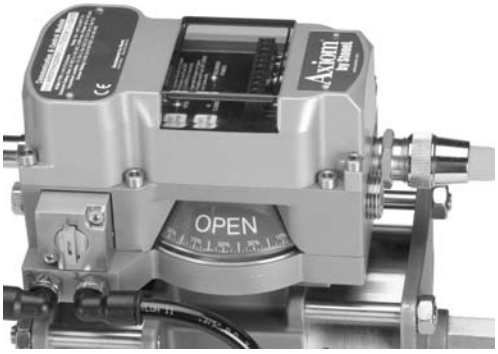
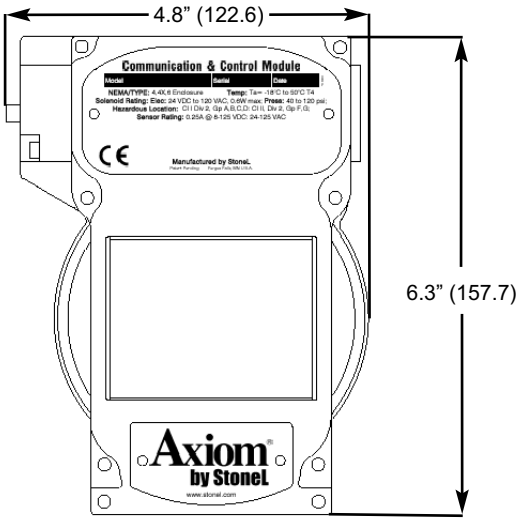
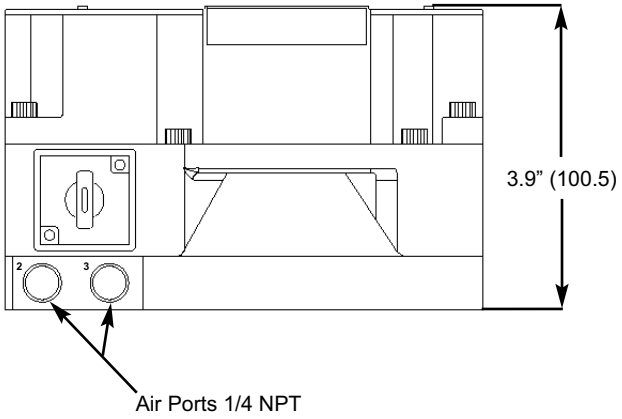
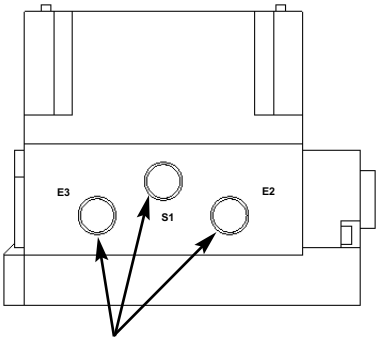
Axiom® with MODBUS Sensing & Communications Module (AMI95_____)

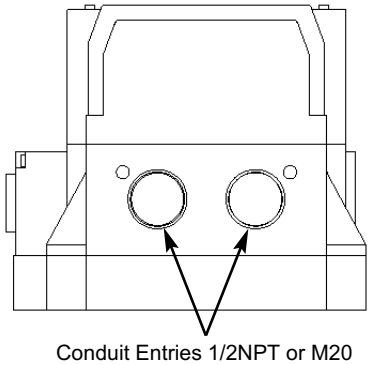
Installation & Adjusting Instructions











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Axiom Model Selector (Example: AMI951DA11SRA)

