Axiom® AN
Advanced performance

The Axiom AN series offers unmatched reliability using non-contact position sensing with solid state electronics and contaminant-tolerant pneumatic control. Coupled with its space-efficient design, corrosion resistance and networking/Wireless Link capability, the AN offers unrivaled convenience and cost-saving benefits in hazardous and general purpose process applications.

**Exceptional reliability**
The proven technologies combined with efficient design and durable materials, delivers long life and exceptional performance.
- Survives harsh conditions
- Tolerates air contaminants
- Provides solid state position-sensing

**User-friendly advanced technology**
Designed with the user in mind, the Axiom AN offers the utmost in ease and convenience.
- Rapid enclosure entry
- Easy configuration
- Convenient wiring access
- Wireless Link app set up

**Universal application**
The strategic engineering reduces inventory and ensures universal adaptability in many applications and environments.
- Universal voltage capability
- Selectable SR/DA action
- Direct actuator attachment

**Space efficient design**
The Axiom AN encloses all electrical components in a compact package. The automated valve spacing envelope is minimized without compromising performance or maintainability.
- Requires less than 5" of total clearance
- Additional 2" clearance for cover removal
- No tools for cover removal
Features

1. **Impact-resistant cover**
   Vapor tight; Lexan® cover screws off for rapid entry without tools. It withstands high-pressure wash downs and typical process environment corrosives.

2. **Universal voltage solenoid system**
   Operates from 24 VDC – 250 VAC at extended temperate range and features manual override. Single or dual coil available.

3. **Convenient settings**
   Touch pad enables position settings to be conveniently locked in. Switch settings remain in place during power cycling.

4. **Fully sealed module**
   Solid state, fully potted sensors provide protection against residual moisture, vibration, and corrosives.

5. **High flow pneumatic valve**
   5-way, 2-position valve operates on standard plant air. Rebreather prevents ingestion of contaminated air into actuator.

6. **High visibility indication**
   Mechanical and electronic indication confirms open and closed position. Intense LEDs display position status from a distance.

7. **Exceptional long life**
   Magnetic position sensor has no bushings or shafts to wear out, delivers reliable performance, and is unaffected by actuator shaft wear.

8. **SR/DA plug**
   Plug positions into designated port to enable spring return or double-acting operation.

9. **Direct actuator attachment**
   Compact mounting manifold system requires less space and wiring, connects to VDI/VDE 3845 (NAMUR) actuators and adapts to spring return or double-acting actuators.

**Proven performance in process industries**
- Chemical
- Oil and gas
- Pharmaceutical and biotech
- Food and beverage
- Marine
- Offshore service vessels (OSV)
- Biofuels
- And more...
Pneumatic control

The Axiom’s pneumatic valve system consists of a low-power pilot that drives the main high-flow spool valve. Pilots may be selected for conventional or bus networking applications. Both stages of the pneumatic valve system have been designed for long life, high tolerance to air line contaminants, and ease of maintenance should components become fouled. Pilots are automatically associated with the appropriate function selected.

Special features

- Solenoid pilot and main spool design offer long life, exceptional tolerance to dirty air, and tight shut-off.
- Universal voltage solenoid system may be used for standard AC or DC applications.
- Five-way, two-position spring return configuration may be used for either single- or double-acting actuators. Dual coil shuttle piston versions are also available for fail-in-last position.
- Rebreather channels exhausted air from pressurized side of actuator into spring side, preventing ingestion of contaminated air from the environment that may corrode springs or actuator internals.
- Pneumatic manual override is conveniently located on top for easy access.

