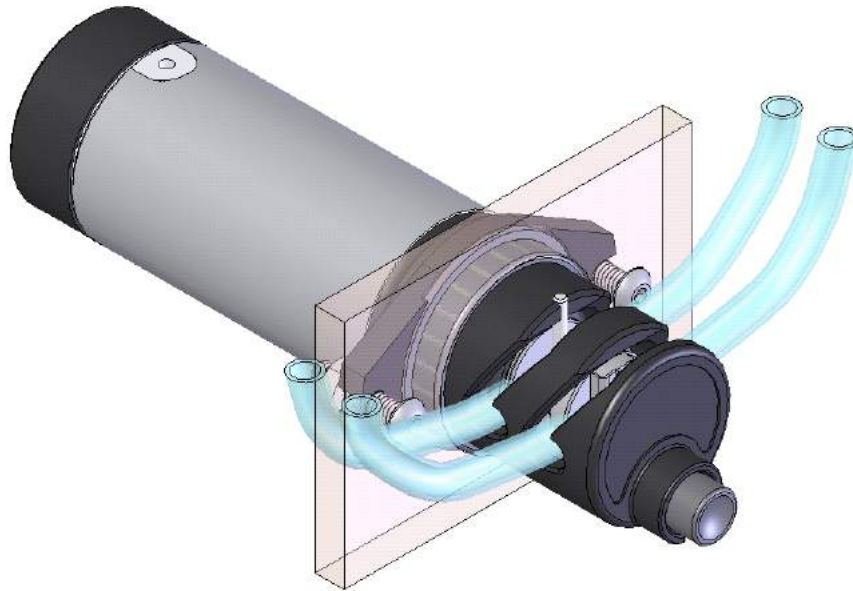




ACRO

VERSAGRIP® SOLENOID PINCH VALVE INSTALLATION AND OPERATION MANUAL



Thank you for choosing Acro Associates, Inc! This Installation and Operation Manual contains relevant information to safely install and operate your Versagrip Solenoid Pinch Valves.

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1 INTRODUCTION

This Installation and Operations Manual provides the necessary information to install and operate ACRO's Versagrip Pinch Valves . All Versagrip Pinch Valves are designed to meet RoHS 2, CE & IEC 60601 requirements and are all IP60 rated.

1.1 TERMS & ABBREVIATIONS

Pinch Valve – a device design to pinch and release flexible tubing or membrane bag channels.

RoHS – a certification involving the Reduction of Hazardous Substances.

CE - Conformité Européenne; also known as European Community – required certification for certain products sold within the European Economic Area.

Pinch Gap – distance between opposing pinch surfaces at “close” position of valve.

Total Opening – distance between opposing pinch surfaces at “open” position of valve.

Pinch Force – linear force applied over a surface area of tubing or membrane bag channel .

Gen 2 – Versagrip: designation assigned to pinch valves based on date of design.

Fail Safe State – state where the solenoid is de-energized and the return spring holds the pinching surface in the pre-described location.

Normally-Closed – Valve with a fail-safe state of sealed; if power to the valve fails or is turned off, valve will close against the tubing installed.

Normally-Open – Valve with a fail-safe state of open; if power to the valve fails or is turned off, valve will release the sealed tube allowing flow.

Dual-Acting – Valve intended for use with two tubes in an alternating fashion; tubes alternate open or sealed condition.

Durometer – flexible tubing material hardness; typically referring to Shore-A scale

1.2 Acronyms

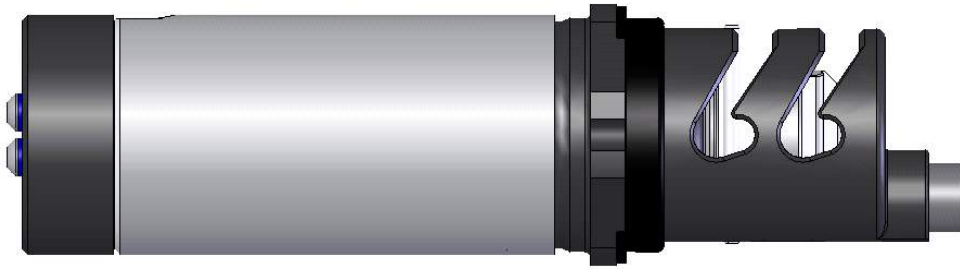
List Acronyms here.