	Function	Pneumatic Valve	Approvals	Entry Options	Capabilities	Visual Indicator	Brand	Options
AMI	**Bus Communication Modules** **95** ModBus	**Single Solenoid Spring Return** **1B** 24VDC/1.8 watt coil *(Use with Function 92, 94, 95, 96, 97)* **1D** 24VDC/0.5 watt coil *(Use with Function 92, 94, 95, 96, 97)* **Dual Solenoid Shuttle Piston** **2B** 24VDC/1.8 watt coil *(Use with Function 92, 94, 95, 96)* **2D** 24VDC/0.5 watt coil *(Use with Function 92, 94, 95, 96)* **Single Solenoid Spring Return** ***(Momentary Ext. Manual Override)*** **3B** 24VDC/1.8 watt coil *(Use with Function 92, 94, 95, 96, 97)* **3D** 24VDC/0.5 watt coil *(Use with Function 92, 94, 95, 96, 97)* **Dual Solenoid Shuttle Piston** ***(Momentary Ext. Manual Override)*** **4B** 24VDC/1.8 watt coil *(Use with Function 92, 94, 95, 96)* **4D** 24VDC/0.5 watt coil *(Use with Function 92, 94, 95, 96)* **Single Solenoid Spring Return** ***(Latching Ext. Manual Override)*** **5B** 24VDC/1.8 watt coil *(Use with Function 92, 94, 95, 96, 97)* **5D** 24VDC/0.5 watt coil *(Use with Function 92, 94, 95, 96, 97)* **Dual Solenoid Shuttle Piston** ***(Latching Ext. Manual Override)*** **6B** 24VDC/1.8 watt coil *(Use with Function 92, 94, 95, 96)* **6D** 24VDC/0.5 watt coil *(Use with Function 92, 94, 95, 96)*	**A** cFMus **V** ATEX **L** Inmetro	**02** (2) 1/2" NPT **05** (2) M20 **10** (1) 4-Pin Mini Connector **11** (1) 5-Pin Mini Connector **13** (1) 4-Pin Micro Connector **15** (1) 5-Pin Micro Connector **17** (1) 6-Pin Micro Connector **18** (1) 8-Pin Micro Connector **19** (1) 6-Pin Mini Connector **20** (1) 7-Pin Mini Connector **21** (1) 8-Pin Mini Connector	**S** Standard **D** Diagnostics *(Function 96 only)*	**R** Red Closed **G** Green Closed **1** T1 Three Way **2** T2 Three Way **X** Special	**A** StoneL **M** Metso **N** Neles	**-XXXXX** Special Unit ID **-T** Extended Temp. Coil

Axiom with ModBus Sensing & Communications Module

ModBus Module Specifications

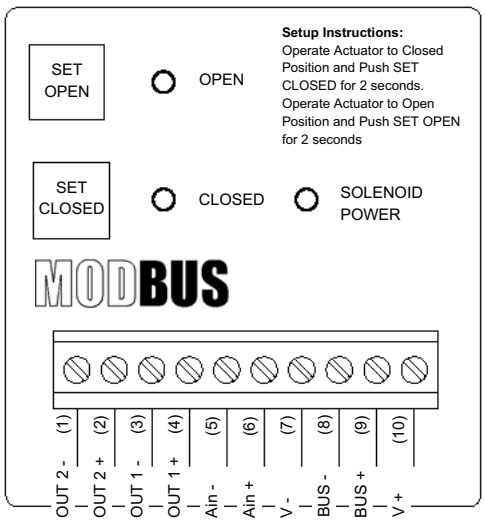
Communication Protocol:	ModBus
Configuration:	(2) Discrete Inputs (Sensors) (1) Auxiliary Analog Input (4-20mA) (2) Discrete Outputs (Solenoids)
Voltage:	24VDC (The 24VDC power source should have the same ground reference as the communication line)
Output Voltage:	24VDC
Current Consumption:	40mA (1) 0.5w coil; 61mA (2) 0.5w coils 94mA (1) 1.8w coil; 169mA (2) 1.8w coils
Max. Output Current:	200mA
Default Address:	03
Bit Assignment:	Inputs 10001 = Red LED (Bottom Sensor) 10002 = Green LED (Top Sensor) 30001 = Analog Input Outputs 00001 = OUT 1 00002 = OUT 2

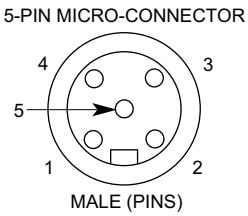
To Bench Test a ModBus Sensing & Communications Module:
To test sensors, use a 24 Vdc power supply. No series load resistor is required. Operate actuator to the closed position. Apply power across the "V+" and "V-" terminal points. Press and hold "Closed Set" button until "Closed LED is lit (2 seconds). Release button. Operate actuator to the open position. Press and hold "Open Set" button until "Open LED is lit (2 seconds). Release button. Set points are retained even after power is removed. A functioning ModBus network is required to test communications.

