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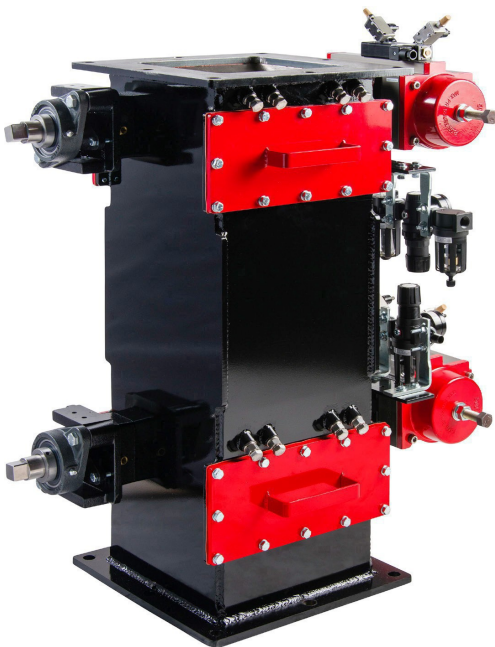
# HPSC, HPTC, LPTF Double Flapgate Airlock Valve

## INSTALLATION, OPERATION & MAINTENANCE INSTRUCTIONS



Read this manual carefully before installing, operating, or maintaining this equipment. Failure to do so could result in serious injury or death.

*Save this manual*



HPSC/HPTC



LPTF

**Your Source for Bulk Handling/Air Process Equipment**

Wm. W. Meyer & Sons, Inc.

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### SECTION I SAFETY PRECAUTIONS

#### 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”, “Double Flapgate”, “Valve”) is of great importance to Wm. W. Meyer & Sons, Inc (“Meyer”, “Factory”). In some applications, Single Flapgates are used. The hazards and warnings in this document apply equally to Single, Double and Triple Flapgates. 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 Instructions***. Failure to do so could result in serious injury or death.

#### ***Equipment owner responsibilities***

Equipment owners are responsible for understanding the contents of this document and compliance with applicable government laws and regulations and appropriate industry standards. In addition, owners must create a control of hazardous energy procedure for the complete system that incorporates this Double Flapgate Airlock Valve and ensure that workers are properly trained to follow it. (See information regarding the vented isolation valve for air-operated units on page 5.) 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 based on the following:

- Installation and maintenance of equipment must be performed by qualified mechanics/millwrights/maintenance personnel that are familiar with the relevant contents of this manual.
- Installation of any electrical equipment must be completed by qualified electricians, in compliance with applicable codes and ordinances.

Because Meyer is not always aware of the application and does not always have access to the installation, your participation in the safe installation, operation and maintenance of your Double Flapgate is critical. The owner/operator is responsible for any hazards related to the material that is being processed through the equipment. If you have any safety or operational questions pertaining to the design or application of the Double Flapgate Airlock Valve we encourage you to contact the Factory at (800) 963-4458. Consult the Factory for the availability of manuals in other languages.

## SIGNAL WORD DEFINITIONS



**DANGER**

Indicates a hazardous situation which, if not avoided, will result in death or serious injury.



**WARNING**

Indicates a hazardous situation which, if not avoided, could result in death or serious injury.



**CAUTION**

Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

**NOTICE**

Indicates information that is important, which if not followed, may cause damage to the equipment.

## IMPORTANT SAFETY INFORMATION



**WARNING**

To reduce the risk of serious injury or death:

### **Be qualified.**

Operation of this equipment must be limited to those that are properly trained in its use.

Servicing or maintaining this equipment must be performed by trained maintenance personnel only.

### ***Read all safety information.***

- Read and understand all the **safety-related information contained in this manual** prior to attempting to perform any work on this equipment.
- Obey all the **safety labels** on the equipment. Do not remove any safety labels. If the equipment is missing any labels (see “SAFETY LABELING” section), contact the Factory immediately, before putting the equipment into service.
- For **add on equipment**; motor, switches, etc. refer to the appropriate manufacturer’s safety information.

**Heavy – handle safely.** The weight of this equipment and its component parts could cause serious injury if dropped or mishandled during installation, service, or maintenance. Always use safe handling and rigging methods.

**Guard and avoid dangerous internal parts.** The internals of this equipment contains moving part(s) that will crush and cut any body parts they come in contact with, resulting in serious injury or death.

