A-Series

Double Flapgate Airlock Valve

INSTALLATION, OPERATION & MAINTENANCE INSTRUCTIONS
SECTION I
SAFETY PRECAUTIONS

WARNING: TO THE OWNER, AND INSTALLATION, OPERATION AND MAINTENANCE PERSONNEL

The safety of the operator and those people that may come into contact with the Double Flapgate Airlock Valves (“Equipment”) is of great importance to Wm. W. Meyer & Sons, Inc (“Meyer”). The decals, shields, guards or other protective features furnished or recommended for this machine are there for your protection. BEFORE attempting to install, operate or perform maintenance on this Equipment READ carefully and UNDERSTAND all safety instructions contained in this Installation, Operation and Maintenance Manual.

Additionally, Operation, Installation and Maintenance personnel should READ carefully and UNDERSTAND the sections of this Installation, Operation and Maintenance Manual relevant to the work they are performing. Equipment owners are responsible for understanding the contents of this document and compliance with applicable government laws and regulations and appropriate industrial standards. Appropriate plant safety and Equipment training is the responsibility of the plant owner. This Manual is intended to assist the owner in the training process. The operation, installation and maintenance of this Equipment should be restricted to only those personnel properly trained:

- Installation and maintenance of Equipment must be performed by qualified mechanics/millwrights/maintenance personnel.
- Installation of any electrical Equipment must be completed by qualified electricians, in compliance with applicable codes and ordinances.
- Operation of Equipment must be restricted to those trained in its use.

Wm. W. Meyer & Sons is not always aware of the application and is not involved with the installation, therefore your participation in the safe installation, operation and maintenance of this Equipment is critically important. Meyer would be pleased to supply qualified personnel to assist on-site. To obtain a quotation for field service or if you have any safety or Equipment-related questions we encourage you to contact the Meyer factory at (800) 963-4458.
Always CONTROL / DE-ENERGIZE potentially hazardous energy sources when installing and maintaining the Equipment, as follows:

1. The Double Flapgate Airlock Valves product family uses a common mechanical principle which creates an internal pinch point in order to function properly: a metal plate rotates around an axis from a hinged position to mate with a metal sealing surface.
   a. This Equipment should never be maintained or operated in a manner which could expose personnel to the internal moving parts. To do so will expose personnel to the potential risk of serious injury.
   b. Never operate the Equipment when the inlet or outlet discharge is open to access to these internal components as these actions will expose personnel to internal moving parts which could lead to serious injury.
   c. Never open any access doors of this Equipment while in operation, the internal moving parts will be exposed, which could lead to serious injury.
   d. Never open access covers/doors to inspect the Equipment when the overall plant system is under process pressure. Wait for process pressures to be relieved (i.e. ambient pressure is confirmed).
   e. If requested, Meyer can design, build and supply custom duct work, transition pieces, piping or special guards to protect against the risk of injury.

2. Always de-energize all electrical Equipment by Lock Out/Tag Out procedures before working on this Equipment, including motors, switches, solenoids and other ancillary electrically powered or controlled Equipment. If the electrical components are not properly de-energized, this will expose personnel to the potential risk of serious injury.

3. When the pneumatically actuated version of the Equipment is supplied, always shutoff compressed air supply to all pneumatic cylinders and relieve residual pneumatic pressure before working on the Equipment. If the pneumatic components are not properly de-energized, this could expose personnel to the potential risk of serious injury.

4. If working on the Equipment when the Equipment surface is hot, always wear appropriate clothing (e.g. gloves and other protective outer clothing), or if hot surfaces could burn skin, wait for surfaces to cool before performing work which could put someone in a hazardous situation.

5. All process material should be removed from within the Equipment before working on any internal components. Process material could provide a force that could accidentally move a gate, the material may be hot, corrosive, or otherwise hazardous or the material could otherwise lead to injury when working on the internal components. To clear material, before de-energizing the valves, isolate the valves from material above the valve and cycle the valve until all process material has passed through the valve. Note, some materials may stick to internal components. If working
on the internal components, make sure these materials are reasonably removed before working on the internal components, after the Equipment has been properly locked out/tagged out and air pressure relieved per plant safety requirements.