O.D. – outer diameter (referring to flexible tubing)

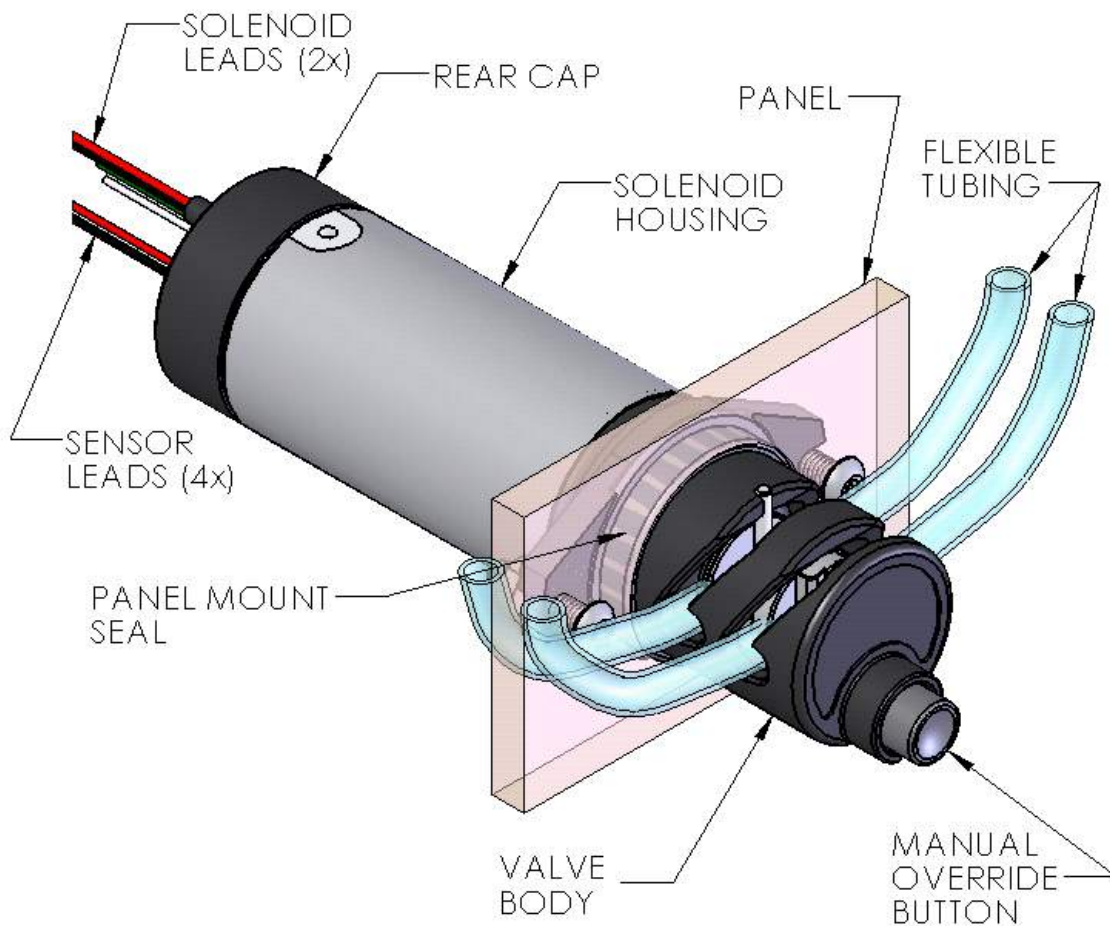
I.D. – inner diameter (referring to flexible tubing)

ESD – Electro-Static Discharge

2 VERSAGRIP SOLENOID PINCH VALVES



ACRO Solenoid Pinch valves are designed with safety and ease of use in mind. ACRO offers three different models to choose from: 1100, 1300, and 1400. These models, designed as a family, are scaled, allowing for a wide variety of flexible tubing sizes ranging from 1/8" O.D. to 3/8" O.D. tubing. Models can be configured with an optional position sensor.



2.1 SAFETY

Every ACRO Pinch Valve is designed to meet the Fail-Safe mode defined by the application. All Versagrip models that come with a tube-slot head are configured with a Manual Override button. This allows the user to override the Fail-Safe condition manually by the press of a button. Each model has a button scaled to match the size and force of the valve.

2.2 ENVIRONMENTAL LIMITATIONS

ACRO Versagrip Solenoid valves have been tested to comply with an ambient system internal temperature of 40°C. Consult factory for information regarding systems with a maximum internal temperature limit that exceeds 40°C. Also see individual product specification sheet for environmental limits that may be specific to an individual product.

2.3 APPLICATION LIMITATIONS

ACRO Versagrip Solenoid valves have been tested to the following cycle rates based on the environmental restrictions stated in section 2.2. Limits determined using an ACRO Pulse & Hold Driver board.

