

CHECKFIRE MP-N Electric Detection and Actuation System

Features

- MSHA approved for permissible applications in an explosive methane/air atmosphere
- Gas motor actuation
- Manual and automatic actuation
- 3 detection options – Linear, spot and pneumatic/linear
- Self contained – Internal 3.6 VDC power source
- Power fault monitoring for internal power
- Euro-style terminal block for field connections
- Two part enclosure design simplifies installation and servicing
- Tamper-proof screws on front cover
- Environmentally sealed enclosure
- Mounting feet for mounting to any suitable flat surface
- Microprocessor based circuitry
- Sealed, membrane push button for reset and delay
- Vibration and shock resistant design
- Electronic circuitry that meets the iec standards for electromagnetic compatibility in heavy industrial environments
- Form “C” relay output connection for shutdown functions
- Two supervised initiating circuits – one for detection and one for either manual electric actuation or pressure switch feedback
- One supervised release circuit
- Manually field programmable circuits (can optionally be pc programmed)
- History file to record the last 50 alarm and trouble events
- Built-in diagnostic function identifies the source of trouble
- Programmable time delays (alarm to shutdown, shutdown to release)

Applications

The CHECKFIRE MP-N Electric Detection and Actuation System furnishes fire detection for equipment hazard areas. Its unique actuator allows actuation of a pneumatically-actuated fire suppression system either manually or automatically.

The CHECKFIRE MP-N system is typically used with an ANSUL® A-101 Vehicle Fire Suppression system for 24-hour protection of equipment. The system is particularly suited for protection of equipment that is subjected to extreme environmental and physical conditions. The system design complies with the “Safety Standards For Underground Coal Mine Ventilation – MSHA Title 30: Part 75.”



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The control module can be utilized as a self contained system, powered by its own internal Lithium battery. This allows the detection system to operate around-the-clock without use of external power.

The control module may be installed where the ambient temperature is between -40 °F to 140 °F (-40 °C to 60 °C).

Description

The complete CHECKFIRE MP-N system is composed of components which are combined to provide automatic fire detection and actuation. The electric detection and actuation system is designed for use with the ANSUL fire suppression systems that use pneumatic actuation as a means of system actuation.

The first of two initiating circuit is the supervised detection circuit designed to be connected to linear (wire) and/or spot type thermal detectors that provide a contact closure input to initiate a fire detected condition. The second initiating circuit is designed to accept a contact closure type of actuating device such as a manual electric pull station input or a pressure switch to initiate the module when the system is actuated with the pneumatic/manual actuator. The initiating circuits are low impedance and designed to eliminate nuisance alarms associated with contact bounce.

First Initiating Circuit

Two field programmable time delays provide timing of shutdown and release functions associated with the operation of the detection and electric manual pull/pressure switch input initiating circuits. The first time delay is field programmed to assign the time between the initial alarm condition from the detection circuit and the operation of the shutdown relay. The first time delay is programmable for 5, 10, 20, or 30 seconds. The second time delay is field programmed to assign the time between the completion of the first time delay (when the shutdown relay operates) and operation of the release circuit. The second time delay is field programmable for 0, 10, 20, or 30 seconds.

Description (Continued)

Second Initiating Circuit

The second initiating circuit is field programmable to be used as an electric manual pull or as a pressure switch feedback circuit. If selected as an electric manual actuation input circuit, its operation will override the first time delay function and initiate a second time delay condition, causing the shutdown relay to immediately operate and the release to occur upon expiration of the second delay. Additionally, the control module can be field programmed, if it is so desired, to shorten the second time delay when a manual actuation occurs. The time delay options associated with the manual actuation are 0, 10, 20, and 30 seconds, with the condition that it can only be less than or equal to the time delay associated with the detection circuit.

Selection of the second initiating circuit as a pressure switch feedback circuit will result in the operation of the shutdown relay, but will not operate the release circuit. Additionally, a trouble condition will occur on the control module, indicating the need for service.

The front panel contains a "DELAY" and "RESET" button. Operation of the DELAY button will repeat the first time delay if initiated while time delay one is active. Once time delay two has started, operation of the DELAY switch has no affect.

The RESET button is used to re-initialize the control panel when depressed; it provides an indication that all LEDs and the sounder are functional. It is also used to upload the manual programming into the control module.

The front panel also contains LEDs for visual annunciation of alarm, trouble, release, and power conditions.

EMI filtering is provided on all inputs, outputs, and power circuitry.

Construction

The enclosure consists of a cover assembly and back box which is constructed of Noryl SE1GFN3 with a flammability rating of UL94 V-1. The back box contains the field interface terminal block, battery, and field wiring entrance ports. The cover assembly contains the control PC board assembly, sounder, operator interface panel, and environmental seal. The enclosure meets IEC 529 requirements for dust and water spray in all directions. Mounting feet allow mounting to any suitable flat surface. Steel mounting brackets are also available.

