

# G300 Operations Manual



*Please Read Carefully Before Operating*

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## Introduction

The G300 is a Microprocessor Controlled, Water Base Fog and Haze generating system.

### Microprocessor Control

The Microprocessor is responsible for the following control elements -

- Monitoring the heat exchanger temperature.
- Driving the heater within the heat-exchanger in a proportional power mode.
- Driving the fluid pump units in a pulse mode, relating fluid flow to temperature
- Accepting and manipulating data from the Flow, Duration and Interval controls.
- Accepting data from the Smoke Switch.
- Accepting data from the 0-10 volt inputs.
- Sending and receiving data relating to machine/machine linking.
- Monitoring the heater and pump power switching devices.
- Monitoring the voltage supply.
- Determining the mains frequency.
- Determining the main mode of operation and adjusting the required parameters.
- Monitoring the 31 step mode adjustment preset for parameter offsets.
- Monitoring the display preset to allow one of three display modes.
- Sending display information relating to FlowRate, Duration Time, Interval Time, Ready Status, Heater Status, temperature ( if selected) and mode step (if selected).

### Water Base Fog Technology

Water Base Fog technology is achieved by pumping a Glycol/Water mixture through a Heat exchanger. The heat exchanger has been heated to the point where at the fog fluid mixture will vaporize.

The fluids own vaporization forces the hot mixture out of the output nozzle where, when it mixes with the ambient air, it forms an opaque aerosol (fog). The fog is made up of tiny droplets of glycol that form around the small particles in the air. The suspended droplets reflect the light, which is why fog will take on the colour of the light illuminating it.

Warning

**IMPORTANT SAFETY INSTRUCTIONS**  
**Do not touch or place hands, expose skin,**  
**within 50 cm. of discharge nozzle.**  
**SAVE THESE INSTRUCTIONS**  
**READ THESE IMPORTANT SAFETY INSTRUCTIONS**

**WARNING**  
**READ THESE IMPORTANT SAFETY INSTRUCTIONS**  
**Do not remove the outer case until power has been**  
**disconnected from the machine**

**READ THESE IMPORTANT SAFETY INSTRUCTIONS**  
**Persons suffering from asthma or allergenic**  
**sensitivity may experience irritation, discomfort, or**  
**allergic symptoms when exposed to heated**  
**fog effects**

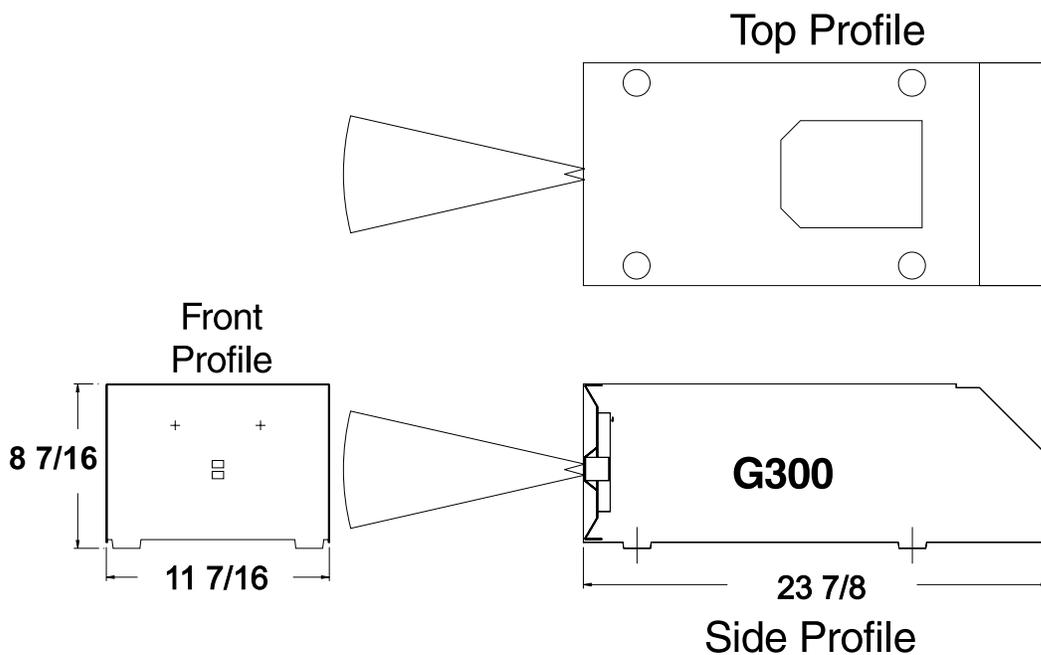
**WARNING**  
**Ensure that this unit is grounded at all times.**  
**Failure to do so may result in serious injury.**

