QUICK GUIDE

NANO MARINE

Commissioning, installation and testing

TYPE APPROVED PRODUCT
TAA000037H
DNV
DNV.COM/AF

quick guide for a control and monitoring system meant for a Stat-X aerosol fire extinguishers

1 TABLE OF CONTENTS

2 IMPORTANT NOTES – PLEASE READ CAREFULLY

This quick guide manual is an addition to the existing DIOM of the NANO MAR SYSTEM dated April 1, 2024 version 2.2 from the K&G Groep BV. This quick guide should be read thoroughly and understood before installing of the NANO MAR SYSTEM is undertaken. It is assumed that the person installs, testing and commissioning the system, is familiar with the terminology and the objective of the equipment. The NANO control panel and the corresponding connections must be properly connected to the NANO extinguishers terminal box and KG/KVB Stat-X extinguishing aerosol generators by an appropriately qualified and competent person. The equipment is only guaranteed in accordance with the DIOM of the NANO MAR SYSTEM dated March 1, 2024 version 2.2

3 PREFASE

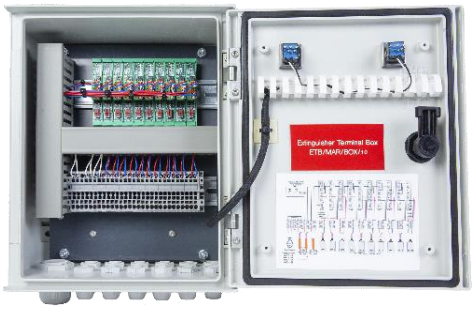
In our standard DIOM is all written for installing/commissioning and servicing the NANO MAR SYSTEM, NANO control panel and NANO extinguishers terminal box. this quick guide is a shortened step-by-step plan who guides you to put the system into operation. The NANO MAR SYSTEM is a multi-functional controller for fire detection and fire extinguishing release systems. This quick guide only covers the NANO MAR SYSTEM intended for rooms on vessels. For other applications, please refer to the standard and comprehensive installation instructions.

4 PURPOSE

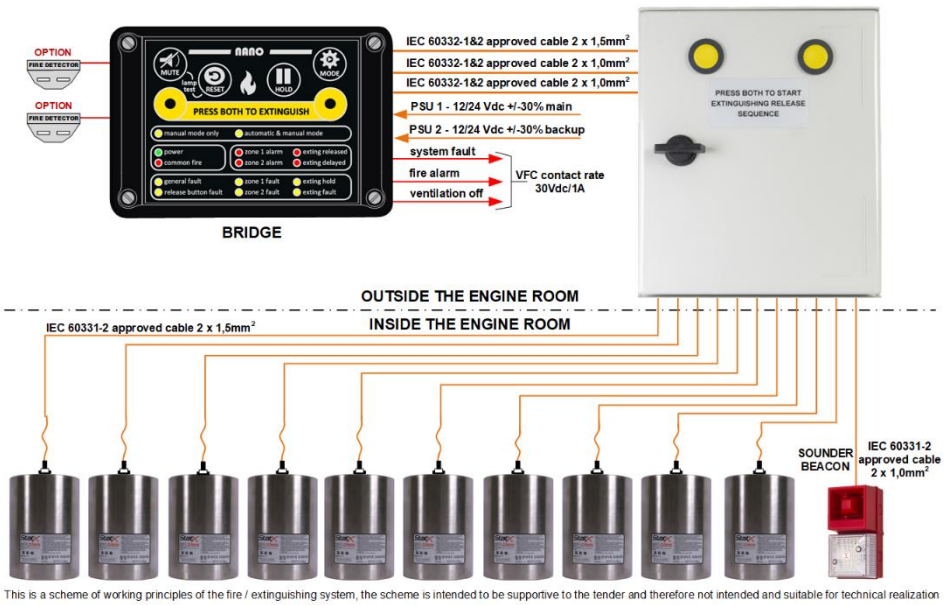
The purpose of this document is to describe installation, service and troubleshooting of the NANO MAR SYSTEM. Please note that only aspects regarding the NANO MAR SYSTEM itself are covered by this manual. Physical placement of aerosol generators and cables etc. is not handled as these issues are typically to be specified specifically for each installation.

5 SYSTEM OVERVIEW

The purpose of the NANO MAR SYSTEM is to control and monitor a number of aerosol generators mounted on a ship as part of a fire extinguishing system. The primary purpose of the NANO MAR SYSTEM is to activate the aerosol generators in event of fire. The secondary purpose of the NANO MAR SYSTEM is to monitor the system itself (e.g. power supplies, cables and individual system components) and give an alarm if a fault within the system is detected. To handle single-point power supply failures, the NANO control panel provides 2 power supply inputs. This NANO MAR SYSTEM consists of two components. The basis is formed by the NANO control panel which is placed on the bridge or in its vicinity. Then there is an extinguisher terminal box. The NANO extinguishers terminal box must be placed outside, but in the immediate vicinity of the to protected room. The NANO extinguishers terminal box is suitable for connecting 10 extinguishers. For **more than 10** extinguishers, refer to **Appendix B** describing the NANO master slave configuration. From the NANO extinguishers terminal box, the cable leads to the KVB plug & play Stat-X extinguisher installed in the volume to be protected. Just like on the front of the NANO control panel on the front of the NANO extinguishers terminal box, we have applied two dual-action buttons for releasing extinguishing. The fire extinguishers will be released, depending on the Dip Switch (time) settings.



In a marine application it is NOT common for a fire suppression system to be released by an automatic fire detector. However, the NANO control panel has two fire zones suitable for connecting Apollo Orbis Marine approved fire detectors. The NANO MAR SYSTEM can be set up so that fire alarms from these Apollo fire detectors are detected, signalized, and reported on the NANO control panel, but considered as informative.



