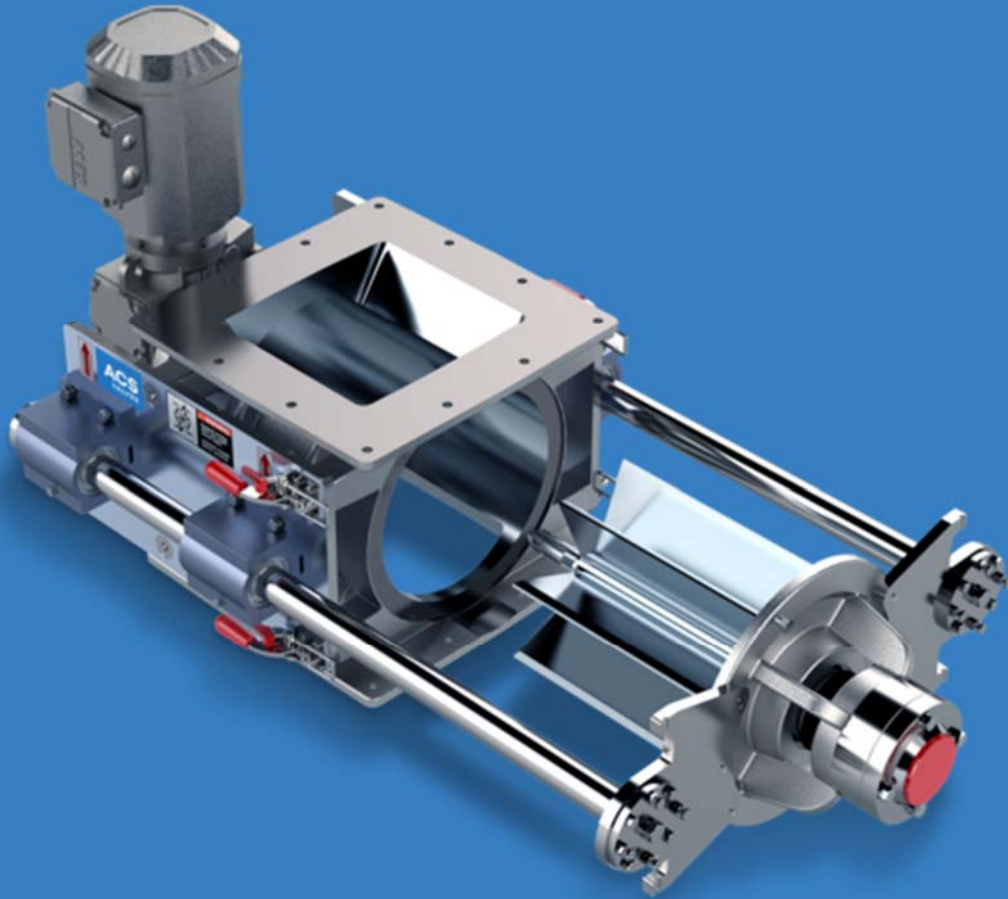


Installation, Operation & Maintenance Manual



ACS Rotary Airlock Valve
Quick-Clean on Rails Design

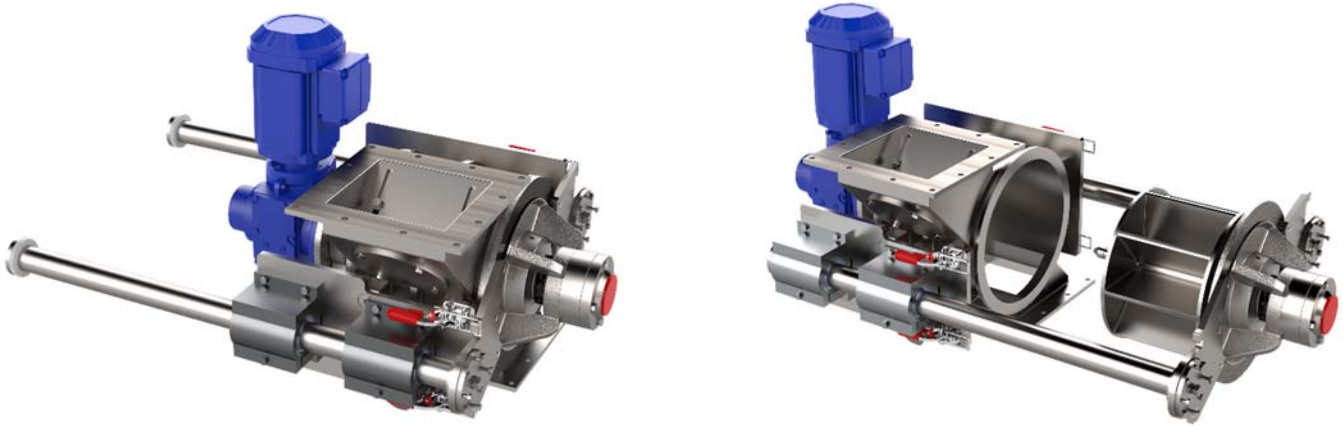
ACS
VALVES

Introduction

These instructions are intended to familiarize the user with the product and its permitted use. Operating the product in compliance with these instructions helps to ensure reliability in service and avoid risks. Installation and maintenance of equipment should always be performed by qualified personnel in compliance with applicable codes and regulations.

Equipment owners are responsible for understanding the contents of this document and compliance with applicable government laws and regulations and appropriate industry standards.

Control of the equipment must be in accordance with OSHA Standard 1910.147 “Control of Hazardous Energy (Lockout-Tagout)” or similar hazardous energy control procedure as defined by CSA or ANSI. “Lockout/Tagout” refers to specific practices and procedures to safeguard employees from the unexpected energization or startup of machinery and equipment, or the release of hazardous energy during service or maintenance activities. This requires, in part, that a designated individual turns off and disconnects the machinery or equipment from its energy source(s) before performing service or maintenance and that the authorized employee(s) either lock or tag the energy- isolating device(s) to prevent the release of hazardous energy and take steps to verify that the energy has been isolated effectively.



S-Pellet Feeder with Quick Clean on Rails Design

Rotary Valve for Metering, Feeding and Airlock Applications

Tool-less, single-step access to rotor and internal surfaces; simplifying cleaning, validation, and inspection. Rotor and endplate mounted on rails for ease of dis-assembly; ensures fast and accurate rotor and endplate re-alignment during re-assembly

Table of Contents

Introduction.....	2
Safety First.....	4
General Information	7
Receiving Your Equipment.....	8
Design and Construction.....	9
Rotor Types.....	10
Operation.....	11
Installation	12
Accessories	13
Initial Start-up Procedure	15
Disassembly/Re-assembly	16
Maintenance Procedures	17
Parts List.....	20
ACS Rotary Valve Lubrication Chart.....	24
Troubleshooting	26
Spare Parts and Service.....	27

Safety First

SAFETY ALERT SYMBOLS



This Safety alert symbol is used to call your attention to an important safety message on equipment, safety decals and in manuals, to warn you of possible danger to your personal safety. When you see this symbol, be alert; your personal safety or the safety of the other persons is involved.

THE FOLLOWING DEFINITIONS FOR IDENTIFYING HAZARD LEVELS ARE:



DANGER (RED) – Danger is used to indicate the presence of a hazard that WILL cause SEVERE personal injury, death, or substantial property damage if the warning is ignored.



WARNING (ORANGE) – Warning is used to indicate the presence of a hazard that CAN cause SEVERE personal injury, death, or substantial property damage if the warning is ignored.



CAUTION (YELLOW) – Caution is used to indicate the presence of a hazard that WILL, or CAN cause MINOR personal injury or property damage if the warning is ignored.

SAFETY PRECAUTIONS

Prior to starting work on the equipment, we recommend the following:

1. Always de-energize all electrical equipment by following lock out/tag out procedures. If working on a quick clean design valve, disconnect all sources of power before cleaning or performing maintenance on your quick clean valve.
2. Do not operate rotary airlock valves & feeders with the inlet or the outlet flange openings unguarded or disconnected from system components. Inlet & outlet flange guards are mandatory. These flange guards are available for purchase upon request.
3. Always allow equipment to come to a complete stop. Never attempt to artificially brake the motion of the equipment.
4. Warning labels must be located on the equipment and near access openings to remind operating personnel of the risk.
5. Block the rotor from turning if the drive chain is disconnected or the gear drive has been removed.