- **Equipment can be actuated remotely, without warning, if energized.**
- **Inlet and outlet flanges** must always be permanently fastened to mating system components or permanently guarded. Components and guards must be designed such that no access to the interior of the equipment is allowed during operation. See “HAZARD IDENTIFICATION” for process integration and installation details.
- **Never open access covers/doors or reach inside** the equipment for any reason while it is in operation.

**Guard external moving parts.** Unguarded external moving parts expose personnel to pinch points, which could result in serious injury or death.

- Never operate this equipment without guards attached.
- Any accessory or auxiliary components installed with this equipment must have protective guarding correctly installed and permanently fastened in place.

**Lockout/Tagout all sources of energy and relieve pressure** in accordance with the owner/employer's procedure for the control of hazardous energy before installing, servicing, or maintaining this equipment or removing any access doors above, below, or on the valve itself. Potential sources of energy include but are not limited to: motors, switches, cylinders, and solenoids. Also consider:

- Equipment may start remotely, without warning, if energized.
- For air actuated units, even if all sources of energy are locked out, there may be residual air pressure in the actuator that must be relieved. Block further pressurizing with the lockable in-line vented isolation valve. (See "Isolating Energy with Vented Isolation Valve" subsection on page 5.)
- If electrical devices are part of the equipment, hazardous voltage exists and presents the risk of electrical shock.
- Equipment may be under pressure – pressurized gas and material could cause serious injury or death.
- Equipment surfaces may be hot; allow them to cool before performing any work.

Always ensure that any electrical devices present are properly grounded in accordance with OSHA, the National Electric Code (NEC), and local codes. Failure to do so could expose personnel to hazardous voltage which could lead to serious injury or death.

## **HAZARD IDENTIFICATION**

### ***Principle of operation***

Double Flapgate Valves are components that are used as an airlock transition point, sealing pressurized systems against loss of air or gas while maintaining a flow of material between components with different pressures. They are a particularly versatile component that can be utilized in a wide variety of material handling applications. By their nature, the valves are of no use by themselves; they are only useful when added as a component to a material handling system as part of a larger process.

### ***Amputation hazard***

The Double Flapgate Airlock Valves use a common mechanical principle which creates an internal pinch point in order to function properly: a metal plate, driven by a powerful actuator, rotates around an axis from a hinged position to mate with a metal sealing surface.

If either the inlet or discharge openings are left unguarded, the Double Flapgate's moving plate presents a serious personal injury hazard, including but not limited to amputation. Any part of the human body in the way of the plate and the housing will be crushed or cut off.

### ***Guarding discharge***

As a courtesy, the Double Flapgate is shipped with an attached **discharge** flange guard. This guard should not be removed and should remain in place during operation. However, due to the vast number of potential applications in which the valves can be used, it is neither feasible nor practical for Meyer to supply a discharge guard which will be effective in every possible application or process. If the supplied **discharge** flange guard does not work for your specific application or process, alternative suitable guarding **must** be utilized to ensure safe operation. "Alternative suitable guarding" could be another piece of equipment, chute, bin or custom discharge guard. It is imperative that the valve should not be operated without the discharge opening fully guarded such that no contact can be made with the moving parts inside of the equipment. It remains the owner/operator's responsibility to ensure that the Double Flapgate is safely integrated for the particular process and application for which it was purchased and that the discharge opening remains guarded at all times during operation.

### ***Guarding inlet***

In most applications, the Double Flapgate Airlock Valve will be integrated into a process, system or application where the **inlet** opening of the valve will be guarded by virtue of being attached to another piece of equipment (bin, hopper, etc.) However, there may be instances or situations where the **inlet** of the valve becomes accessible (i.e. through a clean out door or access hatch on the attached equipment) to a user. As noted above, due to the vast number of potential applications in which a Double Flapgate Airlock Valve may be used, it is neither feasible nor practical for Meyer to design or supply an inlet flange guard that will work for every possible application or process. It is the owner/operator's responsibility to ensure that the valve is safely integrated for the particular process and application for which it was purchased and that the inlet opening remains guarded at all times during operation.

