

# **FIREBOY - XINTEX**

## **M-2A GASOLINE FUME DETECTOR**

### *Installation and Operation Manual*

MADE IN U.S.A.

- Solid State Sensors
- Dual Sensor Capability
- Microcomputer Operation
- Quick Disconnect Sensors
- Self Testing Circuitry



**READ THIS MANUAL CAREFULLY AND SAVE FOR FUTURE REFERENCE. KEEP THIS MANUAL WITH THE M-2A.**

### **Introduction**

The M-2A vapor monitoring system utilizes advanced technology for detection of engine compartment gasoline fuel vapors as well as hydrogen vapors caused by overcharged batteries. The M-2A allows connection of two (2) sensors and has both visual and audible alarms. Test switches are provided for full checking of all operations after complete installation. System operation and correct sensor operation are continually monitored and indicators are provided for fault detection. The M-2A allows for connection to a remote alarm. Read this owners manual completely before installation (see wiring diagram figure 6). Failure to read and follow these instructions can result in damage to the unit voiding the warranty.

### **Components This Kit Includes**

- One M-2A Module w/Bezel
- One 20' MS-2 Gasoline Sensor
- Four screws for the module
- Two screws for the sensor

**CAUTION:** NO POWER ON/OFF SWITCH IS PROVIDED FOR THIS UNIT. TO FUNCTION AS INTENDED, THE M-2A MUST BE CONNECTED TO A CORRECT POWER SOURCE, AND FOR MAXIMUM EFFECTIVENESS, BE POWERED AT ALL TIMES WHILE ABOARD. IF POWER IS ON AND LEFT UNATTENDED FOR EXTENDED PERIOD OF TIME BATTERY POWER MAY BE DIMINISHED.

---

## Tools Required and Hardware

- Screw Drivers (Slotted & Phillips)
- Electrical Connector Crimping Tool With Wire Stripper
- Power Drill
- Electrical Tape
- Drill – 3/4" (19.05mm) Diameter
- Drill – 1/8" (3-17mm) Diameter
- 2 In-line Fuse Holder - Moisture Resistant
- Hole Saw 2 1/8" diameter
- One 1 Ampere Fuse
- Wire Nuts (for #20 and #16 Gauge Wire)
- A Length of #16 Gauge Wire
- A Length of #20 Gauge Wire
- Tape Measure and Pencil

## Manual Display Controls / Indicator

- A - Sensor #1 Indicator
- B - Sensor #2 Indicator
- C - Unit Fault Indicator
- D - Sensor #1 Test Switch
- E - Sensor #2 Test Switch
- F - Horn Mute Switch
- G - Audible Horn (Internal)

## Indicator Definitions

- Sensor #1/#2
- Green = Sensor active, no fumes detected
  - Amber = Sensor failure or sensor not connected
  - Red = Fumes detected, alarm condition
  - Fl. Grn = Sensor warm up period
  - Off = No sensor detected on power-up

- Unit Fault
- Off = Unit functional
  - Amber = Fault Detected, horn beeping

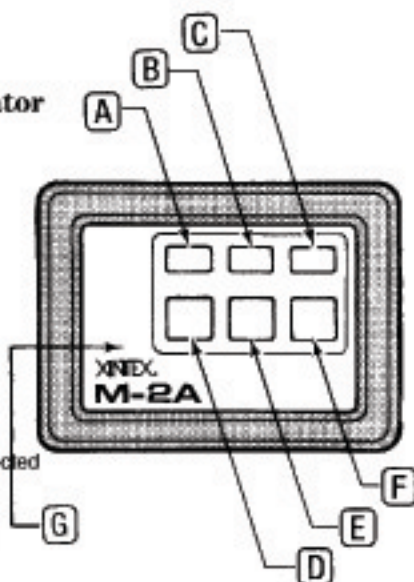


Figure 1

## Module Display Installation

The M-2A should be mounted in a convenient location at the helm station where the visual indicators may readily be seen. To install the display module you must first remove the snap-on bezel. This is accomplished by inserting a small, flat blade, screw driver into the slot located on either side of the bezel (see figure 4) and carefully prying up until the bezel snaps free. Install the control module using the module for a hole template locating and marking the screw hole locations.

**CAUTION:** Do not attempt to remove the four (4) screws which are now exposed which attach the printed circuit panel to the frame. Doing so will void all warranties.

