



Hurricane Giant Flame System

User Guide

Product Choreography



Set of Equipment Supplied

- Hurricane Giant Flame System : 1
- Power Cable : 1
- DMX Signal Cable(3pin & 10m) : 1
- Gas Hose(15m) : 1
- Regulator Adapter : 1
- Funnel : 1
- Operation Manual : 1
- Handy DMX Controller & Road Case are not included to the set

Product Description

Hurricane Giant can fire natural flame, using Isopar G or H for natural flame and Nitrogen Gas as propellant, the system gives you the ability to shoot a flame approximately 15m(50ft) on average at working pressure 2.5MPa(25 bar)

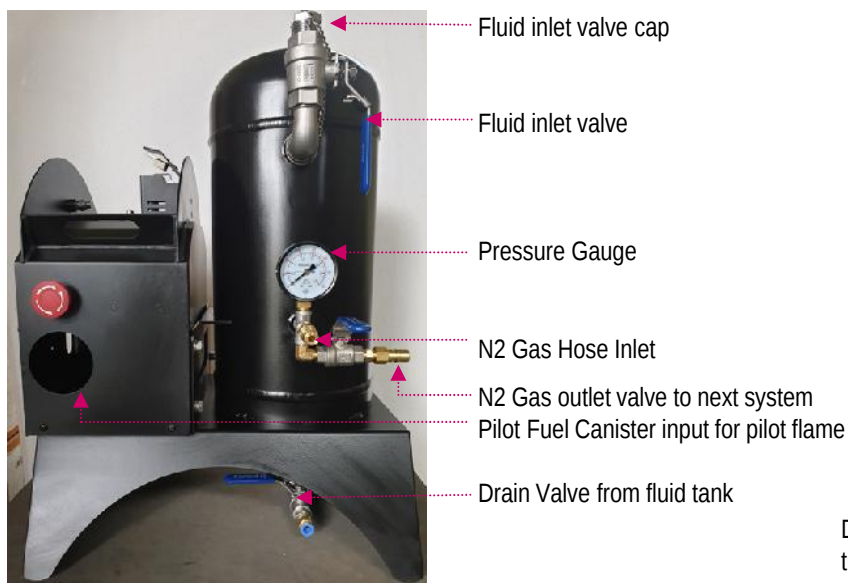
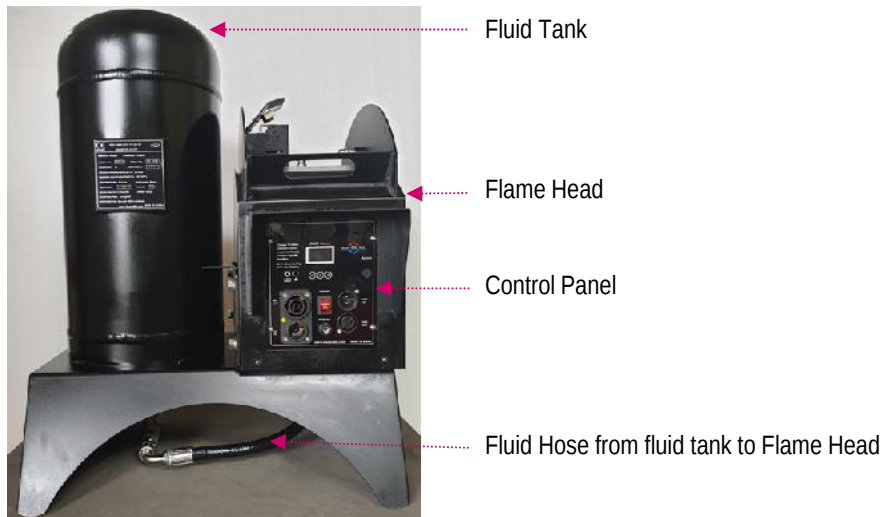
For safety, this system has safeguard system which is composed of flame sensing rod and its flame sensing board. Without the solid pilot flame, the solenoid valves do not open and accordingly, it cannot shoot the flame. The pilot flame striking process repeats till the pilot flame becomes solid and even during the show, when the pilot flame is gone unexpectedly, the pilot re-strike resumes automatically and immediately within 0.3seconds. During this re-strike process, the valves keep closed so that no danger to shoot the flame accidentally.