WARNING:

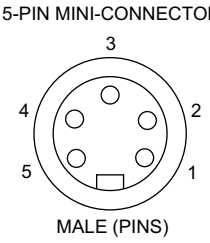
DO NOT APPLY EXTERNAL POWER TO THE OUTPUT TERMINALS. THIS WILL CAUSE PERMANENT DAMAGE TO THE UNIT

Wiring Diagram and Standard Connector Configuration Pin-Out





PIN	SIGNAL
1	Not Used
2	V+
3	V -
4	BUS +
5	BUS -



General Specifications and Ratings

Materials of Construction	
Cover:	Lexan® Polycarbonate
Housing:	Epoxy Coated Anodized Aluminum
Fasteners:	Stainless Steel
O-Rings:	Nitrile compound
Valve Manifold:	Epoxy Coated Anodized Aluminum
Operating Life:	One Million Cycles
Temperature Range:	See Solenoid Specifications

Enclosure Protection	
NEMA:	4, 4X, 6; IP67
Hazardous Location Ratings	
Nonincendive:	Class I&II, Div 2, All Gas Groups
Warranty	
Sensing & Communication Module:	Five Years
Mechanical Components:	Two Years

Pneumatic Valve Specifications

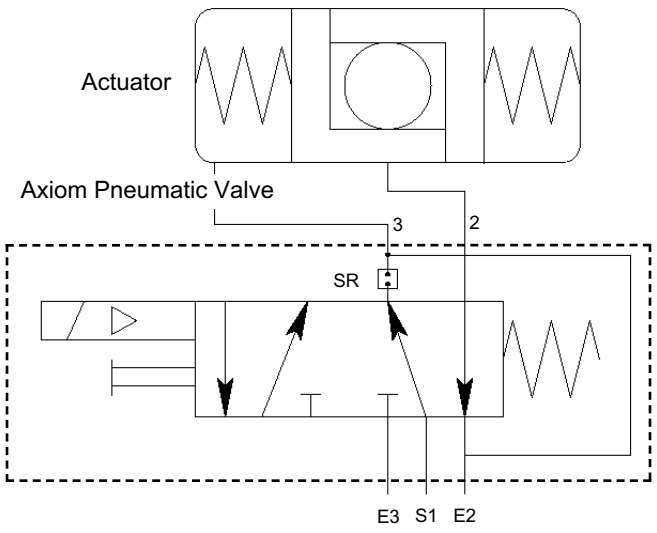
General Pneumatic Specifications	
Valve Design:	Pilot operated spool valve
Pilot Operator Options:	Solenoid Coil or Piezo
Configuration:	
Single Pilot:	5-Way, 2-Position, Spring Return
Dual Pilot:	5-Way, 2-Position, Shuttle Piston
Flow Rating:	0.70 Cv (Kv = 0.60 based on flow m3/h)
Porting:	1/4" NPT
Operating Pressure:	40 psi to 120 psi (2.7 to 7.5 bar)
Filtration Requirements:	40 Microns
Operating Temperature:	See pilot specifications
Operating Life:	1 million cycles
Manual Override:	Internal momentary
Material of Construction:	
Spool:	Anodized aluminum
Body:	Epoxy coated anodized aluminum
O-ring Spacers:	Polysulphone
End Caps & Fasteners:	Stainless Steel
O-rings	A Nitrile Compound

