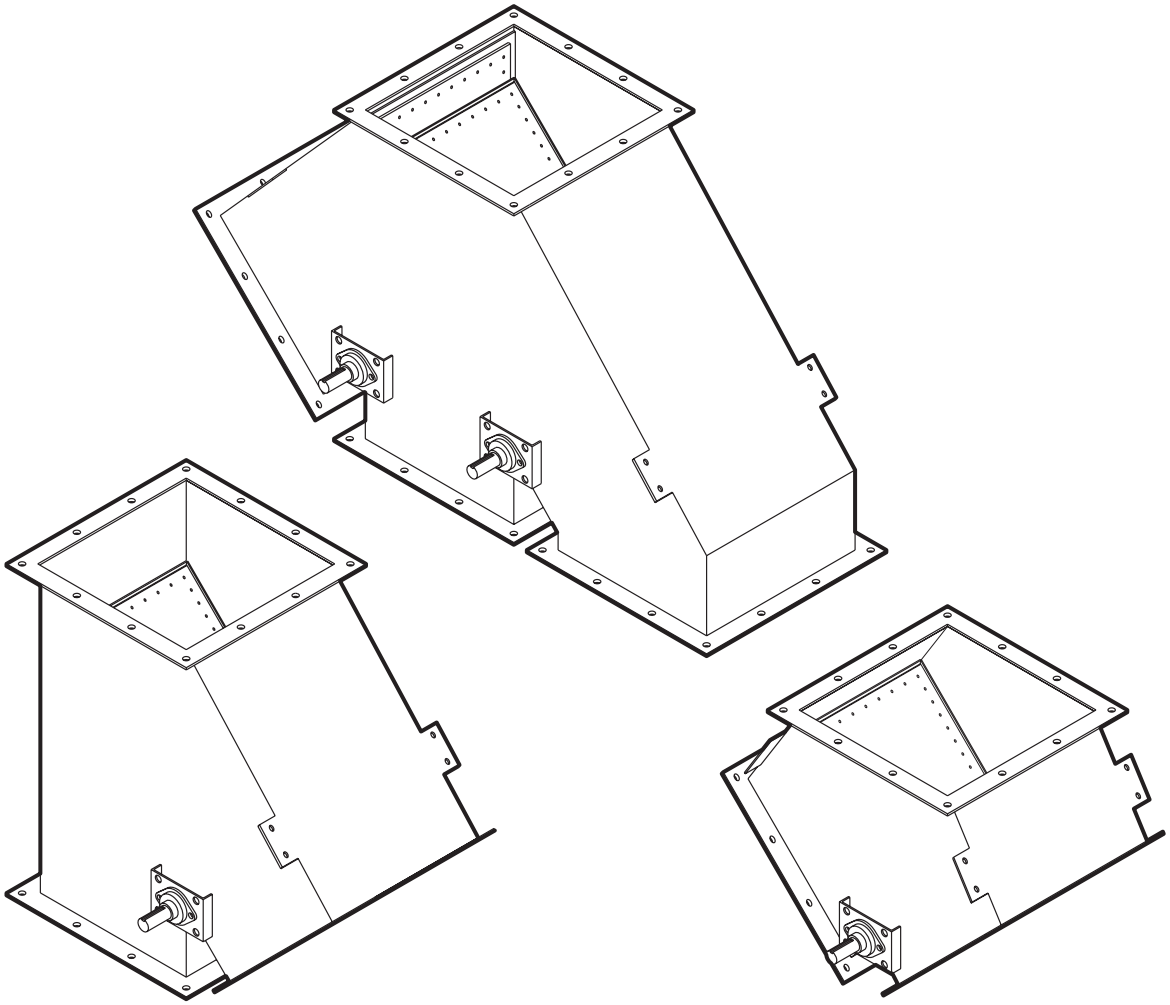
DIVERTER VALVES

Installation Manual



Manual, Air or Electric Operators

SCHLAGEL

Manufacturers of Innovative Materials Handling Equipment since 1957.

491 North Emerson Street • Cambridge MN 55008-1316 U.S.A.
Toll Free (800) 328-8002 FAX (763) 689-5310
Local / International (763) 689-5991 EMAIL sales@schlagel.com
www.schlagel.com

TABLE OF CONTENTS

SECTION 1 - GENERAL

SECTION 2 - ASSEMBLY AND INSTALLATION

INTRODUCTION

All the valves in this manual are 45 degrees based on the most popular sizes and styles. We make a great variety of other sizes and styles that are custom built to your particular needs and requirements. All hole layouts are based on our standards and can be changed to meet your specifications. Round inlets and/or outlets are available in any combination to suit your applications.

All are available in mild steel, galvanized steel or stainless steel construction.

USE OF MANUAL

This manual provides installation, operation, service recommendations and replacement parts identification for Schlagel Diverter Valves.