HAZARD WARNINGS AND SAFETY PRECAUTIONS



The safety warnings below are basic guidelines and by no means all inclusive. National and local safety codes and even common sense should be used by qualified personnel to carry out installation and maintenance of the equipment. The hazards listed below are the most likely to be encountered during installation, operation and maintenance of your equipment.

Shear Hazard

There are shear points wherever the rotor and housing meet. Contact with moving rotor blades will amputate fingers, hands, arms or legs and may result in death. Accidents can occur when operators reach through upstream or downstream equipment mounted adjacent to the valve through access openings to clean or remove blockage.



Drive Chain Hazard

There are pinch points where the chain and sprocket engage. Exposed moving parts can cause severe injury or death. Never operate the valve without the guard installed. Follow Lockout/Tagout procedure before removing guard.



Exposed Rotating Shafts

Exposed shaft locations exist at the seal access area and tail shaft. Contact with rotating shafts can crush or amputate fingers, hands or arms. Avoid touching or contact with the exposed shaft. Tail shaft guards are available as an option.

Electrical Hazard

Electrocution accidents are most likely during maintenance of the electrical system. Follow Lockout/Tagout procedures before working on the equipment.

Automatic Startup of the Valve - Quick Clean on Rail Design

Rotary airlocks are often controlled by an automated system and may start without warning. Ensure that Lockout/Tagout procedure is followed before working on the equipment. The quick clean on rail design is specifically designed for ease of cleaning by the operator without tools. There is a manufacturer supplied safety switch for protection of personnel and equipment which must be installed and operational to prevent accidental start-up of the valve.

Pressurized System

Danger from opening of equipment if the process is under pressure or from compressed air. Ensure that process pressure has been relieved prior to opening unit.

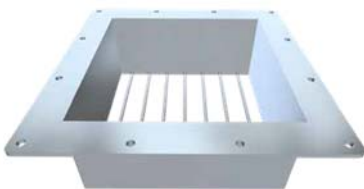
SAFETY LABELS AND GUARDS



This piece of equipment contains several warning decals located in many different locations. It is the owner/operator's responsibility to maintain the integrity of these decals and to ensure that all operators of the equipment are aware of them and understand their meaning. Replacement decals are available free of charge by calling customer service department at 1-800-655-3447 or 1-905-765-2004.



This piece of equipment may contain one or more safety guards to protect the operator(s) from injury. It is the owner/operator's responsibility to maintain and ensure that they are in place when the equipment is in operation. If you have any safety or operational questions related to the design or applications of the Rotary Airlock Feeder, we encourage you to contact ACS at 1-800-665-3447 or 1-905-765-2004.



Discharge Flange Guards

General Information

Record the MODEL and SERIAL NUMBER of the ACS Rotary Airlock, including the same information for the auxiliary equipment (gearmotors, motors, sheaves size, type and any special modifications to standard).

For additional information, application assistance or special service, contact the factory. For ready reference, please record this information on the lines in the adjacent table. The SERIAL NUMBER is clearly indicated on the valve nameplate installed on the valve.



Typical Nameplate showing Serial Number location. Serial no. should be provided when consulting the factory

MODEL

SERIAL NUMBER

MODEL

SERIAL NUMBER

MODEL

DATE OF DELIVERY



WARNING –All owners and operators should read this manual, or be instructed in safe operating and maintenance procedures, before attempting to uncrate, install, operate, adjust or service this equipment. Read All Instructions contained in this manual before installing and operating this equipment.

Receiving Your Equipment



Equipment should be carefully inspected immediately after receipt to make certain the unit is in good condition and all items listed on the packing list are included. All damages or shortages should be reported immediately to ACS. Purchaser should take immediate steps to file reports and damage claims with the carrier. All damages incurred to the units in transit are the responsibilities of the common carrier. Any claims for in transit damage or shortage must be brought against the carrier by the Purchaser.

HANDLING AND STORAGE OF YOUR EQUIPMENT

Moving the valve during unloading or installation site should be done with the use of a hand truck or forklift while the unit is on its shipping skid until it is ready to be installed.



When moving the unit from the skid, install lifting eyes on the inlet flange for attaching chains or slings. Take care to position them to keep the unit horizontal when it's lifted. Prevent it from rotating due to unbalanced weight distribution.

Short Term Storage

If the equipment is not put into immediate use it should be stored in a clean, dry location. Care should be taken to keep the equipment covered when moving from a cold location to a warm location, otherwise condensation may occur. If condensation does occur, allow it to dry thoroughly before applying power. If the unit is not going to be installed shortly after arrival, it should be stored in a warm, dry location to protect from corrosion to the machined surfaces. Flange covers should be left in place until ready to install.

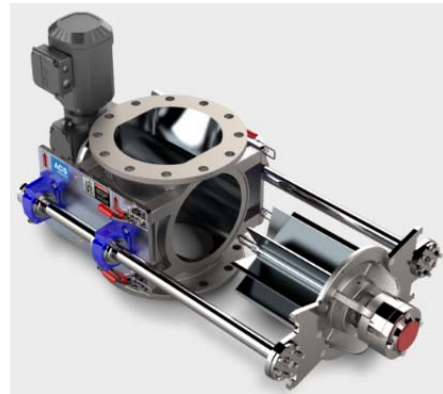
Long Term Storage

If the equipment storage is required for longer than 90 days, additional precautions are required.

1. Storage should be indoors in a temperature-controlled facility such as a warehouse or enclosed building.
2. Leave weatherproof covering in place. Keep vented parts exposed.
3. Make certain unpainted portions are covered and retouch any scratches or flaked areas.
4. If condensate plugs or drain plugs have been used, make sure they are operative.
5. Consult vendors instruction manual for guidance on recommendations for long term storage. i.e., If motor is equipped with space heaters make sure space heaters are properly connected and operative.
6. A systematic inspection and maintenance schedule should be established. If rotating apparatus is to be stored for 6 months or longer, it should, in addition to the precautions above, be given a visual inspection every month.
7. Contact ACS for recommendations where equipment has been in storage for periods longer than 12 months.

Design and Construction

Rotary airlock construction consists of a housing with two endplates, rotor and drive package. The housing has a top inlet and bottom outlet and is precision machined to provide close tolerances between the rotor and housing internal surfaces. The endplates have a raised face that extend into the body bore to provide sealing and proper alignment of the rotor. The rotor has multiple vanes that extend radially from the shaft to the housing. The rotor and driveshaft extend through the endplates and are supported by outboard bearings. Product sealing uses a glandless teflon sleeve with elastomeric seal rings.



Model Nomenclature

A QC MD-12 is our Quick Clean MD series with a 12-inch inlet and outlet.

C.F.R.

Cubic Feet per Revolution, or the displaced volume of material that the airlock moves from inlet to the outlet in one revolution of the rotor. C.F.R. is calculated based on the displacement or s are 100% pocket fill; actual C.F.R. will vary due to pocket fill efficiency and rotor speed.

Capacity can be determined by multiplying the C.F.R. by the speed and density of the product.

ROTARY VALVE CAPACITY (CUBIC FEET/HR.)											
VALVE SIZE (INCHES)	6	6	30	48	60	72	84	96	108	120	132
	8	12	60	96	120	144	168	192	216	240	264
	10	24	120	192	240	288	336	384	432	480	528
	12	45	225	360	450	540	630	720	810	900	990
	14	66	330	528	660	792	924	1056	1188	1320	1452
	16	84	420	672	840	1008	1176	1344	1512	1680	1848
	18	162	810	1296	1620	1944	2268	2592	2916	3240	3564
	22	276	1380	2208	2760	3312	3864	4416	4968	5520	6072
	24	384	1920	3072	3840	4608	5376	6144	6912	7680	8448
	26	540	2700	4320	5400	6480	7560	8640	9720	10800	11880
	1	5	8	10	12	14	16	18	20	22	
	ROTOR SPEED (RPM)										

Clearance

This refers to the measurement between the rotor vane tip and housing and/or endplate. Design clearances vary with temperature, material and the product. Refer to the Rotor Clearance chart or the contract data for specific details on your valve construction.

Temperature Ratings

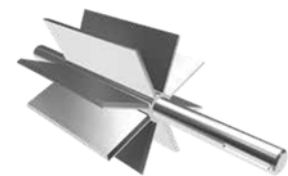
The standard temperature rating is 250 F. Special high-temperature airlocks rated at temperatures above 250 F are available with modified features including clearance, bearings shaft seals, paint, etc. Refer to the Order documentation for the temperature rating of your airlock.

