# Table of Contents

1 – INTRODUCTION .......................................................................................................................... 1

2 – SAFETY INFORMATION ............................................................................................................. 2

  
  Why is Safety Important? ............................................................................................................... 2
  Signal Words.................................................................................................................................. 2
  General Safety Statements .............................................................................................................. 3
  Shields and Guards ......................................................................................................................... 4
  Beware of Electrical Hazards ........................................................................................................ 4
  Personal Protective Equipment (P.P.E.) .......................................................................................... 5
  Operator Qualifications ................................................................................................................. 6

3 – INSTALLING SAFETY SIGNS .................................................................................................... 7

4 – INSTALLATION .......................................................................................................................... 8

  Filter Unit and Ducting Installation ............................................................................................... 8
  Electrical Installation ..................................................................................................................... 27
  Purge Air Supply Installation ....................................................................................................... 27
  Blast Gate and Butterfly Valve Adjustment ..................................................................................... 28

5 – OPERATION ................................................................................................................................. 30

  Air Purge Operation ..................................................................................................................... 30

6 – MAINTENANCE .......................................................................................................................... 32

7 – PARTS ......................................................................................................................................... 34

  How to Order Parts ....................................................................................................................... 34
  Filter Cartridge .............................................................................................................................. 35
  Solenoid Valve ............................................................................................................................... 36
  Diaphragm Valve............................................................................................................................. 37
1 – Introduction

Document Scope and purpose, and general responsibilities.

Thank you for purchasing your new Seed Filtration system from KSi Conveyors. We are pleased to have you as a customer, and hope you will enjoy many years of productive service from our products and staff.

This operator’s manual is intended to act as a supporting document to the more detailed Schenk Process Installation, Operation, and Maintenance Manual provided with the system. Please read and understand these manuals before operating the equipment. Pay special attention to the safety information to protect yourself from harm. If you need information beyond what can be found in these manuals, please give our friendly staff a call at 888 KSI-CONV.

**Before proceeding with this operator’s manual, completely read and understand the provided Schenk Process “Mini MAC2flo Dust Filter” Installation, Operation, & Maintenance Manual.**
2 – Safety Information

Tips for safe operation of KSi equipment

This Safety Alert symbol means

ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED

The Safety Alert symbol identifies important safety messages on KSI equipment and in the manual. When you see this symbol, be alert to the possibility of personal injury or death. Follow the instructions in the safety message.

Why is SAFETY important?

The Three Best Reasons
Accidents Disable and Kill
Accidents Cost $$
Accidents Can be Avoided

Signal Words

Note the use of signal words Danger, Warning and Caution with the safety messages. The appropriate signal word for each message has been selected using the following guidelines:

DANGER – Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations, typically for machine components that, for functional purposes, cannot be guarded.

WARNING – Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury, and includes hazards that are exposed when guards are removed. It may also be used to alert against unsafe practices.

CAUTION – Indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.
General Safety Statements

1. KSi’s principal concern is your safety and the safety of others associated with seed handling equipment. We want to keep you as a customer. This manual is to help you understand safe operating procedures and some problems which may be encountered by the operator and other personnel.

2. As the owner and/or operator, it is your responsibility to know what requirements, hazards, and precautions exist, and to inform all personnel associated with the equipment or that are in the area. Safety precautions may be required from the personnel. Avoid any alteration to the equipment. Such alterations may produce a very dangerous situation, where serious injury or death may occur.

3. This equipment shall be installed in accordance with the current installation codes and applicable regulations which should be carefully followed in all cases. Authorities having jurisdiction should be consulted before installations are made.

4. Untrained operators subject themselves and others to the possibility of serious injury or death. NEVER ALLOW untrained personnel to operate this equipment.

5. Keep children and other unqualified personnel out of the working area at all times.

6. NEVER start equipment until ALL persons are clear of the work area.

7. Be sure ALL operators are adequately rested and prepared to perform all functions of operating this equipment.

8. Keep hair, loose clothing, and shoestrings away from rotating and moving parts. Never wear loose-fitting clothing when working around equipment.

