

CHECKFIRE Marine Electric Detection and Control System

Features

- USCG approved
- Internal 3.6 VDC battery provides battery backup
- External 12/24 VDC power source connection available for primary power
- Power fault monitoring for internal and external power
- Euro-style terminal block for field connections
- Two part enclosure design simplifies installation and servicing
- Environmentally sealed enclosure
- Mounting feet for mounting to any suitable flat surface
- Microprocessor based circuitry
- Sealed, membrane push button for reset and silence
- Vibration and shock resistant design
- Electronic circuitry that meets EN 50082-2 Standard for Electromagnetic Compatibility and EN 55011:1991 Standard for Emissions for Heavy Industrial Environments
- Form "C" relay output connection for both auxiliary alarm and control functions
- Normally open trouble contacts for remote trouble annunciation
- Two supervised initiating circuits
- Manually field programmable circuits
- Built-in diagnostic function identifies the source of trouble

Application

The CHECKFIRE Marine Electric Detection and Control System has been designed to be used in conjunction with an ANSUL® fire suppression system requiring manual input as a means of actuation to meet the fire protection requirements of 46 CFR Subchapter T - Small Passenger Vessels (Under 100 Gross Tons). Its unique low voltage low power operating system, designed to operate from a 12 to 24 VDC power input, makes the CHECKFIRE Marine an ideal fire detection controller in applications where accessibility to standard 115 VAC power is either impractical or not available.

The CHECKFIRE Marine system is primarily used for automatic fire detection in machinery spaces where an automatic fire detection system is required to accompany a manual fire suppression system, but may also be used for other shipboard hazard areas. Because of its rugged construction, it is especially suited for protection of equipment that is subjected to extreme environmental and physical conditions.

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



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Description

The complete CHECKFIRE Marine system is composed of components which are combined to provide automatic fire detection and control.

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

Input Power

The CHECKFIRE Marine control unit will accept an external 12 to 24 VDC regulated power source as its primary power. The control module uses an internal long life Lithium battery to provide a secondary supply in the event the external 12/24 VDC primary power source is interrupted. The internal battery has the capacity to perform all of the detection and control functions in the absence of primary power. Under quiescent load (system operating in a non-alarm condition), the secondary supply has the capacity to operate the system for a period of up to one year, and at the end of that period is capable of operating the system in a full alarm condition for 72 hours.

Initiating Circuits

The control module contains two supervised detection initiating input circuits that are designed to be connected to contact closure type thermal detectors. The initiating circuits are identical, and detection wiring can be connected to either one or both circuits. An environmentally sealed End-of-Line module is used to terminate the detection circuit after the last detector in line. If only one detection circuit is used, the unused circuit can be terminated inside the enclosure with a 4.7 K ohm resistor that is provided with the module. The initiating circuits are designed to eliminate nuisance alarms associated with contact bounce in high vibration environments.

Description (Continued)

Audible Alarms

The control module is provided with an internal high pitch audible alarm that sounds whenever an alarm or trouble condition exists. Additionally, an alarm relay with a set of normally open/normally closed contacts is available for connection of an auxiliary high level alarm; and a trouble relay with a set of normally open contacts is available for remote trouble annunciation.

Auxiliary Control Relay

An auxiliary control relay with one set of 2 amp rated NO/NC contacts is provided for auxiliary shutdown and control functions. This relay will transfer upon an alarm condition and is non-silenceable.

Operator Interface Panel

Operator interface is provided by a front panel mylar overlay containing four visual status LEDs, a silence button, and a reset button. The status LEDs include:

- Green Power LED: Indicates a “power normal” condition when pulsing.
- Power Fault LED: Pulses when an “off normal” condition exists with either the external or internal power source.
- Red Alarm LED: Pulses when an alarm condition is present.
- Detection Fault LED: Pulses when an “off normal” condition exists in either initiating circuit.

