

This information is provided to fire authorities to demonstrate compliance with requirements for building and operating flame effects

This information is not intended as instructions to be used for the construction of any other flame effect device. If you are interested in building flame effects devices please consider taking one of many available flame effects courses.

Moltensteelman Single Burner Group 1 Flame Effect

This is a ***Group 1 Flame Effect*** device and is built under NFPA 54 and 58 LP gas codes, and NFPA 160 guidelines *Standard for the Use of Flame Effects Before an Audience*. It is a single burner flame effect (commonly known as a poofer) used on three platforms:

1. The Walking Beast by Moltensteelman
Steel vehicle 10' 7" tall. Flame effect is mounted above top of vehicle to give a discharge point of 16' above the ground.
2. The Flamboni by Moltensteelman
Aluminum vehicle 5' tall. Flame effect is mounted on pole to give a discharge point of 10' 6" from the ground.
3. Freestanding stationary tripod
A steel frame holds the flame effect for discharge point 8' above the ground.

Information:

All components are rated for 300 psi with the exception of the regulated low pressure pilot light. A pressure regulator is not required for the 300 psi components as the pressure relief valve on the supply tank is set at 275 psi. Operating pressure typically ranges from 50-150 psi, depending on outside temperature during operation. A commercial bottle warming blanket is used to maintain bottle temperatures. This bottle blanket is made specifically for use on propane cylinders and is UL listed and CSA approved for this use.

Description:

This effect is fueled by LP propane gas provided from a 100 lb (20 gallon) cylinder connected to a 1/4-turn ball main shut off valve. The supply cylinder is well protected from impact and well ventilated, mounted in the vehicle frame on custom mounting supports. A 3/8" fuel line supplies fuel to a charge valve on the flame effects unit. The charge valve allows fuel to fill the accumulator (2 1/2 gallon propane tank.) There is an LP pressure gauge mounted in front of the accumulator for reading operating pressure. A full port normally closed, explosion proof solenoid valve (effect valve) is mounted to 3/4" Sch. 80 pipe coming from the accumulator. The effect valve is controlled with a trigger switch. The trigger switch is powered from an arm switch (barrel key; the key can only be removed in the off or disarm position for safety.) Fuel for the pilot burner comes from a T fitting at the

accumulator charge valve and goes to a ¼-turn ball valve pilot shut off valve.) From there it goes through a 1 lb pressure regulator to a needle flow control valve and into a 1/4" copper pipe with flare fittings to the burner.

The burner is a copper tube rolled in a circle with several small holes and wrapped with stainless steel wool. The pilot burner is ignited manually.

All pipe is 3/4" Sch. 80 and 1/4" Sch. 80. All lines, fittings, valves and gauges are rated for propane and have a 300 psi rating or higher. See Diagram 1 below for details.

Operation:

Once the area around the platform or vehicle is checked and cleared, a visual inspection of the flame effects is conducted, the key is momentarily turned on to verify the operation of the effect valve. The key is turned off and the ¼-turn manual ball valve main shutoff is opened. This is followed by a soapy water test of fittings. Any components found to need repair are fixed prior to further operation.

When everything checks ok, the key is installed and turned to the arm position. (Note: the key can only be removed in the off position for safety.) The accumulator charge valve is opened followed by the pilot shutoff valve. The pilot control valve is slowly opened while pilot light is manually lit. The pilot flame is adjusted to desired flame height and the accumulator shutoff valve is opened to charge the system. The trigger is used to open the effect valve creating the flame effect. After using the flame effects, the main shutoff is turned off and remaining fuel in the accumulator is discharged. Once fuel has been used up, the pilot burner is shut off followed by all remaining valves. The system is then disarmed by removing the key.

Safety:

A 5-lb ABC fire extinguisher is kept near the operator and within reach of the fire controls. A basic first aid kit is kept near the operator as well as a wet towel in case of emergency. If a gas leak is discovered, the main shutoff valve will be turned off by the flame effects operator, while safety crew clears people from around the area until the leak is fixed and any fumes dispersed. If a person catches fire, the fuel will be shut off and the wet towel will be used to smother the fire. Water will be kept on hand to cool any burns as well as to flush or wash fuel off a person. Minor burns will be taken care of with first aid supplies on hand. For more serious burns medical personnel will be contacted.

Operators:

Martin Montesano has passed the pyrotechnician safety course including fire extinguisher training at Western Display Fireworks in Canby, Oregon, May 2006 Successfully completed Flame Effects for the Artist course in Reno, Nevada Nov. 21st 2010 taught by Dave X, Fire Safety Manager for Burning Man for more than 10 years, and Eric Smith, Chief Inspector for the State of Nevada Board for the Regulation of LP Gas

Anne Peterson has received flame effects safety information and has current American Red Cross Adult First Aid training certification.

Cathy Komlofske has received flame effects safety information and has current American Red Cross Adult and Child First Aid training certifications.

Jeffrey Cheek has received flame effects safety information and has completed fire extinguisher training.

Additional safety assistants receive basic operating information and instruction about their duties and are added as needed for different events.

Diagram 1: Moltensteelman single burner Group 1 Flame Effect