Each section of the manual is fully illustrated for fast, accurate reference. It is highly recommended that this manual be read thoroughly by those who are responsible for the installation, operation and maintenance of this diverter valve. Refer to the Table of Contents for the location of specific information.

As new information and equipment become available, service and parts bulletins will be issued by us. So that they will be readily available for reference, all bulletins should be inserted with this manual. This manual covers standard diverter valve equipment only. For any items or special equipment not covered in this manual, please consult our service department for recommendations or instructions regarding this equipment.

INFORMATION SERVICE

Our service department will provide consultation on installation, operation and maintenance at no cost to you. Also, information from you, regarding operation or service problems that are not covered in this manual will be greatly appreciated.

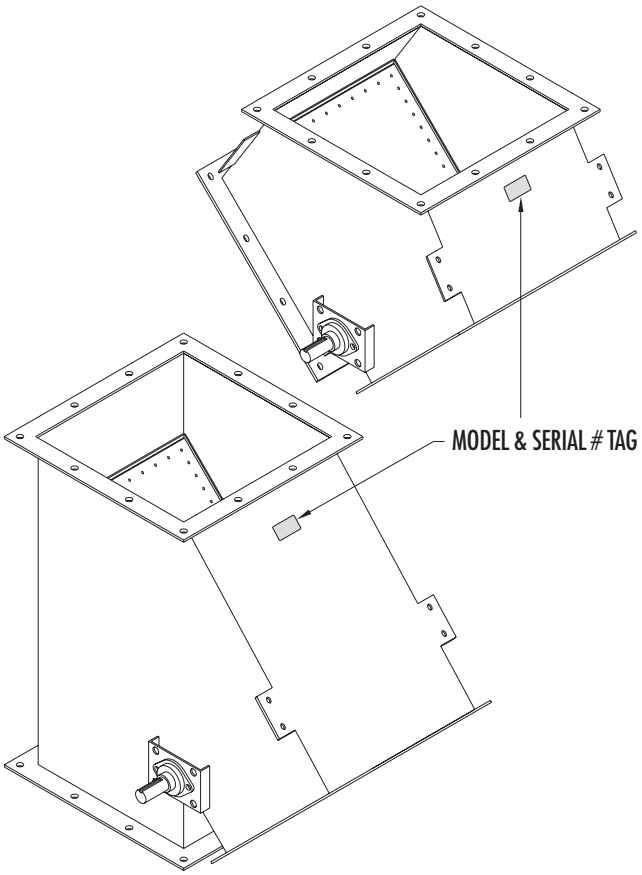
Date of Purchase: _____

Serial Number: _____

Model: _____

Purchased from: _____

Email or Call: Schlagel, Inc.
491 North Emerson Street
Cambridge, MN 55008
(763) 689-5991 or 1-800-328-8002
sales@schlagel.com



UNCRATING AND INSPECTION

Your diverter valve has been carefully checked and packed for shipment from our factory. In the event that any parts are missing or damaged, please notify us immediately and also have the delivering carrier note this is on the Bill of Lading.

IMPORTANT

All claims for shipping damages must be noted by the consignee at the time of delivery and filed with the transportation company.

SAFETY CODE

⚠ WARNING ⚠

The icon shown below was proposed as a safety alert symbol by the Farm and Industrial Equipment Institute (FIEI) and approved by the American Society of Automotive Engineers (ASAE) and others for the purpose of calling attention to safety precautions which if not heeded might lead to bodily injury.

Please read instructions carefully and follow the instructions exactly wherever this symbol appears in the manual. ⚠

SAFETY FIRST

LOOK FOR THIS SAFETY LABEL

GENERAL NOTES

- All diverter valves should have the flange joints caulked or gasketed during installation.
- Bucket (basket) type valves should be installed in a vertical position. Flop type valves can be installed at a slight angle but this may cause extra wear on the seal with certain products.
- No long spouting runs or misaligned flange joints should be connected to a diverter valve if they would cause a twist in the valve's housing.
- Long vertical drops of product into the diverter valve should be avoided, especially with bucket type valves as this may cause the bucket to slightly open and leak product. If a long run is required then try to install some type of flow retarder above the valve to reduce the product velocity.
- Do not use bucket type valves where the valve is likely to become plugged with product or where you expect an unusual amount of air coming back up the spout that the product is flowing into. Either condition may allow the product to leak around the bucket sides.
- Do not use standard flop valves where the temperature exceeds 170° F (77° C). Consult the factory for special high temperature seals or for food grade products.

