

USER AND INSTALLATION MANUAL

MAG:CFX®

ENGLISH

/ARM CONTROLLER.®



CE SFX SAFETY

PART01882

rev 02-00

DISCLAIMER

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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TRADEMARKS

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LIABILITY

MAGIC FX accepts no liability for claims from third parties arising from unauthorised use, use other than that stated in this manual, and use other than in accordance with the General Conditions registered at the Chamber of Commerce.

MAGIC FX is not responsible for the implementation and validation of the overall safety system and safety plans at events. The system integrator that integrates the ARM SYSTEM into a complete SFX system for an event, is responsible for the overall system and system safety. The system integrator must make sure that the entire implementation complies with all relevant local, national and international laws and regulations, and that the system is tested and validated correctly.

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.

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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).

For instructions related to the configuration of an ARM SYSTEM and its integration into a complete SFX system at an event, refer to the ARM SYSTEM Configuration Manual.

TARGET GROUP

This manual is targeted at authorised personnel in the event industry that install and operate the ARM SYSTEM with the ARM CONTROLLER, and their supervisors.

Authorised personnel are those who:

- Are appointed by their supervisor to install and/or operate the ARM CONTROLLER at the event.
- Are familiar with and able to implement the ARM SYSTEM configuration associated with the SFX setup and the risk reduction strategy for the event.
- Are trained in recognizing and avoiding hazards related to SFX applications at events.
- Are familiar with the safety instructions of each involved SFX machine.
- Are familiar with and abide by the applicable local, national and international laws and regulations.

LANGUAGE

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

OTHER ARM SYSTEM DOCUMENTATION

Document	Document number
ARM SYSTEM Configuration Manual	PART02323
E-STOP User and Installation Manual	PART02291
BEACON User and Installation Manual	PART02059
COMBINER BOX User and Installation Manual	PART02293
COMBINER 19" RACK User and Installation Manual	PART02292

Other ARM SYSTEM documentation

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
BEACON	MAGICFX® SFX SAFETY BEACON
COMBINER BOX	MAGICFX® SFX SAFETY COMBINER BOX
COMBINER 19" RACK	MAGICFX® SFX SAFETY COMBINER 19" RACK
TERMINATOR	MAGICFX® SFX SAFETY TERMINATOR
DMX INJECTOR	MAGICFX® SFX SAFETY DMX INJECTOR
LABEL	MAGICFX® SFX SAFETY LABEL

Abbreviations

REVISION TABLE

Doc nr	Version-Revision	Date	Description	Applies to*	Author	Approved
PART01882	01-00	23-04-2020	Initial release	FX-ARM CONTROLLER	ES, MB	RD
PART01882	02-00	07-11-2022	New version for the updated SFX SAFETY ARM SYSTEM compatible controller	SFX SAFETY ARM CONTROLLER	TF	PvdW

* Check the type plate on your controller to ensure that you are looking at the correct user and installation manual, see also Section 1.4 'Product identification'.

1 DESCRIPTION

1.1 GENERAL DESCRIPTION

The ARM CONTROLLER is the control unit of the ARM SYSTEM. The ARM SYSTEM is a manually operated safety system for ARM compatible SFX machines manufactured by MAGIC FX. The ARM SYSTEM consists of an independent safety circuit that connects the SFX machine(s) to the ARM CONTROLLER. The ARM CONTROLLER is equipped with a key switch to arm/disarm the SFX machines, an emergency stop button, and a reset button. The ARM SYSTEM is wired with EtherCON cables that carry the safety signal from the ARM CONTROLLER.

NOTICE

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

ARM/DISARM FUNCTION

When the key switch on the ARM CONTROLLER is in the OFF position, the system is 'disarmed': The high-risk output of the SFX machines is disabled.

When the key switch is in the ON position and all safety conditions are met, the system is 'armed': The SFX machines can be operated normally with the use of the connected control device, for example with a DMX controller.

