be indicated by the red LED on the top of the machine. When the machine reaches proper operating temperature, the green LED on top of the machine will light. When the proper DMX channel is given a non-zero value, the machine will make fog. The fog volume will be proportional to the value of the channel setting.

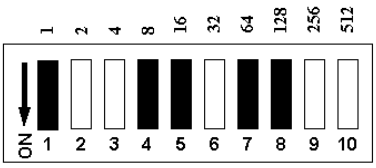
Test Button: There is a red momentary test button located on the DMX Interface. This button is operable if the machine is on and the DMX interface is plugged in. When the machine is at proper operating tempearture (as designated by the green LED on top of the machine), pressing the Test Button will momentarily make fog.

DMX INTERFACE ADDRESS

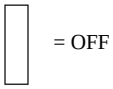




Address for Channel 19
1+2+16=19



Address for Channel 217
1+8+16+64+128=217


= OFF


= ON

DO'S & DON'TS

DO	Read the entire manual before operating the machine and pay particular attention to all CAUTIONS AND WARNINGS.
DO	Use ONLY Rosco manufactured fluids.
DO	Use an extension cord which is properly rated for voltage, current and length and which is free from nicks or other signs of wear.
DO	Before each operating period, check to see that the machine is clean and free of foreign objects.
DO	Test first for dry smoke.Turn the FOG switch on. Place a piece of cardboard or paper 18 inches in front of the machine. If the surface is at all wet return the machine to your dealer for servicing.
DO	Ensure that the machine is adequately ventilated.
DO	Use proper caution when handling hot surfaces
DO	Use the **minimum** amount of smoke required to achieve the desired effect.
DO NOT	Use the machine near a person who has asthma or similar inhalation disorder.
DO NOT	Use any foreign substances in the machine.
DO NOT	Use a machine that is damaged or operating improperly in any way.
DO NOT	Use a machine that leaks fluid from the housing.
DO NOT	Leave the machine switched on for prolonged periods without producing fog.
DO NOT	Enclose the machine.
DO NOT	Install the machine in such a fashion that the operator cannot see the whole machine including indicator lights.
DO NOT	Touch the shielded nozzle of the machine. Allow sufficient cooling time after operation before attempting to perform maintenance.
DO NOT	Direct the smoke continuously against the same spot. This may eventually cause fluid to recondense on walls, furniture, sets, etc.

READ THE COMPLETE MANUAL TO INSURE SAFE OPERATION.

MAINTENANCE

1. There are two fuses on the ROSCO MODEL 1900 smoke machine, one is located on the circuit card inside the machine and the other is located on the rear, below the mains switch. **NOTE:** Be sure to check the specifications when replacing any fuses.

WARNING: DISCONNECT THE ROSCO MODEL 1900 FROM POWER BEFORE CHECKING OR REPLACING THE FUSE. FAILURE TO DO SO COULD BE HAZARDOUS AND RESULT IN AN ELECTRICAL SHOCK.

2. After every operation, the siphon hose should be removed from the external reservoir. The machine should be turned on and fog produced. When there is no more fog coming out of the machine, the machine should be **immediately** turned off.

3. After every operation, **only after the machine has cooled**, it should be wiped with a clean damp cloth or paper towel. This practice prevents the build up of dirt and dust which may enter the machine and damage sensitive internal components. Do not use solvents for cleaning. Soap and water are effective.

4. Before and after the machine is stored for an extended period, the machine should be properly cleaned. The best method for cleaning is using distilled or de-ionized water. To flush the machine, turn it on and, when ready to use, put the fluid pick-up tube into a container of distilled or de-ionized water. Run the water through the machine and flush for three minutes. The tube should be removed from the water and the machine run until nothing comes out of the nozzle. The machine should be **immediately** turned off.

5. During use, operation of all switches and indicator lights should be monitored. Lights that blink or flicker when they should be on or off, for example, are an indication of problems in the machine's circuitry.

