



# ICM491

## Single Phase Line Monitor

Reliable line voltage protection for single phase systems



**Protects against High/Low voltage and rapid system recycling, 95-270 VAC operation, adjustable anti-short cycle timer...**

### DESCRIPTION

The ICM491 was specifically designed to guard equipment against damage caused by under/over voltage conditions and/or rapid system recycling.

### FEATURES

- **5-Second Interrogation Delay...** helps prevent nuisance tripping
- **LED Indication...** normal run and fault indications
- **95-270 VAC Operation...** in a single model
- **Integral Anti-Short Cycle Protection...** "Delay on break" circuit provides adjustable (.1 to 10 minutes) lockout delay to prevent rapid system recycling; no external ASC timers required
- **Meets IEEE 587...** A&B for transient protection

### SPECIFICATIONS

#### Input

- **Line Voltage:** 95-135 VAC or 190-270 VAC (selectable)
- **Maximum Operating Input:** 142-275 VAC
- **Line Frequency:** 50-60 Hz

#### Output

- **Type:** Relay, energized upon acceptable conditions
- **Form:** SPDT, Single Pole, Double Throw
- **Ratings:** 6A @ 120 VAC resistive  
5A @ 240 VAC resistive

#### Response Times

- **Line Dropout:** .05 seconds (typical)
- **Line Voltage Sag:** 5 seconds (typical)
- **Turn On (sec):** Based on minimum time selected

#### Lockout Delay Timer

- **Dry Relay Contacts**
- **Time Delay:** Adjusts from 6-600 seconds (+/- 10%)

#### Under Voltage Protection

- **Voltage Dropout:** Setpoint is -12%
- **Voltage Pickup:** Setpoint is -8%

#### Over Voltage Protection

- **Voltage Dropout:** Setpoint +12%
- **Voltage Pickup:** Setpoint +8%

#### Environmental

- **Operating Temperature:** -40°F to +167°F (-40°C to +75°C)
- **Transient Protection:** Meets IEEE 587 Standards for Categories A&B without false output or degradation
  - (6Kv 0.5  $\mu$ s x 100 KHz Ring Wave)
  - (6Kv 1.2 x 50  $\mu$ s Impulse Wave)

#### Mechanical

- **Mounting:** Surface mount using (2) #8 screws
- **Terminations:** .25" male quick-connect terminals

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## MODE OF OPERATION

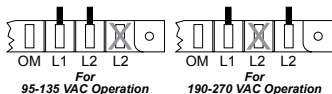
Upon application of power to the monitor, and provided all voltages and line conditions are acceptable, the green load energized LED indicator will glow. This is an indication that the output contacts have successfully transferred.

Should a High/Low voltage condition exist for longer than the 5 second interrogation delay or a loss of power for more than 50 mS, the relay and green LED shall be de-energized. The red status LED will rapidly flash. Re-energization is automatic upon correction of the fault condition, after the anti-short cycle time delay is complete. Should a fault condition exist upon application of power, the relay will not energize and the red status LED will flash rapidly, indicating power is outside specifications. A blinking LED indicates power is good, but unit is still in ASC lockout.

**Adjustment:** Select the desired operating voltage. If status LED blinks once per second, voltage is within specification and unit is awaiting the end of the ASC delay. If the red status LED rapidly flashes red, adjusting input voltage knob higher or lower should cause a slow blink to result, but ensure input voltage is not beyond motor operating specification. Once input voltage is properly set, adjust "ASC Time Delay" knob to desired ASC delay.

## INSTALLATION

1. Determine operating voltage, 95-135 VAC or 190-270 VAC.
2. Disconnect power.
3. Connect the ICM491's power connections (L1 & L2) to power supply lines L1 & L2 (or N). Ensure there is only one "L2" terminal connected at any time:



4. Find a convenient location in control circuit where the ICM491's on-board relay contacts can make or break the control circuit. The "COM" terminal connects to the "NO" contact when power is within specification, "COM" connects to "NC" when power is outside specification.
- 5a. With control power off, cut control circuit and terminate control wires with 1/4" female spade connections. Connect one terminated line to "COM" terminal, the other terminated line to "NO" terminal.
- 5b. For new installations, where the control circuit voltage is the same as the voltage being monitored, it may be easier to connect "COM" terminal to "L1" terminal with a jumper wire as shown in ladder diagram. Then, connect control circuit to terminal "NO."
6. Set the "input voltage" knob to the actual line voltage, or to the motor's nameplate voltage.
7. Turn the "ASC Time Delay" knob to its minimum position (counter-clockwise).

8. Apply power. Observe "Load Energized" and "Status" LEDs. If incoming power is within specification, unit will energize load in 6 seconds. The following is a table showing what LED indicators correspond to:

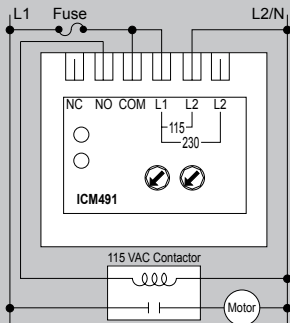
LED	STATE	INDICATION
Load Energized	Off	Internal relay is de-energized
Load Energized	On	Internal relay is energized
Status	Off	Voltage is within range
Status	Blink	Voltage is good, unit is in ASC
Status	Rapid Flash	Voltage is out of range

**Note:** Both LEDs off indicates no power to unit.

9. Set the "ASC Time Delay" to the desired anti-short cycle lockout time.

## WIRING DIAGRAM

### Typical wiring diagram for 115 VAC system



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