Rotor Types

Several Rotor options are available including open or closed end design, adjustable or fixed vanes, additional vanes on higher differential pressure services, serrated vane edges, rounded pockets for sanitary services, flexible tips, reduced volume or metering styles and staggered pockets.

Open End Rotor

Open end rotors are easier to clean and maintain compared to closed end, which could ultimately lead to less material build up and wear on your valve. They are also better suited to mechanical seal applications. This is also a better option with lighter materials, as closed end rotors are more likely to have materials escape into the space between the endplates and the rotor disc.



Open End Rotor

Closed End Rotor

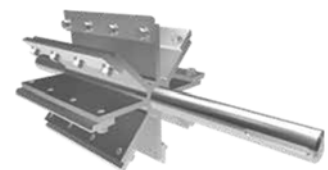
A closed end rotor has a round disc at both ends that are welded to the blades and shaft. There is a gap between the disc and the endplates that allows any material that does end up outside of the rotor to fall out the bottom easily. Closed end rotors are used with extremely abrasive material, and flake or chip material as the shield protects the outboard bearings and endplates from damage. It also prevents material from building up on the endplates, causing wear.



Closed End Rotor

Adjustable Rotor

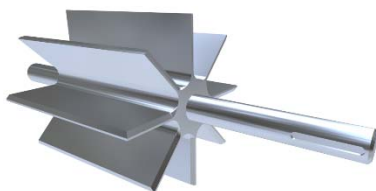
With very harsh and abrasive material, tips will wear prematurely. With this type of valve, you can adjust the tips by sliding them up as they wear to keep them compliant and keep the clearance as close to their starting point as possible. This ultimately helps your valves last longer. This is available for open or closed type rotors.



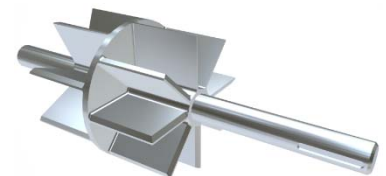
Adjustable Rotor

Staggered Pocket Rotor and Radius Pocket Options

Staggered for applications requiring continuous and uniform flow. With 16 offset pockets to provide a consistent material flow. Radius Pocket Option-this rotor's pockets are U-shaped. The pocket shape minimizes material packing in the crease of a rotor vane, making it optimal for sanitary or food grade valves.



Radius Pocket Rotor



Staggered Pocket Rotor

Operation

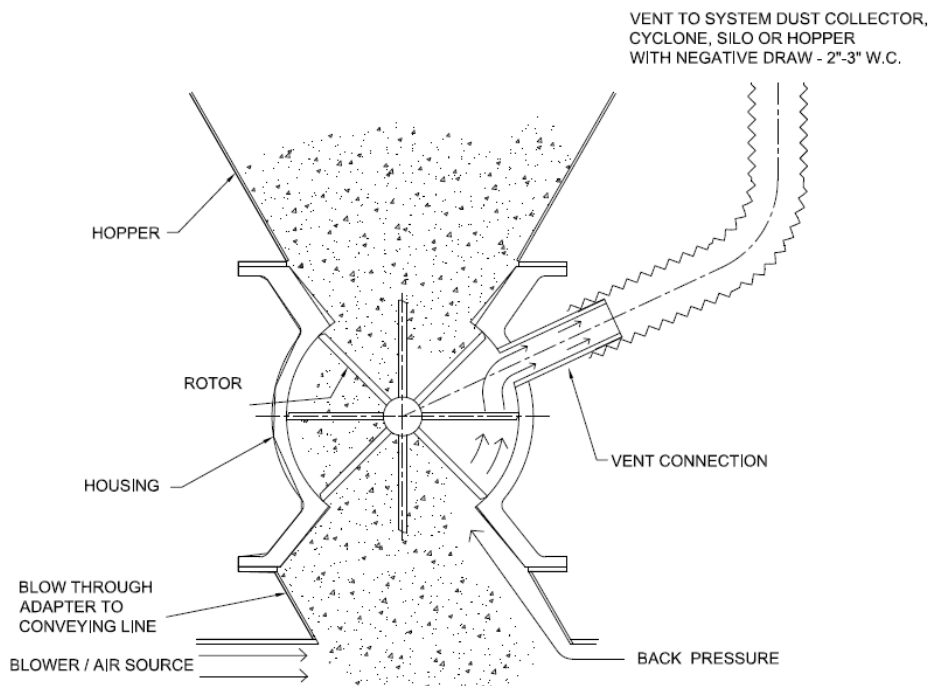


The Rotary Airlock is one of the most important units in your material handling system.

The function of the airlock is to hold pressure or vacuum in a pneumatic system and to meter products into conveying lines or storage areas, (bins, tanks, hopper, etc.). The airlock operates by filling each rotor pocket with material at the high point of rotation and then empties into conveying lines or storage areas at the low point of rotation.

In the case of conveying lines, a blow-through is used to allow the velocity of the air to move the material through the conveying line. After each rotor pocket has emptied into the blow-through it still contains pressurized air. With some products, this air can escape up through the bulk material as soon as the edge of the rotor blade passes the edge of the inlet opening. The release of this pressurized air assists in maintaining a continuous flow of product to the airlock inlet. With some products, this air must be vented to atmosphere or to a system that has a negative pressure such as a dust collector, as it tends to prevent the flow of material into the airlock. The rotation produces a continuous flow of material at the discharge end of the conveying line.

The airlock rotor is precision machined to obtain the desired high degree of accuracy and close tolerance. Rotors may be supplied either with fixed or adjustable tips. The airlock rotor is mounted on bearings at each end of the rotor shaft. Rotor clearance is small to prevent excessive air leakage back to the product inlet.



Rotary Airlock Installed on Pressure Conveying Line with Vent



CAUTION – Equipment is shipped factory assembled. Accessories such as blow through adaptors may be mounted to the inlet of the valve for safe shipping even though they are designed to be mounted on the outlet of the valve.

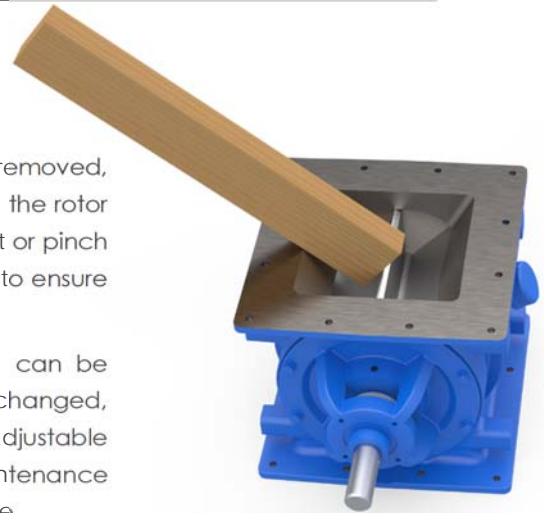
Always check the general arrangement drawing, rotation arrows or contact ACS factory if there are any questions regarding how the equipment and accessories are to be installed and mounted.

Installation

Inspection:

Once the protective flange cover and shipping materials are removed, check the valve and drive components. Don't attempt to turn the rotor assembly by hand as the rotor vane is sharp and can easily cut or pinch hands or fingers. Use a soft push bar (such as a wooden 2 x 4) to ensure that it rotates freely.

The as-built clearance is recorded on the inlet flange and can be measured with feeler gauges. If the clearance measured has changed, this is an indication that the rotor has shifted during shipment. If adjustable tips are provided, re-adjust as per instructions found in maintenance section of this manual. If airlock clearances and rotations are correct, replace chain drive, position and anchor package.



After removing the protective flange cover, use soft push bar to turn the rotor

Mounting to Inlet and Discharge:

Numerous types of bulk materials feeding devices can be connected to the inlet opening of an airlock. Bins, hoppers, mixers and screw conveyors can be adapted for attachment to the airlock by rigidly attaching to the airlock flange using silicone caulk or flexible gasket to obtain an air-tight connection. Be sure all seams in the feeding device are air-tight. Moving feed devices such as sifters require special consideration to support the valve and a flexible connection.

