

Concise User Manual



NANO FIRE DETECTION AND EXTINGUISHING CONTROL SYSTEM



TABLE OF CONTENTS

1	DOCUMENT REVISION DETAILS	2
2	IMPORTANT NOTES	2
3	WARRANTY	3
4	INTRODUCTION	3
5	ENCLOSURE & INSTALLATION	3
6	MAINTENANCE & CLEANING	3
7	KEY PROPERTIES	3
8	NANO	4
9	FEATURES NANO	4
10	INPUTS	4
11	OUTPUTS	4
12	CONTROL BUTTONS	5
13	LED INDICATORS	5
14	DIP SWITCHES	6
15	WIRING DIAGRAM NANO CONNECTED TO IGNITING ACTUATORS	6
16	WIRING DIAGRAM NANO CONNECTED WITH AN ETB	7
17	CONNECTING USING THE EXTINGUISHER TERMINAL BOARD (ETB)	7
18	WIRING DIAGRAM OF THE NANO MEANT FOR SOLENOID SYSTEM	8
19	WIRING & CABLE SPECIFICATIONS:	8
20	TECHNICAL SPECIFICATIONS	9
21	SUPPORTED DETECTION DEVICES	9
22	SOUNDER / BEACON DEVICE SUPPORT	9
23	NANO FIRE DETECTOR AND WIRING OPTIONS	10
24	NANO EXTERNAL EXTINGUISHERS RELEASE & HOLD WIRING OPTION	10
25	NANO EXTERNAL VTB-EM SOUNDER & BEACON WIRING OPTIONS	10
26	NANO EXTINGUISHERS CONNECTIONS	11

1 DOCUMENT REVISION DETAILS

Ver.	Modification Detail	Author	Date
01	1 st publishing document	CvT	01 / 08 / 2022
02	Textual addition chapter 20 (environment & power)	CvT	01 / 09 / 2022
03	Textual addition chapter 22 (specifications extended)	CvT	01 / 03 / 2023
04	Improvement diagram 16	CvT	14 / 04 / 2023
05	Textual addition chapter 5	CvT	01 / 07 / 2023
2.0	Sounder & beacon type expanded, improve diagram 16/17/19/30	CvT	01 / 07 / 2024
2.1	Add Modbus register	CvT	01 / 08 / 2024
2.2	Add test mode	CvT	01 / 10 / 2024
2.3	Hold function improved	CvT	01 / 02 / 2025
2.4	Add Extinguish confirmed	CvT	01 / 04 / 2026

2 IMPORTANT NOTES

This manual is a shortened version of the original NANO User Manual, Version 2.4 (April 2026). Read this manual carefully before installing or commissioning the NANO system. Installation, commissioning, and maintenance must only be carried out by qualified personnel and in accordance with applicable local, national, and international standards. Warranty is valid only if the system has been installed and commissioned correctly.

The NANO system complies with applicable CE, FCC, and EMC requirements, is DNV Marine Type Approved (Certificate No. TAA000037H), and, where applicable, complies with the FSS Code (International Code for Fire Safety Systems).

3 WARRANTY

N2KB B.V. warrants that the NANO system is free from defects in materials and workmanship. This warranty applies only when the system is installed, operated, and maintained in accordance with the supplied documentation. The warranty does not cover damage caused by misuse, unauthorized modifications or repairs, or electrostatic discharge (ESD).

4 INTRODUCTION

The NANO is a compact, stand-alone fire detection and extinguishing release panel for protecting electrical cabinets, CNC machines, marine engine rooms, vehicles, and other small enclosed areas. It continuously monitors connected fire detectors and activates the extinguishing system when a fire is detected. The extinguishing system can be released manually via the front panel or an external release button, or automatically through the fire detection inputs. For marine engine room applications, the default configuration is manual release only, with automatic release available if required. Featuring two detection zones, the NANO provides reliable, high-performance fire detection and extinguishing control for a wide range of applications.

5 ENCLOSURE & INSTALLATION

TMount the NANO control panel horizontally on a dry, flat surface at eye level in an easily accessible location. Avoid installation in areas exposed to excessive heat or other unsuitable environmental conditions. The enclosure has seven cable gland entries (2 × M16 and 5 × M12). Use suitable cable glands to maintain the specified IP rating. Enclosure dimensions: 120 × 80 × 58.5 mm (W × H × D).