This system is controlled with standard DMX 512 controller or our Handy DMX controller.

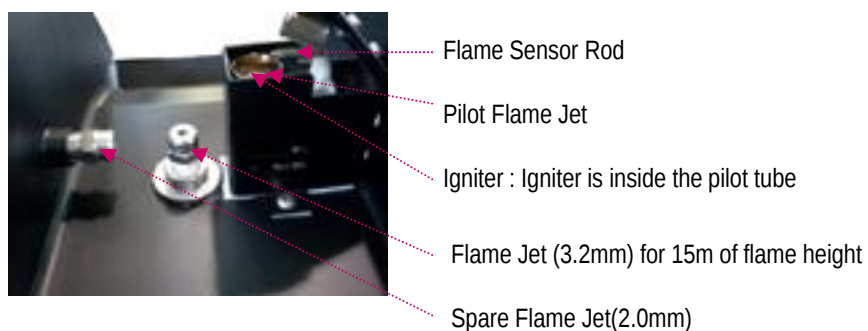
Specification

- Power : 220VAC, 50/60Hz.
- System Size : 45cm(L) x 40cm(W) x 62cm(H), 25KGS
- 3.2mm flame jet is installed. [2.0mm flame are supplied for 10m flame as spare]
- Fluid Tank Capacity : 30L/tank (max. 28L of fuel can be filled) or 16L/tank(max. 14L of fuel can be charged)
- Shooting time : 2 second/liter on average with 3.2mm flame jet.
- Average Flame Height : 15m(50ft) with 3.2mm flame jet
- Propelling Gas : Nitrogen Gas(N2 gas) or Air compressor (recommend 25-30bar outlet pressure)
- Working Pressure : 2.5MPa(25 bar) for 3.2mm flame jet and 2.0MPa(20bar) for 2.0mm flame jet.
Do not charge over 30 bar.
- Control : Our Handy DMX Controller or Standard 512 DMX Controller.
- Pilot fuel : Butane Gas Canister (Main flame is lit by pilot flame and pilot flame is lit by the HV igniter).
- Main flame source : Isopar G or H. **DO NOT USE COLORED FLAME FLUIDS.**
- All valves closed when power is removed.

System Overview



Drain Valve : Connect the supplied tube to this valve for draining.





Warnings

- ❖ This system is intended to provide a normal flame special effect. As with all potentially dangerous special effects, the operator should be in full view of the systems at all times during operation.
- ❖ The system's flame height is 15m(50ft). Appropriate clearance for flame and its heat is required.
- ❖ Under the rainy or strong-windy weather, do not use the system.
- ❖ Don't shoot flames toward people or any flammable objects. Place the system on flame resistant surface and secure safe distance as follows : 3.2mm flame jet – minimum 6.0m(20ft) from the audience and 25m(80ft) to the ceiling, When using the system on the grass or artificial grass, put the flame proof carpet (size: 5m x 5m) down and place the system onto that carpet. If not, the grass can be damaged by the heat of the flames.
- ❖ Keep always a security guard around the propelling media (Gas tank, etc) and isolate it from ordinary people.
- ❖ Understand completely how to operate and control the system before using.
- ❖ Always keep the working pressure stipulated in this manual. Working pressure is the most important factor for the best show and for the safety. Always abide by the working pressure.
- ❖ Always check any leakage of gas and fuel for the system, hoses and tanks before using.
- ❖ Also, check all the power and signal cables if there is any damage or trouble before using.
- ❖ During transportation and storage, remove all the fuels and pressure from the system.
- ❖ Under emergency situation, push E-stop or turn off power switch of system and close main valve of gas tank. For safety, make your own secondary E-stop power cable, connect all the systems power to it and under emergency, turn off this E-stop power cable.
- ❖ If you cannot stop the burst-out of flame due to effect valve's trouble, close the main valve of gas tank and open drain valve of regulator adapter.
- ❖ Do not touch pilot covers during and just after the show. They are very hot and you can be injured. Wait till the pilot covers are completely cooled down and then touch the burner head.
- ❖ Do not open the main valve of N2 gas tank before the completion of fluid charging and do not disconnect the gas hose before the pressure is discharged from the fluid tank and hose completely.
- ❖ Do not disconnect hose from system or Nitrogen gas tank while gas and pressure remains inside hoses. The pressurized Nitrogen gas bursts out from hoses and causes risk of injury or trouble of hose couplers.
- ❖ When fluid remains below 1 liter inside the tank, some unburnt fluid can be fallen out and it makes the ground wet so that it could pose fire risk. So, always pour 1 liter or more fluid basically into the tank than the fluid quantity you want to shoot. For example, if you want to shoot 8liter, it is better for you to charge 9-10 liter.
- ❖ Please charge the fluid below 14 liter. The remaining space of tank is for Nitrogen gas. If it is charged over 14 liter, fluid overflows through gas pipe lines and gas inlet valve of fluid tank. When you charge the fluid into the tank, please confirm beforehand that the gas hose is not connected to the gas inlet valve and drain valves are completely closed.
- ❖ When charging fluid into tanks, open gas inlet valves till the completion of fluid charging for easy air-circulation. If not, fluid could be bumped out from the fluid inlet ball valve.
- ❖ Do not use DMX signal cable which is weak to Noise matter. Use always same brand and same specification of the DMX signal cable supplied by us.

