

Installation Instructions

1. **Read complete instructions** before proceeding and do not discard packing materials until any/all loose items are located. Also, make sure that the installation of the Maxon valves will be in compliance with all applicable governmental, insurance and/or agency requirements or codes, such as NFPA-70, National Electric Code, CSA C22.1, Canadian Electric Code, etc.
2. **General considerations:**
 - A. Prior to shipment, each valve is operated electrically and cycled at rated and 1-1/2 rated pressure while being leak tested. **Every Maxon valve is operationally tested and meets the requirements of ANSI B16.104 Class VI Seat Leakage.**
 - B. **Inspect your valve** for any shipping damage. Contact Maxon Corporation with the valve's serial number (printed on the valve's nameplate) for replacement and/or repair parts.
 - C. **Read the nameplate on your valve.** This gives the maximum pressure, temperature limitation, voltage requirements and service conditions of your specific valve. **DO NOT exceed nameplate ratings.**
 - D. **Select mounting location carefully.** Your Maxon valve is designed to operate for many years if installed in a location that is cool, clean and dry.
3. **Pipe the valve** in the direction of the flow arrow [3] on the valve body. The Maxon valve body can shut off flow in one direction only.
 - A. **Remove all thread and flange protectors** before installing valve in your service line.
 - B. **Teflon tape** acts as a lubricant and greatly reduces the pipe wrench turning force required to seal the threads.

Take care not to overtighten threads as this can damage the valve.

- C. **Good piping practice** dictates that piping be independently supported, so that valve bodies are not placed in a bind. In addition, large valves may require support.
- D. **Clean pipe lines** of foreign materials before installing valve into line.

For new installations, a gas filter or strainer shall be installed in the fuel gas piping to protect the downstream safety shut-off valves.

per NFPA 86-4-2.4.3 (1995)

E. **Mount valve** so that open/shut window indicator [1] will be visible to your operating personnel.

F. **Main system shut-off** should always use a manual leak-tight upstream fuel cock.

G. **Time lag** between valve action and fluid flow (or flame response) is reduced if valve is located near the burner (or outlet).

4. **Wire the valve** in accordance with **all** applicable codes and standards. Supply voltages must agree with valve's nameplate voltage within -15%/+10% AC for proper operation. For electrical wiring schematics, refer to appropriate Maxon catalog literature and/or the wiring schematic diagram affixed inside your valve's access cover plate.

A. **The Maxon valve must be electrically interlocked** with your safety-limit devices in accordance with all applicable codes, standards, and the authority having jurisdiction over the safety requirements for your overall system installation. Normally, Maxon valves are electrically wired in series with all of your safety-limit devices. Therefore, any one device can cause the valve to react. Each valve was production tested when manufactured. If it now appears inoperative, make sure it is being powered properly from and through your control circuit.

B. **Maintain integrity of Maxon top assembly** enclosure by using dust and water-tight electrical connectors. Use cable-sealing grips and strain-relief loops for any cord or cable. Use internal sealing materials on all conduit connections. Moisture can have a harmful effect on valve internals if permitted to enter



Installation Instructions (cont'd.)

through wiring connectors. Make sure that all access cover plates are in place and securely fastened. All cover screws should be tightened using an alternate cross corner tightening pattern to the values shown below.

Cover	Torque (in-lbs)
.25"-20 access covers	50

While all covers are torqued at time of production testing, torque should be rechecked periodically to ensure adequate sealing protection.

5. Pre-operational exercising:

Prior to initial fluid flow start-up and with upstream manual cock still closed, operate the valve electrically for 10-15 cycles. This not only provides an electrical check, but also wipes valve body disc and seat free of accumulated foreign matter.

6. Air actuated valves require clean, dry air at designated pressures. Outlets and vents, where present, should be protected from accidental blockage.

NOTE: Although Maxon ACTIONAIR® Valves do not require lubrication, they do contain Buna N bellows diaphragms in the air actuator sub-assembly. Quality of the compressed air supply must not contain any lubricant that is not compatible to Buna N elastomers. Although many synthetic oils and additives have been publicized for advanced lubricating characteristics in pneumatic systems, strict attention should be exercised to avoid their use, even in small amounts.

