

OWNER'S MANUAL

K1 HAZER



40510-230 K1 Hazer - EU version

Rev. 1 2019-10-03

SWE  **FOG**

BRING LIGHTING TO LIFE



IMPORTANT!

Read all cautions and warnings prior to assembly, mounting and operating this equipment.

IMPORTANT !

Prière de lire toutes les **précautions et les avertissements avant l'assemblage**, le montage et de faire fonctionner cet équipement.

WICHTIG !

Lesen Sie alle Warnungen sorgfältig bevor Sie das Gerät zusammenbauen, installieren und benutzen.

¡IMPORTANTE!

Por favor, lea todas las precauciones y las advertencias antes de ensamblar, montar y operar este equipo.

IMPORTANT!!

Leggere tutti gli avvertenti prima di montare e usare questo apparecchio.

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HOW TO USE THIS GUIDE:

For your safety, it is important that you read this manual thoroughly before you operate the K1 hazer. This manual describes how to unpack, plan for, set up and operate the machine. It also lists important safety precautions. For service & maintenance, refer to separate service manuals & technical support online.

In this manual you will find the following symbols:



CAUTION: This symbol appears adjacent to caution messages. Not heeding these messages could result in minor personal injury and/or damage to equipment.

QUICK SETUP GUIDE:

1. **Read chapter 3: "SAFETY PRECAUTIONS".**
2. Place machine on a level surface.
3. Ensure a K1 fluid container is installed
4. Connect to a 230V outlet with earth lead.
5. Machine will automatically start heating up
6. (For DMX control): Connect a DMX cable to the male XLR connector.
7. Make settings; DMX address etc.

1. INTRODUCTION:

The K1 hazer is a high-performance water-based haze generator, using the latest technology with state-of-the-art electronics, and a low-mass, wide bore heat exchanger. The hazer requires a low operating air pressure and therefore it can use a silent linear air pump. It can operate continuously without interrupts for re-heating or purging.

The fluid:

K1 uses a special developed molecular haze liquid and is NOT compatible with other fluids. The liquid is supplied as standard in 3L bag-in-box Oktagon™ containers. This patented container reduces the use of plastics with 75% compared with common plastic canisters. The outer box is made with recycled paper, and the bag & carton are recycle-able after use.

The bag-in-box system is a completely sealed container. Unlike common plastic canisters with cap, no air needs to be let into the bag while the fluid is consumed, the bag collapses flat while the liquid is consumed. Bag with a dual-layer EVOH, an environment-friendly, food-grade PE plastics (recycle-able). This material transfers 100,000 times less oxygen compared with common plastic canisters. The fluid is kept in an almost 100% oxygen-free environment during the whole consumption cycle. This means no aging of fluid, no growth of bacteria or mold, and no reduced lifetime of fluid. A bag-in-box container can be stored for long times, even after consumption started.

No loose caps or openings mean the machine and fluid can be stored, shipped & handled in any position without risk of leaking.

- K1 requires a 1-minute heat-up time only.
- It can operate continuously at full, non-reduced output as long as fluid and power are supplied.
- One 3L fluid container will last for approx. 5 hours at full (100%) output, and theoretically, up to 300 hours at 1%. Estimated for most normal venues, a 3L container will last for 8-20 hours of normal use but depends on capacity requirements.
- K1 can be connected to external fluid containers, for permanent installations. This requires a special adapter (optional).
- All internal parts are easy to service or replace.
- Parameter service control maintains the lifetime of electro-mechanical components such as pumps & filters and will remind the user when service or replacement is needed. This method is similar to motorcars, where the owner is reminded when service is required.

We hope that you will be fully satisfied with the performance and the affordable Total Cost of Ownership (TCO) offered with a Swefog K1. However, to keep your machine functioning like new throughout its entire life, it is important to follow the instructions in this manual and to perform regular maintenance of the hazer and always to use original spare parts & fluid.

NOTE: Use original K1 molecular haze fluid only. This machine is NOT compatible with other Swefog liquids, and no OEM fluids. The use of any other fluid will void the warranty, and most likely quickly damage internal components. K1 is developed for K1 fluid, and other fluids will change performance and may interfere with the machine's internal sensors. This may lead to unstable function and in the worst case become hazardous.

Eco-mode:

The machine uses an eco-mode to increase the life-time of air pump & filter. The air pump is active during fog production and for purging after fog has been produced. Then, the air pump will be automatically disabled, which increases lifetime and makes the machine silent.

If the machine is not producing fog for long periods (idle), the air pump will automatically re-start and run for a short period, and then be switched off again. This, to purge the heat

exchanger continuously and avoid clogging. Therefore, always be aware the air pump can re-start at any time when fog is not produced.

How to use this manual:

This manual contains important safety precautions and information on how to use your machine. Always read the **owner's** manual before using the machine!

Service bulletins, which contain detailed information on regular maintenance, can be downloaded from www.swefog.com. Refer all service and repair work to qualified personnel.

This manual and updates can also be downloaded as PDF-files from www.swefog.com

2. UNPACKING:

Swefog K1 hazer package contains:

- One machine + one manual.
- Please note, no mains cable is included, and no fluid.
- Save the box and packing material for future use.
- If the machine needs to be transported, ship, preferably in the original box, or in a flight case, placed on a small pallet. Use straps to fix it to the pallet to avoid damage during transport.

3. SAFETY PRECAUTIONS:



- Haze residues and fluid spillage may be dangerous. A slippery surface can cause serious personal injury! ALWAYS check surfaces before, during and after use of the machine.
- Use Swefog K1 molecular fluid only. Other fluids may damage the machine, cause residues inside and outside the machine, or cause toxic or odorous haze.
- NOTE: The fluid is made with water and food-grade polyols and may cause allergic reactions to people suffering from hyperaesthesia. Make sure that persons subjected to haze and fluids are not allergic to the substance. The original Swefog fluid is made with food-grade chemicals only and is non-toxic. But always ensure the haze will not cause inconvenience.
- Connect to mains outlet with earth. Use a cable with earth. Check for correct voltage and/or mains frequency (see machine label). NEVER use the machine with incorrect mains voltage or frequency.
- NOTE: The condensation of the haze can make floors, stairs and other surfaces slippery. Do NOT direct the machine's haze output beam towards cool or hard surfaces like wood, plastics, glass or metal. If haze is generated for a long time, check frequently that no surface is slippery.

