



ACI A-MCS-A Series Mini Adjustable Status Switch Instruction Manual

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ACI A-MCS-A Series Mini Adjustable Status Switch



Product Information

The Mini Adjustable Status Switch Series is a current switch designed for monitoring and controlling electrical currents. The product is available in two models: A/MCS-A and A/MSCS-A. It is manufactured by Automation Components, Inc., a company based in Middleton, WI. The product dimensions and mounting instructions are provided in the user manual.

Precautions

- Before installation, it is important to take precautions to avoid electrical shock.
- Contact with high-voltage wires can result in severe injury or death.
- Ensure compliance with national and local electrical codes.
- Only qualified individuals familiar with codes, standards, and safety procedures for high-voltage installations should attempt installation.

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

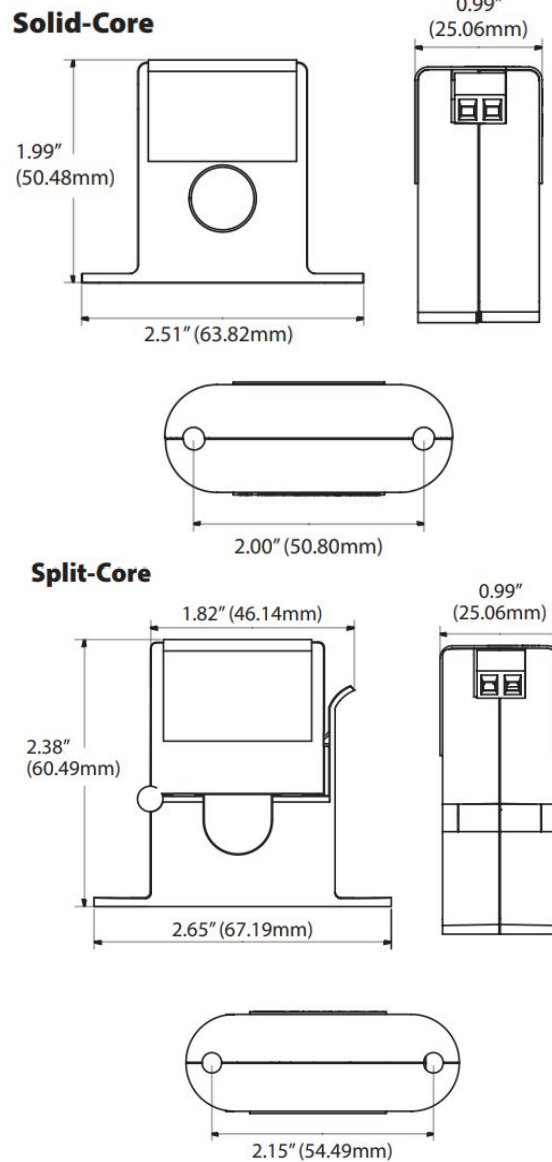
The Miniature Adjustable Current switches are designed for use in any AC current monitoring application in which you are looking for an adjustable current switch to monitor normal operating conditions, equipment failure or preventative maintenance scheduling for a particular piece of equipment. The adjustable current switches should be installed on the line side of the power to the motor, pump, compressor or other equipment. The adjustable current status switches can also be used to determine the run time of your equipment where you want to know when your piece of equipment runs and for how long it runs when logging the contact closures on your building management system or PLC.

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

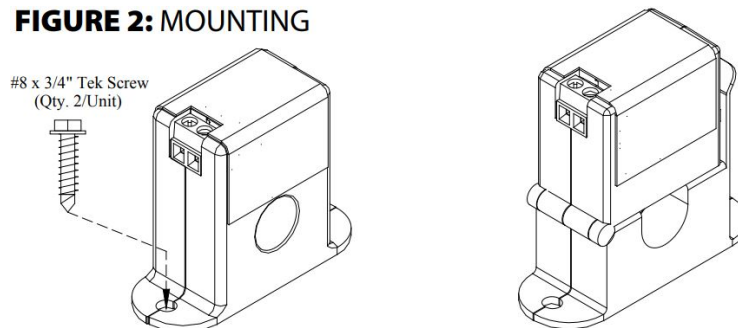
should attempt installation. The current switches will not require external power, since the power for the current switch is induced by the conductor being monitored.

FIGURE 1: DIMENSIONS



The A/MCS-A and A/MSCS-A 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 (p.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: MOUNTING



Wiring Instructions

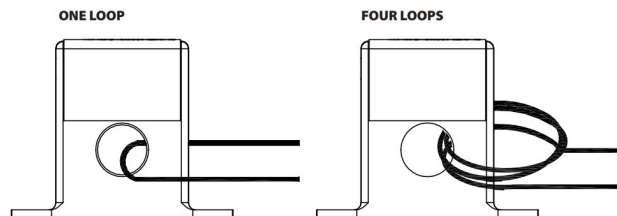
- For all current switch applications, it is recommended to use a two-conductor 16 to 22 AWG shielded cable or twisted pair copper wire. The maximum wire length should be less than 30 meters (98.4 feet) between the current switches and the Building Management System or controller.