6 INSTALLATION

6.1 CONNECTION NANO CONTROL PANEL & NANO EXTINGUISHERS TERMINAL BOX

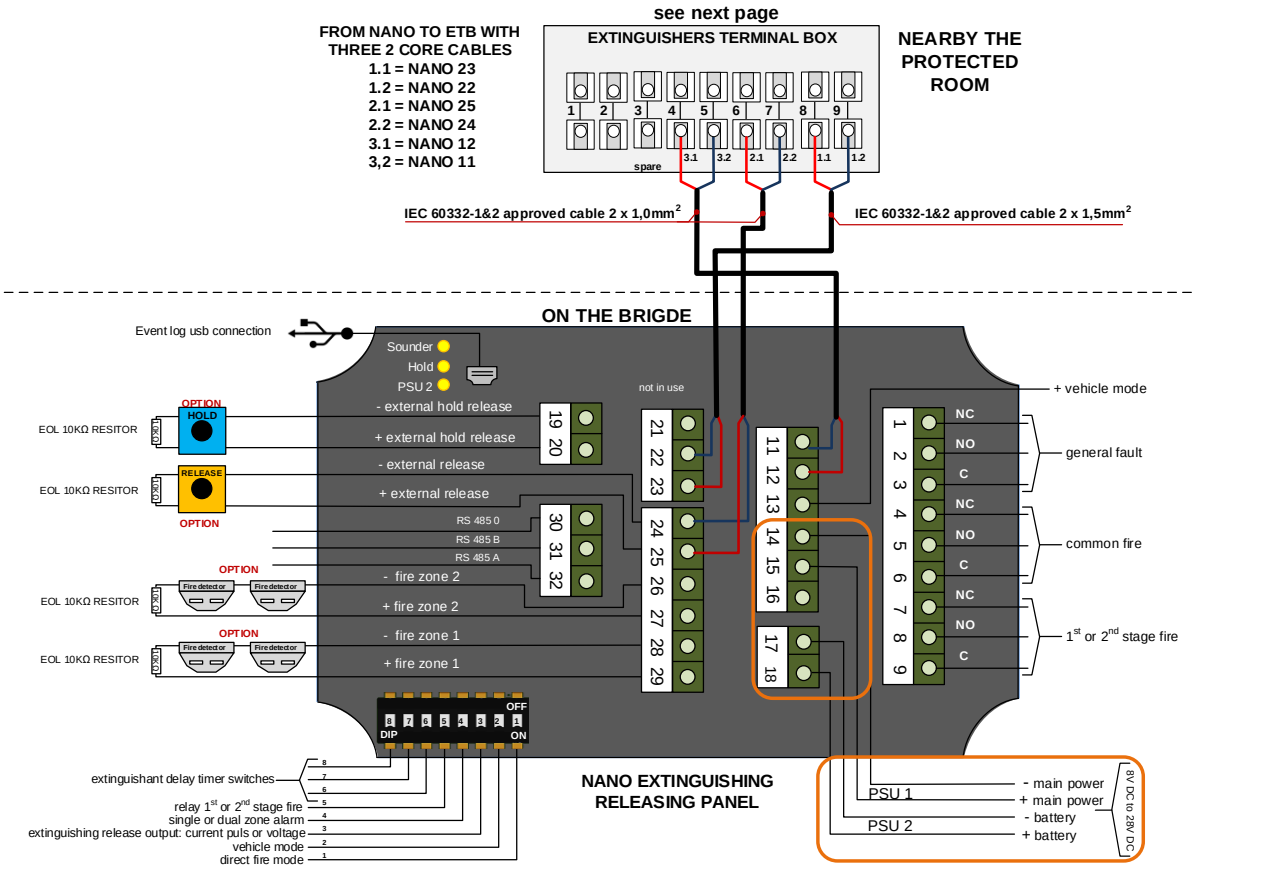
Make sure when installing the cables you chose for solution 1 or solution 2.
See principle diagram page 3

6.2 CABLE SPECIFICATIONS

There is NO need for shielded cable, but we prefer pair twisted cable, this strength the protection against electrical or magnetic fields
Minimal solid copper core diameter, extinguishers cable <50 m length 1,0 mm² (AWG 18)
Minimal solid copper core diameter, extinguishers cable >50 m length 1,5 mm² (AWG 16)
Minimal solid copper core diameter, fire detection cables 0,5mm² (AWG 20)
Maximum solid copper core diameter other cables 1,0mm² (AWG 18)
Maximum conductor loop resistance, 1,5mm² cable is 24 Ω/km.
Maximum cable length of the fire zone cables is 50 meters
Maximum cable length of the cable from NANO control panel to NANO extinguishers terminal box is 30 meters
The total cable length of all extinguishers together is max 125 meters in total

6.3 POWER

1. the main power supply will need to be connected to PSU1 (connection point 15 + / connection point 14 -)
2. the backup power supply will have to be connected to PSU2 (connection point 18 + / connection point 17 -) (see wiring diagram)