### ***Isolating Energy with Vented Isolation Valve***

Even if all sources of energy are locked out, the air-operated units may have residual air pressure in the actuator. This air pressure must be relieved and further pressurizing of the actuator must be blocked in order for the Double Flapgate to be considered at "Zero Energy State" and comply with Lockout/Tagout. The lockable in-line vented isolation valve included with the controls must be closed and locked for this equipment to be deemed safe to service or maintain. To do this: close the valve, slide the locking tab into position, and then secure the tab with the proper Lockout/Tagout device.

### ***Training***

The owner also bears the responsibility to ensure that personnel who may be working around a Double Flapgate are properly trained. Personnel **must** be aware that: (1) anything coming into contact with the moving plate **will** be cut off/amputated; (2) Double Flapgate valves can start without warning; (3) before working on, cleaning, repairing or maintaining a Double Flapgate valve, Lockout/Tagout procedures **must** be strictly followed; and (4) valves **must not** be operated without guarding in place. Before working around a Double Flapgate valve, personnel **must** read the Operator's Manual.

### ***SAFETY LABELING***

The safety labels shown are affixed to your Double Flapgate Airlock Valve. A Safety Supplement Datasheet has been packed with your equipment at the time of shipment. Because Double Flapgates can be used in a vast number of applications and in a number of configurations, it is possible that the

safety labels affixed to the equipment may be obscured when installed and integrated into a customer's particular application or process. If this is the case, contact the factory for additional labels.

The following recommendations are offered to assist in the placement of additional safety labels if needed. The objective is for anyone who approaches the Double Flapgate to be able to see the labels alerting him or her how to avoid the hazard.

- Place labels in locations that all personnel operating and maintaining the Double Flapgate Airlock Valve or any other people that may have access to the equipment will readily see as they are preparing to work on the equipment and/or as they approach it.
- Due to the location of the Double Flapgate Airlock Valve, labels may have to be located near it, for example: on nearby structural steel or adjacent equipment. This location needs to be the point of access where the label can be easily seen and the hazard is clearly associated with the Double Flapgate.

If you have received a unit without labels or if labels fall off or are damaged, contact Meyer immediately (800-963-4458) to obtain replacements at no charge, prior to installation, use or maintenance.

Please provide unit operating temperature at time of request.





## SECTION II RECEIVING AND STORAGE

### **A. Receiving**

Upon receipt of equipment and material from Meyer, the following basic steps should be taken. The equipment is heavy and proper handling procedures should be used (See the “**Heavy - handle safely**” information in the “IMPORTANT SAFETY INFORMATION” section).

1. Use the packing list to determine that all the items shipped have been received. Your equipment was carefully crated for safe shipment when given to the carrier. If items are missing, contact Meyer, per the contact information at the end of this section.
2. Check for damage. Damage in transit is the responsibility of the carrier. Title to your equipment 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. In the event damage has occurred:
  - a. 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.
  - b. Contact the carrier 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.
  - c. If there are any visible problems with your unit 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 Meyer.
  - d. Photographic records of the damage are helpful to communicate the extent and type of damage as well as provide a clear record.
  - e. In addition to inspecting damaged equipment, you should also check the condition of the safety labels to ensure they have not been damaged or come off. If they have, contact the Factory for replacements prior to installation.
  - f. **Concealed Damage:** If Equipment or goods are discovered to be damaged in shipment at a later date, contact the carrier and Meyer immediately.
  - g. In all cases of damage in transit, contact Meyer 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.  
1700 Franklin Blvd  
Libertyville, IL 60048

800-963-4458 or 847-918-0111  
sales@wmmeyer.com

## **B. STORAGE**

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:
  - a. 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.
  - b. Flapgates should be stored in an upright position.
  - c. The interior of the valve should be sprayed with a rust preventative coating
  - d. All exterior exposed machined surfaces should be sprayed with a rust preventative.
  - e. 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.
  - f. Keep covers on until unit is installed for service.
  - g. 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 III PRODUCT DESCRIPTION**

The Double Flapgate Airlock Valve is specifically designed to control the rate of material flow through a system, while at the same time preventing air leakage by isolating the processing system pressures from one material handling point to another.

- HPSC & HPTC (High Pressure)
  - Differential pressure up to 20 PSIG and temperatures up to 1650°F.
- LPTF (Low Pressure)
  - Differential pressure lower than 1 PSIG and temperatures up to 250°F.