All circuitry, relays, switches, and LEDs are contained on a single PC board. A board mounted receptacle mates with the plug-in terminal block mounted in the back box. A high pitch sounder is threaded into the cover and plugged into the PC board. The PC board is encapsulated to provide added protection against moisture and dust. An RS232 connector is provided for field programming from a PC and for data retrieval from a trouble and alarm event history file. The PC board assembly contains a DIP switch for optional manual programming functions without the use of a PC.

Internal Communications

The internal battery is connected to the PC board via a single plug.

The field connection terminal strip located in the back box is a 16 position terminal block containing the following terminations:

<u>Position</u>	<u>Circuit Description</u>
1	Not Used
2	Not Used
3	+ Detection Input
4	- Detection Input
5	Initiating Input Circuit No. 2 (+)
6	Initiating Input Circuit No. 2 (-)
7	+ Release Output
8	- Release Output
9	Not Used
10	Not Used
11	Not Used
12	Not Used
13	Not Used
14	Shutdown N.O.
15	Shutdown Common
16	Shutdown N.C.

Operational Environment Specifications

- Operating temperature rating: -40 °F to 140 °F (-40 °C to 60 °F)
- Humidity: 24 Hours at 85% +/- 5% at 86 °F (30 °C)
- Shock: In accordance with UL1254
- Vibration: In accordance with UL1254
- Electromagnetic Compatibility: Meets EN 55011 and EN 50082-2 for heavy industrial environments
- Moisture and Dust: Meets IEC 529 for direct water spray

Sequence Of Operation

Upon receiving an input signal from either a shorted detection wire or a closed thermal detector, the following functions will be performed automatically:

1. The Alarm LED will flash, the internal sounder will pulse at a rate of two times per second. The shutdown time delay begins. (The operator can repeat the shutdown time delay if the DELAY button is pressed before the shutdown time delay has expired).
2. After the shutdown time delay has expired, the Alarm LED pulse rate and the sounder pulse rate will change to four times per second. The shutdown relay will transfer resulting in equipment shutdown (when provided), and the discharge time delay begins (when set).
3. After the discharge time delay has expired, the control module release circuit operates, resulting in the fire suppression system actuation.

After system discharge, the Alarm LED and sounder will continue to pulse at a rate of 4 times per second for 30 seconds. After that, it will switch to the trouble mode and pulse once every 10 seconds.

If manual actuation is performed through operation of the manual input circuit, the first time delay will be by-passed and either immediate release will occur or the second time delay will begin.

If manual actuation is performed by operating the mechanical actuator, the fire suppression system will immediately discharge. The shutdown function will take place through the pressure switch circuit (if provided).

Approvals

- MSHA – 2G-4107-0

Ordering Information

Part No. Shipping Assembly

427312	CHECKFIRE MP-N electric detection and actuation system includes: control module, manual/automatic actuator, mounting bracket, gas motor actuator, LT-10-R Cartridge, 1/4 in. check valve, label package, and owners manual (battery must be ordered separately)
71230	Linear detection wire, 356 °F (180 °C), 100 ft (30.5 m)
71231	Linear detection wire, 356 °F (180 °C), 500 ft (152.4 m)
426520	End of line resistor assembly
416218	Spot Detector – 270 °F (132 °C)
416219	Spot Detector – 325 °F (163 °C)
416220	Spot Detector – 360 °F (182 °C)
416213	Spot detector package (one required per detector)
416214	Spot detector cable clamp package (for use with protective tubing) – one required for each detector
416762	Spot detector cable clamp package (for use without protective tubing) – one required for each detector
416215	Flex protective tubing – 100 ft (30.5 m)
416221	Spot detector bracket – one required for each detector
416784	AMP crimp tool (required for spot detector assembly)
416113	Pneumatic/Linear detector, 35 ft (10.7 m) (model 808-DRV)
416216	Cable assembly, 15 ft (4.6 m) (for pneumatic/linear detector)
416378	Mounting clips package for pneumatic/linear detector sensing element (includes 100 clips)
417055	Wire, 200 °C, 18 AWG-2 w/Shield and drain wire 500 ft (152 m)
56691	Nylon cable ties (pkg. of 20)
56692	Rubber sleeves (pkg. of 20)
71820	Splicing device (for linear detection wire)
427308	Battery shipping assembly (3.6 VDC)
423541	Release circuit test module
427310	Operation and maintenance manual
428042	Battery extender cable assembly
426601	Extender cable assembly
423524	RS232 PC interface cable kit
426461	End-of-Line resistor assembly (10 of Part No. 426520)
428966	Cover removal tool
423423	LT-10-R cartridge

Note: The converted metric values in this document are provided for dimensional reference only and do not reflect an actual measurement.

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