6. Refer also to appropriate supporting vendor safety information in addition to this Manual.

**SAFETY LABELING**

Your unit is shipped with an attached discharge flange guard. **DO NOT** operate Equipment with unguarded inlet or outlet. **DO NOT** remove flange guards.

The following precautionary labels are affixed to your Equipment.

![Safety Labels](image)

**NOTICE:** If you have received a unit without labels or if labels fall off or are damaged, contact Wm. W. Meyer & Sons immediately (800-963-4458) to obtain replacements.

Meyer ships the Equipment with labels mounted. However, as the orientation of the Equipment varies, the OWNER is responsible for affixing supplementary labels so they are visible to those operating and maintaining this Equipment. In some cases, the best location for signs to alert personnel to hazards may be on equipment adjoining or connected to the Meyer Equipment.

The following recommendations are offered to assist placement of safety labels:

- Place labels in locations that all personnel operating and maintaining the Equipment will readily see, as they are either working on the Equipment and/or as they approach the Equipment. The safety objective is for anyone who could come in contact with a hazard sees the label alerting him or her to such a hazard.
In some cases, labels may be located near the Equipment (on nearby structural steel, adjacent equipment), if this is the point of access where it can be easily seen and the hazard is clearly associated with the label's location and how it relates to the Equipment.

For some applications, the Equipment is operated at elevated temperatures. Standard labels will not survive the high temperatures. Special labeling materials and mounting procedures may be required. This may consist of stainless steel labels, which may require special mounting or a mounting location near but not on the Equipment.

SECTION II
INTRODUCTION

Thank you for purchasing a Wm. W. Meyer & Sons A-Series Double Flapgate Valve. This manual describes recommended methods of handling, storage, installation, operation, maintenance and safety of a Double Flapgate Airlock Valves. This manual applies to our family of MPSA (Medium Pressure Short A-Series) and MPFTA (Medium Pressure Full Throat A-Series) valves.

The information included herein provides a basic set of recommendations. Wm. W. Meyer & Sons, Inc. assumes no liability, express or implied, for the interpretation of this manual. Responsibility is restricted to defect-free product only and does not extend to improper installation, operation or maintenance of the Equipment.

SECTION III
EQUIPMENT RECEIVING & STORAGE

NEW EQUIPMENT RECEIVING

Upon receipt of Equipment and material from Wm. W. Meyer & Sons, Inc., the following basic steps should be taken:

- Use the packing list to determine that all the items shipped have been received. If any items are missing, please contact Meyer to identify, resolve and replace, as required.

- Your Equipment was carefully crated for safe shipment when given to the carrier. Check for damage immediately upon receipt.

- Damage in transit is the responsibility of the carrier. Title to your machine and all other items in the shipment were transferred to you as soon as the shipment left our dock, thus it is your responsibility to handle any claim.

- Be sure to have the driver sign a copy of the freight bill with a notation about any damage and contact their office before the driver leaves your premises.

- Contact the truck line to arrange for an independent inspector to come out to inspect the damage and to prepare the inspection report. It is imperative that this inspection is done before you start to unpack or use any of the Equipment.
• If there are any visible problems with your machine or any other items in the shipment, you or the driver must note in detail the damage on all copies of the freight bill before signing for the shipment. Then immediately call Wm. W. Meyer & Sons Inc.

• If helpful, photographic records of the damage may be used to communicate the extent and type of damage as well as provide a clear record.

• If a shipment was sent to you by parcel post, have the postmaster complete a damage claim report.

• Concealed Damage: If Equipment or goods are discovered to be damaged in shipment at a later date, contact the carrier and Wm. W. Meyer & Sons, Inc., immediately.

