

Instruction & Operation Manual for B5107 Butterfly Valve



Read and understand this manual prior to installing, operating or servicing this equipment.



The Right Connection®

Rev E

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Safety Information

The following DANGER, WARNING and CAUTION signs are contained in this manual. To avoid serious injury and/or possible damage to equipment, pay attention to these messages. Hazards or unsafe practices could result in severe personal injury or death.



DANGER is used in the most extreme cases.



Hazards or unsafe practices which could result in minor or moderate injury. May also be used to alert against an unsafe operating or maintenance practice.



Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



Safety logos, which appear throughout this manual, are used as a reminder that the user should carefully review for the appropriateness of the product for the media, application and environment in which it will be used.

Use only replacement parts and devices recommended by the manufacturer to maintain the integrity of the equipment. Make sure the parts are properly matched to the series, model, serial number and revision level of the equipment.

Safety labels are placed on equipment where appropriate. Do not remove any labeling from any piece of equipment. Replace any label that is missing.

DO NOT modify any Dixon product. Non-factory modifications could create hazardous conditions and void all warranties. DO NOT attempt to use a Dixon product in any application that exceeds the product rating.

General Guidelines

- The owner must comply exclusively with these operating instructions and the authorized use of this piece of equipment. Should problems arise that cannot be solved using these operating instructions, please contact Dixon® – Sanitary Division. We will be happy to provide further assistance.
- If any modification work is performed on the product by the owner themselves, Dixon® shall no longer be considered the manufacturer of the device. In such cases, all components must be subjected to a new certification process for any applicable certifications that the equipment holds. Unless agreed to in writing by Dixon®, liability, warranties and guarantees shall immediately be deemed null and void as soon as you:
 - o Perform modifications/conversion work on the product.
 - o Use the product for unauthorized purposes.
 - o Remove or disable safety elements.
 - o Process products whose material, form and size do not correspond exactly to the description provided.
 - o Make alterations to the original state of the device.
- The operating instructions are regarded as part of the valve.
- The operating and maintenance personnel must always be able to access the operating instructions.
- The safety instructions provided in the operating instructions must be observed.
- The operating instructions shall be valid for the entirety of the device's lifespan.
- The operating instructions must be maintained and updated as necessary.
- The operating instructions must be passed on to any subsequent owners or operators of the device.

Safety Information

Owner Must Ensure

- The product is only used as authorized.
- The product is only used when it is in fault-free, fully functional condition, and that the safety equipment is regularly checked to ensure that it is fully functional.
- The product is only operated, maintained and repaired by personnel with the appropriate qualifications and authorization.
- Checks are made before the product is put into operation to ensure that only the authorized person is in the work area, and no one is in danger of being injured if the product is in operation.
- The product is checked for visual damage prior to commissioning to ensure that it is only operated when free of faults.
- Any defects are reported immediately to the appropriate supervisor.
- All safety and warning notices attached to the equipment are legible and none are removed.
- The operating instructions are always kept close to the product operation site, in a legible and complete state.
- Personnel are regularly instructed on all occupational safety and environmental protection issues, and are familiar with and observe the operating instructions, especially the safety instructions contained herein.
- Personnel are trained and supervised to ensure that they follow safety measures, including the obligatory use of personal protective equipment.
- The product is only connected to pipelines that are depressurized at the time of connection.
- There is no tensile or compressive stress acting on the product connections.
- There is no residual risk at any point where high pressure could occur. High pressure can cause sudden failure in or damage to the lines and connections.
- Warning notices in the documentation for supplier modules are observed and integrated into the risk assessments in the workplace.

Care of Stainless Steel

The stainless-steel components in Dixon equipment are machined, welded and assembled by skilled craftsmen using manufacturing methods that preserve the corrosion-resistant quality of the stainless-steel. Retention of corrosion-resistant qualities under processing conditions requires regular attention to the precautions listed below.

1. Regularly check all electrical devices connected to the equipment for stray currents caused by improper grounding, damaged insulation or other defects. Corrosion: Pitting often occurs when stray currents encounter moist stainless-steel.
2. Never leave rubber mats, fittings, wrenches, etc. in contact with stainless-steel. Corrosion: Pitting or galvanic action. Objects retard complete drying, preventing air from reforming the protective oxide film. Galvanic corrosion occurs when two dissimilar metals touch when wet.
3. Immediately rinse equipment after use with warm water until the rinse water is clear. Clean the equipment (manual or CIP) as soon as possible after rinsing. Corrosion: discoloration, deposits, pitting. Product deposits often cause pitting beneath the particles.
4. Use only recommended cleaning compounds. Purchase chemicals from reputable and responsible chemical manufacturers familiar with stainless-steel processing equipment they continuously check the effects of their products on stainless-steel.
5. Use cleaning chemicals exactly as specified by the manufacturer. Do not use excessive concentrations, temperatures or exposure times. Corrosion: Pitting, discoloration, stress cracks. Permanent damage often occurs from excessive chemical concentrations, temperatures or exposure times.
6. For manual cleaning, use only soft non-metallic brushes, sponges or pads. Brush with the grain on polished surfaces to avoid scratching the surface. Corrosion: Pitting, scratches. Metal brushes or sponges will scratch the surface and promote corrosion over a period of time. Metal particles allowed to remain on a stainless-steel surface will cause pitting.
7. Use chemical bactericides exactly as prescribed by the chemical manufacturer in concurrence with the local health authority. Use the lowest permissible concentration, temperature and exposure time possible. Flush immediately after bacterial treatment. In no case should the solution be in contact with stainless-steel for more than 20 minutes. Corrosion: Protective film destroyed. Chlorine and other halogen bactericides can destroy the protective film. A few degrees increase in temperature greatly increases chemical activity and accelerates corrosion.
8. Regularly inspect the joints in pipelines. Be sure all connections are tight fitting without binding. Corrosion: Crevice corrosion. Small crevices caused by improperly seated gaskets will promote crevice corrosion. Stainless-steel under stress will develop stress cracking, especially in the presence of bactericides containing chlorine.
9. Regularly inspect equipment for surface corrosion (i.e. pitting deposits, stress cracks, etc.). If deposit or color corrosion is detected, remove it immediately using mild scouring powder and detergents. Rinse thoroughly and allow to air dry. Review production and cleaning procedures to determine the cause. Note: If corrosion is not removed, the protective film cannot be restored, and corrosion will continue at an accelerated rate.



Technical Specifications

Materials of Construction – Steel Components

- product contact components (Body & Disc): 316L
- non-product contact components: 304

Sealing Materials

- product contact components (Seals): EPDM, FKM, Silicone. NOTE: 6in valve only available with EPDM & Silicone, 8in only EPDM
EPDM and Silicone is USP VI rubber on valve sizes: 0.5" to 4"
- non-product contact components (Bushings): Polyacetal

Line Pressure Technical Data

- max product line pressure: 140 **psi (10bar)**
- min product line pressure: 0.4in Hg vacuum at 68°F

Product Temperature Technical Data

- max operating temperature: 200°F (93°C)
- minimum operating temperature: 15°F (-9°C)

Surface Finish Technical Data

- product contact components: Ra ≤ 32
- optional finishes: 15Ra, 20Ra, 25Ra

Pneumatic Connections Technical Data (linear actuator)

- threaded air fitting size: G1/8"
- air connection hose size: ¼" Flexible Poly Tubing
- max supply air pressure: 100 **psi (6.9bar)**
- minimum supply air pressure: 80 **psi (5.5bar)**

Pressure Drop

- see table on page 8

Connections

- clamp (standard)
- additional available connections: Weld, Female I-Line, Male I-Line, Threaded Bevel, Plain Bevel, Q-Line, John Perry Threaded
- connection sizes: 0.5in – 8in

Flow Coefficient (Cv)

Valve Size	Flow Coefficient (Cv)	Valve Size	Flow Coefficient (Cv)
0.5in	7	2.5in	264
0.75in	11	3.0in	372
1.0in	23	4.0in	800
1.5in	80	6.0in	1200
2.0in	230	8.0in	2800

Valve Torque Values

- see table on page

Technical Specifications

Valve Break Torque (Based on Water at 68°F)

Valve Size	Break Torque (in-lbs.) Silicone	Break Torque (in-lbs.) EPDM	Break Torque (in-lbs.) FKM
0.5in	20	13	70
0.75in	20	13	70
1.0in	20	13	70
1.5in	35	20	125
2.0in	35	48	175
2.5in	133	98	220
3.0in	133	146	310
4.0in	266	341	450
6.0in	775	830	NA
8.0in	1106	1106	NA

Equipment Serial Tags

All Dixon butterfly valves assembled at the factory in Pewaukee, WI with pneumatic or electric actuators are supplied with a valve tag as standard. The tag includes the part number, serial number, and date of assembly. Fig. A below is an example of the tag provided. **NOTE:** manual handle valves are marked with their part number and heat number, but not marked with a serial number.