6 MAINTENANCE & CLEANING

The NANO contains no user-serviceable parts. Always follow ESD precautions when opening the enclosure and wear a properly grounded anti-static wrist strap. Avoid touching electronic components or connectors. Before cleaning, take the system out of operation to prevent unintended activation of the extinguishing system. The NANO enclosure is rated IP65 when installed correctly with suitable cable glands. Clean the front panel only with non-alcohol-based cleaning products. Do not use high-pressure washers or steam cleaners, as these may damage the front panel, buttons, and LED indicators.

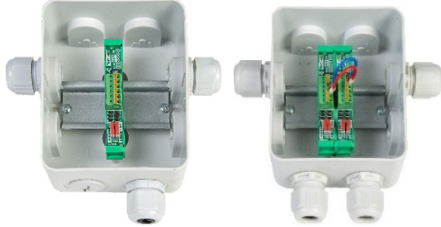
7 KEY PROPERTIES

- Configurable for manual, single-stage, or double-stage fire detection and extinguishing
- Outputs for fire, fault, ventilation shutdown, and audible/visual alarm devices
- Monitored extinguishing system output
- Two monitored fire detection zones for linear heat and/or point detectors
- Monitored inputs for external release and hold functions
- Dual release buttons and adjustable release delay (0–35 s) to prevent unwanted activation
- Extinguishing hold function to delay system release
- Event log accessible via Mini-USB and Modbus RS485
- Operates on 8–28 VDC with IP65, ESD, and EMC protection



8 THE NANO

The NANO is suitable for both land-based and marine applications and is DNV-CG Type Approved in accordance with DNV-CG 0339. The system consists of the NANO control panel and an Extinguishant Terminal Board (ETB). The control panel is typically installed on the bridge or nearby, while the ETB is mounted in a suitable enclosure outside, but close to, the protected engine room. The ETB is available in standard ($<2\ \Omega$ actuator resistance) and ETB/H ($>2\ \Omega$ actuator resistance) versions.



Connections between the control panel, ETB, and extinguisher are continuously monitored for faults. In marine applications, the default configuration is manual release only. Fire detectors can be connected for alarm indication, or the system can be configured for automatic extinguishing release if required.



9 FEATURES NANO

- **Acoustic alarm** – Internal buzzer and monitored output for an external sounder/beacon.
- **Extinguishing release output** – Supports aerosol igniters and solenoid-operated system (DS 3).
- **Event log** – Stores up to 10,000 events, accessible via the USB port.
- **Communication** – Integrated Modbus RS485 interface for system integration.
- **Direct release** – Bypasses the configured release delay when enabled (DS 1).
- **Vehicle mode** – Disables the release delay for vehicle applications when required. (DS 2)
- **General fault relay** – Fail-safe relay that signals any system or power fault.
- **Fire relay (VFC)** – Can be configured to activate on the first or second fire alarm (DS 5).
- **Single or dual-zone operation** – Selectable single-zone or (dual-zone) fire detection (DS 4).
- **Adjustable release delay** – Configurable from 0 to 35 seconds in 5-second steps using DS 6–8.

10 INPUTS

The NANO features two monitored fire detection zones and two monitored external control inputs (Release and Hold). All inputs require a 10 k Ω end-of-line resistor, even when unused. External Release and Hold buttons must use a 470–1000 Ω trigger resistor.

- **Detection zones** – Two monitored inputs for fire detectors with automatic fire and fault monitoring.
- **External Release** – Input for a remote extinguishing release button, providing the same function as the front panel release buttons.
- **External Hold** – Input for a remote hold button, allowing the extinguishing release to be delayed while activated.

11 OUTPUTS

The NANO provides **five outputs**: two monitored and three potential-free relay outputs. The monitored outputs are supervised for open- and short-circuit faults. The relay outputs are rated at **30 VDC / 1 A**.

- **Monitored extinguishing output** – Supervised for open- and short-circuit faults.
When used with the ETB (Extinguishant Terminal Board), the output is protected against reverse polarity and surge voltages.
- **Monitored sounder output** – Supervised output for an audible and/or visual alarm device.
A 10 k Ω end-of-line resistor is required for monitoring.

12 CONTROL BUTTONS

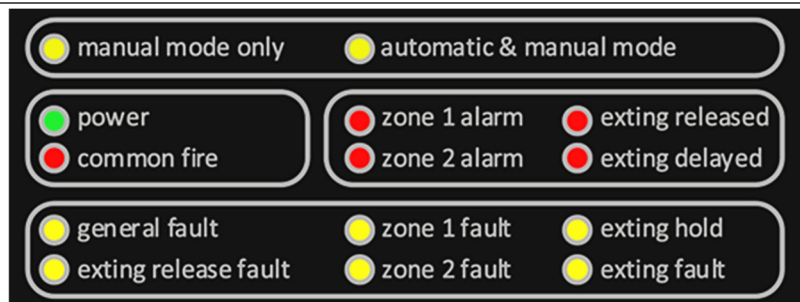
The NANO has a clear and orderly front panel. The figure shows the controls and indications with text.

