Pneumatic Screw Pump

INSTALLATION, OPERATION & MAINTENANCE INSTRUCTIONS
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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 Pneumatic Screw Pump 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 Pneumatic Screw Pump 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 pertain 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 Pneumatic Screw Pump is critical. If you have any safety or operational questions pertaining to the design or applications of the Pneumatic Screw Pump we encourage you to contact the factory at (800) 963-4458.

**WARNING:** Always CONTROL / DE-ENERGIZE potentially hazardous energy sources when installing and maintaining the Pneumatic Screw Pump, as follows:

1. The Pneumatic Screw Pump product uses a common mechanical principle which creates an internal pinch point in order to function properly: a metal screw with flights rotates around an axis within a metal housing.
   - The Pneumatic Screw Pump 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 Pneumatic Screw Pump. To do so will expose personnel to the potential risk of serious injury.
   - 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 Pneumatic Screw Pump, 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 Pneumatic Screw Pump may stop and start automatically, and may also operate very quietly. Equipment in an idle mode does not mean it is off-line.

3. Inlet and Outlet connections 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 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. Pneumatic Screw Pumps, their drive 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 Pneumatic Screw Pump 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 Pneumatic Screw Pump 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

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.
WARNING
Rotating shaft can cause severe injury
Keep hair and loose clothing away

WARNING
Exposed moving parts can cause severe injury
LOCK OUT POWER before removing guard

WARNING
Exposed screw and moving parts can cause severe injury
LOCK OUT POWER before removing cover or servicing
Meyer ships the equipment with affixed safety labels which are located on the Pneumatic Screw Pump housing and other surfaces, the drive guards and drive bases (when included). 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 Pneumatic Screw Pump 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 Pneumatic Screw Pump (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 Pneumatic Screw Pump.

- Consult Factory when the equipment is operated at temperatures over 350°F.

INFORMATION FOR SAFETY AND SERVICE

Because of the wide variety of material handling systems for which a Pneumatic Screw Pump must be tailored, many considerations determine the proper size, design, materials of construction, operating speed, type of driver, etc. A description of every Meyer Pneumatic Screw Pump 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 Pneumatic Screw Pump feeder 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__________________________

The Meyer Pneumatic Screw Pump is an airlock designed to feed dry pulverized material from a gravity feed hopper into a pneumatic conveying line by using a screw auger. It is engineered to perform in applications that exceed the abilities of typical dilute phase rotary airlock feeders. Unlike rotary airlock feeders that require tight clearances to seal against conveying air, the Screw Pump utilizes the material being conveyed as a seal against the air pressure. There is an integral gate that acts as a seal against blowback during startup or when the Screw Pump is running empty.

The Pneumatic Screw Pump is designed to work with a clean air supply in a range of 2 to 15 PSIG. (4 to 9 PSIG being optimum) The conveying line must be the same size as the Pneumatic Screw Pump.
discharge cone. The conveying line should be installed horizontally from the end of the discharge cone for a minimum distance of 6 to 18 feet, depending on the conveying line size, before the first change in direction. This will reduce the likelihood of the conveying line becoming plugged.

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. If items are missing, contact Wm. W. Meyer & Sons, Inc., per contact information at the end of this section.

2. Check for damage. 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. In the event damage has occurred:
   - 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.  
1700 Franklin Blvd  
Libertyville, IL 60048  
800-963-4458 or 847-918-0111  
sales@wmwmeyer.com
B. STORING THE PNEUMATIC SCREW PUMP

1. Short Term Storage (Up to 4 weeks)
   - If moved to storage, the equipment should be located in a dry area, preferably inside. Outside storage will require adequate protection from the weather.
   - The inlet and outlet of the Pneumatic Screw Pump 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. Follow motor manufacturer’s recommendations for short term storage.
   - After storage and prior to start-up, the Pneumatic Screw Pump and its drive train should be inspected by qualified personnel.

