



# Hurricane-AW



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Distributed by :

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Hurricane-AW

# 1. General Safety Information

This General safety information is for the safe and successful using of the device

1. All the persons who are involved in using the device should fully read and understand the manual prior to using the device.
2. The usage of the device in front of public audiences can have many potential risks, such as severe personal injuries or property damages. So, it is mostly important to follow all safety rules and regulations as well as instructions imposed or recommended by relevant parties such as authorities or manufacturer.
3. Never instruct or order unqualified persons to run the devices in a potentially risky application.
4. This device is intended to provide general flame effect. As with all potentially dangerous special effects, the operator should be in full view of all the devices at all times during whole events. In addition, he has to be able to take action in the technical control of the devices at any time if a potentially dangerous situation happens.
5. Keep off any ignition sources, unqualified persons or children.
6. The necessary fire prevention and first aid measurements should be prepared properly depending on the size and type of the events.
7. Do not use fuels that are not recommended by the manufacturer.
8. Do not touch the flame head during and just after the usage. It is very hot and you can be injured. Wait till the flame head is completely cooled down and then touch it
9. Inspect thoroughly and regularly the devices every 6 months for reliability.
10. Do not use damaged equipment. If a damage is found, immediately repair the device or if you can't repair, send the device back to the manufacturer for professional repair.
11. Any changes in or to the devices is not allowed. In any case of change to the devices, our warranty and product liability will be void.
12. Please be sure that the devices are standing securely.
13. Make sure that the device is not covered by anything and that the fuel can be easily exhausted through the nozzle. Furthermore ensure that combustible objects like papers, confetti or streamers should not enter the burning chamber of the device.
14. Arm the devices as shortly as possible before the effect and disarm them immediately after the effect.
15. Cable connections from the control units to the device are always to be insulated and must comply with the technical standards. At the same time, avoid cable damage from heat, twisting, pinching and burn-off cinders or forced piercing. All cables must be checked before using.
16. All the relevant persons should meet the relevant safety distances during whole event period.
17. During testing and firing the devices, no persons or animals are allowed in the hazard area. Furthermore no materials that are heat-sensitive or that can catch fire are allowed in the same.
18. Never bow over the device or put parts of your body above or respectively before the burning chamber if the device is switched on and always keep at least the safety distance that is required so that no dangerous situation can happen

## 2. General/Description of Components

### 2.1 Introduction

Hurricane-AW is moving flame system. Swiveling flame head can produce wide range of magnificent flame effects and very fast and accurate flame effects with a radius of 180°. Upto 7m flame can be provided. This device is the all-in-one flame system and it does not need any external propelling media and fuel reservoir. Fuel reservoir, pumps and accumulator are built in the device. Max. 11 liter of fuel can be charged into fuel reservoir and the device can shoot 120 shots with 0.5 sec. Also, the device can be controlled with dmx controller.

### 2.2 Features

- **All-in-one** flame system without any external pressure propelling media and fuel reservoir.
- 2 small pressure pumps are built in the device
- Max 11L fuel reservoir and an accumulator are built in the device
- Moving flame head swivels within a radius of 180°
- Flame head is motorized and moveable with pressurized liquid fuel.
- Max. 7m flame can be provided
- Electric spark ignition is adopted

### 2.3 Package detail

- Hurricane-AW flame device x 1pc
- Power Cord x 1pc
- DMX Cable 5m x 1pc
- User Manual x 1pc

### 2.4 What should be prepared locally by the operator for using this device

- Fuel (Isopar, Isopropyl alcohol)  
✘ Do not use green & blue color flame fuel and they can break pump.  
Only red, gold, orange and purple can be used as fuel for color flame effect.
- DMX Controller