- **Mute** – Silences the internal buzzer. Press twice to silence the external sounder. Any new alarm reactivates the alarms.
- **Reset** – Resets the system after the alarm condition has been cleared. Reset any activated manual call points first.
- **Lamp Test** – Press **Mute** and **Reset** simultaneously to test all LEDs and the internal buzzer.
- **Hold** – Temporarily pauses the extinguishing release sequence while the Hold button is pressed. Releasing the button restarts the programmed delay timer.
- **Mode** – Switches between **Manual Only** and **Automatic & Manual** operation by pressing the **MODE** button for 3 seconds.
- **Extinguishing Release** – Press both release buttons simultaneously to activate the extinguishing system (subject to the configured release delay).
- **Test Mode** – Allows testing of alarm and fault functions without activating the extinguishing output.



13 LED INDICATORS

The NANO panel contains one common fire indicator, three internal fault indicators, and thirteen individual LED indicators. Under normal condition only the green Power LED and either the Manual Only or Automatic and Manual LED lite.

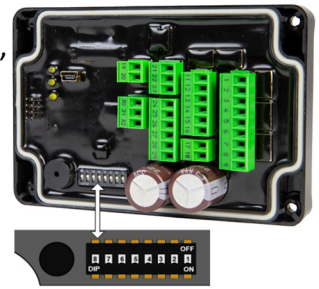


- **Power (green)** – Indicates normal operation. Flash patterns indicate power supply status or system start-up.
- **Common Fire (red)** – Lights when a fire alarm or manual extinguishing release is activated.
- **Manual Only (yellow)** – Indicates automatic extinguishing is disabled.
- **Automatic & Manual (yellow)** – Indicates the system can be activated automatically or manually.
- **Fire Zone Alarm (red)** – Flashes when the corresponding detection zone is in fire alarm.
- **Extinguishing Released (red)** – Indicates the extinguishing system has been activated.
- **Release Confirmed (red)** – Steady illumination confirms successful activation of the extinguishing device.
- **Release Delay (red)** – Flashes while the programmed release delay is active.
- **General Fault (yellow)** – Indicates a system or power fault.
- **Fire Zone Fault (yellow)** – Flashes when a fault is detected in the corresponding detection zone.
- **Hold (yellow)** – Flashes while the extinguishing release is being held.
- **Extinguishing Release Fault (yellow)** – Flashes on extinguishing output faults and lights continuously in Test Mode.
- **Internal Fault LEDs** – Additional internal indicators provide detailed diagnostic information for service personnel.



