



# 5-Master

## Safety instructions and operating manual



TBF-PyroTec GmbH  
Lichterfelder Str. 5 A  
21502 Geesthacht

Tel.: + 49 (0)4152 157 9950 Fax: + 49 (0)4152 157 9951

# Flame projector 5-Master

## Safety instructions



**Caution!** The directions in this manual must be followed strictly. It is imperative that the safety instructions and the manual are completely read and understood before start-up! The device may only be operated under the constant supervision of trained personnel. Maintenance of the device may only be carried out by the manufacturer. In occurrence of malfunctions or dangerous situations the device must immediately be shut down! Do not operate the device in strong winds or precipitation (e.g. rain or snowfall).



**WARNING!** Non-observance of the following safety instructions may lead to severe damage to persons and/or property, by fire, explosion or electric shock!

### 1. Transport and storage



Check the incoming goods for damage and completeness. Notify the shipper immediately of any transport damage.



**When transporting the device must not have fluid in the tank. The device must be emptied before the transport.**



When transporting the device, ensure that all components are carefully packed and secured against jolting and impact load.



The parts must be unpacked with great care and caution to prevent damage to sensitive components, such as controls.



The components of the device must not be stored unsheltered outdoors. Protect against moisture and precipitation. The permissible ambient temperatures are +5° C to +50° C.

## 2. Installation



The device is suitable for indoor use. When installing it on outdoor stages, make sure the device is protected against wind or heavy airflow, precipitation or heavy moisture. Set up the device on a level and even surface and ensure good stability. The device must be fully secured against dislocation. **The device must only be filled, emptied and actuated in horizontal position! After filling and until emptying the device must not be moved!** The assembly of the device must be carried out deenergized. No impact or vibration stress may occur. Installation must only be carried out in a way that the middle flame is projected vertically upwards. The device must be secured against unauthorized access. Any contact with the hot parts of the burner must be avoided.



Sufficient safety distance to the area involved in performance and to flammable materials must be considered when assembling the device. Performers and participants must be clear of the safety distances beforehand, and the operation must be rehearsed. In dangerous situations the device must immediately be shut down (emergency shutdown)!

In still air, the sideway safety distance in the line of the fire fan is 9 m.

The front and rear safety distance in still air is 2.5 m.

The safety distance above the burner is 9 m.

In draft or wind the emitted flames may drift. That means the safety distance must possibly be extended to a range where danger to persons and property is excluded.



Maintenance of the device may only be performed by the qualified personnel of the manufacturer. The casings of the burner or the control panel must not be opened. Risk of electric shock!

By opening the casings of the burner or the control panel any guarantee and/or warranty expires and we assume no liability for consequential accidents and damage to persons and/or property.



The disassembly of the burners must not be carried out until they have sufficiently cooled down.



For the assembly and operation of the device, only original parts from the manufacturer may be used. The usage of other parts can lead to severe damage to persons or property.

## 3. Start-up



The initial operation may only be carried out after complete assembly of all necessary components and safeguards by trained personnel, in consideration of all topics addressed in these safety instructions and the operating manual. We disclaim liability for faulty start-up carried out by an untrained third party, and the warranty expires.

#### 4. Operation



The flame projector is used at events. Before start-up, the usage of the device must be clarified with a representative of the preventive fire protection.



The operation of the unit is only allowed for the designated purpose, within its boundaries of design, by trained personnel. We assume no liability for inappropriate use, which can lead to severe damage to persons and/or property. Furthermore, the manufacturer's warranty expires.



Safeguards must not be removed or disabled! Do not open components of the unit (e.g. casing covers or front panels), as that poses great risk of injury, like burns, electric shock etc.



In dangerous situations the device must immediately be shut down and disconnected from the power source. **Make sure the device can be disconnected from the power source at any time.**



Make sure that all hoses and connections are intact. Defective or damaged parts must not be used.



Eliminate all sources of ignition, like open flame and spark-producing equipment, when setting up, filling, operating or disassembling the device, and never smoke during these tasks.



The device may only be operated by trained personnel. Sufficient safety distances during operation of the unit, protection against accidental contact with hot burner parts and safe assembly must be ensured. Extended safety distances in draft or even breezes must be considered. The device must not be operated in strong winds or precipitation.



The device must only be filled with 5-Master fluid. No liability is assumed for consequential damage caused by use of other fluids. Moreover, any warranty from the manufacturer expires.