- 1) Continuous-Duty: valve will maintain safe operating temperature when held open continuously in ambient temperature stated in section 2.2.
- 2) 5-Second Cycle Rate (50% Duty): valve will maintain safe operating temperature when actuated at a 5-second cycle rate at 50% duty (2.5 seconds on, 2.5 seconds off).

Consult factory for applications requiring faster cycle rates or higher duty cycles.

2.4 INSTALLATION

2.4.1 ACTUATION

ACRO Versagrip Solenoid valves come standard with 12 Inch Red & Black solenoid leadwires with a 2-pin Molex connector designed to fit varying lengths of additional cabling. Most ACRO Pinch Valves have either a 12VDC/3A or 24VDC/3A recommended supply power. Versagrip units are generally recommended for 24VDC x 3A power supply setups. See additional specific product specification sheet for individual valve power requirements.

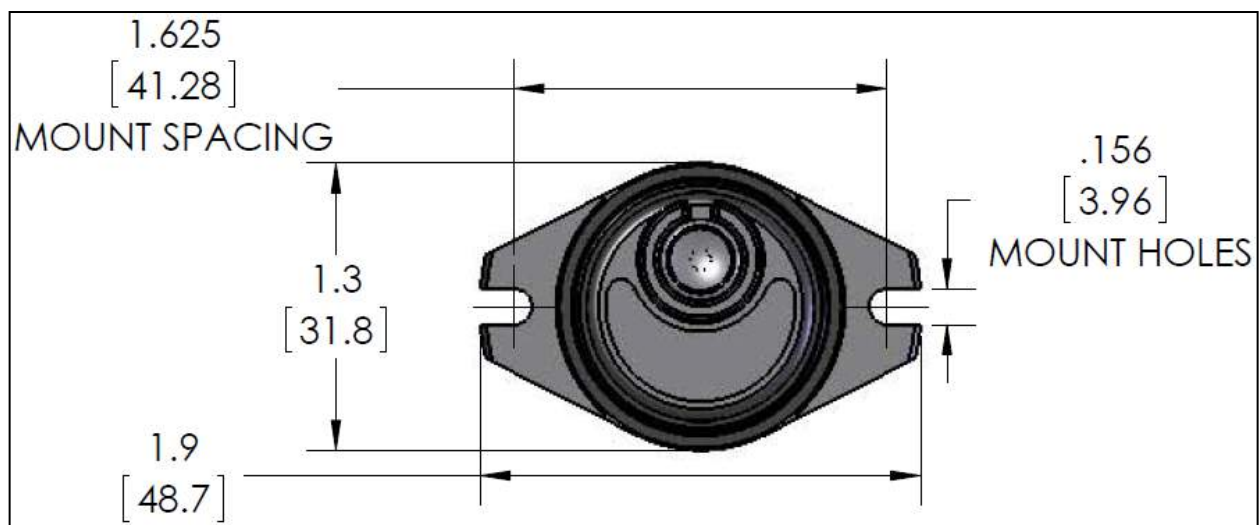
2.4.2 MOUNTING

Valves come standard as Panel mount variants. See specific product specification sheet for mounting configuration dimensions. Contact factory if application requires a different mounting style.

Design for panel cut-outs will require inclusion of panel seal diameter to ensure snug valve fit to the front panel. See product specification sheet for panel seal diameter information and additional mounting requirements.