4. HANDLING SAFETY PRECAUTIONS:



- NEVER mix or dilute the fluid.
- NEVER heat the fluid. Use room temperature fluid only.

- The machine is for indoor use only. Keep away from moisture!
- Operate in room temperature only. Min. operating temperature is +10 °C, max. temperature is +30 °C.
- NEVER cover vents or air inlets on machine housing.
- NEVER use dimmers to control the power to the machine.
- Service internal parts ONLY if you have the know-how and experience to perform the service correctly. If not, please contact a Swefog service center or the manufacturer. NOTE: Incorrect service and/or use of non-original spare parts will void the warranty.
- NEVER change or modify internal parts, use original spare parts only!
- NEVER disconnect the mains power if the machine is switched on. ALWAYS switch machine off using the 1-minute “switch off” purging cycle, see this manual, chapter “operation”. Disconnecting from mains while machine is in operation will clog heat exchanger and cause damage to the machine, not covered by warranty.
- NOTE: If there is a fluid leakage or spillage, wipe off fluid. DO NOT use the machine until it is mended.
- NOTE: The haze may cause residues on mirrors, lenses and similar components if the fog concentration is too high in the air. Equipment using fan ventilation may draw haze through the lamp housing, which may cause residues. Always check carefully where to direct the output of the machine, and keep equipment that uses fans away from the haze.

5. INSTALLATION AND PRECAUTIONS:



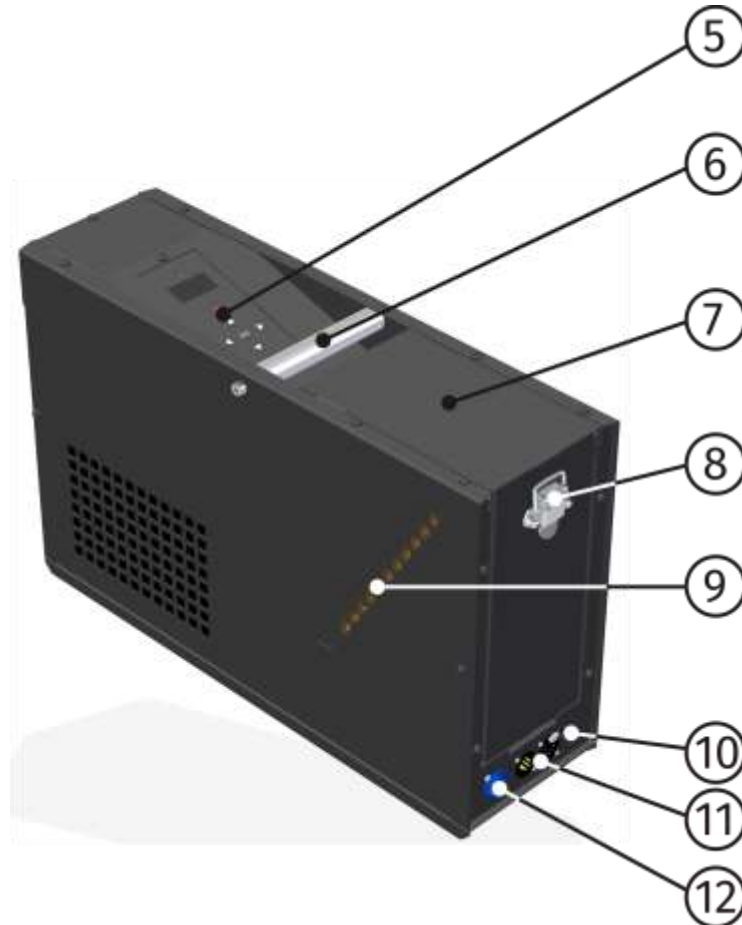
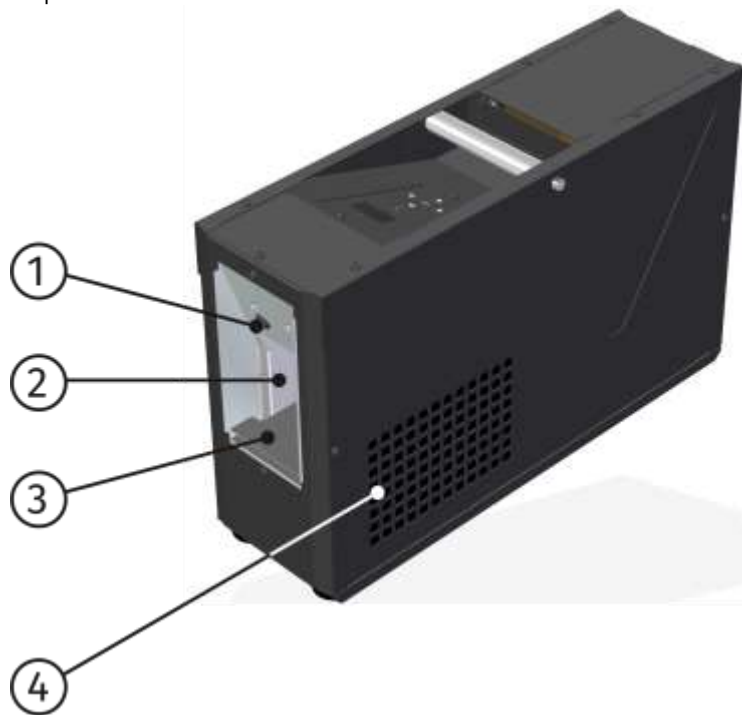
- Make sure the area in which this product is to be used is well ventilated.
- Do NOT install the machine directly above an audience.
- Do NOT direct the haze outlet directly towards an audience.
- Do NOT operate near flammable materials.
- Do NOT expose to rain or moisture. Use indoors only.



- Use only Swefog K1 molecular fluid in this machine.
- Use responsible concentrations of haze to create atmospheric effects.
- Not for residential use.
- Must be handled by qualified personnel at all times.