9. NEVER allow any person intoxicated or under the influence of drugs or alcohol to operate the equipment.

10. Make sure someone is nearby who is aware of the proper shutdown sequence in the event of an accident or emergency.

11. NEVER work alone.

12. ALWAYS think before acting. NEVER act impulsively around the equipment.

13. Make sure ALL equipment is locked in position before operating.

14. Keep hands and feet away from any moving parts.
15. NEVER attempt to assist machinery operation or to remove trash from the equipment while in operation.

16. Use ample overhead lighting during periods of low light, such as after sunset, to light the work area.

17. ALWAYS lockout and tagout ALL power sources to the equipment before beginning adjustments or repairs.

18. Keep the area around intake free of obstacles such as electrical cords, blocks, etc. that might trip workers.

19. Components of this equipment have sharp edges which can scrape and/or cut an operator.

20. Moving pieces with this equipment can sever an operator’s limb or even kill.

Shields and Guards

1. Always keep all shields and guards in place during operation.

Beware of Electrical Hazards

Electricity can kill! Use extreme caution around electrical components.

Have your electric company check the transformer and lead wires to be sure that they are large enough to handle the additional load of the motor.

Electrical wiring should be done by a qualified electrician and all components shall comply with applicable provisions of National Fire Protection Association Standard NFPA No. 70, American National Standard Inst. ANSI-C1 or with the requirements of the authority having local jurisdiction. KSi assumes no responsibility for the electrical wiring used with this machine.

KSi will not be liable for failure of the equipment due to poor or improper electrical power installation.

Wires which are too small deliver insufficient voltage causing the motor to overload or burn out.

Improper or inadequate wiring can kill or cause fires.

All electrical devices used on this machine shall be arranged to operate in a “fail safe” manner, that is, if power failure or failure of device occurs, a hazardous condition must not result. This means, the machine must not restart by itself after a power failure etc. when power returns. A means to lock out power must be provided at time of installation to prevent inadvertent starting of the equipment.
Personal Protective Equipment (P.P.E.)

1. The proper personal protective equipment should be worn at all time.

2. Always wear safety glasses when in the work area.

3. Proper footwear should be worn during the installation process, as well as any maintenance functions.

4. It is recommended to wear protective gloves during the installation process, as well as any maintenance functions. It is recommended to wear them also when removing any covers.

5. The use of fall protection is required at all times during the installation process, as well as maintenance functions.

6. The operator should never wear jewelry.

7. Loose-fitting clothes should not be worn around moving parts on conveyors or equipment. Any clothing that becomes loosened should be tucked in tightly.

8. Loose or dangling shoestrings should be tucked in.

9. Long hair should be tied up and/or back.
Operator Qualifications

1. The User/Operator must be competent and experienced to operate the equipment. Anyone who works around this equipment must have good common sense in order to be qualified. These persons must also know and meet all other qualifications, such as:

   A. Any person who has not read and/or does not understand all operation and safety procedures is not qualified to operate any seed filtration system.

   B. Certain regulations apply to personnel operating power machinery. Personnel under the age of 18 years may not operate power machinery, including seed filtration systems. It is your responsibility, as owner and/or supervisor, to know what these regulations are in your area or situation.

   C. Unqualified or incompetent persons are to remain out of the work area.

   D. O.S.H.A. (Occupational Safety & Health Administration) regulations state:

      “At the time of initial assignment, and at least annually thereafter, the employer shall instruct every employee in the safe operation and servicing of all equipment with which the employee is, or will be, involved.” (Federal Occupational Safety & Health Standards for Agriculture. Subpart D, Section 1928.57 (a) (6).

2. As a requirement of OSHA, it is necessary for the employer to train the employee in the safe operating and safety procedures for this equipment. We have included this sign-off sheet for your convenience and personal record keeping. All unqualified persons are to stay out of the work area at all times. It is recommended that another qualified person who knows the shutdown procedure is in the area at all times in the event of an emergency. A person who has not read this manual or does not understand all operating and safety instructions is not qualified to operate this machine.

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3 – Installing Safety Signs

**NOTICE**

Normal Range: 2” to 3” W.C.
Do not exceed 10” W.C. or filter damage will occur.
4 – Installation

Filter Unit and Ducting Installation

This system may be installed in many different situations and plan layouts. This is an example of a current system that was retrofitted to have a Seed Filtration System added to it. Each site’s configuration may be different such as retrofit installations versus installing it on a brand new site. There are some pictures that are labeled Actual; these are pictures that can be used for any install as they are not site specific. The installer should use their own judgement and call the office for any install questions beyond this manual.