• In all cases of damage in transit, contact Wm. W. Meyer & Sons, Inc., for assistance in determining whether or not this damage may in any way affect safety or proper operation. Please contact us so that we can assist you with replacement parts or with any questions about the claim process, using the following contact information:

  Wm. W. Meyer & Sons, Inc.  800-963-4458 or 847-918-0111
  1700 Franklin Blvd    sales@wmwmeyer.com
  Libertyville, IL 60048

EQUIPMENT STORAGE

NOTICE: The following comments are offered to assist in protection of the Equipment, if stored.

1. If moved to storage, the Equipment should be located in a dry area, preferably inside. Outside storage will require adequate protection from the weather.

2. The inlet and outlet of this Equipment should be securely covered to protect the interior while in storage. For prolonged storage, an anti-rust compound should be applied to all interior surfaces. See actuator and electrical component instructions for storage recommendations for these items.

3. After prolonged storage and prior to start-up, the Double Flapgate Valve and its actuator(s) should be inspected and cleaned by qualified personnel. Contact Wm. W. Meyer & Sons, Inc. if any assistance is required.

4. In the event this Equipment is to be stored for an extended period, the following Long Term Storage procedures are recommended:
   • The Double Flapgate Airlock Valves and any ancillary Equipment supplied (e.g. solenoid valves, limit switches, regulators, gauges, etc.) should be stored unpacked in a dry, humidity-controlled, adequately ventilated, indoor area not subject to extreme temperature changes.
   • Flapgates should be stored in an upright position.
   • The interior of the valve should be sprayed with rust preventative coating
   • All exterior exposed machined surfaces should be sprayed with a rust preventative.
   • All openings must be sealed using pipe caps, plugs or metallic or wooden flange covers. Attach flange covers using a full flange gasket or weather proof seal and a minimum of four mounting bolts.
• Keep covers on until unit is installed for service.

• These Equipment storage procedures are the minimum that should be performed. Other special requirements may supplement this list, as recommended by specific component vendors, environmental (e.g. corrosive environment) and other factors.

SECTION IV
PRODUCT SPECIFICATIONS

APPLICATION

Double Flapgate Valves are designed for:

1. Transferring and/or isolating process material in a wide variety of industry applications:
   • From one material handling point to another
   • Under pressure (typically 1 PSIG and higher) or vacuum (typically up to -15”HG)
   • Over a range of material and process gas temperatures

2. Continuous conveying of many types of materials without bridging, including abrasive, chunky, friable, difficult fine powder, metallurgical fume and other materials, using pneumatic, electromechanical, or gravity-driven operators to cycle the gates.
   • For pneumatically actuated applications, the timed sequence between when top and bottom gates are opened and closed may be varied by adjusting a timer, if included, ranging between 1 and 10 full cycles per minute.

   • For electromechanically-actuated applications, the cycle time is fixed by the motor/reducer combination, typically at 6 cycles per minute. This may be varied by changing the gear ratio or with a variable speed motor. Electromechanical gates can operate with both gates open simultaneously, in the event the process material weight is sufficient to overcome the counterweights on the upper and lower gates at the same time.

   • For gravity-actuated applications, the cycle time depends on the rate and density of the process material. Gravity-actuated gates can operate with both gates open simultaneously, in the event the process material weight is sufficient to overcome the counterweights on the upper and lower gates at the same time.

The application conditions define the materials of construction of the basic valve housing and components, depending mainly on process temperature, corrosiveness and potential wear. The seals, bearings, gaskets and use of special features such as purge air systems are determined from operating pressure, temperature, internal gas composition and other factors.