Fig. A

Technical Specifications

Pressure Drop ΔP (PSI)

CAPACITY (USGPM)	Valve Size (in)									
	0.5	0.75	1	1.5	2	2.5	3	4	6	8
5	7	5								
10		2.5	0.2	0.0						
50			4.7	0.4						
90			15.3	1.3	0.2					
130				2.6	0.3	0.2				
170				4.5	0.5	0.4	0.2			
210				6.9	0.8	0.6	0.3			
250				9.8	1.2	0.9	0.5			
290					1.6	1.2	0.6			
330					2.1	1.6	0.8	0.2		
370					2.6	2.0	1.0	0.2		
410					3.2	2.4	1.2	0.3		
450					3.8	2.9	1.5	0.3		
490					4.5	3.4	1.7	0.4	0.2	
530						4.0	2.0	0.4	0.2	
570						4.7	2.3	0.5	0.2	
610						5.3	2.7	0.6	0.3	
650						6.1	3.1	0.7	0.3	
690						6.8	3.4	0.7	0.3	
730							3.9	0.8	0.4	
770							4.3	0.9	0.4	
810							4.7	1.0	0.5	
850							5.2	1.1	0.5	
890							5.7	1.2	0.6	
930							6.3	1.4	0.6	
970								1.5	0.7	
1010								1.6	0.7	
1050								1.7	0.8	
1090								1.9	0.8	0.2
1130								2.0	0.9	0.2
1170								2.1	1.0	0.2
1210								2.3	1.0	0.2
1250								2.4	1.1	0.2
1290								2.6	1.2	0.2
1330								2.8	1.2	0.2
1370								2.9	1.3	0.2
1410								3.1	1.4	0.3
1450								3.3	1.5	0.3
1490								3.5	1.5	0.3
1530								3.7	1.6	0.3
1570								3.9	1.7	0.3
1610								4.1	1.8	0.3
1650								4.3	1.9	0.3

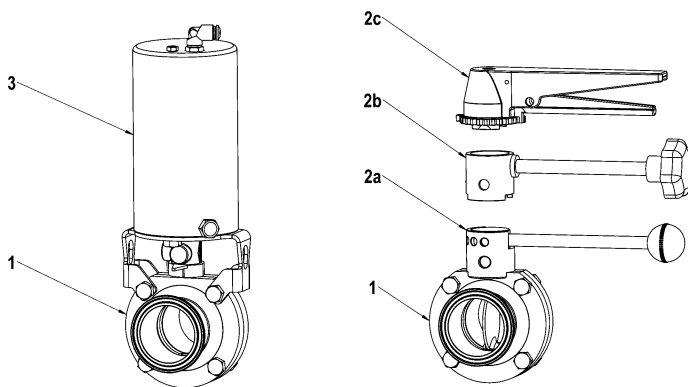
$$\Delta P = \left[\frac{\text{GPM}}{C_v} \right]^2 G$$

Installation & Start-Up

The following should be performed upon receiving the product and prior to installation and use of the product. It is important that all the following processes and procedures are carefully followed and adhered to. Dixon® is not responsible for any damage that occurs during the unpacking or installation process.

Unpacking

Carefully unpack all the parts of the butterfly valve and inspect each part for any damage that may have occurred during shipment. Report any damage to the carrier immediately. The ports on the valve are protected with a plastic cover. If any covers are missing or damaged, inspect the ports on the valve thoroughly for any damage. The valve is shipped with all necessary certificates and manuals. Please add this paperwork to the plant maintenance files for future use and reference. Additional information for the valve can be found at dixonvalve.com.



The product may consist of the following components:

Item #	Description
1	Butterfly valve
2a	Pull Handle *
2b	Infinite Handle *
2c	Trigger Handle *
3	Canister Actuator

* Note: manual handle valves do not ship with handles attached. You will only receive the handle option you ordered.

Tools Needed

The following tools are required for maintenance of the product:

- Metric set of box wrenches
- Food grade grease
- Metric set of Allen keys
- Torque wrench

Welding

- For equipment delivered with weld end connections, any rubber or plastic components MUST be removed from the equipment prior to welding. (See disassembly instructions for proper removal of such components.)
- Follow all necessary safety precautions, check lists and standard procedures prior to performing any welding on the equipment.
- Weld the equipment into the process line, being sure to follow and comply with appropriate industry welding procedures and standards. For equipment used in food, beverage or dairy applications that carries 3A® certification, see 3A® standard 00-01-2018 section E1.1.1 for proper procedure and requirements.
- Re-assemble the equipment per the assembly section of this manual.
- Check the equipment for proper operation and perform leak test if necessary.

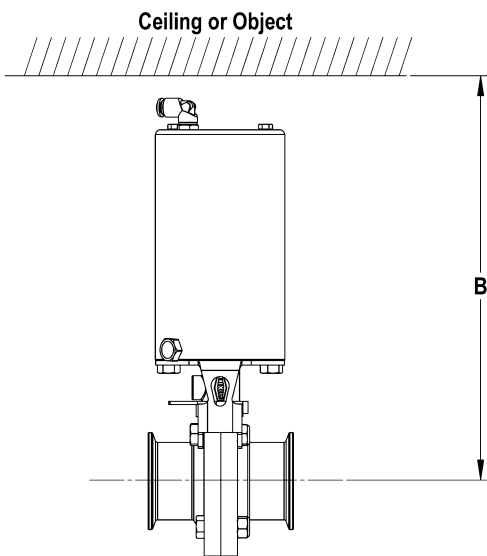
Installation & Start-Up

Function Testing

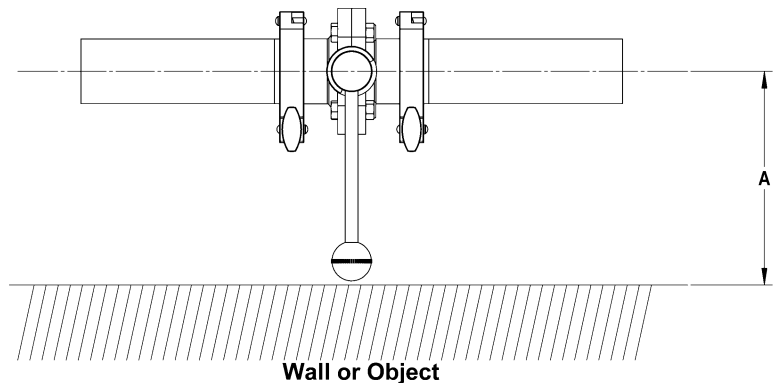
- Check visually to ensure that the equipment is not leaking.
- Any defective seal that could have been damaged during disassembly or assembly must be replaced.
- Check all equipment components for any signs of damage and replace damaged components.
- Ensure that all screw fittings are tight if applicable.
- Ensure that any pneumatic hose connections are free of leaks if applicable.
- Confirm all pipes and fittings connected to the equipment permitted for use are in the intended pressure range.
- Confirm all electrical installations are protected sufficiently and in accordance with appropriate safety standards if applicable.
- Check that the maximum pressure indicated on the equipment or in the specifications section of this manual has been complied with.
- For manual handle valves, open and close the handle several times to ensure that the valve operates without any difficulty. See valve operation section in the installation and start-up section of this manual to see how to operate the valve.
- For valves equipped with a pneumatic actuator, supply air to the actuator and cycle several times to ensure the valve operates without any difficulty.

Installation Orientation

Equipment must be installed in the proper orientation to ensure proper functionality and cleanliness. Please refer to the following diagrams below for proper installation. **NOTE:** adequate spacing must be maintained around the valve for proper operation and maintenance. Please see diagrams and chart below for guideline.