7. Air-operated ACTIONAIR® Valves equipped with the Power-to-Close or Power-to-Open actuator assembly require electrical power and compressed air to be actuated. The valve will remain in the actuated position for a minimum of 15 minutes on loss of power. The valve will return to its normal position with a loss of cylinder air or continuous power to the overriding solenoid valve.



Maxon practices a policy of continuous product improvement. It reserves the right to alter specifications without prior notice.

Installation Instructions (cont'd.)

Top Assembly Rotation

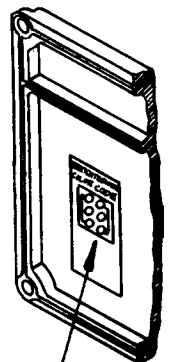
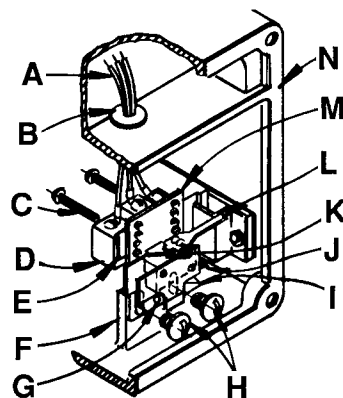
Maxon valves can and should be ordered in a configuration compatible with planned piping, but if open/shut indicator window is not visible and/or valve orientation is not proper, the top assembly can be rotated in 90° increments around the valve body centerline axis by the following procedure:

- 1. Shut off all electrical and pneumatic power** and close off upstream manual cock.
- 2. Remove wiring access cover plate [2]** and disconnect power lead wires. (Tag carefully for later re-assembly.)
- 3. Remove conduit**, electrical leads, and any air line connections.
- 4. Note physical position** of any signal switch actuator wands on auxiliary signal switches (see switch arrangement sketch).
- Unscrew the two body bolts [4] screwed up from the bottom to 1/4 inch. **DO NOT** completely remove. These bolts secure the valve body [3] to the valve's top assembly housing [5].
- 6. Gently lift the top assembly [5] (not more than 1/4" in height)**; just enough to break the seal between the valve body assembly and the rubber gasket adhering to the bottom of the top housing. This step may require loosening the stem coupling [6] to permit components freedom of movement.

WARNING: LIFTING TOO FAR MAY DISLodge SOME SMALL PARTS INSIDE THE TOP HOUSING, REQUIRING COMPLEX RE-ASSEMBLY AND RETESTING BY TRAINED FACTORY PERSONNEL.

- Remove the two body bolts [4] screwed up from the bottom (were partially unscrewed in step 5).
- Carefully rotate top assembly** to the desired position in a plane parallel to the top of the valve body casting. **Rotate the top housing about 30° beyond this position, and then rotate it back.** Reposition the top housing back down onto the valve body casting. This should align the open/shut indicator with its window and provide proper alignment of the internal mechanism.
- Realign holes** in valve body casting with the corresponding tapped holes in the bottom of the top assembly housing. Be sure the gasket is still in place between the body and top housing. Retighten the stem couplings.

Auxiliary Switch Arrangement



Wiring Diagram

A- Number Coded Wires
 B- Rubber Grommet
 C- Mounting Screws
 D- Normal (de-energized) Position Switch
 E- Insulating Barrier
 F- Bracket Mounting Pad
 G- Drive Pin & Locating Hole

H- Mounting Screws
 I- Spring Retainer Extension
 J- Switch Wand
 K- Actual (energized) Position Switch
 L- Switch Wand
 M- Switch Mounting Bracket
 N- Gasket

Installation Instructions (cont'd.)

Top Assembly Rotation (cont'd.)

10. Reinsert the body bolts up from the bottom through the body and carefully engage threads of the top assembly. Tighten securely.