The Silence and Reset buttons allow silencing of the audible alarms and reset of the control panel respectively. The internal audible alarm is always silenceable, while the audible alarm relay is field selectable for either silenceable or non-silenceable operation. Operation of the reset buttons will allow resetting of the control panel after alarm conditions have been cleared.

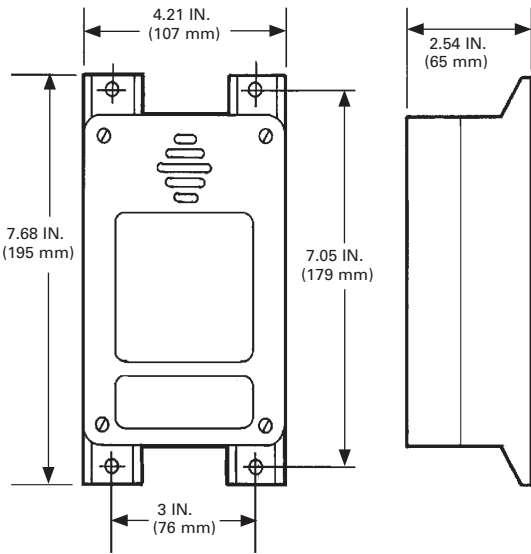
Construction

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 mounted into the cover and connected to the PC board. The PC board is encapsulated to provide added protection against moisture and dust. The PC board assembly contains a DIP switch for manual programming functions.

Mounting the Control Module

The CHECKFIRE Marine Control Module can be mounted to a flat, rigid surface using appropriate fasteners.



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When using the optional bracket, securely fasten the control module to bracket with the supplied mounting hardware.

Control Unit Field Connections

The internal battery is connected to the PC board via a single plug. The external power is connected to the field connection terminal strip located in the back box.

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

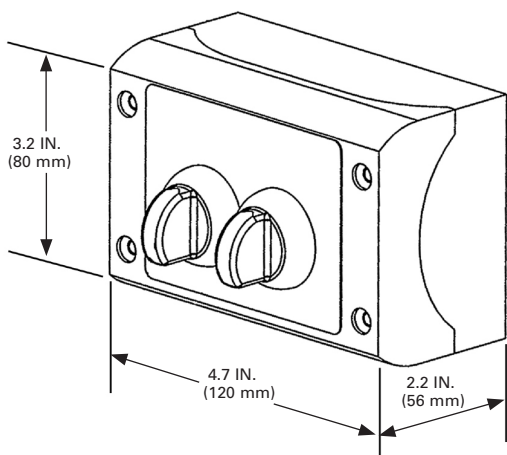
Position	Circuit Description
1	+ External 12/24 VDC Power
2	– External 12/24 VDC Power
3	+ Detection Input 1
4	– Detection Input 1
5	+ Detection Input 2
6	– Detection Input 2
7	Not Used
8	Not Used
9	Trouble Common
10	Trouble N.O.
11	Alarm N.O.
12	Alarm Common
13	Alarm N.C.
14	Auxiliary Relay N.O.
15	Auxiliary Relay Common
16	Auxiliary Relay N.C.

Control Unit Field Connections (Continued)

Detection Circuit Test Module

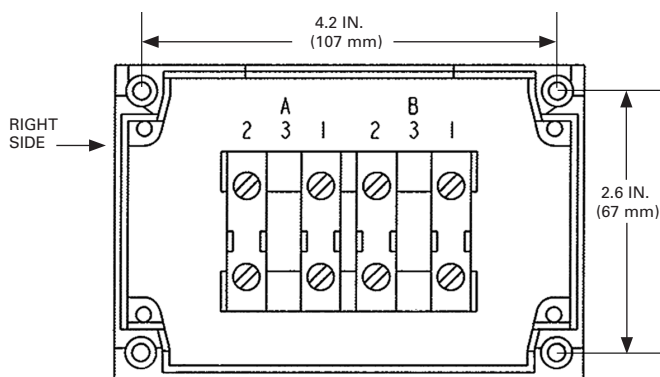
The Detection Circuit Test Module (Part No. 426519) meets the USCG requirements to provide a simple and convenient means at the control module to individually test each fire detecting circuit by simulating an alarm and trouble condition.