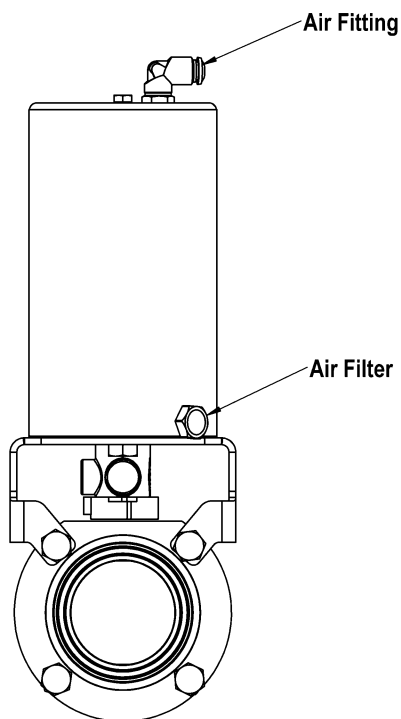


Valve Size	Manual Handle	Pneumatic Actuator	Pneumatic Actuator + Control Head
	A (in)	B (in)	
0.5in	7.0	10.6	16.9
0.75in	7.0	10.6	16.9
1in	7.0	10.6	16.9
1.5in	7.0	10.6	16.9
2in	7.0	11.0	17.3
2.5in	7.0	11.4	17.7
3in	7.0	11.5	17.8
4in	7.0	12.4	18.7
6in	12.0	NA	NA
8in	18.5	NA	NA

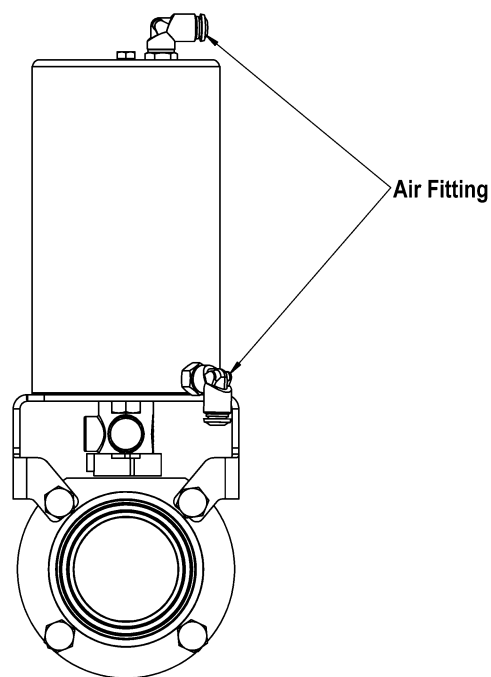


Pneumatic Connections

Air Requirements (In accordance with DIN/ISO 8573.1)	
Min. supply pressure to actuator	80psi (5.5bar)
Max. supply pressure to actuator	100psi (6.9bar)
Air connection hose type	1/4" (6mm) Flexible Poly Tubing
Air Fitting Type	1/8"G Swivel Elbow
Solid particle content	Class 3 Quality. Max size of solid particles per cubic meter 10000 of $0.5\mu\text{m} < d < 1.0\mu\text{m}$. 500 of $1.0\mu\text{m} < d < 5.0\mu\text{m}$
Water Content	Class 4 Quality. Max dew point temperature $+3^{\circ}\text{C}$ (37.4°F). Installations at lower temperature or varying altitudes may require adjustments accordingly.
Air Consumption (liters free air)	$0.24 \times \text{Supply Pressure (bar)}$



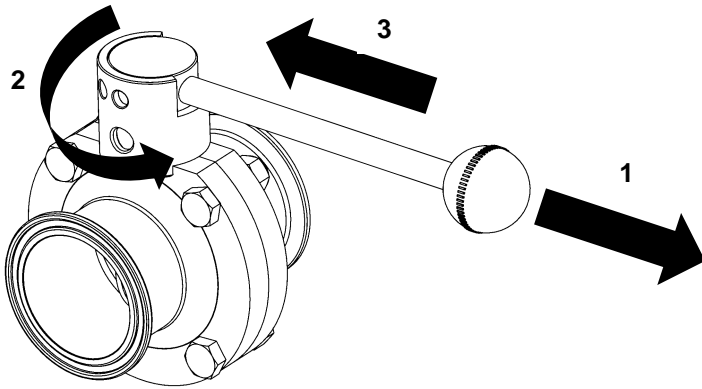
Spring Return Actuators



Double Acting Actuators

For normally closed (NC) spring return actuators, supply air to the air fitting to open the valve. For normally open (NO) spring return actuators, supply air to the air fitting to close the valve. For double acting actuators, supply air to the air fitting to open and close the valve. **NOTE:** if you wish to change the valve from NO to NC or vice versa, follow the disassembly section of this manual to remove the actuator, then turn the valve disc to the desired fail position and reattach the actuator.

Manual Handle Operation



Pull Handle

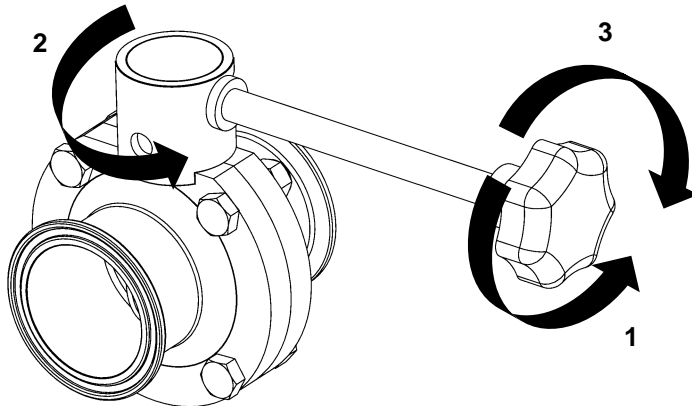
Operating Steps

Step 1: Pull handle toward yourself to unlock the handle from its current position.

Step 2: Rotate the handle to the desired position.

Step 3: Release the handle rod from step 1 and ensure that the handle plunger locks into one of the four holes machined on the handle hub.

Operating Steps



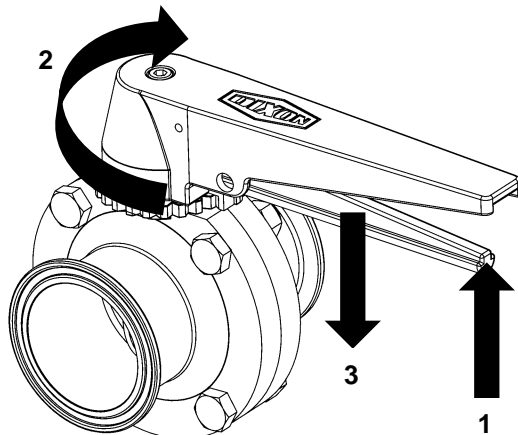
Infinite Handle

Step 1: Rotate handle knob counterclockwise to unlock the handle.

Step 2: Rotate the handle to the desired position.

Step 3: With the handle in the desired position, rotate the handle knob clockwise and tighten completely.

Operating Steps



Trigger Handle


Step 1: Pull trigger on handle to disengage lock arm from toothed sprocket.

Step 2: Rotate the handle to the desired position.

Step 3: Release the trigger on handle to engage lock arm with teeth in sprocket. Ensure that handle is locked.

Cleaning

IMPORTANT: Before operating the equipment during formal production, please follow the guidelines listed below to ensure that your equipment is clean and ready for service.

- Ensure that the equipment is installed in a proper orientation to allow the equipment to be cleaned and drained properly. Reference the installation and startup section of the manual for orientation guidelines.
- Flush the equipment with an appropriate cleaning agent to remove any residue that may be on the equipment from shipping.
IMPORTANT: DO NOT use cleaning agents that will attack stainless-steel or the elastomers that were supplied with the valve. If you are unsure what elastomer is used in the valve, reference the part number key in this manual to make the determination.
- Follow any MSDS instructions for proper use or handling of cleaning agents. 
- Flush the equipment sufficiently to remove any soiling from the product contact components. Depending on the process, there may be varying amounts of soiling. Cleaning times and cleaning agent concentrations will vary depending on the product being processed. It is the responsibility of the operator to determine and adjust these cleaning specifications as necessary.
- The equipment should not be allowed to sit with product present in it for extended periods of time. Equipment should be cleaned immediately after processing is complete.