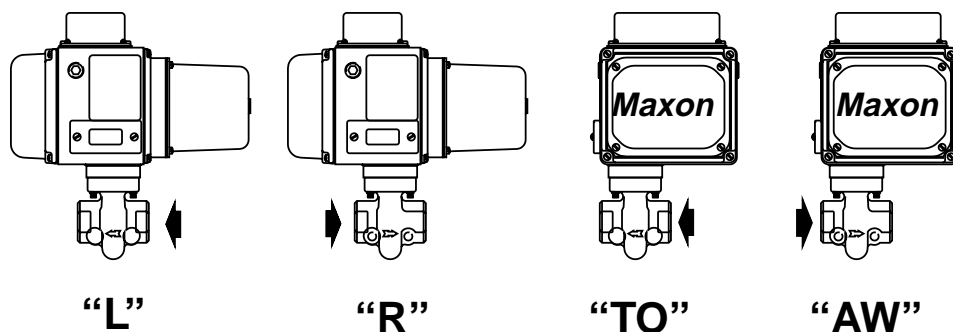
Cover	Torque (in-lbs)
.25"-20 access covers	50

11. Reconnect conduit, electrical leads, and all pneumatic lines, then check that signal switch wands are properly positioned and that open/shut indicator moves freely. **Failure to correct any such misalignment can result in extensive damage to the internal mechanism of your valve.**

12. Energize valve and cycle several times from closed to full open position. Also electrically trip the valve in a partially opened position to prove valve operates properly.

13. Replace and secure side cover access plate and place valve in service.

Alternate Top Assembly Positions



Four top assembly positions are available for most Maxon valves. When looking at the open/shut window indicator of a valve assembly, the motor (for motorized version), or the operating handle (for manual version), will be on the left side of the top assembly. The valve body is on the bottom. From this

view, the unidirectional valve body and the arrow on the valve body casting points in direction of fluid flow: to the right (position "R"), to the left (position "L"), towards you (position "TO") or away from you (position "AW"). With smaller size swinging gate valve bodies, only position "R" and position "TO" may be used.



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CORPORATION
MUNCIE, INDIANA, USA

INDUSTRIAL COMBUSTION EQUIPMENT AND VALVES

Operating Instructions

Refer to appropriate catalog bulletin and specification page for operating sequence applying to your specific valve. **Never operate valve until all essential allied equipment is operative and any necessary purges completed.** Failure of pneumatically operated valve to operate normally indicates that it is not powered. **Check this first!** Then check air control solenoid and/or cylinder air supply.

Main system shut-off should always be accomplished with an upstream leak-tight manual fuel cock.

All Maxon valves react within a fraction of a second when de-energized. One cycle drop in electrically supplied power can cause this reaction.

All manual reset valves may be operated manually when solenoid is electrically energized, but electrical tripping is recommended for normal shut-downs.

Manual reset valves require two positive actions to open: a half rotation of handle to latch internal mechanism, and a reversed half rotation of handle to open valve. This refers to normally closed valves. With normally open valves, the procedure is the same, but the valve body position (i.e., open or closed) is opposite to the normally closed version.

Normally closed motorized valves begin opening cycle immediately upon being powered; motor runs only until full open position is reached. Normally open valves begin to close immediately, and motor runs until fully closed position is reached.

Operator should be aware of and observe characteristic opening/closing action of the valve. Should operation ever become sluggish, remove valve from service and contact Maxon for recommendations.

Address inquiries to: Maxon Corporation, Muncie, IN 47302, Phone (765) 284-3304
FAX (765) 286-8394

Always include valve serial number and nameplate information to insure positive identification.

Maintenance Instructions

Maxon valves are endurance tested far in excess of the most stringent requirements of the various approval agencies. They are designed for long life even if frequently cycled, and to be as maintenance-free and trouble-free as possible.

Every Maxon valve is operationally tested and meets the requirements of ANSI B16.104 Class VI Seat Leakage when it leaves our plant.

Top assembly components require no field lubrication and should **never** be oiled.

Auxiliary switches, motors and solenoids, may be replaced in the field.

WARNING: Do not attempt field repair of valve body, top assembly or motor drive unit. Any alterations void all warranties.

Valve leak test, performed with valve in line as prescribed by jurisdictional authorities, is strongly encouraged and should be done on a regularly scheduled basis. In rare instances where valve shows leakage, perform **Pre-Operational Exercising** (see Installation Instructions) and retest. If leakage does not stop, remove valve from service.

Maxon valves are designed to be used with clean fluids. If foreign material is present in the fuel line, it will be necessary to inspect the valve to make certain it is operating properly. If abnormal opening or closing is observed, the valve should be removed from service. Contact your Maxon representative for instructions.