**WARNING**  
**Never use alternative fluids. Toxicity free output**  
**is your responsibility.**

## Technical Specifications:

Model:	G300 Continuous Flow Fog / Haze Micro-Processor Control Management
Type:	Water Base Fog/Haze generating system
Size: 2" High	610 x 210 x 295 mm.    23 7/8"x11 7/16"x10 1/2" (Incl. Handle)
Weight:	24 Kilos , 52 Lbs.
Power Rating:	110 Volt A.C. 50/60 Hz    18 Amps 240 Volt A.C. 50/60 Hz    9 Amps
Facilities:	Selectable 'Haze' or Hi-Power 'G300' Mode Detachable Digital Display Remote 0-10 Volt Fog/Flow Control Fog/Flow Digital Machine Linking Flow /Fog/Data Accept Switches

## G300 Illustration



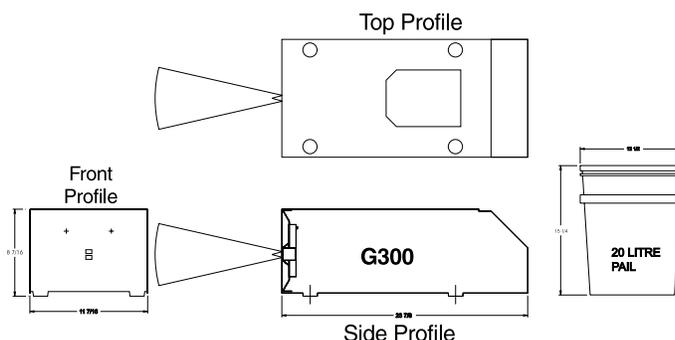
## Operating Procedure

- 1) The G300 must only be connected to a mains supply capable of sustaining at least 18 Amps, and be adequately Grounded. The supply should be 'clean' and free of interference.
- 2) The Power to the G300 should be controlled by the illuminated Mains Power switch located on the rear panel.
- 3) Shortly after switching 'ON', the digital display on the remote panel will show a 50H or 60H. This is an automatic line frequency check which allows highly accurate timing features.
- 4) The Display unit will now start flashing 'HAZE'. This is a default setting. If Regular Haze fluid is to be used, then the machine should be allowed to continue without interruption. If the Hi-Power G300 mode of operation is required where fog fluid will be used, then at this time of display flashing, the button marked 'G300 MODE' should be kept depressed. The display will change to read G300, until such time as this mode is recorded, and the machine continues in its start up procedure. The button can then be released. For those machines equipped with a G300 MODE keyswitch please refer to key card for proper keyswitch position.

### Note:

Should 'Haze' mode be selected when the machine has been operating in the 'G300' mode, then it is possible that time will be required to allow the machine to adjust to the 'Haze' characteristics.

This will be indicated by a flashing 'C' code in the Heat-Flash window of the remote control.



5) The Remote Display will now enter its standard phase. This indicates the 'Heating' power, the 'Flow' rate setting, and the 'Ready' status.

