StoneL: Axiom AN
Valve communication and control for challenging environments

Exceptional reliability
Universal application
User-friendly advanced technology
Advanced performance

The Axiom AN 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

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

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

StoneL products proven in
• Chemical
• Oil and gas
• Pharmaceutical and biotech
• Food and beverage
• Marine
• Offshore service vessels (OSV)
• Biofuels
• And more...

5 YEAR warranty
See StoneL.com/approvals for current approvals.
Universal voltage solenoid system
Operates from 24 VDC – 250 VAC at extended temperate range and features manual override. Single or dual coil available.

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.

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

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

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

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

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

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

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.
User-friendly advanced technology

**Convenient switch setting**
The touch sensors have no moving parts; just hold your finger for two seconds on the button to set. The bright LED indication confirms that you have successfully set the position. Communication models allow you to configure and set the sensors using your smart phone or tablet; no cover removal needed!

**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.

**Easy everything**
You will save maintenance time and trouble with the user-friendly design offering easy attachment, easy cover removal, easy access to wiring right on top, easy access to internal pneumatic manual overrides and easy component replacement.

**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.

**High-visibility LED indication**
Clearly view valve position status with the high-visibility LED indicators. The LEDs offer easy viewing from a distance with the high intensity lighting that can be identified even in sunlight.

**Networking with Wireless Link**
Both the AS-Interface and DeviceNet models offer dramatic installation cost savings and have optional Wireless Link, with an iOS app. This feature offers unrivaled convenience and maintenance savings during the automated valve’s entire life cycle. You may remotely access your valves from up to 50 meters, depending on obstructions.

Pneumatic manual override is conveniently located on top for easy access.

Touch sensors and LED indicators make set up fast and easy.

No cams, shafts or seals - offering exceptional vibration tolerance and nothing to wear out.
Universal application

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.
3. Pneumatic plug for 5R/DA configuration.

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.

The mounting manifold system is specified and sold separately. Kits are specific to actuator manufacturer. For kit numbers visit: StoneL.com/mounting.
Integral pneumatics

The Axiom’s pneumatic valve system consists of a solenoid pilot that drives the main high-flow spool valve. 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.

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>Axiom porting</td>
<td>¼&quot; NPT (0.8 Cv)</td>
</tr>
<tr>
<td></td>
<td>¼&quot; NPT (1.2 Cv)</td>
</tr>
<tr>
<td>Manifold porting</td>
<td>¼&quot; NPT</td>
</tr>
<tr>
<td>Operating pressure</td>
<td>45 psi to 120 psi (3.1 to 8.2 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</td>
</tr>
<tr>
<td></td>
<td>Body</td>
</tr>
<tr>
<td></td>
<td>Seal spacers</td>
</tr>
<tr>
<td></td>
<td>Spool seals</td>
</tr>
<tr>
<td></td>
<td>O-rings</td>
</tr>
<tr>
<td></td>
<td>End-caps and fasteners</td>
</tr>
<tr>
<td></td>
<td>Nickel plated aluminum</td>
</tr>
<tr>
<td></td>
<td>Epoxy-coated anodized aluminum</td>
</tr>
<tr>
<td></td>
<td>Polysulfone</td>
</tr>
<tr>
<td></td>
<td>Nitrile compound</td>
</tr>
<tr>
<td></td>
<td>Nitrile compound</td>
</tr>
<tr>
<td></td>
<td>Nickel plated aluminum</td>
</tr>
<tr>
<td></td>
<td>and stainless steel</td>
</tr>
</tbody>
</table>

Solenoid coil specifications

**35**
- Operating voltage: 40 - 250 VAC, 20 - 55 VDC
- Power consumption: 20 mA @ 40 - 250 VAC (1.1 watts typical)
- Inrush current: 0.14 A @ 24 VDC (typical)
- Filtration requirements: 50 micron

**45**
- Operating voltage: 12 - 24 VDC (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 double-acting configuration

The same Axiom AN 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.
Proven sensing and communication

The Axiom platform has all position sensing, communication or switching integrated into StoneL’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.

Conventional I/O network
Valve monitors and valve controllers are often controlled and monitored using conventional I/O. In these cases, the position feedback is wired back to a PLC/DCS discrete input (DI) card. The solenoid valves are wired to and operated by a discrete output (DO) card. The Axiom solid state sensors are designed to work with the vast majority of DI/DO cards enabling compatibility with most PLC/DCS systems and a wide array of different voltages.

