ICM450
Programmable Three Phase Voltage Monitor with 25-Fault Memory
Protects motors from premature failure and burnouts

Installation, Operation & Application Guide
For more information on our complete range of American-made products – plus wiring diagrams, troubleshooting tips and more, visit us at: www.icmcontrols.com

Specification
Input
• Line Voltage: Universal, 190-630 VAC
• Frequency: 50-60 Hz
• Load Side Monitoring: Optional
• Control Voltage: 18-240 VAC
• Frequency: 50-60 Hz
Output
• Type: Relay, SPDT
• Voltage Range: 240VAC @ 10A maximum
• Frequency: 50-60 Hz

Control Operating Temperature
• Operating Temperature: -40°F to +167°F (-40°C to +75°C)
• Storage Temperature: -4°F to +185°F (-20°C to +80°C)

LCD Operating Temperature
• Operating Temperature: -4°F to +167°F (-20°C to +75°C)

Mechanical
• Mounting: Surface mount using (2) #8 screws
• Terminations: Screw terminals
• Weight: 12 ounces (341 grams)

Dimensions
• 6 1/2" L, 4 1/4" W, 1 3/8" H (16.5 cm. L, 10.8 cm. W, 3.5 cm. H)

Parameters
Phase Unbalance Protection
• Voltage Unbalance: 2-20% adjustable

Over/Under Voltage Protection
• Under Voltage: 2-25% adjustable
• Over Voltage: 2-25% adjustable

Phase Loss Protection
• Phase Loss Condition: Equals 25% of nominal for any given phase; system will shut down and a fault will be recorded should this occur

Delay on Break Timer
• Control Voltage: 18-240 VAC
• Time Delay: 0 to 10 minutes adjustable

Fault Interrogation Delay
• Time Delay: 0 to 15 seconds adjustable
• Provides a delay between fault detection and system shutdown - helps to eliminate nuisance trips or unnecessary shutdowns

Warning
Installation of the ICM450 shall be performed by trained technicians only. Adhere to all local and national electric codes.
Disconnect all power to the system before making any connections.

Setting the Parameters
1. Press the green SETUP button to enter Setup mode. Setup LED will light.
2. Use the ▲ and ▼ arrows to change user parameters.
3. Scroll through setup by pressing and releasing the SETUP button.
4. When the last parameter has been set, the phase average will be displayed and the Setup LED will automatically turn OFF.

Button Functions
- Press arrows to scroll through and select user parameter settings in Setup mode.
- Hold for voltage display (simultaneously).
- Press to read faults. Hold for 5 seconds to clear faults and reset memory.

ICM450 Wiring Diagrams

2-Pole Contactor
3-Pole Contactor

Caution
Read当地和全国电规码。
Disconnect all power to the system before making any connections.
**ONE-YEAR LIMITED WARRANTY**

The Seller warrants its products against defects in material or workmanship for a period of one (1) year from the date of manufacture. The liability of the Seller is limited, at its option, to repair, replace or issue a non-case credit for the purchase prices of the goods which are provided to be defective. The warranty and remedies set forth herein do not apply to any goods or parts thereof which have been subjected to misuse including any use or application in violation of the Seller’s instructions, neglect, tampering, improper storage, incorrect installation or servicing not performed by the Seller. To obtain service under this warranty, the Buyer shall: 1) Notify the Seller promptly of any claim, submitting date code information or any other pertinent data as requested by the Seller. 2) Permit the Seller to inspect and test the product claimed to be defective. Items claimed to be defective and are determined by Seller to be non-defective are subject to a $30.00 per hour inspection fee. This warranty constitutes the Seller’s sole liability hereunder and is in lieu of any other warranty expressed, implied or statutory. Unless otherwise stated in writing, Seller makes no warranty that the goods depicted or described herein are fit for any particular purpose.

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### Table: Parameters and Descriptions

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Range</th>
<th>Default</th>
<th>Recommended</th>
</tr>
</thead>
<tbody>
<tr>
<td>Line Voltage</td>
<td>Average phase to phase line voltage</td>
<td>190-600</td>
<td>205</td>
<td>Nameplate Voltage</td>
</tr>
<tr>
<td>Delay On Break</td>
<td>Amount of time between the load de-energizing and re-energizing</td>
<td>0-10 minutes</td>
<td>.1 minute</td>
<td>4 minutes**</td>
</tr>
<tr>
<td>Fault Interrogation</td>
<td>Amount of time before the load de-energizes due to a non-critical fault*</td>
<td>0-15 seconds</td>
<td>15 seconds</td>
<td>7-8 seconds**</td>
</tr>
<tr>
<td>% Over/Under Voltage</td>
<td>Maximum/minimum phase to phase average voltage, respectively</td>
<td>2-25%</td>
<td>20%</td>
<td>12-15%/**</td>
</tr>
<tr>
<td>% Phase Unbalance</td>
<td>Amount of allowable voltage unbalance</td>
<td>2-20%</td>
<td>20%</td>
<td>4-6%**</td>
</tr>
<tr>
<td>Reset Mode</td>
<td>AUTO or number of times the load can be re-energized after a load side fault before a manual reset is necessary</td>
<td>AUTO, 0-10</td>
<td>AUTO</td>
<td>AUTO</td>
</tr>
<tr>
<td>Control Mode</td>
<td>With control mode set to OFF, the load will energize if no 3-phase fault conditions exist; with control mode ON, the load will energize if no fault conditions exist and control voltage is present at terminals 1 and 3 of the ICM450</td>
<td>ON or OFF</td>
<td>ON</td>
<td>Based on wiring</td>
</tr>
</tbody>
</table>