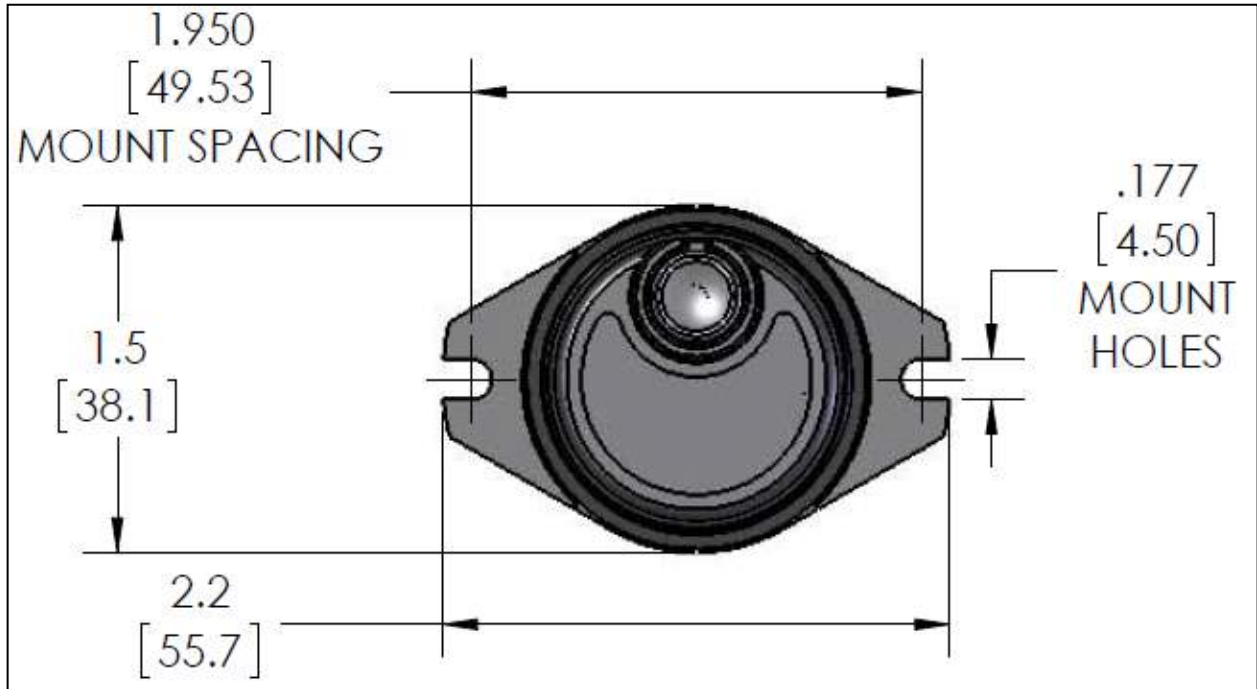
MODEL 1100

INCH [MM]



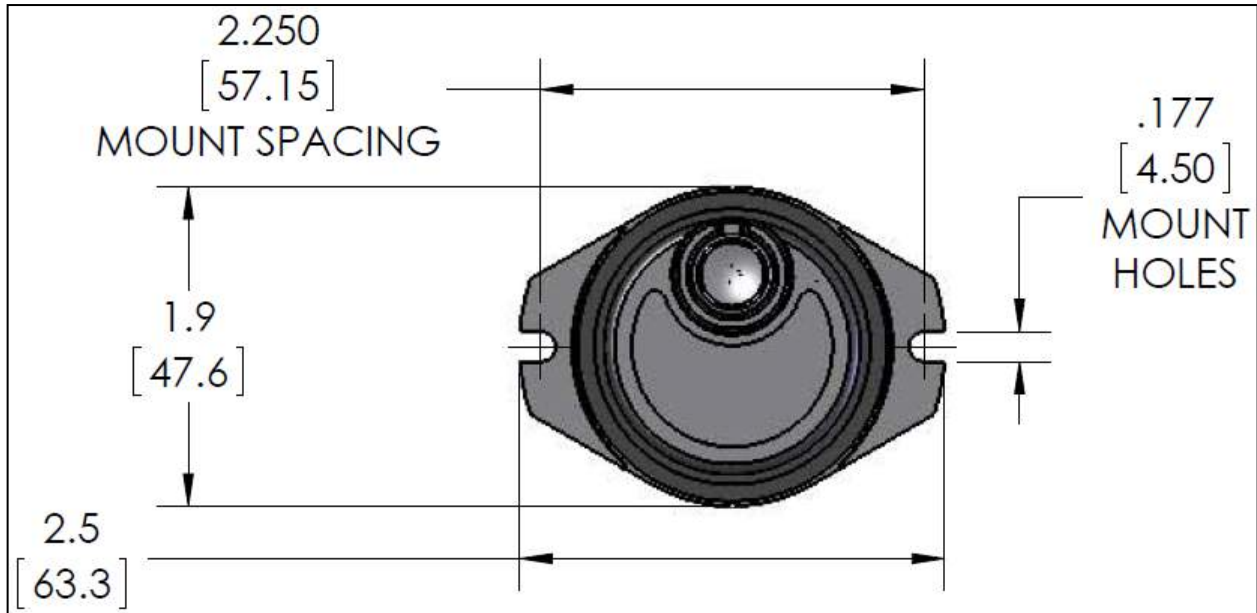
MODEL 1300

INCH [MM]



MODEL 1400

INCH [MM]



2.4.3 SEALS

All headed ACRO Versagrip Solenoid valves come standard with a silicone internal seal as well as a silicone panel seal to prevent media, cleaners & solvents, and debris from entering the solenoid housing or contaminating the components protected by the panel. Seal diameters and extension from flange vary by model number. Consult product specification sheets for more information.