If the airlock package is to be hung from a hopper, storage tank, etc. it may be necessary for some type of structural steel support. However, in most cases, the hopper or tank flange will have enough strength to support the weight of the airlock package. It is not good practice to use the airlock to support equipment loads either in compression on the top flange or in tension from the bottom flange. Excessive loads will cause the housing to distort, which will cause reduced clearance with the rotor. This will result in excessive noise, binding and galling. Flanges of components, which attach to the airlock must be flat and "square" with the airlock flanges. The flanges of the airlock housing should never be forced in place or attached to warped or twisted mating connections. This practice can result in broken airlock housing or loss of clearance as noted above.

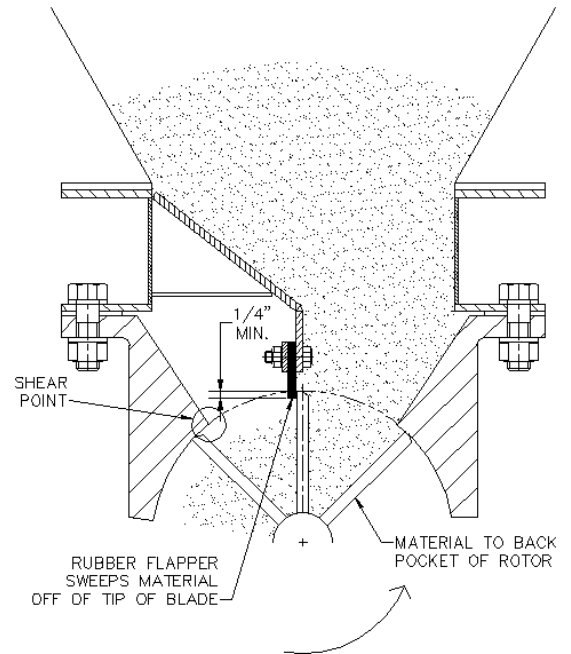
If the airlock is to be installed with either the inlet or discharge exposed, a guard must be mounted to the appropriate flange to reduce the risk of personal injury to operators, maintenance personnel and others who may be near the equipment. Any object placed in the inlet area or discharge area of the airlock will be sheared off. Inlet and discharge guards are available from ACS. Contact Sales for further information.

Accessories

Inlet Shear Protector

Prevents shearing of material, as well as jamming of material in rotor clearances. Available for various flange configurations and materials, flat or spool style, vented or without. The vented style is provided for connecting to a vent sock or dust collection system where pressure from the discharge can disrupt material entering the inlet. It is designed to be bolted above the inlet using sealant or flexible gaskets. Available for square (CI) or round (MD) housings.

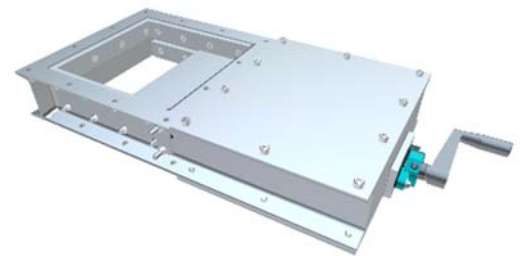
Also available with adjustable plates restrict the inlet size to prevent pocket overfilling.



Inlet Shear Protector

Maintenance Slide Gate

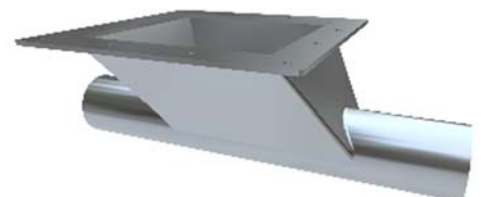
Designed for gravity-flow applications; variable slide gate actuation settings enable partial material flow, as well as full-open or closed settings. They allow the airlock to be removed or serviced without removing material from the feed hopper. Available in various configurations, materials. Manual, air or electric actuators are available. The slide gate is installed directly above the inlet and the mounting arrangement can be oriented for easier access.



Maintenance Slide Gate

Blow Through Adapter

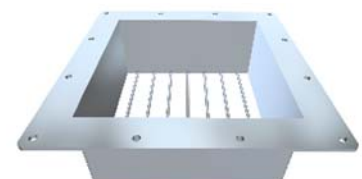
Adapter to connect the discharge of the rotary valve to a pneumatic or vacuum conveying line. Install using sealant or flexible gasket and through bolts.



Blow Through Adapter

Flange Guard

Mandatory safety feature for rotary valves with an open or exposed discharge. Available in steel or stainless steel construction. They are designed to mount directly on the inlet or discharge with sealant or flexible gasket.



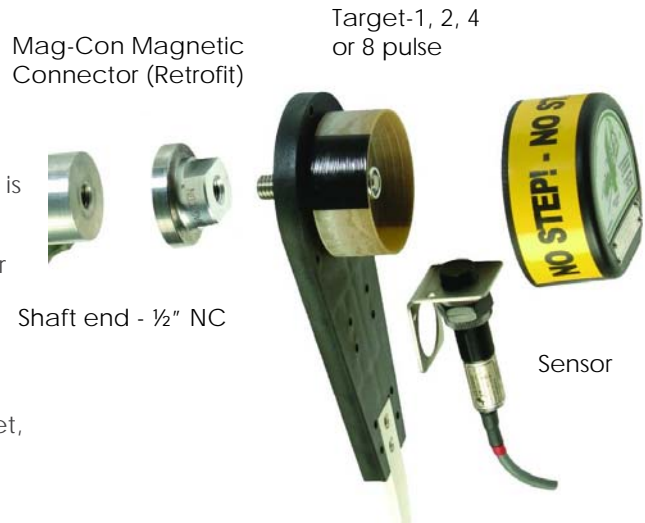
Flange Guard

Zero Speed Switch Assembly

Shaft speed-monitoring device, which signals when the shaft has stopped rotating. The switch is mounted on the non-drive end of the valve. Typically, the drive shaft is drilled and tapped for mounting but there is an optional magnetic mounted connector for field retro-fit.

Standard assembly includes motion switch, target, bracket and guard.

Refer to manufacturer's instruction manual for installation and maintenance or settings.



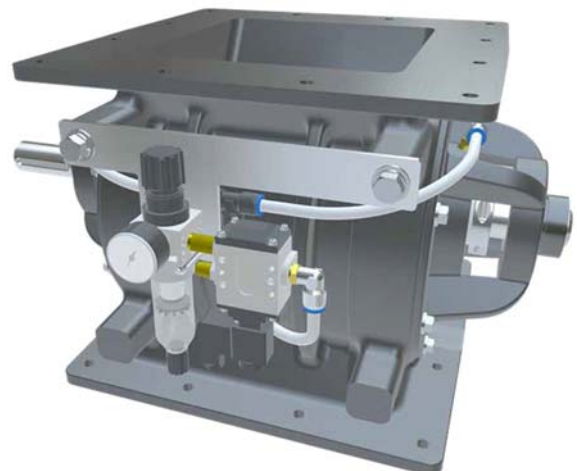
Zero Speed Switch Assembly
4 B M100

Air Purge Kit

The Air Purge Kit is used to provide compressed air to the shaft seal area and/or rotor pocket on airlocks with either open or closed end rotors. This kit may also be used to provide compressed air to the end plate cavity on the airlocks with closed end rotors. The Air Purge Kit includes a Filter/Regulator, 0-30 psi pressure gauge, poly tubing and miscellaneous push to connect fittings.



Rotor Pocket Purge Kit



Shaft Seal Purge Kit



WARNING – Equipment must be wired in accordance with local, state and national electrical codes to the appropriate power circuits before it can be operated. This installation is the responsibility of the airlock owner. Installation must be done by qualified personnel who are familiar with proper installation practices of the equipment and with the control functions of the devices they are installing.

Initial Start-up Procedure

Prior to Starting

1. The gearmotors are shipped filled with oil. Check the oil level in the drive gearbox and top off if necessary. Oil level and drain plugs must be accessible. Remove any shipping provisions from the breather plug. Refer to the manufacturer's instructions included with the shipment.
2. Make sure that the airlock, feed device, and conveying line are free of foreign material.
3. Verify that all electrical connections have been properly made.
4. Replace all guards and covers.

Start-Up

1. Energize the electrical service (and purge air if applicable.)
2. Jog the airlock to verify the direction of rotation is correct. Listen for sounds of unwanted mechanical contact and correct if necessary.
Note that reverse operation can result in jamming and possible motor overload.
3. Start the airlock and operate it for a period with no load. Check for excessive noise or other indications of improper operation. Investigate and correct if necessary.
4. Start feed device or fill the hopper. As material flows into the airlock, listen for excessive noise or other indications of improper operation. Investigate and correct.
5. Verify that the current draw of the motor does not exceed its full load amp rating. Refer to motor nameplate for rating.
6. While the system is operating check for air leaks. Correct as needed.
7. Monitor the operation of the main components for heat, noise or vibration as these are indications of a potential problem.