System Requirements

The system requires working pressure of 2.5MPa(25 bar) with 3.2mm flame jet. Nitrogen gas can provide this pressure constantly. One Nitrogen Gas tank(40 liter) can charge 4 units constantly during whole show. The gas hoses as well as dmx signal cables can be made in daisy chain from this system to that system.

CAUTION : Never provide pressure lower than 1.5MPa(15bar) and higher than 3.0MPa(30 bar) to the system. If the delivery pressure from the gas tank is over 3.0MPa(30 bar), install a pressure regulator between the system and gas tank and set the delivery inlet pressure at 2.5MPa(25 bar).

For operating the system, you have to prepare i) Nitrogen Gas as propelling media with pressure regulator, or Air Compressor, which can supply the delivery pressure of 2.5 ~ 3.0MPa with pressure regulator.
ii) main fuel (Liquid fuel), iii) Butane canister for pilot fuel and iv) DMX controller.

Propelling Media & Fluid

Propelling Media

Hurricane Single Flame System needs a propelling media to pressurize the fluid inside the tanks and shoot the flames up to 15m. For supplying the stable and high pressure, Nitrogen Gas or compressed air is perfect, because they are neutral and non-toxic. This gas or compressed air as propellant plays a role to shoot the fluid through flame jet with high speed and spray it into the air.

Nitrogen Gas (Don't use liquid Nitrogen type)

The pressurized Nitrogen Gas inside the tank or cylinder has very high pressure(15MPa or 3,000psi more or less). If this high-pressurized gas is supplied to the system directly, gas hose and fluid tanks become destroyed. So, the nitrogen pressure regulator should be installed at the outlet of nitrogen gas tank and the delivery pressure should set at 2.5MPa for 3.3mm flame jet before you open the main valve of nitrogen gas tank. One N2 gas tank(40~50L size) can supply the stable pressure to 4 units of Hurricane Single System

For selecting correct Nitrogen Pressure Regulator, please refer to following website. Below model is perfect as regulator.
<http://www.harrisproductsgroup.com/equipment/regulatorinfo.asp?ID=25HVAC> (Model No. : 25-500C-580)

For connecting gas hose to pressure regulator, you need the following adapter.



Connect this part to the pressure regulator.
Connect gas hose to this plug.

This Drain Valve is used for draining gas inside the hose and the system.



Instead of Nitrogen Gas, you can use the air compressor which can supply the compressed air of 2.5MPa.

2.5 or 3.0MPa pressure-deliverable air compressor would be perfect. You can regulate the delivery pressure with installing pressure regulator at the outlet of the air-compressor like the nitrogen gas pressure regulator.

