

ENGINEERING SPECIFICATION

SYMCOM MODEL ISS-102CCI-M-MC Intrinsically Safe Switch

PART 1 GENERAL

1.1 REFERENCES

- A. 30 CFR Part 18 – Mine Safety and Health Administration
- B. 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 ISS-102CCI-M-MC, manufactured by SymCom, Inc.

2.2 DESCRIPTION

- A. Regulatory Requirements:
 - a. MSHA has evaluated the device to comply with the requirements in CFR 30 18.68 for intrinsically safe devices. The evaluation number is 18-ISA070001-0.

2.3 PERFORMANCE/DESIGN CRITERIA

- A. Capabilities and Features:
 1. Inputs:
 - a. The equipment shall accept two control inputs from the hazardous area.
 - b. The equipment shall accept single-phase input voltage rated 120VAC.
 2. Outputs:
 - a. The equipment shall include two relays.
 - 1) Relay 1 shall be Form C (SPDT), non-isolated. Contacts pilot duty rated 180VA@120VAC. Contacts general purpose rated 5A@120VAC.
 - 2) Relay 2 shall be Form C (SPDT), isolated. Contacts pilot duty rated 180VA@120VAC. Contacts general purpose rated 5A@120VAC.
 3. Functional Specifications:
 - a. The equipment shall provide pump-up or pump-down mode.
 - a) The equipment shall allow the user to select direct or inverted logic and probe setting for the specific application
 - b. The equipment shall provide single-channel switch mode.
 - 1) The equipment shall activate both output relays when control input #1 is activated.
 - c. The equipment shall provide dual-channel switch mode.
 - 1) The equipment shall activate the appropriate relay when a control input is activated.
 - 2) The equipment shall allow the relays to be activated independently of one another.
 - d. The equipment shall provide the following functions controlled from a DIP switch:
 - 1) Mode selection: single-channel switch, dual-channel switch, dual-channel differential / latching
 - 2) Input logic selection: direct, inverted
 - 3) Debounce selection: 0.5 seconds, 2 seconds
 - e. The equipment shall include an input sensitivity threshold of 4.7-100kiloohms, adjustable.
 - f. The equipment shall include two LEDs.
 - 1) Each LED shall illuminate upon activation of the corresponding output relay.
- B. Intrinsically Safe Requirements:
 1. The equipment shall have the following entity parameters:
 - a. $V_{oc}=16.8V$
 - b. $I_{sc}=1.2mA$
 - c. $L_a=100mH$
 - d. $C_a=0.39\mu F$
 - e. $P_o = \frac{V_{oc} * I_{sc}}{4}$
 2. The equipment shall provide intrinsically safe circuit into the following locations:
 - a. Class I, Divisions 1 & 2, Groups A, B, C, & D
 - b. Class II, Divisions 1 & 2, Groups E, F & G
 - c. Class III
 3. The equipment shall provide two inputs to the hazardous area.



- 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 per IEC 61000-4-4, Level 3, 4kV power supply port, 4kV input/output ports.
 - 3. The equipment's power supply port 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.
 - 4. The equipment shall be immune to radiated radio frequency emissions. Specified limits shall be 10V/m at 150 MHz.
- 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. Enclosure Class of Protection: The equipment shall provide IEC IP20 (finger safe) protection.
- F. Environmental Requirements:
 - 1. The equipment shall operate continuously without derating in ambient temperatures of -40° to 55°C (-40° to 131°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° to 80°C (-40° to 176°F).
- G. Dimensions: The equipment dimensions shall not exceed 3.5" H x 2.084" W x 2.35" D.
- H. Mounting:
 - 1. The equipment shall be mountable on standard 35 mm DIN rail.
 - 2. The equipment shall be surface mountable.

End of Section