2.5 MAINTENANCE

Caution: Solenoid pinch valves are actuated by the application of electricity. Before performing any maintenance or full solenoid handling it is recommended the valve or entire system is disconnected from the power source. See next page for inspection points.

2.5.1 INSPECTION POINTS

Several points on the valve should be checked regularly to ensure proper valve function.



POINT	SERVICE
Override	Visually inspect button (not available on NDB models), depress button several times, take note of any stickiness or binding.
N/O Pinch Pin	Visually inspect condition of pin (not available on CDB or NDB models, verify pin is properly seated in pin-hole.
Internal Seal (not shown)	Inspect condition of seal (not available on NDB models), take note of any cracking or discoloration.*
Panel Seal	Inspect condition of seal, take note of any cracking or discoloration.*
Mounting Flange	Inspect condition of flange, tighten panel mount screws as needed to secure to panel.
Crimp	Check for any debris build-up around solenoid housing to flange crimp area, clean as needed.
Rear Cap	Check tightness of rear cap to bottom of solenoid housing, tighten cap screws as needed.
Sensor Mounting (not shown)	Check tightness of sensor to rear cap (S models only), tighten sensor if needed. **
Coil Leads	Inspect coil leads, take note of any exposed wire or missing insulation, verify wires are routed away from any hot components and are in good condition.
Sensor Leads (not shown)	Inspect sensor leads (S models only), take note of any exposed wire or missing insulation, verify wires are routed away from any hot components and are in good condition.

*Cracking or Discoloration can be a sign of seal failure.

**Sensor positioning is set and calibrated at the factory, do not remove sensor unless requested to do so by a trained ACRO technician.

2.5.2 MANUFACTURER'S ESTIMATED MTBF

All ACRO Versagrip Solenoid Pinch Valves have been life cycle tested and rated to 3 Million cycles MTBF under specified duty cycle and ambient temperature conditions. Our MTBF specification was carried out using a 50% duty cycle at 20 degree C ambient environmental conditions.

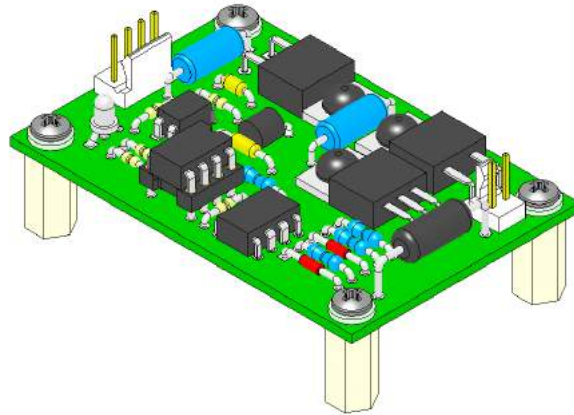
2.5.3 REPAIR & REPLACEMENT

In addition to 3 Million cycles MTBF, ACRO assumes a useful lifetime of Solenoid Pinch Valves based on field experience. General knowledge suggests a useful lifetime of 3 to 5 years or 3 Million cycles. It is the responsibility of the end user to establish a maintenance schedule and a process to replace all solenoids before the end of the useful life.

2.5.4 ACRO NOTIFICATION

Any product that does not meet the Manufacturer's MTBF rating or fails within the warranty period should be immediately reported to ACRO Associates. For notifying us of any product performance issues please contact our customer service department.

3 900R PULSE & HOLD CONTROLLER BOARD



The ACRO Associates 900R Solenoid Driver Board is a control module designed for interfacing high-performance solenoid actuators to computer systems and digital logic.

We recommend the use of our 900R control board with all Versagrip solenoid unit. Using a Pulse & Hold Controller can greatly reduce power consumption and heat generation. Pulse & Hold Controllers also enable solenoid valves to be held in the actuated position for extended periods of time without over-heating.

3.1 SAFETY

ACRO 900R Solenoid Driver Boards are ESD Sensitive Devices. Use ESD preventative measures when handling all circuit boards. Mishandling of circuit boards can significantly reduce product lifespan and cause unexpected field failures.

3.2 ENVIRONMENTAL LIMITATIONS

See 900R Product Data Sheet for operating and storage environmental limitations.

3.3 APPLICATION LIMITS

See 900R Product Data Sheet for application limitations.