General pneumatic valve specifications

<table>
<thead>
<tr>
<th>Valve design</th>
<th>Pilot operated spool valve</th>
</tr>
</thead>
<tbody>
<tr>
<td>Configuration</td>
<td>Single pilot</td>
</tr>
<tr>
<td></td>
<td>Dual pilot</td>
</tr>
<tr>
<td>Flow rating</td>
<td>0.8 Cv</td>
</tr>
<tr>
<td></td>
<td>1.2 Cv</td>
</tr>
<tr>
<td>Axion porting</td>
<td>W NPT (0.8 Cv)</td>
</tr>
<tr>
<td></td>
<td>W NPT (1.2 Cv)</td>
</tr>
<tr>
<td>Manifold porting</td>
<td>W NPT</td>
</tr>
<tr>
<td>Operating pressure</td>
<td>45 psi to 120 psi (31 to 82 bar)</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>-40°C to 80°C (-40°F to 176°F)</td>
</tr>
<tr>
<td>Operating life</td>
<td>1 million cycles</td>
</tr>
<tr>
<td>Manual override</td>
<td>Internal momentary</td>
</tr>
<tr>
<td></td>
<td>Optional external momentary available</td>
</tr>
<tr>
<td></td>
<td>Optional external latching available</td>
</tr>
<tr>
<td>Materials of construction</td>
<td>Spool Nickel plated aluminum</td>
</tr>
<tr>
<td></td>
<td>Body Epoxy-coated anodized aluminum</td>
</tr>
<tr>
<td></td>
<td>Seal spacers Polysulphone</td>
</tr>
<tr>
<td></td>
<td>Spool seals Nitrile compound</td>
</tr>
<tr>
<td></td>
<td>O-rings Nitrile compound</td>
</tr>
<tr>
<td></td>
<td>End-caps and fasteners Nickel plated aluminum and stainless steel</td>
</tr>
</tbody>
</table>

Solenoid coil specifications

35
- Operating voltage 20 - 250 VAC, 20 - 55 VDC
- Power consumption 12 mA @ 20 - 250 VAC (1.1 watts typical)
- Filtration requirements 50 micron

45
- Operating voltage 12 - 24 VDC (5 watts output of barrier)
- Power consumption 0.5 watts @ 12 VDC, 1.0 watt @ 24 VDC
- Filtration requirements 50 micron

92 & 97
- Operating voltage 24 VDC
- Power consumption 0.5 watts
- Filtration requirements 50 micron

Single or dual pilot configuration

The Axiom AN is available in either single or dual pilot configurations. Dual pilot options are available for shuttle piston, fail-in-last position applications. Several external manual override options are also readily available. For special valve configurations with non-standard manual override features, please consult Stonel.
Manifold and mounting system

The Axiom is designed to readily adapt to most quarter-turn actuators. The mounting manifold system combines the mounting base and pneumatic manifold to minimize space and simplify installation. It attaches the Axiom directly to the actuator and ports air from the pneumatic valve to the actuator.

Included in the manifold system are:
1. Actuator shaft adaptor and fastener.
2. Epoxy-coated anodized aluminum mounting plate manifold with o-rings and stainless steel fasteners.

The manifold system readily adapts to VDI/VDE 3845 sizes 1, 2 and 3. Special variations may be made for sizes 3, 4 and non-standard quarter-turn actuator mounting patterns.

Single or double-acting configuration

The same Axiom model is suitable for both single-acting/spring return (SR) and double-acting (DA) actuators. The standard rebreather capability for single-acting/spring return is built in. Field configuration may be made by conveniently removing and reinserting the plug for the appropriate actuator type. For rebreather to function properly, both manifold ports must be tubed to the actuator.

Spring return actuator

Double-acting actuator
Sensing and communication module

Switching and sensor specifications

**SST NO sensor (355)**
- Configuration: 2 NO 2-wire solid state sensors
- Voltage range: 20 - 250 VAC/VDC
- Minimum on current: 2.0 mA
- Maximum continuous current: 0.1 amps
- Typical leakage current: AC circuits 0.35 mA
  DC circuits 0.25 mA
- Typical voltage drop: 6.5 volts @ 10 mA
  7.2 volts @ 100 mA
- Circuit protection: Protected against short circuits and direct application of voltage with no load

**Wiring diagram (355)**

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**SST**

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**Valve Communication Terminal (VCT) specifications**