PRODUCT DESCRIPTION

1. Double Flapgate Valve consists of two actuated gates that open and close against stationary mating seats to cyclically fill and empty the chambers on top of the upper and lower gates. The driving force of the gate will be one of the following:
• Pneumatically driven cylinder operation (Refer to Figure 1).
  • One cylinder per gate.
    This configuration requires only one side of the valve to be driven by a single cylinder. The
    single cylinder may be mounted on either side.
  • Two cylinders per gate.
    Over a certain process pressure, the force required to actuate a gate may require the use of
    two pneumatic cylinders, one mounted on each side of each valve.
• Electromechanically gear / motor driven cam operation with counterweights (refer to Figures 7
  through 11).
• Gravity actuated counterweights (refer to Figure 12).

2. The product comes in two basic configurations, MPSA (Medium Pressure Short A-Series) and MPFTA
   (Medium Pressure Full Throat A-Series) valves, as shown in Figure 1. The short version is most
   commonly used in applications where height is limited. The full throat version is proportionately
   taller and allows for higher volumetric flow rates. The volume between the gates is greater in the
   full throat than the short version. A spool piece or “Dutchman” can be included between the gates
   to increase the internal volume. The other main differences are:
  • The cylinder mounting for pneumatic operation, has a center trunnion mounting for the MPSA
    and the MPFTTA is end mounted.
  • The MPFTTA has two access doors per valve, and the MPSA has one access door per valve.

Figure 1: MPSA (Left) and MPFTTA (Right) Versions of Double Flapgate Valve (Pneumatic Actuation)
3. With the standard cast iron and cast steel components, the valves can operate up to 750°F (internal process temperature). Between 500°F and 750°F, provisions must be made for higher temperature bearings, seals and gaskets.

4. The valve assembly is comprised of housing, door(s), seat, gate, shaft, gate lever arm, cylinder lever arm, bearings, seals and gaskets.
   - Seats are mounted in the housing by supporting bolts.
   - Gates (also referred to as flaps) are connected to the shaft through the gate lever arm.
   - Shafts are supported on two flange bearings mounted on the housing.

5. For the pneumatic operator, the external end of the shaft is keyed and clamped to a cylinder lever arm. The cylinder levers are attached to the rod end of the pneumatic actuators with a clevis (MPFTA) or rod end (MPSA).

6. For the electromechanical operator, the external end of the shaft is keyed and clamped to a cam lever arm. A motor drives a coupled gear reducer which then turns a rotating cam. This cam rotates and sequentially actuates each cam arm, thereby opening and closing each gate as the cam rotates. A counterweight acts on the opposite side of the valve to keep the cam levers riding on the cam and close the valve.

7. Rows of packing ring seals are provided in the packing areas built into each side of each the housing. Packing gland nuts may be periodically tightened to compress the packing material, thereby providing a seal between shaft and the housing. In some cases, purge air may be provided in this seal area. In this case, one row of packing is removed and a lantern ring is installed in its place. Compressed air is then introduced externally through a connection in the housing into the lantern ring.

BASIC OPERATIONAL CYCLE

A pneumatic or electromechanical Double Flapgate Valve has four repeating stages in its normal operating cycle, as follows (refer to Figure 2):

Stage I. At the start, top and bottom gates are both closed.
Stage II. Top gate opens allowing the material to move inside the empty chamber between the gates. The bottom gate remains in the closed position.
Stage III. Top gate closes.
Stage IV. After the pre-determined cycle time, the bottom gate opens and allows the material to discharge.

Figure 2: Double Flapgate Valve Stages (MPFTA example)
A gravity-actuated valve gate will remain closed until the combination of process pressures and process material weight exceeds the counter-force offered by the counterweight on a given valve. If the pressure above the gate is greater than the pressure below, this force acts to keep the gate open and conversely, if the pressure below is greater, this force acts to keep the gate closed. Once the combination of material weight and the force of any pressure across the gate exceed the counterweight force, the gate will open. Often, this same material load will drop from the upper to lower gates, actuating the lower gate shortly after the upper gate releases the material, sometimes allowing both gates to be open simultaneously and the closing once the material has been discharged. Note, the electromechanical operate valve can act in a similar way, provided there are sufficient pressures and material weights.