MANUALLY OPERATED VALVE NOTES

- When controlling the valve from a remote location, be certain that any cable runs have as few changes in direction as possible. Each direction change around a pulley will result in poorer operator "feel" of the bucket or flop position in the valve. Be especially careful that the cable does not bind against a pulley's mounting bracket or some other object. Use a swivel type pulley when necessary.
- Plainly mark the operating controls so that any personnel can tell from a glance what position the diverter is in.
- No bucket type valve should have the product coming into the valve at an angle or high enough velocity to cause the bucket to slightly open and "leak". If this cannot be avoided then you may have to make some type of locking mechanism on the controls to hold the valve in a closed position.

AIR OPERATED VALVE NOTES

- Use a clean dry air supply of 100 PSI. It is recommended that some type of air dryer be used to remove moisture rather than a simple bowl type filter.
- If a lubricator is installed in the line then use an air system oil that will not harm the seals used in air cylinders or solenoid valves. There are oils available with anti-freeze ingredients for cold weather areas.
  DO NOT USE EXCESSIVE AMOUNTS OF OIL.
- For cold weather areas, we recommend that electric air solenoid valves be located in a warm control room rather than out by the air cylinder. The freezing that results from moisture in the air line normally happens in the solenoid valve, not the air cylinder. Having the solenoid valve in a control room may also eliminate the need for an explosion proof electrical rating in addition to providing better service access.
- Use adjustable speed controls on large diverter valves or diverter valves that will be cycling frequently. This will extend the life of all the mechanical components in the valve.
- Use muffler/filters on the exhausts of any manual or electric solenoid valve to prevent contaminants from getting inside.
- Two limit switches are typically supplied. Field adjustment may be required to get valve to operate properly. See switch wiring diagram.

⚠ WARNING ⚠

Lock Out - Tag Out the motor on any drive before removing a drive guard!

ELECTRIC OPERATED VALVE NOTES

- The standard right angle gear reducer has been factory filled with Mobil Delvac synthetic oil 75W-90 98HL97. Do not use anything but a synthetic oil in cold weather areas.
- The standard gear reducer has an adjustable internal slip clutch that has been factory set. The large nut on the threaded shaft extension (opposite the keyed shaft side) is used to adjust the torque setting. Tightening the nut increases the torque slip point. Consult the factory before adjusting this unit.
- If necessary, the drive chain tension may be adjusted by loosening the reducer bolts and moving the reducer in the slotted holes until there is only a small amount of sag in the chain.
- Two limit switches are typically supplied. Field adjustment may be required to get valve to operate properly. See switch wiring diagram.

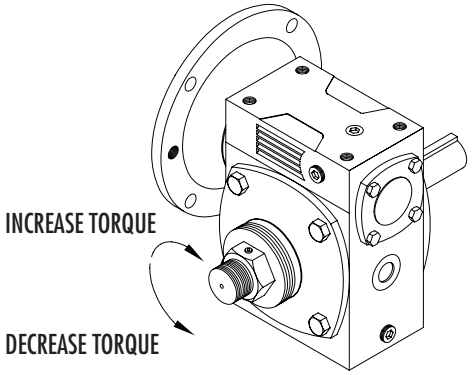
⚠ WARNING ⚠

Lock Out - Tag Out the motor on any drive before removing a drive guard!

HAMPTON WORM GEAR REDUCER 100:1 RATIO, 56C FRAME

This reducer is equipped with a built-in slip clutch. The slip clutch is set at the factory from 45 ft/lbs. – 120 ft/lbs. In the event the slip clutch needs to be field adjusted, loosen the set screw (using a 3mm allen wrench) and turn the nut as shown using a torque wrench to the desired setting.

The reducer is filled with Mobil Delvac synthetic oil 75W-90 98HL97. This provides good service in most normal temperature ranges. As with any gear reducer, the oil should be changed in your normal routine maintenance schedule.

