



FailSafe®

MSE of Canada Ltd.

## INSULATION MONITOR FOR 24V. D.C. UNGROUNDED CONTROL SYSTEMS FailSafe™ TYPE MG600 MODEL CVM-DC

The FailSafe Type MG 600 Model CVM-DC Insulation Monitors are intended for use in ships or industry and meet Lloyds Type Certification, MIL Specification M-24678, UL Listing and CSA Certification requirements. The range of insulation resistance covered -1 Megohm to 0.25 Megohms - was chosen to meet the needs of the marine environment, which is more severe than industrial environments. The monitors provide a visual alarm indication, with contacts for external alarm and other functions and are intended for use to monitor ungrounded, 24 volts DC control systems.

### FEATURES:

- ◆ Easy Installation
- ◆ Small footprint DIN Rail mounting
- ◆ Completely automatic in operation
- ◆ Gives early warning of insulation problems
- ◆ Automatic alarm reset simplifies control system trouble-shooting
- ◆ High phase to ground impedance
- ◆ Solid state circuitry
- ◆ Integral self-test capability
- ◆ LED alarm indicator
- ◆ Contacts provided for local alarm and PLC connection



### APPLICATION:

On ungrounded control systems ground faults can short out control elements, often with catastrophic results. This defect can be eliminated entirely and system operation can be assured at all times simply by installing a FailSafe Insulation Monitor Model CVM-DC to supervise the integrity of the system insulation and operating the control system ungrounded. The FailSafe Model CVM-DC Monitor detects and alarms for insulation defects at pre-selected levels on energized, ungrounded 24 volt DC control systems and its automatic alarm reset feature greatly simplifies the task of locating deteriorated insulation.

The Model CVM-DC device monitors insulation resistance in the megohm range and so is effective in detecting potential grounds on the control system before they occur. With its local and remote indication capability, it gives early warning of insulation deterioration - and raises the alarm immediately, if a ground fault occurs, allowing the operator to clear the fault before a second fault can occur and shut down the system. The decay of insulation resistance may be observed by switching through the three available alarm levels to progressively lower alarm levels as the insulation deteriorates and noting the time intervals, to estimate the time remaining until the lowest level is reached.

The ability to give early warning of an impending ground fault on energized DC control systems is unique to FailSafe Insulation Monitors Model CVM-DC.

## ORDERING INFORMATION

Installation Kit IK-CVM-DC includes the bracket DIN-MGM, the flashing alarm light FAL-24, a Test Resistor and hook-up wire, wire connectors, Ty-wraps and mounting screws sufficient to install the unit, Explanatory and Warning labels.

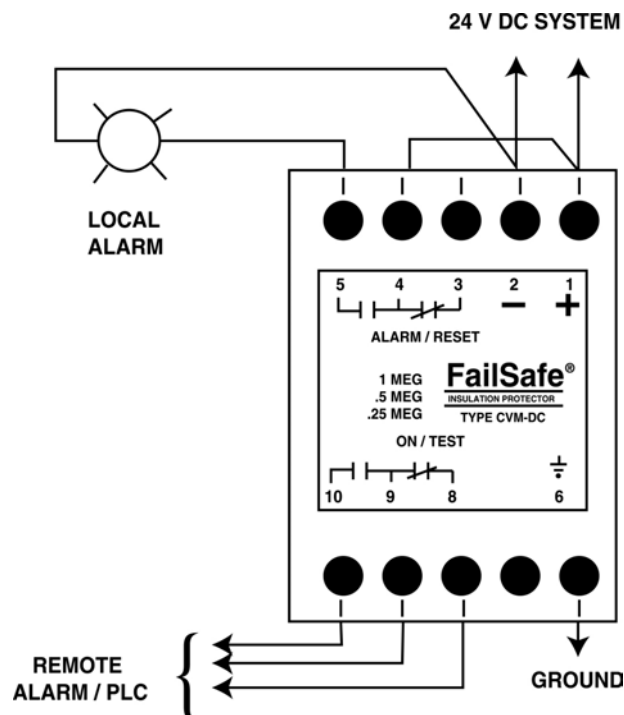
## SPECIFICATIONS

Model CVM-DC-24

Max Line Voltage	24V DC
Supply Voltage	Derived from line voltage
Power Requirements	3 WA.
Factory Set point*	1, 0.5 & 0.25 Megohms
Contact Rating	5 A., 250 V. AC resistive
Dimensions (mm) WxHxL (in)	45 x 68 x 112 1.77 x 2.67 x 4.4
Weight (kg)/(oz)	0.27/9.5

- \* For other set points, consult factory.
- Maximum short circuit current 24 microamps.
- Operating temperature  $-20^{\circ}\text{C}$  to  $+50^{\circ}\text{C}$ ; storage temperature  $-40^{\circ}\text{C}$  to  $+100^{\circ}\text{C}$ .
- Environment; maximum 95% relative humidity, non-condensing.
- UL and CSA Approved, meets Lloyds and US Coast Guard requirements.