### Switching and sensor specifications

<table>
<thead>
<tr>
<th>SST NO sensor (35S)</th>
<th>NAMUR sensor (45S)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Configuration</strong></td>
<td>(2) NAMUR sensors (EN 60947-5-6; IS)</td>
</tr>
<tr>
<td><strong>Voltage range</strong></td>
<td>20 - 250 VAC/VDC</td>
</tr>
<tr>
<td><strong>Minimum on current</strong></td>
<td>2.0 mA</td>
</tr>
<tr>
<td><strong>Maximum continuous current</strong></td>
<td>0.1 amps</td>
</tr>
<tr>
<td><strong>Typical leakage current</strong></td>
<td>AC circuits 0.35 mA</td>
</tr>
<tr>
<td></td>
<td>DC circuits 0.25 mA</td>
</tr>
<tr>
<td><strong>Typical voltage drop</strong></td>
<td>6.5 volts @ 10 mA</td>
</tr>
<tr>
<td></td>
<td>7.2 volts @ 100 mA</td>
</tr>
<tr>
<td><strong>Circuit protection</strong></td>
<td>Protected against short circuits and direct application of voltage with no load.</td>
</tr>
</tbody>
</table>

#### Wiring diagram

**SST**

```
<table>
<thead>
<tr>
<th>Solenoid Valve</th>
<th>SOL 1 PWR 1</th>
<th>SOL 1 OUT</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOL 1 OUT</td>
<td>SOL 2 PWR 1</td>
<td>SOL 2 OUT</td>
</tr>
</tbody>
</table>
```

**NAMUR**

```
<table>
<thead>
<tr>
<th>Solenoid Valve</th>
<th>SOL 1 PWR</th>
<th>SOL 1 OUT</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOL 1 OUT</td>
<td>SOL 2 PWR</td>
<td>SOL 2 OUT</td>
</tr>
</tbody>
</table>
```

#### 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.
**Communication (bus) network**

In a communication network system, many devices such as valve communication terminals and other process instruments, can be connected to a single cable back to the DCS/PLC. Power and signal for all of the devices is carried over the network. Each device has its own address and it may have several I/O points.

AS-Interface is a versatile, low-cost alternative to traditional hard-wired I/O. It can replace traditional point-to-point wiring with a better, more flexible solution that is easier to install, operate and maintain and easier to re-configure. DeviceNet is another versatile, cost-saving alternative to traditional hard-wired I/O. It can replace traditional point-to-point wiring with a better, more flexible solution that saves money on installation and maintenance.

---

**Valve Communication Terminal (VCT) specifications**

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

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

---

<table>
<thead>
<tr>
<th>AS-Interface communication and extended addressing (97S &amp; 97W)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Communication protocol</strong> AS-Interface v3.0</td>
</tr>
<tr>
<td><strong>Configuration</strong></td>
</tr>
<tr>
<td>(2) Discrete inputs (sensors)</td>
</tr>
<tr>
<td>(2) Auxiliary discrete inputs</td>
</tr>
<tr>
<td>(2) Discrete outputs (solenoids)</td>
</tr>
<tr>
<td><strong>Input voltage</strong> 26.5-31 VDC (AS-I voltage)</td>
</tr>
<tr>
<td><strong>Output voltage</strong> 24 VDC (+/- 10%)</td>
</tr>
<tr>
<td><strong>Quiescent current</strong> 35 mA</td>
</tr>
<tr>
<td><strong>Maximum output current</strong> 100 mA (all outputs combined)</td>
</tr>
<tr>
<td><strong>Default address</strong> 0A</td>
</tr>
<tr>
<td><strong>ID/IO codes</strong> ID = A; IO = 7; ID1 = F; ID2 = E (S-7.A.E.)</td>
</tr>
</tbody>
</table>

**Wiring diagram (97S & 97W)**
Axiom AN with Wireless Link

Conventional iPhone® and iPad® devices may be used. Contact StoneL regarding additional devices and special enclosures to make these devices suitable for use in hazardous locations.

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.

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.
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.

All settings and inputs are locked when standard network communication is functioning.

Benefits of Wireless Link

1. Fast, convenient set-up for valve automation suppliers without special equipment.
2. Electronically enter and store key automated valve system information including:
   • End user tag number/information
   • Valve and actuator identification as well as Axiom model and serial number (Axiom information preset from factory)
   • Maintenance log.
3. Improve safety by easily accessing hard-to-reach automated valves without putting plant personnel at risk.
4. Reduce network commissioning time by accessing the VCT address and making changes if necessary.
5. Reduce maintenance time by monitoring valve cycle count, cycle times, storing maintenance logs, and accessing multiple valves from one location.
6. Conveniently retrieve installation manuals and access StoneL website when connected to Internet.