1. Your current applicator and bypass system looks similar to this.

2. Remove bolts and take the old bypass off of the K-valve.
3. The conveyor spouting from the seed inlet conveyor should be removed. The air lines and hopper full sensor should also be disassembled from the K-valve and hopper.

4. The hopper on top of the K-valve should also be removed as it will be needed later.

5. Using a forklift lift arm extension, take the K-valve and its support structure from the top of the applicator.
6. Attach a strap through the holes on the seed filtration box and lift the stack onto the applicator.

7. Using the bolts and nuts removed from the K-valve stack earlier, bolt the new K-valve stack with the seed filtration box back to the applicator.
8. Attach the K-valve inlet hopper back onto the K-valve with the same bolts and nuts that were removed earlier.

9. Unpack the seed filtration system filter unit from the crate by picking it up from the top.

10. Position the filter unit close to the spot its final installation position. Do not secure to the floor at this time.
11. Cut two 4” pipes 12” long from one end of the pipe.

12. Take one of the 4” to 6” wyes and add a 12” long 4” adjustable sleeve to each 4” leg of the wye.

13. Insert one of 12” pieces of cut pipe into the 12” long pipe attached to the wye.
14. This should be inserted until 7¼” is left extended. The rubber seal should be installed mating to the flange on the 12” long 4” adjustable sleeve and a clamp added. Repeat for both legs of the wye.

15. Put together a 45° elbow and a 90° with a clamp and set them up to each end of the pipe as shown. Only put a clamp on one side of this wye on the 45° elbow and straight pipe.

16. Clamp one side of the wye with its elbows to one side of the seed filter box.
17. Hold the other end to the opposite side of the seed filter box.

18. Add the other 45° and 90° elbows and clamp both ends.

19. Assembly of the first manifold is complete.
20. Assembly the second manifold, following the same assembly steps as when assembling the first.

21. Both seed filter box manifolds are now assembled.
22. Use the steel cable to support the end of the manifolds to end of conveyor or K-valve stack.

23. Add elbows to the manifolds and turn them in the desired direction of travel.

24. Add 90° and 45° elbows and sections of straight pipe to line up pipes.
25. Use cable to tie up ducting where possible.

26. Keep adding pipe and elbows to get pipes going together in the same direction towards the seed filtration filter unit.
27. Keep adding 90° elbows and sections of 6” straight pipe.

28. Cut 6” pipe down to the length needed. It can be cut long as it fits into a 12” long 6” adjustable sleeve.
29. Slide the cut 6" pipe into the 12" long 6" adjustable sleeve. Use an O-ring and clamp to secure it at the proper length.

30. Clamp elbow to the wall or other structure if present and clamp it to the pipe. Loosen the clamp holding the cut length of pipe and adjust the position of the adjustable sleeve so that it and the elbow connect correctly.
31. Add pipe and elbows to the second pipe run as with the first to get it to the same installation point.

32. For long runs, two pipes can be clamped together before installing.
33. Attach pipe to elbow and install level. Attach to supporting structures if present.

34. Install and secure second pipe run as with the first run.

35. Unscrew the intake and exhaust flanges from the seed filtration filter unit crate. Drill out holes in the flanges to 5/16" as shown.
36. Caulk and install the intake flange to the intake side of the filter unit with six 5/16” x 1” bolts. The nuts are already welded in the receiving holes.

37. Caulk and attach exhaust flange to exhaust of filter unit with six 1/4” x 3/4” bolts and nuts.

38. Clamp a 6” 45° elbow and a 6” 90° elbow together.
39. Clamp the elbows to one of the pipes. Make sure that the line running from the lower set of holes on the seed filter box above the applicator is running to the exhaust side of the filter unit.

40. Clamp the 6” damper unit to the exhaust flange.
41. Add the 6” tee to the top side of the damper and attach the blast gate to the side.

![Actual Image of 6" tee and blast gate](image1)

ACTUAL

42. Move the seed filtration filter unit until the exhaust pipe run lines up with the exhaust side of the filter unit.

![Actual Image of filter unit and exhaust pipe](image2)

ACTUAL

43. Secure the exhaust pipe with clamps. The pipe may need cut and inserted into an adjustable sleeve and an O-ring used to fill the space between the two pipes.

