



## ENGINEERING SPECIFICATION

### SYMCOM MODEL 102A / 102A-2 / 102A-3 / 102A-9 / 102-600 3-PHASE VOLTAGE MONITOR/PROTECTION RELAY

#### PART 1 GENERAL

##### 1.1 REFERENCES

- A. UL 508 Industrial Control Equipment – Underwriters Laboratories

##### 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 102A*

The equipment specified shall be the Model 102A, manufactured by SymCom, Inc.

*For Model 102A-2*

The equipment specified shall be the Model 102A-2, manufactured by SymCom, Inc.

*For Model 102A-3*

The equipment specified shall be the Model 102A-3, manufactured by SymCom, Inc.

*For Model 102A-9*

The equipment specified shall be the Model 102A-9, manufactured by SymCom, Inc.

*For Model 102-600*

The equipment specified shall be the Model 102-600, 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 (single phasing)
- b. phase reversal
- c. low voltage
- d. voltage unbalance

*For Model 102A-9 Only*

- e. high voltage

*For Model 102A-2 Only*

- e. rapid cycling due to power faults\*

- B. Capabilities and Features

1. Inputs

*For Model 102A, 102A-2, 102A-3 and 102A-9*

- a. The product shall accept 3-phase input voltage range of 190-480VAC, adjustable.

*For Model 102-600*

- a. The product shall accept 3-phase input voltage range of 475-600VAC, adjustable.

*For All Models*

- b. The product shall accept 3-phase input voltage at 50/60 Hz.

2. Outputs

- a. The equipment shall include one Form C (SPDT) output relay. Contacts pilot duty rated 480VA@240VAC. Contacts general purpose rated 10A@240VAC.

3. The equipment shall include:

*For All Models*

- a. a low voltage trip point of 90% of nominal setting
- b. a phase unbalance trip point of 6%
- c. voltage accuracy  $\pm 1\%$

*For Model 102A only*

- e. a trip delay of 4 seconds for low voltage and a trip delay of 2 seconds for unbalanced & phasing faults
- f. a restart delay of 2 seconds

*For Model 102A-2 only*

- e. a trip delay of 4 seconds for low voltage and a trip delay of 2 seconds for unbalanced & phasing faults
- f. a manual reset, standard, with adjustable restart delay of 2-300 seconds

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



*For Model 102A-3 only*

- e. an adjustable trip delay for low voltage of 2–30 seconds
- f. a restart delay of 2 seconds

*For Model 102A-9 only*

- e. a high voltage trip point of 110% of nominal setting
- f. a trip delay of 4 seconds for high/low voltage and a trip delay of 2 seconds for unbalanced & phasing faults
- g. a restart delay of 2 seconds

*For Model 102-600 only*

- e. a trip delay of 4 seconds for low voltage and a trip delay of 2 seconds for unbalanced & phasing faults
- f. a restart delay of 2 seconds

- 4. The equipment shall have one indicator light. The light scheme shall have the capability to indicate whether the phase monitor is in run mode, restart delay mode, or fault mode.

*For Models 102A, 102A-2, 102A-3, 102-600*

- 1) Fault modes shall be low voltage, unbalance/single phase and phase reversal.

*For Model 102A-9*

- 2) Fault modes shall be high voltage, low voltage, unbalance/single phase and phase reversal.

C. Electromagnetic Compatibility

- 1. The equipment shall be immune to electrical surges per IEC 61000-4-5. Specified limits shall be  $\pm 6$ kV line-to-line and line-to-ground.
- 2. The equipment shall be immune to electrical fast transient bursts exceeding IEC 61000-4-4, Level 3. Specified limits shall be 4kV input power, 2kV inputs/outputs.
- 3. The equipment shall be immune to electrostatic discharge per IEC 61000-4-2, Level 3, 6kV contact discharge and 8kV air discharge.

- 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  $70^{\circ}$ C ( $-40^{\circ}$  to  $158^{\circ}$ F).
- 2. The equipment shall operate continuously without derating in relative humidity of 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  $80^{\circ}$ C ( $-40^{\circ}$  to  $176^{\circ}$ F).

- F. Dimensions: The equipment dimensions shall not exceed 2.90" high X 5.25" wide X 2.913" deep.

G. Mounting:

- 1. The equipment shall be surface mountable.

End of Section