General Maintenance

To ensure proper operation of your Dixon® equipment, proper maintenance must be performed at regular intervals. To prevent damage, check all fitting connections and screw connections for any loosening of the connections during equipment operation. Maintain adequate spare parts stock for all replacement components on the piece of equipment. Please refer to the repair kits section of the manual for complete component part numbers and kit part numbers.

Servicing Intervals

Recommended intervals for one shift operation would be 3 months. However, only the user/owner can determine the appropriate service intervals as the length between service intervals is dependent on the following parameters:

- duration of use per day – number of cycles
- type of product
- product temperature
- product viscosity
- cleaning agent

Lubrication

Please use the following chart below for proper grease type for varying component materials. DO NOT use mineral or animal-product-based greases. Check all visible seals for any signs of damage and replace as necessary. For sliding surfaces, use Jax® PurGel Klear food grade grease. If a different grease is used other than what is specified in this manual, there is risk of damaging the seals. Lubrication is only required when the equipment is being reassembled after servicing.

Seal Material	Grease Type
EPDM	JAX® PurGel Klear
FKM	JAX® PurGel Klear
Silicone	JAX® PurGel Klear
Polyacetal	Do Not Grease

General Maintenance

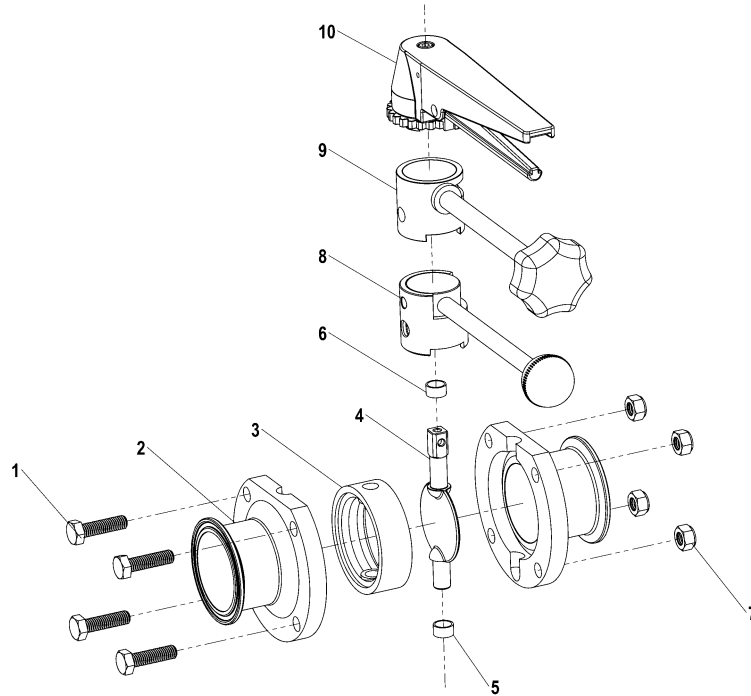
Inspection

Inspection of the components listed below should be done during regular servicing intervals. Before removing the equipment from the process line, please take care to do the following:

- Clean the process line completely to remove any product that may be harmful if contacting a person.
- Drain the process line completely that connects to the equipment being serviced.
- Close any isolation valves on either side of the equipment being serviced.
- Once the equipment has been removed from the line, cap the lines that were connected to the piece of equipment being serviced to prevent any foreign material from entering the line.

Components to be inspected:

- item 2 – Valve Body
- item 3 – Valve Seat
- item 4 – Valve Disc
- item 5 – Lower Bushing
- item 6 – Upper Bushing



Any components that show signs of severe wear or damage should be replaced during the scheduled maintenance time for the equipment. Please refer to the assembly and disassembly section of this manual for proper instructions on removing and replacing any worn or damaged components. Replacement components and repair kits can be found in the BOM or repair kits section of this manual.

Manual Cleaning (COP)

1. Refer to the disassembly section of the manual and follow instructions to remove all product contact components.
2. Inspect the product contact components of the equipment for any signs of possible damage. Replace components as necessary. (See the equipment BOM in this manual for replacement component part numbers.)
3. Clean all surfaces of the product contact components by manually brushing in a bath of cleaning solution (acid detergents or simple alkaline soda type detergents).
4. After cleaning, rinse all components thoroughly with water.
5. Refer to the assembly section of the manual and follow instructions to properly reassemble the equipment.

Assembly and Disassembly

To ensure quality operation of your Dixon® equipment, the equipment must be disassembled and assembled properly to prevent equipment damage during operation. Please follow the instructions contained in this manual carefully and be sure to follow any safety warnings contained herein. If any questions should arise during the assembly or disassembly process that are not addressed in this manual, please feel free to contact Dixon® – Sanitary Division at 800.789.1718.

Assembly – Manual Handle Valves

1. Apply food grade anti-seize to the body bolts (**item 1**).
2. Install the seat (**item 3**) onto the valve disc (**item 4**) see **Figure B**. Pinch the seat between your thumb and index finger. Slide the long end of the disc stem through the hole in the seat. Stretch the remaining end of the seat over the short end of the disc stem.
3. Slide the upper bushing (**item 6**) over the square of the valve disc stem. **NOTE:** the upper bushing is split.
4. Slide the lower bushing (**item 5**) onto the bottom of the valve disc.
5. With disc in the open position, press the seat/disc assembly into the seat groove in one side of the valve body (**item 2**).
6. Press the remaining valve body (**item 2**) onto the seat/disc assembly. Ensure the bushings are both in alignment and the seat is sitting securely in the valve bodies.
7. Insert the body bolts (**item 1**) through the holes in the valve body (**item 2**) and thread on the body bolt nuts (**item 7**).
8. Tighten the body bolts in a star pattern to the torque values listed below:
 - M6 = 77 in-lbs.
 - M8 = 188 in-lbs.
 - M10 = 372 in-lbs.