Double Flapgate Airlock Valves are also suitable for conveying material that tends to bridge and material that is: abrasive, chunky, friable, or difficult to handle.

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 air purge systems, are determined from operating pressure, temperature, internal gas composition and other factors.

Double Flapgate Airlock Valves consist of two actuated gates that open and close against stationary mating seats to fill and empty the chambers on top of the upper and lower gates.

The actuating method of the gate will be one of the following:

- Pneumatic operation
  - One actuator per gate.  
Depending on process conditions only one actuator is employed.
  - Two actuators per gate. (HPSC & HPTC only)  
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.
- Electro-mechanically motor-driven cam operation with counterweights
- Gravity actuated with counterweights

The high-pressure product comes in two basic configurations, HPSC (High Pressure Short) and HPTC (High Pressure Tall) valves. The short version is most commonly used in applications where height is limited. The tall version allows for higher volumetric flow rates. A spool piece or “Dutchman” can be included between the gates to increase the internal volume.

The low-pressure units are only available in specific heights and are not available with different spool pieces.

The standard materials of construction:

- HSPC & HPTC are made from mild steel, hi-chrome, stainless steel and Incoloy® depending on application and temperature.
- Bearings, seals and gaskets are specific to the application.
- LPTF is fabricated from mild steel or stainless steel materials with the appropriate bearings, seals and gaskets.

All the assemblies are comprised of housing, door(s), seat, gate, shaft, gate lever arm, and cylinder lever arms.

- 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.

For pneumatic operation, the HPSC and HPTC use shaft-mounted rotary actuators while the LPTF has the external end of the shaft keyed and clamped to a cylinder lever arm of a pneumatic cylinder.

For electro-mechanical operation, cam followers are mounted on the external end of the shafts. A motor drives a gear reducer which has a cam mounted on its output shaft. This cam rotates and sequentially actuates each cam follower, thereby opening and closing each gate. A counterweight mounted on the opposite end of the shaft keeps the cam followers riding on the cam.

The gravity actuated valve relies on the combination of the weight of the material and system pressure to open and counterweights to close.

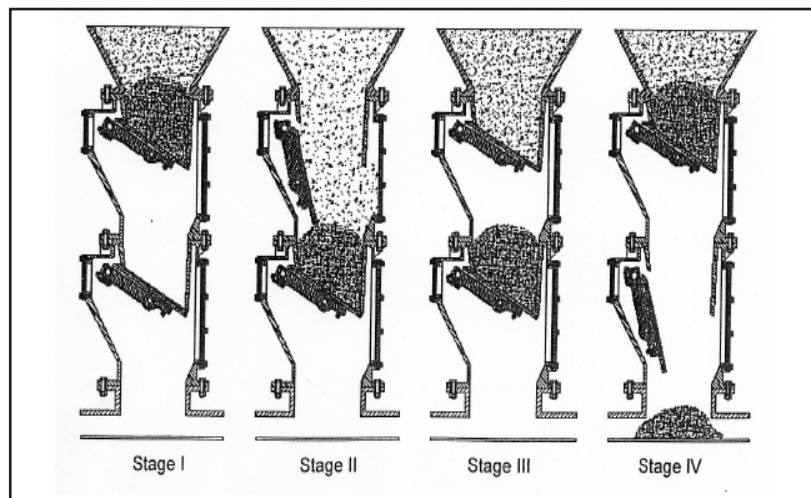
HPSC & HPTC have rows of packing ring seals provided in the packing areas built into each side of the housing. Packing gland nuts may be periodically tightened to compress the packing material, thereby providing a seal between shaft and the housing. In some cases, air purge may be provided in this seal area; 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.

LPTF utilize the flange mounted bearing seal to provide sealing around the shaft since these are for low pressure differential applications.

#### **BASIC OPERATIONAL CYCLE**

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

- 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.



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 then closing once the material has been discharged. The electromechanically operated valve can perform in a similar way, given sufficient air pressures and material weights.



## SECTION IV INSTALLATION

When installing the equipment, verify that the openings will be properly guarded and that the labels will be visible (See “HAZARD IDENTIFICATION” section). In addition, the installer must read and understand the “IMPORTANT SAFETY INFORMATION” section before installing the equipment.