![Actual Image of exhaust pipe with clamps](image3)
44. Using a 3/8” masonry drill bit, drill holes for 3/8” cement anchors to hold the filter unit down. Fasten the filter unit securely to the concrete.

45. Continue to add pipe to the suction/inlet side and bring it closer to the intake. A pipe may need to be cut and inserted into a 12” long 6” adjustable sleeve.

46. Clamp another 90° elbow and a 45° elbow to the intake pipe.
47. Measure the distance between the elbow and the top of the intake flange on the filter unit. Cut a pipe to this measurement and install it with a 12” long 6” adjustable sleeve between the intake pipe elbow and intake flange on the filter unit.

48. Once all pipe connections are complete, the ducting system should be ready for startup.
Electrical Installation

For electrical installation instructions, see the provided KSi electrical schematics set.

Purge Air Supply Installation

Follow the diagram below for installation instructions for the air supply for the air purge. The PSI for the air supply should be between 80 and 100 PSI.
Blast Gate and Butterfly Valve Adjustment

Initial Setup
When installed, the Butterfly Valve should be first in line on the clean air stream, before the tee and Blast Gate. When running seed through the Seed Filtration unit for the first time, start with the Butterfly Valve open 100% and the Blast Gate closed 100%.
Adjust Butterfly Valve

During this step, the Blast Gate should remain 100% closed. The Butterfly Valve will be adjusted slowly closed until just a few whole seeds end up in the dust bucket. To determine this, at the end of each run, remove the dust bucket and view the amount of whole seed kernels in the bucket. If none, slightly open the Butterfly Valve and run again. If too many seeds are in the dust bucket, slightly close the Blast Gate and run again. Repeat this process until satisfied.

Adjust Blast Gate

During this step, the Butterfly will remain in the same position as set in step 2. The Blast Gate will be slowly opened until the amount of dust escaping from the seed conditioner assembly is minimal. While the unit is running, and seed is flowing through the seed conditioner, observe the amount of dust. Slowly open the Blast Gate until the amount of dust is minimal.
5 – Operation

Air Purge Operation

Differential Pressure Timer Operation
The digital timer is designed to control the pulse valve on the dust filter. It provides timed sequential energization of the pilot solenoid valves. The number of outputs is programmable for the quantity of solenoid valves installed in the timer enclosure. LED indicators are provided for visual indication of which valve is energized. A digital three position LED readout is provided to indicate the programmed settings of the various functions. Digital controls allow adjustment of the “on” and “off” time, the total number of outputs to be energized and the number of blowdown cycles required. Timer is equipped with integral surge suppression on power input and solenoid load outputs to protect against voltage spikes. The timer will retain programmed settings if input power is removed for any reason.

Automatic Blowdown
The automatic blowdown feature allows the timer to continue to operate for a programmed number of complete cycles after the baghouse fan is turned off. The blowdown cycle is initiated by the opening of the auxiliary contact on the fan motor starter when the fan is stopped. The number of blowdown cycles is programmable from 0 to 25. When the programmed number of cycles is completed, the timer turns itself off. The timer will automatically start when the baghouse fan is restarted if the blowdown terminals B1 & B2 are connected to the auxiliary contacts on the motor starter in the electrical installation instructions.

Timer Board Programming Instructions
Press the “Select” button to illuminate the LED indicator adjacent to the function required, then press the “Adjust” button repeatedly until the required setting is displayed on the Digital Readout. After all the functions have been set, push the “Select” button to the Locked LED indicator. In the locked position, the Digital Readout will display the last setting, which is the number of blowdown cycles programmed. To check a specific function setting, push the “Select” button to illuminate the desired function LED, the setting is then shown on the Digital Readout.

- The ON TIME setting is adjustable from 30 to 250 milliseconds in 5 millisecond increments.
- The OFF TIME setting is adjustable from 1 to 180 seconds in 1 second increments.
- The NUMBER OF VALVES CONNECTED setting is adjustable from 1 through the total number of outputs available on the Timer Board.
- The NUMBER OF BLOWDOWN CYCLES setting is adjustable from 0 to 25 cycles.