7 VOLT FREE RELAY CONTACTS

Contact load relays 30VDC /1A

7.1 GENERAL FAULT

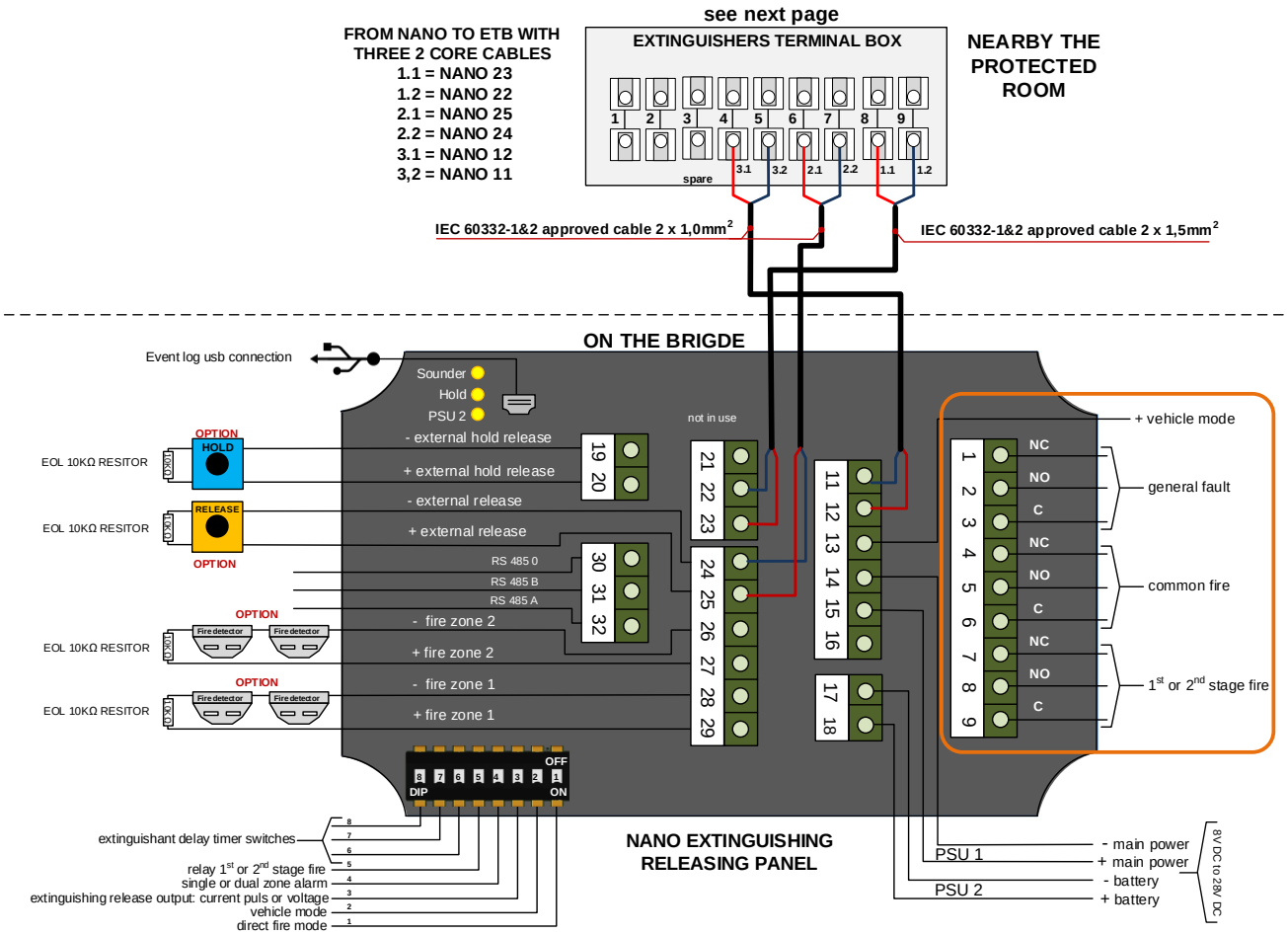
The general fault relay signals the presence of a fault in the NANO MAR SYSTEM. In the event of a complete power failure, the general fault relay will be activated. (connection point 1 – 2 – 3)

7.2 GENERAL FIRE

The general fire relay will energize upon activation of a fire condition on any of the fire zones or by pressing of the in or external extinguishing release buttons. (connection point 4 – 5 – 6)

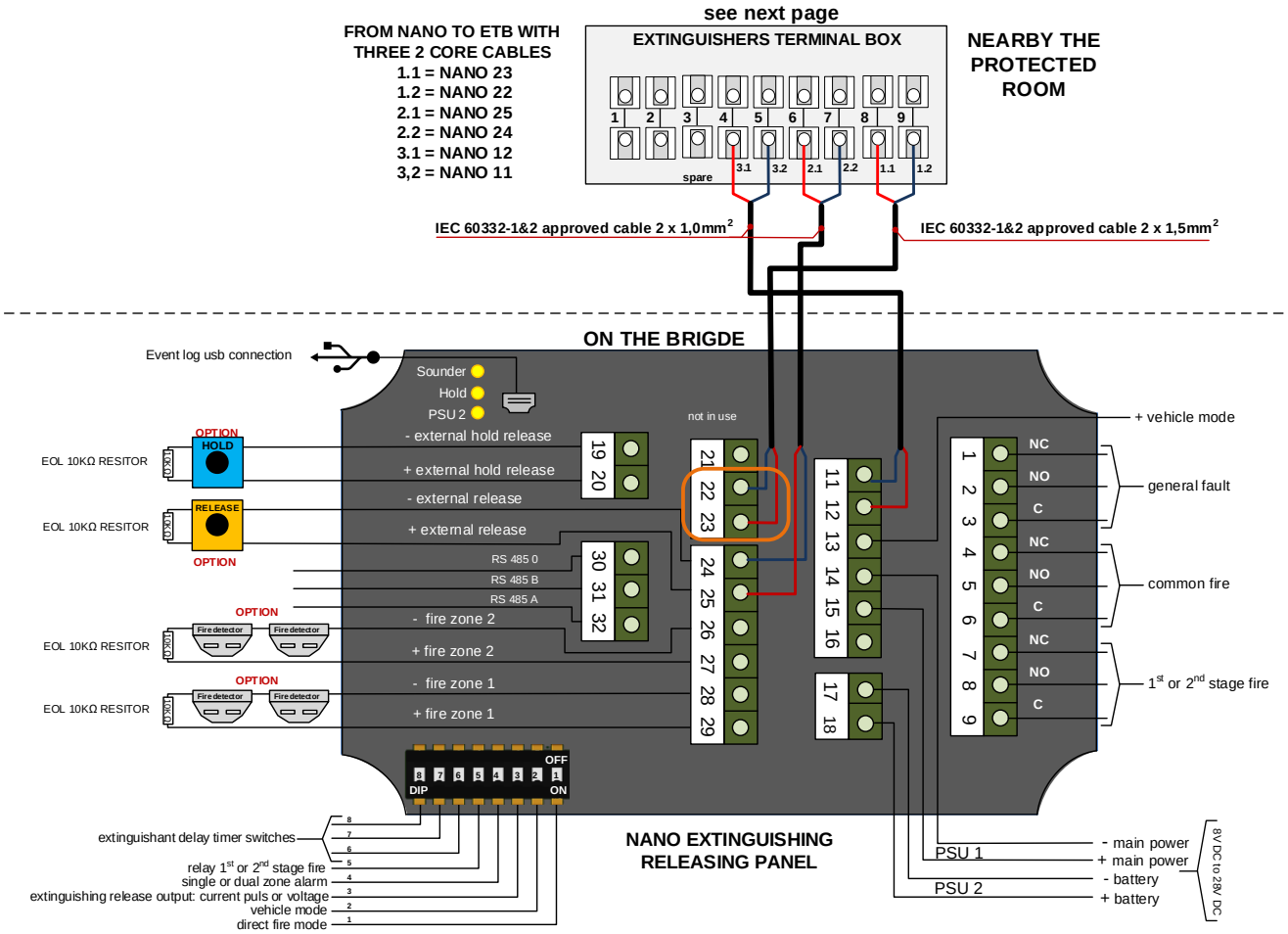
7.3 VENTILATION

Use relay output at 1st or 2nd fire alarm for ventilation. This Volt Free Contact relay output is programmable for 1st or 2nd fire alarm and intended, among other things, for switching off ventilation and/or air conditioning of the area to protected. (connection point 7 – 8 – 9) **Marine settings see page 12 subject 15.7**



8 EXTINGUISHER OUTPUT

The NANO control panel, equipped with a fire extinguisher output (connection point 22 - connection point 23 +) is monitored for short circuit and wire breakage. Only in combination with the NANO extinguishers terminal box the NANO control panel extinguishing output is protected against reverse polarity and equipped with surge protection.