The test module is housed in a polycarbonate enclosure that conforms to IEC/EN 60947 with protection to IP66. The enclosure contains knockouts on four sides for field wiring. The module contains two three-position momentary contact selector switches for manually simulating a trouble and an alarm condition in each of the two detection circuits. One switch is designated "Alarm Test" 1 & 2, and the other switch is designated "Trouble Test" 1 & 2.



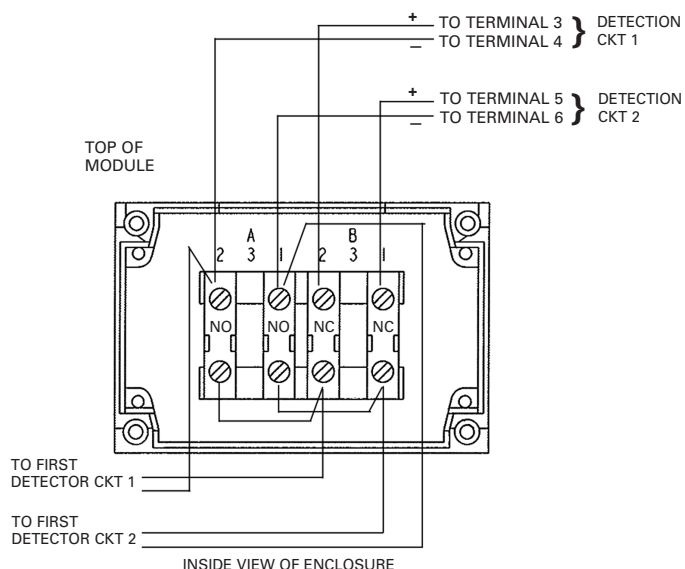
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The Detection Circuit Test Module uses four mounting holes for mounting to a suitable surface. The holes will accept up to a #8 machine screw with a maximum head diameter of 0.335.



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The detection circuit wiring from the control module is first routed and connected to the Detection Circuit Test Module where connections are made on the test switch contact blocks. Field wiring to detectors is continued from the switch contact blocks.



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Operational Environmental 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 a thermal detector, the following functions will be performed automatically:

1. The Alarm LED will flash, the internal sounder will pulse, the alarm relay will transfer resulting in remote alarm operation if connected, and the auxiliary control relay will transfer to operate auxiliary functions if connected.
2. If the silence button is operated during an alarm condition the internal sounder is silenced and, if programmed to do so, the auxiliary alarm relay is also silenced.
3. Operating the Reset button returns the control panel to a fire ready monitoring state providing all alarm and trouble conditions have cleared.

Approvals

U.S. Coast Guard No. 161.002/40/1

Ordering Information

Part No.	Shipping Assembly
426518	CHECKFIRE Marine Electric Detection and Control System
426520	End-of-Line Module
426461	End-of-Line Module - Pack of 10
426519	Detection Circuit Test Module
426521	Operation and Maintenance Manual
4727	140 °F (60 °C) Thermal Detector
404751	160 °F (71 °C) Thermal Detector
13970	190 °F (88 °C) Thermal Detector
13976	225 °F (107 °C) Thermal Detector
14286	Heat Trap
417805	6 in. Alarm Bell, 24 VDC
417806	10 in. Alarm Bell, 24 VDC
24747	WBB Surface Mount Back Box, Weatherproof
432962	Manual Fire Station, Weatherproof Model NBG - 12LOB
79559	Remote High Level Alarm
427308	Battery, 3.6 VDC
423528	Mounting Bracket
426601	Extender Cable Assembly
428042	Battery Extender Cable Assembly
426530	Control Module Assembly
423512	Enclosure (Back Box)
426534	Cover Assembly
419783	Battery Connection (fused at 5 amps)

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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