**DeviceNet™ communication (925 & 92W)**
- Communication protocol: DeviceNet™
- Configuration: (2) Discrete inputs (sensors)
  (1) Auxiliary analog input (4-20 mA)
  (2) Discrete outputs (solenoids)
- Input voltage: 11 - 25 VDC via DeviceNet™ network
- Output voltage: 24 VDC
- Analog input impedance: 254 ohms
- Quiescent current: No analog input, no outputs energized: 35 mA @ 24 VDC; 57 mA @ 11 VDC
- Maximum output current: 150 mA (all outputs combined)
- Default address: 63 (software assigned)
- Default baud rate: 125K (software selectable 125K, 250K or 500K baud)
- Messaging: Polling, cyclic and change of state
- DeviceNet™ type: 100

**Wiring diagram (925 & 92W)**

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**Switching and sensor specifications**

**NAMUR sensor (455)**
- Configuration: 2 NAMUR sensors (EN 60947-5-6:15)
- Voltage range: 5 - 25 VDC
- Current ratings: Target present current < 1.0 mA
  Target absent current > 2.1 mA
- Use with intrinsically safe repeater barrier: NAMUR sensors conform to EN 60947-5-6 standard
- Intrinsically safe solenoid coil
  Voltage: 12 - 32 volts from output of solenoid barrier to coil
  *Note: Use of an intrinsically safe solenoid barrier with internal impedance, or end-to-end resistance, of ≤ 500 ohms required for proper solenoid coil operation.*

**Wiring diagram (455)**

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**Valve Communication Terminal (VCT) specifications**

**AS-Interface communication and extended addressing (975 & 97W)**
- Communication protocol: AS-Interface v3.0
- Configuration: (2) Discrete inputs (sensors)
  (2) Auxiliary discrete inputs
  (2) Discrete outputs (solenoids)
- Input voltage: 26.5 ± 3.6 VDC (AS-I voltage)
- Output voltage: 24 VDC (± 10%)
- Quiescent current: 35 mA
- Maximum output current: 100 mA (all outputs combined)
- Default address: 0A
- I/O codes: 1D = A; 1O = 7; 1D1 = F; 1D2 = E (5-7 A,E)

**Wiring diagram (975 & 97W)**

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Valve communication & control
Position sensor and module

The Axiom platform has all position sensing, communication or switching integrated into Stone’s C-module. Users may set open/closed positions conveniently and accurately on all modules. And easy-to-view instructions, along with bold LED indication, are displayed on the module itself.

**Continuous sensing with open/closed settings**

The C-module (continuous sensing) integrates a magnetic resistive sensor system to monitor exact valve position throughout the rotational range. Touch-sensitive or remote open and closed position setting along with microprocessor based operation make this state-of-the-art system convenient, reliable, and smart.

Position settings are made using the touch-sensitive buttons on the module’s overlay. Simply operate the actuator to the open position (using standard internal manual override) and touch the SET OPEN button. Operate the actuator to the closed position and touch the SET CLOSED button. Position settings remain locked in when power is removed and reapplied.

**Reliable position sensing**

An extremely reliable solid state magnetic resistive (mag res) sensor detects the valve position by monitoring the orientation of a magnet attached to the actuator. This design is tolerant of lateral and vertical shaft movement, which may occur in heavily used actuators, without affecting rotational measurement.

No cams, shafts or seals - offering exceptional vibration tolerance and nothing to wear out.
Axiom AN with Wireless Link

**Easily access hard-to-reach automated valves**
Discover convenient remote access of your automated valves when you install the Axiom AN with AS-Interface and DeviceNet featuring Bluetooth® technology. Devices may be remotely accessed from up to 50 meters depending on obstructions. Setting changes and solenoid control are enabled through the DeviceNet or AS-Interface network or by the AS-Interface power supply jumper.

**Special features**
- Improve safety by easily controlling hard-to-reach automated valves without putting plant personnel at risk.
- Look up factory preset module code and serial number remotely.
- Electronically enter and store key automated valve system information including user tag and maintenance log.
- Reduce network commissioning time by accessing the VCT address and baud rate to make changes.
- Reduce maintenance time by monitoring valve cycle count, cycle times, storing maintenance logs, and accessing multiple valves from one location.
- Conveniently retrieve installation manuals for additional technical information when connected to internet.