Quick-Clean Disassembly



WARNING – The Rotor is designed with a square drive extension that is precision machined to fit into the driveshaft bore with a close tolerance. Keep these parts clean and free from damage to ensure the best performance of your equipment.

NEVER SLAM THE ROTOR INTO HOUSING. WHEN INSTALLING THE ROTOR INTO POSITION, DON'T APPLY EXCESSIVE FORCE AS YOU WILL DAMAGE THE ROTOR OR DRIVE SHAFT. USE THE LOCATING KEY TO ALIGN THE ROTOR TO THE DRIVESHAFT BORE DURING RE-ASSEMBLY.

1. Prior to beginning any service or maintenance activities, ensure that “Lockout/tagout” procedures have been completed to safeguard employees from the unexpected energization or start-up of machinery and equipment.
2. Remove T-handles or release Toggle clamps. If provided, insert the T-handles into the jacking-bolt holes located top and bottom of the Tail Endplate. Turn clockwise simultaneously until endplate is clear of the housing. If equipped with air or rotor purge, the fitting connections will need to be disconnected.
3. If the slide rails are dirty, clean or wipe them down to prevent contaminating the internals of the linear bearings.
4. Applying an even force to both sides of the rails, carefully slide rotor assembly out until it's clear of Housing and clean parts as required.

Quick-Clean Reassembly

1. Check the Rotor extension and driveshaft bore is clean and free of material. If there is material on either of these items, it will affect the fit of the components.
2. Clean and apply anti-seize lubricant to rotor shaft extension and the driveshaft bore.
3. Carefully slide Rotor assembly into Housing until resistance can be felt.
4. Use the Locating Key fit into the Tail shaft and slowly turn applying light force until the square drive is aligned with the driveshaft and push into closed position with a steady, even touch.

NOTE: If you feel resistance, remove rotor and inspect the extension and bore for debris before re-alignment.

5. Once rotor/endplate is flush with housing, assemble T-handles back into tail endplate or close toggle clamps. Return Locating Key back on Holder on Linear Bearing Mount.



Maintenance Procedures

Regular maintenance is important to the operation and life of your airlock. Areas requiring regular inspection and maintenance are the rotor clearance, seals and drive package.

Quick-Clean on Rails Clearance and Rail Adjustment

1. ACS Quick-Clean on Rails are supplied with linear slide rails and linear bearings. They should be cleaned of dust and foreign material to prevent premature wear to the linear bearings before opening or closing the rotor assembly.
2. If the valve is getting difficult to reassemble your rotor may have come out of alignment with the housing and rails and may need to be adjusted. Using qualified experienced personnel, follow the instructions below:
3. With rotor located inside housing, check your existing clearances these are typically 0.007–0.010 for models 4" through 12" and 0.010–0.016 for 14" and 0.016–0.020 for 18" and above. **Double check the clearances against the provided drawing or check with ACS Valves as your actual clearances will vary depending on the application.**
4. On the Linear Shaft Mounts you will find four, ¼-20 hex head bolts. Using these adjustment screws adjust ¼" turn at a time in desired direction and re-check clearances until target range is acquired.

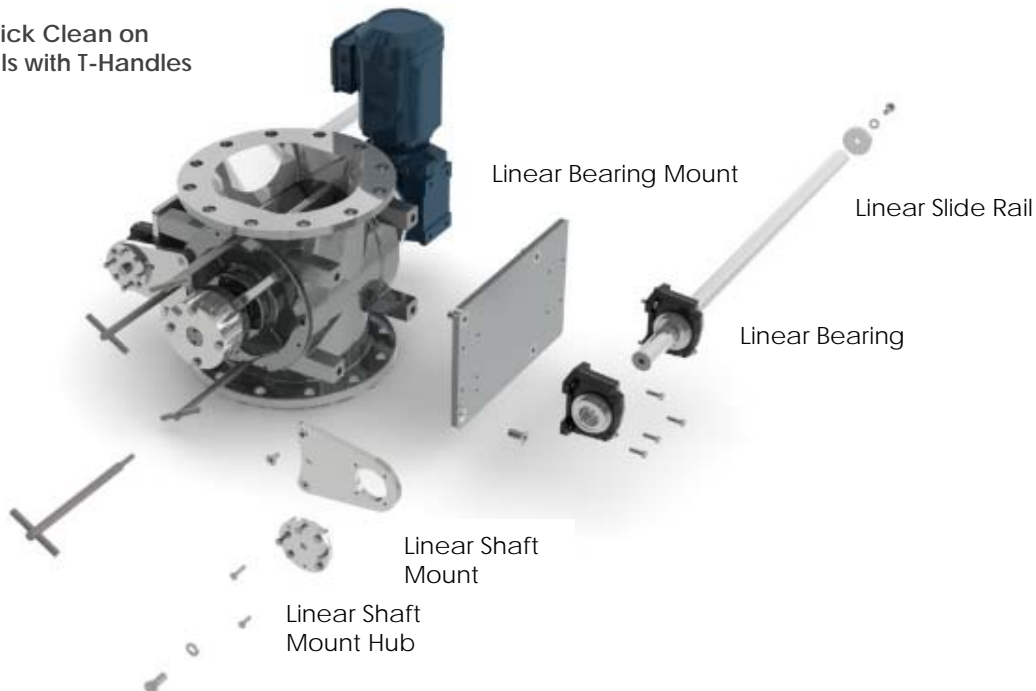
Replacing Linear Rails

1. Loosen Linear Bearing Screw set.
2. Remove Hex Bolts located on Drive End and Tail End of the Linear Shaft.
3. Slide rails out towards drive end of the valve.
4. Install new rails by reversing above directions.

Replacing Linear Bearing

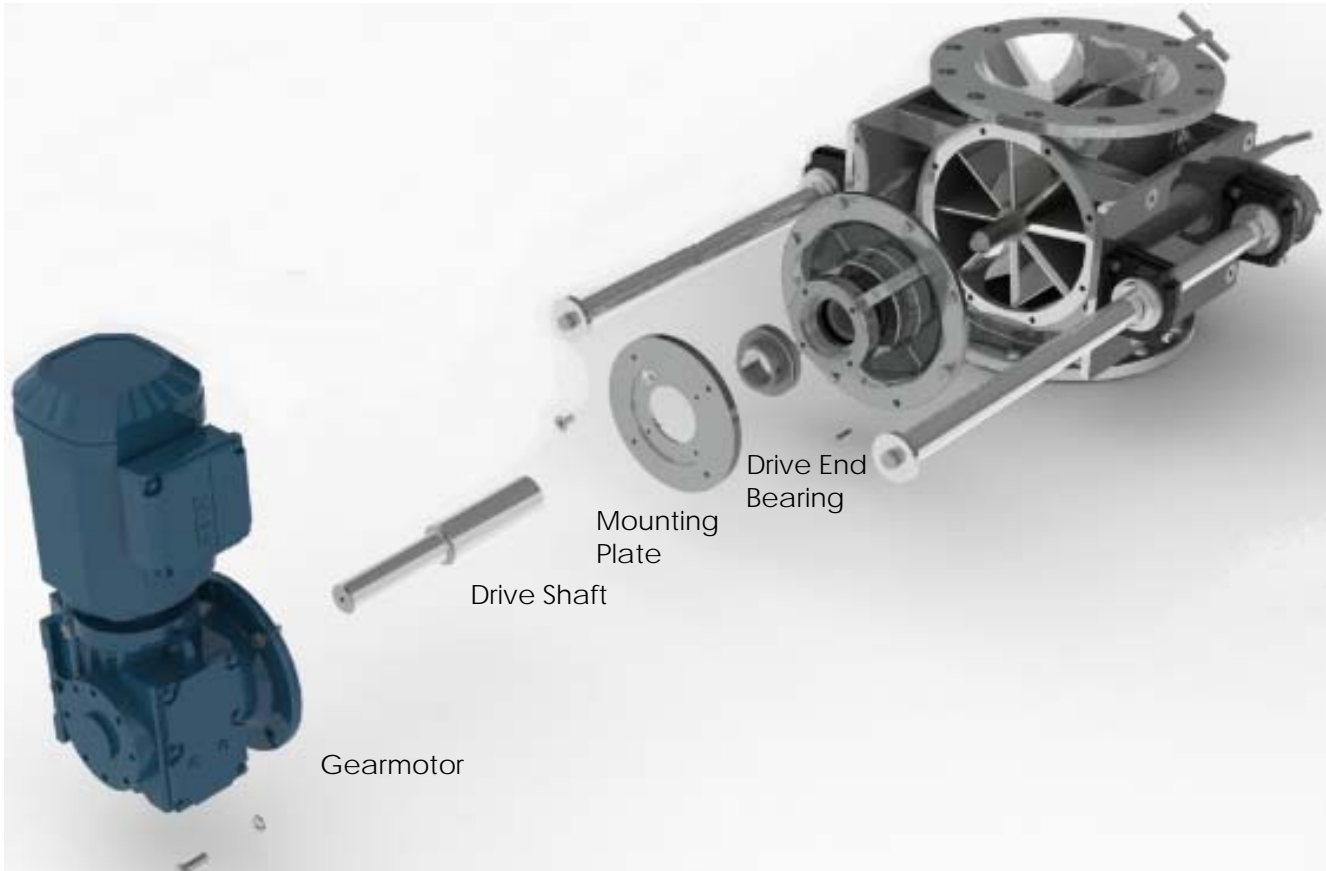
1. Remove Linear Shaft using above instructions for replacing Linear Shaft.
2. Remove (4) ¼-20 Hex Head Bolts from Linear Bearing Base
3. Install new Linear Bearing by reversing above instructions.