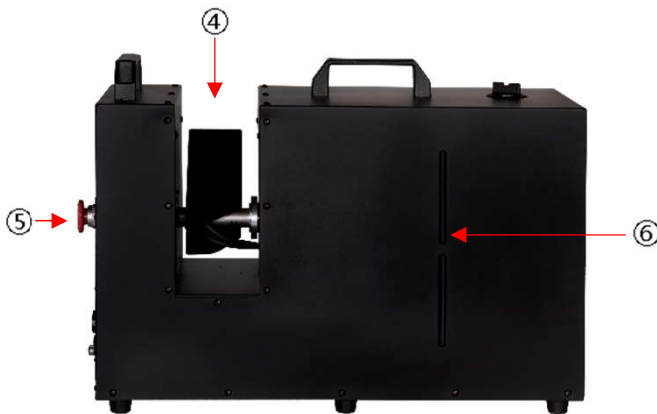
## 2.5. Technical Specification

Power	110-120V, 50/60Hz	220-240V, 50/60Hz
Power Consumption	7A/1100W	3.5A/550W
Working Pressure	16 ~ 18bar	232 ~ 261psi
Flame height	Max. 7m	Max. 23ft
Ignition	Electric spark (2 pins arc installed)	
Fuel	Isopar G or H, IPA, our Red, Gold, Orange and Purple color flame fuel can be used.(Blue and green color flame fuel should not be used. The pumps will be broken)	
Fuel consumption	200ml/sec	
Fuel Tank Capacity	11 Liter/3.17gallon (Fuel reservoir is built in the device)	
Moving range	0° - 180°	
Moving Speed	18ms from 0° to 180°	
Propelling Media	Pump(2 fuel pumps are built in the device)	
Control	DMX-512	
No of DMX Channel	19 Channels	
Pressure Charging Time	10 seconds(10 seconds needed for charging pressure at beginning)	
Safety Distance	10 meters from the device in all direction. 10 meters to the ceiling.	
Size & Weight	255mm(W)x580mm(L)x415mm(H) 10" x 22.8" x 16.3inch	31Kgs 68LBS
Packing Size & Weight		

## 2.6 Overview of Hurricane-AW



1. Fuel Reservoir cap
2. Pressure Discharge manual valve
3. Handle
4. Ignition & flame jet Box
5. E-stop SW
6. Fuel Level
7. Control Panel



### Pressure Discharge manual Valve is for

- Stop or allow the pressurized liquid to flow into the fuel reservoir from accumulator. Before the pump working, close this VALVE to get the working pressure. After the show, open this VALVE to remove the pressurized fuel from accumulator, pumps and piping.
- When you get new machine from us, or you use it again after fully draining, you need to work only pump for 10 sec to remove air inside piping, pumps and accumulator at the open position of this VALVE.

### E-Stop SW

- E-stop SW is for cutting power to solenoid valves and spark igniters.



## 2.7 Overview of Control Panel



- a. DMX Screen : DMX Starting address is displayed.
- b. DMX address setting button
- c. Power In
- d. Power Out
- e. Power Switch
- f. Fuse(10ampere fuse)
- g. 3 pin DMX Out
- h. 3 pin DMX In
- i. Emergency Switch

## 3. Control via DMX 512

### 3.1. DMX Key Value

The device is controlled by DMX 512. The device has 19 DMX channels. The spark ignition(CH3), solenoid valve for flame(CH2) and Pump(CH4) work at the range of dmx key 200 ~ 255. At the range of 0 to 199, the ignition, the solenoid valve and pump do not work.

### 3.2. Setting Starting Address

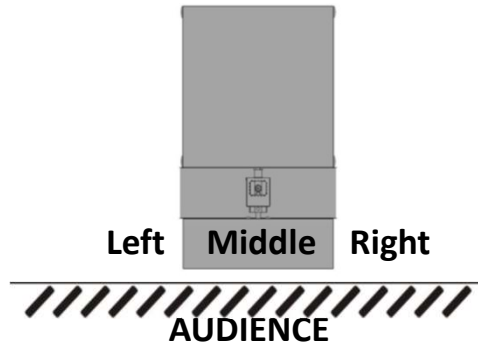


- ① DMX(Yellow Color) : indicate that all the dmx connection is normal
- ② 001(Blue color) : indicate the Machine's DMX starting address
- ③ DMX Channel Set Button
  - M : push 3 seconds for setting "Machine DMX Add."
  - ▶ : change the current mode to the other mode
  - ▲ : change the channel address