Customize the tag for a device, change the address, force the solenoids on or off, wink the device, and set the valve limits.

Store and view additional information about a specific valve.

View real time valve position, cycle count, cycle timing, current valve temperature, error status, and more.

**Interfacing devices**
Conventional Apple® devices may be used including:
- iPhone® Version 4S and above
- iPad® Version 3.0 and above
- iPad mini® All

Contact Stonel regarding additional devices and special enclosures to make these devices suitable for use in hazardous locations.
Set up and operation
Devices with Wireless Link are commissioned and set up identically to the standard AS-Interface or DeviceNet unit. In addition, when powered up with a conventional power source or by the network, it may be accessed by standard IOS devices. The Axiom is accessed with the Bluetooth protocol using the Stonel Wireless Link application. Sequence of operation is:

1. Download the Stonel application from the App Store onto your device (free of charge)
2. Start the application in your Apple device
3. All energized wireless modules in range will come up
4. Push wink to positively confirm the device you have linked (device LEDs will flash)
5. Touch the specific ID tag to link with your handheld.

You can then monitor all status and diagnostic information and make necessary information changes to the free form fields at any time. Switch settings, address changes, and solenoid operation may be performed only if network- or power supply-enabled. Other information may also be added to the free form fields.

Wireless Link enabled network
All settings and inputs are locked when standard network communication is functioning. For fast commissioning and asset management you can import and export electronic tags, model number, serial number, device address, descriptive fields, diagnostic data and more to and from standard CSV/Excel files.
**Model selector**

<table>
<thead>
<tr>
<th>SERIES</th>
<th>AN</th>
<th>Nonincendive or intrinsically safe</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>FUNCTIONS</th>
<th>35S</th>
<th>SS/ Universal 20 - 250 volt (NO sensor)</th>
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<tbody>
<tr>
<td>45S</td>
<td>NAMUR module (EN 60947-5-6; 15) (not available with any dual pilot option)</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Valve communication Terminals (VCTs)</th>
<th>925</th>
<th>DeviceNet</th>
</tr>
</thead>
<tbody>
<tr>
<td>92W</td>
<td>DeviceNet™ with Wireless Link</td>
<td></td>
</tr>
<tr>
<td>97S</td>
<td>AS-Interface with extended addressing</td>
<td></td>
</tr>
<tr>
<td>97W</td>
<td>AS-Interface with extended addressing and Wireless Link</td>
<td></td>
</tr>
</tbody>
</table>

**PNEUMATIC OVERRIDE / CV** (standard pneumatic pilot and valve -40° C to 80°C)

<table>
<thead>
<tr>
<th>For single pilot</th>
<th>For dual pilot</th>
</tr>
</thead>
<tbody>
<tr>
<td>1N</td>
<td>2N</td>
</tr>
<tr>
<td>1M</td>
<td>2M</td>
</tr>
<tr>
<td>1L</td>
<td>2L</td>
</tr>
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<td>2E</td>
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<td>1Y</td>
<td>2Y</td>
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<tr>
<td>1G</td>
<td>2G</td>
</tr>
<tr>
<td>9N</td>
<td>No pneumatics</td>
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**ENCLOSURE**

<table>
<thead>
<tr>
<th>Clear cover</th>
<th>Aluminum cover</th>
</tr>
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<tbody>
<tr>
<td>C</td>
<td>North American (MEC/CEC)</td>
</tr>
<tr>
<td>D</td>
<td>International (IEC)</td>
</tr>
<tr>
<td>A</td>
<td>North American (MEC/CEC)</td>
</tr>
<tr>
<td>V</td>
<td>International (IEC)</td>
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</tbody>
</table>