FOG DISTRIBUTION

The fog distribution in an enclosed area depends on air flow and temperature. Natural air movement, air conditioning and other ventilation systems will affect movement of the fog. Test under realistic conditions before using. If a space must be filled very quickly, move the machine up and down and side to side. To conduct fog to particular areas, use a hose adaptor and ducting hose (see OPTIONAL ACCESSORIES). Make sure that there is an air space of 2-3 inches between the nozzle and any ducting hose. Do not use ducting hose smaller than 4 inch diameter. The ROSCO MODEL 1900 works properly only in a horizontal position. Do not tilt the machine during operation.

ROSCO OFFICES WORLDWIDE

If the machine fails and repairs are required, call or write the nearest Rosco office (listed below) or your local Rosco dealer.

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LIMITED WARRANTY

ROSCO LABORATORIES, INC. warrants to the original purchaser that the ROSCO MODEL 1900 will be free from original defects in workmanship and material for a period of twelve months from the date of purchase. During the warranty period, machines will be repaired or replaced at the option of ROSCO.

The warranty does not extend to any parts of the ROSCO MODEL 1900 that have been subject to misuse or accident. Neither does the warranty cover any machine that has been opened, modified or repaired other than by ROSCO or its designated repair station.

The warranty will not apply if procedures described in the Operations Manual are not followed. It is the user's obligation to clean and maintain the ROSCO MODEL 1900 according to these instructions, and to follow acceptable practices for handling electrical devices.

NOTE: USE OF ANY FLUID OTHER THAN A ROSCO BRAND FLUID WILL VOID THE WARRANTY.

STORAGE AND SHIPMENT

If you do not anticipate using your machine for an extended period, prepare your machine for storage as follows:

1. Perform maintenance as outlined in "Maintenance" section.

2. Wipe the outside of the machine clean.

3. Store in a sealed cardboard box.

4. Whenever the unit is shipped, considerable care should be taken in packing to avoid damage in transit.

ROSCO MODEL 1900
TECHNICAL SPECIFICATIONS

POWER REQUIREMENTS
115 volts, 60 Hz., 15 amps
230 volts, 50 Hz., 7 amps

PARTICLE SIZE
0.25-60 microns

DIMENSIONS
Height: 8.5 in. (21.6 cm)
Width: 9.75 in. (24.8 cm)
Length: 22.5 in. (57 cm)

WEIGHT
27 lb. (12.3 kg)

REMOTE CONTROL
Volume Control
Sequencers
On time: 2-18 seconds
Off time: 2-18 seconds

MAX. FLUID CONSUMPTION
6 liters/hour

FUSE
15/115v
10/230v

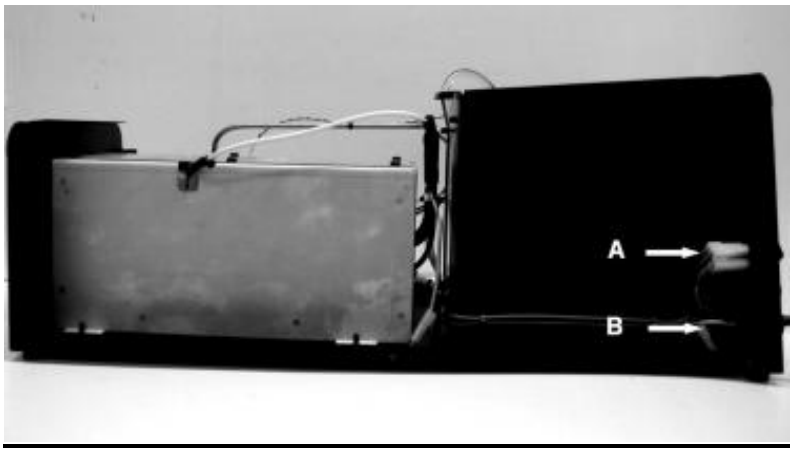
OPTIONAL ACCESSORIES

DMX INTERFACE
Allows the machine to be operated from a lighting control console.