6.0 OPERATION:

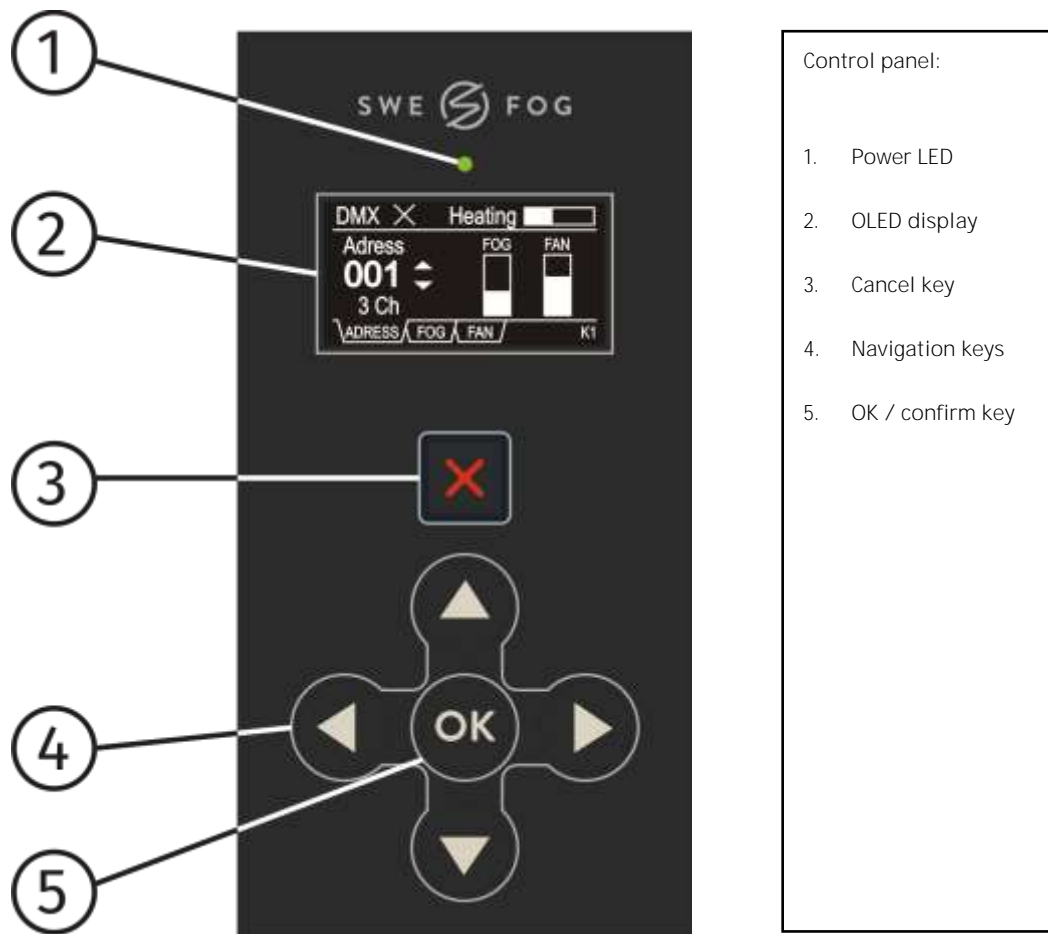
Explore the K1 hazer:



- 1. Haze outlet
- 2. Fan air outlet
- 3. Wave guide
- 4. Air inlet

- 5. Control panel & display
- 6. Ergonomic AluGrip handle
- 7. Fluid container compartment
- 8. Latch
- 9. Illuminated fluid level indicator
- 10. USB connector (type B)
- 11. XLR connectors, for DMX
- 12. PowerCon 230V mains inlet

6.1 Control panel & display:



6.2 Normal operation & preparation:



- Place the machine on a level surface.
- Connect to 230V mains outlet with earth lead, machine consumes 6,5 amps max. The machine will automatically start up when connected to mains. Heat-up time until ready is approx. 1 minute.
- Open fluid compartment, release latch (8) and open the top lid. Pull out BiB container assembly.

- To remove an empty container, pull the locking ring on the machine's female (black) connector and release coupling.



- A small amount of fluid will remain inside the connector, pour out drops onto the cellulose cloth below the connector. Replace cloth when necessary.



Clean fluid drops / spillage immediately. A clean machine will last longer and will be much nicer to handle.

- Open & prepare a 3L K1 molecular fluid container by following instructions printed on container. NOTE: K1 hazer uses fluid box knock-out opening "A".

- Grasp container & spout as the picture shows below.



- The spout flange shall be positioned in the rail, between the black & stainless metal plates. Push in spout to center position.



- Check container slips behind the edge of the fluid container assembly.



- Connect fluid line to bag spout by pulling the ring on machine's female (black) connector backward about 3 mm, push black tube connector assembly towards container spout until it 'clicks' to correct, fully connected position. Release locking ring. Test proper connection by pulling the tube connector. NOTE: Incorrect connection will cause leaks.



NOTE: Incorrect connection will cause fluid to leak out !



"Click !"

- Close BiB container assembly, close top lid. Lock with latch.
- Prime pump by producing fog at full output for about 1-1½ minute.
- Choose how to control the machine; by DMX, with or without RDM, stand-alone manual or timer. K1 is also able to control with compatible remote control. The remote control will be automatically recognized when connected.
- Make settings, see detailed instructions under chapter “menu system/user interface”.
- Do not operate the machine while the fluid container is replaced. Always set the machine in ‘fog off’ mode during container change.
- Do not unplug mains supply until the machine has completed the 1-minute switch-off purging cycle and is in standby mode. Unexpected power loss may cause permanent damage to the heat exchanger.

6.3 WAVE GUIDE™ :

Haze beam direction can be adjusted from a straight, horizontal (0 degrees) angle up to approx.. 40 degrees. Please note that at low fan speeds combined with high fog output, the haze beam angle can be difficult to control because of the low airspeed.

Use fan speeds of 25% and above for best control.

It is not recommended to use the fan at very high speed (70% and above) in combination with a high WaveGuide angle, the WaveGuide guide will block some of the airflow from the fan and increase air blow noise at the machine’s front.



6.3 MENU SYSTEM / USER INTERFACE :

K1 hazer uses Swefog's Merlin 5, a PLC-based electronic control module, where all functions are controlled with firmware. Product improvement is performed on a continuous basis, and your machine's software is upgradeable using Swefog's PC-link and a USB cable. Software & drivers required are available at swefog.com.

A lot of effort has been made to create an easy-to-use and self-explaining menu system. All functions, messages & settings are presented in clear text and, if more suitable, with symbols or bars. A fully graphical, high contrast OLED display is used, to simplify readout in both dark and light environments.

