



# Pneumatic Screw Pump

## 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*



**Air and Dry Bulk Solids Processing 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 Pneumatic Screw Pump is of great importance to Wm. W. Meyer & Sons, Inc. (“Meyer” “factory”). The decals, shields, guards and other protective features designed, furnished or recommended for this equipment 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. 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 equipment and ensure that workers are properly trained to follow it. 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 Pneumatic Screw Pump 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 applications of the Pneumatic Screw Pump, 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 entanglement hazards and 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's/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 unit 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.
- Electrical devices are part of this 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***

Pneumatic Screw Pumps are components that are used as an airlock transition point, allowing material to be fed into a pressurized system. By their nature, the Pneumatic Screw Pumps 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 Pneumatic Screw Pumps use a common mechanical principle that creates an internal pinch point in order to function properly: a metal screw, driven by a powerful motor, rotates inside a metal enclosure. If either the inlet or discharge openings are left unguarded, the screw shaft presents a serious personal injury hazard, including but not limited to amputation. Any part of the human body in the way of the screw shaft and the enclosure will be crushed or cut off.

### ***Guarding Inlet and outlet***

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 to reach the internal moving part. If requested, Meyer can design, build and supply custom ductwork, transition pieces or special guards to protect against the risk of injury.

### **Training**

The owner also bears the responsibility to ensure that personnel who may be working around a Pneumatic Screw Pump are properly trained. Personnel **must** be aware that: (1) anything coming into

contact with the moving part will be cut off/amputated; (2) Pneumatic Screw Pumps can start without warning; (3) before working on, cleaning, repairing or maintaining the equipment, Lockout/Tagout procedures must be strictly followed; and (4) Pneumatic Screw Pumps must not be operated without guarding in place. Before working around the equipment, personnel must read the Operator's Manual.


## **SAFETY LABELING**


The safety labels shown are affixed to your Equipment. A Safety Supplement Datasheet is packed with your equipment at the time of shipment. Because the Pneumatic Screw Pump can be used in different applications and orientations, it is possible that the safety labels affixed to the equipment may be obscured when installed and integrated into a 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 equipment to be able to see the labels alerting him or her on how to avoid the hazard.

- 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 preparing to work on the equipment and/or as they approach it.
- Due to the location of the Pneumatic Screw Pump, 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 equipment.

If the unit you received does not have labels, the labels are damaged, come off during installation or will be obscured after installation, contact Meyer immediately (800-963-4458) to obtain labels at no charge prior to use or maintenance.

	<b>! WARNING</b>
	<p><b>Automated machinery.</b> This unit may start at any time. <b>STAY CLEAR.</b> Lockout/tagout power before servicing.</p> <p style="text-align: right;">430Z-230</p>



	<b>! WARNING</b>
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	<b>! WARNING</b>
	<p><b>Equipment may be under pressure.</b> Lockout/tagout power and relieve pressure before servicing.</p> <p style="text-align: right;">430Z-231</p>

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	<b>! WARNING</b>
	<p><b>Hot surface.</b> Do NOT touch.</p> <p style="text-align: right;">420Z-233</p>

	<b>! WARNING</b>	
	<p>To reduce the risk of serious injury or death: Equipment must be operated, serviced and maintained by trained personnel. Read and understand all instructions before operating, maintaining or servicing this machine.</p> <p>Scan code for instruction manual</p> <p style="text-align: right;">430Z-244</p>	

	<b>! WARNING</b>
	<p><b>Hot surface.</b> Do NOT touch.</p> <p style="text-align: right;">420Z-233</p>





**! WARNING**

Rotating shaft can cause severe injury

Keep hair and loose clothing away

CHR951023 <http://www.cemanet.org>



**! WARNING**

Exposed moving parts can cause severe injury

**LOCK OUT POWER** before removing guard

CHR930001 <http://www.cemanet.org>



**! WARNING**

Exposed screw and moving parts can cause severe injury

**LOCK OUT POWER** before removing cover or servicing

CHR930011 <http://www.cemanet.org>

## 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 \_\_\_\_\_



## SECTION II APPLICATION

### 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 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 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.
  - 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.