At this stage the flow rate may be adjusted freely between minimum and maximum settings. (Upon entering a 'ready to operate' phase the maximum allowable flow rate will be automatically adjusted based on the energy available. )

6) The Timer controls are of an auto-display option, and will display immediately upon being adjusted, or if set to any position apart from the Interval being 'Off' will display approximately every 10 seconds.

The 'Interval' control ( time between repeating fog issues ), allows the following selection:

'OFF'	-	No timer or time display
'1-SH'	-	Single issues upon Fog activation
'00:10'	-	Timer selection in 10 second steps
'05:00'	-	to 5 Minutes, then 30 second steps
'20:00'	-	to 20 Minutes.

The 'Duration' control ( time of actual fog issue ) allows the following selection:

'00.02'	-	Timer selection in 2 second steps
'00.30'	-	to 30 Seconds then 30 second steps
'08.00'	-	to 8 Minutes.

Note that when the automatic display of the timer settings occurs, the Interval time will have a central colon (:) whereas the Duration time will have a central point (.) displayed.

7) As the machine heats up to its operating temperature, if the flow setting has been set to maximum, there will be a point when this will readjust to a much lower value. It is at this point that the machine has reached its lowest 'ready' point. A flashing 'H' or 'G' will appear in the 'Ready Flash' window, indicating that the machine is now ready at its minimum level. The machine can in fact be operated at this point, or further time allowed for maximum issue capabilities. If the machine is allowed further time, then the 'Flow' rate will be seen to increase in its allowable maximum setting until position 31 is reached.

At this time, or shortly afterwards, the 'Heat Flash' indicator bars on the Remote handset will reduce from 3 bars to 2, and then 1 and finally no bars, as the heater switches off.

When settled, the 'Heat Flash' indicator will indicate the power being used in maintaining the working temperature. Since proportional control is used, this will vary upon the operating environment.

8) The machine may now be operated fully as desired with due attention to all prevailing safety regulations.

Note:

#### FLUID REPLACEMENT

Replacing fluid does not require any attention to 'priming' conditions. The G300 uses a unique system of fluid pumping which allows fluid system replenishment without requiring special settings of flow control.

Note:

#### 'HAZE' FLOW CONTROL

The machine will change the characteristics of the 'Flow Rate' settings when 'Haze' mode is in effect. This allows very short burst issues up to 5 seconds apart to be selected just by the 'Flow Rate' control when at its lowest 'on' setting. ('0' is actually no flow, which can be useful if only a single channel 0 -10v control is available).

This decreases to every 4,3,2, and 1 seconds, after which point normal flow control commences as the flow rate is increased.

This feature allows instant 'Hazing' to be instigated by employing a high flow setting, then allowing replenishment of loss by means of a low output, high velocity haze issue.

Note:

#### AUTOMATIC and CONTINUAL FLOW CONTROL

The G300 employs an extremely high accuracy thermal monitoring system. Combining this with Micro-Processor control and a highly stable Patented Heat Exchanger, allows a self management system to automatically adjust the flow rate for maximum conditions at any temperature. This means that regardless of energy availability, a continual flow setting is automatic. If the initial flow setting is high, then this will be decreased as flow continues, until such time as a stable situation is attained.

## Remote and External Control Features

The standard Remote Handset may be removed from the machine, and operated effectively away from the issue site. The maximum recommended cable length is 30 Metres.(100 Feet).

It is not recommended to plug/unplug the handset while the machine is still powered up. If this should occur, there is a possibility that the display will produce non readable characters if transmission is broken mid stream of a display update.

## Analog 0-10V Control

The rear panel of the machine is fitted with a 4 Pin 'XLR' connector which will allow the connection of two 0 - 10 volt lines.

One line is of a switching characteristic for the activation of fog, simulating the 'Smoke On' switch, while the second line is for analog control of the 'Flow Rate'.

Both lines can be used simultaneously for complete control, or either can be used individually.