Presentation of information is displayed generally with a status bar, a main window, and a tab bar:

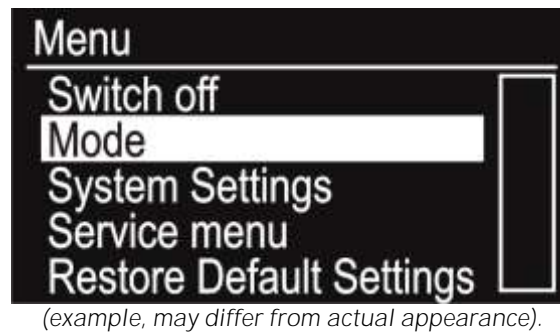
- STATUS BAR presents operation mode, errors and machine status. Information only, no user-adjustable settings.
- MAIN WINDOW presents all necessary information and user settings and will look different depending on what function currently active. For example, in DMX mode (below), the address number is presented with large digits, while output levels are presented as bar symbols. In manual mode, fog & fan output is presented as digits (%) instead of bar symbols, and under separate tabs, to make settings easier.
- TAB BAR indicates which main window that is currently displayed. In the below example, the address window is active. To change between tabs, use ◀/▶.



Basic operation procedure:

- The machine is equipped with three control modes; DMX, manual & timer. Machine always start-up in previously used control mode. All previous settings are automatically pre-set. In DMX mode, the last used address is default, in manual mode, previous fog output & fan speed are pre-set, and in timer mode, previous output settings, delay & operate time are pre-set.
- To change control mode and make system settings, enter the main menu.
- Main menu is entered from any of the control modes as below:
- DMX mode: From any tab, press 'OK'.
- Manual mode: From FOG or FAN tab, press 'OK' (menu is not accessible from fog on/off tab).

MAIN MENU:



The current choice is highlighted. To enter, press 'OK'. Go back / cancel, press 'X'

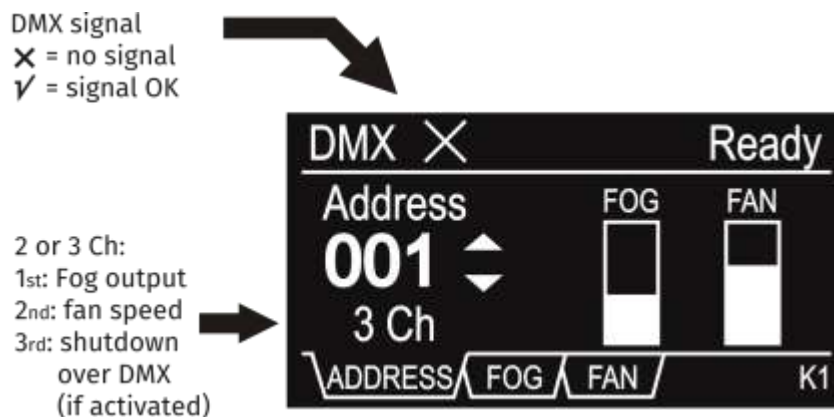
SWITCH OFF:

- Press 'OK' and confirm again to switch off the machine. A one-minute purging process starts, once completed, the machine is off. The progress is shown on the display.
- To stop the switch-off countdown, press 'X' to cancel.
- Do NOT unplug from mains until the machine is completely switched off.

CHOOSE HOW TO CONTROL THE MACHINE:

- Set control mode: DMX, Manual, Timer mode.

DMX MODE (uses standard DMX512-A USITT protocol):



- DMX mode has 3 tabs: Address, fog, fan.
- Change start address in the 'Address' tab only. Use ▲ / ▼ to set address numbers. K1 uses two DMX channels for fog & fan output.
- A third DMX channel is used only if 'Shutdown over DMX' is activated, see 'System settings' menu.
- Confirm (store) address with 'OK'.
- Fog & fan tab: For information only, no user settings. When this tab is active, the actual DMX level in % is displayed. Fog level = start address. Fan level = Start address + 1
- NOTE: Device label (RDM) is set in 'System settings' menu.

RDM CONTROL (ANSI E1.20):

The machine can be controlled via a RDM ANSI E1.20 protocol. This is an intelligent bi-directional communication using the standard DMX 512 link. The light console is able to directional, read and configure the machine. The type of parameters and functions available may be different depending on model configuration. Supported parameters:

RDM Parameter ID:	Value:	GET allowed	SET allowed	Default text / number:
DISC_UNIQUE_BRANCH	0x0001			
DISC_MUTE	0x0002			
DISC_UN_MUTE	0x0003			
QUEUED_MESSAGE	0x0020	YES	No	
STATUS_MESSAGES	0x0030	YES	No	<i>E120_STS_LOW_FLUID, E120_STS_READY, E120_STS_NOT_READY, E120_STS_OVERTEMP, E120_STS_UNDERTEMP</i>
STATUS_ID_DESCRIPTION	0x0031	YES	No	
SUPPORTED_PARAMETERS	0x0050	YES	No	
DEVICE_INFO	0x0060	YES	No	
PRODUCT_DETAIL_ID LIST	0x0070	YES	No	PRODUCT_DETAIL_FOGGER_GLYCOL
DEVICE_MODEL_DESCRIPTION	0x0080	YES	No	K1EU
MANUFACTURER_LABEL	0x0081	YES	No	Swefog
DEVICE_LABEL	0x0082	YES	YES	K1
SOFTWARE_VERSION_LABEL	0x00C0	YES	No	
BOOT_SOFTWARE_VERSION_ID	0x00C1	YES	No	<i>Software ver ID, higher number = newer ver.</i>
BOOT_SOFTWARE_VERSION_LABEL	0x00C2	YES	No	<i>Human readable software version. Higher number=newer ver.</i>
DMX_PERSONALITY	0x00E0	YES	YES	<i>select personality & see personality selected</i>
DMX_PERSONALITY_DESCRIPTION	0x00E1	YES	No	<i>Fog, Fan, Control * **Control* alternative enabled only if 'shutdown over DMX' is enabled, see system settings.</i>
DMX_START_ADDRESS	0x00F0	YES	YES	
SENSOR_DEFINITION	0x0200	YES	No	"Heater Temp" & "Board Temp"
SENSOR_VALUE	0x0201	YES	No	Values for above temperatures
IDENTIFY_DEVICE	0x1000	YES	YES	