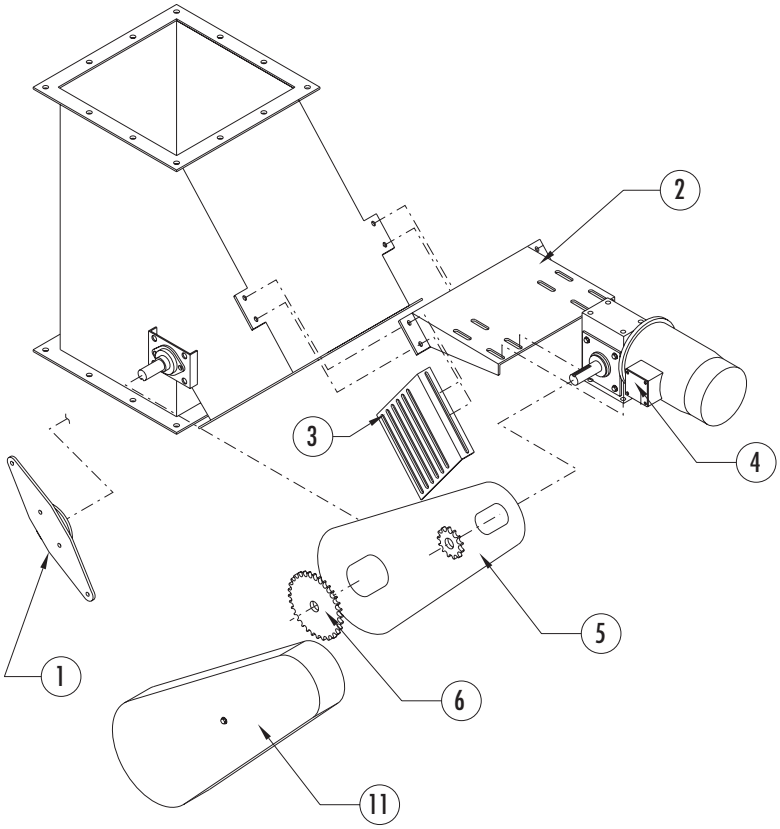


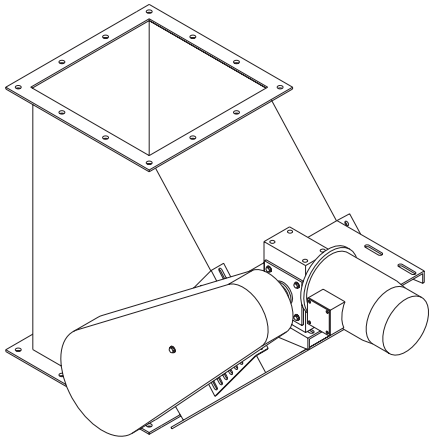
ELECTRIC CONVERSION FOR NEW STYLE K-VALVES

1. Remove the manual operator by loosening the allen head set screw on the shaft collar.
   - On bucket style valves only, also remove the spring and arm from the back side of the valve, leaving the weld on bracket in place.
2. Bolt on the new reducer mounting bracket using (2) 3/8" x 1" long hex head bolts and flange nuts. Leave the (2) 3/8" x 1-1/4" long bolts out of the drive side, but tighten the (2) bolts on the switch side using a 9/16" wrench.
3. On the drive side, use the (2) 3/8" x 1-1/4" long bolts to attach the guard mounting bracket on top of the reducer bracket. Leave these bolts loose.
4. Attach the reducer to the mounting bracket with the (4) 3/8" x 1" long bolts, lock washers, and flat washers. Leave these bolts loose also.
5. Attach the chain guard to the chain guard bracket using (2) 3/8" x 1" long carriage bolts and flange nuts. Leave the flange nuts loose.
6. Assemble the sprockets and chain at this time. Tension the chain (by moving the reducer in the slotted holes) until there is only a small amount of sag in the chain. **DO NOT OVER TENSION!** Then tighten the bolts holding the reducer with a 9/16" wrench. Position the chain guard back and the chain guard mounting bracket so they are visually aligned and clear all rotating parts, then tighten the bracket and guard bolts with a 9/16" wrench.
7. Bolt the universal switch bracket to the bearing bracket (on the side opposite the drive) using (2) 3/8" x 1" long bolts and flange nuts.
8. Bolt each limit switch to the bracket using (2) 5/16" x 3/4" long bolts on each switch (in opposite corners).
9. Attach the switch lever to the shaft using an allen head set screw.
   - **If this is a bucket valve** then the bucket should be in the horizontal position, parallel to the top flange and the switch levers should also be parallel before tightening the set screw.
   - **If this is a flop valve** then the flop should be perpendicular to the top flange and the switch lever perpendicular to the top flange before tightening the set screw.
10. Attach the (2) switch arms and set them so the switches "click" just before the end of travel for the bucket/flop diverter.
11. Attach the chain guard cover using (1) 1/2" x 3/4" bolt and flat washer. Tighten with a 3/4" wrench.

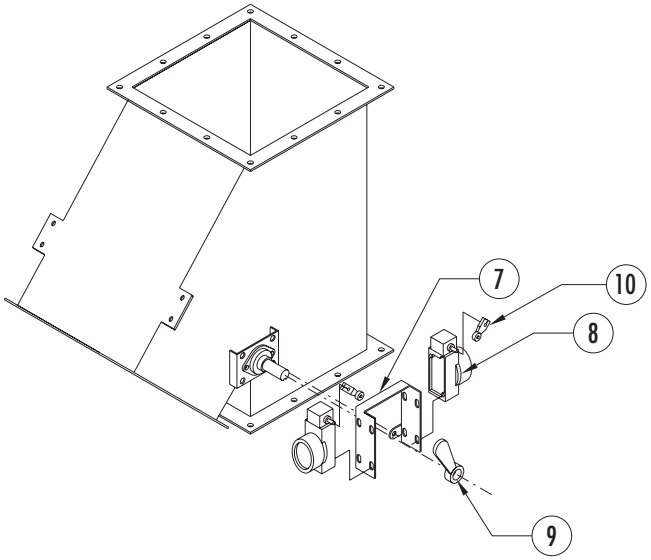
ELECTRIC CONVERSION FOR NEW STYLE K-VALVES