EMERGENCY STOP FUNCTION

When an emergency occurs with one or more of the SFX machines, an operator will press the emergency stop button. This will disable the parts in each connected SFX machine that produce the high-risk SFX output. As a result any related hazard/or property damage is stopped and prevented.

After actuation, the emergency stop button remains latched and actuated. To be able to return to the 'armed' state and normal SFX operation, the operator must manually unlatch the emergency stop button and perform a reset of the ARM SYSTEM.

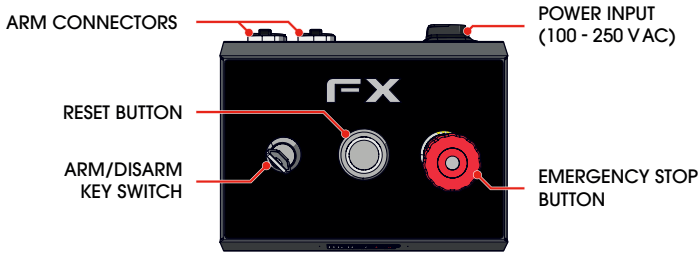
INDEPENDENT OPERATION

The ARM SYSTEM is complementary to any other safeguards on the connected SFX equipment and does not replace the control for normal operation of the SFX machines, such as DMX or pyro. The ARM SYSTEM operates independently from the data and power supply to the SFX machines. As a result, all internal systems except for the ones that are responsible for the high-risk effect, remain powered in an emergency stop situation. The control data (RDM) in the SFX machines is not lost, and the machines keep performing their normal operating tasks and checks.

SYSTEM EXTENSIONS

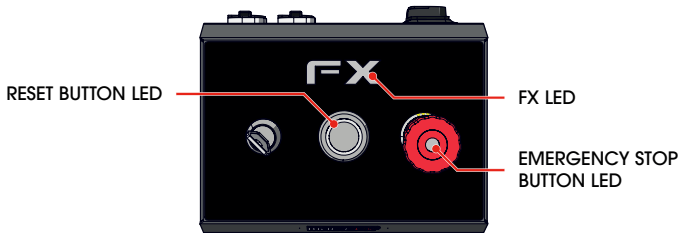
The ARM SYSTEM can be extended with additional control and signaling devices, such as an external emergency stop device called the E-STOP.

1.2 MAIN PARTS



Main parts

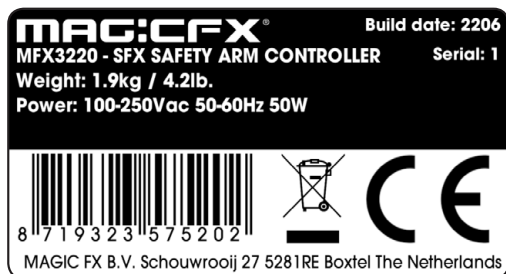
1.3 LED INDICATORS



LED indicator	Light	Meaning
FX LED	On	The system is armed: The SFX machines can be operated normally.
	Off	The system is disarmed. The output of the SFX machines is disabled.
Emergency stop button LED	On	Normal operation: You can arm/disarm the system.
	Off	The emergency stop button is actuated or a line interruption outside of the controller is detected. The output of the SFX machines is disabled. Check the Reset button LED.
Reset button LED	Red	A line interruption outside of the controller is detected and the output of the SFX machines is disabled. Possible causes: - An external E-STOP is actuated by a spotter, and still latched. - The ARM SYSTEM is not set up correctly (e.g. missing TERMINATOR). - A cable is damaged or has a loose connection.
	White	A reset is needed to return to normal operation. Possible causes: - The emergency stop button on the ARM CONTROLLER was actuated. - A line interruption outside of the controller (red LED) was resolved.
	Off	Normal operation: You can arm/disarm the system.

LED indicators

1.4 PRODUCT IDENTIFICATION



Type plate

NOTICE

If the product name on the type plate of your controller shows 'FX-ARM CONTROLLER' instead of 'SFX SAFETY ARM CONTROLLER', you have an old version of the ARM CONTROLLER. The old version is not compatible with the ARM SYSTEM as described in this manual (version 02). Please refer to the correct manual (version 01) for instructions or contact MAGIC FX if you want to update your controller.