## 4 . Handling Hurricane AW

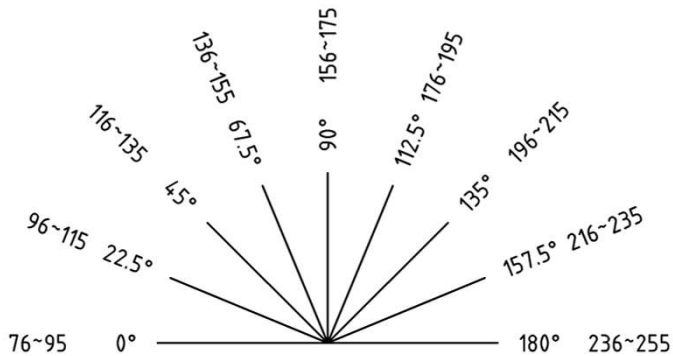
### 4.1 Definition of the audience-side

The control panel side, is the audience-side of the device. This is the side the audience should be seeing during the show. All Sequences and Positions have been made from this point of view. All important Positions for the device as well as the movement labels left, middle and right, are only correct, if the device has been placed in this way. The following graphic shows Hurricane AW from above, and is meant to give you an idea of the labeling.



### 4. 2 Definition of Positions

The spectrum of 180° can be used. This spectrum was separated into 9 positions in steps of 22.5° for the control. These 9 positions were numbered from 1 to 9, and the left end defined as 0°. The following graphic depicts the single positions as seen from the audience side. When you turn on Hurricane AW, ignition box is located at 90°. Then, when Hurricane AW gets signal from DMX controller, it moves to the angle of 0° (1) automatically and enter to standby mode.



No.	Angle	DMX Key
1	0°	76-95
2	22.5°	96-115
3	45°	116-135
4	67.5°	136-155
5	90°	156-175
6	112.5°	176-195
7	135°	196-215
8	157.5°	216-235
9	180°	236-255

### 4.3. DMX Channels

*Hurricane AW has 19 DMX channels as follows.*

CH	Function	DMX key	Definition	Remark
1	Angle Channel	0-255	Moving flame head to the angle	
2	Flame Channel	200-255	You can shoot flame manually or you can program your own flame show with this flame channel differently from single stepp sequences or autoshow. This flame channel works only after pump and ignition works. Without pump and ignition working, this channel does not work.	Below 6bar, flame channel does not work below 6 bar.
3	Electric spark	200-255	Electric spark ignition works only after pump starts.	Electric spark channel
4	Pump	200-255	Turn on and off the pump(pump stops automatically at 18bar and below 14bar, re-start to secure enough working pressure. Initially, Pump needs 10 sec to get working pressure 16bar then, can start the show	Working pressure : 16-18bar.
5	Stepp sequence of single flame shot	76-255	This single shot sequence is pre-programmed on the device. Flame shooting time is 20ms(0.2sec)	See the chart 1 for detail
6	Bank 1	61-255	13 autoshow are pre-programmed. Each program is selected by DMX key value	See the chart 2 for detail of the autoshow.  See the chart 3 for setting loop numbers and transit time.
7	Loop of Bank 1	0-255	Loop numbers of bank 1	
8	Transit time	0-255	Transit time from bank 1 to bank 2	
9	Bank 2	61-255	13 auto shows are pre-programmed. Each program is selected by DMX key value	
10	Loop of Bank 2	0-255	Loop numbers of bank 2	
11	Transit time	0-255	Transit time from bank 2 to bank 3	
12	Bank 3	61-255	13 auto shows are pre-programmed. Each program is selected by DMX key value	
13	Loop of Bank 3	0-255	Loop numbers of bank 3	
14	Transit time	0-255	Transit time from bank 3 to bank 4	
15	Bank 4	61-255	13 auto shows are pre-programmed. Each program is selected by DMX key value	
16	Loop of Bank 4	0-255	Loop numbers of bank 4	
17	Transit time	0-255	Transit time from bank 4 to bank 5	
18	Bank 5	61-255	13 auto shows are pre-programmed. Each program is selected by DMX key value	
19	Loop of Bank 5	0-255	Loop numbers of bank 5	



#### 4.4. channel 1: Angle (Starting address)

Ignition and flame jet box is located at 90 degree position originally. When it receives dmx signal, it moves to 0 degree position. This Channel is for setting shooting angle and each angle is determined by dmx key value.

#### 4.5. Channel 2: Flame – solenoid valve (Starting address +1)

This flame channel is for making your own sequences or manual flame shooting. Under the condition of pump and electric spark working, the flame channel works. Under that condition, when you turn on this channel, you can shoot a single flame as you wish in shooting time and shooting angle. If you do not want to use pre-programmed sequences, you can make your own sequences with this flame channel.