In the case of the 'Flow Rate' line being used alone, the 'Smoke On' switch will be required to be set in the 'On' position, and a definite 0 volt condition available from the controller to switch the fog output off.

No special selection of rear panel control switches is required for this mode of operation.

## 0-10V Control Pin Assignments

The Pin Assignment for the connector port labeled 0-10 v Control are as follows:

Pin 1 Common

Pin 2 Smoke On 0- 10V

Pin 3 Flow 0- 10 V

Pin 4 (Not used)

## Machine To Machine Linking

This facility is available for the purpose of multi-machine control.

The rear panel of the machine is fitted with two 5 Pin 'XLR' connectors for 'daisy chaining' any number of machines.

Three selector switches above the Remote panel control various available options.

Please note that the protocol of the communication is exclusive to the G300.

Linking cable should be of high quality screened data type.

Communication is dealt with via opto-coupled links, which will isolate ground potential, but it should be remembered that if the cable is grounded at both ends, then any ground voltage difference could convert to high current paths between machines via this screen.

## Linking Switch Setting Options

If it is required for a machine to accept 'Flow Rate' data from an 'upstream' unit, then the 'Flow Accept' switch on this machine must be active.

If it is required for a machine to accept the 'Smoke On' switch data from an 'upstream' unit, then the 'Smoke Accept' switch on this machine must be active.

If it is required to control the next 'downstream' machine with the 'timer' control of the local machine then the 'Send Timer' switch must be active.

Using these various switching options will allow flexibility in a link up pattern, and enable individual machine setup without the need to break the linking path.

## G300/ HAZE - Mode Changing

The two modes of operation that can be performed by the G300 machine are unique in their operating characteristics. They allow distinctly different fluid types to be used for a wide range of effects.

As stated repeatedly throughout this operations manual, 'Hazing' type fluid should not be used in the Hi-Power G300 Fog Mode. Although actual machine damage will not result, long term performance will suffer as a result.

Changing modes of operation is effected at the point of switch on, and re-selection of the Hi-Power Fog mode at the time of Fluid replacement.

It is important to note that the 'user' will be responsible for ensuring that the machine is in the correct mode for the prevailing fluid type.

All that is required is a brief machine switch 'Off' then back 'On' again.

In the example given i.e. from Hi-Power G300 mode to HAZE mode, a re-adjustment period will be required for the machine to settle to the 'Hazing' characteristics. ( Indicated by a flashing 'C' in the heater flash window of the digital display.)

To allow a quicker change over from G300 to Haze, operate the machine with normal' fluid to the point of continuous flow, switch the machine off, replace the fluid with the 'Hazing' type, switch back on, and all will be well.

## Electrical Connections

The G300 must only be connected to a suitable electricity supply line. This supply line must support a suitable earth line.

The following colour codes are employed in the electrical connection.

BROWN or BLACK	-	LIVE
BLUE or WHITE	-	NEUTRAL
YELLOW/GREEN	-	GROUND

Always ensure that the G300 is properly grounded and that the supply is in accordance with the specifications on the back panel of the machine.

## Maintenance

### Exterior:

The casing of the G300 is steel with a powder paint coating. To clean simply wash with mild soap and warm water.

### Fluid Pick up:

Periodically check to ensure that the fluid pick up filter screen is in place and clean from debris.

### Heat Exchanger:

With normal use we do not recommend flushing or cleaning the heat exchanger, with the use of genuine Le Maitre fluids. Using high quality Le Maitre fluid should result in a long heat exchanger life. (See warranty policy later in this manual).

## Recommended Fluids

### Fog Fluid

This fluid has been our long standing blend. It is a clean, white, practically odourless fog. It is used for many applications where a cloud of fog is required with a medium hang time.

### Long Lasting Fluid

This is a brand new blend. We have had many compliments on our fog fluid but many of our customers would like it to hang longer so we introduced the "Long Lasting Fluid". It is still odourless but a little less white than our "Fog Fluid". It hangs in the air 2 - 3 times longer than the above "Fog Fluid".