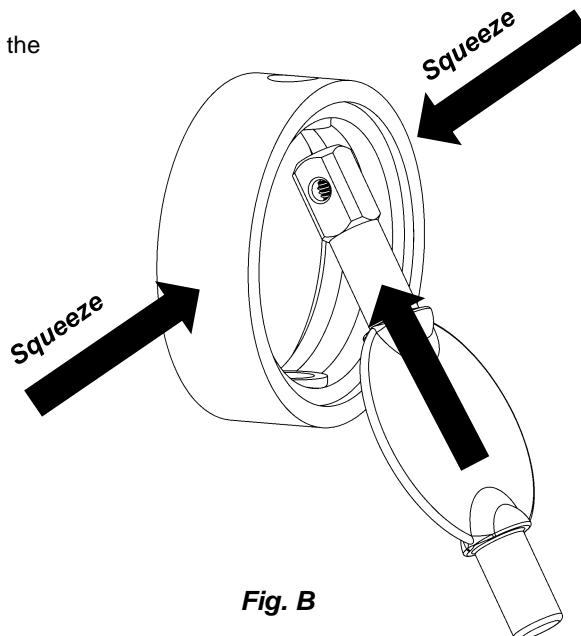
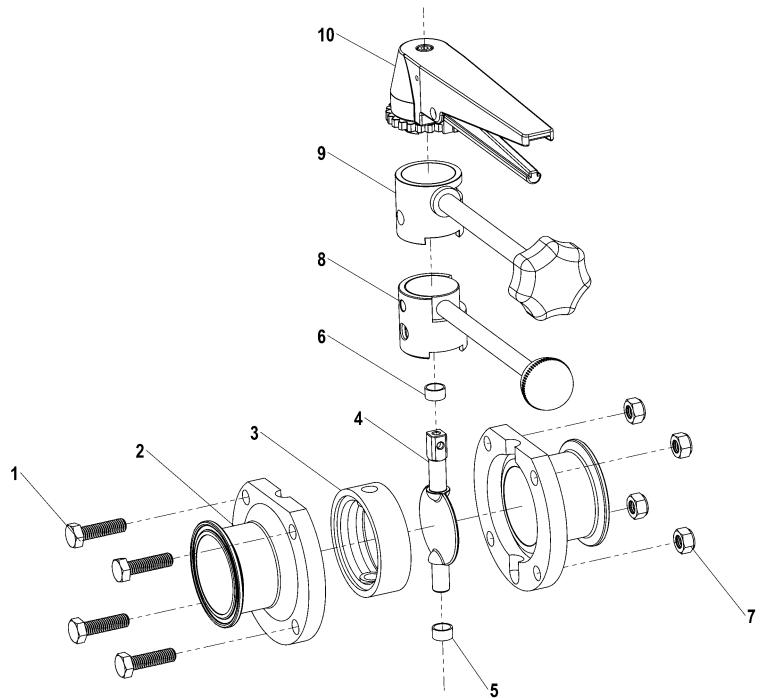
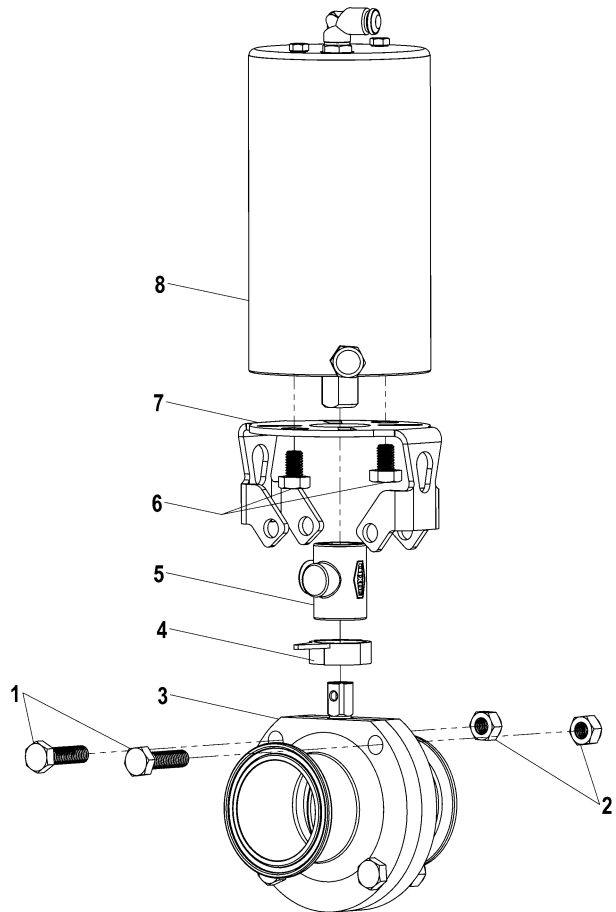


Fig. B

Assembly – Vertical Canister Actuator

1. For spring return actuators, turn the valve disc to the desired fail position.
2. Press the position indicator (item 4) onto the coupler (item 5) so that the bottom of the indicator is flush with the bottom of the coupler. **NOTE:** the indicator goes on the side of the coupler with the square drive. Align the pointer of the indicator with the position of the valve disc.
3. Slide the coupler/indicator (item 4 & 5) assembly onto the valve stem.
4. Slide the actuator bracket (item 7) over the valve body (item 3) and align the bolt holes of the bracket with the holes in the valve body.
5. Insert the hex head bolts (item 1) through the holes in the actuator bracket and valve body. Loosely tighten the bolts.
6. Place the actuator (item 8) onto the actuator bracket (item 7) and align the shaft of the actuator with the coupler (item 5). It can only engage one way.
7. Thread the actuator bolts (item 6) through the bolt holes in the bracket (item 7) and loosely tighten the bolts.
8. Tighten the hex head bolts (item 1).
9. Tighten the actuator bolts (item 6).
10. Install the air fitting(s) and air filter according to the section of this manual called **Pneumatic Connections**.



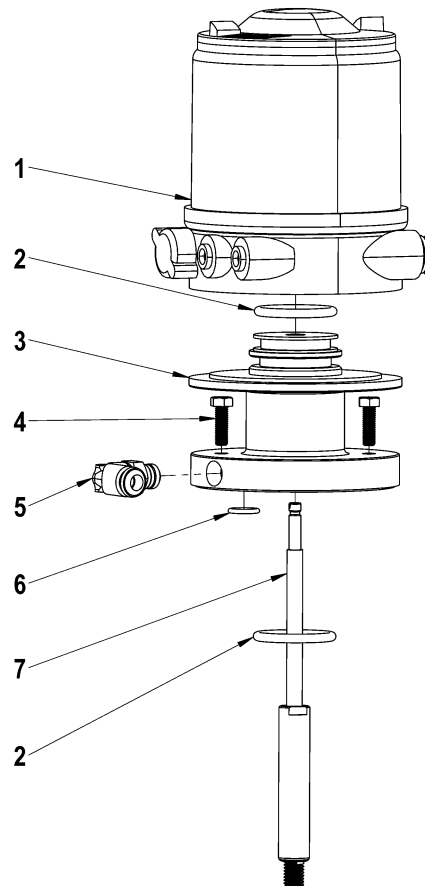
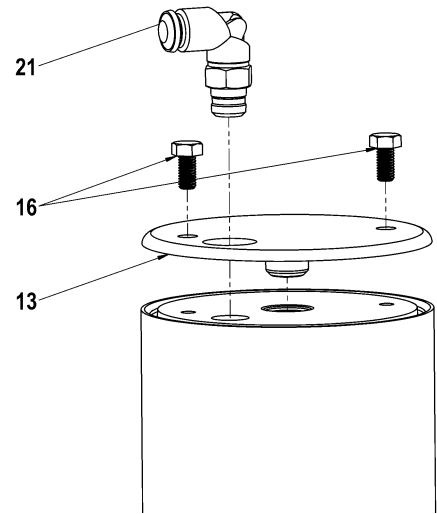
Assembly – Burkert Control Top

1. Remove the air fitting (item 21) from the top of the actuator. Do not discard the air fitting.



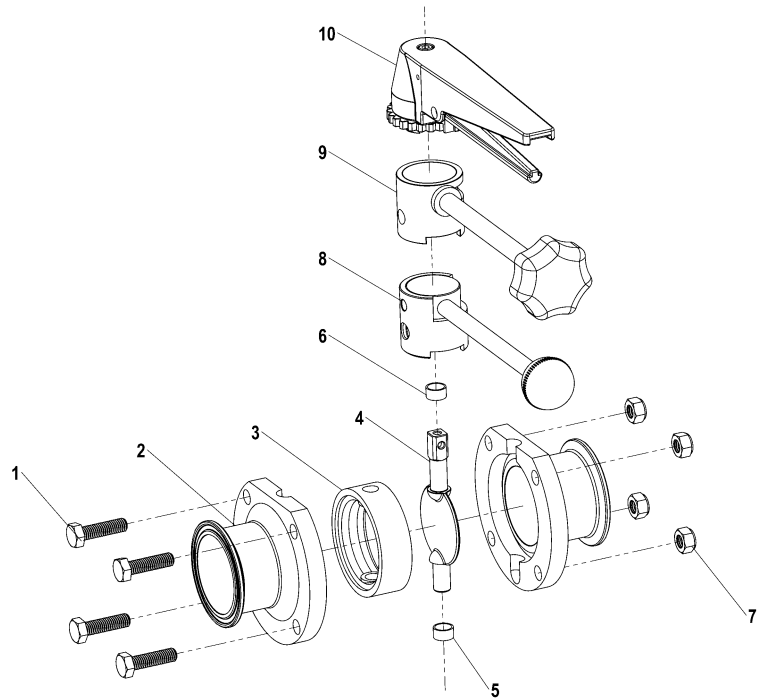
DO NOT remove while under pressure.