## **PNEUMATIC SCREW PUMP DESIGN**

The Screw Pump is designed for feeding a wide variety of materials and is pre-configured at the factory for optimum performance, with the material(s) specified in the CMDS. Although the pump does come pre-configured, minor adjustments may be necessary for best performance after installation and start-up. The speed of the screw shaft controls the overall throughput capacity and can be adjusted within the design limits for each model. The Screw Pump is designed to work with a clean air supply in a range of 2 PSI to 12 PSI; optimum pressure is usually 4 to 9 PSIG. The conveying line must be the same size as the Screw Pump discharge cone. In order to reduce the chances of the conveying line plugging, the conveying line must 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 line direction.

The multi-purpose Tailpiece is the primary wear point and is designed to be easily replaceable. The end adapter also helps to adjust the optimum packing of the material plug. If the material plug has a tendency to over-pack on the screw and locks up the pump, an extended pitch end adapter would be used. However, when the material is too free-flowing and the plug formed does not prevent blowback, a tighter pitch on the end adapter will eliminate the blowback.

The gate must close without binding and quickly seat itself properly to form a seal, whenever the Pneumatic Screw Pump is priming or when running without material. If the gate does not close and seat completely, blowback will occur. As the gate is closing, a slight, momentary blowback of air is normal and helps to seat the gate. The angle of the gate lever varies with the flow rate and can be adjusted by loosening the set collar.

Raise the angle to slightly increase the closing pressure or lower it to allow the gate to float and minimize wear during operation. Under normal operation, the gate does not require a weight on the gate lever. With some very free-flowing materials, a small weight on the lever may be used to assist closing, ask Meyer for details.

The Shaft Assembly is specific to your product and plant installation. Consult Meyer before making any changes to the original design. Factory production of alternate (non-standard) shaft configurations, changes in shaft or flighting design and/or other shaft changes may be used to accommodate specific issues with certain materials and capacities. The shaft seals are intended to run dry. Do not lubricate the seals. Dust from the process can combine with any lubrication present and cause rapid seal and shaft wear.



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.

**⚠ WARNING** 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 could lead to serious injury or death if a body part contacts a moving part.

1. We recommend that the inlet flange remains covered until the Pneumatic Screw Pump is ready to be attached to the mating equipment.
2. Prior to installing the Pneumatic Screw Pump and with the power disconnected, check to ensure no foreign objects have been left inside or have accidentally fallen into the valve.
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.



#### SECTION IV START-UP PROCEDURE

**⚠ 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.

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.

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

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 from 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. Remove the belt guard and check V-belt tension; adjust if necessary. Re-install belt guard before the next step.
6. Check that the electric and air supply lines are properly connected and that all other pipes and joints are tight and properly supported.
7. 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.

**⚠ WARNING** The internals of this equipment has part(s) that will crush and cut. Before restoring electrical power to the Pneumatic Screw Pump install/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.

8. "Jog" the unit with the motor starter to check for correct counterclockwise rotation; when viewed for the drive side of the pump. Change the phase sequence to the motor if rotation is wrong. Always ensure the unit is properly grounded in accordance with OSHA, the NEC and local codes.
9. 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.

10. 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.
11. 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, shut down 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".
12. If a major problem is encountered: Loud banging/grinding, excessive leakage or blowback, line plugging – shutdown immediately and contact your Meyer representative.
13. Check the Pneumatic Screw Pump feed point and lift the gate handle daily, with or without material load to confirm proper operation.



## 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. The gate closes on the end of the barrel and must do so quickly enough with no gaps between the two parts. If there are any gaps or the gate does not close quickly enough; there can be blowback of conveying air.

**⚠ WARNING** The internals of this equipment has parts that will crush and cut. Before checking the gate, make sure that Lockout/Tagout procedures have been followed. Failure to do so may lead to serious injury or death. If a body part contacts a moving part.

If there is a problem with the gate closing, follow Lockout/Tagout procedures (See Lockout/Tagout in the IMPORTANT SAFETY INFORMATION section), 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:
  1. Remove the eight bolts that hold the gate bearing blocks.
  2. Remove the handle, shaft collars, and bearing blocks from the gate carrier rod.

3. Clean 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.

4. Apply new silicone sealant to the bearing blocks.
5. Reassemble leaving the eight bolts and shaft collars loose for adjustment later.
6. Slide the bearing blocks backward and forward to seat the gate flat against the barrel.
7. Tighten the eight bolts.
8. Slide the gate carrier rod through the bearings to center the gate over the end of the barrel.
9. 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 gate need to swing freely.