HOSE ADAPTOR
Metal frame that connects ducting hose to machine
Dimensions: 4 in. (10.2 cm) x 6.75 in. (17.14 cm)

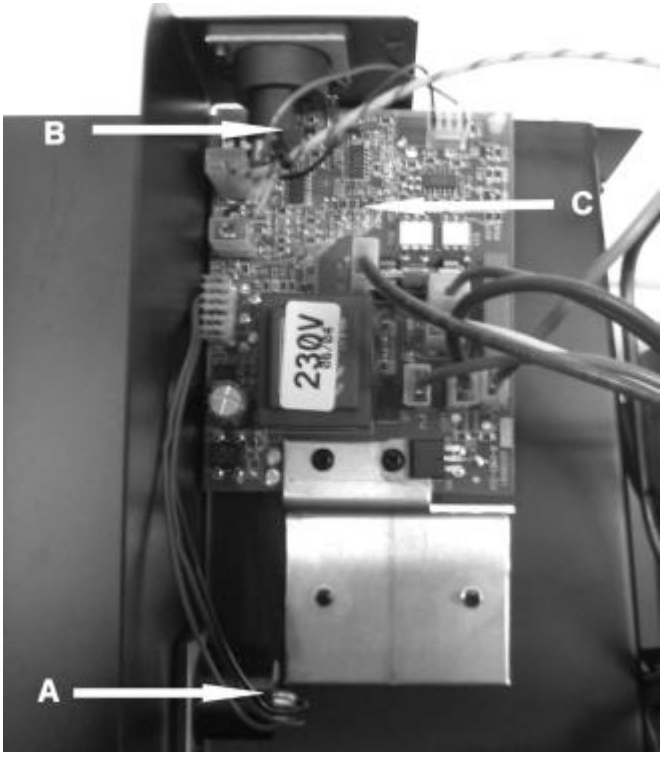
DUCTING HOSE
Flexible, plastic hose, connects to hose adaptor for ducting of fog
Dimensions: 4 in. (10.2 cm) x 25 ft. (7.62 m)

ROSCO MODEL 1900 PARTS IDENTIFICATION GUIDE
Left View with Cover Removed



A. Mains Switch # 23711700E001
B Fuse Holder (240V)
Fuse Holder (110V)

Right View: Main PCB and XLR

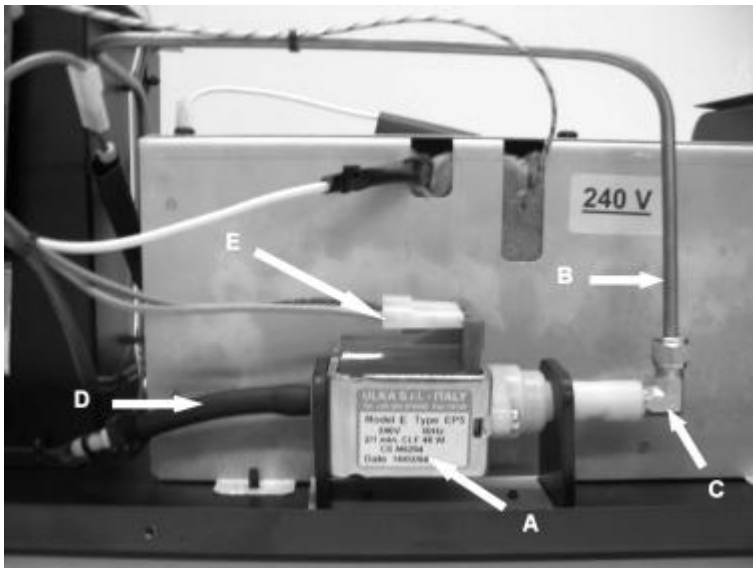


A. 3 Pin male XLR-Panel Mount #23711700E009
B. 3 Pin female XLR-Panel Mount #23711700E010
C. Main PCB (240v) # 23711900E240
   Main PCB (110v) # 23711900E110