3.4 PACKAGING

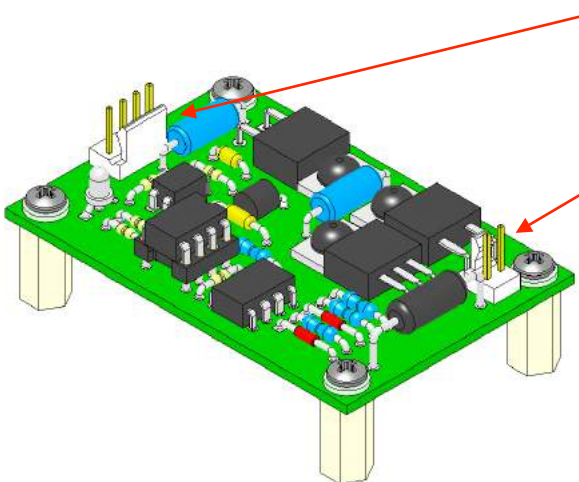
The 900R module is an OEM style printed circuit board, appropriate for panel mounting inside of an equipment enclosure. Four 12.7mm plastic hex standoffs, with #4-40 internal threads, are provided for mounting. Nylon washers and stainless-steel screws for attaching the standoffs to the board are included. The user must supply hardware for attaching the standoffs to their enclosure. See 900R Product Specification Sheet for device footprint.

3.5 USER INTERFACE

The 900R's user interface consists of an opto-isolated differential input port that can be directly wired to relays, transistor logic, digital I/O boards, and PLCs. The trigger port can be wired for either active-low or active-high operation, depending on the application. The 900R also provides a multi-color diagnostic LED. See 900R Product Specification Sheet for hook up diagnostic information.

3.6 MAINTENANCE

The ACRO 900R Solenoid Driver board requires minimal maintenance. Below are some regular inspection points.



POINT	SERVICE
Power/Trigger Input Connection*	Verify good connection and terminals are clean, clean gently with isopropyl alcohol or contact cleaner if needed
Valve Connection*	Verify good connection and terminals are clean, clean gently with isopropyl alcohol or contact cleaner if needed

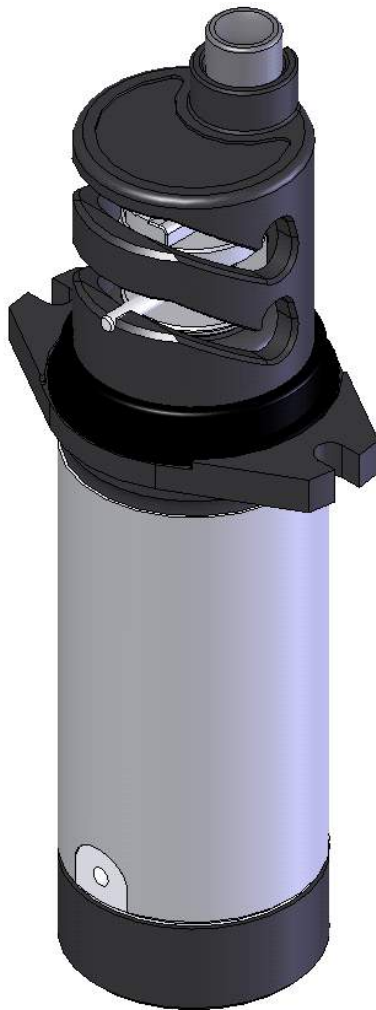
*Loose connection may be a sign of wear and should be evaluated for replacement

4 MODEL DIAGRAMS

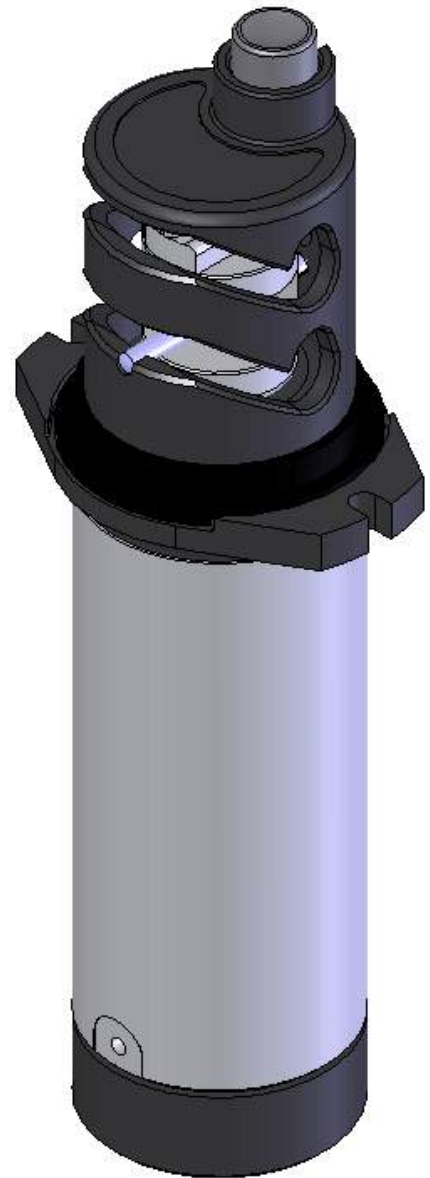
For complete Product Specifications, Data Sheets, and Dimensional Drawings visit the ACRO Associates website: www.acroassociates.com



