

USER AND INSTALLATION MANUAL

ENGLISH

MAG:CFX®

/HELLFIRE.®



FLAME FX

PART01880
rev 01-00

DISCLAIMER

WARNING

Read this manual carefully before installing and/or using this product. Failure to read the manual and to follow the printed instructions may lead to personal injury and/or damage to the product.

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We further refer to the General Conditions. These are available on request, free of charge.

Although considerable care has been taken to ensure a correct and comprehensive description of all relevant components, the manual may nonetheless contain errors and inaccuracies.

Should you detect any errors or inaccuracies in the manual, we would be grateful if you would inform us. This helps us to further improve our documentation.

TABLE OF CONTENTS

Disclaimer	2
Trademarks	2
Liability	2
Introduction	4
Target group	4
Other documentation	5
Language	5
Abbreviations	5
Revision table	5
1 Description	6
1.1 Main parts	7
1.2 Fuel	7
1.3 Technical data	7
1.4 Product identification	8
1.5 Accessories	8
1.6 Control	9
2 Safety	10
2.1 General safety rules	10
2.2 Indoor/outdoor use	10
2.3 Rigging	11
2.4 Safety symbols	11
2.5 Safety precautions	12
3 Installation and use	14
3.1 Install on stage	14
3.2 Clamp to a truss	14
3.3 Mounting at an angle	16
3.4 Connect to the PUMP STATION	16
3.5 Fire with DMX	17
3.6 Use the emergency stop	17
4 Troubleshooting	17
5 Maintenance	17
6 Correct disposal	18
7 EC Declaration of Conformity	19

INTRODUCTION

This manual contains all information required for the intended use of the equipment. Deviation from the described intended use can result in a hazardous situation and/or property damage.

This manual includes notes and warnings on safe operation of the equipment. These notes and warnings are accompanied by the following icons. Read them attentively!

⚠ DANGER

Indicates a hazardous situation that, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations.

⚠ WARNING

Indicates a hazardous situation that, if not avoided, could result in death or serious injury.

⚠ CAUTION

Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.

NOTICE

Indicates information considered important, but not hazard-related (e.g. messages relating to property damage).

TARGET GROUP

This manual is targeted at authorised personnel in the event industry that install and operate the HELLFIRE and the required ARM SYSTEM.

Authorised personnel are those who:

- Are appointed by their supervisor to install and/or operate HELLFIRE and the related ARM SYSTEM at the event.
- Are trained in recognizing and avoiding hazards related to SFX applications at events.
- Are familiar with the safety instructions of each involved ARM SYSTEM component.
- Are familiar with and abide by the applicable local, national and international laws and regulations.

OTHER DOCUMENTATION

Document	Document number
LIQUID FLAME SYSTEM User and Installation Manual	PART01420
ARM SYSTEM Configuration Manual	PART02323

Other related documentation

LANGUAGE

This document contains the original instructions in English. In case you require other languages please contact MAGIC FX.

ABBREVIATIONS

Abbreviation	Description
SFX	Special effects
DMX	Digital Multiplex
RDM	Remote Device Management
ARM SYSTEM	MAGICFX® SFX SAFETY ARM SYSTEM
ARM CONTROLLER	MAGICFX® SFX SAFETY ARM CONTROLLER
E-STOP	MAGICFX® SFX SAFETY E-STOP
LIQUID FLAME SYSTEM	MAGICFX® LIQUID FLAME SYSTEM
PUMP STATION	MAGICFX® LIQUID FLAME PUMP STATION
HELLFIRE	MAGICFX® HELLFIRE

Abbreviations

REVISION TABLE

Doc nr	Revision	Date	Description	Author	Approved
PART01180	01-00	26-09-2023	Initial release	MBO	JvG

1 DESCRIPTION

The HELLFIRE is an SFX output component for the LIQUID FLAME SYSTEM, that emits flames into the air.