Next, drill a 2 1/8" diameter hole into the panel. Slip the instrument through the hole and secure, making sure that you have access to the terminals for positive and negative terminal connections and sensor(s) connections.

Quick Disconnect Style Sensor with 20' sensor cable is included. The disconnect/connector plug is located 12" from the red sensor. In the event you need to replace the red sensor, simply disconnect it at the plug and remove. When reattaching the sensor, make sure the connector "snaps" into place by pushing the side locks in. This insures a watertight seal. No need to reroute or replace the 20' sensor cable. NOTE: If longer sensor length is necessary, contact your retailer or our factory for lengths 25' through 100'.

## Sensor Location

**CAUTION:** GASOLINE FUMES ARE HEAVIER THAN AIR AND WILL ACCUMULATE AT THE LOWEST POSSIBLE LEVEL. THEREFORE, SENSOR LOCATION IS VERY IMPORTANT.

Choose a location that will afford the most protection from direct contact with gasoline. Locate the sensor above the normal bilge compartment slish height as determined by the boat manufacturer (on inboard or inboard/outdrive installations this is generally accepted as height where the engine starter solenoid is located). Do not mount the sensor in the near vicinity or directly above the batteries. Batteries produce hydrogen gas which may lead to nuisance alarms. Choose a sensor location that will afford the easiest cable run yet provide the earliest possible warning.

## Sensor Installation

The sensor supplied with the M-2A includes a standard 20 foot (18.29m) cable. If a longer cable is desired contact your dealer or Fireboy/Xintex. Coil excessive cable in a convenient location. Remove the paper covering the adhesive backing on the sensor mounting surface and press the sensor into position on a previously cleaned surface. Install with two (2) screws provided.

**CAUTION:** Do not attempt to use any other manufacturers sensor or previously installed sensors. It is necessary to purchase sensor #2, which is designed specifically for this unit, from Fireboy/Xintex.

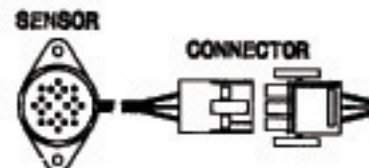


Figure 2

## Remote Horn Wiring

The M-2A may also be used to trigger a remote alarm indicator such as the Xintex RH-1. (See Options). This output is shorted to the battery ground when an alarm condition is detected. DO NOT exceed the maximum rating for this output (see specifications).



Figure 3

## Wiring The M-2A

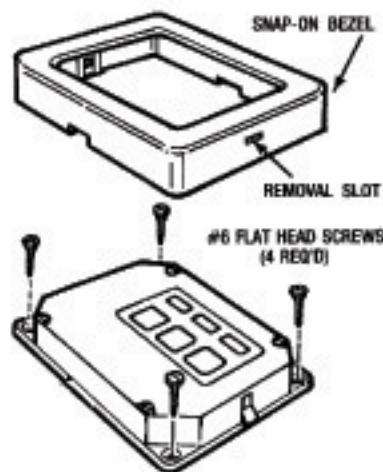
(See Wiring Diagram Figure 5)

Connect wire to battery 12VDC battery positive (+) through a one (1) ampere in-line fuse (not supplied). Connect 12VDC battery negative (-).

## Sensor Connection

Plug sensor #1 provided with the M-2A into the connector on the back side of display. If installing the optional second sensor, plug sensor #2 into the other connector. See wiring diagram figure 5.

Figure 4



## Overall Wiring Diagram

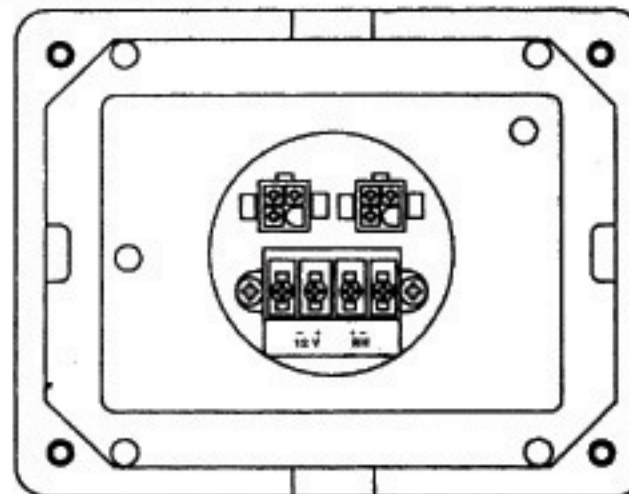


Figure 5 Terminal Strip Connections

- |   |                  |   |                       |
|---|------------------|---|-----------------------|
| - | = Module Ground  | + | = +12 VDC Remote Horn |
| + | = Module +12 VDC | - | = Remote Horn Ground  |

