



MotoSafe®

MSE of Canada Ltd.

LIGHTING CIRCUIT INSULATION MONITOR MotoSafe™ TYPE ALC

Type ALC Lighting Circuit Insulation Monitors are designed to monitor single phase high voltage AC ungrounded installations for deterioration during the hours the circuits are not in use. They are entirely automatic in operation and meet all applicable specifications.

FEATURES:

- ◆ Easy Installation
- ◆ Working voltage 4.5kV AC
- ◆ Dielectric strength – 22.5 kV AC)
- ◆ Lighting circuit terminal withstands test voltage to 5 kV DC
- ◆ Low test voltage for personnel safety
- ◆ Completely automatic in operation
- ◆ Solid state circuitry
- ◆ High/Low alarm selection
- ◆ Local LED / remote alarm indication
- ◆ Local and Remote test / reset capability
- ◆ Small footprint DIN rail mounting



APPLICATION:

MotoSafe Insulation Monitors are designed to provide safe monitoring of electrical insulation integrity. Lighting circuits, cables, junction boxes and lighting enclosures, are subject to failures from environmental conditions and MotoSafe Type ALC Insulation Monitors are designed to supervise these circuits to give early warning of the insulation deterioration which precedes failure. This allows preventative maintenance scheduling and eliminates unpredictable downtimes and catastrophic failures.

Type ALC Lighting Circuit Monitor comprises a Model ALC-M Monitor Unit and an ALC-IU Interface Unit.

The Model ALC-M monitor unit may be installed in the regulator instrument compartment (the low voltage compartment), but the ALC-IU interface unit should be installed in the high voltage compartment.

The device incorporates a circuitry for discharging a residual voltage that may remain on the monitored equipment before it attempts to measure the insulation resistance. This feature elevates safety of maintained equipment and eliminates false alarms.

The Lighting Circuit terminal withstands test voltages to 5 kV DC. Should the circuit be tested with higher voltage, the ALC-IU unit must be disconnected from the tested circuit prior to applying the high test voltage. Failure to do so may damage the monitor.

All models are available for either 120 or 220V AC or 24V DC control power.

ORDERING INFORMATION

- Refer to the Specifications and include the required control voltage.
- Installation Kit includes: Explanatory and Warning labels, mounting brackets, the flashing alarm light, a Test Resistor, hook-up wire, wire connectors, ty-wraps and mounting screws sufficient to install the unit.