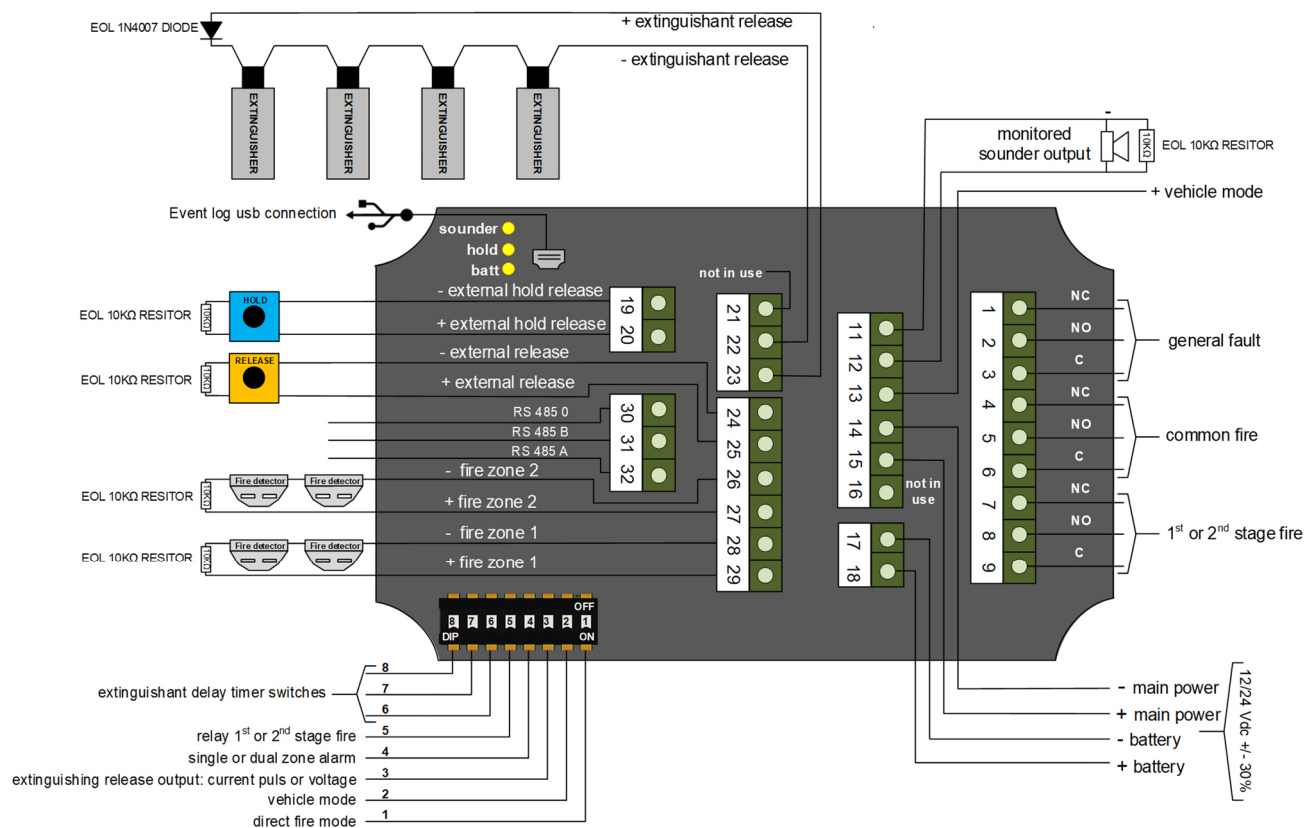
14 DIP SWITCHES

The factory default configuration is intended for **marine engine room** applications, where the system operates in **Manual Only** mode and automatic fire detectors provide alarm indication only. The default extinguishing delay is **20 seconds**.