<table>
<thead>
<tr>
<th>Specifications for Wireless Link</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication</td>
</tr>
<tr>
<td>Transmit power</td>
</tr>
<tr>
<td>Data rate</td>
</tr>
<tr>
<td>Range</td>
</tr>
<tr>
<td>Registrations</td>
</tr>
<tr>
<td>CE compliance</td>
</tr>
<tr>
<td>VCT identification</td>
</tr>
<tr>
<td>VCT link</td>
</tr>
<tr>
<td>Application</td>
</tr>
<tr>
<td>Hand-holds</td>
</tr>
</tbody>
</table>
### 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.

#### Designation

<table>
<thead>
<tr>
<th>Designation</th>
<th>0°</th>
<th>90°</th>
</tr>
</thead>
<tbody>
<tr>
<td>R</td>
<td>Red closed</td>
<td>Green open</td>
</tr>
<tr>
<td>G</td>
<td>Green closed</td>
<td>Red open</td>
</tr>
</tbody>
</table>

#### Visual Indicators

- **R** (Red closed) and **G** (Green closed) are used for single-valve configurations.
- **1** and **2** are used for dual-valve configurations.
- **X** is a specialty configuration and requires consultation with the factory.

**Model Number Example:**

- AN 35S 1L C 02 RM – OPTIONAL

**Model Number:**

- Mounting hardware required and sold separately.

**Visual Indicator:**

- **RM:** Red closed/green open
- **GM:** Green closed/red open
- **XM:** Special

**Enclosure Options:**

- **C:** North American (NEC/CEC)
- **D:** International (IEC)

**Conduit/Connectors:**

<table>
<thead>
<tr>
<th>Standard</th>
<th>Mini-connectors</th>
<th>Micro-connectors (M12)</th>
</tr>
</thead>
<tbody>
<tr>
<td>02</td>
<td>(1) 4-pin</td>
<td>(1) 4-pin</td>
</tr>
<tr>
<td>05</td>
<td>(1) 5-pin</td>
<td>(1) 5-pin</td>
</tr>
<tr>
<td>10</td>
<td>(1) 6-pin</td>
<td>(1) 6-pin</td>
</tr>
<tr>
<td>11</td>
<td>(1) 7-pin</td>
<td>(1) 7-pin</td>
</tr>
<tr>
<td>12</td>
<td>(1) 8-pin</td>
<td>(1) 8-pin</td>
</tr>
</tbody>
</table>

**Series and Functions:**

- **AN:** Nonincendive or intrinsically safe
- **Sensor/switching modules:**
  - 35S: SST Universal, 20–250 volt (NO sensor)
  - 45S: NAMUR module (EN 60947-5-1, I.S.)

- **Valve communication Terminals (VCTs):**
  - 92S: DeviceNet™
  - 92W: DeviceNet™ with Wireless Link
  - 97S: AS-Interface with extended addressing
  - 97W: AS-Interface with extended addressing and Wireless Link
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 [8.43 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 45S only*

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

Approvals*
- See StoneL.com/approvals

* Only models listed on StoneL’s official website are approved per specific rating.
Extensive testing

StoneL is invested in reliability. Comprehensive testing processes assure StoneL products are built to exact specifications and are pre-tested to perform in the most challenging applications.
Mechanical
Acids
Actuator shaft eccentricity
Aging effects
Caustic mixtures
Chlorine
Conduit strength
Cycle life
High pressure spray
Icing
Impact resistance
Ingress protection
Operational positions
Organic oils
Organic solvents
Petroleum based substances
Salt fog
Steam pressures spray
Submerision
Temperature extremes
Ultraviolet tolerance
Vibration

Electrical
Circuit heat rise
Current and voltage limits
Cycle life
Electrostatic discharge immunity
Leakage current
Network protocol compatibility
Operational positions
Over current protection
Position sensor accuracy
(traiging, dwell, dead band)
Power cycling
Radio frequency interference
Reverse polarity
Temperature extremes
Thermal cycling
Thermal shock
Vibration
Voltage tolerance

Pneumatic
Cycle life
Dirty (solids) air tolerance
Flow rate
Housing pressure relief
Oils tolerance
Operation on nitrogen
Operational positions
Pressure limits
Temperature extremes
Vibration
Water tolerance

Robust testing of all components.

Install with confidence

✅ Hazardous location compliance ✗ Built to last with reduced maintenance ✗ Optimized performance

Proven performance from the inside out
Metso is a leading process performance provider, with customers in the process industries worldwide. Metso’s cutting-edge services and solutions improve the availability and reliability in minerals processing and flow control, providing sustainable process and profit improvements. Metso employs approximately 12,000 industry experts in 50 countries. Expect results.

www.metso.com