

Overview

The Miniature Fixed Current Status Switches are designed for use in any AC current monitoring application with a fixed trip point to monitor the “Go/No Go” (On/Off) “Status” for a piece of equipment. The fixed current switches should be installed on the line side of the power to the motor, pump, compressor or other equipment. All of the miniature current switches are available in both solid and split-core versions in a smaller enclosure style than that of the NSA-A/CS2-B and NSA-A/SCS2-B Series fixed current switches rated for higher operating currents. The solid-core versions are a great choice for new installations or OEM applications in which cost sensitivity, lower trip points and environmental issues are of concern. The split-core version of the current switches work great in retrofit applications and for use in service vehicles since one part works in most applications and can be installed without disconnecting any wires. Fixed status switches can also be used to determine the run time of your equipment when logging the contact closures on your building management system or PLC.



Applications: On/Off “Status” Indication, Local Alarms such as Strobes/Audible Alarms, Pumps, Fans, Compressors, Lighting Status and Usage Information, Ovens, Process Control, Industrial Equipment, OEM Opportunities

Part Numbers

NSA-A/MCS

NSA-A/MSCS

Specifications

Monitored Current Type:	AC Current
Maximum AC Voltage:	600 VAC
Operating Frequency Range:	50/60 Hz
Core Style:	NSA-A/MCS: Solid NSA-A/MSCS: Split
Sensor Power:	Induced from the Monitored Conductor (Insulated Conductors only)
Amperage Range:	0 to 150A
Isolation Voltage:	2200 VAC
Trip Point Style Adjustable Trip Point Range:	Fixed Trip Point NSA-A/MCS: 0.20A or less NSA-A/MSCS: 0.55A or less
Contact Type:	Normally-Open “N/O”
Status Contact Rating:	0.5A Continuous @ 36 VAC/VDC
Status Contact On Resistance Off Resistance:	< 0.5 Ohms (tripped) > 1 Meg Ohms (Open)
Response Time:	NSA-A/MCS: < 50 mS typical NSA-A/MSCS: < 40 mS typical
Aperture Size (Diameter):	0.53” (13.46 mm)
Operating Temperature Range:	-22 to 140°F (-30 to 60°C)
Operating Humidity Range:	0 to 95%, non-condensing
Recommended Storage Temperature RH Range:	41 to 95°F (5 to 35°C) 40 to 85% RH, non-condensing
Enclosure Material Flammability Rating:	PC/ABS (Polycarbonate/ABS Blend) UL94-V0
Wiring Connections:	2 Position Screw Terminal Block (Not Polarity Sensitive)
Wire Size:	16 to 22 AWG (1.31 mm ² to 0.33 mm ²) Copper Wires only
Terminal Block Torque Rating:	4.43 to 5.31 in-lbs. (0.5 to 0.6 Nm)
Minimum Mounting Distance:	1” (2.6 cm) between current switch (Relays, Contactors, Transformers)
Agency Approvals ¹ :	UL/CUL US Listed (UL 916) Energy Management Equipment (File # E334792), CE, RoHS2, WEEE
Product Weight:	NSA-A/MCS: 0.15 lbs (0.068 kg) NSA-A/MSCS: 0.20 lbs (0.091 kg)
Product Dimensions (L x W x H):	NSA-A/MCS: 2.510” (63.82mm) x 0.940” (23.94mm) x 2.000” (50.80mm) NSA-A/MSCS: 2.650” (67.19mm) x 0.940” (23.94mm) x 2.380” (60.49mm)

¹Maximum wire length not to exceed 98.4 Feet (30 meters) in order to meet the CE Requirements



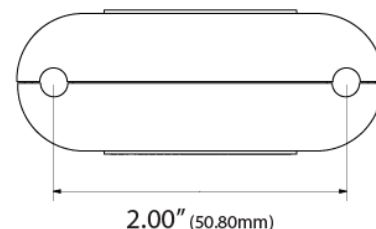
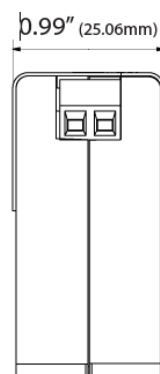
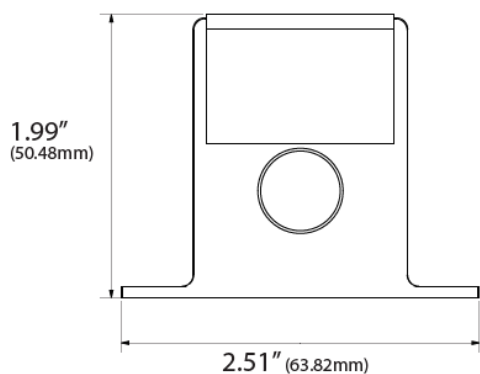
Miniature Fixed Current Status Switches