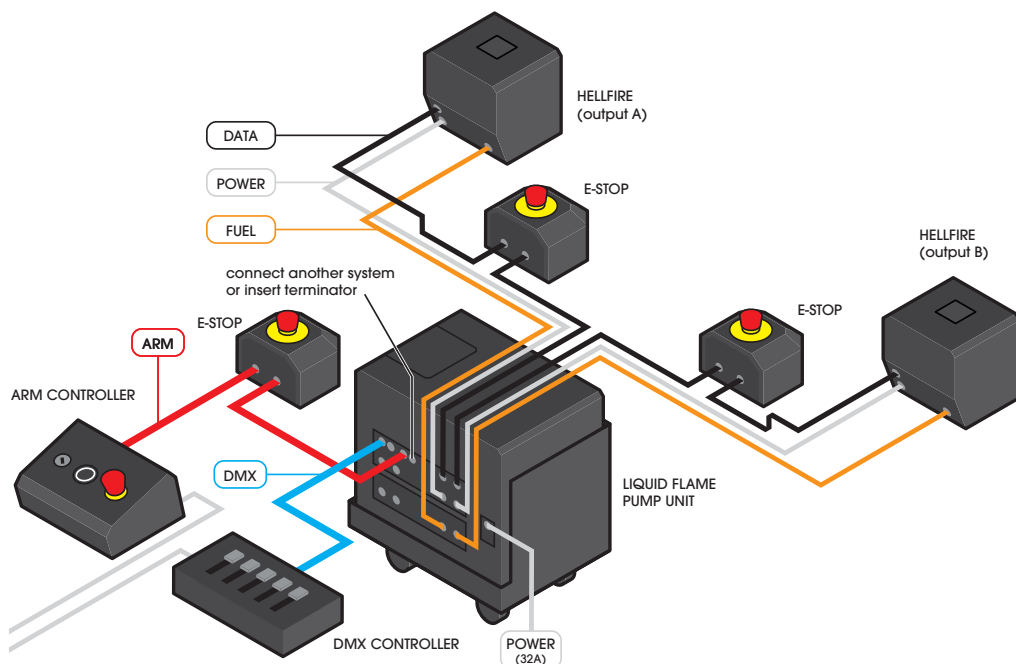
The flame head receives pressurized liquid fuel from the external pump unit of the LIQUID FLAME SYSTEM: The PUMP STATION. The liquid fuel is ejected from the flame head nozzle across spark ignition probes to produce the flame. The HELLFIRE can produce a flame up to 15 m (based on zero wind).

The PUMP STATION has two output groups (A/B) with each one fuel, one power and one data output. Both output groups can serve one HELLFIRE. On basis of DMX input, the PUMP STATION controls the behavior of the flame head(s).

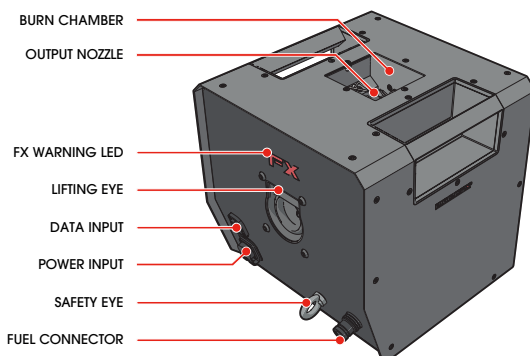
The LIQUID FLAME SYSTEM and the HELLFIRE are configured for safety control with an ARM SYSTEM. Additional ARM devices such as the E-STOP and the BEACON can be incorporated anywhere in the ARM, ARM + DMX, or DATA lines. Check the scheme of an example setup below.

For more information about the LIQUID FLAME SYSTEM, refer to the LIQUID FLAME SYSTEM User and Installation Manual (PART01420).

For more information about the ARM SYSTEM and to learn how to configure a complete safety system, refer to the ARM SYSTEM Configuration Manual (PART02323).



1.1 MAIN PARTS



Main parts

1.2 FUEL

The HELLFIRE receives liquid fuel from the external pump unit of the LIQUID FLAME SYSTEM: PUMP STATION. For fuel connection and filling instructions, refer to the LIQUID FLAME SYSTEM User and Installation Manual (PART01420).