MANUAL MODE:



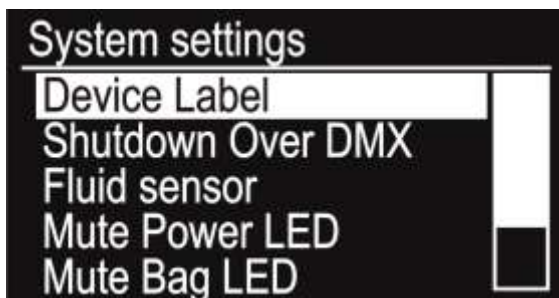
- Manual mode uses 3 tabs: Fog, fan, on/off.
- Current fog output & fan speed is displayed in the main window with bars, independent of what tab that is active. NOTE: Fan always runs at 10% at idle / fog off.
- To set fog output: Activate 'Fog' tab, set output 0-100% using ▲ / ▼. Actual setting in % is shown in display.
- To set fan speed: Activate the 'Fan' tab, set speed 11-100% using ▲ / ▼. The actual setting in % is shown on the display. NOTE: below 11%, fan speed = 'AUTO', and follows fog output.
- Fog on / off: Activate 'ON/OFF' tab, press 'OK' to start & stop fog production.
- NOTE: Fog production can be stopped in any tab by pressing 'X'.

TIMER MODE:



- Timer mode has 5 tabs: Fog, fan, Tfog, Tdel, I/O.
- Set fog output & fan speed using ▲ / ▼ . Confirm with 'OK'.
- Set fog operate time in the TFOG tab. Time is displayed as H:MM: SS. Use ▲ / ▼ to make settings. Time is displayed as H:MM: SS and start flashing during the setting. Move cursor with ◀ / ▶ for faster adjustment of desired time. Confirm with 'OK'.
- Set fog "off" delay time in the TDEL tab. Set the desired delay time using the same procedure as TFOG time.
- Maximum fog operate & delay time is 9 hours 59 min 59 sec (9:59:59).
- For safety reasons, timer is always pre-set as 'OFF'. Start timer operation in I/O tab, press 'OK' to start & stop timer.
- All settings can be changed during timer operation by changing between the tabs.
- To stop the timer operation, go to the 'I/O' tab, press 'OK'. Or press 'X' in any tab.
- To access the main menu, press 'OK' in all tabs except the 'I/O' tab.

SYSTEM SETTINGS:



DEVICE LABEL (RDM):

- Press 'OK' to set the device label. Follow instructions on the display.
- The pre-set device label is "K1".
- Move cursor using ◀ / ▶ .
- To delete, press & hold 'OK'. Use ◀ / ▶ simultaneously to select which character(s) to delete. Release keys to delete selected characters.

Continued

- To insert and/or enter a new label name, press 'OK'. Select character with ◀/▶. Press 'OK' to set.
- When settings are done, press 'X'.
- Press 'OK' to save & exit.
- Press 'X' to exit & discard. No changes will be made.

SHUTDOWN OVER DMX:

By using this function, the machine can be switched off & on using a 3rd DMX channel for control. The function is suitable for remote-controlled on & off via DMX. The control signal is detected on the 3rd channel = start address + 2. For example: Start address = 100, shutdown is controlled with address 102.

- Enable or disable shutdown over DMX. Enabled = machine uses 3 DMX channels, Disabled = machine uses 2 DMX channels. Factory default is enabled (3 ch).
- NOTE: If you don't intend to use shutdown over DMX, disable this function, for two reasons; 1) to avoid unwanted switch-off by mistake because machine detects a DMX signal intended for other equipment, and 2) to reduce the no. of DMX channels in use.
- Automatic shutdown (switch off) process starts at DMX level 220 (87 %) – 239 (93 %) only. Below or above this level, the machine will operate as normal. If the DMX signal is lost during the 1-minute switch-off purging cycle, the machine will continue the switch-off cycle and go to standby mode when completed.
- In standby mode, the machine continues detecting DMX signal and will start heating up at DMX levels below 87 / above 93%.
- If the DMX signal is lost during standby mode, the machine will remain in standby. Same if the machine is on, it will remain on until a control DMX signal is detected.
- In standby mode, the machine will continue detecting DMX signal, meaning if DMX is detected, the shutdown / switch-on function is active.

FLUID SENSOR:

The machine uses a flow sensor to detect an empty fluid container. If no flow is detected, a 'fluid empty' message appears and fog production is stopped to protect the fluid pump from running dry for a longer period.

The function of the flow sensor may be disturbed if there are air bubbles in the fluid line. Air bubbles appear at container change when the connector is removed. Also, the fluid bag contains a small volume of air, which normally will be sucked into the fluid line when the bag is empty or almost empty.

For normal use, it is recommended to keep fluid sensor enabled. In some situations, it might be suitable to disable the sensor, for example, if the machine is used at a low output setting, it may take a very long time for the pump to prime & air bubbles are gone. Also, if external containers are used, and/or if longer suction hoses are used, air bubbles may interfere with the flow sensor.

To avoid unwanted & unnecessary interrupt, disable the sensor and maintain control of the fluid container to avoid the machine from running dry for a long period.

Enable the sensor again if the machine is used under normal conditions, to avoid the risk of fluid pump wear out.

- Choose 'Enable' or 'Disable', press 'OK' to confirm. Press 'X' to exit.

MUTE POWER LED:

If there are requirements of the 'invisible' appearance of the machine, for example on a dark stage, all LEDs and the display can be muted. Choose 'Mute Power LED' to keep the power LED Off.

- Select 'Unmuted' for normal operation.

Continued

- Select 'Muted' to keep the LED switched off.
- Press 'OK' to confirm. Press 'X' to exit.

MUTE BAG LED:

Same function as above, switches bag level LED indicator on/off.

- Select 'Unmuted' for normal operation.
- Select 'Muted' to keep the bag LED switched off.
- Press 'OK' to confirm. Press 'X' to exit.

SCREENSAVER:

Same function as above, if no key is pressed, the display is muted after 30 sec. The display is on immediately if a key is pressed.

NOTE: For theme parks or similar installations where the machine is left long periods without using the display, enable screensaver to increase the lifetime of the display. OLED displays offer great contrast, but OLEDs will wear out and contrast is reduced after many hours of use.