Solenoid Coil Specifications

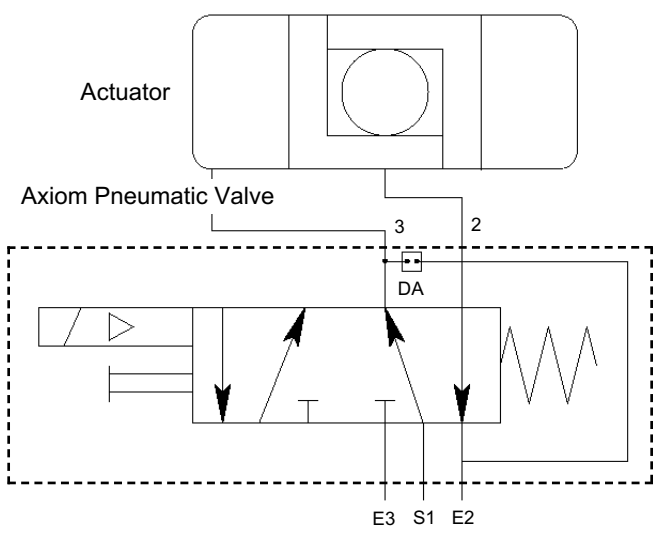
24 VDC/120 VAC Universal (1H, 2H, 3H, 4H, 5H, 6H)	
Operating Voltage:	22 VDC min/130 VAC max
Power Consumption:	0.6 Watts
AC Current Consumption:	18mA
Operating Temperature:	-18° C to 50° C (0° F to 120° F)
Extended Temp (-T option)	-40° C to 80° C (-40° F to 176° F) (NEC)
	-40° C to 70° C (-40° F to 158° F) (IEC)
Filtration Requirements:	40 Microns

24 VDC (1B, 2B, 3B, 4B, 5B, 6B)	
Operating Voltage:	24 VDC
Power Consumption:	1.8 Watts
Operating Temperature:	-18° C to 50° C (0° F to 120° F)
Extended Temp (-T option)	-40° C to 80° C (-40° F to 176° F) (NEC)
	-40° C to 70° C (-40° F to 158° F) (IEC)
Filtration Requirements:	40 Microns
24 VDC (1D, 2D, 3D, 4D, 5D, 6D)	
Operating Voltage:	24 VDC
Power Consumption:	0.5 Watts
Operating Temperature:	-18° C to 50° C (0° F to 120° F)
Extended Temp (-T option)	-40° C to 80° C (-40° F to 176° F) (NEC)
	-40° C to 70° C (-40° F to 158° F) (IEC)
Filtration Requirements:	40 Microns
12 VDC (1E, 2E, 3E, 4E, 5E, 6E) (Intrinsically Safe)	
Operating Voltage:	12 VDC (output of barrier)
Power Consumption:	0.5 Watts
Operating Temperature:	-18° C to 50° C (0° F to 120° F)
Extended Temp (-T option)	-40° C to 80° C (-40° F to 176° F) (NEC)
	-40° C to 70° C (-40° F to 158° F) (IEC)
Filtration Requirements:	40 Microns
Entity Parameters:	Ui=28VDC; Ii=120mA; Ci=0; Li=0; Pi=1.0W
Piezo (1A, 2A, 3A, 4A, 5A, 6A)	
Operating Voltage:	5.5 VDC to 9.0 VDC
Current Consumption:	2.0 mA @ 6.5 VDC
Temperature Range:	-10° C to 60° C (14° F to 140° F)
Filtration Requirements:	Dried/30 Microns

Spring Return Actuator with Rebreather Open



Double Acting Actuator with Rebreather Closed



Assembly and Mounting Instructions

Note

Mounting of the Axiom requires a StoneL mounting kit specific to the actuator the Axiom is to be mounted to.

Note

It is recommended that thread lubricant or anti-seize be used on the Axiom Cover Screws (Item# 1) and Axiom Body Screws (Item# 3) prior to assembly.

Note

In high cycle or high vibration applications, blue Loctite® may be used on the Air Manifold Mounting Screws (Item# 11) and the Visual Indicator Drum Retaining Screw (Item# 9).

Note

It is highly recommended that exhaust ports E2 and E3 be fitted with low restriction mufflers or breather vent caps to prevent ingestion of water and debris into the pneumatic valve .