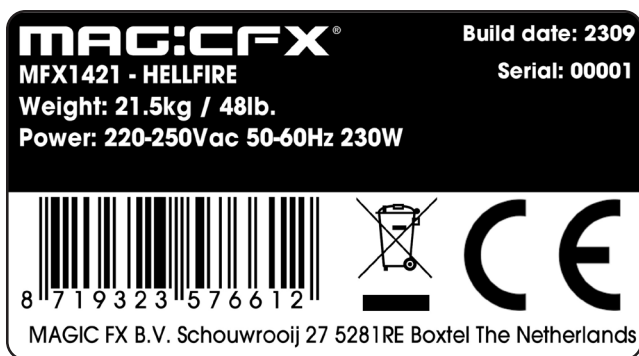
1.3 TECHNICAL DATA

Product	Product Name	HELLFIRE	
	Product Code	MFX1421	
	Product Type	FLAME FX	
Main Dimensions	Length	300 mm	16.4 in
	Width	300 mm	11.8 in
	Height	310 mm	11 in
Weight	Empty Weight	23 kg	41 lbs
Package	Length	540 mm	21.3 in
	Width	400 mm	15.7 in
	Height	420 mm	16.5 in
	Packaged Weight	20.7 kg	45.6 lbs
Environment	Minimum Temperature	-10 °C	14 °F
	Maximum Temperature)	50 °C	122 °F
	Humidity (Relative)	20 % to 90 % (non condensing)	

Electrical	Voltage Input	220-250 Vac
	Voltage Frequency	50-60 Hz
	Power Consumption	370 W
	Power Connector	Neutrik® powerCON TRUE1 (in&out)
Safety controlling	ARM Connector	Neutrik® etherCON, RJ45 (in&out)
Configuring	Configure Options	On the pump
Usage	Consumable(s)	Isopropanol, ISOPAR G, H & L
	Consumable Consumption	≈ 280 ml/s

Technical data

1.4 PRODUCT IDENTIFICATION



Type plate

1.5 ACCESSORIES

Code	Product	Included
MF0313	Schuko to Neutrik® powerCON TRUE1 cable - 1.5 m	
MF03106	Doughty Half Coupler (100 kg) M10	
SPR00119	Safety Steel	

Accessories

For information about the accessories of the ARM CONTROLLER (MFX3220), refer to the ARM CONTROLLER User and Installation Manual (PART01882). For information about the accessories of the LIQUID FLAME SYSTEM, refer to the LIQUID FLAME SYSTEM User and Installation Manual (PART01420).

1.6 CONTROL

NOTICE

The HELLFIRE cannot be operated without a fuel feed and a data signal from a DMX-controlled and ARM-controlled PUMP STATION.

On basis of DMX input, the PUMP STATION controls the behavior of the flame head(s). Furthermore, the LIQUID FLAME SYSTEM and the HELLFIRE are configured for safety control with an ARM SYSTEM. The PUMP STATION sends the control data together with the ARM safety signal to the HELLFIRE through the data cable connection.

The HELLFIRE cannot be operated without the safety signal from the control unit of the ARM SYSTEM: The ARM CONTROLLER. When there's no signal, the HELLFIRE valves and ignition are disabled instantly. The PUMP STATION also depressurises the fuel immediately. This prevents the HELLFIRE from producing high-risk SFX output. As a result, any related hazard/or property damage is stopped and prevented.

Additional ARM devices such as the E-STOP and the BEACON can be incorporated anywhere in the ARM, DMX + ARM, or DATA lines. Check the scheme of an example setup on page 6.

For more information about the DMX and RDM setup of the LIQUID FLAME SYSTEM, refer to the LIQUID FLAME SYSTEM User and Installation Manual (PART01420).

For more information about the ARM SYSTEM and to learn how to configure a complete safety system, refer to the ARM SYSTEM Configuration Manual (PART02323).

For more information about the ARM CONTROLLER and to learn how to correctly set up and use the ARM SYSTEM, refer to the ARM CONTROLLER User and Installation Manual (PART01882).

2 SAFETY

The HELLFIRE has been designed and constructed in such a manner that it can be used safely. This applies to the use, the circumstances and the regulations as described in this documentation. Reading this documentation and following the instructions are therefore necessary for everyone who is authorised to work with the HELLFIRE.

The HELLFIRE must be used in surroundings that:

- Have a reasonably stable temperature of between -10 and 50 °C;
- Have a relative humidity degree between 20 % and 90 % (non condensing);
- Are free of dust, corrosive gases and high concentrations of organic vapours.