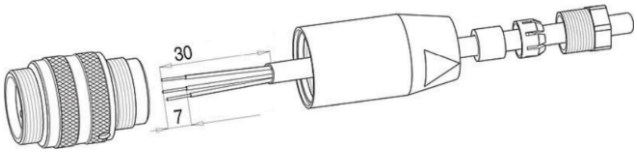
9 CONNECTING CABLE TO EXTINGHUISHERS CONNECTOR

The Stat-X KVB extinguisher comes complete with a male socket sub connector in the top of the extinguisher.

1. Strip cable jacket at the end of the cable, meant to connected the fire extinguisher.

2. Finish the two wires with insulated crimp bootlace ferrules.

3. Follow stricktly the wring specifications of the connetor supplied.



4. Connect the two wires to point 2 and 3 of the supplied female connector.

5. Finish the supplied female connector.

6. Connect the connector to the Stat-X fire extinguisher

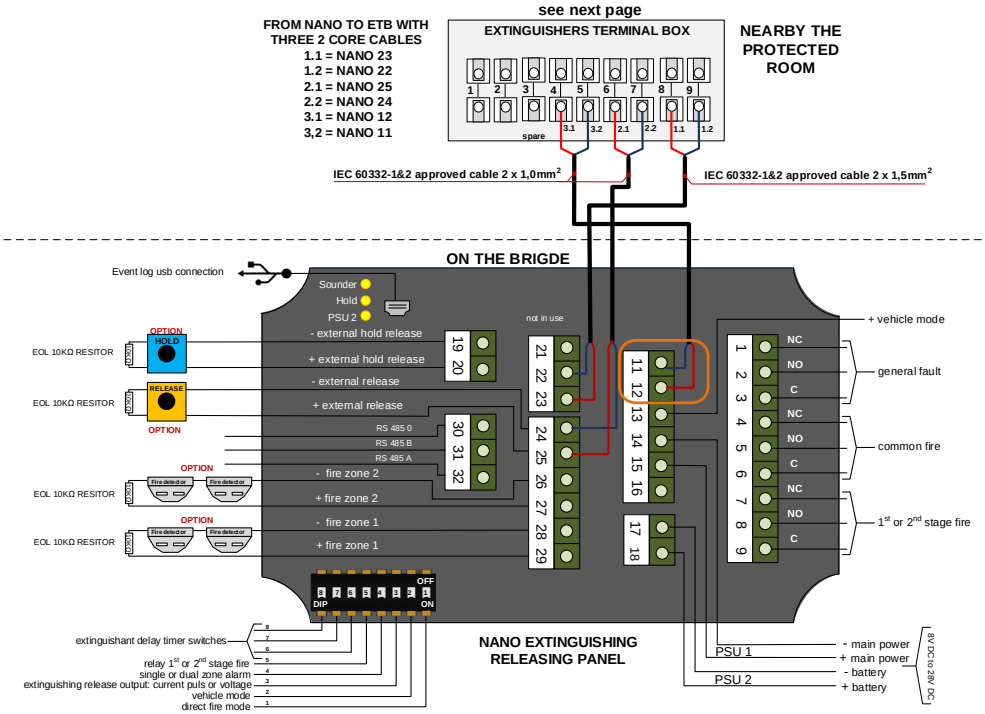
7. Check the connection and measure the resistance from the other end of the cable (NANO extinguishers terminal box side).

8. It should be between 1.4 and 2 4 Ohms.

9. After conducting the point 6 check, connect the cable to the control electronics NANO extinguishers terminal box connection point 10 and 11 and successively to connection point 18 and 19.