Rear View with Remote

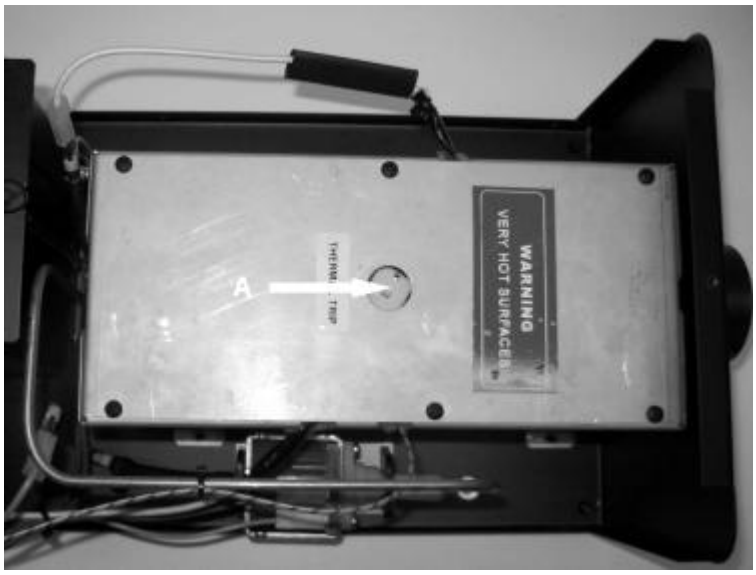
A. Mains Switch #23711700E001
B. Fuse Holder
C. Remote Control #23711700R001

ROSCO MODEL 1900 PARTS IDENTIFICATION GUIDE
Left View: Pump and Fittings



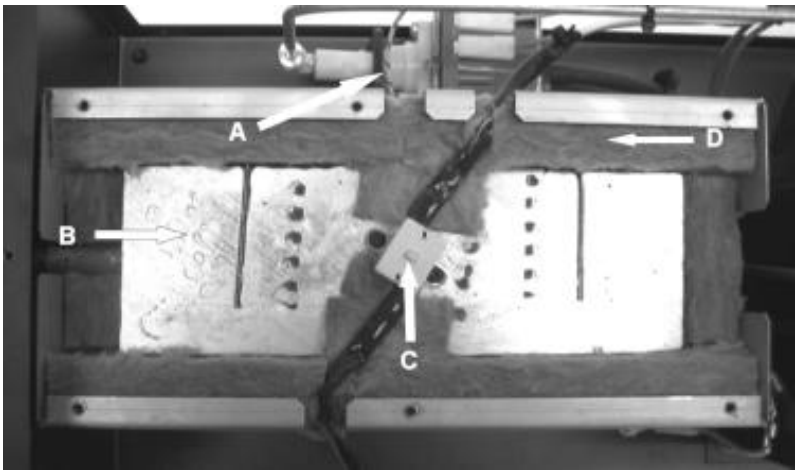
A Pump 240V # 23711700F240
Pump 110V # 23711700F110
Pump 100V # 23711700F100
B Fluid tube to heat exchanger (part of HE assembly)
C Elbow 1/8 x 3/16 # 23711900F001
D Rubber connecting tube # 23711700A002
E Main power connection to pump. When reconnecting power to the pump, please ensure that the positive goes to the diode side of the of the two connectors (this is marked on the pump body)

Top View: Heat Exchanger Assembly (closed)



A. Hole in heat exchanger housing to access Thermal Trip

ROSCO MODEL 1900 PARTS IDENTIFICATION GUIDE
Top View: Heat Exchanger Assembly (open)