2.1 GENERAL SAFETY RULES

- Only authorised persons may carry out work with the HELLFIRE.
- Do not use the HELLFIRE if there are people or animals in the direct output.
- Do not use the HELLFIRE if alterations have been made other than by or on behalf of MAGICFX®.
- Make sure that children, unauthorised people and animals do not obtain access to the HELLFIRE.
- Make sure there are no freestanding objects or objects that can be damaged by the system within the output distance.
- Do not connect more units to a single electrical circuit than the installed fuse is able to handle. (Calculate the summed load with the electrical data from Chapter 1)
- Do not remove any safeguards, safety caps and safety symbols.
- All required safety devices must be in good condition and function properly.
- Ensure sufficient lighting of the surroundings.
- Keep the workplace clean.

2.2 INDOOR/OUTDOOR USE

The HELLFIRE is designed for outdoor use or use in large well-ventilated indoor spaces. Keep the prescribed output zone clear for safe release of the flames and their heat.

⚠ WARNING

Do not use the HELLFIRE in poor ventilated confined spaces. Exposure to accumulated heat and combustion fumes may cause inhalation of hazardous particles and gases, and cause eye and skin irritation.

2.3 RIGGING

NOTICE

Make sure that fuel hoses and cable runs are well supported, and are clear from obstructions and sharp edges. Always support hanging hoses with strain reliefs. Failure to do so, could result in damaged hoses and cables.

NOTICE

Make sure that fuel connections do not carry the weight of the connected fuel hoses. Failure to do so, could result in leaking or damaged fuel connections.

Please follow the European and national guidelines for safe rigging and trussing.

2.4 SAFETY SYMBOLS

Symbol	Meaning	Position
	Read the manual carefully before use!	Front of the unit.
	Warning: Flammable Fluid. There's flammable fluid inside the 100L tank, the internal machine pipework, the connection hoses and projected from the flame outlet.	Front of the unit.
	Warning: High Pressure. There's high pressure liquid inside the internal machine pipework, the connection hoses and projected from the flame outlet.	Front of the unit.
	Warning: Hot Surface! Do not touch.	Top of the unit, near the flame outlet.
	Warning: High Voltage. There's high voltage on the ignition probes in the flame head nozzle during operation.	Top of the unit, near the flame outlet.

Safety symbols

2.5 SAFETY PRECAUTIONS

⚠ WARNING

Make sure that you are familiar with and comply with the instructions from the user and installation manual of the LIQUID FLAME SYSTEM and of each applied ARM SYSTEM component.

⚠ WARNING

Using a damaged or an improper installed HELLFIRE can lead to death, serious injury or property damage. Always inspect the LIQUID FLAME SYSTEM and the HELLFIRE unit thoroughly before operation.

⚠ WARNING

Eye contact with fuel under pressure or burning fuel from the HELLFIRE can lead to serious eye injury. Always wear safety goggles when you enter the safety zone.

⚠ WARNING

The HELLFIRE works with pressurized fuel. Make sure that the fuel pressure is fully dissipated before connecting or disconnecting hoses. Always wear safety goggles and suitable gloves when you connect or disconnect hoses.

⚠ WARNING

Fuels are highly flammable and must be handled with caution and in accordance with local health and safety regulations. Always follow the safety instructions of your fuel supplier.

⚠ WARNING

Never allow smoking, flames, or other sources of ignition near the HELLFIRE (even when the system is turned off or in transit).

⚠ WARNING

Missing or obscured safety symbols can lead to death or serious injury. Make sure all safety symbols are correctly in place, see Section 2.4.

⚠ WARNING

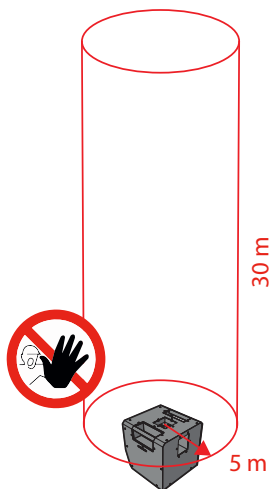
Make sure there are no objects near the HELLFIRE and within the output distance that can be damaged or catch fire by the emitted flames and fuel.

⚠ WARNING

Make sure there are no substances or gasses present that can be ignited by the emitted flames from the HELLFIRE.

⚠ WARNING

Maintain a free cylindrical output zone with a radius of 5 meter and a height of 30 meters from the output of the HELLFIRE head. Always keep the output zone clear of all people, animals and objects. Not doing so results in death or serious injury. Note that the zone shifts accordingly when the machine is installed in a tilted position on the stage.