If it is not necessary the display is always on, keep screensaver function enabled.

- Select 'Muted' for normal operation. The display is off after 30 sec.
- Select 'Unmuted' and display will be active as long as the machine is switched on.

SYSTEM INFORMATION:

'System information' menu contains machine data only, no user-adjustable settings. Information displayed:

- Model version.
- Unique UID (User ID) number for RDM.
- Boot Software version
- Firmware version
- Hardware version

SERVICE MENU:

Service Menu	
Heater Temp	320°C
Board Temp	25°C
Total Runtime	0050 h
Air Filter Time	0010 h
Air Pump Time	0010 h

'Service menu' displays machine data and contains a restore to default factory settings function. The information is intended as a help for service, maintenance & troubleshooting. For service & maintenance, refer to service manuals, for experienced technicians only.

HEATER TEMP:

Actual heat exchanger temperature.

BOARD TEMP:

Current temperature on the main printed circuit board in the machine's PLC.

TOTAL RUNTIME:

Displays the total accumulated “ON” uptime of the machine. Uptime = machine heated up. Non-user resettable.

AIR FILTER TIME:

Displays the total accumulated time air filter has been used since it was replaced. User resettable, see chapter 8.3 “Service messages & reset of component lifetime”

AIR PUMP TIME:

Displays the total accumulated time the air pump has been active since it was changed. User resettable, see chapter 8.3 “Service messages & reset of component lifetime”

FLUID PUMP TIME:

Displays the total accumulated time fluid pump has been active since it was changed. User resettable, see chapter 8.3 “Service messages & reset of component lifetime”

FLUID FLOW TICKS:

Displays current fluid flow sensor ticks detected. Tick count is reset and starts from zero every time the menu is accessed. This function helps check the function of the fluid flow sensor, and is suitable if external containers are used, to confirm functionality.

RESTORE DEFAULT SETTINGS:

This function restores all user settings to factory default. Suitable if you become ‘lost’ and want to clean all settings and start over from scratch.

We recommend using this function, especially for rental companies when a machine is returned by a customer, use this function to delete all user settings, and “clean” settings for the next customer.

Default factory settings in short:

- Operation mode is DMX, start address 001.
- 3-channel operation = shutdown over DMX enabled.
- Screensaver enabled.
- Power LED & bag LED enabled.
- All manual data & output settings & timer settings erased.

NOTE: The restore default settings function will NOT reset machine data such as fluid filter lifetime, component run time, etc.

Reset of component service time can only be done when replaced.

6.5 Fluids:

Swefog K1 is developed and designed to work with Swefog K1 molecular fluids. No other fluid is compatible with this machine!

If the original fluid is used and regular maintenance is performed, the machine will work well for many years.

The use of any other fluid will void warranty and may make the machine instable and/or hazardous. Other fluids may be of good quality but are not developed especially for K1. This means a foreign liquid will vaporize, expand and behave different than original fluid, which may lead to ‘spitting’, non-vaporized fog and/or clogged heat exchanger. The machine’s safety is not guaranteed if non-original fluids are used.

Bear in mind, foreign fluids will never give you the same performance and quality as the original product, the fluid your machine was designed to be used with.

7. Technical specifications K1 hazer:

Type:	Water-based haze generator.
Fluid type:	K1 molecular haze fluid
Operation:	Continuous
Fluid consumption:	Max 600 ml/hour at continuous operation 100% output. Min 10 ml/hour at 1% output
Fluid container capacity:	3 litres (0,8 US gal)
Power consumption:	1500 Watts
Dimensions & dry weight	LxWxH 490x147x313 mm (19.3"x5.8"x12.3"), 13 kgs (28.7 lbs.)
Location of assembly:	Swefog Technology Group AB, Filipstad, Sweden.
Service parameters*	
Air pump filter:	250 hours
Air pump:	500 hours
Fluid pump:	250 hours

* Service parameters subject to change due to firmware updates, changed expected service life, component updates, etc.

8. Service, maintenance & repair:

8.1 General information:

K1 hazer is made with industrial standard components. If regular care and maintenance is performed, the machine will last for many years of regular use.

If you have good know-how and technical experience of electronics and electro-mechanics in general, and haze generators in particular, follow the service bulletins, which can be downloaded from www.swefog.com or contact manufacturer's helpdesk. All Swefog machines have a manufacturer free life-time support. We will be glad to help, please ask.

If you are inexperienced with fog generators, do not start a repair by yourself! A fog generator can be hazardous if modified or repaired incorrectly! Refer service tasks to qualified technical personnel, or contact a preferred Swefog dealer. Preferred dealers have qualified service technicians, and will be able to perform most service works.

K1 uses air filter mats covering all air in/outlets on the machine housing(s), and several air filters to protect internal components from damage.

Filter mats: protects the machine from dirt and dust. *It is very important to clean or replace the filter mats when clogged by dirt and dust. If not, the clogged filters will prevent sufficient airflow through the machine housing, which may cause internal mechanical parts (i.e. the air pump) to overheat.*

To ensure good performance and extended lifetime of internal components, fans and other expensive components, check filter mats frequently. If dust or dirt is clogging the inlets, replace the filters immediately. Do not use the machine if sufficient airflow cannot be guaranteed

Filters: K1 hazer contains two (2) important filters that shall be replaced regularly: Air inlet housing filter mat & air pump inlet filter.

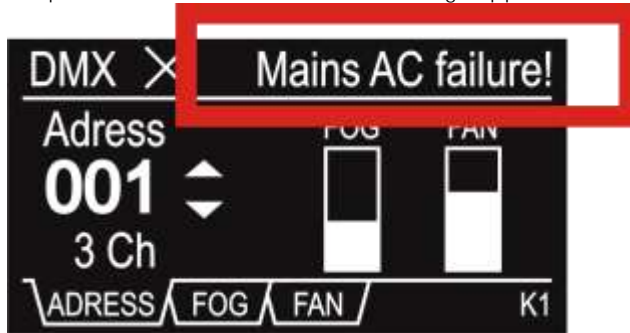
The integrated electronic service reminder is set to remind user to replace filters & wear-out components. However, the wear-out times set in the electronic reminder are general and approximate. Regular manual check of filter condition and performance of the machine will remain necessary to keep the good performance of K1, and it is highly recommended to check the condition of the machine on a regular basis, especially if the machine is used in dusty or moisture environments. For service works, refer to separate service manuals.