10. Reinstall the inspection plate and discharge cone.



## SECTION VI INSPECTION AND TROUBLESHOOTING

**⚠ WARNING** The internals of this equipment has parts that will crush and cut. Before performing any inspection or troubleshooting, make sure that Lockout/Tagout procedures have been followed. Failure to do so may lead to serious injury or death if a body part contacts a moving part.

The Pneumatic Screw Pump is made with only two moving, product contact parts: The Shaft Assembly/Tailpiece and the Gate. Under normal conditions, the Pneumatic Screw Pump wear areas are usually confined to the tailpiece and/or the shaft flighting. These parts should be visually inspected for wear every 3 to 6 months.

The Tailpiece is designed to wear first, gradually. Sudden failure is a rare occurrence. It is normal for 1 to 4 replacements of the Tailpiece (over a year or more), before replacement of the base shaft may be necessary.

The Pneumatic Screw Pump Shaft or Shaft Flighting will also wear, but at a much slower rate. Slow loss of capacity and/or conveying air blow-back is indicative of shaft flighting wear. If there is a definite reduction in the conveying rate and/or sustained blow-back, the shaft will need to be rebuilt or replaced. Too much air volume or pressure will increase the wear rate and decrease the life of the shaft.

**⚠ WARNING** Moving parts can crush and cut. Lockout/Tagout power before servicing. Failure to do so could lead to serious injury or death.

If there is a sudden reduction in system capacity and significant blowback, do a visual inspection.

1. Disconnect the discharge cone.
2. Lift the gate and examine the flighting of the tailpiece, the back of the gate and the inside of the barrel end.

There will most likely be signs of wear, if any surfaces show badly worn areas, contact Meyer for options. The parts may be repairable or need to be replaced.

A regular, in-depth inspection, during scheduled shutdowns will identify the need to schedule replacement of belts, bearings, seals, end adapter, gates or barrel, before unexpected failure occurs, causing expensive downtime.

If there is a blockage in the hopper or barrel, disassembly will be required to remove the blockage.

1. Remove the drive belts, sheaves and belt guard.
2. Remove the purge line hoses from the top and bottom of the seal housing.
3. Clean out loose material from the inlet hopper.
4. Remove the discharge cone.
5. Drive out the four tapered pins from the drive endplate.
6. Remove the four large bolts that hold the endplate to the frame and the six bolts that retain the seal housing on the "H" frame.

Leave the bearing set-screws or locking collars tight and do not remove the bearing from the endplate or the bearing from the seal carrier housing.

7. Lift the gate up, out of the way and drive the auger back towards the hopper. A brass bar or a hardwood block is recommended as the driver. The blockage will appear in the inlet hopper and can be removed.
8. Pull the entire auger-shaft assembly out, with the bearings, drive-end plate and seal housing all attached.
9. Inspect the screw part of the shaft, for bent flights, surface damage, etc.
10. Carefully straighten any bent flights and remove any burrs from the flights.

At this point, do not move or change any positions of the parts on the screw shaft assembly.

11. Replace the intact shaft assembly in the reverse order that was it removed.
12. Replace the endplate and seal housing bolts.
13. Tighten the seal housing bolts.
14. Install the tapered pins and tighten the end plate bolts.
15. Turn the shaft by hand to ensure it is properly aligned. If the shaft has a minor rub, one that can be felt by turning the shaft by hand but does not make the shaft turn hard, the screw and barrel will "wear in" during normal operation.

If the shaft is tight and cannot be turned by hand then the shaft may be bent and require further straightening or replacement.

16. Replace the belt guard, sheaves and belts.
17. Re-install the discharge cone and purge lines.





## SECTION VII MAINTENANCE

**⚠ WARNING** The internals of this equipment has parts that will crush and cut. Before performing any service or maintenance make sure that Lockout/Tagout procedures have been followed. Failure to do so may lead to serious injury or death if a body part contacts a moving internal part.

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** Moving parts can crush and cut. Never operate with guard removed. Follow your company Lockout/Tagout procedures. Failure to do so may lead to serious injury or death if a body part contacts a moving internal part.