⚠ WARNING

Stop operating the system if any fire occurs outside of normal operation and/or if anything other than the emitted fuel for the SFX catches fire. Extinguish any remaining fire immediately with sand, carbon dioxide, dry powder or any other suitable extinguishing media. Do not use a water jet. Refer to the safety data sheet from the used fuel for detailed safety instructions.

⚠ CAUTION

Any material that blocks the output nozzle of the HELLFIRE can result in injuries, fire and damage when the LIQUID FLAME SYSTEM is used. Always inspect the nozzle before operating and remove any obstructing material.

⚠ CAUTION

The HELLFIRE should not be used in winds exceeding 20 mph or 32 km/h.

⚠ CAUTION

Parts of the HELLFIRE heat up during operation and can cause burns when touched. Do not touch any metal parts of a (recently) triggered unit.

NOTICE

Always keep the HELLFIRE dry and do not let excessive amounts of liquids such as rain or snow wet the unit.

3 INSTALLATION AND USE

⚠ WARNING

Eye contact with fuel under pressure or burning fuel from the HELLFIRE can lead to serious eye injury. Always wear safety goggles when you enter the safety zone.

⚠ WARNING

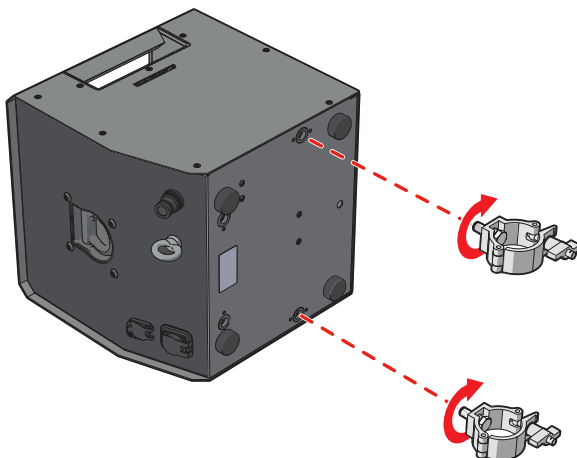
Always choose for a flame height that is safe for the location and position of the HELLFIRE at the event.

3.1 INSTALL ON STAGE

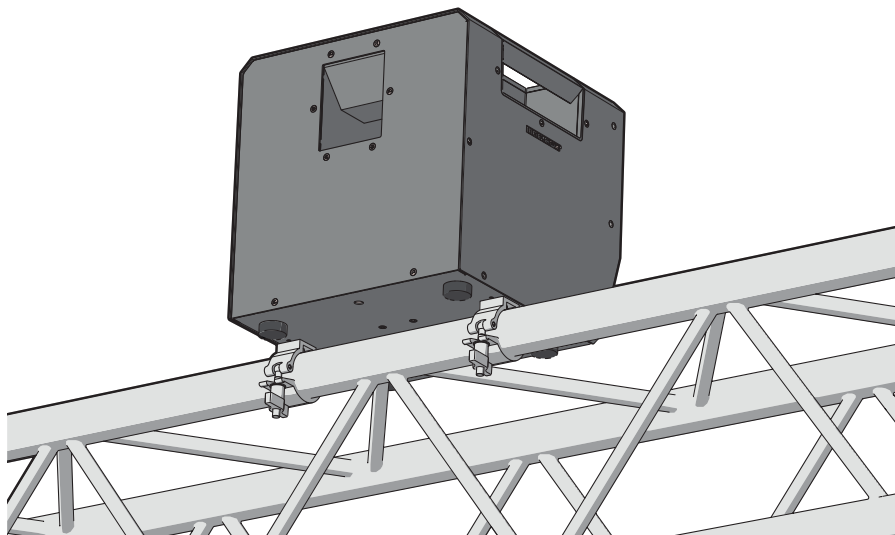
1. Install the HELLFIRE on a firm and level surface.
2. Take the necessary safety precautions, see Section 2.5. This includes creating a safety zones around the HELLFIRE, and making sure that the output from the HELLFIRE will be free from persons, animals, and property.
3. Clean the fuel connections with a soft rag and a small quantity of isopropyl alcohol.