#### 5. Shutdown



During longer idle periods the unit must be depressurized (see operating manual) and de-energized.



At least once a year the device must undergo safety inspection, maintenance and adjustment by the manufacturer. Either an appointment must be made with the manufacturer to have the unit inspected, or it must be sent in.

# Flame projector 5-Master

## Operating manual

**1. Note:** please read and follow the safety instructions closely!

### 2. Preface

The 5-Master is a fluid-operated flame projector, capable of producing effect flames with a height of up to 7m. Latest electronic safety features and controllers allow operating the unit with the highest possible safety. The device is basically designed for in-door use; the use on outdoor stages is only possible if the unit is protected against precipitation, humidity, strong drafts and winds (also see safety instructions). With the 5-Master, you can project five independently controlled effect flames. They are activated by DMX.

### 3. Components of the unit

The unit consists of:

- Burner with integrated tank
- Black drain hose
- Power cable, 5m
- CO2 pressure controller 0 - 10 bar
- Blue high-pressure hose
- Metal funnel

### 4. System functionality

The 5-Master fluid is conducted from the tank into the burner, where it is sprayed with a valve. A high-voltage arc ignites the fluid. CO2, from a compressed gas cylinder without ascension pipe, creates an overpressure in the tank, above the liquid level of the burner fluid, which is used to spray the fluid over the burner nozzles.

### 5. Installing the unit

- **General guidelines:**  
The device must be set up on a level, stable and non-flammable surface. All safety instructions must be strictly followed. The device must only be filled, emptied and actuated in horizontal position! After filling and until emptying the device must not be moved!

- **Filling the tank:**  
**Open flame, spark producing equipment and smoking are strictly prohibited within a radius of at least 10 meters when filling the tank!**

If possible, the tank must be filled in a separate and cool room with **good ventilation**. Keep suitable fire extinguishing agents ready, preferably a CO<sub>2</sub> fire extinguisher. The 5-Master fluid has a very low boiling point and thus vaporizes quickly. The resulting vapors are highly flammable and heavier than air. Read and follow the information on the material safety data sheet at all costs. Always close the 5-Master fluid bottles immediately after use. To fill the device, it must be shut down (see “Shutting down”), depressurized (see “Depressurizing”) and the 5-Master fluid drained from the tank (see “Draining the 5-Master fluid”).

Carefully open the brass-colored screw cap on the upper side of the casing. Light overpressure in the tank will escape through pressure relief bores. In that case, do not open the screw cap any further, but wait until you cannot hear the hissing noise caused by the over-pressure any more. The cap must not be removed until the tank is completely depressurized. Use the metal funnel to fill the tank through its opening. Only use the included funnel to fill the tank!

Do not fill more than three 1l-bottles of 5-Master fluid into the empty tank (the tank's capacity is 3 liters!). Pour the 5-Master fluid slowly and carefully into the tank. To avoid overfilling the tank, the device must be completely drained every time before refilling (see “Draining the 5-Master fluid”). After filling, make sure that the ring seal under the checkered hold of the brass-colored screw cap is placed properly, and close the tank with the cap. Seize the screw cap only by hand, do not use pliers or other tools!

- **Connecting the CO<sub>2</sub> bottle:**  
**Make sure that the CO<sub>2</sub> bottle is standing upright and that it is secured against falling over. Do not use CO<sub>2</sub> pressure cylinders with ascension pipes. Only the gas phase must be drawn from the pressure cylinder!**

Firmly screw the pressure controller to the outlet of the CO<sub>2</sub> bottle, and the blue pressure hose to the outlet of the pressure controller. Now connect the coupling socket of the blue hose with the coupling plug on the rear side of the burner. Then turn the wing screw below the manometer counterclockwise all the way to the stop. Now you can open the CO<sub>2</sub> bottle. Use the wing screw below the manometer to set the pressure to 6.0 bar.

- **Setting the pressure on the device:**  
The pressure with which the 5-Master fluid is injected into the burners by the CO<sub>2</sub> regulates the height of the effect flame. Low pressure creates a low flame, high pressure creates a high flame. The pressure can be set with the gray control dial on the rear side of the device. The manometer above the dial displays the tank pressure. Make sure that the tank is tightly shut and no CO<sub>2</sub> escapes from the inlet cap. Do not operate the unit with a leaky tank! Set the pressure to a value between 0.5 and 5.0 bar.

