



**ENGINEERING SPECIFICATION
SYMCOM MODEL 355-400
3-PHASE VOLTAGE MONITOR/PROTECTION RELAY**

PART 1 GENERAL

1.1 REFERENCES

- A. UL 508 Industrial Control Equipment – Underwriters Laboratories
- B. IEC 60947 Low Voltage Switchgear and Controlgear – International Electrotechnical Commission
- C. ANSI/IEEE C62.41 – American National Standards Institute/Institute of Electrical & Electronics Engineers

1.2 WARRANTY

- A. Manufacturer Warranty: The manufacturer shall guarantee the equipment to be free from material and workmanship defects for a period of five years from the date of manufacture when installed and operated according to the manufacturer's requirements.

PART 2 PRODUCTS

2.1 MANUFACTURERS

The equipment specified shall be the Model 355-400, manufactured by SymCom, Inc.

2.2 DESCRIPTION

- A. Regulatory Requirements:
 - 1. The equipment shall be UL Listed as type NKCR—Industrial Control Equipment-Motor Controllers-Auxiliary Devices.
 - 2. The equipment shall be ULC Listed as type NKCR7—Industrial Control Equipment-Motor Controllers-Auxiliary Devices Certified for Canada.

2.3 PERFORMANCE/DESIGN CRITERIA: 3-PHASE VOLTAGE MONITOR/PROTECTION RELAY

- A. Protective Relay Functions
 - 1. The equipment shall provide protection against the following conditions:
 - a. phase loss
 - b. phase reversal
 - c. low voltage
 - d. voltage unbalance
 - e. rapid cycling due to power faults*
 - f. high voltage
- B. Capabilities and Features
 - 1. Inputs
 - a. The equipment shall accept 3-phase input voltage range from 380-480, adjustable.
 - b. The equipment shall accept 3-phase voltage at 50/60Hz.
 - 2. Outputs
 - a. The equipment shall include one Form C (SPDT) output relay. Contacts pilot duty rated 470VA@600VAC.
 - 3. The equipment shall include:
 - a. a low voltage trip of 90% of nominal setting
 - b. a high voltage trip of 110% of nominal setting
 - c. an adjustable phase unbalance trip point of 2-8%
 - d. an adjustable trip delay of 2-30 seconds for low voltage, high voltage, and unbalanced faults
 - e. a trip delay of 2 seconds for single-phasing faults (>25% voltage unbalance).
 - f. an adjustable restart delay of 2–300 seconds or manual restart
 - g. voltage accuracy $\pm 1\%$
 - 4. The equipment shall include four indicator lights. The indicator lights have the capability to indicate whether the phase monitor is in run mode, restart delay mode, or fault mode.
 - a. Fault modes shall be low/high voltage, unbalance/single phase and phase reversal.
- C. Electromagnetic Compatibility
 - 1. The equipment shall be immune to electrostatic discharge per IEC 61000-4-2, Level 3, 6kV contact discharge and 8kV air discharge.
 - 2. The equipment shall be immune to electrical fast transient bursts exceeding IEC 61000-4-4, Level 3. Specified limits shall be 4kV.
 - 3. The equipment shall be immune to electrical surges per IEC 61000-4-5. Specified limits shall be Level 3, 4kV line-to-line, and Level 4, 4kV line-to-ground.
- D. Dielectric Isolation: Equipment withstands an alternating current potential of 1000V plus twice the rated voltage of the equipment for 1 minute without breakdown between uninsulated live parts and the enclosure with the contacts open and closed; between terminals of opposite polarity with the contacts closed; and between uninsulated live parts of different circuits.

*Using the adjustable restart delay to increase time before restart after a fault.



- E. Environmental Requirements
 1. The equipment shall operate continuously without derating in ambient temperatures of -40° to 70°C (-40° to 158°F).
 2. The equipment shall operate continuously without derating in relative humidity of 10% up to 95% non-condensing per IEC 68-2-3.
 3. The equipment shall operate properly after storage in ambient temperatures of -40° to 80°C (-40° to 176°F).
- F. Dimensions: The equipment dimensions shall not exceed 2.93" H X 5.27" W X 2.95" D.
- G. Mounting: The equipment shall be surface mountable.

End of Section