**⚠ DANGER** The internals of this equipment has part(s) that will crush and cut. Before installing the equipment ensure that Lockout/Tagout procedures have been followed. Failure to do so will lead to serious injury or death if a body part contacts a moving internal part.

### **BASIC DOUBLE FLAPGATE AIRLOCK VALVE MOUNTING**

Normally, the Double Flapgate Airlock Valves are delivered fully assembled. For shipping purposes, they may be broken down due to the overall height of the unit. The single valves/Dutchman can be assembled together and then installed, or installed piece by piece.

1. We recommend that inlet and outlet flanges remain covered until the valve is ready to be attached to the mating equipment.
2. Prior to installing the valve and with the power disconnected, check to ensure no foreign objects have been left inside or have accidentally fallen into the valve.
3. Identify the inlet of the Double Flapgate before beginning installation. This can be done by either comparing the equipment with the images in the product description section or to any available literature or drawings. The metal plate/gate is flat on top and the gate lever is attached below.
4. The Double Flapgate Valves must be installed with the top and bottom flanges level and parallel to the mating system flanges using the appropriate fasteners. The valves must be adequately supported to prevent distortion.
5. Ensure that the inlet and outlet flanges are permanently fastened to mating components or are permanently guarded.
6. Check and make sure that the mounting fasteners are tight and that the equipment is adequately supported.
7. The pneumatically actuated units were tested and adjusted prior to shipment. The gravity actuated counterweight units will require adjustment during startup.

Double Flapgate Valves are sometimes customized to suit specific customer applications. This means some of the components may be supplied by others and need to be installed on the valves. Therefore, the installation and operating procedures for your equipment may vary from the descriptions in this manual. When installing the equipment, refer to relevant information supplied by others. These basic installation instructions apply to the HPSC & HPTC and to the LPTF versions.

### ***PNEUMATICALLY OPERATED DOUBLE FLAPGATES***

1. If a pre-piped and mounted pneumatic air set is provided, the first step is to connect the dry compressed air to the air set.
2. If a pre-piped air set is not provided, the installer needs to install the components necessary for controlling the cylinders.
3. The recommended regulator inlet air supply is 80 to 120 psig. The regulator outlet pressure is typically set at 60 to 80 psig. Operating the gates below 30 psig is not recommended.
4. Make certain no air is leaking from connections and pneumatic components.
5. If the solenoid was supplied as part of the air set, it will already be connected to the filter regulator, if not those connections will need to be made at this time.
6. Connect the solenoid to the timer box and then connect the electric power to the timer box. Refer to the solenoid vendor information for specific details. Note: There are a number of solenoids that are used with the Double Flapgate Airlock Valves, therefore specific connection details are not part of this manual.
7. There are two flow control valves on each solenoid of the Double Flapgate Valves. These are factory set and typically require no adjustment.
8. Position switches may be provided to indicate whether the flap gate is open or closed. These will need to be wired to power and control circuits. Refer to the switch vendor information for instructions.

There may be additional custom devices supplied with the valves. Refer to the appropriate vendor information for installation instructions. The pneumatically controlled Double Flapgate Airlock Valve is now ready for startup. See the appropriate section for instructions.

### ***ELECTRO-MECHANICAL DOUBLE FLAPGATE INSTALLATION***

1. These Double Flaps use a motor to drive the actuation sequence. Electrical connections must be done by a qualified electrician, in accordance with applicable codes and standards. Standard rotation for the electric motor is counter-clockwise as viewed from the fan end. Rotation should only be checked after proper guarding has been completed. There is a directional arrow on the cam which indicates clockwise rotation. In order to check for the proper rotation, look through the expanded metal guard, use a light if needed, so that you can see what direction the cam is turning. "Bump Start" the motor and check for proper rotation.
2. 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).
3. A guard is provided around the rotating drive parts and must be in place during operation.

Failure to have these guards installed could lead to serious personal injury.

Your electro-mechanically actuated Double Flapgate Airlock Valves should now be ready for startup. See the appropriate section for instructions.

### **GRAVITY ACTUATION INSTALLATION**

These valves typically come completely assembled; however, the counterweights may need to be adjusted during initial startup. See the appropriate section for instructions.



## **SECTION V OPERATION/STARTUP**

**⚠ WARNING** Prior to use, the operator must read and understand all the safety-related information including all warnings and guarding instructions. Verify that all guarding is in place and area is clear of all non-essential personnel. Failure to do so could lead to serious injury or death.