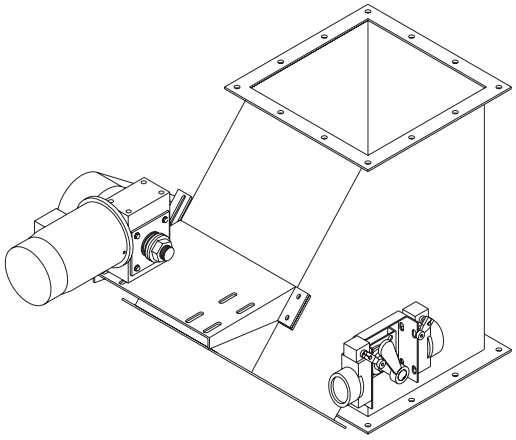
FLOP VALVE SHOWN - BUCKET SIMILAR





TYPICAL ASSEMBLED VIEW
(DRIVE SIDE)





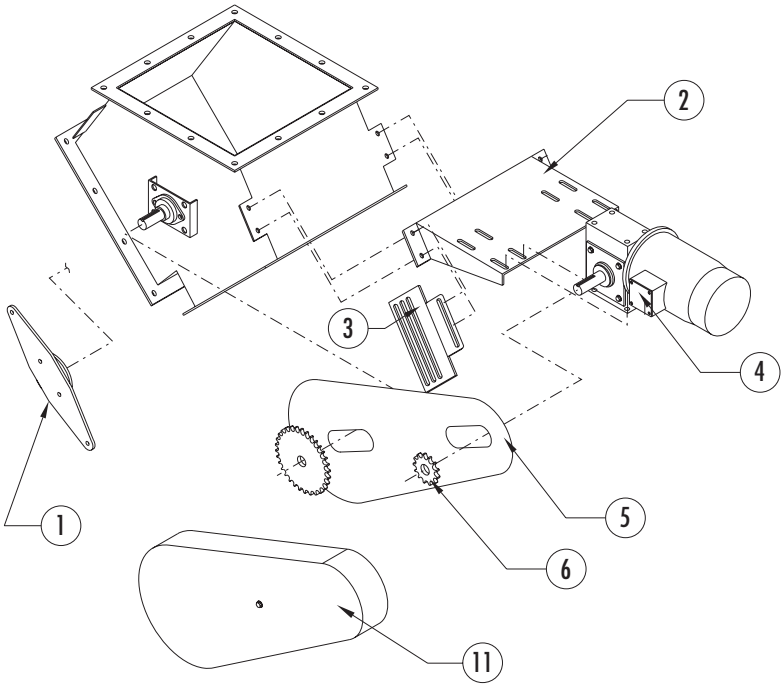
TYPICAL ASSEMBLED VIEW
(SWITCH SIDE)

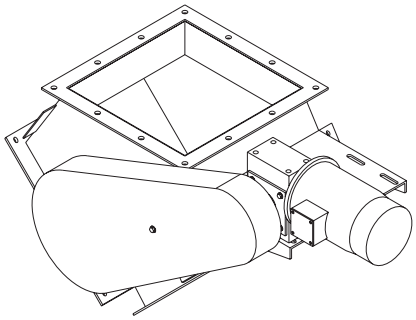
ELECTRIC CONVERSION FOR NEW STYLE 2-WAY VALVES