1.5 TECHNICAL DATA

Product	Product Name	MAGICFX® SFX SAFETY ARM CONTROLLER	
	Product Code	MFX3220	
	Product Type	SFX SAFETY	
Main Dimensions	Length	158 mm	6.2 in
	Width	180 mm	7.1 in
	Height	102 mm	4.0 in
Weight	Weight	1.9 kg	4.2 lb
Package	Length	309 mm	12.2 in
	Width	364 mm	14.3 in
	Height	187 mm	7.4 in
	Packaged weight	2.7 kg	6 lb
Environment	Minimum Temperature	-10 °C	14 °F
	Maximum Temperature	50 °C	122 °F
	Humidity (Relative)	20 % to 90 % (non condensing)	
	IEC 60529 (IP) Rating	IP23	
Electrical	Voltage Input	100 – 250 Vac	
	Voltage Frequency	50 – 60 Hz	
	Power Consumption	35 W	
	Power Connector	Neutrik® powerCON TRUE1 (in)	
	ARM Connector	Neutrik® etherCON, RJ45 (in&out)	
Controlling	Control Options	Manual	

Technical data

1.6 ACCESSORIES

Code	Product	Included
SPR90050	Key for FX-COMM4NDER and ARM CONTROLLER (pair)	1x
MF0313	Schuko to Neutrik ® powerCON TRUE1 - cable 1.5 m	
MF0323	MAGICFX® SFX SAFETY TERMINATOR	2x
MF0326	MAGICFX® SFX SAFETY DMX INJECTOR - cable 25 cm	
SFX3201	MAGICFX® SFX SAFETY LABEL - size small 50 x 25 mm	
SFX3202	MAGICFX® SFX SAFETY LABEL - size medium 75 x 50 mm	
MF0340	SFX SAFETY ARM Data cable (etherCON) - 1 meter	
MF0341	SFX SAFETY ARM Data cable (etherCON) - 3 meter	
MF0342	SFX SAFETY ARM Data cable (etherCON) - 5 meter	
MF0343	SFX SAFETY ARM Data cable (etherCON) - 10 meter	
MF0344	SFX SAFETY ARM Data cable (etherCON) - 15 meter	
MF0345	SFX SAFETY ARM Data cable (etherCON) - 20 meter	
MF0346	SFX SAFETY ARM Data cable coupler NEUTRIK	

Accessories

1.7 COMPATIBILITY

The ARM SYSTEM is only compatible with SFX machines that are manufactured by MAGIC FX, and that have EtherCON connectors for ARM input/output. If you're unsure if a machine is suited for safety control through ARM, please check the corresponding user and installation manual, or contact MAGIC FX.

2 SAFETY

The ARM CONTROLLER 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 ARM CONTROLLER.

The ARM CONTROLLER must be used in surroundings that:

- Have a stable temperature of between -10 and 50 °C.
- Are free of dust, corrosive gases and high concentrations of organic vapours.
- Are not situated in the vicinity of a source of vibration.

2.1 GENERAL SAFETY RULES

- Only authorised personnel may carry out work with the ARM CONTROLLER.
- Do not arm the ARM SYSTEM if there are people or animals in the direct output or in the safety zones of the SFX machines connected to the ARM CONTROLLER. For details, refer to the corresponding user and installation manuals of the machines.
- Make sure that children, unauthorised persons and animals do not obtain access to the ARM CONTROLLER.
- Make sure there are no free-standing objects or objects that can be damaged by the connected machines within the output distance.
- 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.
- Make sure that the ARM SYSTEM is always tested and validated at the site before an event takes place.

2.2 INSTALLATION

⚠ WARNING

As a supervisor, make sure that each ARM component, control device and SFX machine in the ARM SYSTEM is correctly installed in accordance with the ARM SYSTEM configuration associated with the SFX setup and the risk reduction strategy for the event. For configuration instructions, refer to the ARM SYSTEM Configuration Manual.