NOTE: When using a shielded cable, connect only one end of the shield to ground at the controller.

- In cases where the normal operating current is below the trip point (0.20 Amps for A/MCS-A or 0.55 Amps for A/MSCS-A), the conductor being monitored can be looped through the sensor four times to achieve a total operating current of 4X the original current. 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 (A/MCS-A) or 0.55 Amps (A/MSCS-A) 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 A/MCS-A or A/MSCS-A.

FIGURE 3: WIRES THROUGH SENSORS



- For applications in which the normal operating current is greater than 150 Amps or for conductor diameters larger than 0.530" (1.35 cm) in diameter, an external 5 Amp Current Transformer must be used as shown in Figure 4 below. Remember that 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 (A/MCS-A) or 95 Amps (A/MSCS-A), where Current Transformer (C.T.) secondary falls below 1 Amp use a 600:5 ratio C.T. as **shown in Figure 4**.

FIGURE 4: CURRENT TRANSFORMER

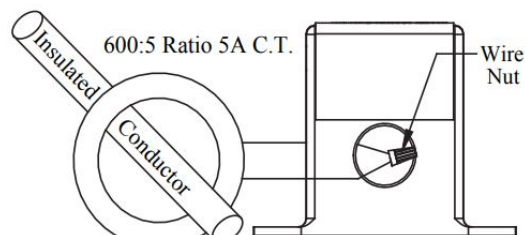
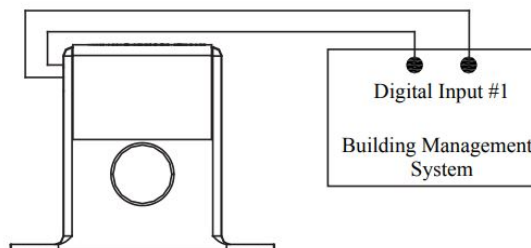


FIGURE 5: DIGITAL CIRCUIT

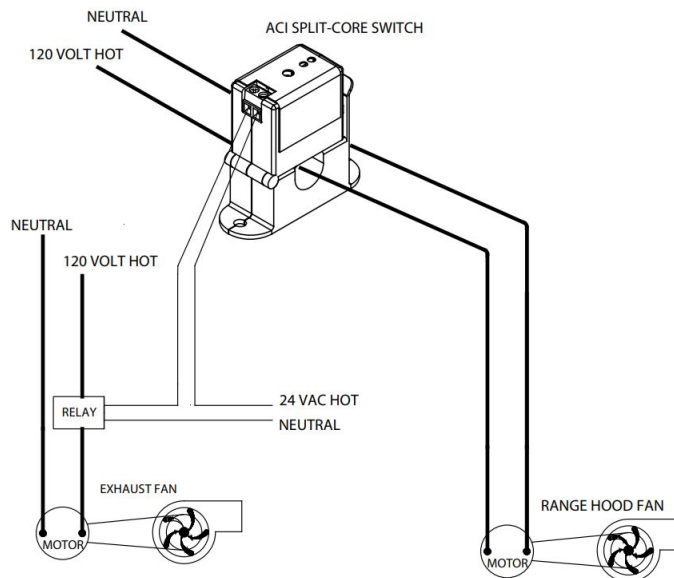


• APPLICATION EXAMPLES

See Figure 5 (p.3) and Figure 6 (p.3) for two different current switch applications. Figure 5 (p.3) is showing the use of the Mini Go/No Go Current Switch as a Digital Input to your BAS/PLC Controller. Figure 6 (p.3) shows a Mini Go/No/Go Current Switch in conjunction with a Contactor to control an exhaust fan.

Note: The ACI Mini Adjustable Go/No Go Current switches(MCS-A & MSCS-A Series) are only rated at 1.0A Continuous @ 36 VAC/VDC. These switches must use an additional Contactor if controlling motor/fans.

FIGURE 6: MOTOR/FAN CONTROL



Product Usage Instructions

1. Ensure compliance with national and local electrical codes before installation.
2. Only qualified individuals familiar with codes, standards, and safety procedures for high-voltage installations should attempt installation.
3. Mount the current switch in any position using the provided #8 x 3/4 Tek screws and the mounting holes in the base. Maintain a minimum distance of 1(3 cm) between the current switch and other magnetic devices.
4. Use a two-conductor 16 to 22 AWG shielded cable or twisted pair copper wire for all current switch applications. The maximum wire length should be less than 30 meters (98.4 feet) between the current switches and the Building Management System or controller.
5. If using a shielded cable, connect only one end of the shield to the ground at the controller.
6. If the normal operating current is below the trip point, loop the conductor being monitored through the sensor four times to achieve a total operating current of 4X the original current.
7. If the normal operating current is greater than 150 Amps or conductor diameters are larger than 0.530 (1.35 cm) in diameter, use an external 5 Amp Current Transformer. Short the secondary of the Current Transformer together before turning on the power to the monitored device.