This channel is locked for 10 seconds for safety reason whenever the device is power on.

#### 4.5. Channel 3: Electric Spark (Starting address +2)

The third channel (starting address +2) activates the electric spark with dmx values 200 and 255. Only after pump starts, it can work. Without pump start, this electric spark channel does not work.

#### 4.6. Channel 4: Pump (Starting address +3)

Hurricane AW has 2 pumps inside the device. After pump pressurizes fuel upto 18bar, it goes into the standby mode(stop working) and when the pressure falls below 14 bar, it works again to get 18 bar.

#### 4.7. Channel 5(Starting address + 4): Program of Stepp Sequence of single flame shot

Hurricane AW has a number of pre-made sequences, allowing you to access certain sequences with 5<sup>th</sup> channel Below, you can find a single flame shot(20ms, 0.2sec.) at each angle of dmx key value.

**Chart 1 : CH5 single stepp sequence with dmx key value**

(O means shooting flame for 20ms)

CH	DMX key	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°	180°
CH 5	0-75	x	x	x	x	x	x	x	x	x
	76-95	O								
	96-115		O							
	116-135			O						
	136-155				O					
	156-175					O				
	176-195						O			
	196-215							O		
	216-235								O	
	236-255									O

#### 4.8. Channel 6, 9, 12, 16, 18 : Bank channel

At these bank channels, the following sequences of autoshow have been pre-programmed.

**Chart 2 : Autoshow Sequence with DMX key value at bank channels**

(numbers 1, 2, 3, 4 ..... means order of shooting)

DMX key		0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°	180°	
<b>Stepp sequences</b>											
0-45											
61-75	(L → R)	1	2	3	4	5	6	7	8	9	
	(L ← R)		16	15	14	13	12	11	10		
76-90	(L ← R)	9	8	7	6	5	4	3	2	1	
	(L → R)		10	11	12	13	14	15	16		
91-105	(L → R)			1	2	3	4	5			
	(L ← R)				8	7	6				
106-120	(L ← R)			5	4	3	2	1			
	(L → R)				6	7	8				
121-135	Random		5	3	1	4	2				
<b>Stepp + wave sequences</b>											
136-150		1	2	3	4	5(wave from 90° to 180°)					
151-165		5(wave from 0° to 90°)					4	3	2	1	
166-180			1	2	3	4(wave)					
181-195			4(wave)				3	2	1		
196-210				1		2					
211-225			1				2				
<b>Wave sequences</b>											
226-240	(L → R)			wave from 0° to 180°							
241-255	(L ← R)			wave from 180° to 0°							

#### 4.9. Channel 7, 10, 13, 16, 19 : Loop channel

This channel is to determine how many times each autoshow sequence loops.

DMX Key	0-9	10	20	30	40	50	60	70	80	90	100	...	...	240	250
		- 19	- 29	- 39	- 49	- 59	- 69	- 79	- 89	- 99	- 109			- 249	- 255
Loop	1	2	3	4	5	6	7	8	9	10	11	...	...	25	26

#### 4.10. Channel 8, 11, 14, 17 : Transit Time channel

This channel is to determine the transit time from one bank to another bank

DMX Key	0-9	10	20	30	40	50	60	70	80	90	100	110	...	240-249
		- 19	- 29	- 39	- 49	- 59	- 69	- 79	- 89	- 99	- 109	- 119		
Loop (ms)	0 - 9ms	10 - 19	20 - 29	30 - 39	40 - 49	50 - 59	60 - 69	70 - 79	80 - 89	90 - 99	1 - 9sec	10 - 19sec	...	140-149sec

#### 4.11. Autoshow Sequence List (DMX Key 0-45 is not used)

DMX key		0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°	180°	
<b>Stepp sequences</b>											
61-75	(L → R)	1	2	3	4	5	6	7	8	9	
	(L ← R)		16	15	14	13	12	11	10		
76-90	(L ← R)	9	8	7	6	5	4	3	2	1	
	(L → R)		10	11	12	13	14	15	16		
91-105	(L → R)			1	2	3	4	5			
	(L ← R)				8	7	6				
106-120	(L ← R)			5	4	3	2	1			
	(L → R)				6	7	8				
121-135	Random		5	3	1	4	2				
<b>Stepp + wave sequences</b>											
136-150		1	2	3	4	5(wave from 90° to 180°)					
151-165		5(wave from 0° to 90°)					4	3	2	1	
166-180			1	2	3	4(wave)					
181-195			4(wave)				3	2	1		
196-210				1		2					
211-225			1				2				
<b>Wave sequences</b>											
226-240	(L → R)			wave from 0° to 180°							
241-255	(L ← R)			wave from 180° to 0°							