3.2 CLAMP TO A TRUSS

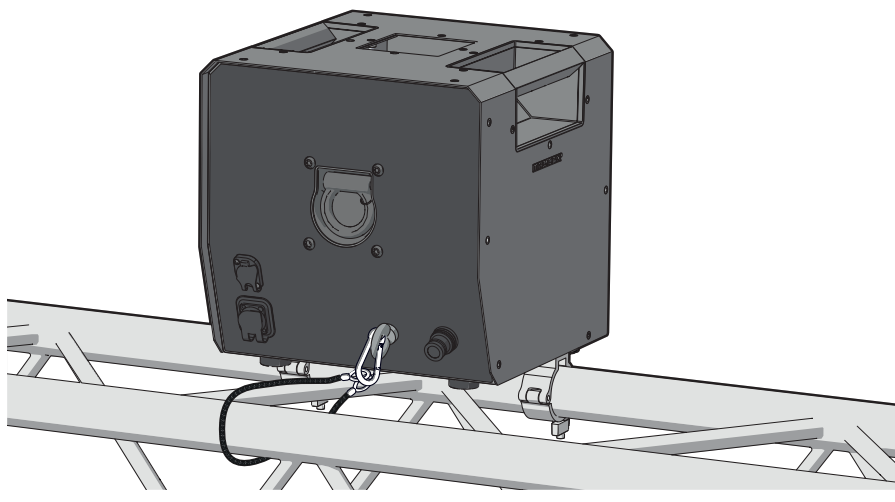
- 1 Screw two clamps into threaded holes on the bottom of the machine. Use two M10 Halfcouplers for truss mounting (product code MFX3106).



-
- 2** Mount the clamps firmly on a truss.



-
- 3** Secure the HELLFIRE onto the truss.



-
- 4 Take the necessary safety precautions, see Section 2.5. This includes creating a safety zones around the HELLFIRE, and making sure that the output from the HELLFIRE will be free from persons, animals, and property.
-

- 5 Clean the fuel connections with a soft rag and a small quantity of isopropyl alcohol.
-

3.3 MOUNTING AT AN ANGLE

The HELLFIRE head can be mounted at a maximum angle of 25 degrees in unlocked mode. In locked mode, the maximum angle is 90 degrees. For more information, refer to the menu chapter of the LIQUID FLAME SYSTEM User and Installation Manual (PART01420).

3.4 CONNECT TO THE PUMP STATION

1. Make sure that the PUMP STATION is disarmed and switched off.
2. Choose a free output group (A/B) of the PUMP STATION.
3. Connect the PowerCon True1 power cable to the power input of the HELLFIRE. Connect the other end to the power output of the chosen output group of the PUMP STATION.
4. Connect the correct cables between the HELLFIRE head(s) and the A and/or B data output of the PUMP STATION. E-STOPS and BEACONS can be placed anywhere in the data lines.
5. Connect the fuel hose between the HELLFIRE fuel connector and the fuel connector of the chosen output group of the PUMP STATION.
6. Use the display and buttons of the PUMP STATION or a RDM controller to assign DMX addresses.

For connection and DMX setup instructions of the complete LIQUID FLAME SYSTEM, refer to the LIQUID FLAME SYSTEM User and Installation Manual (PART01420).

For more information about the ARM CONTROLLER and to learn how to correctly set up and use the ARM SYSTEM, refer to the ARM CONTROLLER User and Installation Manual (PART01882).

⚠ WARNING

The HELLFIRE works with pressurized fuel. Make sure that the fuel pressure is fully dissipated before connecting or disconnecting hoses. Always wear safety goggles and suitable gloves when you connect or disconnect hoses.

⚠ CAUTION

Make sure that hoses and cable runs are clear from obstructions and sharp edges.

3.5 FIRE WITH DMX

For operating instructions, refer to the LIQUID FLAME SYSTEM User and Installation Manual (PART01420).

⚠ WARNING

The HELLFIRE works with pressurized fuel. Do not disconnect hoses when the system is armed and pressurized.

⚠ CAUTION

Wind can influence the effect and cause flames and fuel to divert off vertical.