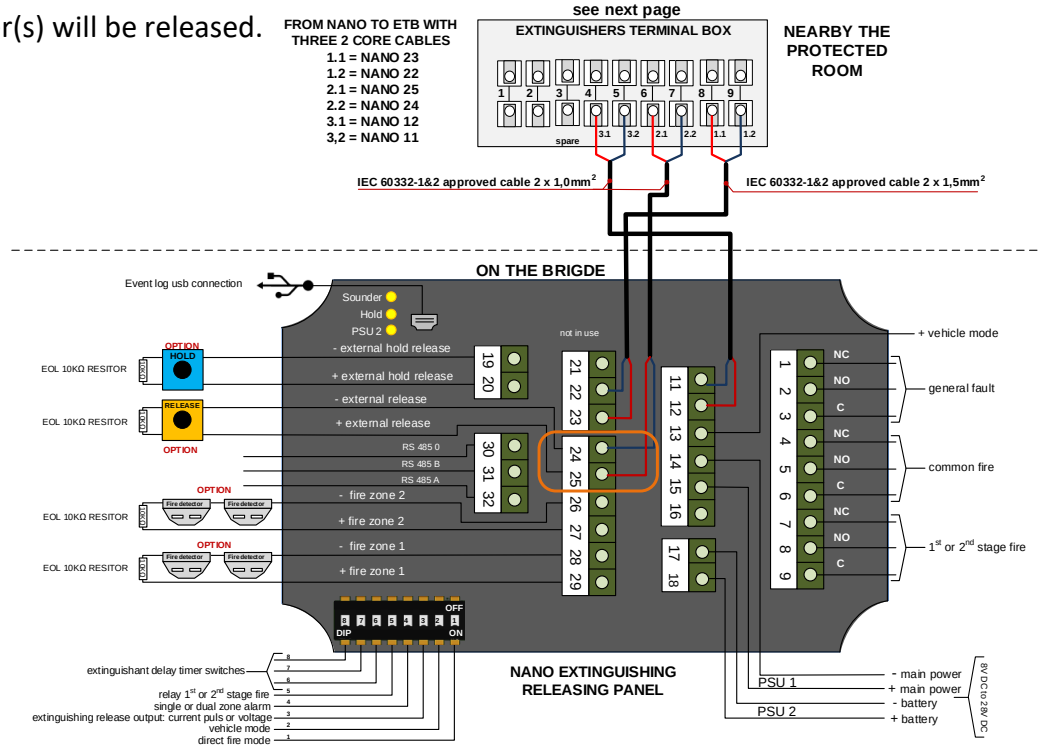
10 SOUNDER OUTPUT

The sounder output is meant for an optical & acoustical alarm device. It is monitored for short circuit and wire break by placing a 10 KΩ end-of-line monitoring resistor on the + and – connection (4 and 6) of the alarm device YL 40. (connection point 11 + connection point 12 -)



11 EXTERNAL EXTINGHUISING RELEASE

The NANO control panel has a separate input (connection point 24 + connection point 25 -) for an external dual action controlled extinguishing release button. This external extinguishing release button has the same function as the dual release extinguishing buttons (fire buttons) on the front of the NANO control panel. By pressing the external release extinguishing buttons simultaneous, the fire extinguisher(s) will be released.



12 ROADMAP FOR FINAL COMMISSIONING

12.1 POWER OFF STEP ONE

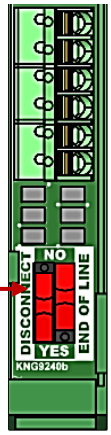
Make sure that both power supplies on the NANO control panel are turned off.

12.2 STEP TWO NANO EXTINGUISHERS TERMINAL BOX

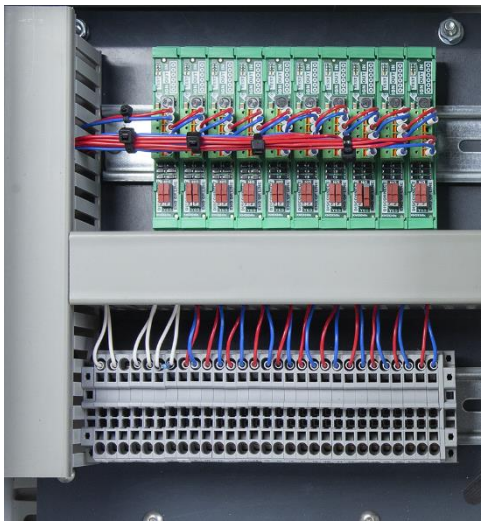
1 Open the NANO extinguishers terminal box connected to the NANO control panel

2 Make sure the aerosol generators are disconnected

DISCONNECT EXTINGHUISHER
Move the disconnect switch in the YES position and the aerosol extinguisher is disabled and can not be activated. All extinguishers terminal boards connected thereafter will remain in operation. A disablement will be signalized as fault on the NANO control panel.



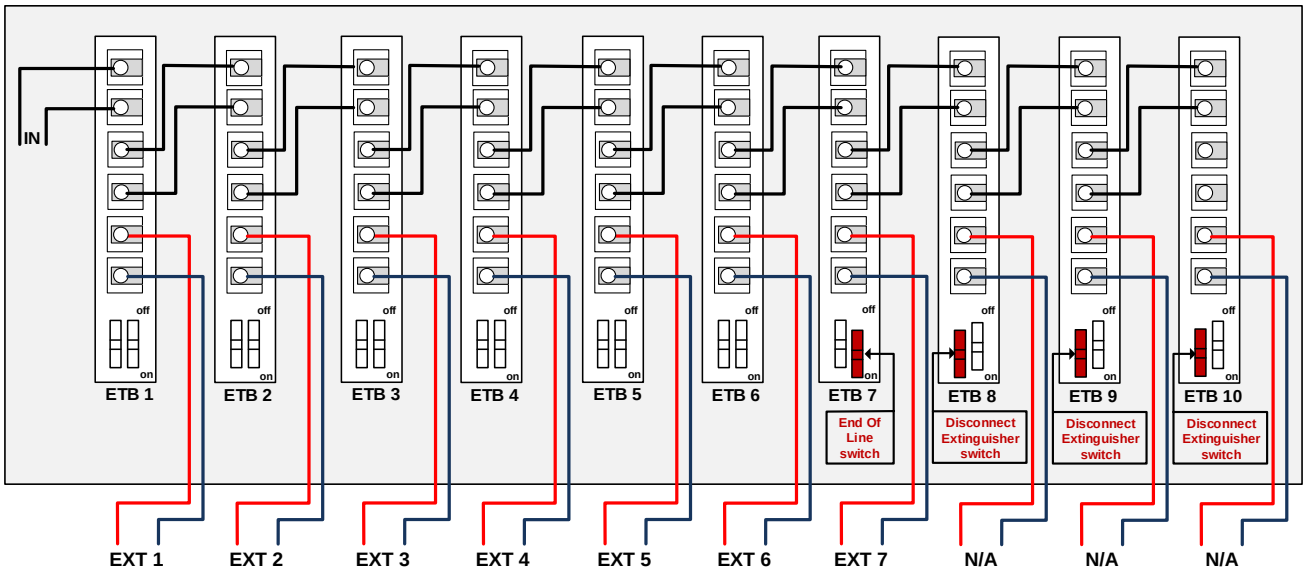
3 Check if the wiring is all connected correctly



4 Check the last extinghuishers terminal board for the end off line diode switch

ENABLE END OF LINE DIODE
To monitor for short circuit or wire break, only the end of line switch on the last extinguishers terminal board must be set into the YES position. A failure to do so will be signalized as a fault on the NANO control panel

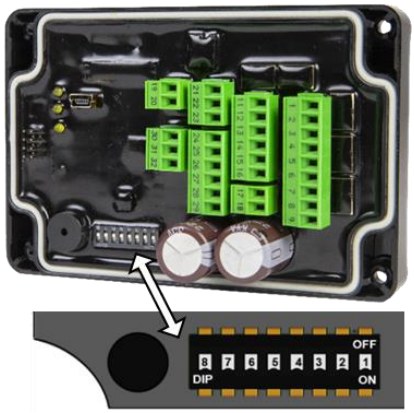
12.3 Example switch posistion NANO extinguishers terminal box 10 with 7 extinguishers



The ETB dip switch positions on a NETB 10 in use with 7 Stat-X extinguishers

12.4 Power step two

1 turn both the power supplies to the NANO control panel back on
2 the system will now power up.