## Operation

Upon powering up the unit, the M-2A goes through an audio/visual cycle of all indicators and the audible horn. Beginning with sensor #1, the indicators will cycle green, amber, red. This will then continue with sensor #2. The unit fault indicator will then illuminate, and then the horn will beep. If the unit does not cycle as described, or the horn does not beep, remove the unit from service and return to Fireboy/Xintex for repair or replacement.

The sensor lights may flash green during the warm-up period. This flashing will occur only if a sensor is connected, if a sensor is not connected the indicator will be amber. Warm-up time will vary depending upon usage of the unit. Long periods of inactivity will require long warm-up periods. After the warm-up period, the indicator will change to green. If a sensor is not installed the sensor indicator will turn off.

Should either of the sensors detect gasoline fumes or high levels of hydrogen, the corresponding indicator will change to red and the audible horn will sound. The indicator will remain red as long as fumes are detected. The horn may be muted by pressing the MUTE switch. Do NOT consider the area clear until the indicator light returns to green.

## Testing Display Mode

Internal operation of the display mode may be tested using the corresponding TEST switch. Pressing the test buttons will simulate the above alarm conditions.

## Sensor Fault Detection

Should the unit determine that either of the sensors is faulty or disconnected, the corresponding indicator will change to amber and the horn will sound. Check that the sensor is connected and that wiring has not been frayed or cut. Should this condition persist, the sensor has been damaged and must be replaced.

## Unit Fault Detection

Should an internal failure occur, the unit fault light will display amber and the horn will sound. Should this occur, return the display module to the manufacturer for repair.

## Nuisance Alarms

The sensor used for the M-2A is sensitive to hydrocarbons. An alarm may be triggered by the use of other chemicals such as cleaners, paint, polish, etc. The sensors will also detect hydrogen fumes from an overcharged battery. If no gasoline fumes are present, check for recent use of cleaners, fiberglass repairs, strong adhesives, etc. If none of these are present, the sensor may have been damaged and will need replacement.

### WARNING:

The M-2A has been designed to alarm nominally at 20% of the LEL (Lower Explosive Limit) of gasoline. Implement immediately the following procedures in the event of an alarm. Shut down all operating engines, including generators. Turn off all electrical circuits EXCEPT circuits which operate the blowers. Remove all passengers from the interior of the boat. If an explosion or fire should occur, the probability of an injury will be reduced. Check for any signs of smoke or fire, check that compartments are cool to the touch. If there is no sign of fire, make a visual inspection of the compartment. If there is no fire, turn on the blowers and leave the compartment door open. Carefully check all fuel lines, tanks, and fittings to locate the leak. Have the problem repaired by qualified personnel.

## Maintenance

The M-2A requires very little maintenance. Periodically examine the sensors for contamination or damage. Check that sensor wires are not frayed, pinched, or cut. Test the operation of both sensors and display module frequently. While the sensors are resistant to liquids, do not expose to direct spray or submersion. When cleaning the bilge with water or chemicals, seal off the sensor(s) with a plastic covering. Harsh chemicals may damage the sensor. Keep sensor(s) sealed until compartment has been completely ventilated.

**CAUTION:** DO NOT FORGET TO REMOVE SENSOR COVERINGS OR THE M-2A WILL NOT OPERATE CORRECTLY.

## Specifications

Voltage .....	+12VDC Nominal
Current .....	.150 mA with one sensor
.....	.280 mA with two sensors
.....	.300 mA maximum
Alarm .....	.20% Lower Explosive Limit (LEL)
Horn .....	.75 dB @ 10cm 3kHz frequency
Remote Horn (alarm mode) .....	.300 mA

## Options

MS-2 .....	Gasoline Sensor
RH1* .....	Loud Auxiliary Horn
CNV12-1 .....	12V Converter for 24/32 volt systems

\*The RH-1 is recommended for areas with excessive background noise (engines, generators, etc.) and/or for persons with hearing impairments.