**PRODUCT PERFORMANCE TABLE**

Table 1 provides estimated volumetric flow rates for various Double Flapgate Airlock Valves. This may vary depending on other application specifics (material flow properties, system operation conditions, etc.). These data are provided for reference only and do not implied guaranteed levels of capacity. In some cases, a spool piece is added in between two valves to increase the volumetric capacity.

<table>
<thead>
<tr>
<th>Size</th>
<th>MPSA Volumetric Flow Rate*, ft³/hour</th>
<th>MPFTA Volumetric Flow Rate*, ft³/hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>8&quot;</td>
<td>33</td>
<td>93</td>
</tr>
<tr>
<td>10&quot;</td>
<td>70</td>
<td>150</td>
</tr>
<tr>
<td>12&quot;</td>
<td>104</td>
<td>300</td>
</tr>
</tbody>
</table>

*Table 1: Volumetric Flow Rate of Various Size Double Flap Gate Valves
*Basis 6 cycles/minute, free flowing material, no spool piece

**SECTION V INSTALLATION**

**INSTALLATION SAFETY**

*When installing the Equipment, the following safety requirements must be adhered to:*

- When installing the Equipment, make certain the Equipment and any components are safely rigged by qualified personnel. The valves and parts (doors, seats, gates) may be heavy and proper lifting methods must be applied during installation, else serious injury could occur.

- Do not install this Equipment with any active and potentially hazardous energy sources: all electrical power must be de-energized (locked out/ tagged out) and air pressure supplies must be shutoff and locked out and bled down to ambient pressure.

- When first installing and starting the Equipment, make sure all flange fasteners are tight. Loose fasteners could lead to process gases escaping the valves during operation. In some applications this could lead to injury. Loose fasteners could also cause Equipment damage during operation.
If the valve is being used in an electrical area requiring explosion protected Equipment, these components must comply with appropriate local, state and federal codes and laws.

**GENERAL INSTALLATION**

Normally, Double Flapgate Airlock Valves are delivered fully assembled. In some cases the Equipment may be supplied in more than one piece, for shipping purposes. For example when spool pieces are supplied, the Equipment may be supplied with the two valves separated and/or the spool piece may be mounted to one of the gates. If shipped in pieces, the valves may be optionally assembled and then attached to adjacent equipment or can be built piece by piece on to equipment already installed.

- Prior to installing the valve and with the power disconnected, check to assure no foreign objects have been left inside or have accidentally fallen into the valve. It is recommended that the inlet and outlet flanges remain covered until Equipment is ready to be attached to the mating components.

- Place the Equipment in its intended location and bolt the upper flange to the upper mating device and the lower flange bolted to the lower mating device. If gaskets are included, these should be installed at each of these mating flanges.

- If a spool piece is included, this may be bolted at the factory, including gasketing between the mating flanges. If the spool piece is long, it may be shipped separately and require field assembly, including assembly of flange gaskets.

**TIPS:**

- For proper operation, these valves must be mounted with the top and bottom flanges level. This will allow process material to fall vertically through the valves.

- Be certain that the Equipment orientation is as designed before bolting to upper and lower mating device.

*NEVER operate the Double Flapgate Airlock Valves with unguarded inlet/outlet. Contact Wm. W. Meyer & Sons, Inc. for flange guards at no additional charge.*

Once the basic valve has been mechanically installed, the actuator feature can be installed, if not already installed, and started up. Each actuator feature installation and operation is discussed separately.

*KEEP bystanders away from Double Flapgate Airlock Valves when installing, as distractions can lead to mistakes.*

In some cases, Meyer customizes the components of the Double Flapgate Valves to suit customer requests. This means some of the components may be supplied and/or assembled and/or controlled by the customer or end user. Therefore the installation and operating procedures for your installation may vary from the descriptions in this Manual. When installing the Equipment, refer to other relevant information supplied by others. These basic installation instructions apply to both the MPSA and MPFTA versions. Refer also to any General Arrangement/Assembly drawings and vendor installation information that may have been provided for the Double Flapgate Airlock Valve and ancillary equipment.
**PNEUMATIC ACTUATION INSTALLATION**

These instructions apply for either a single or double pneumatic cylinder actuated arrangements. Figures 3 and 4 show a model of the MPSA pneumatic operator configuration and Figures 5 and 6 show a model of the MPFTA pneumatic operator configuration.