Insurance authorities agree . . .

. . . that the safety of any industrial fuel burning installation is dependent upon well-trained operators who are able to follow instructions and to react properly in cases of emergency. Their knowledge of, and training on, the specific installation are both vital to safe operation.

Safety controls may get out of order without the operator becoming aware of it unless shutdowns result. Production-minded operators have been known to bypass faulty controls without reporting the trouble.

Continued safe operation of any installation is then assured only if the plant management carefully develops an exact schedule for regular periodic inspection of all safety controls, insisting that it then be rigidly adhered to.

A main gas shut-off cock should be located upstream from all other fuel train piping components and used to shut off all flow of fuel for servicing and other shutdowns.

All safety devices should be tested at least monthly* and more often if deemed advisable. Periodic testing for tightness of manual or motorized shut-off valve closure is equally essential.

*per NFPA 86-Appendix B-4 (1995)

Operator should be aware of and observe characteristic opening/closing action of the valve. Should operation ever become sluggish, remove valve from service and contact Maxon for recommendations.

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INDUSTRIAL COMBUSTION EQUIPMENT AND VALVES

Auxiliary Signal Switches

Field Installation Instructions

NOTE: Instructions below are written for normally closed valves. For normally open versions (STO-MNI, STO-ANI, Fig. 1 & 2), reverse switch nomenclature. (VOS becomes VCS and vice versa.)

General: Shut off fuel supply upstream of valve, then de-energize valve electrically.

- Remove top or side cover to provide access, being careful not to damage gasket.
- Compare with illustrations at right to identify YOUR valve type.

To replace existing switches:

- Note wand position and mounting hole location carefully, then remove 2 screws and lift existing switch.
- Install replacement switch in same mounting holes on bracket and verify correct wand position.
- Replace existing wiring one connection at a time, following original route and placement.

To add switches to existing valve:

- Check illustrations at right. If your valve uses a switch mounting bracket as in Fig. 1 & 2, mount switches to bracket using the mounting holes appropriate for valve type and size.
- Position bracket so VCS wand just touches top of actuator, then move downward slightly, depressing wand until switch clicks, then tighten mounting screws to hold this position.
- Pin bracket by drilling 1/8" dia. holes 1/4" deep into bracket mounting pad through drive pin holes, then tap drive pin in until flush.
- Route wires to wiring compartment as shown, then complete wiring connections and clean out metal drilling chips from previous procedure.
- Cycle valve, checking switch actuation points carefully. (VCS actuates at top of stem stroke, VOS at bottom.) Simultaneously the valve body must be tested for switch continuity and seat leakage. Bend VOS switch wands slightly if necessary to insure valve is opening fully.
- Replace gasket and cover, then return valve to service.

Fig. 1
.75" – 3" NI
non-CP

Remove side cover plate. Switches mount on bracket. (See "A" below)

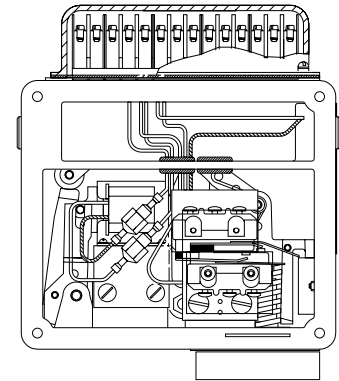
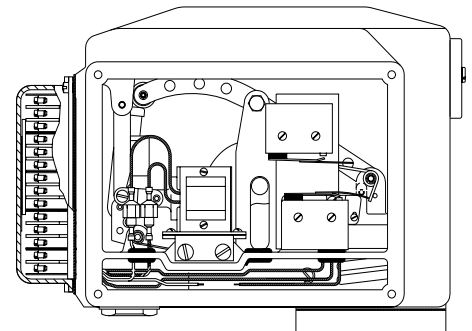


Fig. 2
2.5" – 4" NI-CP
6" 808NI

Remove side cover plate. Switches mount on bracket. (See "B" below)



Wand Position

VOS switch wand should be actuated **from above.**



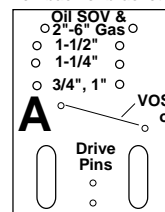
VCS switch wand should be actuated **from below.**