FLUID as main fuel

This system is designed for natural flame only. Do not use any colored flame fluids to this system. The solenoid valve's sealing is NPBR(a kind of rubber) and it is very weak against the aggressive fluids. The aggressive fluids can make the sealing being damaged and it can cause the leaking of the pressure and fluid. So, do not use colored flame fluids and other aggressive fluids to the rubber. We recommend to use ISOPAR G or H to this system. This Isopar G or H is formulated and supplied by ExxonMobil Chemicals. Except Isopar G or H, we cannot guarantee that the other fluids has no negative effect to the systems.

Pilot Fuel for pilot flame

220~250gr butane canister is used as pilot flame fuel.

(see http://www.amazon.com/Sunmax-SM-101-Butane-Fuel-Cannister/dp/B000I1XYYA/ref=pd_sbs_sg_2)

At cold weather, this butane is not well-gasified. Under cold weather, make butane canister warm and use it. Always use new butane canister for strong pilot flame at the show. Weak pilot flame may not light the flame jets Very well. Try to keep strong pilot flame regardless of cold weather or outdoor for best flame effect.



Operating Procedure

How to set the system;

- Locate the system and N2 Gas tank at the safe place. Install pressure regulator to N2 gas tank.
- Please confirm that main valve of nitrogen gas tank and handle of pressure regulator are closed tightly and completely. (Always check the close/open direction of pressure regulator handle. Generally, it is the opposite to main valve of gas tank)
- Disable the system electrically by pushing E-stop switch or turn off the power switch.
- Close the drain ball valve of fluid tank and open gas inlet ball valve before fluid charging.
- Use funnel for fluid charging. Do not charge over 14liter into a 16L tank or 28Liter into a 30L tank. After fluid charging, close fluid inlet ball valve and gas inlet ball valve tightly. Then, screw the cap into the fluid inlet ball valve.
- Then, load butane canister to the burner head. Insert it to the pilot fuel input and turn it right with pushing.
- Connect power code and DMX signal cable to the system. And set the starting address of each system.
- Then, connect gas hose to the gas tank and then the system. Then, open gas inlet ball valve of the fluid tank. The gas hoses can be connected in daisy chain from this system to that system.
- After all the gas hose connection is made, slowly open the main valve of the gas tank and then, set the delivery pressure at 2.5MPa(25bar) for 3.2mm flame jet by opening the handle of pressure regulator bit by bit and very slowly. If 4 units are connected to one gas tank, you can set the delivery pressure a little higher for quick nitrogen gas charging to each system during shooting but do not charge over 30 bar. Check the pressure gauge of each system if the gauge indicates the right working pressure.
- After nitrogen gas charging, please check if there is any leakage of gas or fluid or pilot gas.
- When everything is okay and safe to shoot the flame, release E-Stop Switch and turn on power switch of each system.
- Notice : 0.3 second per shot or longer is recommended. Too short shot can make some fluid residue around flame jets. Also, the last 3~4 shots can make the unburnt fluid get shot together. This is caused by the lack of remaining fluids inside the tanks. So, for preventing this case, charge one or two liters more than your planned and designed fluid quantity.
- After the show, firstly close the main valve of nitrogen gas tank and then close the regulator's handle. Then, disable the system electrically. Then, for removing remaining gas inside the tanks and hoses, open drain ball valve of regulator adapter or fluid inlet ball valves bit by bit. Keep your body and face far away from the gas-drain direction.
- After completely removing gas inside the system and hoses and then, disconnect all the hoses and cables, pilot gas. Lastly, plug the supplied tube for drain into the drain valve of the system and drain remaining fluid from each tank.
- After drain, close fluid inlet ball valves, and gas inlet valve and cover the fluid inlet valves with cap. 
- Don't touch pilot flame areas, covers and heads. It could be very much hot and you can be damaged and injured. After it is cooled down completely, then, touch the pilot areas if necessary.
- Always, remove all the gases and fluids from the systems and hoses after use. Before storage, always wipe out the systems clean with wet towels. Then, store it into the road case always.