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*Front view*

*Rear view*

*Figures 3 and 4: MPSA Model, Single Pneumatic Operator*

*Front view*

*Rear view*

*Figures 5 and 6: MPFTA Assembly – Single Pneumatic Operator*
WARNING! When initially wiring, use proper precautions and make sure all Equipment lock out and tag out precautions are taken and power to the electrical Equipment is de-energized. The electrical components when energized will actuate the gate opening and closing. Failure to do so will expose personnel to the potential risk of serious injury.

1. If a pre-piped and mounted pneumatic air set is provided, the first step is to connect the dry plant compressed air to the filter / regulator upstream of solenoid valves. The recommended regulator inlet air supply is 80 to 120 psig. The regulator outlet pressure is typically set from 60 to 80 psig outlet pressure. The gates are not recommended to operate below 30 psig regulator outlet pressure. The air set typically consists of a mounting plate and brackets on which are mounted solenoid valves, filter, regulator, fittings and tubing. If a pre-piped air set is not provided, the installer needs to field-install the components for controlling the cylinders. **NOTICE:** Make certain no air is leaking from connections and pneumatic components; else the Equipment may not operate properly.

2. Solenoid valves must be field wired and powered. Refer to solenoid vendor information for installation and wiring. Some solenoid valves come pre-mounted and others are shipped loose. If supplied pre-mounted, the solenoid valves must be wired and powered. If solenoid valves are supplied loose, they will require piping as well as wiring.

3. Connect the timer to the appropriate electrical power source and connect the control output power to the electric coils of the solenoid valves.

4. Two flow control valves of suitable port size are provided for each pneumatic cylinder. In some cases the flow control valves are mounted on each cylinder. In other cases, the flow control valves are mounted on or near the solenoid valve. Flow control valves are to be connected to the bottom and top ports of the pneumatic cylinders of top and bottom units. The flow control valves have been factory set based on the 60 psig regulator outlet pressure. Normally no adjustment should be necessary.

5. Limit switches may be provided for regular indication of the rotation of the shaft / cycling of the gate. As the shaft rotates, the limit switch arm will be actuated as it contacts the end of the each cylinder gate arm. If limit switches are included, they should have been factory-tested, but will need to be field-wired to power and control circuits. Refer to vendor information for installation and operation. In some cases other types of position or motion indication devices are provided for the same purpose. Refer to vendor information for installation and operation.

Your pneumatically actuated Double Flapgate Airlock Valves should now be ready for operation. Refer to Section VI for operational instructions.
ELECTROMECHANICAL ACTUATION INSTALLATION

These installation instructions apply for electromechanically-actuated arrangements (refer to Figures 7 through 11).

Figure 7: Electromechanical Actuator front view

Figure 8: Electromechanical Actuator viewed from counterweight side
1. Electromechanically-actuated valves come completely assembled and should be ready for installation as described in Section V.

2. Counterweight assemblies are provided on the top and bottom valve (Figures 7 and 8) sides opposite the cam drive. The counterweights act to keep the cam followers riding on the cam. Note that the lower counterweight arm is slightly shorter than the upper counterweight, in order that the counterweights clear each other. To adjust the amount of force acting on the cam, the counterweights can be moved axially along the length of each arm by loosening the jam nuts, then the counterweight bolts, moving the weight on the arm and then retightening the bolts to the shaft and the jam nuts. To increase the closing force, move the counter weight away from the gate shaft.
3. In some cases, a motion or proximity switch may be provided. These switches indicate that the gates are moving/shafts are turning. Refer to vendor information for wiring and installation instructions (if not already installed).