⚠ WARNING

Make sure that each ARM component, control device and SFX machine in the ARM SYSTEM is correctly installed in compliance with the instructions from the corresponding user and installation manuals from MAGIC FX.

⚠ WARNING

Make sure that each ARM CONTROLLER is labeled in such a way that it's completely evident to the operator which SFX machines are connected and, if applicable, which SFX machines are not connected to the related ARM SYSTEM. Correct and clear labeling reduces the chance that in an emergency situation the operator stops the wrong machine(s), and thereby not stopping or preventing any hazards and/or property damage.

NOTICE

Do not connect the ARM CONTROLLER to machines that are not compatible with the ARM SYSTEM. Failure to do so could cause damage to the equipment.

NOTICE

Do not use RJ45 cables in the ARM SYSTEM that come from any other system than the ARM SYSTEM, carrying a different data protocol. Failure to do so could cause damage to the equipment.

NOTICE

Do not use more than one ARM CONTROLLER in a single ARM SYSTEM. Failure to do so could cause damage to the equipment and emergency stop malfunction.

NOTICE

Position the ARM CONTROLLER in such a way that it is readily accessible by the operator and that it cannot be actuated accidentally.

2.3 OPERATION

⚠ WARNING

Using a damaged ARM CONTROLLER could lead to death, serious injury and/or property damage. Always inspect the controller thoroughly before operation.

⚠ WARNING

Make sure that you are familiar with and comply with the instructions from the user and installation manuals of each relevant ARM SYSTEM component and each connected SFX machine.

NOTICE

Make sure that you are familiar with the installed configuration of the ARM SYSTEM on-site and its associated risk reduction strategy.

NOTICE

As a supervisor, only provide safety keys of the ARM CONTROLLER to authorised personnel.

NOTICE

Remove the safety key and store it in a safe place when you leave the ARM CONTROLLER unattended.

3 INSTALLATION AND USE

3.1 INSTALL THE CONTROLLER

NOTICE

Do not connect the ARM CONTROLLER to machines that are not compatible with the ARM SYSTEM. Failure to do so could cause damage to the equipment.

NOTICE

Do not use RJ45 cables in the ARM SYSTEM that come from any other system than the ARM SYSTEM, carrying a different data protocol. Failure to do so could cause damage to the equipment.

NOTICE

Do not use more than one ARM CONTROLLER in a single ARM SYSTEM. Failure to do so could cause damage to the equipment and malfunction of the emergency stop.

NOTICE

Insert a TERMINATOR in the last ARM output of each line to close the safety circuit. The ARM SYSTEM will not work when a line remains open.

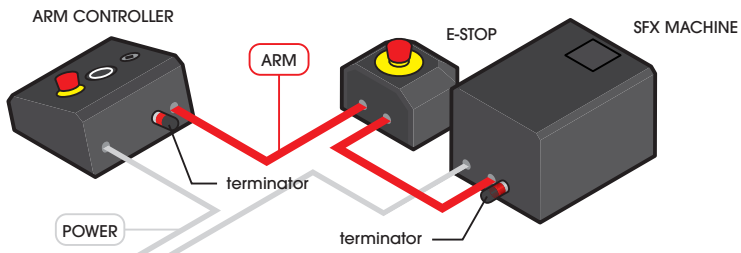
1. Place the ARM CONTROLLER on a stable surface.
-