All Options are available from Fireboy/Xintex. Contact the Customer Service Department at (616) 735-8380. Visa, Mastercard, or C.O.D. accepted.

Plug in your sensor to connector one and make positive and negative connecting for the module display. Finish the module installation by fastening to panel with four screws (provided) and snapping bezel back into place.

### WARNING

The M-2A is a gasoline fume detector ONLY. This device is meant to serve as a supplemental warning only. It is NOT intended to replace standard safety practices which should be carried out around explosive gases (i.e. inspect engine compartment, check for loose fuel fittings, smell for gasoline fumes, etc.). To function properly the M-2A must be powered at all times while aboard. Do not install this unit in a location which is out-of-doors. Before installing in applications which may appear different than those outlined in this manual, contact Fireboy/Xintex (616-454-8337). This device is not intended for use in aircraft.

There are no user or field serviceable parts in this product. The M-2A must be returned to the manufacturer for any repair or trouble shooting beyond what is recommended in this manual. Installation shall be done by qualified personnel authorized to do so by the authorities having jurisdiction for the particular application in which the product is being used. Electrical wiring shall be in accordance with applicable codes. Improper wiring, including all wire connections, may render the unit inoperable, damage components, or cause a fire, and will void all warranties.

## More Safety Products from FIREBOY-XINTEX Inc.

- Clean Agent Automatic Fire Extinguishers
- Clean Agent Manual / Automatic Fire Extinguishers
- M-1 / M-2A Gasoline Fume Detectors
- MB-1 / MB-2 Gasoline Fume Detectors with Blower Control
- S-1 Propane Fume Detector
- S-2A Two channel Propane / LPG Detector with Solenoid Control

## One (1) Year Limited Warranty

**This Warranty is in lieu of all other express or implied Warranties.**

Seller warrants title, materials, and workmanship on Fireboy equipment, and assigns the original manufacturer's warranty on those components manufactured by others, as permitted. Seller's warranty shall be for a period of (1) one year from the date of sale to the ORIGINAL CONSUMER. Fireboy-Xintex Inc. does not assume the costs of removal and/or installation of the product or any other incidental costs which may arise as a result of any defect in materials or workmanship. Any non-conforming equipment returned to the Seller at Buyer's expense and risk shall be repaired or replaced at Seller's option, provided that: (a) the product has not been subjected to abuse, contamination, neglect, accident, incorrect wiring not our own, improper installation or servicing, or used in violation of the instructions furnished by Fireboy/Xintex Inc.; (b) the product has not been repaired or altered by anyone other than Fireboy/Xintex Inc.; (c) the serial number has not been removed, defaced or otherwise changed; (d) the product is determined to contain defective materials or workmanship; and (e) use of the product is discontinued upon discovery of defective materials or workmanship and Fireboy/Xintex Inc. is notified immediately.

ANY WARRANTY IMPLIED BY LAW, INCLUDING WARRANTIES OF MERCHANTABILITY OR FITNESS, IS IN EFFECT ONLY FOR THE DURATION OF THE EXPRESS WARRANTIES, OR TO ASSUME FOR FIREBOY/XINTEX INC. ANY OTHER LIABILITY IN CONNECTION WITH THE SALE OF ITS PRODUCTS. FIREBOY/XINTEX INC. SHALL NOT BE LIABLE FOR LOSS OF USE, REVENUE, PROFIT, INJURY, OR ANY OTHER CONSEQUENTIAL OR INCIDENTAL DAMAGES. BUYER IS NOT RELYING ON SELLER'S JUDGEMENT REGARDING BUYER'S PARTICULAR REQUIREMENTS, AND HAS HAD AN OPPORTUNITY TO INSPECT THE PRODUCT TO BUYER'S SATISFACTION.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

FIREBOY-XINTEX, Inc.

Mailing address: PO Box 152, Grand Rapids, MI USA 49501-0152

Shipping Address: 0-379 Lake Michigan Drive NW, Grand Rapids, MI USA 49544

Phone (616) 735-9380 FAX (616) 735-9381

Website: [www.fireboy-xintex.com](http://www.fireboy-xintex.com)

E-mail: [fireboy@fireboy-xintex.com](mailto:fireboy@fireboy-xintex.com)