- **Wiring the unit:**  
Start by connecting the DMX cable with the respective input jack on the rear side of the burner. Now plug the power cord into a power outlet with a 16A fuse, and the gray Neutrik connector into the gray input jack on the rear side of the device. The DMX channel display on the front side of the burner will light up to indicate that the device is ready. Now connect the DMX cable from the 5-Master with a DMX console. When the connection to the switched-on DMX console is established, a green LED on the display will light up.

- Setting the DMX channel:**

There are two small black push-buttons to the left of the DMX display to select a DMX channel. The small black button to the right of the display confirms the selected channel. The channel shown in the display is the “activation channel”, the following five channels are the “trigger channels” for the five flames.
- Triggering the unit:**

Make sure that there are no persons or flammable materials within the safety zone!  
In still air, the sideway safety distance in the line of the fire fan is 9 m.  
The front and rear safety distance in still air is 2.5 m.  
The safety distance above the burners is 9 m.  
Make sure that the unit can be disconnected from the power source at any time.  
Without the possibility to disconnect the unit from the power source, the unit must not be operated!  
The unit must not be triggered if the operator cannot directly overview the device and the entire safety zone! The unit may only be operated by qualified personnel.

Activate the selected DMX channel shown in the display. The 5-Master is ready as long as this channel is activated, and the flames can be triggered by activating the following five channels.
- Shutting down:**

First, disconnect the unit from the power source, then disconnect the DMX cable and close the CO2 bottle.
- Depressurizing:**

Open flame, spark-producing equipment and smoking are strictly prohibited within a radius of 10m when depressurizing the unit! The unit must be shut down before depressurizing it (see “Shutting down”).

The tank must be depressurized before it can be opened. To do so, turn the gray control dial on the rear side of the device counterclockwise until the manometer installed above it displays 0.0 bar. Now you can either re-fill the tank (see “Filling the tank”) or drain the 5-Master fluid (see “Draining the 5-Master fluid”).
- Draining the 5-Master fluid:**

For transport, during longer idle periods or before filling, the tank must be completely drained by letting off the 5-Master fluid. Before doing so, the unit must be shut down (see “Shutting down”) and depressurized (see “Depressurizing”). Make sure that the CO2 bottle is shut. Follow all safety measurements described in “Filling the tank”.

First, connect the black drain hose with the coupling socket on the front side of the device. Make sure that the ball valve on the black drain hose is closed (the lever must stand crosswise to the direction of flow). Then, open the CO2 bottle and set the pressure on the device with the gray control dial on the rear side of the 5-Master to 0.5 bar. For this, the pressure hose must be connected with the device and the pressure controller of the CO2 bottle. Now plug the power cord into a power outlet with a 16A fuse, and the gray Neutrik connector into the gray input jack on the rear side of the device. The 5-Master fluid from the tank can now be filled into an empty 5-Master fluid bottle by opening the ball valve on the drain hose. Close the ball valve before the bottle runs over! The unit is completely drained of 5-master fluid if there is only CO2 coming from the ball valve. Now close the ball valve, depressurize the unit (see “Depressurizing”), disconnect the black hose from the unit and shut the unit down (see “Shutting down”).
- Dismounting the unit:**

Now you can disconnect the high pressure hose from the unit, and the CO2 pressure controller from the CO2 bottle after closing it.

## 6. In case of emergency

If serious malfunctions occur that pose a threat to persons and property, the device must immediately be shut down and disconnected from the power source.

## 7. Care and maintenance

Dirt on the unit should be removed with a soft and moist cloth. Never try to clean the electrodes inside the burner head by inserting any objects! Do not use aggressive cleaning agents.

Maintenance of the device can only be carried out by the manufacturer. Maintenance must be carried out **annually**, please make an appointment with the manufacturer, or send the unit in.

## 8. Technical specifications

### 5-Master:

Dimensions:	60 cm x 33 cm x 36 cm
Weight:	approx. 31 kg
Power input:	230V AC/16A
Power consumption:	1250W
Control:	DMX 512
Required DMX channels:	6 channels, including 1 channel for activation and 5 channels for triggering each of the five flames
Tank capacity:	3 liters
Pressure gas:	CO2 gas
Operating pressure:	6.0 bar