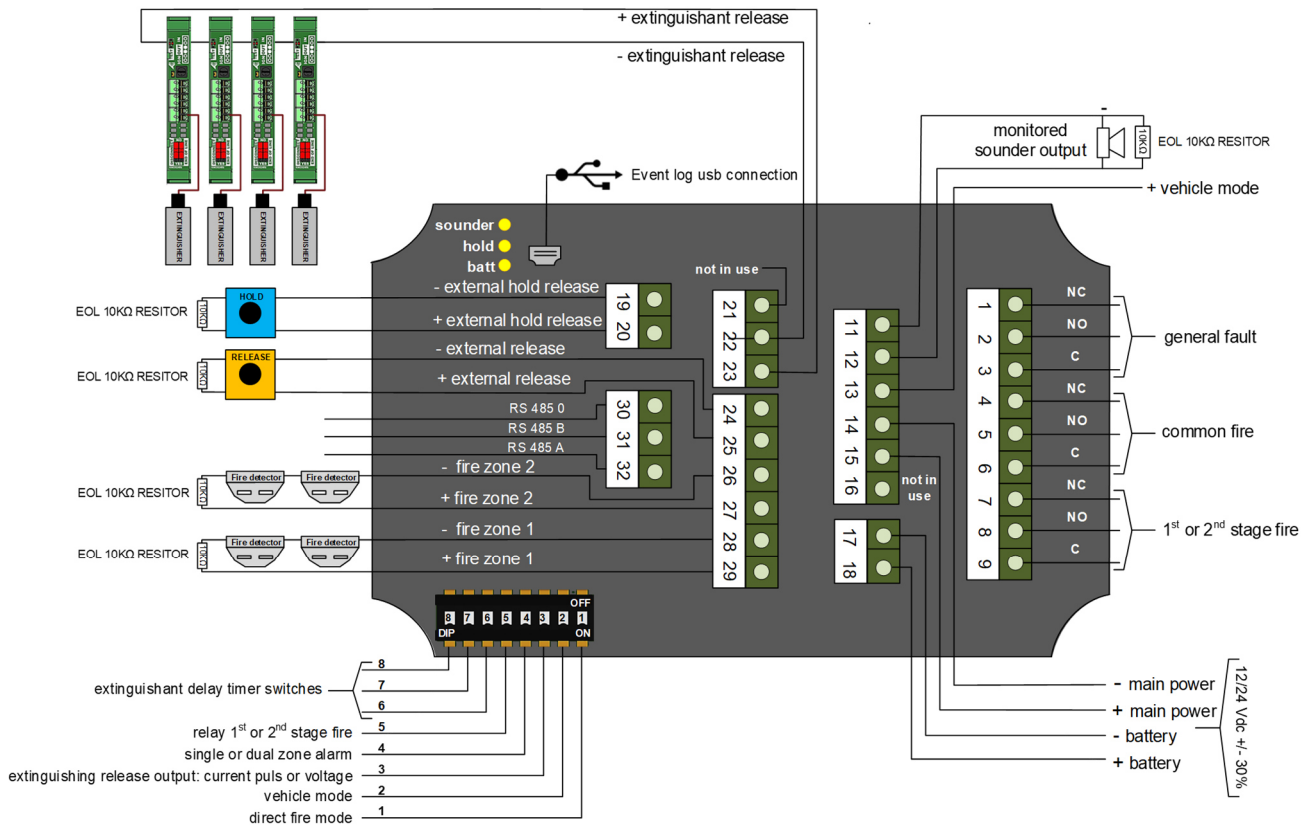


DIP Switch	Function
DP1	Enables Direct Release, overriding the programmed release delay.
DP2	Enables Vehicle Mode, disabling the release delay when the vehicle is parked.
DP3	Selects the extinguishing output: OFF = aerosol igniters (default), ON = solenoid output. Do not use ON with an ETB.
DP4	Selects Single-Zone or Dual-Zone (coincidence) fire detection.
DP5	Sets the VFC relay to activate on the first or second fire alarm.
DP6–DP8	Sets the extinguishing release delay from 0 to 35 seconds in 5-second increments.

15 WIRING DIAGRAM NANO CONNECTED TO IGNITING ACTUATORS



16 WIRING DIAGRAM NANO CONNECTED WITH AN ETB



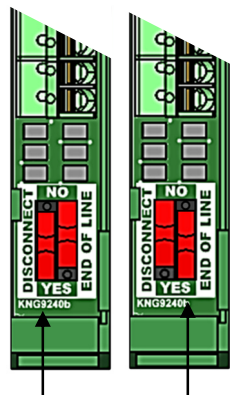
17 CONNECTING USING THE EXTINGUISHER TERMINAL BOARD (ETB)

The ETB is designed for use with the NANO and aerosol extinguishers. It incorporates safety electronics to ensure reliable activation of all extinguisher igniters and, together with the end-of-line switch, provides continuous monitoring of the extinguishing circuit.

Warning: The end-of-line switch must be installed correctly. Incorrect installation may prevent part of the extinguishing circuit from operating. Always verify the wiring during commissioning and maintenance.

DISCONNECT EXTINGUISHER

Move the disconnect switch in the YES position and the aerosol extinguisher is disabled and can not be activated. All ETB's connected thereafter will remain in operation. A disablement will be signaled as fault on the NANO.



ENABLE END OF LINE DIODE

To monitor for short circuit or wire break, only the end of line switch on the last ETB must be set into the YES position. A failure to do so will be signaled as a fault on the NANO panel.