CALIBRATION OF ADJUSTABLE TRIP POINT

The adjustable current switch has an operating range of 0-150 Amps. Do not exceed! The adjustable current switch comes with its fifteen-turn adjustment potentiometer set to the 100 Amp trip point position. The adjustable current switch can be used to monitor Under Load, Normal Load, and Over Load conditions, depending on how it's set. The procedure below is for the Normal load condition for part numbers A/MCS-A & A/MSCS-A.

NORMAL LOADS

With current flowing through the aperture of the A/MCS-A and A/MSCS-A current switches, first verify that the Blue LED is on. If the Blue LED is on, now slowly adjust the potentiometer clockwise until the Red LED just turns on and stop immediately. This will set the trip point at your normal operating load current. If the RED LED is on after the initial power-up, this means that you will need to slowly adjust the potentiometer counter-clockwise until the Blue LED turns on and then slowly adjust the potentiometer clockwise until the Red LED just turns on and stop immediately. The adjustable current switch is now tripped. Now verify the output with an Ohmmeter to verify that the contacts of the switch are approximately 0.200 Ohms. The adjustable current switch Hysteresis (Dead Band) is typically 10% of the trip point.

- Clockwise = Decrease Trip Point
- Counter-clockwise = Increase Trip Point

TROUBLESHOOTING

PROBLEM	SOLUTION(S)
The 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 Standard Ordering Table (p.5) for the actual resistance readings for an open or closed switch reading.
The 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 .

ACI Model #	Resistance if switch open	Resistance if switch closed
A/MCS-A	Greater than 1 Meg ohms	Approximately 0.2 ohms
A/MSCS-A	Greater than 1 Meg ohms	Approximately 0.2 ohms

WARRANTY

The ACI Current Switch Series are covered by ACI's Five (5) Year Limited Warranty, which is located in the front of ACI'S SENSORS & TRANSMITTERS CATALOG or can be found on ACI's website: www.workaci.com.

W.E.E.E. DIRECTIVE

At the end of their useful life the packaging and product should be disposed of via a suitable recycling centre.

- Do not dispose of with household waste.
- Do not burn.

PRODUCT SPECIFICATIONS

SENSOR NON-SPECIFIC INFORMATION	
Monitored Current Type:	AC Current
Maximum AC Voltage:	600 VAC
Operating Frequency Range:	50/60 kHz
Core Style:	Solid-Core and Split-Core Versions available (See Ordering Grid)
Sensor Power:	Induced from the Monitored Conductor (Insulated Conductors only)
Amperage Range:	See Ordering Grid
Isolation Voltage:	2200 VAC
Trip Point Style Trip Point:	Adjustable Trip Point See Ordering Grid
Hysteresis:	10% Trip Point, typical
Contact Type:	Normally-Open "N/O"
Contact Rating:	1A Continuous @ 36 VAC/VDC
Contact "On" Resistance "Off" Resistance :	< 0.5 Ohms (tripped) > 1 Meg Ohms (Open)
Response Time:	A/MCS-A: < 90 mS typical A/MSCS-A: < 45 mS typical
Status LED Indication:	Red LED (Current above trip point) Blue LED (Current below trip point)
Aperture Size:	0.53" (13.46 mm)
Operating Temperature Range:	-22 to 140°F (-30 to 60°C)
Operating Humidity Range:	0 to 95%, non-condensing
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 :	1" (2.6 cm) between current switch (Relays, Contactors, Transformers)
Pollution Degree:	2
Environmental:	Indoor


STANDARD ORDERING

Model #	Item #	Trip Point Type	N/O	Solid-Core	Split-Core	Amp Range	Amp Range	Contact Rating
A/MCS-A	117854	Adjustable	•	•		0.32 to 150A	0.32 to 150A	1A @ 36 VAC/VDC
A/MSCS-A	117855	Adjustable	•		•	0.70 to 150A	0.70 to 150A	1A @ 36 VAC/VDC



Automation Components, Inc. 2305 Pleasant View Road Middleton, WI 53562 **Phone:** 1-888-967-5224 **Website:** workaci.com

Documents / Resources



[ACI A-MCS-A Series Mini Adjustable Status Switch](#) [pdf] Instruction Manual
A-MCS-A, A-MCS-A Series Mini Adjustable Status Switch, Mini Adjustable Status Switch, Adjustable Status Switch, Status Switch, Switch, A-MSCS-A

References

-  [Building Automation Sensors | Automation Components, Inc.](#)
-  [Building Automation Sensors | Automation Components, Inc.](#)