NOTICE

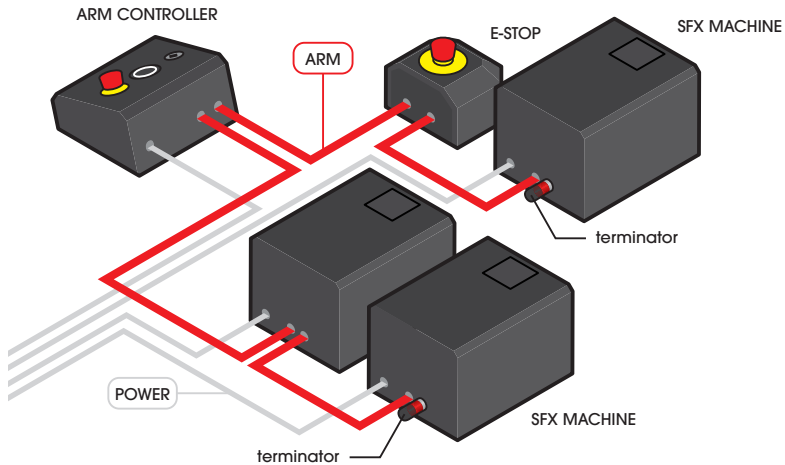
Position the ARM CONTROLLER in such a way that it is readily accessible by the operator and that it cannot be actuated accidentally.

2. Make sure that the safety key is in the OFF position.
3. Make sure that the emergency stop button is unlatched. If latched, turn the button a quarter in the clockwise direction to release it.
4. Connect the PowerCon TRUE1 power cable to the power input of the controller. Connect the other end to a power outlet.
5. Connect the correct cables between the ARM CONTROLLER, the SFX machines, the control equipment and ARM SYSTEM components (if applicable). Check the following variants for connection details.

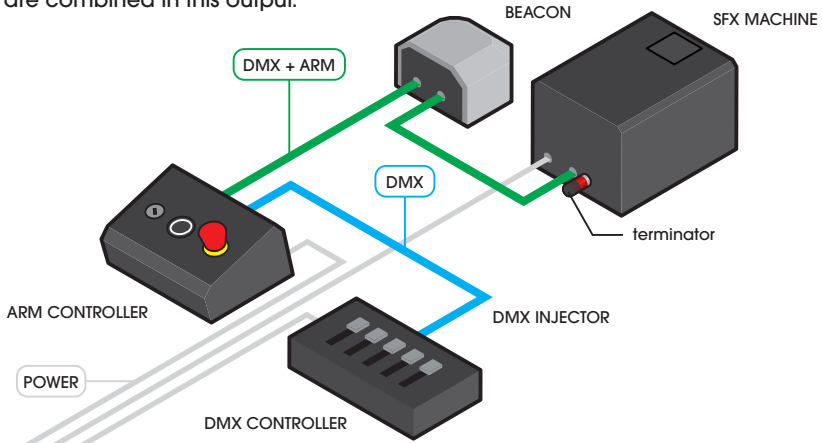
-
- A** With an ARM data (EtherCON) cable, one ARM connector of the ARM CONTROLLER is connected to a SFX machine or an ARM SYSTEM component. The other ARM connector has a TERMINATOR to close the line.



-
- B** With an ARM data (EtherCON) cable, both ARM connectors of the ARM CONTROLLER are connected to a SFX machine or an ARM SYSTEM component.



- C** With a DMX INJECTOR cable, one ARM connector is connected to a DMX controller, that feeds the DMX signal into the ARM CONTROLLER. With an ARM data (EtherCON) cable, the other ARM connector is connected to a SFX machine or an ARM SYSTEM component. The DMX signal and the ARM signal are combined in this output.



NOTICE

Make sure that the DMX/RDM settings on each SFX machine match your wiring setup. If the DMX signal runs separately over 5-pole XLR cables (Variant A & B), make sure that XLR is selected as DMX INPUT in the menu. If a combined DMX and ARM signal runs over the ARM data (EtherCON) cables (Variant C), make sure that ARM is selected as DMX INPUT in the menu.

6. Label the ARM CONTROLLER.

⚠ WARNING

Make sure that each ARM CONTROLLER is labeled in such a way that it's completely evident to the operator which SFX machines are connected and, if applicable, which SFX machines are not connected to the related ARM SYSTEM. Correct and clear labeling reduces the chance that in an emergency situation the operator stops the wrong machine(s), and thereby not stopping or preventing any hazards and/or property damage.