DMX Operation

In case that W-DMX receiving card is installed , the below are applied

- DMX Cable Connection



Photo a

1. Connect DMX cable under Power Switch OFF(Photo a)
2. Turn on power switch and confirm LED lamp is flashing(Photo b)
3. The yellow-colored DMX word is displayed on left-top of DMX address Monitor when DMX cable is correctly connected.



Photo b

Change Color of DMX Group by pushing this button.

※ When you use wireless dmx, plug out dmx cable and then use wireless dmx.

- Wireless DMX Connection

Color of DMX Group						
Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7
RED	GREEN	YELLOW	BLUE	PINK	SKYBLUE	WHITE

Photo c

R x D – Green Flashing : Receiving Data
T x D – Red Flashing : Sending data



Photo d



Photo e

1. When you turn on the power of flame head, one of DMX Group colors (photo c) is displayed on DMX Channel Group(photo d)

※ In case that green or red led lamp is flashing, change the color of DMX Group by pushing the button or plug off dmx cable from the flame head.

2. Connect Wireless dmx sender to the main controller and turn on the wireless dmx sender.

※ In case that green or red led lamp is flashing, change the color of wireless DMX sender.

3. Unify the color of flame head DMX Group and the color of wireless DMX sender like photo d and photo e.

4. The yellow-colored DMX word is displayed on left-top of DMX address Monitor when wireless DMX connection is correct.

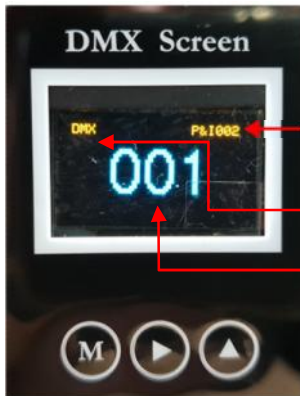
DMX Operation

- How to set Starting Address

Yellow color of DMX : DMX or wireless DMX connection is OK.
P & I means Pilot or Ignition Channel Number.

DA means Machine DMX address.
PW means

For setting DMX address, push M button longer than 3 seconds. Then, push Select & set number by pushing Up button.