2. Remove the two hex head screws (item 16) and set aside – these will not be used again.
3. Remove the top cap (item 13) and set aside – this will not be used again.
4. Apply thread locker to the thread at the base of the detection shaft (item 7).
5. Thread the detection shaft (item 7) into the top of the actuator and tighten until it bottoms out.
6. Thread the air fitting (item 5) into the control top adapter (item 3) and tighten. **Note:** Air fitting (item 21) removed from **Step 1** can be used here.
7. Apply lubricant to the air port O-Ring (item 6) and fit the O-Ring into the O-Ring groove of the adapter (item 3).
8. Insert the hex head bolts (item 4) through the holes in the adapter (item 3) and thread into the top of the actuator (item 8). Tighten the hex bolts.
9. Place the adapter O-Rings (item 2) on the top groove of the adapter (item 3) and into the bottom groove on the bottom face of the adapter.
10. Install the plastic sensing puck (provided with the Burkert Control top) onto the detection shaft (item 7). The fingers of the puck should snap into the small groove at the very end of the detection shaft.
11. Place the control top (item 1) onto the adapter making sure to align the plastic sensing puck with the plastic sensing rail inside the control top (item 1). For further explanation refer to the Burkert User manual provided with the unit.
12. Tighten the socket head bolts on the control top until snug.
13. Follow the Burkert user manual for installing the air connections properly.



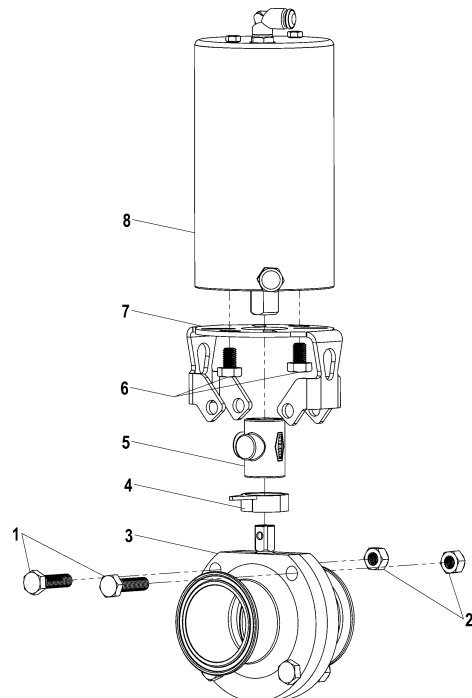
Disassembly – Manual Valves

1. Remove the bolt or set screw from the handle of the valve.
2. Remove the handle from the valve.
3. Remove the body bolts and nuts (items 1 & 7) from the valve body.
4. Separate the two valve bodies (item 2) from one another.
5. Remove the disc/seat assembly from the valve body (item 2).
6. Squeeze the seat between your thumb and index finger as shown in Figure A of the assembly procedure and pry the seat over and off the short end of the valve stem.
7. Pull the disc out completely from the valve seat.



Disassembly – Valves with VC1 Series Actuator

1. Remove the body bolts and nuts (items 1 & 7) from the valve body.
2. Remove the actuator bolts (item 6) from the actuator.
3. Remove the actuator (item 8).
4. Remove the indicator (item 4), coupler (item 5), and bracket (item 7) from the valve.
5. Follow the disassembly steps 3-7 from the disassembly of manual valves section listed above.



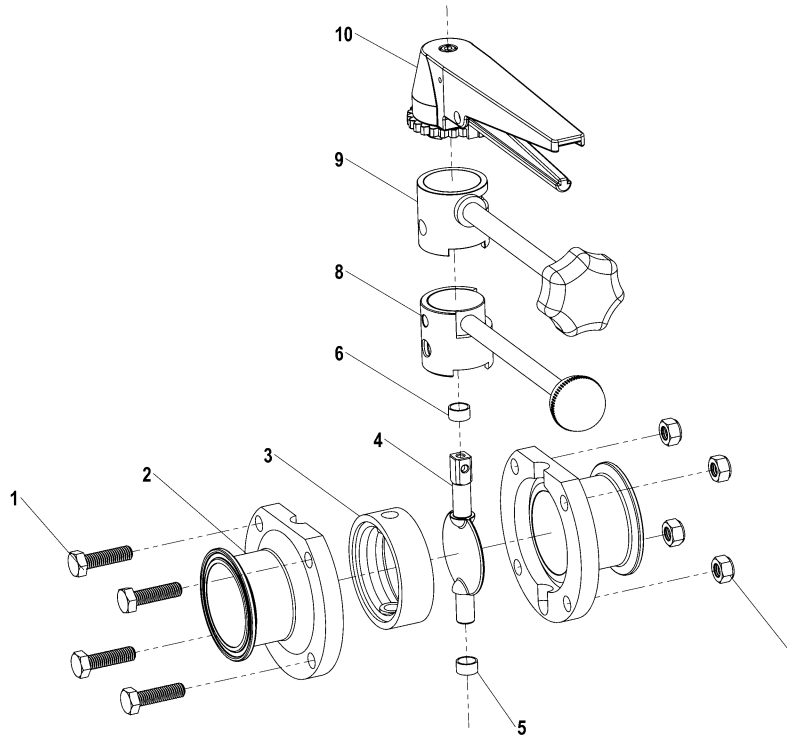
Repair Kits

To ensure proper operation of your Dixon® equipment, proper maintenance must be performed at regular intervals. To prevent damage and improper operation, use only genuine replacement parts and kits offered by Dixon® to maintain the integrity of the equipment. Make sure the parts are properly matched to the series, model, serial number and revision level of the equipment. Please see the list of kits below offered for this piece of equipment:

<u>Repair Kit Part Number</u>	<u>Part Description</u>	<u>Part Type</u>
B5107-RKV100	B5107 FKM Repair Kit, For 0.5in-1in Valves	Valve Seat Repair Kits
B5107-RKV150	B5107 FKM Repair Kit, For 1.5in Valves	
B5107-RKV200	B5107 FKM Repair Kit, For 2in Valves	
B5107-RKV250	B5107 FKM Repair Kit, For 2.5in Valves	
B5107-RKV300	B5107 FKM Repair Kit, For 3in Valves	
B5107-RKV400	B5107 FKM Repair Kit, For 4in Valves	
B5107-RKS100	B5107 Silicone Repair Kit, For 0.5in-1in Valves	
B5107-RKS150	B5107 Silicone Repair Kit, For 1.5in Valves	
B5107-RKS200	B5107 Silicone Repair Kit, For 2in Valves	
B5107-RKS250	B5107 Silicone Repair Kit, For 2.5in Valves	
B5107-RKS300	B5107 Silicone Repair Kit, For 3in Valves	
B5107-RKS400	B5107 Silicone Repair Kit, For 4in Valves	
B5107-RKS600	B5107 Silicone Repair Kit, For 6in Valves	
B5107-RKE100	B5107 EPDM Repair Kit, For 0.5in-1in Valves	
B5107-RKE150	B5107 EPDM Repair Kit, For 1.5in Valves	
B5107-RKE200	B5107 EPDM Repair Kit, For 2in Valves	
B5107-RKE250	B5107 EPDM Repair Kit, For 2.5in Valves	
B5107-RKE300	B5107 EPDM Repair Kit, For 3in Valves	
B5107-RKE400	B5107 EPDM Repair Kit, For 4in Valves	
B5107-RKE600	B5107 EPDM Repair Kit, For 6in Valves	
B5107-RKE800	B5107 EPDM Repair Kit, For 8in Valves	

Bill of Materials

Valves with Manual Handle



Item No.	Part Type	Part Number					Material	Qty	Spare Part
		0.5in	0.75in	1in	1.5in	2in			
1	Body Bolt	M6x1x30			M8x1.25x30		18-8	4	No
2	Body Half	B5107-HSG50	B5107-HSG75	B5107-HSG10	B5107-HSG15	B5107-HSG20	316L	2	Yes
3	Valve Seat	See Repair Kits	See Repair Kits	See Repair Kits	See Repair Kits	See Repair Kits	---	1	Yes
4	Disc	B5107-DSC5010			B5107-DSC15	B5107-DSC20	316L	1	Yes
5	Lower Bushing *	NA	NA	NA	NA	NA	Polyacetal	1	No
6	Upper Bushing *	NA	NA	NA	NA	NA	Polyacetal	1	No
7	Body Nut	M6x1 Nylock				M8x1.25 Nylock	18-8	4	No
8	Pull Handle	B5107-SH5025					304	1	Yes
9	Infinite Handle	B5107-IH5025					304	1	Yes
10	Trigger Handle	B5107-TH5025					304	1	Yes