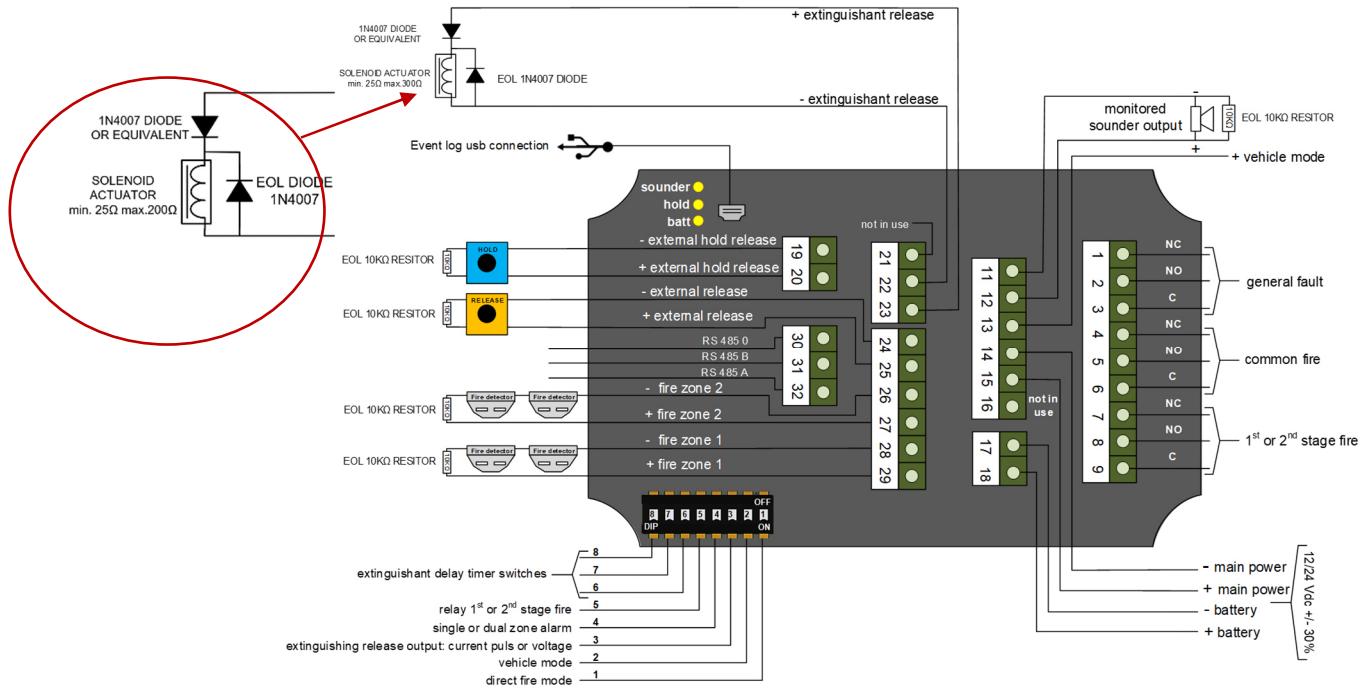


18 WIRING DIAGRAM OF THE NANO MEANT FOR SOLENOID SYSTEM

The NANO can control both aerosol igniters and solenoid-operated extinguishing systems. When configured for solenoid operation, the extinguishing output can supply up to **1 A**.

Use solenoids with a resistance of **25–200 Ω (18–28 VDC)** to ensure the output current rating is not exceeded. The maximum permitted cable impedance depends on the solenoid coil resistance.

For maintenance and testing, N2KB recommends installing a **key-operated isolation switch** in the extinguishing output circuit to prevent unintended system activation.



19 WIRING & CABLE SPECIFICATIONS:

- Shielded cable is not required.
- Use twisted-pair cable. This improves protection against electrical and magnetic interference.
- Minimum solid copper conductor cross-section for extinguisher line cables:
- Cable length < 50 m: 1.0 mm² (AWG 18).
- Cable length > 50 m: 1.5 mm² (AWG 16).
- Minimum solid copper conductor cross-section for fire detection cables: 0.5 mm² (AWG 20).
- Maximum solid copper conductor cross-section for other cables: 1.0 mm² (AWG 18).
- Maximum conductor loop resistance for 1.5 mm² cable: 24 Ω /km.
- Maximum cable length of fire zone cables: 50 m.
- Maximum cable length between the NANO and the ETB: 30 m.
- The total cable length for all extinguishers combined must not exceed 125 m.

20 TECHNICAL SPECIFICATIONS

Parameter	Specification
Ambient temperature	-25 °C to +55 °C
Enclosure rating	IP65
Compass safe distance	Minimum 50 mm
Supply voltage	12/24 VDC ±30%
Power consumption	1 W (standby), 5 W (alarm)
Relay rating	30 VDC / 1 A
Fire zone voltage	15 VDC
Detector alarm current	Max. 60 mA
Extinguishing output (aerosol)	1.3 A, 35 ms pulse
Extinguishing output (solenoid)	24 VDC, max. 1 A, 8 s pulse
Solenoid coil resistance	25–200 Ω
Detection inputs	Monitored, 10 kΩ EOL, 470 Ω alarm resistor
Operating modes	Manual, Single-Zone, Dual-Zone

21 SUPPORTED DETECTION DEVICES

The following **Apollo Orbis Marine** detectors are approved for use with the NANO:

- ORB-OP-42001-MAR – Optical smoke detector
- ORB-OH-43001-MAR – Optical/heat detector
- ORB-HT-41002-MAR – Heat detector, 61 °C
- ORB-HT-41004-MAR – Heat detector, 73 °C
- ORB-HT-41006-MAR – Heat detector, 90 °C
- ORB-MB-00001-MAR – Standard detector base

22 SOUNDER / BEACON DEVICE SUPPORT

The following sounder/beacon has been approved for use with the NANO:

Part No.	Description	Brand
VTB-32EM-DB-RB/RL	Sounder/Beacon	Cranford

Notes

- Approved detector input voltage: **15–22 VDC**
- Approved sounder/beacon input voltage: **18–22 VDC**
- Always verify device specifications before connecting them to the NANO.