Mounting Brackets

For 1", 1.25" C.I. & 2", 3" non-CP

VCS switch mounts on back of bracket



Bracket Mounting Slots

- 3", 4", 6" (-2)
- 3", 4", 6" (-2)
- 2-1/2" (-2)
- 2-1/2" (-1)

VCS Switch on back

B

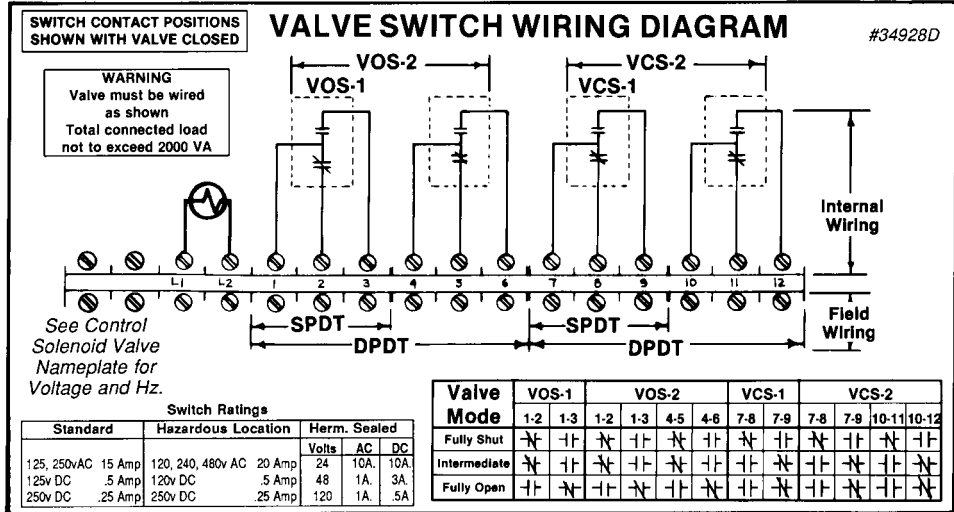
VOS switch on front

Bracket Mounting Holes

Electrical Data ACTIONAIR® Valves

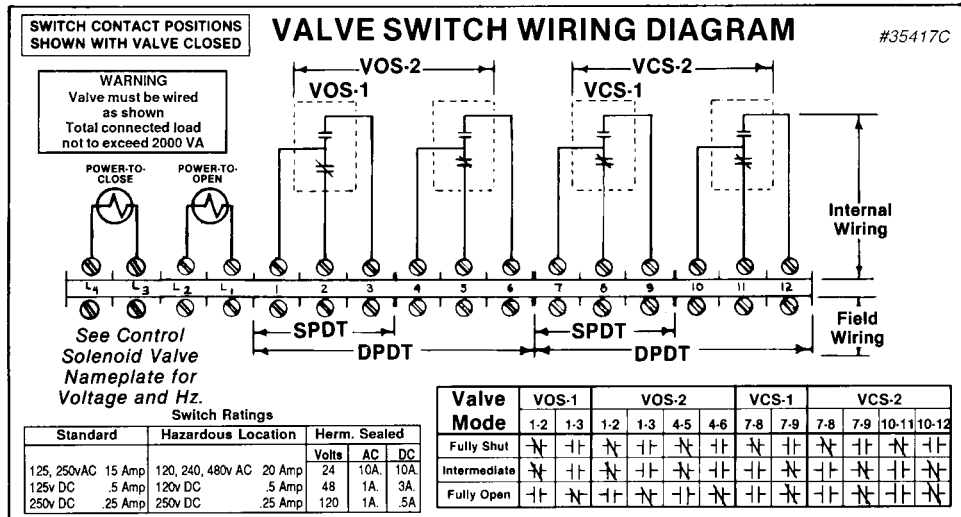
Normally Closed Valves

Normally closed
Series 1000 & 3000
ACTIONAIR® Valves
(internal wiring schematic)



Power-to-Close
Series 1000 & 3000
ACTIONAIR® Valves
(internal wiring schematic)

WARNING: ACTIONAIR® Valves equipped with Power-to-Close actuator assembly require electrical power and compressed air to be opened. The valve will remain in the opened position for a minimum of 15 minutes on loss of power. The valve will return to its normally closed position with a loss of cylinder air or continuous power to the overriding solenoid valve.