* Non-critical faults are faults such as High/Low Voltage and Phase Unbalance. Critical faults, such as Phase Loss and Phase Reversal, have a fault interrogation of under 2 seconds and it is not user adjustable.

** For best recommendations, consult manufacturer of equipment.

### Fault Conditions

Press and release fault button to scroll through all saved faults.  

* Note: For initial setup, press and hold FAULT for 5 seconds to remove any previously stored faults.

<table>
<thead>
<tr>
<th>Fault Problem</th>
<th>Corrective Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Back Phase Loss</td>
<td>Not all three of the phases on the load side are present</td>
</tr>
<tr>
<td></td>
<td>1. Re-energize the contactor.</td>
</tr>
<tr>
<td></td>
<td>2. If the fault reappears after the load energizes:</td>
</tr>
<tr>
<td></td>
<td>a. Turn all power OFF</td>
</tr>
<tr>
<td></td>
<td>b. Check all load side connections</td>
</tr>
<tr>
<td></td>
<td>c. Check the contacts of the contactor for debris or excess carbon.</td>
</tr>
<tr>
<td>Back Phase Rev</td>
<td>Loads 1, 2, or 3 are not in sequence (not 120° phase shifted)</td>
</tr>
<tr>
<td></td>
<td>1. Turn OFF all power.</td>
</tr>
<tr>
<td></td>
<td>2. Swap any 2 phases on the load side of the ICM450 only (example: swap load 1 and load 2)*</td>
</tr>
<tr>
<td></td>
<td>3. Re-apply power.</td>
</tr>
</tbody>
</table>

### Troubleshooting

<table>
<thead>
<tr>
<th>Problem</th>
<th>LCD Readout</th>
<th>LED Status</th>
<th>Corrective Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Load will not energize</td>
<td>Phase Average</td>
<td>All LEDs Off</td>
<td>Confirm that the control input (terminals 1 &amp; 3) is properly connected and configured</td>
</tr>
<tr>
<td>Load will not energize</td>
<td>Phase Average</td>
<td>Load LED Off, Fault LED blinking</td>
<td>Press FAULT once to observe the current fault; correct the condition of the first fault that appears (see Fault Conditions above, for a list of corrective actions)</td>
</tr>
<tr>
<td>Load will not de-energize when control voltage is OFF</td>
<td>Phase Average</td>
<td>Load LED On, Control LED OFF</td>
<td>Indicates there are faults saved in the memory; press FAULT rapidly to scroll through saved faults; to clear the faults, press and hold FAULT for more than 5 seconds</td>
</tr>
<tr>
<td>Setup LED is on while load is being energized</td>
<td>Anything Other Than Phase Average</td>
<td>Setup LED On, Load LED On</td>
<td>The control mode setting is OFF; press SETUP to get to the control mode. Press ▲ to set the control mode ON</td>
</tr>
<tr>
<td>Load turns ON and OFF repeatedly</td>
<td>Reset</td>
<td>Fault LED Blinking</td>
<td>To exit the setup mode, press either READ or FAULT</td>
</tr>
<tr>
<td>Load will not energize</td>
<td></td>
<td></td>
<td>Unit in lockout; maximum number of retries in manual reset mode has been reached; to reset unit, press FAULT and hold for more than 5 seconds</td>
</tr>
<tr>
<td>Load will not energize</td>
<td></td>
<td></td>
<td>Fix load side fault; press FAULT to observe condition; the delay on break period may be too short; press SETUP to enter the delay on break mode; press ▲ to lengthen the delay</td>
</tr>
</tbody>
</table>

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**READ**

**FOR BEST RECOMMENDATIONS, consult manufacturer of equipment.**

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7313 William Barry Blvd., North Syracuse, NY 13212
(Toll Free) 800-365-5526 (Phone) 315-233-5266 (Fax) 315-233-5276
www.icmcontrols.com

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