#NSA-A/MCS, NSA-A/MSCS – 11/14/2019

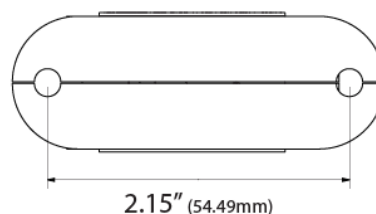
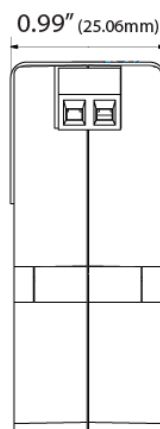
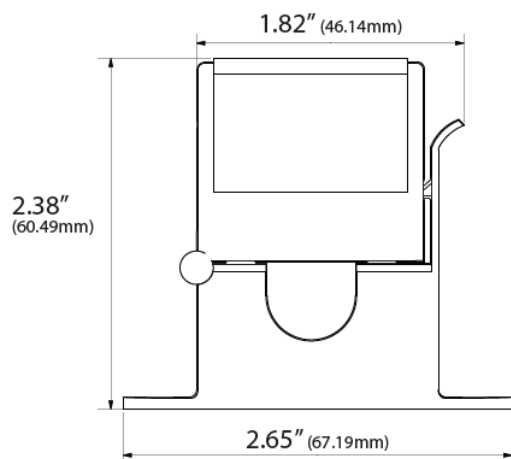
Installation and Operation

Dimensional Drawing

Solid-Core



Split-Core



Front View

Right View

Bottom View

Figure 1

Installation

Warnings

- This product is not intended to be used for Life or Safety applications.
- This product is not intended for use in any hazardous or classified locations.

HIGH VOLTAGE

Disconnect and lock out all power sources before installation as severe injury or death may result from electrical shock due to contact with high voltage wires.

General Information

The Miniature Fixed Current Status™ Switches are designed for use in any AC current monitoring application in which you are looking for a fixed trip point to monitor the “Go/No Go” (On/O-) “Status” for a particular piece of equipment. The fixed current switches should be installed on the line side of the power to the motor, pump, compressor or other equipment. All of the miniature current switches are available in both solid and split-core versions in a smaller enclosure style than that of the NSA-A/CS2-B and NSA-A/SCS2-B Series fixed current switches rated for higher operating currents.

Mounting Instructions

Make sure that all installations are in compliance with all national and local electrical codes. Only qualified individuals that are familiar with codes, standards, and proper safety procedures for high-voltage installations should attempt installation. The current switches will not require external power, since the power for the current switch is induced from the conductor being monitored. The A/MCS and A/MSCS Current Switches should be used on Insulated Conductors Only! The current switch may be mounted in any position using the (2) #8 x 3/4” Tek screws and the mounting holes in the base (see Figure 2). Leave a minimum distance of 1” (3 cm) between the current switch and any other magnetic devices such as contactors and transformers.

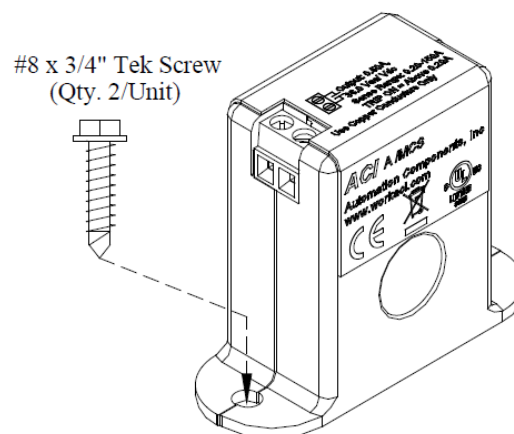


Figure 2

Wiring Instructions

Carrier recommends the use of a two conductor 16 to 22 AWG shielded cable or twisted pair copper wire only for all current switch applications. A maximum wire length of less than 30 meters (98.4 feet) should be used between the NSA-A/MCS and NSA-A/MSCS current switches and the Building Management System or controller.