### Quick Dissipating

We have been mixing this for some time for our special effects people working in the movies. We have decided that there are many other applications for this fluid. When using this in the LSX or LSG you will find it works very well if you are having problems with the smoke rising too quickly. It has also been used for quick burst-of-steam effects, nitrogen bursts, etc. It will dissipate at about twice the rate of the "Molecular Fluid".

#### Extra Quick Dissipating:

It is very similar to the "Quick Dissipating" but dissipates at about twice the rate of the "Quick Dissipating".

#### Molecular:

The "Molecular Fluid" was originally designed for use in the LSX, however, many other applications were found very quickly. It is a clean, white, thick fog, practically odourless and dissipates as it begins to warm.

#### Maxi Fluid:

Maxi Fog Fluid was developed for our high volume users requiring an excellent balance of price and performance without compromise.

#### Regular Haze:

The "Regular" Haze is a water based formula, and gives a quicker result with less operation time of the G300. Ideal for medium size rooms and cutting down on operational costs.

**Warning!!**  
**Never use Neutron Haze Fluid in your G300**

All of our Haze Fluids are water base and leave NO residue. The G300 must always be in Haze mode when using Haze Fluids. Permanent damage will occur if Haze Fluid is used in G300 Mode for any length of time.



## Warranty

- Warranty:** All warranty is one year parts and labour unless specified and is on manufacturer defect only. Overuse or poor maintenance is not accepted. Le Maitre fluids must always be used. Any trace of other fluids will automatically void **ALL** warranties. Accept no substitutions as there are no exceptions to this rule. Proof of purchase or proof of sale must always accompany any warranty returns. An RA (return authorization) number must be noted on the outside of any box returned to our facilities. Any packages without a clearly marked RA number will not be accepted by our receiving department. Freight on warranty items are freight prepaid to our facility and we will prepay freight back to your facility after repair, by the most economical means available. Should you require the item express-returned, then you are responsible for any difference in freight cost.
- Return Policy:** Return of any product must be done within 30 days of purchase. The package must be returned freight prepaid and the RA number clearly marked on the outside of the box. A restocking charge of up to 25% may be levied. Only credits are issued to the dealers account. Any product not returned within 30 days is considered purchased.
- Warning:** Le Maitre Special Effects Inc. considers all it's product to be safe for use in the application it was intended. Le Maitre Special Effects takes no responsibility for misuse or incorrect use. Always refer to equipment owners manual for proper use.

## Safety Precautions

1. Ensure that operation of the machine is supervised by suitably trained and authorised personnel.
2. Do not modify the machine or use a machine which has been damaged in any way.
3. Allow sufficient air circulation around the machine at all times.
4. Protect the G300 from direct weather effects and wet locations.
5. Only use fluids recommended by the Manufacturer.
6. Do not continue to produce Fog output in an enclosed area when visibility is reduced below 50cm.
7. Avoid direct Fog output continuously at persons, structure or objects within close proximity of the discharge nozzle.
8. Ensure that adequate exhausting arrangements are available in the event of an emergency.
9. Do not place hands, or exposed skin within the first 50cm of the discharge nozzle at any time during fog production.

## Accessories

Model	Description
CLF 2782	G300 with Steam (Air) Option
CLF 2777	G300 with LSG Option
CLF 2778	G300 with 20Litre Pail Option
CLF 2776	G300 220 Volt Fog & Haze Machine
CLF 2780	4" Ducting Hose Adapter
<b>CLF 2785</b>	<b>Optional DMX Interface</b>
CLF 2787	G300 Hanging Bracket
CLF 2824	Flight Case For G300 Machine
CLF 2832	Flight Case For G300 Machine with 4" Casters
CLF 2770	25' G300 Remote Cable
CLF 2771	50' G300 Remote Cable
CLF 2773	100' G300 Remote Cable