- 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.

### REPAIR AND PARTS REPLACEMENT

Moving parts can crush and cut. Follow Lockout/Tagout information in the

**⚠ WARNING** “IMPORTANT SAFETY INFORMATION” section before service or maintenance. Failure to do so may 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.

Before replacing any parts on your Pneumatic Screw Pump locate the Serial Number of the unit and contact Meyer for the correct parts. Only use factory/Meyer recommended or supplied parts.

#### Shaft Removal (Preferred method)

1. Remove the sheaves, V-belts and belt guard.
2. Remove the discharge cone and lift and block open (or remove) the gate.
3. Loosen the bearing locking collar (counterclockwise to loosen). Old pumps have set screws on the shaft bearings, not a locking collar.
4. Loosen the two (2) setscrews on both drive-end and seal housing bearings.
5. Clean and deburr the auger shaft between the two bearings.
6. Using a brass driver, wooden block, or soft-faced hammer on the sheave end of the shaft, drive out the shaft (do not damage the end of the shaft). After about 4” to 5” of movement, the shaft should be loose and can be pushed out of the barrel.

**NOTICE** Damage to the shaft or seals can occur when the keyed section of the sheave end passes through the seal housing. Do not scratch the polished (seal area) of the shaft as it passes the end of the barrel.

### **Shaft Removal** (Alternate method-Drive end removal)

1. Remove the sheaves, belts and belt guard.
2. Remove the inlet and outlet purge hoses from the seal housing.
3. Drive out the four tapered pins from drive endplate.
4. Remove the four bolts that hold the drive endplate to the frame.
5. Loosen the two locking screws on the drive end bearing and remove the drive endplate and bearing assembly.
6. Remove the six bolts from the rear of the Seal Housing.

Do NOT loosen the Seal Housing bearing set screws or locking collars.

The shaft is now free and can be removed from the drive end of the pump. The seal housing and the bearing will be removed with the shaft and they both can be removed if needed.

### **Shaft Seal Removal** (Seals can only be removed After shaft removal)

1. Remove the bearing from the Seal Housing, to expose the Seal Carrier.
2. Remove the seal carrier-retaining bolt located on the top of the seal housing.
3. Remove the seal carrier which has the shaft seals and O-rings. There are two tapped holes in the seal carrier to aid in the carrier's removal.
  - Three seal carrier only: Once the seal carrier is removed the third lip seal may be removed from the other end of the seal housing.
  - Three seal carrier only: Drive third seal out of seal housing and into the hopper.

### **Shaft Seal Replacement**

Models produced after 9/2001 have a four shaft seal design. Seals are designed to run DRY. Do not lubricate.

Three seal design. (Before 9/2001)

1. Apply a small amount of silicone sealant on the outside of each seal, before installing.
2. Install the two (2) new shaft seals into the seal carrier; one on each side of the seal carrier, each seal lip facing out. (The backside of the seals will be facing each other).
3. Inspect O-ring and if necessary, install a new one onto the seal carrier.
4. Working through the hopper, install the third lip seal into the seal housing.
5. The lip of the third seal must face towards the inlet hopper.
  - Pneumatic Screw Pumps manufactured after S/N 247 (1999) have a counterbore in the inlet hopper end of the seal housing. With the lip facing out, press the seal into housing, seating it against the shoulder of the counterbore. Older units have no counterbore and seals must be held, using Loctite or equivalent. Newer units have four seals.

Four seal design. (After 9/2001)

1. Unbolt the backside of the seal carrier to remove the center seals in the seal carrier.
2. Apply a small amount of silicone sealant on the outside of each seal, before installing.
3. Install the four (4) new shaft seals into the seal carrier; two in the front and two in the back of the seal carrier, the first seal on each side goes in with the seal lip facing in and the second seal goes in with the seal lip facing out. The backside of the seals will be facing each other.

4. Bolt the seal carrier back together.
5. Inspect O-rings and if necessary, install new ones, using silicone lube, into the seal carrier.

#### **Shaft Installation** (Preferred removal method)

1. With the seal carrier removed, clean out the barrel, hopper and the seal housing of any loose material or debris. Deburr the shaft and keyway of any rough spots.
2. Wipe the shaft clean. Do Not use grease. Lift and hold the gate while inserting the shaft into the barrel.

