



# Operating & Maintenance Instructions

## "M" Series AAA Valves — 1/4" & 3/8" Sizes

**Precision matched stainless steel spool and brass sleeve, metal-to-metal fit. This assembly is installed in an aluminum body with static O-ring seals between each port.**  
**The information listed below is for reference only and may change at factory discretion.**

### INSTALLATION

**RATINGS:** First, make sure your operating conditions match valve ratings. Valves are for compressed air, vacuum, or any inert gas which is compatible with aluminum, brass, and stainless steel. Line pressure must not exceed 250 psi (except hydraulic models identified by -H as last letter in model number). Hydraulic models are for petroleum base hydraulic oil with recommended viscosity in the range of 100 to 500 SSU (at 100°F). Hydraulic line pressure must not exceed 1500 psi on pressure inlet and cylinder ports and 150 psi on exhaust port(s). On valves for air service, full pressure may be applied to any port, or any port may be pugged as for 2-way or 3-way service. On hydraulic models (with Suffix -H model number), exhaust port(s) must be drained to reservoir at no more than 150 psi back pressure. Hydraulic models may be used for 2-way or 3-way service provided the exhaust port(s) are drained to reservoir and not plugged.

**MOUNTING:** Protect exhaust port(s) against entry of shop dirt and chips. Use exhaust mufflers, or use pipe fittings which discharge downward. Two-position valves which do not have internal springs on the spool should be mounted with valve axis horizontal to avoid spool drift.

Solenoid models which have threaded body ports should be mounted on MP2 mounting spacer for clearance under solenoid covers. This spacer also serves as an electrical junction box, having 1/2" conduit knockouts.

**ORIENTATION:** To facilitate plumbing, the actuators may be reversed end for end on the valve body. However, the spool and sleeve, being a precision matched fit, should not be reversed inside the sleeve. If the spool is removed from the sleeve, mark it so the spool can later be re-inserted into the sleeve to maintain the same precision matched fit.

**FLOW PATTERN:** Energizing a solenoid, or applying pilot pressure, causes air to come out the cylinder port farthest from the end actuated.

### FACTORY PRE-LUBRICATION

All valves are pre-lubricated at the factory using Magnalube®-G teflon based all purpose grease. Valves are suitable for, and perform best in a low lube service.

For long life, use an air line filter/lubricator installed no further than 8 to 10 feet from the valve. The filter should be rated 25 µm or finer. Use a high grade of petroleum base non-detergent lubricating oil no heavier than **SAE 10W**.

**CAUTION!** Do not use questionable fluids in air line lubricators. Do not use petroleum oil with detergent additives. Detergents, volatile or aromatic fluids may swell rubber seals in valves and cylinders. Never use cooking or vegetable oil as a lubricant.

When cleaning "M" Series valves after extended service, lubricate the sleeve and spool with 10W non-detergent petroleum oil before re-assembly. Be sure to install the spool in the sleeve the same way it came out.

### RECOMMENDED LUBRICATION

AAA Products International recommends the use of Magnalube®-G in all of its products. This lubricant is rated to serve under load conditions up to 1,450 psi, temperature ranges from -35°F to 458°F, mechanically and chemically stable, water resistant, and reduces the need for repetitive re-application. We do not recommend any lubricants that include cleaners or solvents. These types of lubricants have a tendency to swell the O-Rings and reduce the performance of the valve and O-Rings must be replaced.

### VALVE SEALS

Because of the metal-to-metal fit of the spool inside the sleeve, a small amount of air leakage out the exhaust ports may be noticed. This is normal for any valve with metal-to-metal fit. The leakage should be small because of the precision match between spool and sleeve. If this leakage should become excessive after extended service, replace spool and sleeve as a unit with a matched set ordered from the factory. Give complete model number from valve nameplate when ordering. Replacement spools will not be furnished except in matched spool and sleeve assemblies.

*(Continued on Opposite Side)*

"M" Series valves use standard size O-rings available almost anywhere in the world (70 Shore durometer hardness is standard). Specially built or non-standard valves may have been furnished with special O-rings to suit special operating conditions. When inquiring from the factory, give all model numbers and engineering numbers appearing on the valve nameplate.

1/4" and 3/8" valve bodies use 6 O-Rings, 3/4" I.D. x 15/16" O.D., Viton A. or Buna-N

One U-cup seal 5/16" I.D. x 1/2" O.D. x 3/32" wide, on each end of the spool, Buna-N.

Install U-Cup seals with lip facing toward center of spool to prevent external leakage.

On pilot-operated models, only.

One U-Cup seal is used on the piston in each actuator, 1/2" I.D. x 7/8" O.D. x 3/16" wide, Buna-N.

### TO REPLACE SLEEVE O-RINGS

The six O-Rings sealing the sleeve inside the body are contained within grooves in the body. They are static seals and should never need replacing unless they are damaged by improper fluids or lubricants used in the valve. If they must be replaced, proceed as follows.

Remove both end caps from the valve body and push out the spool and sleeve as a unit. If the spool is removed from the sleeve, mark it so it can later be re-inserted in the same way it was removed. Use a sharp tool such as a pick or scribe to remove the old rings from the valve body. Use an air hose, and solvent if necessary, to thoroughly clean out the grooves in the body. Use a pair of tweezers with angle point, starting ring in groove in one side and working around. Install 3 rings from each end of the valve. After installing rings, lightly grease the sleeve and body bore before assembly, using 10W non-detergent petroleum oil. If tweezers are not available, slip the sleeve into the bore, as a guide, to just below a groove, and work the ring into the groove with a small rod.

### SPEED CONTROL OF AIR CYLINDERS OR MOTORS

To control the speed of a double-acting air cylinder or reversible air motor operated from an "M" Series valve, use two AAA Model MFC2 (1/4" NPT) or MFC3 (3/8" NPT) exhaust flow control valves screwed into the two exhaust ports. Each flow control valve will control actuator speed in one direction of movement.

### SPECIAL INFORMATION FOR HYDRAULIC MODELS

"M" Series valves are built for air, vacuum, or inert gas service and should not be used on liquids unless specifically built for this service. Such valves are identified with the suffix -H as the last letter in the model number on the name plate. Valves specifically built for hydraulic service may be used at ratings given in the paragraph "INSTALLATION". They should be used only on petroleum based hydraulic oil, not on water or fire resistant fluids.

Valves with threaded ports in body have dual exhaust ports, both of which must be piped to the reservoir at no more than 150 psi back pressure. Hydraulic models may be used for 2-way or 3-way service provided always that pressure appears only on the pressure inlet and the cylinder ports; exhaust ports must be drained to reservoir, and never plugged.

### SOLENOID VALVES

Coils are suitable for continuous duty under normal operating conditions. However, the electrical circuit in which they are used must be designed to prevent both solenoids of a double acting solenoid valve from ever being energized at the same time. This would cause one of the coils to burn out in a short time. Overheating could occur under certain unusual operating conditions such as continuous rapid cycling (several times per minute for long periods), unusually high surrounding air temperature, a number of valves mounted close together in a confined area and all of the continuously energized, etc.

Solenoids should not be operated either on voltage or frequency (Hz) different from their rating. Abnormally low voltage, as well as over-voltage, may burn out coils.

"M" Series valves draw 5.3 amps inrush, and 0.6 amps holding current at 120 volts, 60 Hz. For coils with other voltage ratings, the current will be inversely proportional to the voltage. For example, a 230 volt coil will draw 2.65 amps inrush, and 0.3 amps holding current. Limit switches used in the circuit must be rated to handle full inrush current.

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