Quick Clean on Rails with T-Handles



Disassembly-Drive End

1. Remove the auxiliary equipment (zero speed switch, air purge piping) if supplied.
2. Remove the cover on gearmotor hollow shaft bore. If there is a retaining bolt or washer installed this must be removed.
3. Remove the (4) hex bolts located on mounting plate. Use the (2) 3/8"-16 NC threaded holes for installing jacking bolts to separate the gearmotor from the mounting plate.
4. While supporting the weight of the gearmotor, move the gearmotor away from the mounting plate and remove from driveshaft once it is clear. Watch for drive key during disassembly.
5. With the gearmotor removed, the motor mounting plate is accessible. Remove fasteners and motor mount.
6. Remove bolts that hold endplate to housing. Remove Endplate using gear puller tool. Endplate with driveshaft stub can be removed for access to seals and bearings for maintenance or replacement.



Replacing Bearings and Seals – Drive End

Our standard design uses sealed permanently lubricated bearings and ACST-4 seals consisting of a PTFE (teflon) sleeve and 3 quad rings with shaft collar which require replacement when worn. It's recommended to always replace the seals and bearings at the same time.

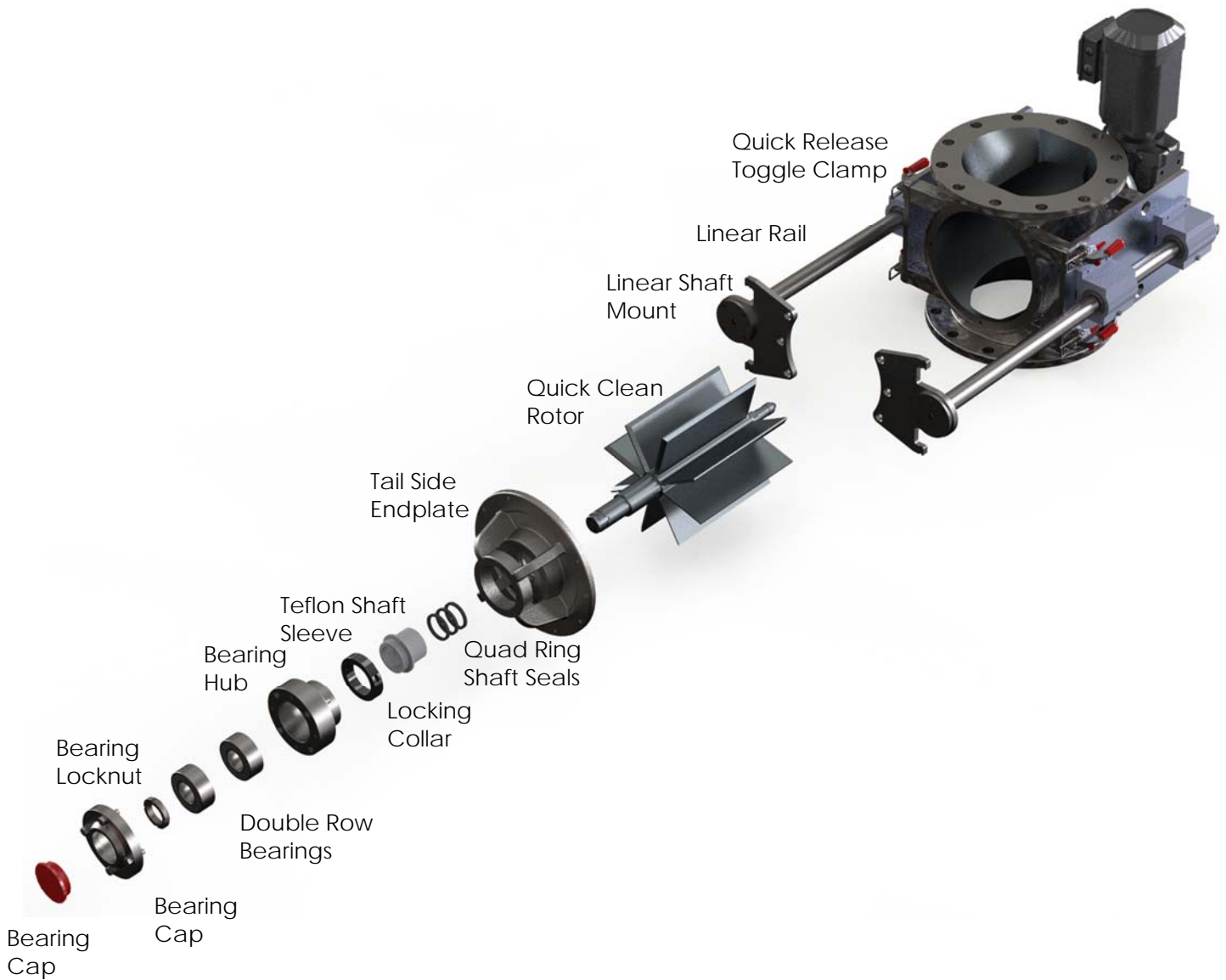
1. The bearing, split locking collar, teflon bushing and quad ring seals will come out with the endplate. Remove the locking collar and driveshaft.
2. Remove bearing by pressing away from the seal arrangement.
3. Pry the teflon seal straight up and out of the quad ring assembly. Remove quad rings by poking with a sharp object and prying out of seat. Repeat for remaining two (2) rings.
4. Install new quad rings and Teflon sleeve in end plate. Apply a small amount of lubricant to the teflon seal and gently push into the quad ring bore.
5. Install seal lock collar.
6. Install the new bearing in place.
7. Install endplate onto Housing, move into position. Install and tighten fasteners.
8. Install driveshaft, into position with driveshaft bore section end flush with endplate.
9. Slide bearing collar on shaft. Rotate the collar in the opposite direction of shaft rotation until eccentric faces of collar and inner bearing ring engage.
10. Check clearances and see that rotor turns freely in housing. If rotor does not turn freely, adjust as necessary.
11. Lock the bearing in place by rotating the collar using a drift or flat punch in the non-threaded hole and tapping the collar with a lightweight hammer in the opposite direction of rotation until snug. Tighten set screws.
12. Position teflon sleeve and shaft seal collar. Tighten seal collar.



Drive side Endplate with
shaft seal and bearing

Replacing Tail Endplate Bearings and Shaft Seals

1. Remove Cover and Bearing Cap fasteners. Remove Bearing Cap.
2. Remove locking nut.
3. Remove Bearing Hub fasteners. Note: It is good practice to match mark the bearing hub position relative to the endplate before removal. It will ensure the best fit for re-assembly.
4. Remove Bearing Hub Cap and Bearing Assembly from Endplate.
5. Remove and replace double row bearings.
6. Shaft seal sleeve and quad rings are accessible for replacement. Note: It is good practice to replace shaft seals and bearings at the same time.
7. Reverse above steps for Re-assembly.