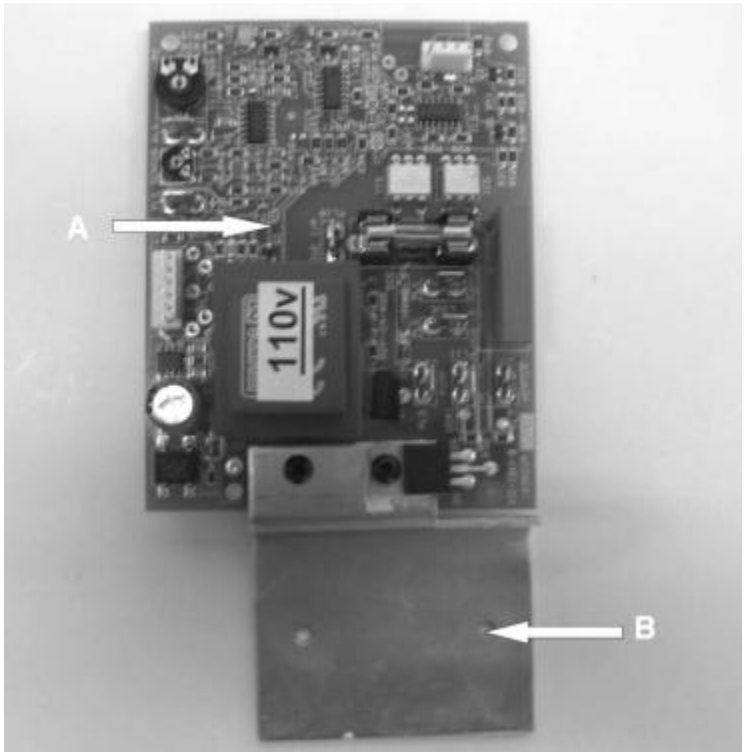
A. Thermocouple attached to the heat exchanger.
B. Heat Exchanger Assy. 240V # 23711900H240
   Heat Exchanger Assy. 110V # 23711900H110
C. Thermal Trip (240V) # 23711700E005
   Thermal Trip (110V) # 23711900E006
D. Insulation Kit # 23711900H001

ROSCO MODEL 1900 PARTS IDENTIFICATION GUIDE
Remote Control

A	FOG Switch
B	POWER ON switch
C	TIMER ON switch
D	FOG LEVEL knob
E	TIMER OFF knob
F	TIMER ON knob
G	Male XLR Connector # 23711700E002

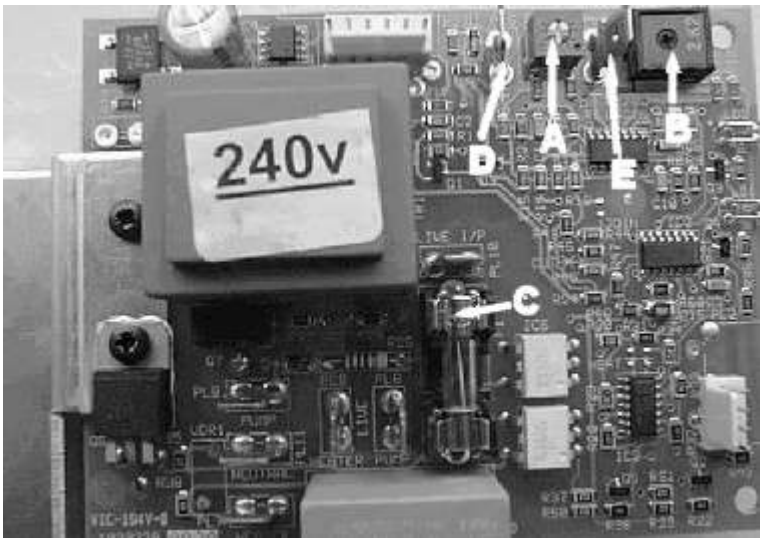
All knobs # 23711700R002

ROSCO MODEL 1900 PARTS IDENTIFICATION GUIDE
Main PCB with Heatsink



A	Main PCB (240v) # 23711900E240
	Main PCB (110v) # 23711900E110
B	Heatsink # 23711900E011

ROSCO MODEL 1900 PARTS IDENTIFICATION GUIDE
Main PCB: Fuse and Calibration



A. Calibration potentiometer for TEMPERATURE CONTROL
B. Calibration potentiometer for PUMP SPEED SETTING
C. Fuse 10 amp (240v) #23711900E003
   Fuse 15 amp (115v) #23711900E004
D. Positive terminal for the thermocouple.
E. Negative terminal for the thermocouple.

