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Gravity Diverter

INSTALLATION, OPERATION & MAINTENANCE INSTRUCTIONS



Your Source for Bulk Handling/Air Process Equipment

Wm. W. Meyer & Sons, Inc.

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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 Gravity Diverter Valves is of great importance to Wm. W. Meyer & Sons, Inc (“Meyer”). The decals, shields, guards and other protective features designed, 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 in addition to all applicable government safety/health laws and regulations and generally recognized industrial standards. The operation and maintenance of this Gravity Diverter Valve should be restricted to only those personnel trained in its use. Consult Factory for the availability of manuals in other languages.

Operation, Installation and Maintenance personnel should READ carefully and UNDERSTAND the sections of this Installation, Operation and Maintenance Instructions relevant to the work they are performing.

The various precautions and recommendations detailed within this manual are not necessarily all inclusive. These instructions are intended to provide general safety and operational guidance relating to typical installations with which Meyer is familiar.

Additional information may be provided that pertains to your specific installation upon request. 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.

Because Wm. W. Meyer & Sons 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 Gravity Diverter is critical. If you have any safety or operational questions pertaining to the design or application of the Gravity Diverter we encourage you to contact the factory at (800) 963-4458.



Always CONTROL / DE-ENERGIZE potentially hazardous energy sources when installing and maintaining the Gravity Diverter, as follows:

1. The Gravity Diverter product family uses a common mechanical principle which creates an internal pinch point in order to function properly: a metal diverter plate closes against a metal housing.
 - a. The Gravity Diverter should **never be maintained or operated in a manner which could expose personnel to the internal moving parts**; either via the inlet/discharge port, an access door of any kind or via ancillary equipment affixed to the Gravity Diverter. **To do so will expose personnel to the potential risk of serious injury.**
 - b. Avoid serious injury by **always** keeping hands, fingers, feet or any parts of your body, loose clothing, and foreign objects away from inlet and discharge openings, drive components, auxiliary components, and associated equipment.
2. **Always de-energize all electrical equipment by Locking Out/Tagging Out power** before working on this Gravity Diverter, 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.
WARNING! The Gravity Diverter may move automatically, and may also operate very quietly. Equipment in an idle mode does not mean it is off-line.
3. Inlet and Outlet flanges must **always** be permanently fastened to mating system components. Such components must be designed so that under normal operation personnel are neither allowed access to the inlet or outlet flange nor able reach the internal moving parts. If requested, Meyer can design, build and supply custom ductwork, transition pieces, piping or special guards to protect against the risk of injury.
4. Gravity Diverters, their actuation components, accessory components, and any auxiliary or companion equipment, should be installed and operated only with protective guarding correctly and securely fastened in place.
5. 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).
6. If working on the Gravity Diverter when the surface is hot, always wear appropriate protective 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.
7. The weight of a Gravity Diverter or its components parts can cause serious injury or damage if accidentally dropped or mishandled during installation. Use safe and acceptable methods when handling this equipment. Contact the factory for recommended safe handling and rigging techniques.
8. Refer also to appropriate supporting vendor safety information, MSDS sheets or any other applicable safety information in addition to these Instructions.

SAFETY LABELING

DO NOT operate equipment with unguarded inlet or outlet. The safety labels shown are affixed to your Equipment. A Safety Supplement Data sheet is packed with your equipment at the time of shipment. Additional Safety Supplement label packs are available at no additional charge for the system installer's or plant owner's discretionary use/placement to ensure this Equipment is installed, operated and maintained in the safest possible manner.



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



Meyer ships the equipment with affixed safety labels which are located on the Gravity Diverter housing and other surfaces. However, as the orientation of the Equipment varies, the OWNER is responsible for requesting, at no charge, any supplementary labels to allow safety label visibility to be maximized. The following recommendations are offered to assist placement of safety labels:

- Place labels in locations that all personnel operating and maintaining the Gravity Diverter or any other people that may have access to 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 and the means to avoid the hazard.
- In some cases, labels may be located near the Gravity Diverter (e.g. 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 Gravity Diverter.
- Consult Factory when the equipment is operated at temperatures over 350°F.