**CONDUIT/CONNECTORS**

<table>
<thead>
<tr>
<th>Standard</th>
<th>Mini-Connectors (M12)</th>
</tr>
</thead>
<tbody>
<tr>
<td>02</td>
<td>02</td>
</tr>
<tr>
<td>05</td>
<td>(2) M20</td>
</tr>
<tr>
<td>10</td>
<td>13</td>
</tr>
<tr>
<td>11</td>
<td>14</td>
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<td>19</td>
<td>17</td>
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<tr>
<td>20</td>
<td>18</td>
</tr>
<tr>
<td>21</td>
<td></td>
</tr>
</tbody>
</table>

**VISUAL INDICATOR** [see chart below]

<table>
<thead>
<tr>
<th>RM</th>
<th>GM</th>
<th>OPTIONAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>AN</td>
<td>35S</td>
<td>1L</td>
</tr>
<tr>
<td>C</td>
<td></td>
<td>02</td>
</tr>
<tr>
<td>RM</td>
<td>1M</td>
<td>Three way 1</td>
</tr>
<tr>
<td>GM</td>
<td>2M</td>
<td>Three way 2</td>
</tr>
<tr>
<td>XM</td>
<td>Special</td>
<td></td>
</tr>
</tbody>
</table>

**MODEL NUMBER**

Mounting hardware required and sold separately. Some models may include 5-digit identification suffix.

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**Visual indicator designations**

Clearly view valve position status from up to 75 feet with the Axiom’s visual indicator. The indicator’s rugged Lexan® construction makes it resistant to physical damage and tolerant to most corrosives.

<table>
<thead>
<tr>
<th>DESIGNATION</th>
<th>0°</th>
<th>90°</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>R</strong></td>
<td>RED CLOSED</td>
<td>GREEN OPEN</td>
</tr>
<tr>
<td><strong>G</strong></td>
<td>GREEN CLOSED</td>
<td>RED OPEN</td>
</tr>
<tr>
<td>1</td>
<td>A&lt;sup&gt;a&lt;/sup&gt; &lt;sup&gt;b&lt;/sup&gt; B&lt;sup&gt;c&lt;/sup&gt;</td>
<td>A&lt;sup&gt;a&lt;/sup&gt; C&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>2</td>
<td>A&lt;sup&gt;a&lt;/sup&gt; B&lt;sup&gt;c&lt;/sup&gt;</td>
<td>A&lt;sup&gt;a&lt;/sup&gt; C&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>X</td>
<td>Specially configuration – please consult factory</td>
<td></td>
</tr>
</tbody>
</table>

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<sup>a</sup> <sup>b</sup> <sup>c</sup>
# Specifications

## Materials of construction
- Housing and air manifold plate: Epoxy-coated anodized aluminum
- Visual indicator drum: Nylon
- Visual indicator cover: Polycarbonate
- Fasteners: Stainless steel
- O-rings: Nitrile compound
- Operating life: 1 million cycles
- Temperature range: -40°C to 80°C (-40°F to 176°F)

## Warranty
- Sensing and communication module: Five years
- Mechanical components: Five years

## Unit weights
- Aluminum: 2.38 kg / 5.25 lb

## Unit dimensions
- Unit height: 122 mm [4.81 in]
- Cover removal clearance: 214 mm [8.40 in]

## Position sensing
- Accuracy: Within 1°
- Repeatability: Within 1°
- Setting buffer: 4° from setpoint (Rotational distance from original setpoint where switch will energize on return stroke)
- Dead band: 6° from setpoint (Rotational distance from original setpoint where switch will de-energize)
- Max rotational range: 120°

## Ratings
- Nonincendive (Class I and II, Div. 2): All models*
- Intrinsically safe (Ex ia Zone 0, Class I and II, Div. 1): Function 455 only*

## Enclosure protection
- Type 4X and 6: All models
- Ingress Protection 66 and 67: All models

## Approvals*
- See Stenel.com/approvals

* Only models listed on Stenel’s official website are approved per specific rating.

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## Dimensions

- Clear cover*: 4.81 in [122 mm]
- 1/4" NPT (2)
- 1/2" NPT (2) or M20 (2)
- 1/4" NPT (3) [0.8 Cv] or 3/8" NPT (3) [1.2 Cv]

* Aluminum cover 4.90 in [125 mm]