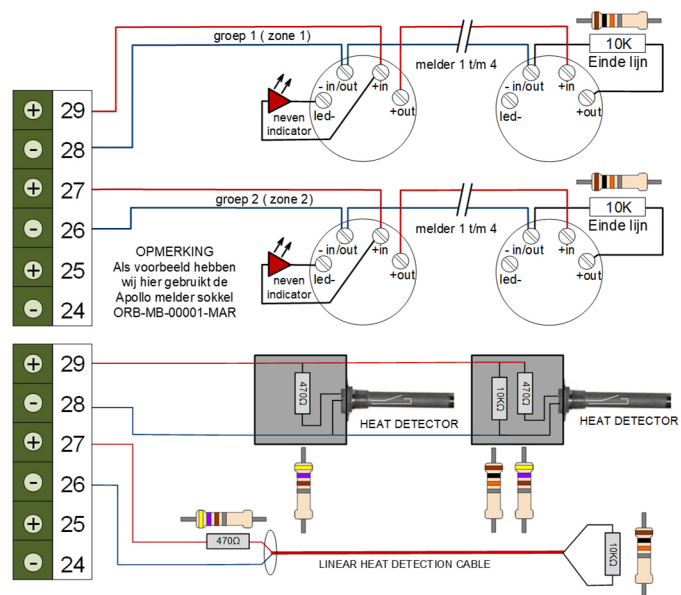


23 NANO FIRE DETECTOR AND WIRING OPTIONS

The NANO supports three types of fire detection:

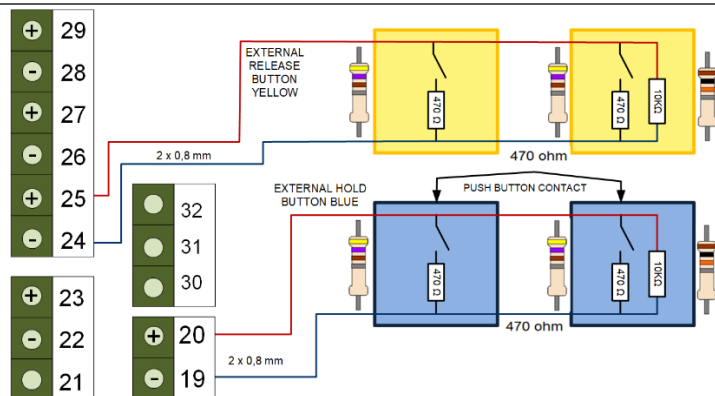
- Conventional **Apollo Orbis** fire detectors
- **Point heat detectors**
- **Linear heat detection cable**

These devices can be connected to either of the NANO's two monitored detection zones.



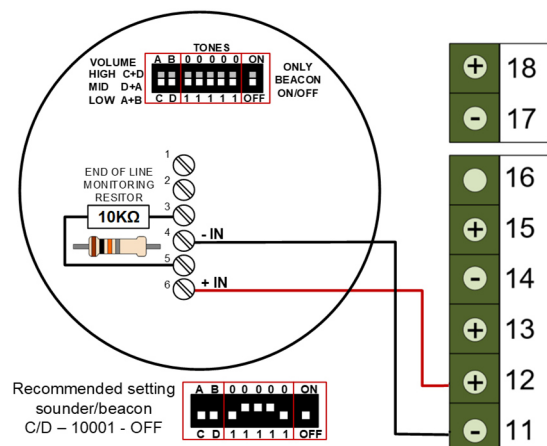
24 NANO EXTERNAL EXTINGUISHERS RELEASE & HOLD WIRING OPTION

The NANO provides separate inputs for an external extinguishing release button and an external hold-off button. NANO has a separate input for external extinguishing release and external hold-off button.