As discussed in the Product Description Section, your Double Flapgate Airlock Valve will be one of the following types: Pneumatically driven operation, Electro-Mechanical or Gravity actuated with counterweights.

When operating this Equipment:

- ✓ Instructions in this manual must be followed.
- ✓ Do not operate this Equipment in excess of its rated capacity, speed, pressure or temperature.
- ✓ Exceeding the operating parameters could damage the valves and void the warranty.

### **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 (See “HAZARD IDENTIFICATION” section), including all access doors being securely closed, the valve may be test-cycled and set up for regular operation. The Double Flapgate Valve was run at the factory and the controls were 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, the control output power is cycled to the solenoid valves, alternating the pressurized air supply to the front and rear of each cylinder and thereby operating the valves. After start-up, the timer may be adjusted to tune-in the operational cycle. Refer to the timer vendor information for details.
2. The flow control valves may be adjusted to tune-in the open and closed positions on each valve to eliminate the flap 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 actuators. The flow control valves are connected to the solenoid: one controls the closing speed of the gate while the other controls the opening speed.

### ***ELECTRO-MECHANICAL ACTUATION STARTUP***


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 (See “HAZARD IDENTIFICATION” section) 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).

Start the electric motor and observe the operation of the valves.

The motor is coupled to a gear reducer driving a cam assembly at a constant speed (normally 6 RPM). As the cam turns, it contacts the upper and lower cam follower rollers. The cam contacts and pushes on either the upper or lower cam followers, 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.

The counterweights keep the cam followers riding on the cam by applying downward pressure. 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 nuts on the counterweight arms, moving the weight on the arm and then re-tightening the nuts. To increase the force, move the counterweight away from the gate shaft.

When the unit is operating satisfactorily, it can begin handling material. Continue to observe the operation and make adjustments if needed.

 **WARNING** Follow proper Lockout/Tagout procedures before making adjustments; failure to do so could lead to serious injury or death.

### ***GRAVITY ACTUATION STARTUP***

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 (See “HAZARD IDENTIFICATION” section) 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 the gate, the counterweight acts to re-close the gate, thereby creating a gravity-driven open and closed cycle of each gate.

To counterbalance the action of the weight of the upper and lower gates, counterweight assemblies 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 arms, moving the weight on the arm and then re-tightening the nuts. To increase the force, move the counterweight away from the gate shaft. By moving the counterweights outward, more material will be required to force the gate open; decreasing the number of cycles per minute. Moving the weights inward will have the opposite effect.



## SECTION VI LUBRICATION/SERVICE

**⚠ DANGER** The internals of this equipment has parts that can crush and cut. Follow Lockout/Tagout information in the "IMPORTANT SAFETY INFORMATION" section before service or maintenance. Failure to do so will lead to serious injury or death if a body part contacts a moving internal part. In addition, the equipment and parts are heavy - use safe handling and rigging methods.

Bearings should be grease lubricated at least once per month. In extremely dusty or high-temperature applications, lubrication may be required more often. Removal of guards may be required on some units to access the bearing's grease fitting depending on the model and size. Standard bearings require NLGI #2 grease. High-temperature bearings use DC-44 grease. Extremely high-temperature applications use a graphite bushing that does not require grease.

1. Wipe off the grease fitting before adding grease.
2. Add grease into the bearing until grease is present at the bearing seal.
3. If contaminants are present in the grease, slowly add more grease until the discharge is clean.

Standard packing (HPSC & HPTC) is graphite impregnated aramid fiber (up to 450°F) and for high-temperature applications, a graphite/PTFE packing is used. The packing nut can be adjusted as necessary to maintain the seal around the shaft. The packing should be replaced periodically to maintain the shaft seal. Frequency depends on application and use.

The flange bearing seal on the LPTF valves seal the shaft opening and cannot be replaced separately from the bearing.