## G300 Industrial 20 L. Pail Option

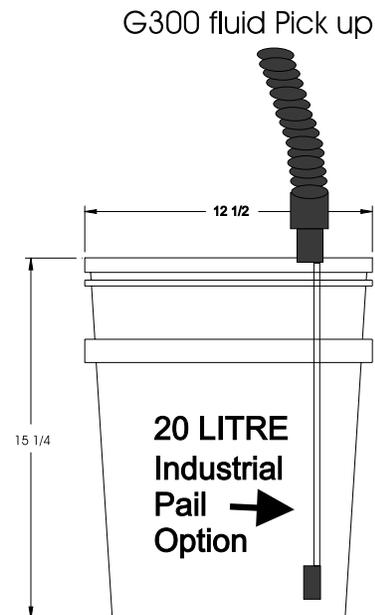
1. Follow these steps for easy setup.

- a) Remove cap from 20L pail (this will not be used, so you may want to put it in a safe place for use later on.), and remove inner cap if equipped.
- b) Examine the end of the hose from your machine and make sure the filter is in place and free from obstruction.
- c) Now place the hose into the pail's pour spout and snap the black fitting into place.

2. It is now necessary to prime fluid into the system by following these steps:

- a) Set Flow Rate fully clockwise
- b) Set duration to 0 sec.
- c) Set interval to 0 min.
- d) Switch the smoke control to ON

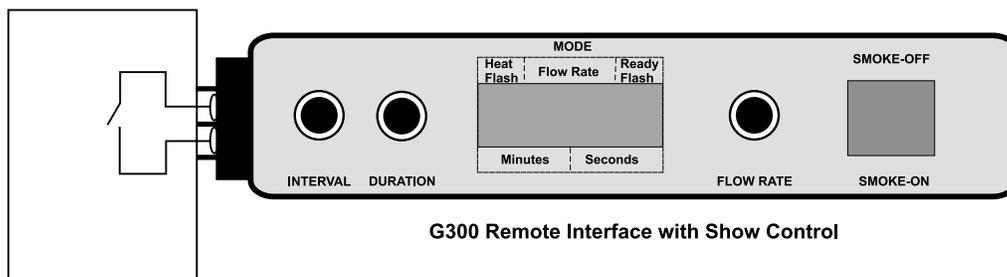
This will produce a pulsing fluid flow which will prime the machine correctly. Please allow one minute to ensure proper priming.



3. Dry Contact show control terminals have been added to your G300 remote to facilitate control through central control system. One set of Normally open contacts are all that is required.

4. Your custom machine is now ready for regular use.

Show Control Dry Contact Closure



G300 Remote Interface with Show Control

## G300 Steamer/ Air Purge Control List

A- Air pressure Gauge: This is used as a visual aid to help in setting the air pressure used in the steam simulation/ air purge effect.

B- Air Pressure Control: This is used to control the velocity of the steam/ air purge effect, with the setting being displayed on the Air Pressure Gauge in p.s.i (pounds per square inch).

C- Air Input: This quick coupler connector is used as the input for the compressed air, and is an industrial interchange 1/4" body.

D- Continuous Air Over Ride: This switch is used if continuous air output is desired. If show control air is used, this switch must be in the off position.

E- G300 Mode Control (Key Switch): The G300 is a dual operational machine which operates in Haze (H) mode or Fog (G) mode. For the purpose of steam simulation, the fog (G) mode is used ONLY. Fog (G) mode is activated when the key is in the horizontal position.

F- Show Control Smoke On (Terminals): These show control terminals control the 'fog' ON or OFF. These are dry contact controls, where the contacts are open or closed.

G- Interval Control: Controls the interval between fog bursts. If show control is used the interval setting must be 0.