12.5 Programming steps

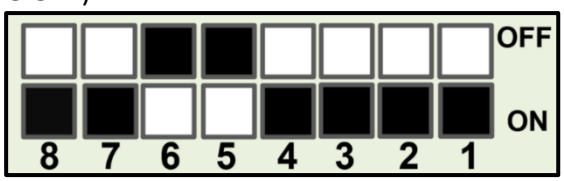
1. Open the NANO control panel
2. At the back of the NANO control panel you will see the programming dipswitches Dip Switch
3. These are numbered 1 to 8

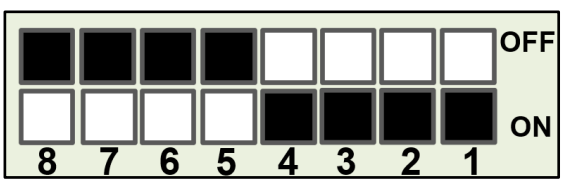
12.6 Recommended setting for marine application with manual release only

1. Front NANO control panel manual release ONLY, fire detectors are not in use (Dip Switch 1 OFF)
2. The vehicle mode is disabled is not in use (Dip Switch 2 OFF
3. Activation of electrical igniters for aerosol fire extinguishers (Dip Switch 3 OFF)
4. Dual zone alarm is not in use (Dip Switch 4 OFF)
5. Volt Free Contact relay meant for ventilation off, activate at 1st (Dip Switch 5 ON)
6. Extinguishant release 20 seconds
   (Dip Switch 6 ON - Dip Switch 7 OFF – Dip Switch 8 OFF)

12.7 Change the delay time from 20 to 30 seconds

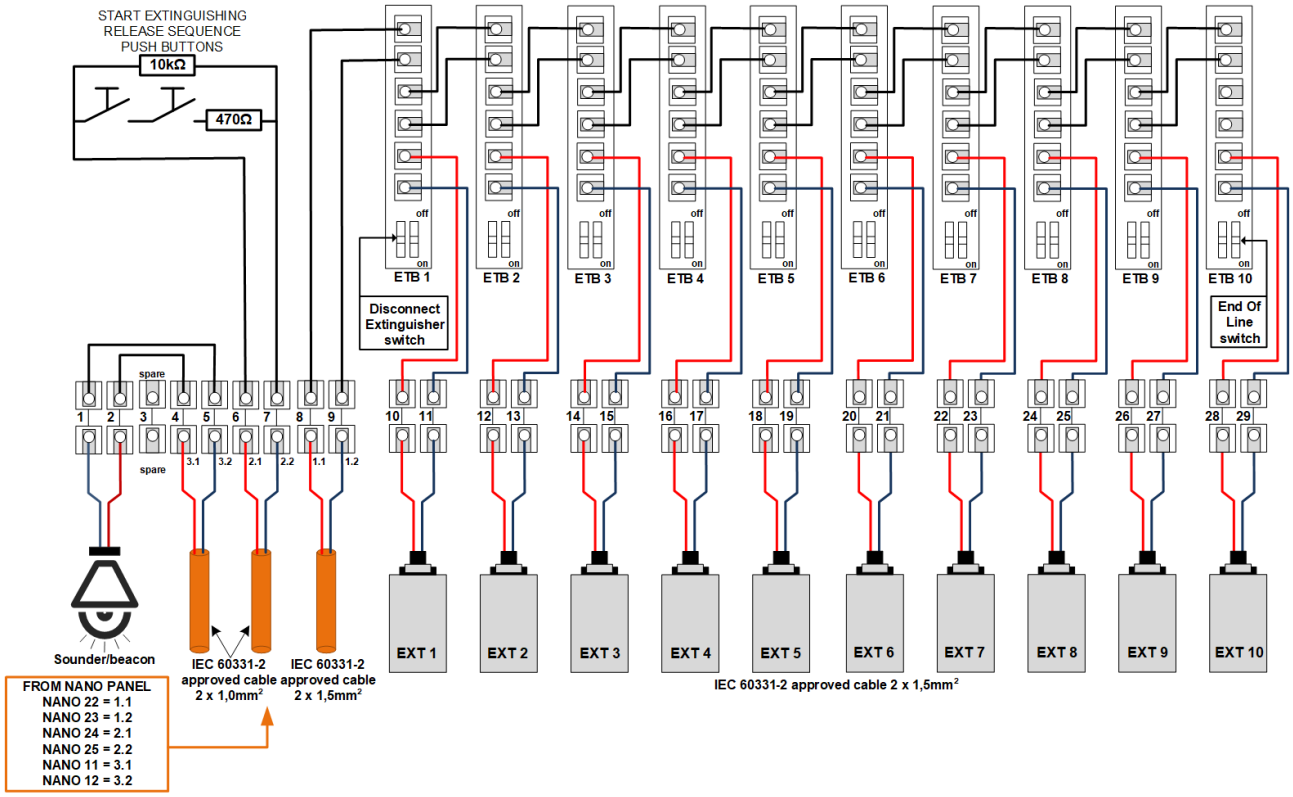
1 Change Dip Switch 7 and 8 to ON position