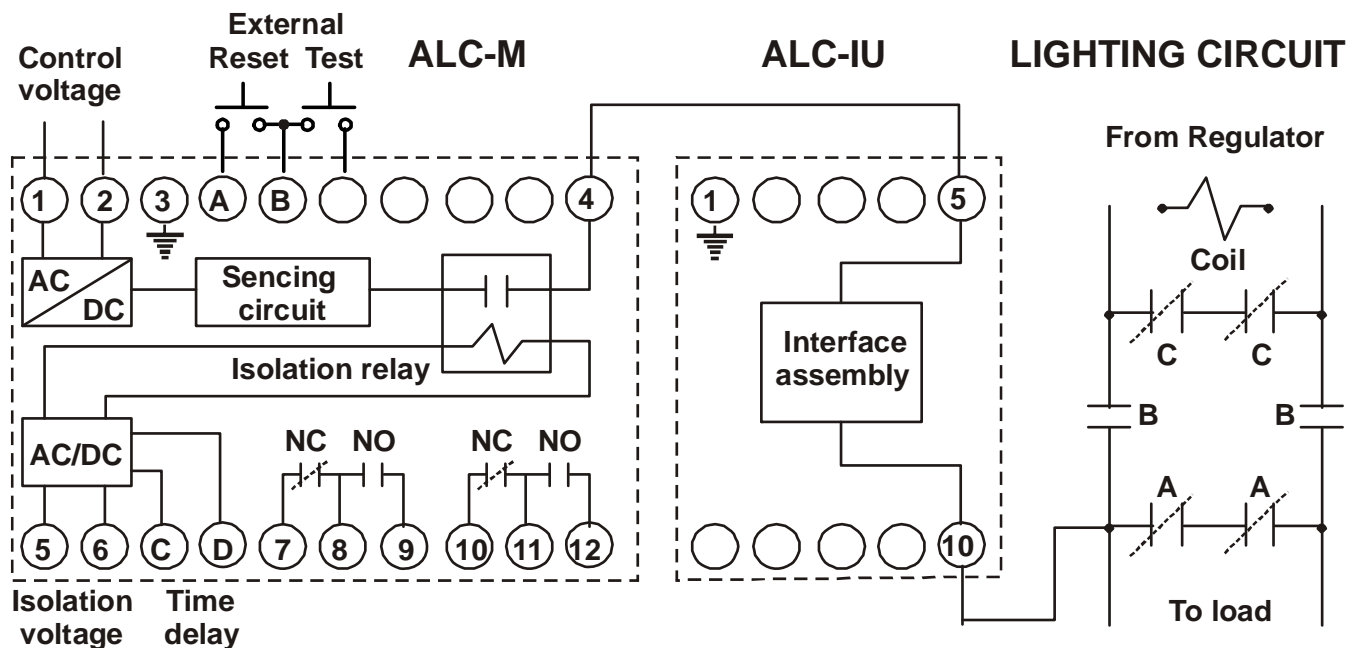
SPECIFICATIONS

MotoSafe Type ALC Lighting Circuit Insulation Monitors

Model	ALC-M	ALC-IU
Parameter		
Max. AC volts	n/a	4.5 kV
Control Voltage	120 or 220, $\pm 20\%$ 50/60 Hz / 24V DC	n/a
Control Power	3 va	n/a
Isolation voltage	24 - 300 AC/DC	n/a
Factory Setpoints*	High 1M Ω / Low 0.5 M Ω	n/a
Contact Rating	5 a., 250v. AC resistive	n/a
Isolation Time	0.5 ms.	n/a
Dimensions (mm) WxHxL (in)	103 x 68 x 112 4.05 x 2.67 x 4.4	55 x 68 x 112 1.77 x 2.67 x 4.4
Weight (kg) / (oz)	0.42 / 14.8	0.15 / 5.3

- * Custom setpoints available - contact factory.
- All units suitable for DIN Rail mounting.
- Maximum short circuit current is 1 microampere.
- Operating temperature: -20°C to +50°C; storage temperature -40°C to +100°C.
- Environment: maximum 95% relative humidity, non-condensing.
- UL listed and CSA approved.

CONNECTION DIAGRAM - TYPE ALC LIGHTING CIRCUIT MONITOR



MotoSafe MONITOR TYPE ALC: INSTALLATION INSTRUCTION

IMPORTANT: READ THE INSTRUCTION BEFORE INSTALLING THE MONITOR

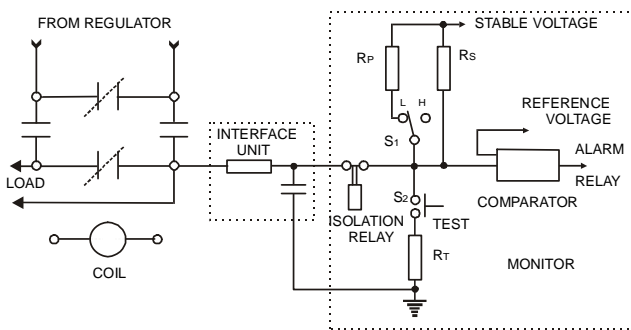
MotoSafe INSULATION MONITOR for SINGLE PHASE CIRCUITS up to 4.5kV, TYPE ALC

The MotoSafe device continuously monitors the insulation resistance of idle circuits and operates an alarm relay when the insulation fails below a set value. This value may be 1 Megohm ("High" setting) or 0.5 Megohm ("Low" setting). If the customer has specified other values, the device will be so marked.