#### **NOTICE**

Do not scratch the polished (seal area) surface on the shaft while inserting the shaft into the barrel. Also, be very careful with the three seal design as the first several inches of the shaft pass through the first lip seal at the inlet hopper end of the seal housing. It is very easy to catch the lip of the seal with the end of the shaft or the first steps on the shaft and tear the seal. Seals are designed to run DRY. Do not lubricate.

3. Slide the shaft into the seal housing until the keyed end of the shaft is mid-way between the two bearing locations.
4. Slide the seal carrier, with the seals and O-ring(s) installed, onto the shaft, O-ring side first - seal side out, on the four seal style. Use Silicone Lube on O-rings, to help slide seal carrier into position.
5. Slide the seal carrier up to the seal housing. Do NOT install the seal carrier into the seal housing.
6. Slide the seal housing bearing onto the shaft, until it contacts the seal carrier.
7. Slide the shaft further into the barrel, until the shaft flighting contacts the seal housing at the back end of the hopper.
8. Temporarily tighten the locking collar or setscrews on the drive-end bearing, to hold the shaft in place, while the seal carrier and the seal housing bearing are assembled into and onto the seal housing.
9. Install the seal carrier into the seal housing.  
The locking hole in the top of the seal carrier **must** align with the hole on the top of the seal housing.
10. Screw the seal carrier-locking bolt into the seal carrier.
11. Bolt the seal housing bearing to the seal housing.
12. For Set-screw bearings only: Loosen the drive bearing locking screws. Drive the shaft approximately 1/16" towards the discharge end, so the shaft flighting clears the end of seal housing/hopper; verify that the shaft turns freely.
13. For Locking collar bearings only: Drive the shaft completely into the pump so the shaft bottoms out in the hopper. The shaft will move slightly towards the discharge side of the pump when the locking collars are tightened.
14. Tighten the locking collar or set screws on both bearings.
15. Replace the sheave, belts and belt guard.
16. Reinstall the discharge cone.

#### **Shaft Installation** (Alternate removal method)

1. Insert the flighted end of the shaft through the hopper and into the barrel.
2. Place the seal housing on the shaft, with the seal carrier and seal housing bearing removed and slide

forward to contact the hopper/H-frame.

3. Seal the junction between the seal housing and the hopper with silicone sealant.
4. Bolt the seal housing to the hopper/H-frame using the six bolts.
5. Slide the seal carrier and then the seal housing bearing onto the shaft but do NOT insert these parts into/onto the seal housing.
6. Replace drive endplate, with the bearing attached.
7. Insert, but do not tighten the four mounting bolts through the plate and screw them partway into the frame.
8. Align and install the four tapered pins in the drive endplate.
9. Tighten the four drive end mounting bolts and insert the seal carrier into the seal housing.  
The locking hole in the top of the seal carrier **must** align with the hole on the top of the seal housing.
10. Screw the seal carrier-locking bolt into the seal carrier.
11. Slide the seal housing bearing to contact the seal housing.
12. Bolt the seal housing bearing to the seal housing.
13. Loosen the drive-bearing locking screws.
14. Carefully drive the shaft approximately 1/16" towards the discharge end, to clear the seal housing/hopper and then verify that the shaft turns freely.
15. Tighten the locking screws on both bearings.
16. Re-check that all the bolts and screws are tight.

### **Barrel Replacement**

1. Remove the discharge cone. (Leave the gate box on the airbox.)
2. Remove the air inlet piping and seal purge airlines.
3. Drive out the four tapered pins from the airbox/frame connection.
4. Loosen the four large bolts that fasten the airbox to the frame.
5. Remove the airbox with the gate box attached; the barrel is inside the airbox. (Retain the silicone gasket, as the barrel is pulled out of the airbox).
6. Replace the old barrel, reinstalling the silicone gasket between the airbox and the barrel and seal the connection to the hopper with silicone.

Reverse the steps to re-assemble the air box & gate box, pins, purge hoses, and discharge cone.

The round flange gasket goes between the barrel and the airbox. Always use silicone sealant to seal the connection between the barrel and the hopper.

### **Gate Replacement**

This procedure is similar to adjusting the gate.