Mode Select Up

Pilot or Ignition
CH No.
DMX Connection
State
Starting Address



Photo 1



Photo 2

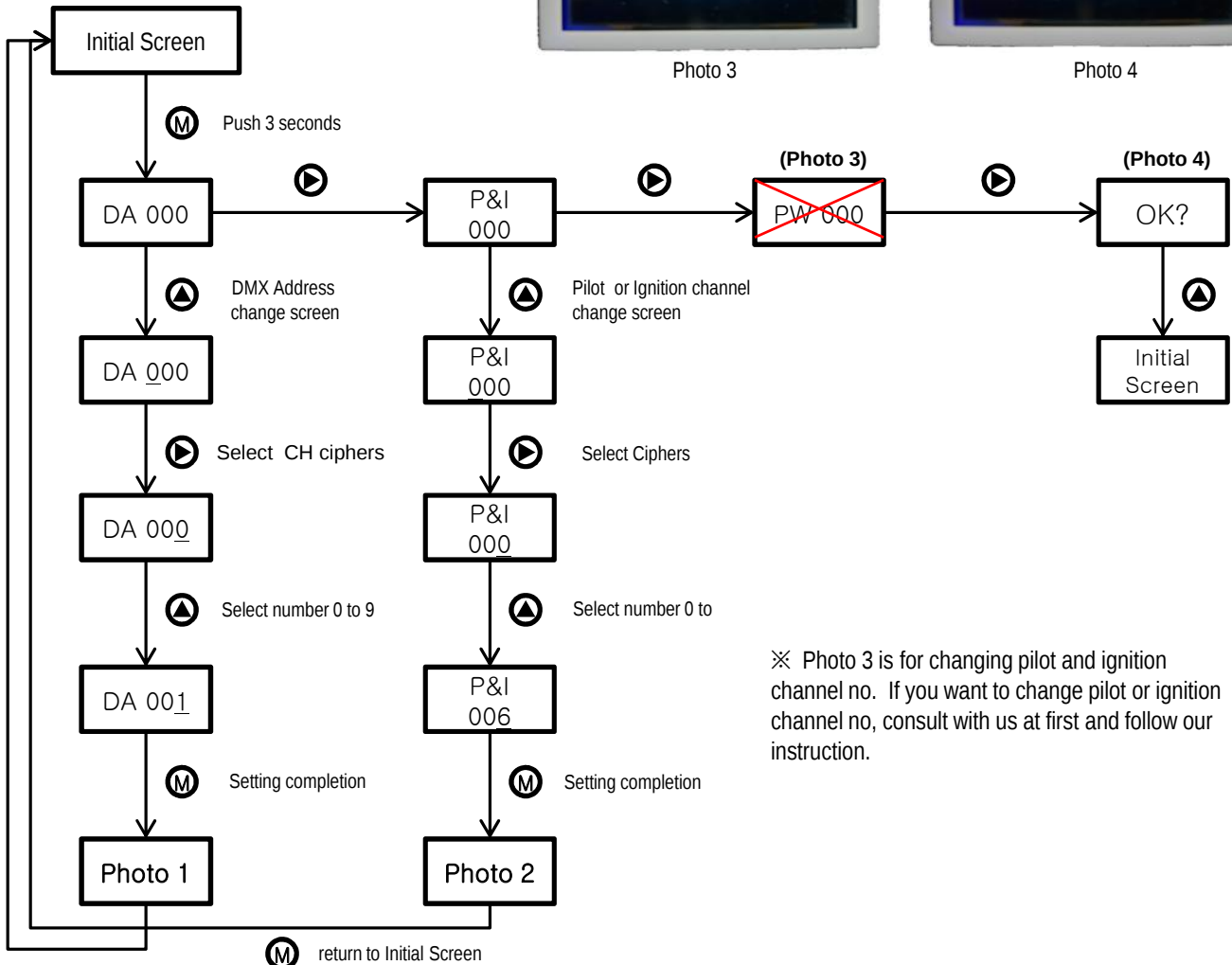


Photo 3



Photo 4

Mode Setting



Maintenance

Maintenance

- After the show, remove pilot gas canister, all the pressure and fluid from the system completely and close all ball valves.
- After using, wipe out fluids from the system with wet naps or paper towel and cleaning solution. After show, ensure that main fuels and Pilot fuel were removed from each system. If not, the life of system might be getting shorter, because vapor of Fluid may damage the system.
- Keep out of reach of the children and don't allow unqualified person to touch the system.
- Store the system in clean, dry and cool area away from flammable or heat sources.
- Don't allow the dust or foreign objects to enter to the system and especially to the fluid inlet ball valves. These objects can block the effect valves and cause its mal-function.
- Check periodically the tubing, hoses, cables and gas piping, if they are damaged.

Trouble Shooting

1. Pilot

- Butane Gas for pilot flame is not gasified well at -0.5°C (31.1°F) or below. In this case, make it warm and use it. If possible, during winter season, please use butane gas canister for winter season. In case that you use the cold butane gas at the cold weather or the used butane canister, in which small gas remains, the pilot flame can become weak and the weak pilot flame may not light the pilot flames located far-outside. Use the butane canister (siphon type).
- In case of no spark, check the distance of igniter and pilot tube. If igniter is bent, located far from pilot tube or too close to it, keep proper distance. Also, check the transformer, ignition cable and its harness.
- Even if the igniter issues spark, some pilot flames cannot light. Pilot flame nozzles may be clogged with some dusts. Blow out the dusts with air-gun or air-compressor. Also, if the centered pilot flame does not light, the flame sensing rod may not sense the pilot flame properly. The main reason that the rod cannot sense the pilot flame is that the flame sensing board is broken or that the flame sensing rod's location is changed.
(When pilot flame sensing rod senses solid pilot flame, the GREEN LED of the flame sensing board lights.
RED LED light is POWER LAMP.)

2. Control Trouble

- When DMX signal works normally, the Starting Address number is displayed in FND firmly after 3 times flashing. If there is any continuous flickering of the number, DMX signal is not transmitted to the system from the controller. Check DMX cable, its input and output and DMX Board.
- When you run two or more units, always check if you set the starting address correctly.
- Please avoid to run DMX signal cable together with high voltage power cable for preventing from "Noise".