4. A guard is provided around the entire rotating cam and drive assembly and must be in place during operation. Failure to have these guards installed could lead to serious personal injury.

Your electromechanically actuated Double Flapgate Airlock Valves should now be ready for operation. Refer to Section VI for operational instructions.

**GRAVITY ACTUATION INSTALLATION**

These instructions apply for gravity-actuated counterweight actuated arrangements (Figure 12).

These valves typically come completely assembled and initially adjusted for operation, and should be ready for installation. Refer to Section VI for operational instructions.

Counterweight assemblies are provided on the top and bottom valve (Figure 12) sides. The counterweights act to keep the gates closed. Note, the lower counterweight arm is slightly shorter than the upper counterweight, in order that the counterweights clear each other. To adjust the amount of force acting on the cam, the counterweights can be moved axially along the length of each arm by loosening the jam nuts, then the counterweight bolts, moving the weight on the arm and then retightening the bolts on the shaft and the jam nuts. To increase the closing force, move the counterweight away from the gate shaft.

In some cases, spool pieces may be included. Refer to Section V for installation instructions.

*Figure 12: Gravity-Operator (left)*
As discussed in the Product Description Section (Section IV), your Double Flapgate Airlock Valve will be one of the following three types:

- Pneumatically driven cylinder operation (Section VI)
- Electromechanically gear / motor driven cam operation with counterweights (Section VI)
- Gravity actuated counterweights (Section VI)

Each type is discussed separately in this Section VI.

Note: this Manual does not provide information on your plant’s system-level operation, but only on your Double Flapgate Airlock Valve. Please refer to other documentation for this information.

**OPERATIONAL SAFETY**

*Plant controls and interlocks may be involved in the safe operation of the Double Flapgate Airlock Valves. Operators must be fully trained on the system controls related to this Equipment. Incorrect operation of the Equipment and related system components could lead to serious injury.*

When operating the Equipment the following requirements must be adhered to, else the Equipment could be damaged:

- Do not operate this Equipment in excess of its rated capacity, speed, pressure or temperature (refer to Section IV). Operation of the valves in excess of the operating parameters set forth in this Manual and in the sales contract could subject the valves to damage and invalidate the warranty.

- Operation of the valves must be in accordance with the instructions contained in this manual.

**PNEUMATIC ACTUATION OPERATION**

Once all of the pneumatic control components have been installed, electrical components wired and the Double Flapgate Valve is properly and safely attached to the upstream and downstream equipment (refer to Section V), including all access doors being securely closed, the valve may be test-cycled and set up for regular operation. The Double Flapgate Valve has been factory set, however, the following adjustments may be made:

1. The timer may be adjusted to set the number of gate cycles per unit time. Set the timer to cycle the gates at a rate appropriate for the application. As the timer relays go on and off based on the timer setting, the control output power is turned on and off to the solenoid valves, alternating the pressurized air feed to the top and bottom of the cylinders and thereby operating the valves. After start-up, the timer may be adjusted to tune-in the operational cycle. Refer to timer vendor information for installation and operation.
2. The flow control valves may be adjusted to tune in the pneumatic cylinder strokes at the open and closed position on each valve to eliminate the seat slamming shut. If valves are slamming open or closed, or plant air pressure is low, adjustments may be necessary to control the flow to and from the cylinders.