1. Remove the manual operator by loosening the allen head set screw on the shaft collar.
   - On bucket style valves only, also remove the spring and arm from the back side of the valve, leaving the weld on bracket in place.
2. Bolt on the new reducer mounting bracket using (2) 3/8" x 1" long hex head bolts and flange nuts. Leave the (2) 3/8" x 1-1/4" long bolts out of the drive side, but tighten the (2) bolts on the switch side using a 9/16" wrench.
3. On the drive side, use the (2) 3/8" x 1-1/4" long bolts to attach the guard mounting bracket on top of the reducer bracket. Leave these bolts loose.
4. Attach the reducer to the mounting bracket with the (4) 3/8" x 1" long bolts, lock washers, and flat washers. Leave these bolts loose also.
5. Attach the chain guard to the chain guard bracket using (2) 3/8" x 1" long carriage bolts and flange nuts. Leave the flange nuts loose.
6. Assemble the sprockets and chain at this time. Tension the chain (by moving the reducer in the slotted holes) until there is only a small amount of sag in the chain. **DO NOT OVER TENSION!** Then tighten the bolts holding the reducer with a 9/16" wrench. Position the chain guard back and the chain guard mounting bracket so they are visually aligned and clear all rotating parts, then tighten the bracket and guard bolts with a 9/16" wrench.
7. Bolt the universal switch bracket to the bearing bracket (on the side opposite the drive) using (2) 3/8" x 1" long bolts and flange nuts.
8. Bolt each limit switch to the bracket using (2) 5/16" x 3/4" long bolts on each switch (in opposite corners).
9. Attach the switch lever to the shaft using an allen head set screw.
   - **If this is a bucket valve** then the bucket should be in the horizontal position, parallel to the top flange and the switch levers should also be parallel before tightening the set screw.
   - **If this is a flop valve** then the flop should be perpendicular to the top flange and the switch lever perpendicular to the top flange before tightening the set screw.
10. Attach the (2) switch arms and set them so the switches "click" just before the end of travel for the bucket/flop diverter.
11. Attach the chain guard cover using (1) 1/2" x 3/4" bolt and flat washer. Tighten with a 3/4" wrench.

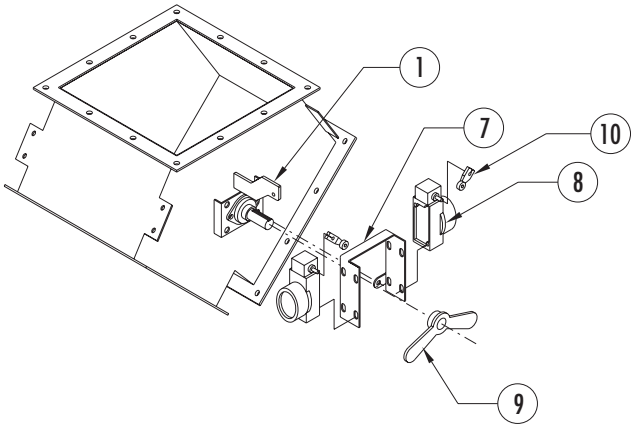
ELECTRIC CONVERSION FOR NEW STYLE 2-WAY VALVES

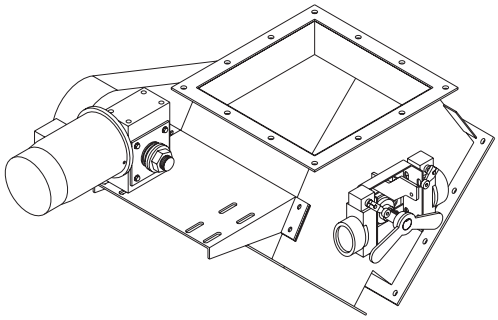
BUCKET VALVE SHOWN - FLOP SIMILAR





TYPICAL ASSEMBLED VIEW
(DRIVE SIDE)





TYPICAL ASSEMBLED VIEW
(SWITCH SIDE)

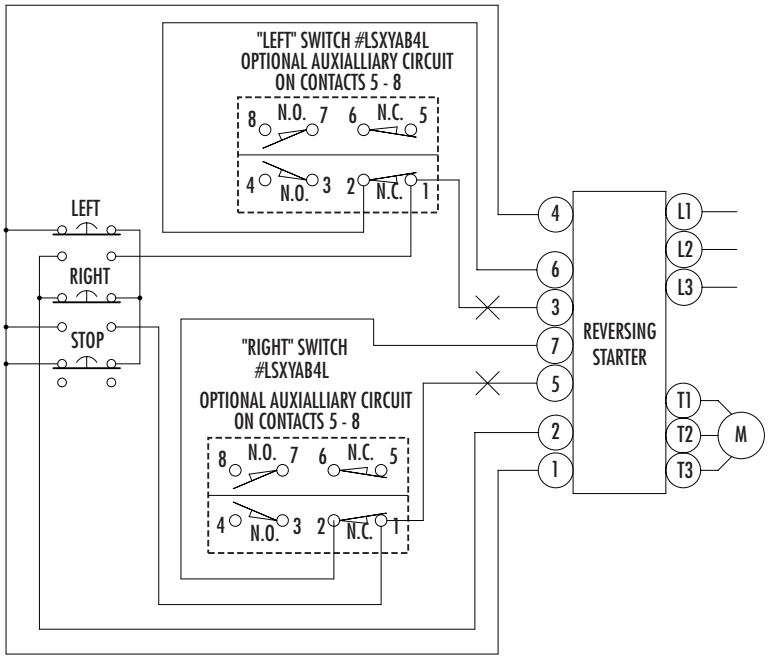
TYPICAL WIRING DIAGRAM FOR GEARMOTOR DRIVE ON A DIVERTER VALVE

TYPICAL WIRING DIAGRAM

REMOVE INTERNAL JUMPERS 3 TO 6, 5 TO 7.