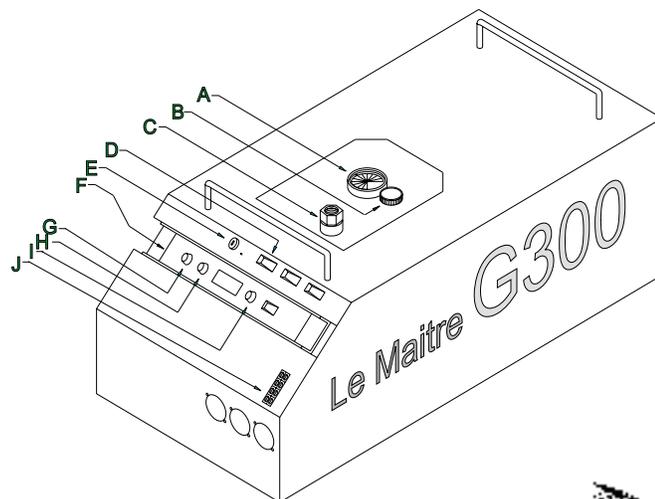
H- Duration Control: Controls the duration of fog bursts. If show control is used the duration setting must be 0.

I- Smoke Flow Control: Controls the density of the steam effect and fog volume

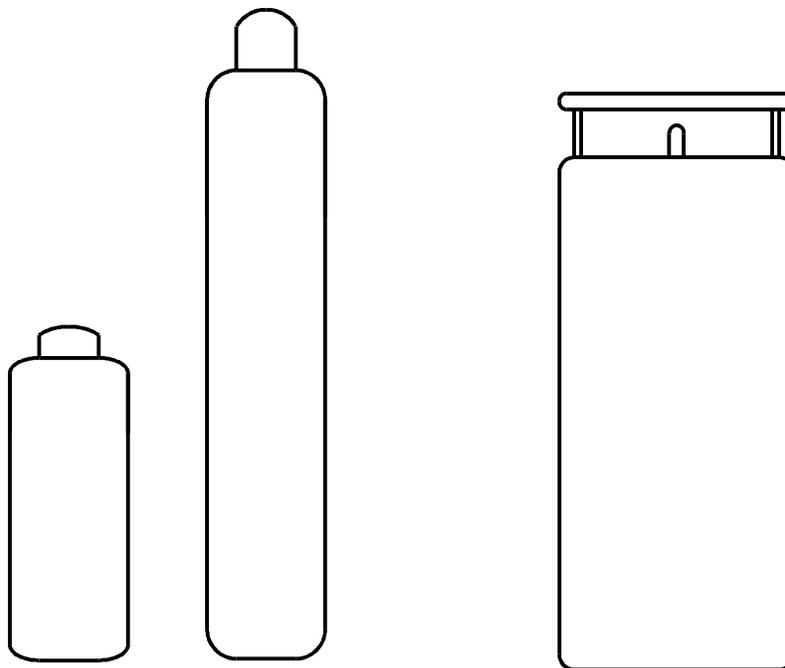
J- Show Control Air On (Terminals): These show control terminals control the air ON or OFF. If Show Control is used the continuous Air Over Ride switch must be in the OFF position. These are dry contact controls, where the contacts are open or closed.

Some experimenting is necessary to achieve each desired effect. A few points to keep in mind are the air pressure will determine the velocity of the effect, while the flow control of the fog machine will determine the density of the effect.

When using the air option as a fog purge, enough time must be allowed for the air to completely purge the heat exchanger of fog and fog fluid. Remember on the next fog cue enough time must be allowed for the fog fluid to fill the heat exchanger and exit out the nozzle.