13 SOUNDER BEACON

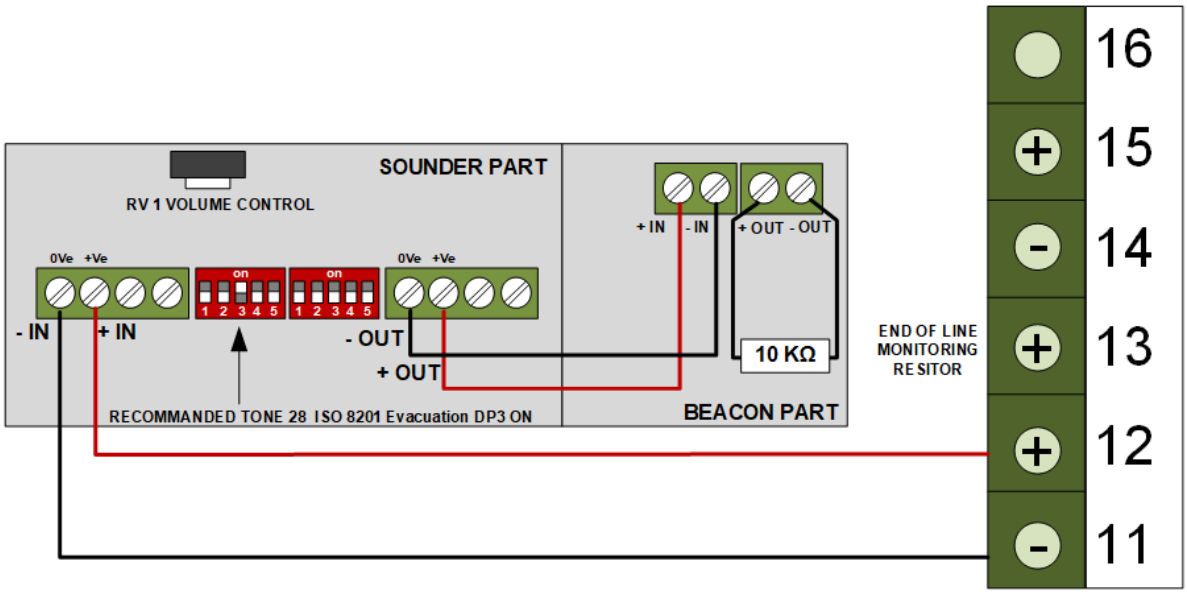
Install and connect the YL40 sounder beacon on Connection Point 1 – and Connection Point 2 + of the NANO extinguishers terminal box.



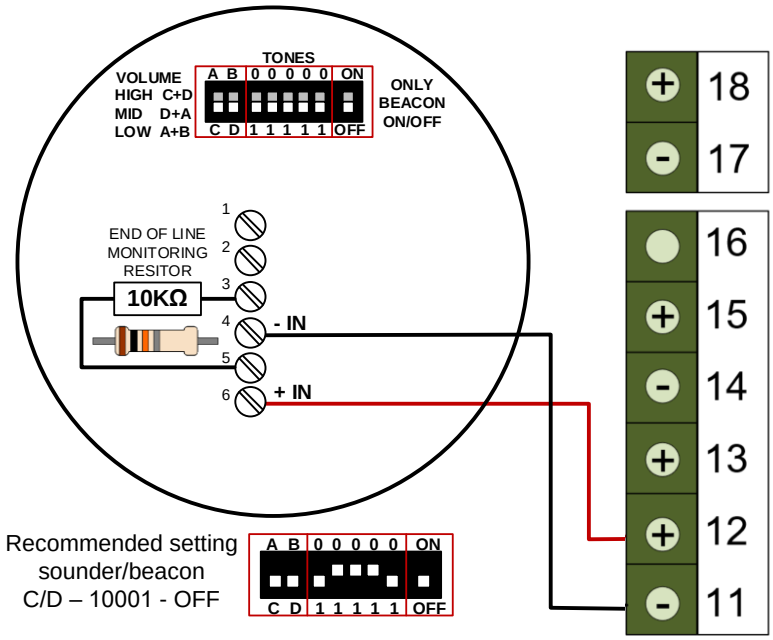
13.1 SINGLE SOUNDER BEACON

By a single sounder beacon follow the connection diagram below. The recommended setting gives the best and deviating alarm signal compared to the usual evacuation alarm signal on vessels. Please note, at some sounders the end of line resistor is **not** necessary, because the resistance of the sounder input is sufficient enough to monitor on short circuit and/or wire break.

13.2 YL40 WIRING OPTION SINGLE SOUNDER & BEACON



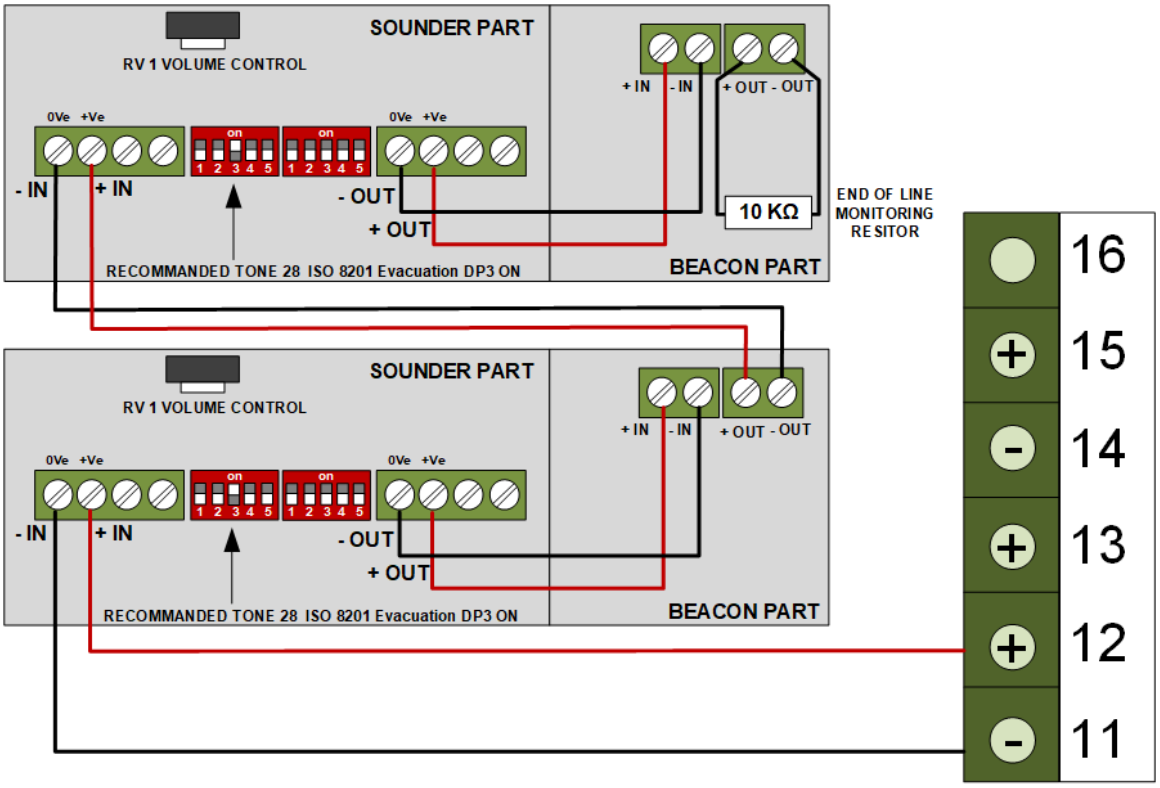
13.3 VTB-EM WIRING OPTION SINGLE SOUNDER & BEACON