Checking Rotor Clearance



Checking clearance of rotor with feeler gauge

Rotor clearance should be checked as part of the maintenance program as increased clearance will affect the performance. Rotor clearance should be within the allowable range as indicated in the table below (See table or if your model isn't shown contact ACS) determined by its size and design operating conditions. Increased clearances will allow more leakage through the airlock resulting in reduced performance. The allowable loss of performance will indicate when repair or replacement is required.

QUICK CLEAN ROTOR CLEARANCE - TYPICAL	
Model & Size	Standard values – consult factory
CI / MD 4 through 12	0.007" to 0.010"
CI / MD 14	0.010" to 0.014"
CI 16 through 18	0.016" to 0.020"
CI 22 through 30	Refer to Factory



WARNING – Prior to beginning any service or maintenance activities, ensure that "Lockout/tagout" procedures have been completed to safeguard employees from the unexpected energization or start-up of machinery and equipment. If working on a quick clean design valve, disconnect all sources of power before cleaning or performing maintenance on your quick clean valve.

If the inlet or outlet of the valve is accessible, the clearances can be measured directly through this opening using a feeler gauge to measure the gap.

1. Number each blade for ease of checking and measure the gap between the rotor blade and housing at each end of the blade and center.
2. Check the inlet and outlet. Measure the side clearance between end of the blade and the endplate.

Accessories

Safety Switch – On Rail Design



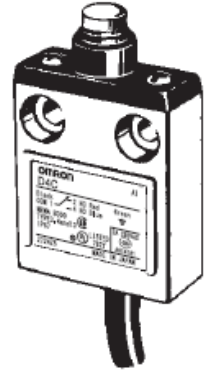
HAZARD- Quick Cleans are supplied with a limit switch that is designed to prevent operation of the valve if the valve has been opened for cleaning.

IT MUST BE FIELD WIRED TO DISCONNECT POWER TO THE DRIVE IF OPEN. DO NOT REMOVE OR MODIFY. CONTACT ACS IF THIS FEATURE IS NOT INCLUDED WITH YOUR SHIPMENT.

THE STANDARD PART NO. IS OMRON PIN PLUNGER SAFETY SWITCH PN: D4C-1631. Refer to Manufacturer's website for installation and troubleshooting assistance.

<https://www.ia.omron.com/product/item/10003/>

Safety switch prevents operation if the rotor is not in closed position



Zero Speed Switch

ACS Valves use 4B Model M100 Zero Speed Switches for most applications.

Refer to the manufacturer's instruction manual for installation details.

<https://www.go4b.com/usa/technical-support/product-manuals/whirligig/whirligig-manual.pdf>

If sensor does not detect Whirligig Target check the sensing range of the sensor being used and move sensor closer to the target.

Gear Drive and Motor

ACS Valves use SEW Eurodrive gear reducers for most applications.

Inspect, lubricate and service the gear drive and motor in accordance with the manufacturer's instructions.

<http://www.seweurodrive.com/>

Air Purge Pressure Adjustment

Shut off the compressed air supply and bleed off air pressure before attempting to install or service the air purge assembly. After installation is complete and while the filter/regulator is shut off completely, the air supply should be turned on.

1. After verifying that all connections are tight the regulator should be adjusted to provide the appropriate purge pressure to the airlock using the following guidelines.
2. Initial setting, prior to conveying product through the airlock or system should be 5 PSIG greater than the operating pressure of the valve.
3. If the airlock is either receiving product from or discharging product to a pressure system, the regulator should be set at 5 PSIG above the system conveying pressure.
4. If the airlock is used in a gravity flow application or is receiving or discharging only to a vacuum system, the regulator should remain set at 5 PSIG.



Purge Kit

AIR PURGE ASSEMBLY FOR AIRLOCKS WITH OPEN OR CLOSED END ROTORS

Item	Qty	Description
1	1	Filter/Regulator with gauge and bracket
2	1	3/8" Male Branch Tee Poly fitting
3	4 ft.	3/8" O.D. Seal Tubing
4*	2	3/8" PTC to 1/8" MNPT Connector
5	1	0-30 PSI, 2" Face, 1/4" CTR Back Gauge
6**	2	3/8" Poly to 3/8" MNPT Connector
7**	2	3/8" Union Tee
8**	2	3/4" x 3/8" Hex Bushing
	1	Air Purge Kit (includes items 1 thru 8)

Please Note: *Fittings for purging shaft seal **Fittings for purging end plate cavity

ACS Rotary Valve Lubrication Chart

Standard bearings on CI and MD series airlocks are sealed for life bearings and do not require lubrication, but greaseable bearings are supplied according to the service conditions.

The following chart is a list of oil lubrication product suppliers including a maintenance schedule for gear reducers based upon an ambient factory atmosphere and normal factory operating conditions. This chart is only a suggested list of suppliers and maintenance schedule times, end users may select from their own list of supplier products and adjust the recommended scheduled maintenance times to suit their own facility conditions.

SEW EURODRIVE GEAR REDUCERS (Refer to Manufacturer for more Information)				
Reducer	Application	Oil or Grease Type (s)	Quantity (L)	Frequency (Hours)
SEW Eurodrive R series FAF series KAF series	Standard (-15°C to +40°C)	Shell Omala S2 G 220 Mobil Mobilgear 600 XP 220 Castrol Optigear BM 220	R series standard M6 Pos. R37(0.95), R47(1.50) R57(1.70), R67(2.00) R77(3.40), R87(6.50)	Check oil every 3,000 hrs. Replace oil every 10,000 hrs.
	High temperature (-20°C to +80°C)	Shell Omala S4 WE 220 Mobil Glygoyle 220 Castrol Optiflex A 220	FAF series standard M1 Pos. FAF37(0.95), FAF47(1.50)	Check oil every 3,000 hrs. Replace oil every 6,000 hrs.
	Low temperature (-40°C to +40°C)	Shell Omala S4 GX 150 Mobil SHC 629 Castrol Optigear Synthetic X 150	FAF57(2.70), FAF67(2.70) FAF77(5.90), FAF87(10.80)	Check oil every 3,000 hrs. Replace oil every 18,000 hrs.
	Food grade (-20°C to +60°C)	Klubersynth GH 6-460	KAF series standard M1 Pos. KAF37(0.50), KAF47(0.80) KAF57(1.20), KAF67(1.10) KAF77(2.10), KAF87(3.70)	Check oil every 3,000 hrs. Replace oil every 12,000 hrs.
SEW Eurodrive S series SAF series	Standard (0°C to +40°C)	Shell Omala S2 G 680 Mobil Mobilgear 600 XP 680 Castrol Optigear BM 680	S series standard M1 Pos. S37(0.25), S47(0.35) S57(0.50), S67(1.00) S77(1.90), S87(3.30)	Check oil every 3,000 hrs. Replace oil every 10,000 hrs.
	High temperature (-20°C to +80°C)	Shell Omala S4 WE 680 Mobil Glygoyle 680 Castrol Optiflex A 680	SAF series standard M4 Pos. SAF37(0.50), SAF47(1.00)	Check oil every 3,000 hrs. Replace oil every 6,000 hrs.
	Low temperature (-40°C to +30°C)	Shell Omala S4 GX 150 Mobil SHC 629 Castrol Optigear Synthetic X 150	SAF57(1.50), SAF67(2.90) SAF77(5.80), SAF87(10.80)	Check oil every 3,000 hrs. Replace oil every 18,000 hrs.
	Food grade (-20°C to +40°C)	Kluberoil 4UH1-220N		Check oil every 3,000 hrs. Replace oil every 10,000 hrs.

ACS Rotary Valve Lubrication

The following chart is a list of grease lubrication product suppliers including a maintenance schedule for bearings based upon an ambient factory atmosphere and normal factory operating conditions. This chart is only a suggested list of suppliers and maintenance schedule times, end users may select from their own list of supplier products and adjust the recommended scheduled maintenance times to suit their own facility conditions.