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 or for help with spare part requirements, please record the following:

Type/Size \_\_\_\_\_

Serial No. \_\_\_\_\_

Date of Installation \_\_\_\_\_







# SAFETY SUPPLEMENT

## ATTENTION INSTALLERS/OPERATORS FOR YOUR PROTECTION:

1. Read and understand the Operating Manual accompanying this equipment before performing any work.
2. Additional safety label kits available from Meyer upon request at no charge. This is part of our effort to ensure this equipment is installed, operated and maintained in the safest possible manner. Affix these labels in locations to achieve maximum visibility and thereby alert any personnel that may ever be on-site that a potential for injury could occur.
3. Under no circumstances should this equipment be installed or operated in a manner that permits access to the interior of the valve.
4. Inlet and Outlet Flanges must always be permanently fastened to mating system components.
5. In the event that the inlet or outlet is ever exposed, proper guarding to prevent access to the valve interior must be installed immediately and prior to start-up. Every unit is shipped with an attached discharge flange guard. **DO NOT OPERATE equipment with unguarded inlet or outlet. DO NOT REMOVE FLANGE GUARD.**
6. Never operate the valve with the actuator guard removed or loose.
7. ***Always follow LOCKOUT-TAGOUT procedure*** before performing any work.
8. Always keep loose clothing, hands, feet or any parts of your body, tools and/or any foreign objects away from all moving equipment and away from any potential pinch point.
9. Never remove any access doors (inspection port covers) above, below, or on the valve itself without first locking out power.
10. Consult your plant safety director, system designer, installation manager or the Meyer factory if you have any questions regarding the proper installation, operation and maintenance of this equipment.

Wm. W. Meyer & Sons, Inc.

1700 Franklin Blvd • Libertyville, IL 60048 • Phone: 847-918-0111 • Fax: 847-918-8183

Website: <http://www.wwmeyer.com> • [www.meyerindustrial.com](http://www.meyerindustrial.com)

File # 295-P-001

**contact us at:**

**Wm. W. Meyer & Sons, Inc.**

1700 Franklin Blvd.

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[www.wmwmeyer.com](http://www.wmwmeyer.com) · [www.meyerindustrial.com](http://www.meyerindustrial.com)

Email: [sales@wmwmeyer.com](mailto:sales@wmwmeyer.com)

**800-963-4458**

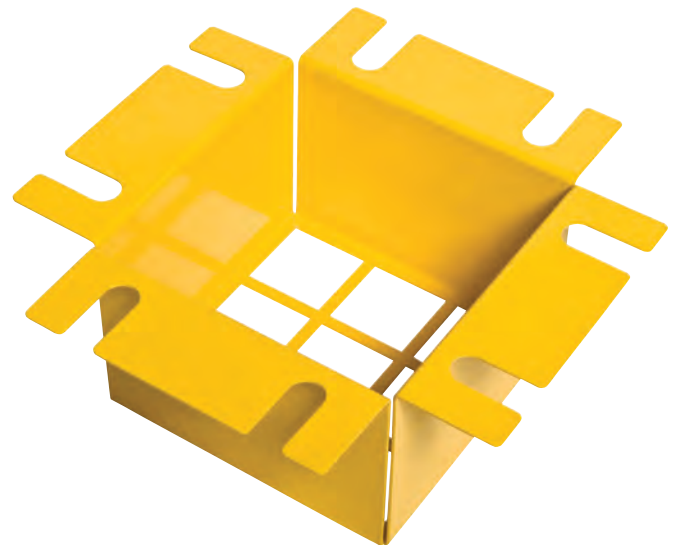
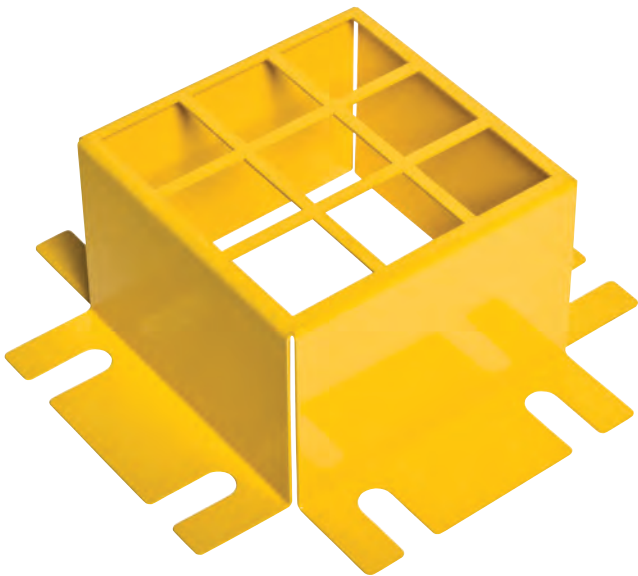
## SAFETY LABELS

Locate all of the safety labels on your equipment and know their meaning before operating your Double Flapgate Airlock Valve.