1. Refer to Axiom Assembly Drawing located on Page 6 when performing mounting and assembly procedures.
2. Remove Axiom unit from shipping container. Ensure all listed items are present.
3. With an M4 allen wrench, loosen the four captive Axiom Cover Screws (Item# 1), remove cover.
4. Determine if the actuator the Axiom is to be mounted on is double acting (DA) or spring return (SR). Flip the Axiom body (Item# 4) over and ensure the DA/SR Plug (Item# 5) is in the correct position. (See Detail - A on Page 6). If the DA/SR Plug is in the incorrect position, gently remove plug with a pair of pliers and insert into the proper hole.
5. From the mounting kit package, locate the Air Manifold Plate (Item# 14). Place the Air Manifold Plate on the actuator. Using an M4 allen wrench, fasten down with the four Air Manifold Mounting Screws (Item# 11). Torque screws to 25 - 30 in.lbs (2.8 - 3.4Nm).
6. Place Visual Indicator Drive Block (Item# 10) into slot on the actuator shaft. Place Visual Indicator Drum Coupler (Item# 8) onto the Visual Indicator Drive Block. Next, place the Visual Indicator Drum (Item# 7) onto the Visual Indicator Drum Coupler. Align the holes in all three items with the the threaded hole in the actuator shaft and fasten down with the Visual Indicator Drum Retaining Screw (Item# 9). Leave screw loose in order to facilitate indexing of the visual indicator.
7. With the actuator in the closed position, center the Visual Indicator Drum until the “OPEN” quadrant is centered between the “V.I INDEX” markings on the AIr Manifold Plate. (See Detail - B on Page 6). Tighten down with the Visual Indicator Drum Retaining Screw 15 - 20 in.lbs (1.7 - 2.3Nm).
8. Verify Air Manifold Plate Orifice O-rings (Item# 12) and Visual Indicator Cover O-ring (Item# 13) are in place.
9. Place the Visual Indicator Cover (Item# 6) over the Visual Indicator Drum assembly then set the Axiom Body (Item# 4) in place. With an M4 allen wrench, torque the Axiom Body Screws (Item# 3) to 25 - 30 in.lbs (2.8 - 3.4Nm).
10. After all wiring and sensor setting procedures have been completed, install Axiom Cover and torque Axiom Cover Screws to 15 - 20 in.lbs (1.7 - 2.3Nm).

Sensing & Communications Module Sensor Setting Instructions

1. With the Sensor & Communication Module (CCM) wired to the control system and power applied, (Refer Wiring Diagram located on Page 4), operate actuator to the closed position.

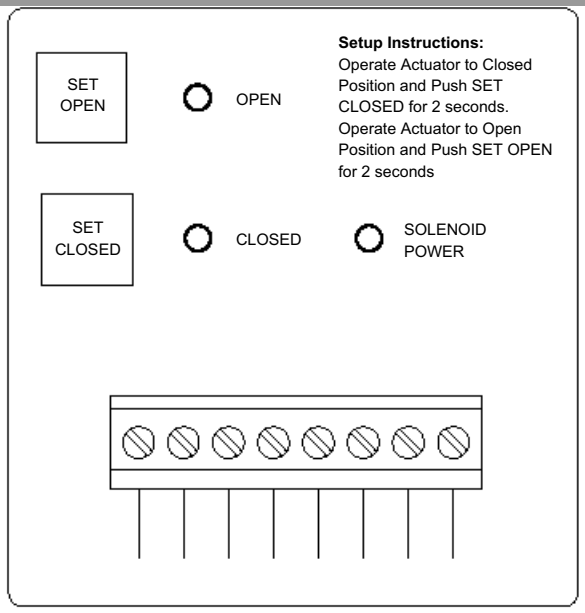
2. Press and hold “Closed Set” button until “Closed LED is lit (2 seconds). Release button.

3. Operate actuator to the open position.

4. Press and hold “Open Set” button until “Open LED is lit (2 seconds). Release button.

5. Set points are retained even after power is removed.

6. Sensor & Communication Modules on Axiom units with a single solenoid have a “Solenoid Power” LED indicating when solenoid power is applied.



Axiom Assembly Drawing

ITEM#	DESCRIPTION	QTY
1	Axiom Cover Screws	4
2	Axiom Cover	1
3	Axiom Body Screws	4
4	Axiom Body	1
5	DA/SR Plug	1
6	Visual Indicator Cover	1
7	Visual Indicator Drum	1
8	Visual Indicator Drum Coupler	1
Item# 9 thru 14 are provided with the mounting kit. Mounting kits are sold separately		
9	Visual Indicator Drum Retaining Screw	1
10	Visual Indicator Drive Block	1
11	Air Manifold Plate Mounting Screws	4
12	Air Manifold Plate Orifice O-rings	3
13	Visual Indicator Cover O-ring	1
14	Air Manifold Plate	1