1. Remove the discharge cone and inspection plate.
2. Remove the eight bolts that hold the gatebearing blocks.
3. Remove the handle, shaft collars, and bearing blocks from the gate carrier rod.
4. Remove the gate handle and shaft collars from the gate carrier rod.
5. Remove the bearing blocks and clean the old sealant from the bearing blocks.

6. Slide the gate carrier out of the handle side of the gate box.
7. Remove the bolt that holds the gate to the carrier rod and remove the gate.
8. Install the replacement gate in the same location on the carrier rod.
9. Apply new silicone sealant to the bearing blocks.
10. Reassemble leaving the eight bolts and shaft collars loose for adjustment later.
11. Slide the bearing blocks backward and forward to seat the gate flat against the barrel.
12. Tighten the eight bolts.
13. Slide the gate carrier rod through the bearings to center the gate over the end of the barrel.
14. 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 gate need to swing freely.

15. Reinstall the inspection plate and discharge cone.

### **Tail Piece Replacement**

1. Remove the discharge cone.
2. Lift the gate to access the end of the Tailpiece.
3. Remove the hex head bolt along with the Belleville and lock washer (save for re-use).
4. Remove the Tailpiece. If necessary, thread a jackbolt into the end of the Tailpiece to force it off the screw shaft (1/2-13 on the 4 Series and 5/8-11 on the 6 series).
5. Coat the end of the screw shaft with an anti-seize compound.

Tail pieces manufactured before 2000 incorporate spaces and have a keyway. After 2000, the Tailpiece was designed with locking tabs to engage with the shaft. If tabs are present, the Tailpiece must be rotated onto the shaft to lock the tabs.

6. Slide the new/reworked Tailpiece onto the shaft.
7. Apply Loctite to the threads of the hex head bolt and together with the washers, bolt the Tailpiece to the end of the shaft.
8. Rotate the shaft by hand to check for free movement.

When replacing the Tailpiece always:

- Coat the end of the screw shaft with an anti-seize compound.
- Use a thread locking compound on the bolt threads before tightening.



# 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 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 equipment.
4. Inlet and Outlet Connections 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 equipment interior must be installed immediately and prior to start-up.
6. **Always follow LOCKOUT-TAGOUT procedure** before performing any work.
7. 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 hazards.
8. Never remove any access doors (inspection port covers) above, below, or on the equipment itself without first locking out power.
9. 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.