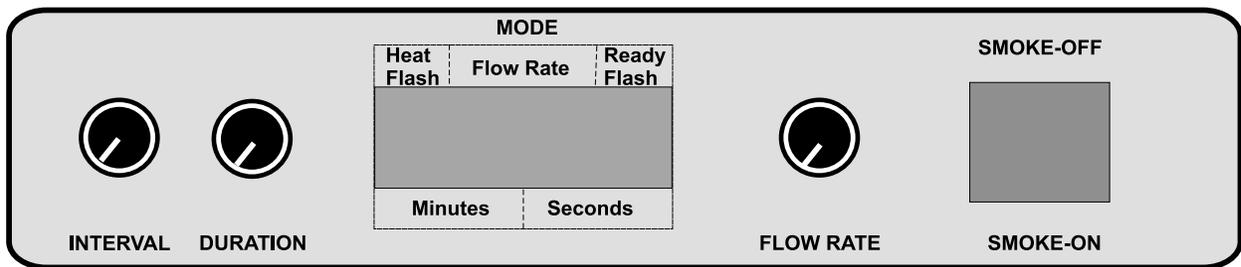
- 1.) Place the G300 directly against the foam ring input of the LSG.  
Proper alignment can be observed by shining a flashlight into the 12" exit of the LSG and noting the G300 output nozzle is centered in the LSG input.
- 2.) Connect the blue Twist lock connector into Custom port on the rear panel of the G300. (Available on G300's with LSG option.)
- 3.) Power up the G300 by turning on the Mains switch.  
Note that the G300 is in Fog mode, which is indicated by a flashing 'G ' on the remote display.
- 4.) Adjust remote interval control fully clockwise, until 'DEL' appears on the display.
- 5.) Adjust remote duration control until desired delay is achieved.  
This delay allows the liquid CO2 to purge the supply hose of CO2 gases ensuring only liquid is available for optimum cooling .  
The recommended formula for calculating delay time is 1 sec. for every three feet of supply hose.
- 6.) Adjust the remote flow rate to desired fog output level. It is recommended to start at '16' and adjust accordingly. The maximum recommended flow is :LSG High Flow rate is twenty. LSG Low Flow rate is twenty-five .



**High Pressure 20 lb. bottle**    **High Pressure 50 lb. bottle**

**Low Pressure 350 Lb. Dewar**

- 7.) The second connection to be made is the CO2 supply hose. This is connected to the liquid port of the CO2 supply. A washer is necessary to prevent leaks and are available from your gas supplier.
- 8.) A LSG Low requires a 350 Lb. Low Pressure Dewar. You must connect the supply hose to the Liquid output of the dewar. This is usually clearly indicated on the dewar outputs. The dewar pressure as indicated on the pressure gauge must read between 300 - 340 psi to operate the LSG, this is achieved by opening the pressure builder valve at least one hour in advance of use. A LSG High requires high pressure CO2 bottle. These are normally available in 20 or 50 lb. sizes. For ease of use it is recommended that bottles with liquid siphon tubes be used. If these are unavailable simply invert the bottle to obtain a liquid supply.
- 9.) Tighten the CO2 supply fitting snug with appropriate wrench .
- 10.) When the G300 Fog machine is up to operating temperature, activate the 'Smoke' button on the remote control. The CO2 will be activated, after the appropriate delay time passes smoke issue will start. Verify cool temperature output waving your hand in the outlet fog, and feeling for cool temperature.



**G300 Remote Interface**

**Note:**

**Controlling the LSG with DMX**

When controlling your G300/LSG with a G300 DMX Interface, the delay feature for purging the supply hose is not available. We recommend using the DMX/LSG interface to control the LSG, this will allow full delay flexibility between the G300 and LSG.

## G300 Flow Rates

Typical G300 Flow Rates in cc (ml.)/second

Flow Setting				Flow Setting		
	Fog	Haze			Fog	Haze
1	0.3	0.05		17		
2		0.06		18		
3		0.08		19		
4		0.12		20	1.0	
5	.5	0.25		21		1.0
6				22	1.25	
7				23		1.25
8				24	1.5	
9				25		1.5
10	0.6	0.5		26	2.0	
11				27	2.5	2.0
12		0.6		28	3.0	N/A
13				29	4.0	N/A
14				30	5.0	N/A
15	0.8			31	6.0	N/A
16		0.8				

Notes