ANALOG SIGNAL AMPLIFIER SERIES

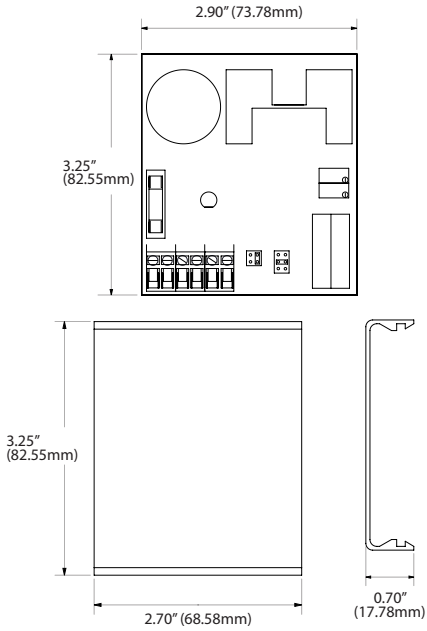
Installation & Operation Instructions

Phone: 1-888-967-5224
Website: workaci.com

GENERAL INFORMATION

The ASA is an analog signal amplifier which accepts an analog (voltage or current) signal and outputs a voltage signal. Several preset input ranges are jumper selectable. It is designed to give a Building Automation System signal output the power (wattage) to control Maxitrol™ Gas Valves normally installed in rooftop units. The top-adjust trimmer potentiometers can be used to make fine adjustments of gain and offset. The output gain can be adjusted anywhere from 1 to 20 times the input on the ASA (gain will vary depending on type of input). By using voltage divider applications, the ASA can also accept a resistance input. The offset of the output can be +/- 0 to 20 VDC. If above 30 watts, derate load current and calculate again (P out = [(V out/Load) (V out)] and/or (P out = (Load Current)(V out)). The ASA is field calibratable, however, factory calibration is available upon request for an additional charge. This will speed up installation time for the end user.

FIGURE 1: DIMENSIONS



MOUNTING INSTRUCTIONS

Circuit board may be mounted in any position. If circuit board slides out of snap track, a non-conductive "stop" may be required. Use only fingers to remove board from snap track. Slide out of snap track or push against side of snap track and lift that side of the circuit board to remove. **Do not flex board or use tools.**

WIRING INSTRUCTIONS

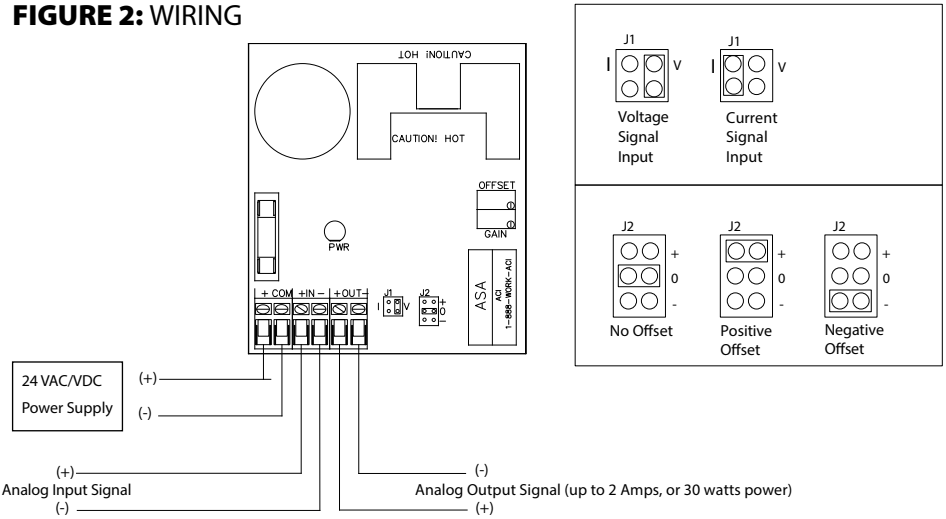
PRECAUTIONS

- **Remove power before wiring. Never connect or disconnect wiring with power applied.**
- **When using a shielded cable, ground the shield only at the controller end. Grounding both ends can cause a ground loop.**
- **It is recommended you use an isolated UL-listed class 2 transformer when powering the unit with 24 VAC. Failure to wire the devices with the correct polarity when sharing transformers may result in damage to any device powered by the shared transformer.**
- **If the 24 VDC or 24VAC power is shared with devices that have coils such as relays, solenoids, or other inductors, each coil must have an MOV, DC/AC Transorb, Transient Voltage Suppressor (ACI Part: 142583), or diode placed across the coil or inductor. The cathode, or banded side of the DC Transorb or diode, connects to the positive side of the power supply. Without these snubbers, coils produce very large voltage spikes when de-energizing that can cause malfunction or destruction of electronic circuits.**
- **All wiring must comply with all local and National Electric Codes.**

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

Version: 6.0
I0000602

FIGURE 2: WIRING



FACTORY CALIBRATION

The ASA is set as follows:

Voltage Input Signal
No Offset to the Output Signal
Input to Output Signal Gain (1:1)
The ASA can be ordered calibrated to your specifications or you may follow the procedure below to set your own calibration.
Be sure to check the input, output, GAIN and OFFSET specifications of the ASA. It is possible that the ASA cannot re-scale to your requirements.

CHECKOUT

Complete the following steps to change the calibration of the ASA. You will need a digital volt/current meter, a 24 to 30 VDC or VAC power supply and a voltage input signal simulator.