## CONNECTION DIAGRAM - FAILSAFE MODEL CVM



# FailSafe MONITOR TYPE CVM-DC; INSTALLATION INSTRUCTIONS

## IMPORTANT: READ THE INSTRUCTIONS BEFORE INSTALLING THE MONITOR

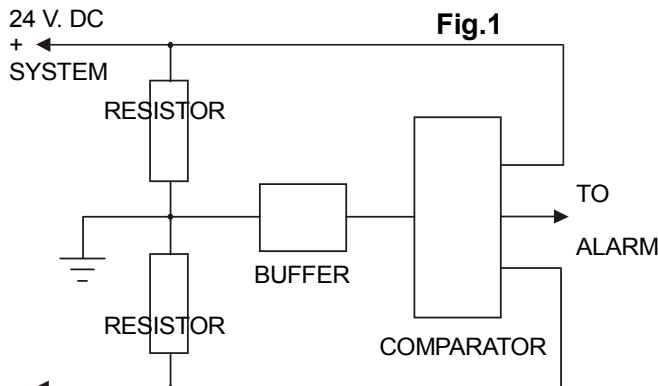
### FailSafe TYPE CVM-DC INSULATION MONITOR FOR UNGROUNDED 24-VOLT CONTROL SYSTEMS.

The FailSafe unit continuously monitors the leakage resistance of the control system and operates its alarm relay when the value falls below the set point. The unit includes a visual alarm indicator and provides changeover contacts for external alarm indication.

### OPERATION

Two high resistance precision resistors are connected in series across the 24V DC system and the junction is grounded, to establish a ground reference (see Fig. 1). A comparator is connected to monitor the voltage to ground of each side of the system. When a fault occurs the voltages change, the comparator senses these changes and activates the alarm if the insulation resistance is less than the reference level. When the fault is removed the device resets automatically (or manually if set so).

### Note:



1. If any other device, which introduces a DC voltage between line and ground, is installed on the system, the monitor alarm accuracy will be affected.
2. If the system is to be meggered, disconnect power to the monitor to obtain a correct reading.

### INSTALLATION INSTRUCTIONS

To instal the monitor in the control panel:

1. Disconnect power from the panel.
2. Install the mounting bracket with the self-tapping screws provided (use the correct size drill bit). Clip the device securely to the bracket. If it is required, install the long life flashing alarm light on the panel door close to the hinges and affix the warning label around the lamp.

### WIRING INSTRUCTIONS

**CAUTION: OBSERVE SAFETY PRECAUTIONS - DO NOT WORK ON LIVE CIRCUITS!**

1. Disconnect power from the panel.
2. Connect terminal 1 to the positive line, terminal 2 to the negative line and terminal 6 to ground (see Fig. 2 below).
3. If a local alarm light is required, connect the supplied flashing alarm light to terminals 2 and 5 and connect terminal 4 to 1.
4. Alternatively, an audible alarm of the correct voltage may be connected to terminals 2 and 5.
5. Reconnect power to the panel.

### TESTING

1. Verify that the FailSafe monitor is not in alarm.
2. Ground one side (+) of the control supply temporarily. After 10 seconds the red LED should light and the local alarm light should light.
3. Remove the temporary ground. The red LED and the local alarm light should go out (automatic reset).
4. Repeat the test procedure for the other side (-). If both sides produce the same result, the installation is correct.

### Note:

If an alarm results during operation of the control system, the segment of the system causing the alarm should be investigated for a ground fault.

### Connection Diagram FailSafe Model CVM-DC

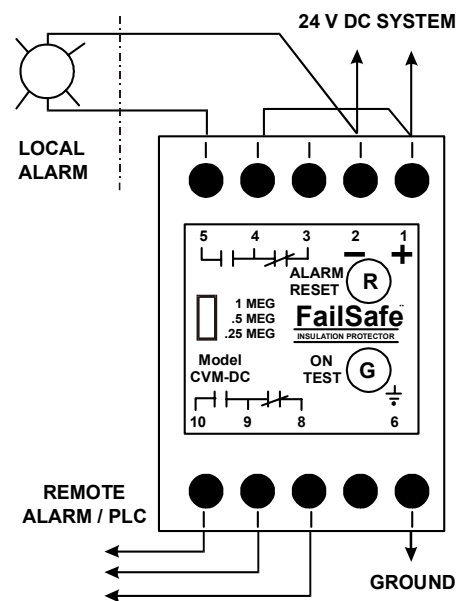


Fig.2