## 5. Set up

1. Check the drain bolt is tightly screwed at the bottom of fuel reservoir and then charge fuel to fuel reservoir, checking fuel level gauge at the side of fuel reservoir.
2. Check the pressure discharge manual valve is closed. Before pump starting, this manual valve should be closed. If not, the device cannot get working pressure.
3. Connect power cable and dmx signal cable and turn on the power.
4. Turn on pump channel to check.
5. Turn on electric spark channel. It is recommended that spark is activated 1 sec before a chain of flame shooting and deactivated 1 sec after a chain of flame shooting.
6. The device is ready to start the show. For manual flame shooting, turn on flame shooting channel(CH2) and for changing shooting angle, use Channel 1 simultaneously. For auto show, use CH5 or Bank channels.
7. After the show, deactivate all the dmx channels to 0 and turn off the power. Then, open the pressure discharge manual valve for remove the pressure inside the pump and pipings.

### Caution

- Check if there is any fuel leakage from fuel reservoir. At the bottom of the device, there is a fuel drain bolt. Check if any fuel leaks from this drain bolt. This drain bolt is for cleaning fuel reservoir periodically.
- After fuel charging, the cap of fuel reservoir should be tightly closed. If not, the fuel can be leaked around cap when pressure purge is made.
- In case of wireless mode, always check wireless DMX group in order to avoid any overlap from other wireless dmx machines or controllers.

## 6. Safety

*Hurricane AW has some safety functions*

- The device has double solenoid valves.
- Without pump working, electrical spark ignition is not made.
- Without electric spark ignition, solenoid valve does not work, then flame cannot be shot.
- The fuel level sensor is installed. Pump does not work in case that the fuel is below the determined low level.
- Below 6 bar, the solenoid valve for flame does not work. The solenoid valve activates only between 6 and 18 bar.
- When the pressure reached to 18bar stops working and enter to the standby mode. When the pressure falls below 14 bar, it works again.

## **7. Maintenance**

### **Cleaning**

After using, please clean the device with wet towels. Please be sure that the power is switched off when you clean it and all dmx and power cables are plugged out.

Do not use solvents or abrasives for cleaning. Just wet towel is enough for cleaning. Keep all power sockets or contacts always clean and dry.

Especially, lots of carbon remnant or soot can be accumulated on the electric spark pins. Clean them with soft-brush. Do not bend spark pins or change the gap between arc pins.

### **Leaking Test**

Before using, always check any leaking from the device. A regular leaking test must be made every six months at 18 bar longer than 20 minutes.

### **Filter**

The filter is built in the device to prevent foreign objects or dusts from being jammed in the fuel line from fuel reservoir to pump and solenoid valve. If some dusts or foreign objects are jammed in this filter, the filter needs to be cleaned. If not, the flame height will be seriously lowered. In this case, please refer to How to clean the filter of our repair service manual which is provided separately.

### **Damages caused by misuse and maloperation, etc**

The devices have been designed to generate flame effects. Discuss all other applications with the manufacturer before usage. In the case that one of the events stated above has happened we are only liable if the defect was within our range of influence.

Especially the user's work must comply with the safety regulations and the instructions given in this manual at all times.

### **High Voltage**

For the electrical ignition of the fuel very high voltages that can be dangerous to life are generated in the device. Never operate the device if the cap of fuel reservoir is not tightly closed. Furthermore never touch anything inside the device and never touch the ignition electrodes while the device is switched on.

### **Warranty**

The warranty period is 12 months.

If there is any defect during in this period please pack the device properly and send it to the manufacturer with carriage paid to have it repaired free of charge. Please do not forget to attach a description of the symptoms, which have occurred. Warranty is excluded if the device was damaged due to wrong usage or excessive stress.