INFORMATION FOR SAFETY AND SERVICE

A description of every Meyer Gravity Diverter is kept on file with the factory. These specifications can be referenced by supplying the serial number to your local Meyer Representative. If you have any safety or Equipment-related questions we encourage you to contact the Meyer factory based on the cover contact information.

NOTE: The serial number is located on a metal identification label permanently affixed to every Gravity Diverter before it leaves the factory. 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 Number _____

Date of Installation _____



SECTION II APPLICATION

A Gravity Diverter is used to direct product flow from a single source to multiple destinations. Sizing of the unit depends on flow rate and bulk density of the material. The unit is not designed for use in pneumatic conveying systems. The flow through the unit should be stopped during actuation.

Meyer gravity diverters are available with manual operators, air cylinders, and electric operators.

The air and electric models are available with optional limit switches to indicate the position of the gate. The switches may be added to an air operated gate in the field. Electric actuators must be ordered with integral switches at the time the actuator and diverter are ordered.

Temperature

Manual and Air Operated Gravity Diverters are rated for 250 Deg F. As an option, they can be built for 450 Deg F service with special high temperature bearings.

Electric Gravity Diverters are limited to 200 Deg F operation. (The actuator is limited to 150 Deg F).

Materials of Construction

Gravity Diverters are available in Mild Steel and Stainless Steel Construction.

Accessories

Air Operated Gravity Diverters require regulated, clean, dry, lubricated air for operation. An air set including a filter, regulator, and lubricator is normally provided for this purpose. Typically, a solenoid valve is used to control the air to the cylinder and open and shut the gate. The solenoid valve may be of various NEMA ratings and air return, spring return, or dual coil (fail last state) depending on the particular requirements of the application.



SECTION III INSTALLATION

A. RECEIVING AND INSPECTION

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

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. Check for damage.

2. Damage in transit is the responsibility of the carrier. Be sure to have the driver sign a copy of the freight bill with a notation about any damage.
3. If a shipment was sent to you by parcel post, have the postmaster complete a damage claim report.
4. 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.
5. 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 valve operation.

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 components data for storage recommendations for these items.
3. After prolonged storage and prior to start-up, the Gravity Diverter and its actuator should be inspected by qualified personnel. Contact Wm. W. Meyer & Sons, Inc. if any assistance is required.
4. Long Term Storage procedures are available by contacting the factory.

C. MOUNTING

1. Prior to installing this equipment and with the power LOCKED OUT, check to assure no foreign objects have been left inside or have accidentally fallen into the equipment. All mating equipment (hopper, screw, dryer, etc.) must be thoroughly cleaned to assure any welding splatter, weld rod, fasteners or other debris does not enter this equipment upon start-up and cause serious damage.
2. We recommend that inlet and outlet flanges remain covered until this equipment is ready to be hard piped to the mating equipment.
3. This equipment must be installed with the inlet and outlet flanges parallel to the mating system flanges and adequately supported to prevent distortion. This equipment is not designed to serve as structural support for companion system components.
4. Be sure the valve is mounted upright. The gravity diverter should have the single inlet on top.
5. The inside measurement of the mating flange above the valve should be the same size as the valve flange. If the mating flange is larger, material can quickly wear out the inlet flange of the valve during normal operation.
6. The air filter (air actuated models) must be mounted vertically so that it can be drained of moisture when necessary. It should be installed ahead of the regulator and lubricator.
7. The air supply to the regulator (air actuated models) should be minimum 80 psig and maximum 120 psig.



CAUTION - Never operate the Gravity Diverter with unguarded inlet/outlet. Contact Wm. W. Meyer & Sons, Inc. for flange guards at no additional charge.