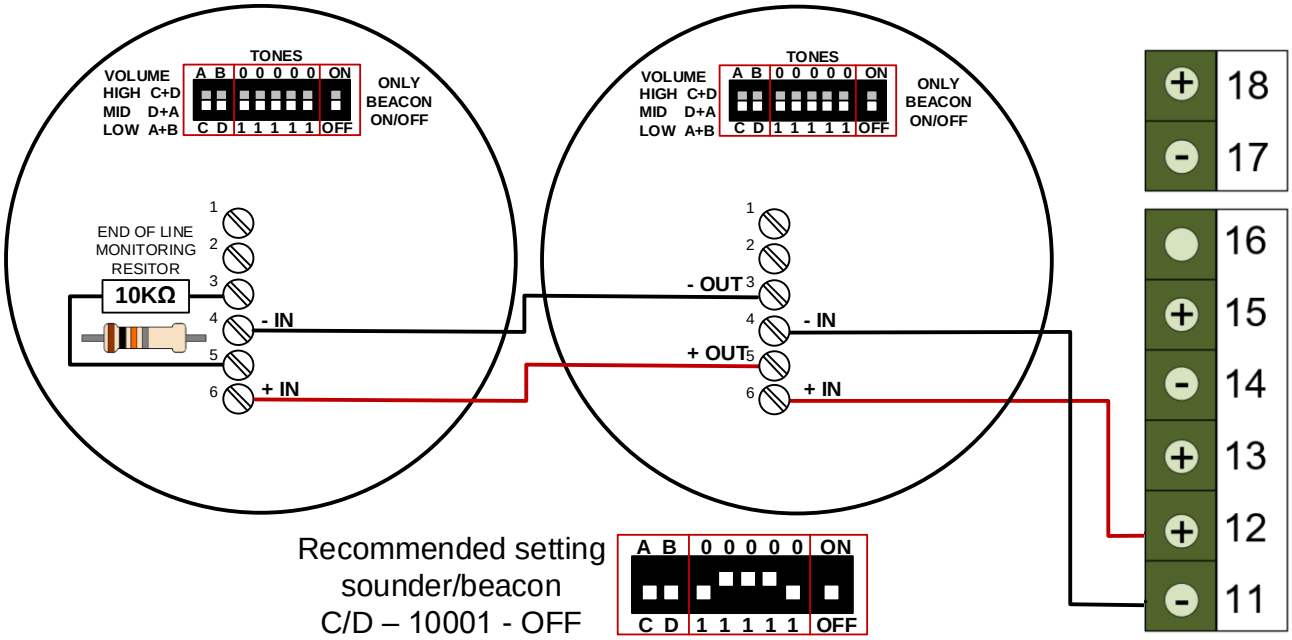
14 OPTION EXPANDED SOUNDER & BEACONS

In some cases, or in larger rooms, the installation of an extra audible and visual notification device is necessary. Usually this is caused by the lack of visibility and observability of the of the optical alarm signal in the protected area. In a noisy environment, the optical alarm signal is the main warning element.

14.1 YL40 WIRING OPTION EXPANDED SOUNDER & BEACONS



14.2 VTB-EM WIRING OPTION EXPANDED SOUNDER & BEACONS

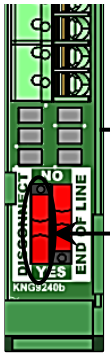


Recommended setting sounder/beacon
C/D – 10001 - OFF

15 NANO MAR SYSTEM TEST

Step 1 **OPEN** the extinguisher terminal box

Step 2 **DISCONNECT** each extinguisher by using the disconnect switch on each extinguisher terminal board.



Disconnect extinguisher

MOVE the disconnect switch of all in the YES position and the aerosol extinguisher is disabled and can not be activated. A disablement will be signalized as fault on the NANO control panel.

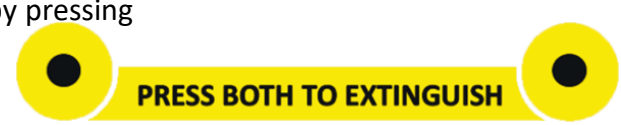
Step 3 **ACTIVATE** the extinguishing by pressing simultaneous both yellow extinguishing release buttons on the extinguishers terminal box door.

Step 4 **CONFORMATION**

Confirmation of extinguisher activation
As confirmation of a successful extinguishment activation, the red LEDs on the extinguishers terminal board will flash and the red extinguishing released LED on the NANO control panel front lite up.

Step 5 **RESET** the system by pressing the reset button on the NANO control panel front.

Step 6 **REPEAT** activate the extinguishing release by pressing simultaneous the extinguishing release buttons on the NANO control panel front.



Step 7 **CONFORMATION**

Confirmation of extinguisher activation
As confirmation of a successful extinguishment activation, the red LEDs on the extinguishers terminal board will flash and the red extinguishing released LED on the NANO control panel front lite up.

Step 8 **RESET** the system by pressing the reset button on the NANO control panel front.

Step 9 **RESTORE** the system and re-connected the extinguishers.

CONNECT extinguishers
Move the disconnect switch in the NO position and the aerosol extinguisher is connected to the system and can be activated.

The fault LED on the front of the NANO control panel goes out. Only the green Power LED and the Manual Only LED light up to indicate that the system is ready for use.

16 NOTES

Outdated or replaced computers and electronics are valuable sources for secondary raw materials, if recycled. Dealers of the NANO MAR SYSTEM must comply with local regulations for waste separation applicable in the country where the supplier is located. Questions concerning the information presented in this manual may be addressed to your dealer. For technical questions or support contact your dealer or further assistance.