Programming Steps
1. – ON TIME – Press the “Select” button until the “ON TIME” LED indicator is illuminated, then press the “Adjust” button until the required ON TIME in milliseconds is shown on the Digital Readout. 150 milliseconds ON TIME has been determined as the optimum duration for many applications.
2. – OFF TIME – Press the “Select” button until the “OFF TIME” LED indicator is illuminated, then press the “Adjust” button until the required OFF TIME in seconds is shown on the Digital Readout. OFF TIME is the length of time between successive cleaning pulses. OFF TIME should be adjusted to maintain a differential pressure of 2”-3” W.G. Initial suggested OFF TIME for this unit is 30 seconds. After operating experience has been gained, the OFF TIME setting may be adjusted to the maximum time possible that will maintain effective cartridge cleaning, which will conserve compressed air. Effective cartridge cleaning is directly related to the differential pressure. The differential pressure gauge is located on the exterior of the filter housing.

3. – NUMBER OF VALVES CONNECTED – Press the “Select” button until the “# VALVE” LED indicator is illuminated, then press the “Adjust” button until the required NUMBER OF VALVES CONNECTED is shown on the Digital Readout.

4. – BLOWDOWN CYCLES – Press the “Select” button until the “# OFFS” LED indicator is illuminated, then press the “Adjust” button until the required number of BLOWDOWN CYCLES is shown on the Digital Readout. Caution: Do not over-clean the filters.

5. – SETTINGS LOCKED – Press the “Select” button until the “LOCKED” LED indicator is illuminated. All settings are now locked in and the Digital Readout will display the last setting, which is the number of blowdown cycles programmed. The “#OFF’S LED” indicator will also stay illuminated.

System Startup-Up

1. Check filter cartridges for proper installation

2. Check all air and electrical connections for proper routing. The compressed air supply should be connected to the 3/4” NPT coupling located on top of the dust filter. Turn on the compressed air supply. Pressure should be between 80-100 PSIG.

3. When all components are operating correctly, start the dust laden air through the filter and observe the differential pressure at the gauge. (The differential pressure is the air resistance across the filter cartridges). The pressure should stabilize between 2” and 3” W.G. Never allow pressure drop across the filter to exceed 10” W.G., this may damage the filter cartridges. If the differential pressure is high, decrease the OFF TIME on the timer board to clean the cartridge(s) more frequently, which will lower your differential pressure.
6 – Maintenance

The filter cartridges are the heart of the filter and need a program of inspection, cleaning, and replacement to maintain high operating efficiency.

1. Shut down the dust filter, and lockout-tagout the electrical and compressed air service.

2. Remove the cartridge access doors.

3. Move the cartridges out of the filter and dispose of properly. The cartridge will fit in 55 gallon drums.

4. Clean and inspect the access doors and gaskets. Replace any worn or damaged gaskets. It is recommended that the outer door gasket be replaced when the cartridges are replaced.

5. Slide the new cartridges, gasket end first, onto the cartridge support yoke. Be careful that the cartridge is not damaged during installation. Position the access door over the cartridge end and the support yoke, alignment tabs will guide the door into place as the hand knob is tightened. Do not use a wrench; hand tighten the knob only.
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7 – Parts

How to Order Parts

1. Refer to the proper layout view for the area of the machine.
2. Find illustration of the part to be ordered.
3. Note the ITEM number in the balloon point to the part.
4. On the parts list, find the ITEM number listed in the table.
5. Find the Quantity, Part Number, and Description associated with the ITEM number for use when placing your order.

Paint
For matching red paint, use Diamond Vogel IB5588, or equivalent paint.

Order supplies from
KSi Conveyors, Inc.
454 N State Route 49
Cissna Park, IL 60924
Phone: 815.457.2403
888.574.2668

Abbreviations used in Parts List
AS—Assembly
BKT—Bracket
ITM—Item
LH—Left hand side
NO—Number
OPT—Optional component
QTY—Quantity
RH—Right hand side
AR—As required (e.g. ft. of belt)

Parts Listing

This section shows parts and exploded drawings for the equipment.
Filter Cartridge

Replacement of Filter Cartridge

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Solenoid Valve

Solenoid Valve Exploded View

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<td>O' RING</td>
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## Diaphragm Valve

### Exploded View

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**Diaphragm Valve Exploded View**