2. Long Term Storage
   - Spray the interior of the Pneumatic Screw Pump with anti-rust preservative oil.
   - Provide and install metal covers for inlet and outlet connections. Keep covers on unit until ready for service.
   - Read and follow motor manufacturer’s instructions for long term storage.
   - Plug all conduit box openings on motors and switches.
   - Store off the floor in a dry, adequately ventilated, indoor area not subject to extreme temperature changes. These requirements are minimum.
   - If stored for more than 6 months, turn the screw 20 revolutions every month. Leave the screw in a different angular position after turning.

3. Placing in service after Long Term Storage
   - Follow motor manufacturer’s instructions for removing motor from storage.
   - Clean preservative oil from interior of Pneumatic Screw Pump.

C. INSTALLATION

1. Prior to installing the Pneumatic Screw Pump and with the power locked out/tagged out, check to assure no foreign objects have been left inside or have accidentally fallen into the Pneumatic Screw Pump.

2. We recommend that inlet flange remains covered until the Pneumatic Screw Pump is ready to be attached to the mating equipment.

3. The Pneumatic Screw Pump must be installed on a concrete pad or other substantial mounting surface. The unit needs to be level so that the frame is free from distortion, shimming of feet may be required. The Pneumatic Screw Pump must be anchored properly to prevent any movement during operation. Grouting of the mounting feet may be necessary.

4. Vessels connected to the Pneumatic Screw Pump hopper must be fully supported. The Pneumatic Screw Pump needs to be isolated from mating equipment such that no mounting stresses are transferred to the equipment.
5. Pneumatic Screw Pumps must be installed with the inlet hopper flange parallel to the mating system flange. The discharge cone must be mounted with the “flat” side down.

6. The conveying air can be connected to one of three ports on the Pneumatic Screw Pump; although the side ports are the recommended connections. The two other ports must remain closed with the cover and gasket.

**CAUTION** - Never operate the Pneumatic Screw Pump with an open inlet or outlet. Mating ducting or piping must be installed prior to start-up and operation.

SECTION IV
START-UP PROCEDURE

Always de-energize all electrical equipment by Locking Out/Tagging Out power before working on this equipment, including motors, switches, solenoids and other ancillary electrically powered or controlled equipment. Follow your company lockout/tag out procedures.

1. Prior to actual operation, the operator must be familiar with the method of starting and stopping the Pneumatic Screw Pump.

2. The general appearance of the Pneumatic Screw Pump and surrounding area should be visually inspected to determine that the Pneumatic Screw Pump can be operated safely and without causing any type of damage.

3. The gate on the Pneumatic Screw Pump must be checked prior to initial start-up. In addition, if the Pneumatic Screw Pump is moved to a new location the gate needs to be rechecked.
   - Remove the discharge cone and access plate above the gate.
   - Lift the gate several times by hand and release. The gate should drop quickly and completely seat against the barrel.
   - Hold the gate closed by hand and gently lift on the gate handle. There should be a small amount of play in the handle.
   - Next check the side to side movement. It should move slightly side to side while still maintaining contact with the entire end of the barrel.
   - If everything is “OK”, move on to the next step. If not see “Gate Adjustment”.

4. Turn the screw shaft by hand to be certain it does not bind. A slight drag from the shaft seals is normal.

5. Check the motor and shaft bearings for proper lubrication. **NEVER lubricate any seals!**

**WARNING**: Never operate with guard removed. Moving parts can crush and cut. Lockout/Tag out power before servicing or maintaining equipment.

6. Remove the belt guard and check V-belt tension; adjust if necessary. Replace belt guard.
7. Check to insure that the electric and air supply lines are properly connected and that all other pipes and joints are tight and properly supported.

8. Insure that the blower relief valve and check valve are installed properly and functional.

9. Check that the small, reinforced air purge hoses are properly attached to the top and bottom of the shaft seal housing and connected to the air box and gate box, respectively.

10. “Jog” the unit with the motor starter to check for correct counter clockwise rotation. When viewed for the drive side of the pump. Change the phase sequence to the motor if rotation is wrong. Always assure the unit is properly grounded in accordance with OSHA, the NEC and local codes.