- Download service manuals from swefog.com for further instructions on how to ordering & replace filters, or send your machine to distributor for service.

Use original spare parts only. Other parts will void warranty and may damage your machine.

8.2 Error & service messages:

If a problem is detected, an error message appears in the status bar:



Error detected:

“ Mains AC failure “:

The power supply is not stable. The machine's PLC detects problems or disturbances at the AC power supply line.

If the power supply is not stable or if severe disturbance signals are detected, the machine will go to interrupt mode.

The mains supply is continuously detected and an error will automatically be reset when power supply works normally again. Possible cause:

- Power socket or mains cable problems. If there is a bad connection voltage will fall and cause failure detection. Start with simple things, like checking power supply cable and/or socket.
- Earth lead is not 0V (ground): If a voltage potential is detected on earth lead, it will generate an error. Check the power supply cable and/or power outlet socket.
- Power supply is unstable, above or below rated voltage. The power supply is a multi-voltage type, but many internal components require a specific voltage to work normal. Example heater element, fan & air pump. To protect the machine from damage and/or unstable operation, it will remain in interrupt mode until the power supply is stable. Check voltage with a True RMS digital multimeter.

“ Disturbance! “:

- Severe disturbance on the mains power supply. The electronics uses both electronic and software-controlled filters to protect from disturbing signals, reactive and magnetic load disturbances. At some bad conditions, the internal filters are unable to clean signals from disturbances, and the machine will go to interrupt mode. This may happen if the power supply frequency is undetectable if many devices containing coils are used on the same power supply line. This generates high peak reactive load currents which may cause interference. This requires an advanced check with special instruments.
- Mains frequency disturbance. Normal frequency is 50Hz (Europe + many other regions), or 60Hz (USA/Canada + regions in Asia & South America). Normally, frequency should never fluctuate, but if power supply is unstable, frequency may fluctuate. Many internal components are controlled using zero-cross detection and are therefore sensitive for frequency problems. The machine will go to interrupt mode if the frequency is unstable. Requires an advanced check with special instruments.

“ Critical overtemperature! “:

Requires manual reset. Press ‘OK’ to reset, ‘X’ to switch off. If cancel is pressed, the machine will switch off immediately, without performing the 1-minute purging cycle.

Error is detected because:

The temperature in the heat exchanger is above normal temperature.

Possible cause:

Overheat is an indication of unstable electronics or problems with temp sensor connection. Correct temperature at all times is the most important function in your fog machine. Send machine to Swefog dealer for qualified service, do not use the machine if the problem has not been solved completely!

Refer to service manuals for service work. Heat exchanger temperature can be viewed in the service menu, heater temp.

Possible false alarm cause:

If temperature fluctuates back and forth more than one or a few degrees C, check temp sensor connection to PCB. Faulty electronics can also cause overtemperature. Consult Swefog or Swefog dealer, refer to service manuals.

“ Air line failure! “:

Requires manual reset. Press ‘OK’ to reset, ‘X’ to switch off. If cancel is pressed, the machine will switch off immediately, without performing the 1-minute purging cycle.

Error is detected because:

Fluid is detected in the air line tube between air pump – heat exchanger, to protect components, the machine will go to interrupt mode.

Possible cause:

Heat exchanger may be clogged. If this occurs, fluid will be forced in the wrong direction, through the air line tube. To protect the air pump from damage, and to avoid fluid leakage, the machine will go to interrupt mode.

Possible false alarm cause:

If air line sensor or air hose is dirty after many hours of use, a false alarm may be triggered. Send machine to Swefog dealer for qualified service & cleaning. Air line sensor may require calibration after service.

Do NOT use the machine until the problem has been checked. Refer to service manuals.

“ Temperature sensor failure! “:

Requires manual reset. Press ‘OK’ to reset, ‘X’ to switch off. If cancel is pressed, the machine will switch off immediately, without performing the 1-minute purging cycle.

Error is detected because:

The temperature in the heat exchanger is not responding as expected.

The machine’s electronics use an advanced PID technology for precise control of temperature in the heat exchanger. If the temperature in the heat exchanger is not responding normally, the machine will go to interrupt mode.

Possible cause:

Bad connection of temperature sensor.

Temperature sensor failure.

Faulty electronics

Correct temperature at all times is the most important function in your fog machine. Send machine to Swefog dealer for qualified service, do not use the machine if the problem has not been solved completely!

8.3 Service messages & reset of component lifetime:

The machine uses 'parameter control' of wear-out parts air filter, air pump & fluid pump. This to help avoid unwanted interrupts for service, and remind the user to replace a component when it reaches the end of life.

The above internal components are calculated to last an estimated no. of service hours. The Electronic Control Module register accumulated service hours separately for the above components.

The expected maximum no. of service hours ("end of life") for detected components is updated continuously with machine's firmware and is based on service experience, component type, part change & updates, etc.

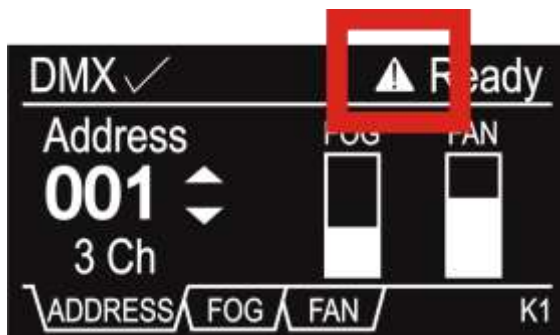
Always keep in mind that external, non-detected conditions such as dusty or moisture environments may cause parts to wear out faster than estimated service life. Therefore, the parameter shall be considered as a convenient assist only, to monitor service intervals of your machine, rather than a strict schedule for replacement.

To reset the lifetime of air pump filter, air pump & fluid pump:

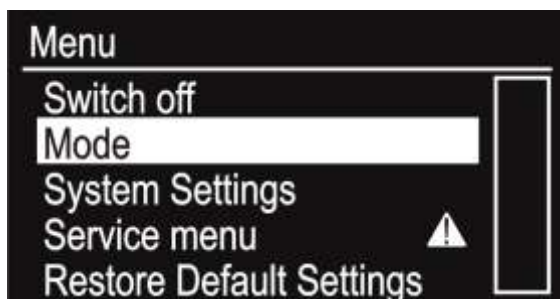
If one or several of these components reach an estimated EOL, a service condition occurs, and a service reminder message is generated. An exclamation mark is shown in the status bar. This will remain active until it is manually reset. Replace concerned component(s) and reset lifetime by following the steps below.