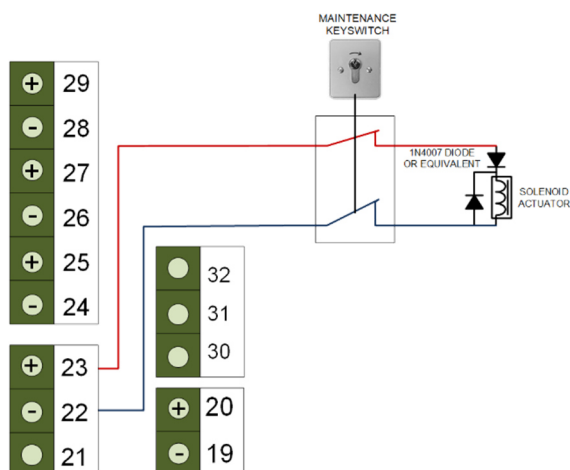
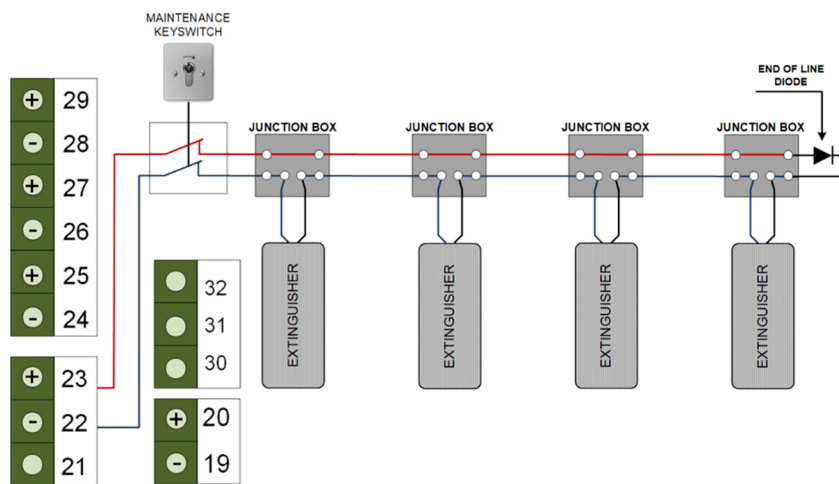
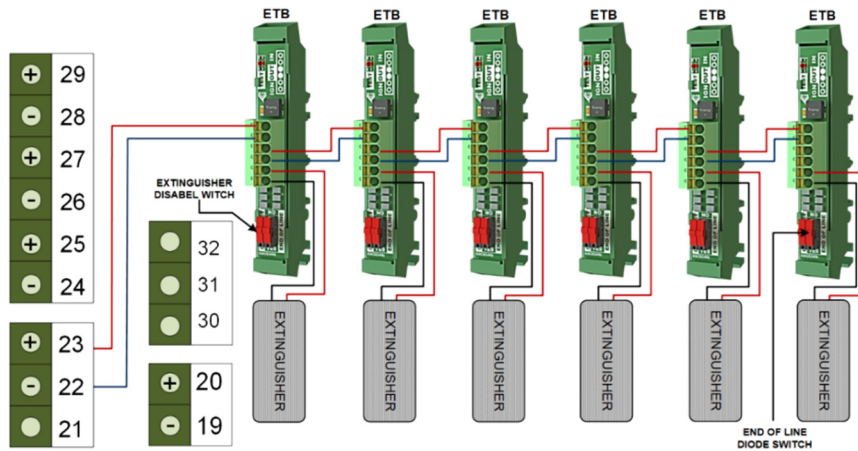
25 NANO EXTERNAL VTB-EM SOUNDER & BEACON WIRING OPTIONS

For a single sounder beacon, follow the connection diagram below. The recommended settings provide a clear and distinctive alarm signal compared to standard evacuation alarms, for example on vessels. If a second signaling device is required, refer to the full NANO user manual for additional options and wiring instructions. Please note that for some sounder devices, an end-of-line resistor is not required, as the input resistance of the device is sufficient to monitor open- and short-circuit faults.



26 NANO EXTINGUISHERS CONNECTIONS

A connection using a junction box is technically possible; however, it is not covered by our warranty. Proper operation of the NANO is only guaranteed when used with an ETB. The ETB provides circuit protection against early interruption and ensures that the activation current reaches all igniters.



The diagrams in this manual are provided for understanding the NANO fire extinguishing system operation only and must not be used for technical design or implementation purposes. No part of this manual may be reproduced or distributed without prior written permission from N2KB B.V. N2KB B.V. reserves the right to modify product specifications without prior notice. Errors and omissions excepted. Dispose of obsolete electronic equipment according to local recycling regulations. For questions or technical support, contact your NANO dealer. Outdated or replaced computers and electronics are valuable sources for secondary raw materials, if recycled.



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