**DANGER STOP DANGER**

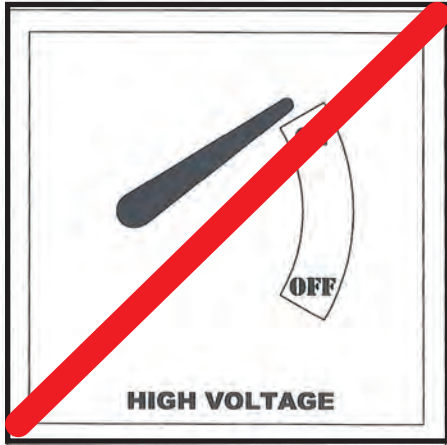
**NEVER OPERATE EQUIPMENT WITH UNGUARDED INLET OR OUTLET**



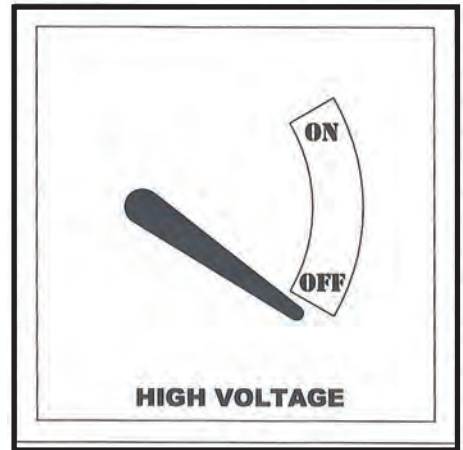
**FLANGE GUARD**

NOTE: Contact Wm. W. Meyer & Sons, Inc. at 800-963-4458 for free replacement safety label kit.

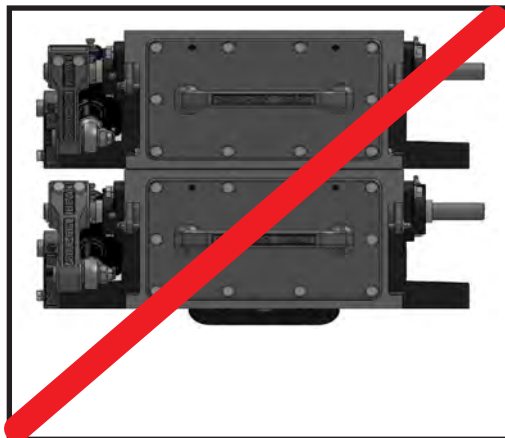
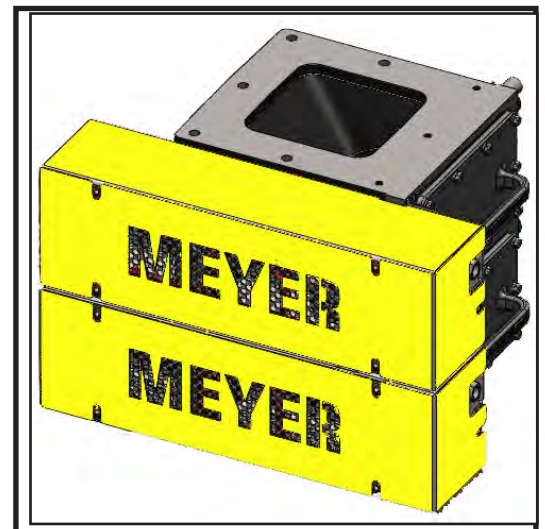
# FLAPGATE VALVE SAFETY PRECAUTIONS



ALWAYS DISCONNECT POWER WHEN WORKING ON THE VALVE. FOLLOW **LOCKOUT-TAGOUT** PROCEDURE.



NEVER OPERATE VALVE WITH THE ACTUATOR GUARD REMOVED



**DO NOT OPERATE** VALVE WITH UNGUARDED INLET OR OUTLET. A FLANGE GUARD IS SHIPPED WITH THE VALVE. **DO NOT REMOVE FLANGE GUARD.**