Temperature recalibration
Adjust the potentiometer (**A)** while taking a voltmeter reading between terminals (**D) & (E)** in millivolts. Reading should be **13.6 mv (+/-0.2mv)** at the point where the heater switches off (red LED goes out). Once this has been done recheck meter reading to confirm the setting.

WARNING- THE GREEN THERMOCOUPLE WIRE IS NEGATIVE AND THE YELLOW IS POSITIVE. IF THESE ARE ATTACHED INCORRECTLY THE HEATER WILL LOCK ON.

Pump speed recalibration
Set the output level on the remote control to "0". Turn on the machine and slowly turn the potentiometer **(B)** until fog just begins to flow.

ROSCO MODEL 1900 TROUBLESHOOTING GUIDE

SYMPTOM	PROBLEM	SOLUTION
Machine does not fog when READY light is on and fog button is pressed	Broken fog switch on remote Defective Remote PCB Break in remote cable Loose wire on remote header on PCB Faulty pump Component failure on main PCB	Replace fog switch Replace remote PCB Replace remote cable Recrimp wire into header Replace pump Test or replace PCB
Machine pumps but has no output (No smoke)	No fluid in bottle Fluid tube into machine is blocked or kinked Pump or fitting on pump is leaking air into the system Blocked heat exchanger	Fill bottle with fluid Replace fluid tube Reseal or replace fittings Replace heat exchanger (Check that only Rosco fluid is being used)
Machine pumps but has low output (Reduced output)	Fitting on output side of pump leaking Metal tubing on input side of block leaking Heater block beginning to block	Reseal or replace fitting Replace heat exchanger Flush block with de-ionized or distilled water
Fog is wet and leaves a trail of fluid in front of the machine	Temperature of machine set too low Wrong fluid in machine Pump speed set too high	Re-calibrate main PCB (see page 20) Ensure only Rosco fluid is being used Recalibrate pump speed (see page 20)
Machine spits hot fluid	Temperature of machine set too high Main PCB faulty Thermocouple faulty	Re-calibrate main PCB Replace main PCB Replace thermocouple
Thermal trip cuts out	Heater block over temperature Thermocouple dead short	Replace Main PCB Replace thermocouple

ROSCO MODEL 1900 PARTS LIST

HEAT EXCHANGER

23711900H110	Model 1900 Heat Exchanger Assy 120v
23711900H240	Model 1900 Heat Exchanger Assy 240v
23711900H001	Model 1900 Insulation Kit
23711700E005	Model 1700/1900 (230V) Thermal Trip
23711900E006	Model 1900 (120V) Thermal Trip

FLUID SYSTEM

23711700F100	Model 1700/1900 Pump 100v/50Hz
23711700F120	Model 1700/1900 Pump 120v/60Hz
23711700F240	Model 1700/1900 Pump 240v/50Hz
23711900F001	Model 1900 Elbow 1/8 x 3/16
23711700A002	Model 1700/1900 Rubber tube connector
23711700F002	Model 1700/1900 Pre-drilled cap
23711700F003	Model 1700/1900 Filter
23711700F004	Model 1700/1900 Plastic hose clamp
23711700F005	Model 1700/1900 Fluid line

ELECTRICAL SYSTEM

23711700E001	Model 1700/1900 Mains Switch
23711900E007	Model 1900 (230V) Mains Cable
23711900E008	Model 1900 (120V) Mains Cable
23711700E002	Model 1700/1900 Male XLR Connector
23711700E009	Model 1700/1900 3 Pin male XLR PM
23711700E010	Model 1700/1900 3 Pin female XLR PM
23711900E003	Model 1900 Fuse (240v) (PCB and chassis)
23711900E004	Model 1900 Fuse (120v) PCB only
23711900E005	Model 1900 Fuse (120v) chassis only
23711900E110	Model 1900 Main PCB (120v)
23711900E240	Model 1900 Main PCB (240v)
23711900E011	Model 1900 Heatsink

MISCELLANEOUS PARTS

23711700A003	Model 1700/1900 Rubber foot
23711700A004	Model 1700/1900 Cover screw
23711900A005	Model 1900 Box