NOTE When using a shielded cable, be sure to connect only (1) end of the shield to ground at the controller.

Connecting both ends of the shield to ground may cause a ground loop. When removing the shield from the sensor end, make sure to properly trim the shield so as to prevent any chance of shorting. The current switch output terminals represent a solid-state switch for controlling both AC and DC loads and is not polarity sensitive. The recommended torque to be used on the terminal block connections is 0.67 Nm or 5.93 in-lbs. The aperture (hole) size of the current switch is 0.53” (1.35 cm) and will accept a 1 AWG maximum wire diameter.

For applications in which the normal operating current is below the 0.20 Amps (NSA-A/MCS) or 0.55 Amps (NSA-A/MSCS) trip point (See Figure 3 below), the conductor being monitored may be looped through the sensor 4 times giving you a total operating current of 4X the original current.

Example: A small fan operating at 0.2A should be wrapped through the sensor 4 times to give you a total operating current of 0.8Amps flowing through the NSA-A/MCS or NSA-A/MSCS.

Wires through Sensors

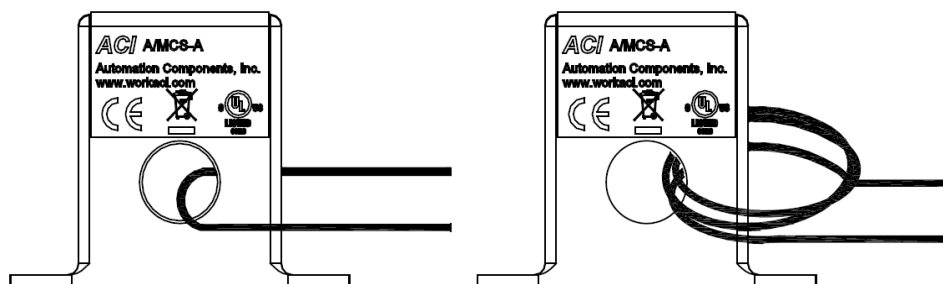


Figure 3

When the normal operating current is >150 Amps, or for conductor diameters larger than 0.530" (1.35 cm), use an external 5 Amp Current Transformer as shown in Figure 4 below. The secondary of the 5A CT must be shorted together before the power may be turned onto the monitored device.

Example: For currents up to 600 Amps (and not below 70 Amps (NSA-A/MCS-A) or 95 Amps (NSA-A/MSCS-A), where Current Transformer (C.T.) secondary falls below 1 Amp use a 600:5 ratio C.T. as shown:

Current Transformer

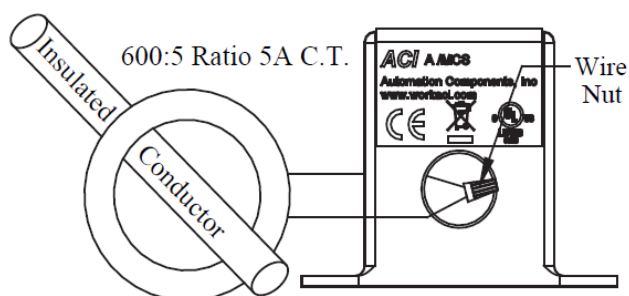


Figure 4

Digital Circuit

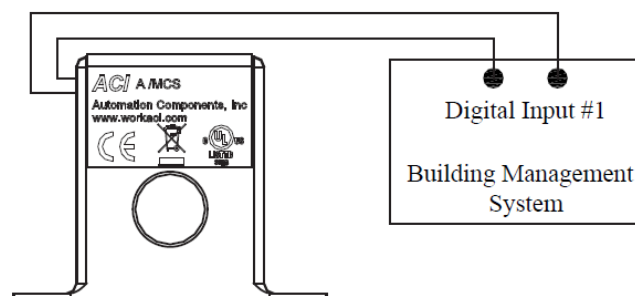


Figure 5

Application Examples

See Figure 5 and Figure 6 for two different current switch applications. Figure 5 shows the use of the Mini Go/No Go Current Switch as a Digital Input to your BAS/PLC Controller. Figure 6 shows a Mini Go/No/Go Current Switch in conjunction with a Contactor to control an exhaust fan.