3. Main Flame Trouble

- If any of fluid fall-out around the system is there, working pressure is not enough or too short shot might be the reason.
- Accidentally, some foreign objects can block the orifice of solenoid valves. In this case, fluid continues to sneak out or be shot because solenoid valves cannot be closed completely. Immediately close nitrogen gas tank and remove the pressure from gas hoses and the systems by opening the drain valve of gas regulator. Then, break down the valves and remove the foreign objects.
- There is very rare case that some foreign objects block flame jets. In this case, that flame jet's flame might be smaller than others. After loose the flame jets, remove the foreign objects.
- When the main flame is lower and weaker than normal without special cause, the filter might be jammed with dirties. In this case, pull out the filter, clean it and re-install it. The jammed filters can block the flow of fluid from the tank to the burner head.

How to clean the filter

We recommend that you need to clean up the filter every 6months because it is polluted with foreign objects and dirties after using the system
Otherwise it causes reduced the flame height or liquid fallouts due to depressurization

1.



2.



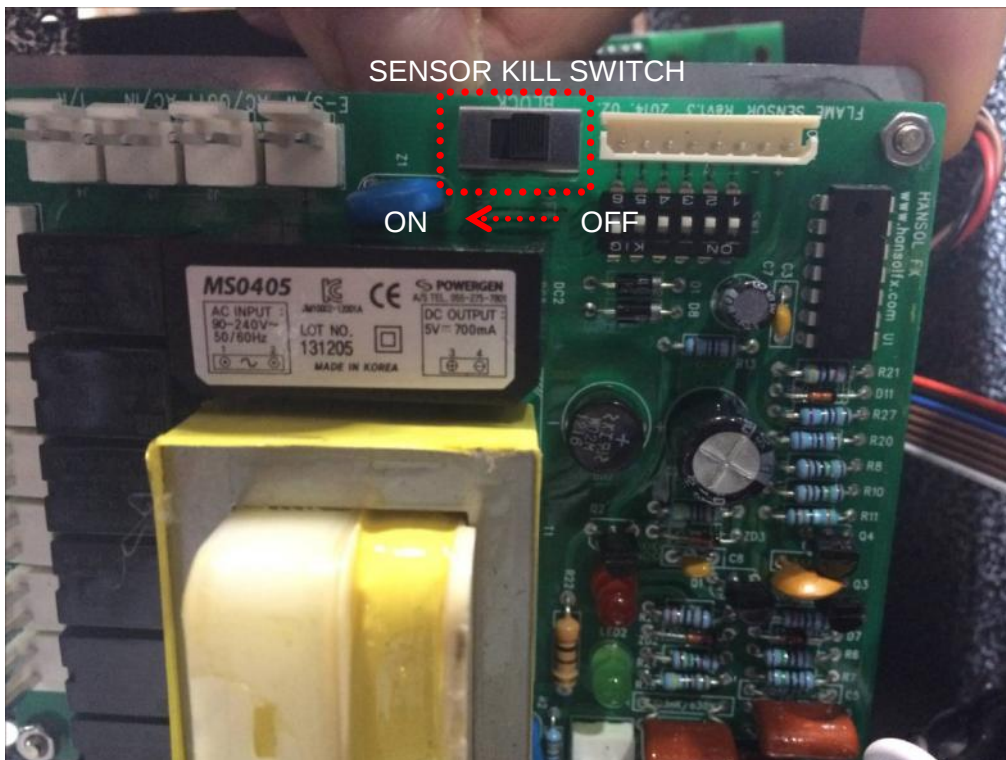
3.



Flame Sensor Troubleshooting

When the flame sensor or power board does not work(power Board-relay board- fault), the pilot flame seems to be working(sparking continues) but you cannot shoot the flame. In order to shoot the flames under that circumstance, you need to kill flame sensing function.

There is flame sensor kill switch on power board as the following photo.



1. Turn on Flame Sensor Kill switch on power board.
2. Then turn on the pilot flames. You can see the pilot flame and sparking.
3. But you can shoot the flame under this condition.

This is the temporal solution. Eventually, you need to replace the broken power board to new power board for safety.