3. Cylinder Air Consumption varies depending on the size of the cylinder, as estimated in the Table 2.

<table>
<thead>
<tr>
<th>Size/Model</th>
<th>Cylinder Bore, inches</th>
<th>Typical Single Cylinder Air Consumption, SCFM *</th>
</tr>
</thead>
<tbody>
<tr>
<td>8” MPSA/ MPFTA</td>
<td>2.5</td>
<td>0.4 to 0.6</td>
</tr>
<tr>
<td>10” MPSA/ MPFTA</td>
<td>2.5</td>
<td>0.6 to 0.8</td>
</tr>
<tr>
<td>12” MPSA</td>
<td>2.5</td>
<td>1</td>
</tr>
<tr>
<td>12” MPFTA</td>
<td>4</td>
<td>3</td>
</tr>
</tbody>
</table>

*Basis: 6 cycles/minute, 60 psig regulator supply air pressure available

Table 2: Estimated Air consumption of Various Size Double Flapgate Valves

**ELECTROMECHANICAL ACTUATION OPERATION**

Once all of the electromechanical components have been installed and wired and the Double Flapgate Valve is properly and safely attached to the upstream and downstream equipment (refer to Section V), including all access doors being securely closed, the valve may be test-cycled and set up for regular operation. The Double Flapgate Valve cycling rate has been factory set, and does not have any adjustments (unless a variable speed drive is controlling the motor, which is not covered in this Manual).

A motor coupled to a gear reducer drives a cam assembly (Figure 9) at a constant speed (normally 6 RPM). The motor and gear are mounted to a base plate that is sandwiched in between the upper and lower Double Flapgate housings. When the motor is electrically powered, the cam is driven.

The cam in turn contacts upper and lower cam follower rollers (Figure 10) mounted on the ends of the upper and lower cam arms. Each cam arm is mounted on one of the gate shafts. As the cam rotates, it rolls on either the upper or lower cam followers or arms, opening and closing the upper and lower gates sequentially. These mechanical settings are factory set and should not require adjustment. If they loosen for some reason, the slots and hold-down bolts in the cam arms can be repositioned and retightened to position the cam arms for correct rotation.

**GRAVITY ACTUATION OPERATION**

Once all of the gravity control components have been installed and the Double Flapgate Valve is properly and safely attached to the upstream and downstream equipment (refer to Section V), including all access doors being securely closed, the valve may be test-cycled and set up for regular operation. The Double Flapgate Valve has been factory set, however, the following adjustments may be made:
The weight of the processed material on the upper and lower gates increases as the material is introduced from above. When the combined weight of the material and the gate exceeds the force provided by the external counterweight and any pressure differential, the gate opens and once the material slides off a gate, the counterweight acts to re-close the gate, thereby creating a gravity-driven open and closed cycle of each gate.

To counter balance the action of the weight of the upper and lower gates, counterweight assemblies (Figure 13) are provided on the top and bottom on either side of each valve. To adjust the amount of force acting to balance the material and gate loading, the counterweights can be moved axially along the length of each arm by loosening the nuts on the counterweight bolts, and then move the weight on the arm and then retightening the bolts to the shaft and the jam nuts. By moving the counterweights outward, more material will be required to force the gate to open and the number of cycles per unit time is decreased. The opposite is true for lessening the material weight to open and increasing the frequency of cycling.

SECTION VII
LUBRICATION

Bearings should be grease lubricated at least once per month. In extremely dusty or high temperature applications lubrication may be required more often. Add grease through the grease fitting on the bearing until the grease is present at the bearing seals. If contaminants are present in the grease discharged at the seal, slowly purge grease through the bearing until the grease is clean. Be sure to wipe the grease fitting with a clean rag before lubricating the bearing. Standard applications with standard bearings require an NLGI#2 grease. High temperature bearings use DC-44 grease. Very high temperature applications use a graphite bushing which requires no lubrication and have no grease fittings present on the bearings.
SECTION XI – SPARE PARTS ORDERING/SERVICE

Because of the wide variety of material handling systems for which this Equipment must be tailored, many considerations determine the proper size, design, materials of construction, operating speed, type of driver, etc. A complete description of every product is kept on file with the factory. These specifications can be referenced by supplying the serial number to your local Meyer Representative.

NOTE: To aid us in providing you with a special service, application assistance and help with spare part requirements, please record the following:

Type/Size _____________________________
Serial No. _____________________________
Date of Installation _______________________