D. WIRING

On air actuated models, the solenoid valve (if applicable) will need to be wired to the electrical control source (a SPST switch, pushbutton equivalent, PLC, etc.) and the optional limit switches (if applicable) will be wired to an electrical indicator (light, PLC, etc.). Note: If a dual coil (fail last state) solenoid is used a SPDT switch or pushbutton equivalent will be required. Refer to the Manufacturer's instructions for the electrical wiring schematics for these devices.

On 1-Phase 120 VAC electric actuated models, a SPDT switch or pushbutton equivalent must be used to control forward and reverse. On 3-Phase electric actuated models, a reversing starter is required to isolate the 3-phase power from the operator in addition to the switch. Refer to the manufacturer's instructions for the electrical wiring schematics for these devices.



DANGER - Disconnect power before servicing Gravity Diverter or actuation components to prevent serious personal injury.



SECTION IV START-UP PROCEDURE

A. INITIAL START-UP

1. Prior to actual operation, the operator must familiarize himself with the method of operating the Gravity Diverter, and the status of supporting utilities.
2. The general appearance of the Gravity Diverter and surrounding area should be visually inspected to determine that the Gravity Diverter can be operated safely and without causing any type of damage.
3. Always assure the unit is properly grounded in accordance with OSHA, the NEC and local codes.
4. Open air supply valve and set regulator on air actuated models. Set at 80 psi.
5. Actuate the Gravity Diverter, noting any unusual noise or vibration. On air actuated models cycle the solenoid valve. If noise is evident it is recommended that the equipment be shut down and reinspected for foreign materials. If no obstruction appears you should contact Meyer and Sons before any further operation. For air actuated models you should adjust the flow controls to control gate speed at this time (see Gate Speed Adjustment Procedure).
6. When shutting down the Gravity Diverter, shut off supporting utilities in accordance with plant operating procedures.
7. When cleaning or servicing is required of the Gravity Diverter, proper lock out of electrical, compressed air and any auxiliary equipment should be completed before the work is started.

Gate Speed Adjustment Procedure - Air Actuator Models Only

The speed of the opening and closing of the gate is regulated by the flow control valves mounted on the solenoid valve. The valves restricts the flow of air out of the cylinder thus controlling the speed that the gate opens and closes. Opening the valve (Turn knob CCW) allows the gate to open and close faster. Closing the flow control valves (Turn knob CW) slows the gate down. Cycle the gate open and closed with the solenoid valve to determine if the gate lands hard or soft. Adjusting the flow control valve until the gate lands softly.

B. OPERATING PROCEDURES

The Gravity Diverter should never be operated with the top or bottom open and accessible to the operator or other personnel.

1. Stop the rotary valve or other device above the Gravity Diverter so that flow through the diverter is interrupted.
2. The Diverter can now be actuated by operating the electrical switch or control that shifts the gate.
3. Restart the rotary valve or other device above the Gravity Diverter so that flow resumes through the diverter and into the alternate leg.

C. GENERAL INSPECTION

1. Observe equipment for any unusual vibration, noise or operating temperatures in excess of the maximum specified for your installation.
2. Check flanges and air connections, and all nuts/bolts for tightness.
3. Inspect inlet and outlet fittings, flanges and piping for leaks. Check utility service piping and associated valves and gauges attached to the diverter valve.
4. Check all accessories for proper operation.



DANGER – Depressurize or shut off compressed air line valves before servicing Gravity Diverter actuation components to prevent serious personal injury.

On air operated models, the solenoid valve and air cylinder are lubricated by a lubricator installed in the compressed air line upstream of these devices. It must be kept filled with adequate lubricant. The air supply should be shut off to fill the lubricator. An adjustment dial allows the lubricant flow rate to be controlled. An air filter at this location protects the solenoid and actuator from contamination with water. Discharge of water from this device should be monitored to insure proper operation. The discharge of water can be controlled with the adjustment knob at the bottom of the bowl. Water can be manually discharged if necessary from this point as well.

For electric operated models, consult the actuator manufacturer's instructions for lubrication requirements.

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.