1100N-DDBX5

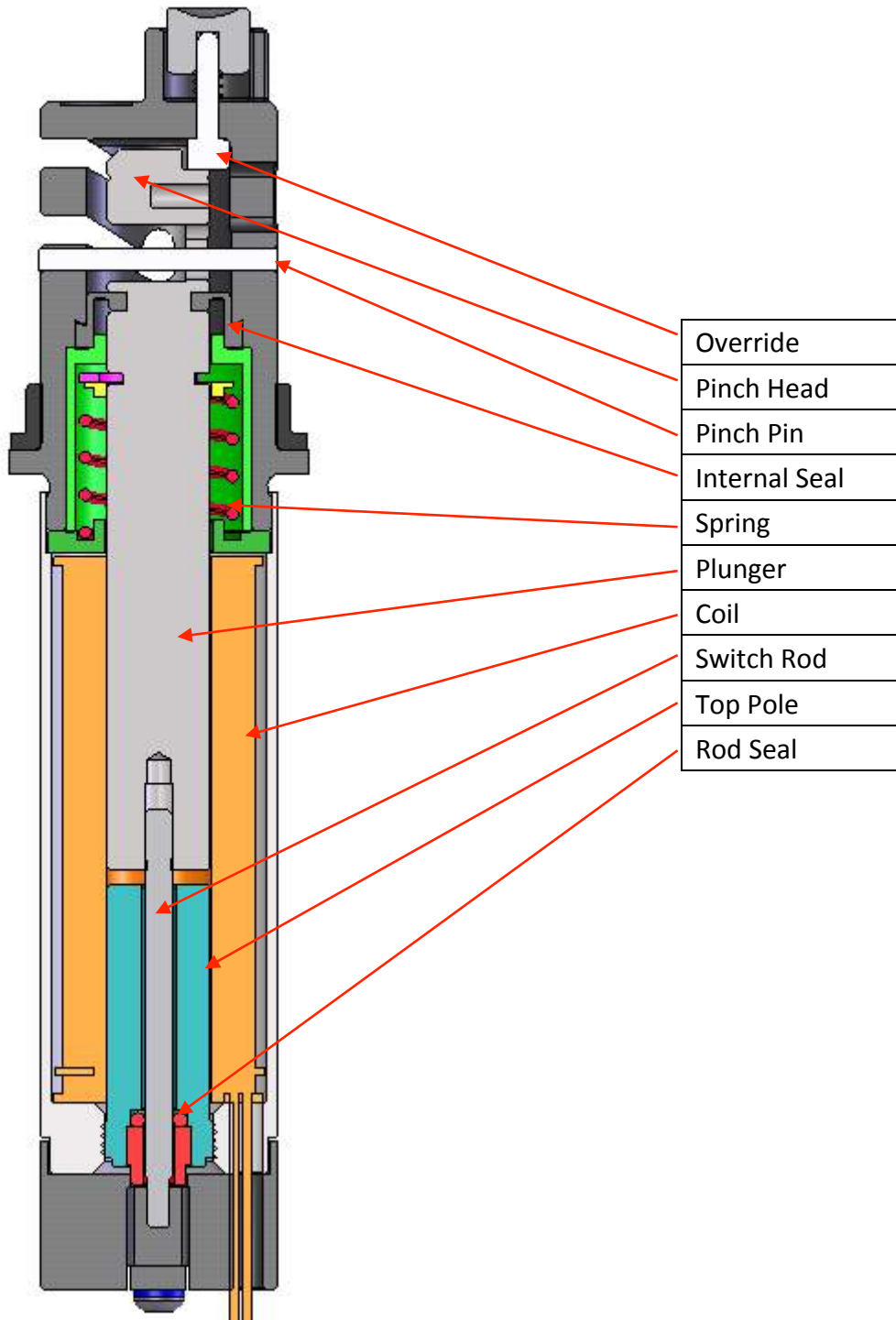


1300N-DDBX5

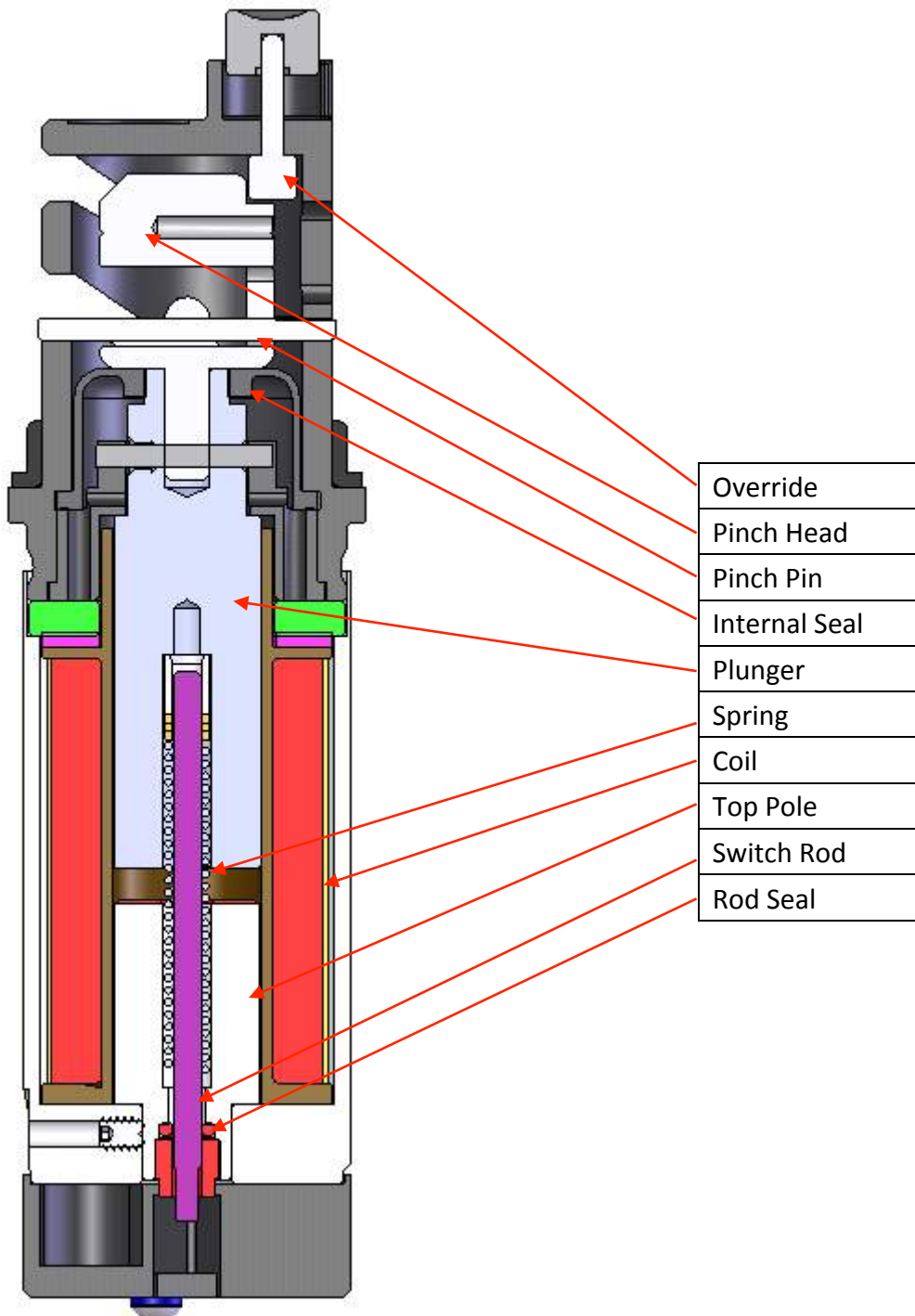


1400N-DDBX5

4.1 1100 CROSS-SECTION



4.2 1300/1400 CROSS-SECTION



5 VALVES COVERED

The following ACRO Associates solenoid pinch valves are covered under this document:

- M1100 Series – Cassette, Dual Slot, Normally-Closed, Normally-Open Pinch Valves
- M1300 Series – Cassette, Dual Slot, Normally-Closed, Normally-Open Pinch Valves
- M1400 Series – Cassette, Dual Slot, Normally-Closed, Normally-Open Pinch Valves

6 STATUS OF DOCUMENT

6.1 RELEASES

Revision: 1

Release Status: IM-0002 Initial Release on 7/3/2014