BREAK FOR MOMENTARY OPERATION

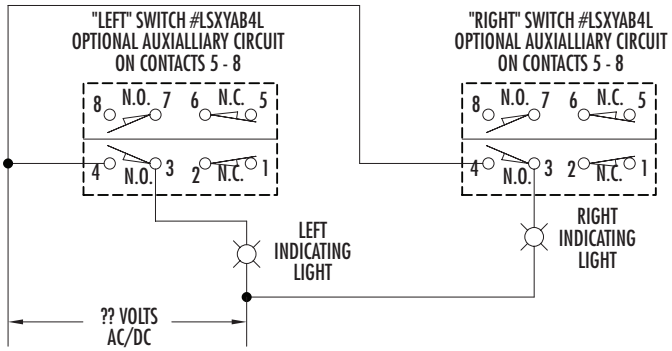
THE LIMIT SWITCHES ARE THE ONLY DEVICES PROVIDED. ANY STARTER, PUSH BUTTON CONTROL OR INDICATOR LIGHTS ARE TO BE SUPPLIED BY CUSTOMER.



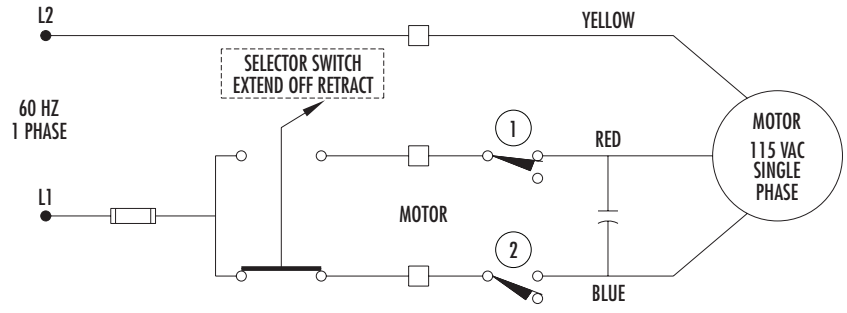
TYPICAL WIRING DIAGRAM FOR POSITION INDICATING SWITCHES ON AN ELECTRIC DIVERTER VALVE

THE ABOVE (LSXYAB4L DPDT) LIMIT SWITCHES ARE SHOWN AS BEING USED TO LIGHT AN INDICATING LAMP.

THIS DIAGRAM IS NOT TO BE USED FOR CONTROLLING A MOTOR CIRCUIT.



TYPICAL WIRING DIAGRAM FOR ANDCO "Eagle" LINEAR ACTUATOR ON A DIVERTER VALVE



1 INTERNAL EXTEND POSITION LIMIT SWITCH

2 INTERNAL RETRACT POSITION LIMIT SWITCH

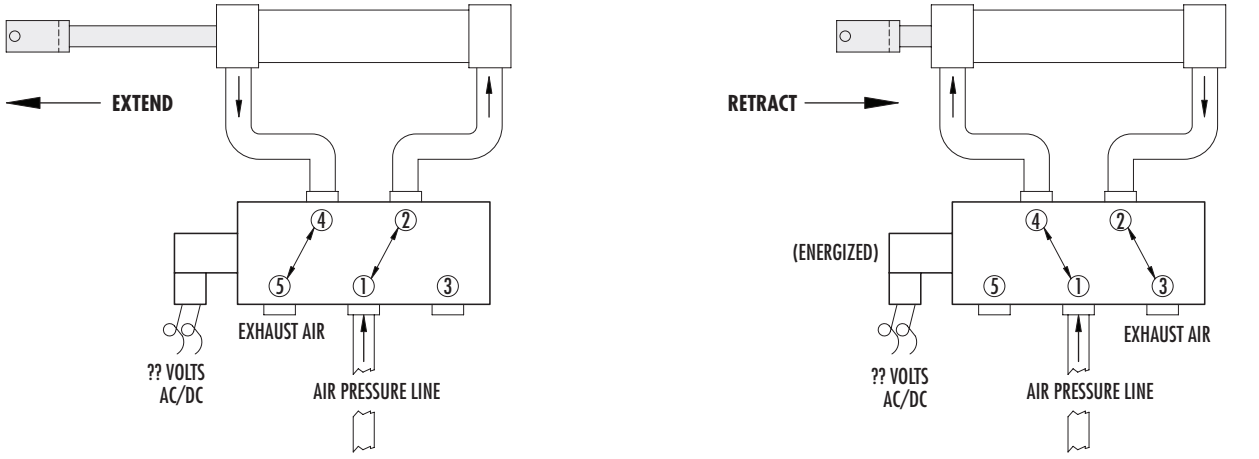
CUSTOMER CONNECTION IN ACTUATOR

NOTE: ACTUATOR SHOWN IN FULL RETRACT POSITION.