3.6 USE THE EMERGENCY STOP

1. When an emergency occurs or is about to occur with the HELLFIRE, you press the emergency stop button on the ARM CONTROLLER or on an external E-STOP (if present). As a result the HELLFIRE valves and ignition are disabled and any related hazard/or property damage is stopped and prevented.
2. Set the safety key on the ARM CONTROLLER to the OFF position.
3. Resolve the emergency situation and inspect the HELLFIRE.
4. Release the emergency stop and perform a reset. For instructions, refer to the ARM CONTROLLER User and Installation Manual (PART01882).
5. Set the enable and effect channel back to 0.

4 TROUBLESHOOTING

Error codes are displayed on the PUMP STATION. For error codes, refer to the LIQUID FLAME SYSTEM User and Installation Manual (PART01420).

5 MAINTENANCE

To achieve the maximum service life of the HELLFIRE you must regularly clean the HELLFIRE and test if it is functioning correctly.

Before conducting any maintenance ensure the machine is switched off and disconnected from a power source and the machine is not hot from recently being used. Always use personal protective equipment such as safety glasses and gloves when handling fuels.

Maintenance task	Activity
General clean.	Remove any foreign objects from burn chamber before every use being careful not to move or damage the spark ignition probes. Remove any dust or dirt from hose connections with a non-abrasive damp cloth.
Inspect and clean nozzles.	Remove nozzle with HELLFIRE Nozzle exchange tool. Submerge nozzle in Isopropanol for minimum of 1 minute. Remove from solution and when dry use compressed air to blow through the nozzle in opposite direction of fuel. Before inserting nozzle back into machine conduct a visual check of the washer seal to make sure no damage to the soft material and replace the washer seal if damaged.
Inspect and clean spark ignition probes.	Any foreign particles should be removed from the probes, which can be cleaned with Isopropanol and a light abrasive cloth. Ignition probes should not be adjusted from the factory setting as this is critical to safe and reliable ignition. To check they are in the correct position each pair of probes must have a gap from tip to tip of 4 mm (+/-2 mm) and opposite probes must have a gap from tip to tip of 16 mm (+2 mm). If they do not have these gaps or are miss-aligned in anyway contact MAGIC FX.

Contact MAGIC FX if the HELLFIRE is not functioning correctly.

Firmware updates for the PUMP STATION can add additional features and bug fixes. Regularly check on the website or with your MAGIC FX account manager to ensure you have the latest version.

⚠ DANGER

Do not replace parts yourself; always consult MAGIC FX if necessary.

6 CORRECT DISPOSAL



This symbol on the product and / or accompanying documents means that used electrical and electronic products should not be mixed with general household waste. For proper treatment, recovery and recycling, please take this product to designated collection points where it will be accepted free of charge. Alternatively, in some countries you may be able to return your products to your local retailer upon purchase of an equivalent new product. Disposing of this product correctly will help save valuable resources and prevent any potential negative effects on human health and the environment, which could otherwise arise from inappropriate waste handling. Please contact your local authority for further details of your nearest designated collection point. Penalties may be applicable for incorrect disposal of this waste, in accordance with your national legislation.

7 EC DECLARATION OF CONFORMITY

DECLARATION OF CONFORMITY

According to Annex III A Machinery Directive 2006/42/EC

MAGIC FX B.V. declares as manufacturer and composer of the technical construction file that the product with the following specifications:

Name machine	: HELLFIRE
Type	: MFX1421
Voltage	: 220-250Vac 50/60Hz
Serial number	: on product
Year of construction	: on product

Is in conformity with the minimal safety regulations as stated in the following directive(s):

- LVD (2014/35/EU) Low Voltage Directive
- EMC (2014/30/EC) ElectroMagnetic Compatibility
- RoHS (2011/65/EU) Restriction of the use of certain Hazardous Substances
- WEEE (2012/19/EU) Waste Electrical & Electronic Equipment

The following harmonized standards were applied:

- NEN-EN-ISO 12100:2010 Safety of machinery - General principles for design - Risk assessment and risk reduction.
- NEN-EN-IEC 60204-1:2006, Safety of machinery - Electrical equipment of machines - Part 1: General requirements.
- NEN-EN-IEC 61000-6-3:2007/A1:2011, Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments.

☐ Original declaration of conformity

☒ Translation of the original declaration of conformity

Name manufacturer	: MAGIC FX B.V.
Address	: Schouwrooij 27, 5281 RE BOXTEL
Country	: The Netherlands

CEO	: B. Veroude
Date	: 17-5-2023

Signature

:



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