7. Perform a functional test of the installed ARM SYSTEM and the connected SFX machines before the actual event takes place, following the steps from the sections below and in accordance with the safety instructions of the machines.

NOTICE

Remove the safety key and store it in a safe place when you leave the ARM CONTROLLER unattended.

3.2 ARM THE SYSTEM

1. Confirm that the safety key is in the OFF position.
2. Confirm that the emergency stop button on the ARM CONTROLLER is unlatched.
3. Check the reset button LED:
 - If the reset button LED is switched off, the system is ready to be armed.
 - If the reset button LED lights white, press the reset button to reset the system.
 - If the reset button LED lights red, a line interruption is detected somewhere in the ARM SYSTEM. Find and resolve the line interruption:
 - If an external E-STOP was actuated by a spotter, resolve the related emergency situation, unlatch the actuated emergency stop button and reset the system, see Section 3.4 'Release the emergency stop and perform a reset'.
 - If the line interruption was caused by an incorrectly connected system (e.g. a missing TERMINATOR), or a damaged or loose cable, you must resolve this first. After that, the reset LED turns white and you can press the reset button to reset the system.
4. Make sure that each safety zone is free from persons and hazardous objects, and set the safety key in the ON position. The FX LED lights in red, indicating the system is now armed and the SFX machines are ready to be operated.

3.3 USE THE EMERGENCY STOP

1. When an emergency occurs or is about to occur with one or more of the connected SFX machines, you press the emergency stop button on the ARM CONTROLLER or on an external E-STOP. As a result:
 - The high-risk SFX output from each connected SFX machine is disabled, thereby stopping and preventing hazards and/or property damage that could be caused by the output.
 - In case the emergency stop button on the ARM CONTROLLER was pressed, the reset button LED lights white.
 - In case the emergency stop button on an external E-STOP was pressed, the reset button LED lights red.
 - Emergency stop button LEDs are switched off.
 - FX LEDs on the equipment are switched off.
 - The emergency stop button remains latched and actuated.
2. Set the safety key to the OFF position.
3. Resolve the emergency situation and inspect the related machines.
4. Unlatch the emergency stop button, see Section 3.4 'Release the emergency stop and perform a reset' for instructions.

3.4 RELEASE THE EMERGENCY STOP AND PERFORM A RESET

1. Confirm that the safety key is in the OFF position.
2. Confirm that the emergency situation has been resolved.

3. Turn the latched emergency stop button (on the ARM CONTROLLER or an external E-STOP) a quarter in the clockwise direction to release it. The emergency stop button LED switches on.
4. Press the reset button to reset the system. The reset LED switches off, indicating the system is now ready to be armed again, see Section 3.2 'Arm the system'.

3.5 DISARM THE SYSTEM

Set the safety key in the OFF position to disarm the ARM SYSTEM and disable the operation of the SFX machines.

NOTICE

Remove the safety key and store it in a safe place when you leave the ARM CONTROLLER unattended.

4 MAINTENANCE

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

Contact MAGIC FX if the ARM CONTROLLER is not functioning correctly.

⚠ DANGER

Do not replace parts yourself; always consult MAGIC FX.

5 TROUBLESHOOTING

Always contact MAGIC FX if any malfunctions or errors occur that cannot be solved with the instructions as described in this manual.

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 Machinery Directive 2006/42/EC

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

Name machine	: FX-ARM CONTROLLER
Type	: MFX3220
Voltage	: 100250Vac 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 602041:2006, Safety of machinery Electrical equipment of machines Part 1: General requirements
- NEN-EN-IEC 610006-3:2007/A1:2011, Electromagnetic compatibility (EMC) Part 63: Generic standard Emission standard for residential, commercial and light industrial environments.

- Original declaration of conformity
- Translation of the original declaration of conformity

Name manufacturer	: MAGICFX BV.
Address	: Schouwroolj 27, 5281 RE BOXTEL
Country	: The Netherlands
CEO	: B. Veroude
Date	: 5-3-2020

Signature

: 

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