LIMIT SWITCHES ARE THE ONLY DEVICES PROVIDED. ANY STARTER, PUSH BUTTON CONTROL OR INDICATOR LIGHTS ARE TO BE SUPPLIED BY CUSTOMER.

TYPICAL ELECTRICAL AIR SOLENOID VALVE CONNECTIONS

Figure 1

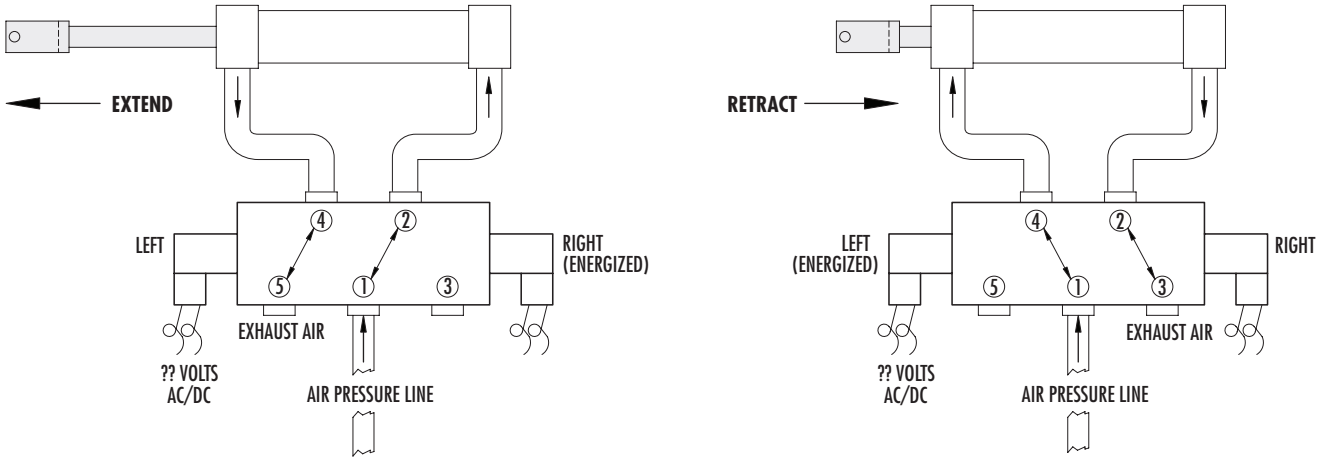


THIS VIEW IS WITH NO ELECTRIC POWER TO THE SOLENOID
(DE-ENERGIZED COIL/SPOOL).
THE CYLINDER ROD WILL EXTEND

THIS VIEW IS WITH ELECTRIC POWER TO THE SOLENOID
(ENERGIZED COIL/SPOOL).
THE CYLINDER ROD WILL RETRACT.

THE SINGLE SOLENOID IS OPTIONAL AND NOT NORMALLY RECOMMENDED FOR DIVERTER VALVES.
THIS STYLE CAN CHANGE POSITION UPON LOSS OF ELECTRIC POWER AND THUS THE PRODUCT FLOW DIRECTION.

Figure 2



THIS VIEW IS WITH ELECTRIC POWER TO RIGHT SOLENOID
(EVERGIZED RIGHT COIL/SPOOL).
THE CYLINDER ROD WILL EXTEND.

THIS VIEW IS WITH ELECTRIC POWER TO LEFT SOLENOID
(ENERGIZED LEFT COIL/SPOOL).
THE CYLINDER ROD WILL RETRACT.

THE DOUBLE SOLENOID CONTROL VALVE SHOWN HERE IS THE STYLE RECOMMENDED FOR DIVERTER VALVES.
THIS STYLE WILL MAINTAIN THE VALVE'S POSITION UPON LOSS OF ELECTRIC POWER AND KEEP MATERIAL FLOWING DOWN THE SAME SPOUT.

The above diagram show typical hookups for air solenoid control valves on diverter valves.

Figure 1 shows a single solenoid (meaning a single electrical coil). This type of solenoid valve, when plumbed as shown, will cause the rod to extend as long as there is no power applied. This means that the diverter valve could change direction if there was a loss of power.

Figure 2 shows a double solenoid (meaning there are two electrical coils). This type of solenoid valve will keep the rod (and thus the diverter valve) in its last chosen position if there was a loss of power. This is the style supplied by us as standard.

Please contact our service department for help with any concerns or questions about your Diverter Valves.

SCHLAGEL

491 North Emerson Street • Cambridge MN 55008-1316 U.S.A.
Toll Free (800) 328-8002 FAX (763) 689-5310
Local / International (763) 689-5991 EMAIL sales@schlagel.com
www.schlagel.com