BEARINGS				
Component	Application	Oil or grease type(s)	Quantity (ml)	Frequency (hrs.)
Greaseable Insert Bearing	Standard (-30°C to +130°C)	Shell Alvania RL2 Mobil Mobilith SHC 220 Castrol Tribol 4020-220-2	ø1.000" (20), ø1.500" (30) ø1.938" (35), ø2.438" (38) ø2.500" (40), ø2.938" (45)	Grease every 3,000 hrs.
	High temperature (-20°C to +180°C)	Shell Stamina RL2 Mobil Mobiltemp SHC 100 Castrol Tribol 4747-220-2		Grease every 2,200 hrs.
	Food grade (-10°C to +100°C)	Shell Cassida Grease RLS2 Mobil Mobilith SHC 220 Castrol Molub-Alloy 823-2 FM		Grease every 2,200 hrs.
Linear Bearing sets for Quick Clean on rails Design	Standard (-20°C to 80°C)	NLGI 00 or 2, DIN 51818 or DIN 51825, KP2K-20 Lithium based High Performance grease	Lubricate on shaft until lubricant emerges	Grease every 3,000 hrs. See Note

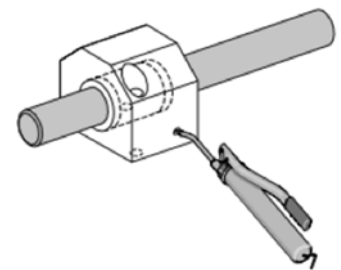
Note:

Linear bearing sets for quick clean on rails come pre-lubricated by the manufacturer. Service lubrication intervals are dependent on the severity of the service and the environment they are installed. Monitor the lubrication condition of the Linear Bushings and Linear Sets after start-up. If necessary, adapt the lubrication intervals.

Between in-service lubrication intervals, check that:

- there is no dirt, even coolants/ cutting fluids can be critical;
- no chips can become trapped around the Linear Bushing guideway;
- there is no red-brown discoloration of the lubricant. if there is, lubricate immediately, increase the lube quantity, reduce the lubrication interval, ask for advice if in doubt;
- the seals are functioning correctly.

Clean shafts and shaft support rails as necessary.



Troubleshooting

Inspection and repair procedures provide guidance for restoring the package to peak operation. In many cases, repair consists of component replacement.

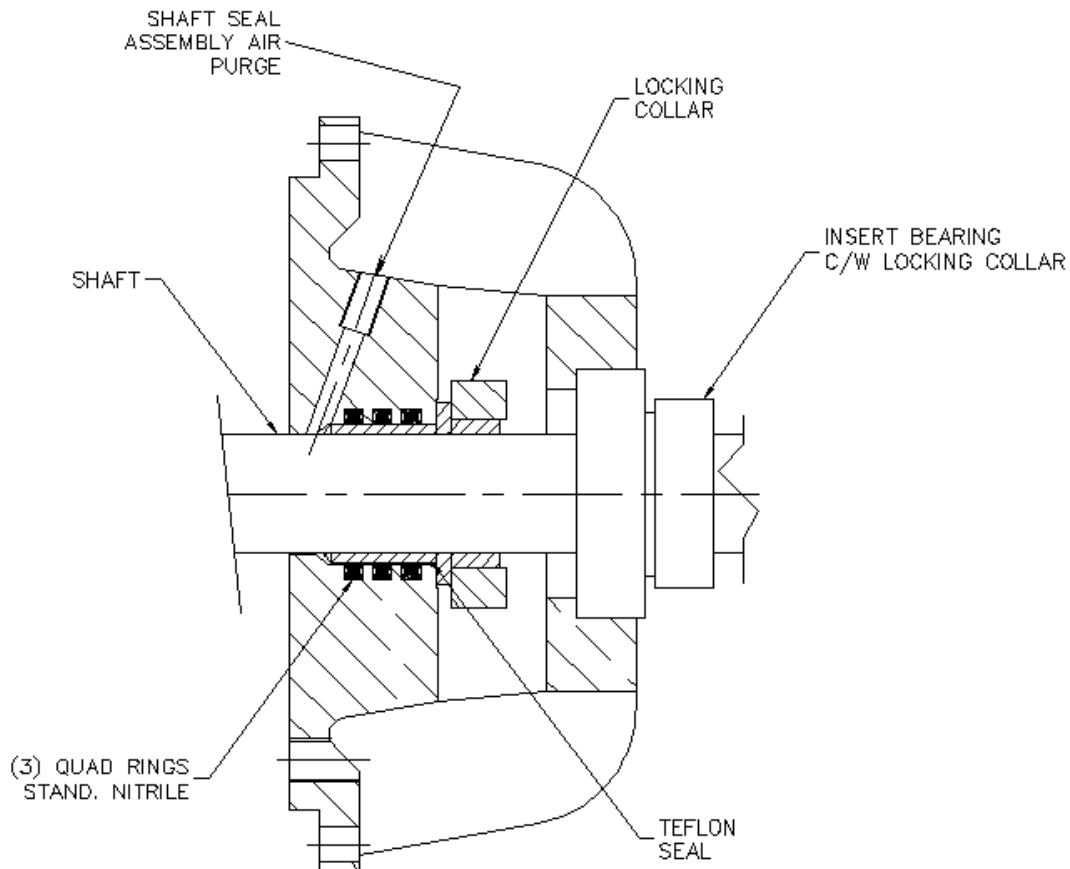
- A. If airlock is not operating efficiently or satisfactory, remove from system, inspect and repair in accordance with preceding information.
- B. Inspect base structure and brackets for damage and deformation. Replace defective parts.
- C. Check all accessory equipment to assure proper operation. Replace any components found to be defective.

When requesting service assistance, please have the following information at hand.

1. Serial no. and/or ACS Sales Order no. or drawing number if available.
2. Application conditions of service including such as product, temperature, ambient temperature.
3. Vacuum or pressure gauge reading above and below the valve,
4. Airlock speed.
5. Method of feeding the valve.
6. Gearmotor amperage reading
7. Blower conditions including speed, Pressure switch setting. Blower motor amperage.
8. Conveying line length. a) Horizontal run b) Vertical run c) Number of elbows.
9. Photos or video of the installation.

FAULTS, CAUSES AND REMEDIES		
Fault	Possible Cause	Possible Remedy
Excessive noise during operation	Incorrect direction of rotation.	Check markings for correct direction. Rewire motor if necessary, to correct.
	Insufficient rotor clearance due to material buildup or thermal expansion Rotor misaligned or bent	Check clearances and for signs of contact. Clean material buildup. Adjust clearance as described in manual. Contact ACS for assistance.
	Bearing failure	Remove and inspect bearings. Replace if necessary, as described in manual.
Airlock does not rotate	No power to airlock	Check motor, settings for electrical issues.
	Driveshaft and Rotor are not engaged or worn	Check rotor for signs of contact, wear. Check position of driveshaft relative to endplate
	Foreign object caught in inlet throat	Inspect and remove.
	Faulty or damaged gearbox	Check for signs of wear or damage. Replace gearbox if necessary.
Material flow problems	Supply source or feed device plugged, empty, or not operating	Check supply source.
	Conveying line piping layout, size or increased pressure	Inspect and review conveying line layout.
	Airlock turning too fast	Adjust motor speed or replace sprockets.
	Excessive rotor pocket fill	Inlet shear protector.
	Excessive moisture in Product	Clean rotor. Check flange connections for proper seal. Check process for proper product condition.
	Excessive blowby air	Check and adjust rotor clearances. Install vent or vented shear protector.
Short seal life	Conveying line piping layout	Inspect and review conveying line layout.
	Incorrect air purge pressure	Adjust air purge pressure as described in relevant section in Instruction Manual
	Seal out of position	Inspect and reposition seal.

Spare Parts and Service



ACST-4 Seal and Bearing Detail

Use only ACS replacement parts. Parts are available from ACS directly or our authorized representative.



For prompt, efficient service, always provide the following information when ordering parts: Serial number, model number and part description and reference number, as given in this manual.

Motor and Speed Reducer Parts and Service

The motor and speed reducer are covered by their own manufacturer's warranty. If there is a problem, check with the local supplier or service representative referencing the manufacturer model and serial number for prompt service or contact ACS Valves Sales for support.

Spare Parts and Service

For assistance in service or ordering parts, contact the Sales Department at:

ACS Valves

611 Argyle Street North, Caledonia, ON, N3W1M1

Phone: 1-800-665-3447 / 905-765-2004

Or visit our website at <http://www.acsvalves.com>

800-655-3447
[acsvalves.com](http://www.acsvalves.com)

Quick Clean Recommended Parts
Rotor
Driveshaft
ACST-4 Teflon Sleeve with Quad Rings
Drive End Bearing
Tail End Bearings
Bearing Locknut

Quick Clean
Drive End Exploded Assembly

Quick Clean
Tail End Exploded Assembly

