

**ENGINEERING SPECIFICATION**  
**SYMCOM MODEL 231-INSIDER-P PUMP MONITOR/PROTECTOR**

**PART 1 GENERAL**

**1.1 REFERENCES**

- A. UL 508 Industrial Control Equipment – Underwriters Laboratories
- B. CSA C22.2 No. 14 Industrial Control Equipment – Canadian Standards Association

The 231-Insider-P shall be installed according to the latest version of the National Electrical Code.

**1.2 WARRANTY**

- A. Manufacturer Warranty: The manufacturer shall guarantee the pump monitor 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 231-Insider-P, manufactured by SymCom, Inc.

**2.2 DESCRIPTION**

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

**2.3 PERFORMANCE/DESIGN CRITERIA: SINGLE PHASE PUMP MONITOR**

- A. Protective Functions
  - 1. The pump monitor shall provide protection against the following conditions:
    - a. overload (125% of calibrated normal operating current)
    - b. dry run/dead head (adjustable to 70-90% of calibrated normal operating power)
    - c. undervoltage (fixed at 190 VAC)
    - d. overvoltage (fixed at 265 VAC)
    - e. rapid cycling (4 restarts allowed in a 60 second period)
- B. Capabilities and Features
  - 1. The pump monitor shall include:
    - a. a calibration method to determine normal operating current and power conditions
    - b. an adjustable restart delay after non-voltage faults of 2-225 minutes or manual restart
    - c. an adjustable dry run/dead head trip setting of approximately 70% to 90% of calibrated normal operating power
    - d. a fixed overload trip delay time of 5 seconds
    - e. a fixed dry-well trip delay time of 4 seconds
    - f. a fixed voltage fault restart delay of 2 seconds
  - 2. The pump monitor shall include a SPST output relay contact, pilot duty rated at 1hp at 240VAC.
  - 3. The pump monitor shall have two indicator lights. The light scheme shall have the capability to indicate whether the phase monitor is in run mode, calibrate mode, or fault mode. Fault modes shall be dry run/dead head, overload, high/low voltage, and rapid cycle.
  - 4. The pump monitor shall transmit calibration data, run hours, trip points, running points, and fault information via an infrared LED that can be processed by the SymCom Informer.
  - 5. The pump monitor shall provide the ability to reset run hours and disable rapid cycling protection.
- C. Electromagnetic Compatibility
  - 1. The equipment shall be immune to electrostatic discharge per IEC 61000-4-2, Level 2, 4 kV contact discharge and 6 kV air discharge.
  - 2. The equipment shall be immune to electrical surges per IEC 61000-4-5, Level 4. Specified limits shall be 4kV line-to-line and line-to-ground.
- D. Environmental Requirements
  - 1. The equipment shall operate continuously without de-rating in operating temperatures of -40° to 55°C (-40° to 131°F).
- E. Mounting:
  - 1. The equipment shall be mountable inside 1/3 to 1 hp, 230 VAC Franklin™, Pentek®, or CentriPro™ type 3R control boxes.

F. Conformal coating:

1. The equipment shall contain harsh environment conformal coating to help extend product life and to protect from hostile environments including moisture, temperature variations, salt spray, organic attack (fungus), and aggressive chemicals and vapors.

End of Section