NOTE The Mini Fixed Go/No Go Current switches(NSA-MCS & NSA-MSCS Series) are only rated at 0.5A Continuous @ 36 VAC/VDC. These switches must use an additional Contactor if controlling motor/fans.

Analog Circuit

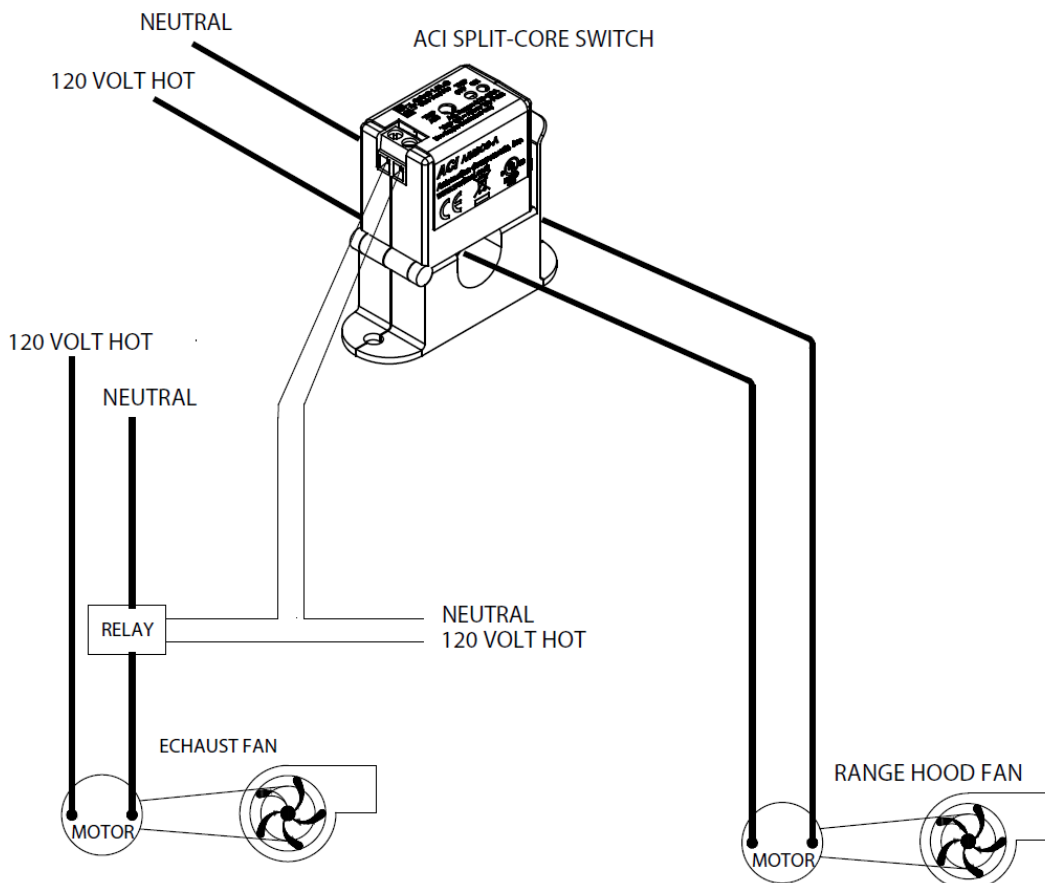


Figure 6

Troubleshooting

Problem	Solution
Current switch didn't activate (Test #1)	Disconnect the wires from the current switch output. Measure the resistance across the contacts with an Ohmmeter. See Specifications for the actual resistance readings for an open or closed switch reading.
Current switch didn't activate (Test #2)	Verify that the current flowing in the conductor being monitored is above the fixed trip point as listed in the operating specifications. If the sensor is monitoring less than the fixed trip point, see Figure 3.

Model #	Resistance if switch open	Resistance of switch closed
NSA-A/MCS-B, NSA-A/MSCS-B	Greater than 1 Meg ohms	Approximately 0.2 ohms

W.E.E.E. Directive

At the end of their useful life the packaging and product should be disposed of via a suitable recycling center. Do not dispose of with household waste. Do not burn.