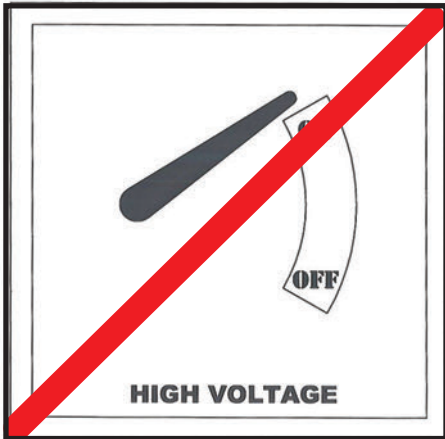
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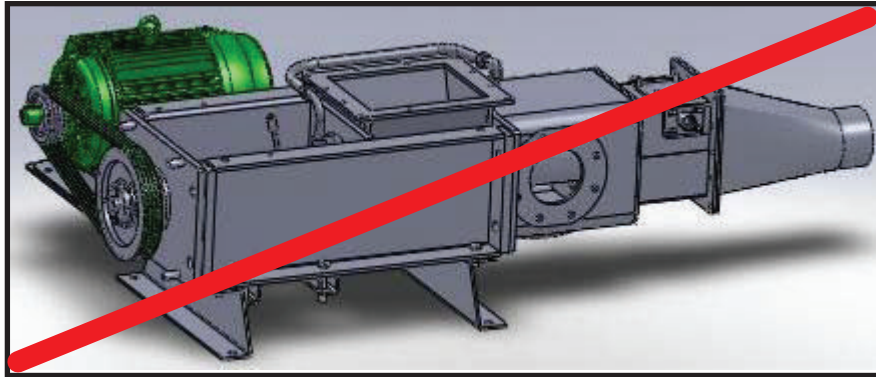
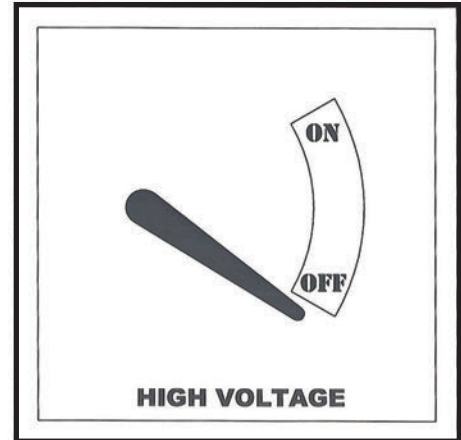
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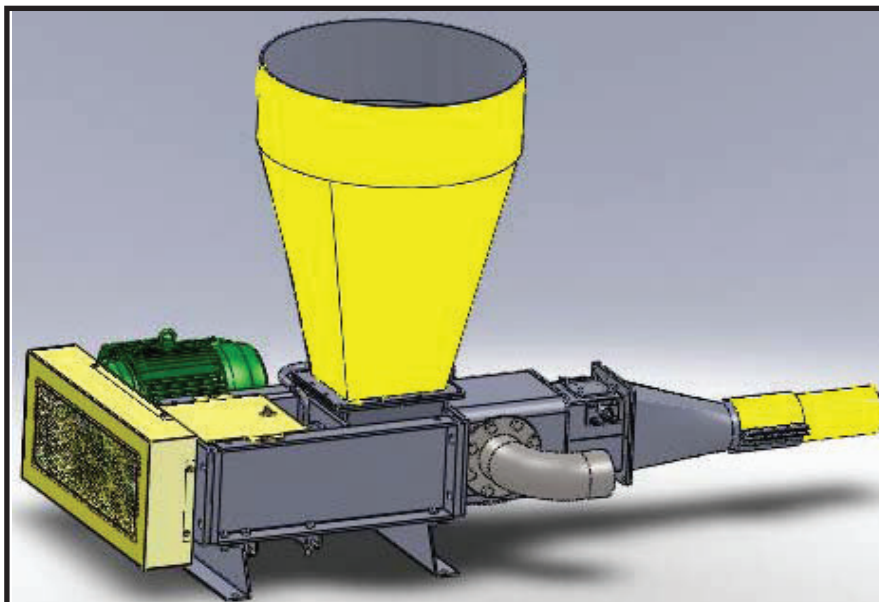
# PNEUMATIC SCREW PUMP SAFETY PRECAUTIONS



ALWAYS SECURE PART FROM MOVING WHEN WORKING ON THE VALVE. FOLLOW **LOCKOUT-TAGOUT** PROCEDURE.




NEVER OPERATE VALVE WITH EXPOSED INLET / OUTLET CONNECTIONS



## SAFETY LABELS

Locate all of the safety labels on your equipment and know their meaning before operating your Pneumatic Screw Pump.

	<b>! WARNING</b>
	<b>Automated machinery.</b> This unit may start at any time. <b>STAY CLEAR.</b> Lockout/tagout power before servicing. <small>430Z-230</small>



	<b>! WARNING</b>
	<b>Automated machinery.</b> This unit may start at any time. <b>STAY CLEAR.</b> Lockout/tagout power before servicing. <small>430Z-230</small>

	<b>! WARNING</b>
	<b>Equipment may be under pressure.</b> Lockout/tagout power and relieve pressure before servicing. <small>430Z-231</small>

	<b>! WARNING</b>
	<b>Equipment may be under pressure.</b> Lockout/tagout power and relieve pressure before servicing. <small>430Z-231</small>

	<b>! WARNING</b>
	<b>Equipment may be under pressure.</b> Lockout/tagout power and relieve pressure before servicing. <small>430Z-231</small>

	<b>! WARNING</b>
	<b>Hot surface.</b> Do NOT touch. <small>420Z-233</small>

	<b>! WARNING</b>	
	<b>To reduce the risk of serious injury or death:</b> Equipment must be operated, serviced and maintained by trained personnel. Read and understand all instructions before operating, maintaining or servicing this machine. <b>Scan code for instruction manual</b> <small>430Z-244</small>	

	<b>! WARNING</b>
	<b>Hot surface.</b> Do NOT touch. <small>420Z-233</small>

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