Reset of a component's lifetime can be performed at any time, before or after it has reached the calculated EOL.

Always perform reset immediately when a component has been replaced with a new. Never perform reset without replacing the concerned component, and never re-use old components!



Open the main menu. The exclamation mark will be shown next to the service menu.



Open service menu. The exclamation mark is shown next to the component that has reached end of life and needs replacement.

Service Menu	
Board Temp	25° C
Total Runtime	0334 h
Air Filter Time ▲	0255 h
Air Pump Time	0255 h
Fluid Pump Time	0186 h

Replace component. Do not reset without replacing first. Select the correct component, press + hold 'OK' for two seconds. This will bring up a reset dialog:



Press 'OK' to reset, 'X' to cancel reset of service time.



Now, the accumulated time for the concerned component is set to 0 in the service menu. The procedure is the same for the other components; Air pump & fluid pump.

Reset can be performed before or after the component's calculated EOL.

NOTE: Reset service messages ONLY when the concerned component has been replaced. False resets without replacing the worn-out component will make the parameter control useless since it will not be based on correct information.

The machine will never stop working because a service message is neglected, the system works as a reminder only.

If the component is not replaced when requested, we strongly suggest leaving the message active, without performing a false reset.

9. Warranty & Returns:

9.1 Unpacking and Saving the Shipping Materials

The customer would be well-advised not to discard the Swefog shipping carton and packing materials. These items are specifically designed to protect this product during transport.

If you ever need to return a product for repair or maintenance, you should return it in its original shipping carton and packing materials, or materials of the same standard. To avoid damage during shipping, place the carton on a small pallet and secure the carton to the pallet with the use of straps (min 2 straps). Always send fog machines without fluid containers to save shipping weight and reduce CO2 footprint. Use necessary packing material, avoid overpacking and heavy pallets for further CO2 footprint reduction.

NOTE: If a returned machine requires extra cleaning, the owner will be charged for the extra labor required and/or replacement of damaged parts due to this extra service work. This is not covered by warranty and not free of charge. To protect the machine from damage during transport, always ensure the machine is transported upright at all times!

9.2 Limited Warranty

Unless otherwise stated, Swefog products are covered by a 12 months parts and labor limited warranty. Note that local variations may apply.

Warranty will be invalid if the Swefog machines have been misused, used with non-original fluids, modified, repaired or used in non-compliance with instructions given in this manual.

It is the owner's responsibility to furnish receipts or invoices for verification of purchase, date and dealer or distributor. If the purchase date cannot be provided, the date of manufacture will be used to determine the warranty period.

Returning an item for repair covered by warranty:

- First of all, consult your Swefog retailer to check if the problem is able to solve without sending the machine back. See FAQ & service bulletins published on swefog.com. Also, always check for firmware updates and make sure to update to the latest version before claiming repair. Problems able to solve by standard firmware updates will not be considered as a valid warranty claim.
- Follow instructions above how to pack and ship a unit for repair.
- Always include with your machine:
- Detailed description of the problem, how it occurs, etc. Everything that will help our service department to recreate the problem and repair the faulty parts.
- If the warranty is claimed, include a copy of the purchase invoice/receipt. The document must include purchase **date, machine's serial number, and buyer's name**. On **Swefog's request**, the purchase document must be able to verify by the distributor.
- Transport costs for the returned units are not covered by the warranty and will henceforth be at the cost of the sender.

Under no circumstances will freight collect shipments be accepted. The customer is aware that normal wear-out parts & components are not covered by warranty.


Warranty service will be performed as below:

- Faulty parts will be replaced or repaired on the **manufacturer's decision**.
- Faulty units must be returned to the retailer.

Swefog Technology Group AB shall not be liable for any indirect, incidental or consequential damage, including lost profits, sustained or incurred in connection with any product or caused by product defects or partial or total failure of any product regardless of the form of action, whether in contract, tort (including negligence), strict liability, or otherwise and whether or not such damage was foreseen or unforeseen.

9.2 Unlimited support:

Swefog will be glad to provide unlimited helpdesk for your **machine's** entire life! Most FAQ are answered on our website, together with service manuals. You are always welcome to contact us for technical and service matters; contact information see website. When contacting us in a service matter, always include the **unit's** serial number.

We Wir Nous	Swefog Technology Group AB
Address Anschrift Adresse	Industrivägen 15 SE - 682 33 FILIPSTAD Sweden / Schweden / Suède
Declare under our sole responsibility that the product	
Erklären in alleiniger Verantwortung, dass das Produkt	
Declarons sous notre seule responsi- bilité, que le produit	
Name Name Nom	Haze generator Dunstnebelmaschine Générateur de fumée
Type Type	K1 hazer EU230V
Fulfills the requirements of the standard	EN 55014 Part 1 / Teil 1 / Partie 1 (generic emission standard / Generische Emissionsnorm / norme d'émission générique)
Mit den Anforderungen der Normen Übereinstimmt	
Satisfait aux exigences des norms	EN 55014 Part 2 / Teil 2 / Partie 2 (generic immunity standard / generischer Immunitätsstandard / norme d'immunité générique)
	EN 60335-1 (electrical safety / elektrische Sicherheit / Sécurité électrique)
Therefore the product fulfills the de- manding of the following EC-directive	2004 / 108 / EG Directive relating to electromagnetic combability Richtlinie über die elektromagnetische Verträglichkeit Directive relatives à la compatabilité électromagnétique
Das Produkt erfüllt somit die Forderungen der EG-Richtlinie	
Le produit satisfait ainsi aux conditions des directives suivantes de la CE	2006 / 42 / EG Machinery directive Maschinenrichtlinie Directive relative aux machines
	
Filipstad January 2, 2019	Johan Sundström
Place and date of issue Ort, Datum der Ausstellung Lieu et date d'établissement	Name, signature of the director and agent for documentation Name u. Unterschrift des Geschäftsführers u. Dokumentations- bevollmächtigen Nom et signature de la Directeur et Agent De documentation

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