EQUIVALENT CALIBRATION VOLTAGE

Use a voltage signal for your input signal during calibration: this makes both the procedure and the explanation easier. If you will require a current input when you are finished, use the equation below to find the equivalent calibration voltage to use during the calibration procedure:
Equivalent Calibration Voltage = Required Input Signal Amps x 250

Example: 1 VDC is the equivalent calibration voltage for a 4 mA input signal (1= .004 x 250) or 5VDC is the equivalent calibration voltage for a 20 mA input signal (5=.020 x 250).

Step 1) Trim Pot Presets
Set all pots as follows to start (These are 25 turn trim pots with no hard stops; they may make a slight clicking sound at either end of their range):
Turn the GAIN pot Full Counterclockwise: = Gain of 1
Turn the OFFSET pots Fully Clockwise: = 0 volts offset

Step 2) Jumper Shunt Presets
J1 IN - INCOMING SIGNAL: Set in "E" position for voltage input.
If you require a current input, you will set this shunt in the "I" position AFTER you are finished with the calibration procedure.

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

Version: 6.0
I0000602

J2 - OFFSET: Set in the 'O' position for no offset to the output. If you will require a (+) or (-) offset, you will set this shunt in the appropriate position in Step 6

Step 3) Wiring Connections
Make the following connections with the power OFF :
Connect a 24 to 30 VDC or VAC power supply (see power supply information on specifications or detail at bottom of page 3 instructions) to the ASA terminals (+) and COM.
Connect the (-) input signal to the IN (-) terminal.
Connect the (-) meter lead to the OUT (-) terminal.
Connect (+) input signal lead to the IN (+) terminal.
Connect (+) meter lead to the OUT (+) terminal.

Step 4) Power Up
Turn on the power supply: the POWER indicator will light
Step 5) Set-Up- Input / Output Signal Adjustments
In this step you will figure the desired voltage/current input signal span and the desired voltage output signal span and calibrate the ASA to these input and output signal spans.

To calculate the voltage/current input signal span, subtract the minimum voltage/current input signal from the maximum input signal (i.e. a 0 to 5 volt input signal will give you a 5 volt input signal span: 5-0=5).

To calculate the voltage output signal span, subtract the minimum voltage output signal from the maximum voltage output signal (i.e. a 3 to 15 volt output signal will give you a 12 volt output signal span: 15-3=12).

Take the number for the voltage input signal span and apply this voltage to the "IN" (+) and (-) terminals. Compare the output voltage reading on your meter with the voltage output signal span you calculated about. If the meter is higher or lower, adjust the "GAIN" potentiometer until the meter reads the calculated output signal span.

Step 6) Offset Adjustments
The offset adjustments simply shift the output signal range up or down from a "no offset" setting. For example, an output signal range with "no offset" is 3 to 15 volts. The maximum offset range is +/- 0 to 20 VDC.

Adding an offset of 2 volts would make the output signal range 5 to 17 volts. Subtracting an offset of 2 volts would make the output signal range 1 to 13 volts.

Apply the minimum voltage input signal and read the minimum output signal on the meter. With the "OFFSET" jumper shunt "J2" in the "0" position, no offset will be added or subtracted from the output signal range.

If you need to shift the output signal range up, set the "OFFSET" jumper shunt "J2" in the "+" position and adjust the "OFFSET" potentiometer until you increase the voltage reading on the meter to match the desired minimum output voltage.

(Remember, this also increases the maximum output by the same amount.)

If you need to shift the output signal range down, set the "OFFSET" jumper shunt "J2" in the "-" position and adjust the "OFFSET" potentiometer until you decrease the voltage reading on the meter to match the desired minimum output voltage.

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

Version: 6.0
I0000602

(Remember, this also decreases the maximum output by the same amount.)

Step 7) Final Adjustments
If you require a current input, set the "J1" IN jumper shunt in the "I" position. Check operation of the ASA for desired signal rescaling and operation.

PRODUCT SPECIFICATIONS

NON-SPECIFIC INFORMATION	
Supply Voltage:	24 VAC +10%/-5% (0-20 VDC out), 24 VDC +/- 10% (0-18 VDC out) 25-30 VDC (0-20 VDC out)
Supply Current:	50A nominal with no load, 2.05A maximum (Dependent on Load Impedance)
Input Voltage Signal Range (@ Impedance):	0 to 20 VDC @ 200,000Ω
Input Current Signal Range (@ Impedance):	0 to 44 mA @ 250Ω
Input Resistance Signal Range:	0 to 500,000Ω
Output Voltage Signal Range:	0 to 20 VDC
Output Voltage Signal Offset:	+/- 0 to 20 VDC
Output Voltage Signal Gain:	1-20 times (output can't exceed 20 VDC)
Output Load Impedance:	10Ω minimum
Output Signal Offset (Jumper Selectable):	Zero Offset, Positive Offset, Negative Offset
Input-Output Tracking Accuracy:	+/- 2% Full Scale Output
Power Range:	2A or 30 Watts maximum
Connections:	45° Captive screw Terminal Blocks
Wire Size:	12 (3.31 mm²) to 22 AWG (0.33 mm²)
Terminal Block Torque Rating:	0.5 Nm (Minimum); 0.6 Nm (Maximum)
Operating Temperature Range:	-40 to 150°F (-40 to 65°C)
Operating Humidity Range:	5 to 95% non-condensing
Storage Temperature:	-40 to 150°F (-28.9 to 65.5°C)

WARRANTY

The ASA Series is covered by ACI's Two (2) 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.

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

Version: 6.0
I0000602