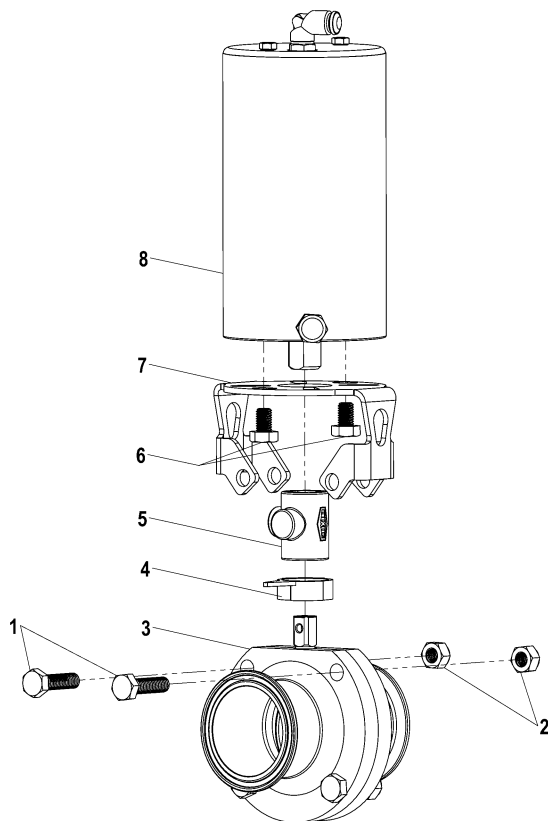
Item No.	Part Type	Part Number					Material	Qty	Spare Part
		2.5in	3in	4in	6in	8in			
1	Body Bolt	M8x1.25x30	M8x1.25x40			M10x1.5x45	18-8	4 **	No
2	Body Half	B5107-HSG25	B5107-HSG30	B5107-HSG40	B5107-HSG60	B5107-HSG800	316L	2	Yes
3	Valve Seat	See Repair Kits	See Repair Kits	See Repair Kits	See Repair Kits	See Repair Kits	---	1	Yes
4	Disc	B5107-DSC25	B5107-DSC30	B5107-DSC40	B5107-DSC60	B5107-DSC800	316L	1	Yes
5	Lower Bushing *	NA	NA	NA	NA	NA	Polyacetal	1	No
6	Upper Bushing *	NA	NA	NA	NA	NA	Polyacetal	1	No
7	Body Nut	M8x1.25 Nylock				M10x1.5 Nylock	18-8	4 **	No
8	Pull Handle	B5107-SH5025	B5107-SH3040	B5107-SH3040	B5107-SH60	B5107-SH800	304	1	Yes
9	Infinite Handle	B5107-IH5025	B5107-IH3040	B5107-IH3040	NA	NA	304	1	Yes
10	Trigger Handle	B5107-TH5025	B5107-TH3040	B5107-TH3040	NA	NA	304	1	Yes

* Upper and lower bushings are included in the seat repair kit. Cannot be purchased separately.

** 4in & 8in valves have Qty 6 bolts & nuts. 6in valve has Qty 8 bolts and nuts.

Bill of Materials

Valves with VC1 Series Actuator

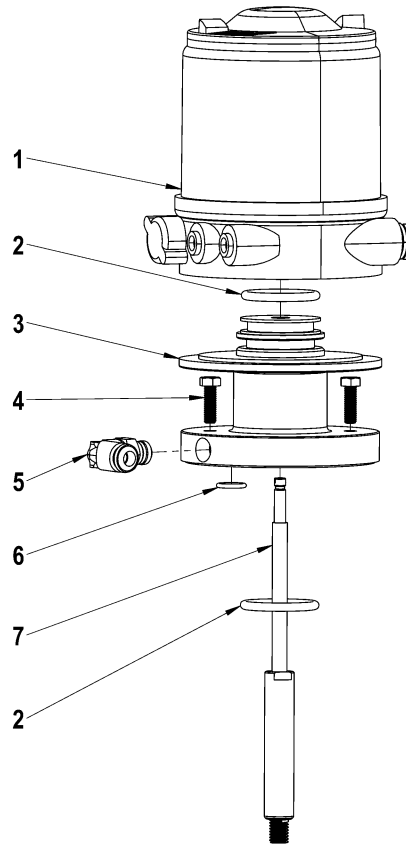


Item No.	Part Type	Part Number					Material	Qty	Spare Part
		0.5in	0.75in	1in	1.5in	2in			
1	Body Bolt	M6x1x35				M8x1.25x35	18-8	2	No
2	Body Nut	M6x1 Nylock				M8x1.25 Nylock	18-8	2	No
3	Valve	<u>B5107_050</u>	<u>B5107_075</u>	<u>B5107_100</u>	<u>B5107_150</u>	<u>B5107_200</u>	---	1	Yes
4	Indicator	XB51-P-N					Polyethylene	1	Yes
5	Coupler	XB51-CPB-NB					CF8	1	Yes
6	Actuator Bolt	M8x1.25x12					18-8	2	No
7	Actuator Bracket	B5107-B100-150			B5107-B200-250		18-8	1	Yes
8a	Spring Return Actuator	VC1SR					304	1	Yes
8b	Double Acting Actuator	VC1DA					304	1	Yes

Item No.	Part Type	Part Number					Material	Qty	Spare Part
		2.5in	3in	4in	6in	8in			
1	Body Bolt	M8x1.25x35	M8x1.25x45		<i>6in & 8in valves can only be actuated using Dixon RP-BA or RP-BS Series Rack & Pinion Actuators</i>	18-8	2	No	
2	Body Nut	M8x1.25 Nylock				18-8	2	No	
3	Valve	<u>B5107_250</u>	<u>B5107_300</u>	<u>B5107_400</u>		---	1	Yes	
4	Indicator	XB51-P-N				Polyethylene	1	Yes	
5	Coupler	XB51-CPB-NB				CF8	1	Yes	
6	Actuator Bolt	M8x1.25x12				18-8	2	No	
7	Actuator Bracket	B5107-B300-400				304	1	Yes	
8a	Spring Return Actuator	VC1SR				304	1	Yes	
8b	Double Acting Actuator	VC1DA			304	1	Yes		

