



## ENGINEERING SPECIFICATION

### SYMCOM MODEL 350-400-2 / 350-400-2-5 / 350-400-2-6 / 350-400-2-8 / 350-400-2-9

### 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

*For Model 350-400-2*

The equipment specified shall be the Model 350-400-2, manufactured by SymCom, Inc.

*For Model 350-400-2-5*

The equipment specified shall be the Model 350-400-2-5, manufactured by SymCom, Inc.

*For Model 350-400-2-6*

The equipment specified shall be the Model 350-400-2-6, manufactured by SymCom, Inc.

*For Model 350-400-2-8*

The equipment specified shall be the Model 350-400-2-8, manufactured by SymCom, Inc.

*For Model 350-400-2-9*

The equipment specified shall be the Model 350-400-2-9, 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\*
    - For Model 350-400-2-9 only*
    - f. high voltage
- B. Capabilities and Features
  1. Inputs
    - a. The equipment shall accept 3-phase input voltage range of 380-480VAC.
    - b. The equipment shall accept 3-phase input voltage 50/60 Hz.
  2. Outputs
    - For Model 350-400-2 and 350-400-2-9*
    - a. The equipment shall include one Form C (SPDT) output relay. Contacts pilot duty rated 470VA@600VAC.
    - For Model 350-400-2-5*
    - b. The equipment shall include one DPDT output relay. Contacts pilot duty rated 470VA@600VAC.
    - For Model 350-400-2-6*
    - a. The equipment shall include two relays:
      - 1) Relay 1 shall be Form C (SPDT). Contacts pilot duty rated 480VA@240VAC. Contacts general purpose rated 10A@240VAC.
      - 2) Relay 2 shall be Form C (SPDT). Contacts pilot duty rated 720VA@240VAC. Contacts motor load rated 1hp@240VAC. Contacts general purpose rated 15A@240VAC.
    - For Model 350-400-2-8 only*
    - a. The equipment shall include two Form C (DPDT) output relays. Contacts pilot duty rated 720VA@240VAC. Contacts motor load rated 1hp@240VAC. Contacts general purpose rated 15A@240VAC.

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



3. The equipment shall include:
  - For All Models*
  - a. a low voltage trip of 90% of nominal setting
  - b. a phase unbalance trip point of 6%
  - c. a trip delay of 4 seconds for low voltage faults and 2 seconds for unbalanced and single-phasing faults
  - d. an adjustable restart delay of 2–300 seconds
  - e. voltage accuracy  $\pm 1\%$
  - For Models 350-400-2, 350-400-2-5, 350-400-2-6, 350-400-2-9*
  - f. a manual reset
  - For Model 350-400-2-9 only*
  - g. a high voltage trip of 110% of nominal setting
  - h. a trip delay of 4 seconds for high voltage
4. The equipment shall have one indicator light. The indicator light has the capability to indicate whether the phase monitor is in run mode, restart delay mode, or fault mode.
  - For Models 350-400-2, 350-400-2-5, 350-400-2-6, and 350-400-2-8*
  - a. Fault modes shall be low voltage, unbalance/single phase and phase reversal.
  - For Model 350-400-2-9 only*
  - 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 4. Specified limits shall be 2kV line-to-line and 4kV line-to-ground.
  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.
- E. Environmental Requirements
  1. The equipment shall operate continuously without derating in ambient temperatures of  $-40^{\circ}$  to  $70^{\circ}\text{C}$  ( $-40^{\circ}$  to  $158^{\circ}\text{F}$ ).
  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  $-40^{\circ}$  to  $80^{\circ}\text{C}$  ( $-40^{\circ}$  to  $176^{\circ}\text{F}$ ).
- F. Dimensions: The equipment dimensions shall not exceed 2.90" high X 5.250" wide X 2.913" deep.
- G. Mounting:
  1. The equipment shall be surface mountable.

End of Section