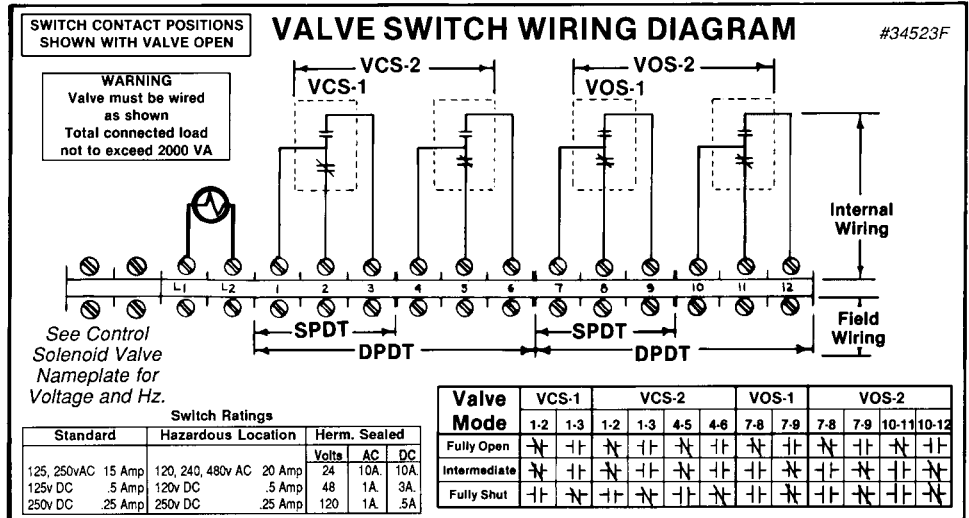


Electrical Data

ACTIONAIR® Valves

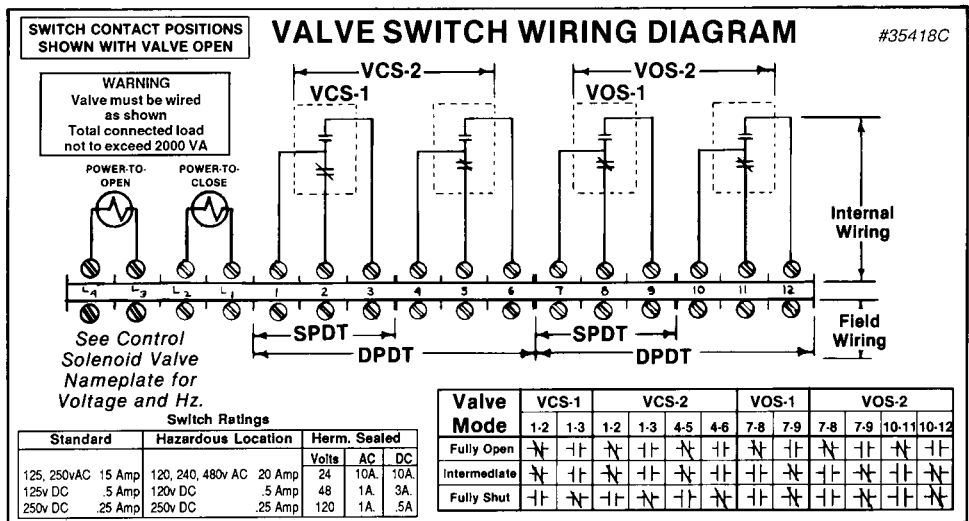
Normally Open Valves

Normally open
Series 2000
ACTIONAIR® Valves
(internal wiring schematic)



Power-to-Open
Series 2000
ACTIONAIR® Valves
(internal wiring schematic)

WARNING: ACTIONAIR®
Valves equipped with Power-to-Open actuator assembly require electrical power and compressed air to be closed. The valve will remain in the closed position for a minimum of 15 minutes on loss of power. The valve will return to its normally open position with a loss of cylinder air or continuous power to the overriding solenoid valve.



Notes



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