11. Start the air blower and then the Pneumatic Screw Pump; operate normally, but without material, for 5 - 10 minutes. During this time, listen to/observe the Pneumatic Screw Pump; look for blowback; check the system for any indications of problems (i.e., pressure increases/decreases) in the conveying line.

   **Note**: During the break-in stage, the shaft flighting may contact the barrel, causing a gentle rubbing sound. This should not be cause for alarm. The shaft will “wear in” within a few days. This is not a problem and it will not cause a reduction in the volumetric efficiency of the unit. However, if loud banging or grinding is heard, shut the machine down and contact Meyer.

12. Final Check – Inspect all connections; Discharge cone and conveying line, Pneumatic Screw Pump hopper flange and mating equipment flange, blower line and Pneumatic Screw Pump connection.

13. Start material feed and check that the blower air pressure is correct and steady. Allow to run for 30 minutes. After 30 minutes, inspect the Pneumatic Screw Pump and system for any air or material leaks, excessive vibration, or unusual sounds. If any problems are found, shutdown and correct them before putting the equipment into service. Contact your Meyer representative for assistance if necessary. Continue to monitor the equipment daily for a week to confirm everything is running as “expected”.

14. If a major problem is encountered; Loud banging/grinding, excessive leakage or blowback, line plugging – shutdown immediately and contact your Meyer representative.

15. Check the Pneumatic Screw Pump feed point and lift the gate handle daily, with or without material load to confirm proper operation.

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**SECTION V**

**GATE ADJUSTMENT**

The gate is integral to the proper operation of the Pneumatic Screw Pump. Its purpose is to isolate the feed area of the screw pump from the pressure side when the unit is priming or running dry. In order to accomplish this, the gate is hardened against wear and polished smooth. Likewise the end of the barrel the gate contacts is also polished smooth. If there are any gaps or the gate does not close quickly enough there can be blowback of conveying air.

If there is a problem with the gate closing remove the discharge cone and inspection plate above the gate and check the following:
• If there are burrs or nicks on the gate or barrel end remove with a fine file or emery cloth.

• If the gate is misaligned and there are gaps present, remove the 8 bolts that hold the gate bearing blocks. Remove the handle, the shaft collars, and bearing blocks from the gate carrier rod. Clean off the old sealant from the bearing blocks. The bearing blocks control the distance, forward and backward, from the gate face to the end of the barrel. The shaft collars control the side to side positioning of the gate on the barrel. Apply new silicone sealant to the bearing blocks and reassemble leaving the 8 bolts and shaft collars loose enough to allow adjustment. Slide the bearing blocks backwards or forwards until the gate seats flat against the end of the barrel. When it is in the correct position, tighten the 8 bolts. Now center the gate over the end of the barrel by sliding the gate carrier rod through the bearings. Once it is centered, tighten the shaft collars to hold the rod in position. Do not tighten the collars against the bearing block such that the collars bind the rotation of the gate carrier rod. The rod and thus the gate need to swing freely.

• Replace the inspection plate and discharge cone.

SECTION VI
MAINTENANCE

WARNING: Always de-energize all electrical equipment by Locking Out/Tagging Out power before working on this equipment, including motors, switches, solenoids and other ancillary electrically powered or controlled equipment. Follow your company lockout/tag out procedures.

The Screw Pump is designed to provide consistent performance, low maintenance and long service life, with abrasive or difficult-to-convey materials.

Suggested preventative maintenance for the Pneumatic Screw Pump:

• The bearings should be greased MONTHLY with high quality NLGI #2 grease. (The original bearings are lubricated with lithium based grease.)

  WARNING: Never operate with guard removed. Moving parts can crush and cut. Lockout/Tag out power before servicing or maintaining equipment. Follow your company lockout/tag out procedures.

• The belts should be inspected and adjusted or replaced, as necessary.

• The gate should be checked at least weekly for free movement and smooth operation.

• Do NOT lubricate the shaft seals. They are designed to run dry.