OPERATION

When the monitored circuit is off, the isolation relay contacts are closed, as shown (see Fig. 1 and 2).

Fig. 1



This connects the monitored circuit (through the Interface Unit) to a stable voltage source through the series resistor R_s . The series resistor and the monitored circuit leakage resistance R_L form a voltage divider with a comparator connected to R_s/R_L junction. The voltage seen by the comparator is therefore a function of the leakage resistance R_L . When this resistance falls below the set value, the comparator voltage falls below the reference voltage and the alarm relay is activated.

The slide switch S_1 changes the value of standard resistance in order to change the alarm set point. The push-button S_2 connects the resistor R_1 between the sense line and ground, simulating a low insulation resistance to activate the alarm.

When the monitored circuit is energized, the isolating relay contacts open and the device is disconnected.

INSTALLATION INSTRUCTIONS

To install the MotoSafe device in the low voltage (instrumentation) compartment of the starter enclosure:

1. Disconnect power from the regulator.
2. Fasten the mounting bracket in place, with the screws supplied. Clip the device securely to the bracket. If required (and regulation permit), install the long-life local alarm lamp (supplied) on the starter enclosure front panel; affix the self-adhesive warning label around the lamp.

WIRING INSTRUCTIONS

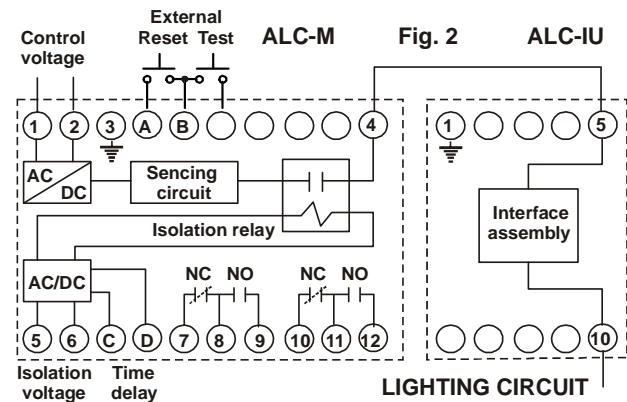
CAUTION: OBSERVE SAFETY PRECAUTION – DO NOT WORK ON LIVE CIRCUITS!

1. Disconnect the supply and control voltages.
2. Connect terminals 1 & 2 of the MotoSafe device to the incoming control voltage (see Fig. 2).
3. Connect terminals 5 & 6 across the breaker coil, auxiliary relay coil or running lights.
4. Connect the Monitor's terminal 3 and the Interface Unit terminal 1 to the ground.
5. Connect the Monitor's terminal 4 to terminal 5 marked "ALC-M" on the Interface Unit.
6. Connect the high voltage lead of the Interface Unit to one side of the lighting circuit.
7. If a local alarm light required, connect terminal 2 to 11 and lamp between 1 and 12.
8. Reconnect the supply and control voltages.

Terminals A & B may be used for an external, NO switch to reset the unit and term B and next to it on the right may be used to test the unit. Terminals C & D are time delay terminals. Bridged, the unit senses the circuit within 1 minute it is deenergized. Unbridged, sensing begins after 7 minutes delay.

TESTING

1. With the lighting circuits de-energized, ground one side momentarily via the supplied test resistor. The red LED should light and the external alarm activated after a delay of 10 seconds. Reset the monitor with the rest button.
2. Energize the lighting circuit. The alarm devices should not operate.



Note: The green light indicates "Power on" and the red light is an alarm indicator. Should the alarm indicator light active but the external alarm device not, recheck connections. If connections are correct, test terminals 10-11 and 11-12 with low-range ohmmeter. If the results are correct, replace the unit.

When installed as described the MotoSafe type ALC devices will withstand 5kV DC Megger™ test voltage. For higher test voltages disconnect the Interface unit from the tested circuitry prior to testing.

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