Bill of Materials

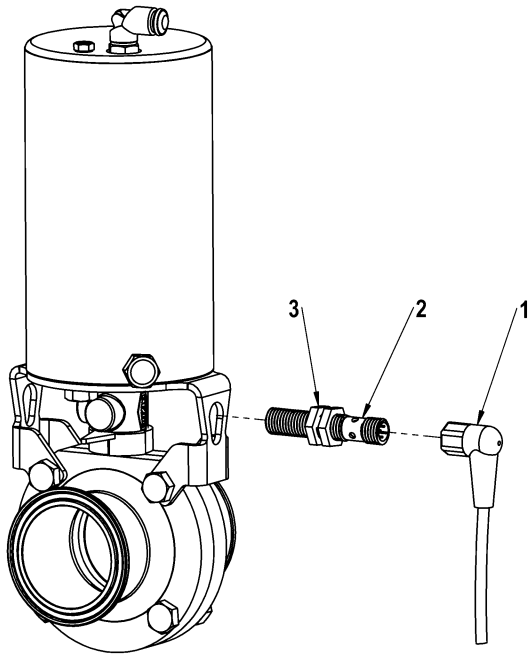
Control Head and Mounting Bracket



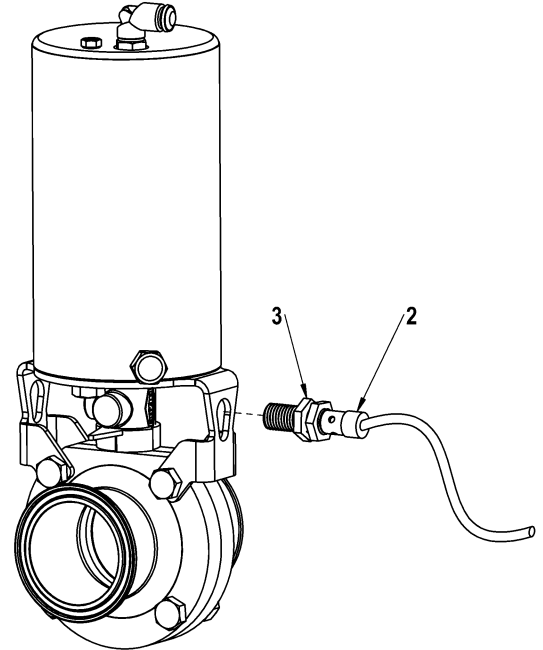
Item No.	Part Type	Description	Part Number	Qty	Spare Part
1	Control Head	Burkert 8691 Top, 24VDC, Single Acting, G1/8" Air Ports, Contact Free Switches, Nema 4X, M12 8pin	BT-PS-24S-M12	1	Yes
		Burkert 8691 Top, 24VDC, Double Acting, G1/8" Air Ports, Contact Free Switches, Nema 4X, M12 8pin	BT-PS-24D-M12	1	Yes
		Burkert 8691 Top, 24VDC, AS-I, Single Acting, G1/8" Air Ports, Contact Free Switches, Nema 4X, M12 4pin	BT-AS-24S-M12	1	Yes
		Burkert 8691 Top, 24VDC, AS-I, Double Acting, G1/8" Air Ports, Contact Free Switches, Nema 4X, M12 4pin	BT-AS-24D-M12	1	Yes
		Burkert 8691 Top, No Solenoids, Contact Free Switches, Nema 4X, M12 8pin	BT-PS-NS-M12	1	Yes
2	Adapter O-Ring	Buna O-Ring (AS568-012)	VC1-BA-OR1	1	Yes
3	Adapter	Control Top Adapter	VC1-BA	1	Yes
4	Adapter Bolts	M5x20mm Hex Head Bolts	NA	2	Yes
5	Air Fitting	G1/8" Swivel Air Fitting for 1/4" (6mm) Poly Tubing	407322	1	Yes
6	Air Port O-Ring	Buna O-Ring (AS568-215)	VC1-BA-OR2	1	Yes
7	Detection Shaft	Detection Shaft For Position Sensor	VC1-DS	1	Yes

Bill of Materials

External Proximity Sensors



Quick Disconnect Style Sensor



Hard Wired Style Sensor

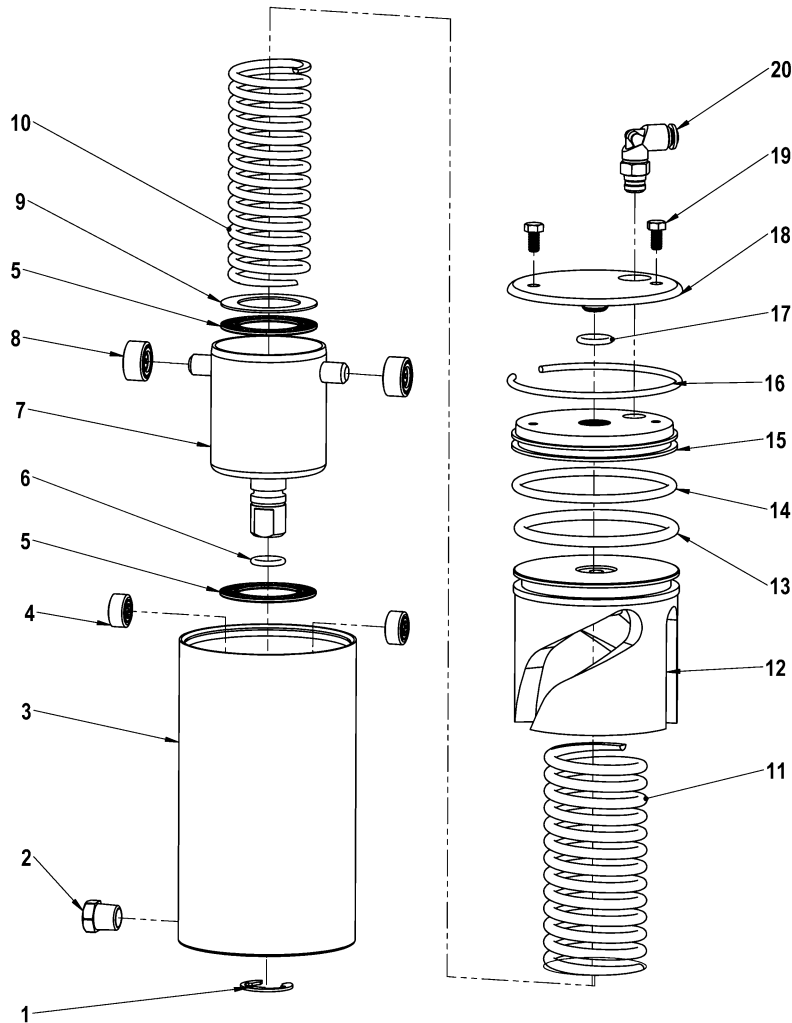
Item No.	Part Type	Description	Part Number	Qty	Spare Part
1	Quick Disconnect Cable	M12 Right Angle Female To Pigtail, 4-Pole, IP69K, FDA Compliant, 6.5FT Long	M12F-4P-69K-2M	1 *	Yes
		M12 Right Angle Female To Pigtail, 4-Pole, IP69K, FDA Compliant, 9.8FT Long	M12F-4P-69K-3M	1 *	Yes
		M12 Right Angle Female To Pigtail, 4-Pole, IP69K, FDA Compliant, 16.4FT Long	M12F-4P-69K-5M	1 *	Yes
2	Proximity Sensor	M12 Inductive Prox Sensor, 60mm Body, NPN, N.O. Output, 6mm Sensing Distance, Shielded, IP67, 4-Pin M12, Male Quick-Disconnect	DW-AS-501-M12	1 *	Yes
		M12 Inductive Prox Sensor, 60mm Body, PNP, N.O. Output, 6mm Sensing Distance, Shielded, IP67, 4-Pin M12, Male Quick-Disconnect	DW-AS-503-M12	1 *	Yes
		M12 Inductive Prox Sensor, 50mm Body, NPN, N.O. Output, 6mm Distance, Shielded, IP67, Cable Hard Wired To Sensor, 6.5FT Pigtail	DW-AD-501-M12 ‡	1 *	Yes
		M12 Inductive Prox Sensor, 50mm Body, PNP, N.O. Output, 6mm Distance, Shielded, IP67, Cable Hard Wired To Sensor, 6.5FT Pigtail	DW-AD-503-M12 ‡	1 *	Yes
3	Lock Nut	M12 Thin Hex Nut (nuts included with sensor)	NA	2	No

* Valve can accommodate up to Qty 2 sensors. If Open & Close feedback is required, purchase Qty 2 each.

‡ If using sensor with hard wired pigtail, Item No. 1 *quick disconnect cable* is not required.

Bill of Materials

VC1 Series Canister Actuator



Item No.	Part Type	Part Number	Qty	Material	Spare Part
1	Retaining Clip	VC1-17	1	304	Yes
2	Air Filter	VC-NR-AF	1 *	304	Yes
3	Actuator Body	VC1-1	1	304	Yes
4	Body Needle Bearing	VC1-8	2	304	See VC1-RK1
5	Thrust Bearing	VC1-10	2	304	See VC1-RK1
6	Drive O-Ring	VC1-11	1	EPDM	See VC1-RK1
7	Actuator Drive	VC1-2	1	304	Yes
8	Drive Needle Bearing	VC1-9	2	304	See VC1-RK1
9	Thrust Washer	VC1-12	1	304	See VC1-RK1
10	Inner Spring	VC1-3	1 †	60Si2Mn	Yes
11	Outer Spring	VC1-4	1 †	60Si2Mn	Yes
12	Piston	VC1-5	1	AL	Yes
13	Piston O-Ring	VC1-13	1	EPDM	See VC1-RK1
14	End Cap O-Ring	VC1-14	1	EPDM	See VC1-RK1
15	End Cap	VC1-6	1	304	Yes
16	Retaining Ring	VC1-15	1	304	Yes

17	Top Cap O-Ring	VC1-16	1	EPDM	Yes
18	Top Cap	VC1-7	1	304	Yes
19	Top Cap Hex Screw	M5x10 Hex Screw	2	18-8	Yes
20	Air Fitting	407322	1 **	Ni PI Brass	Yes
NA	Complete Rebuild Kit (Items 4, 5, 6, 8, 9, 13, 14)	VC1-RK1	1	---	Yes

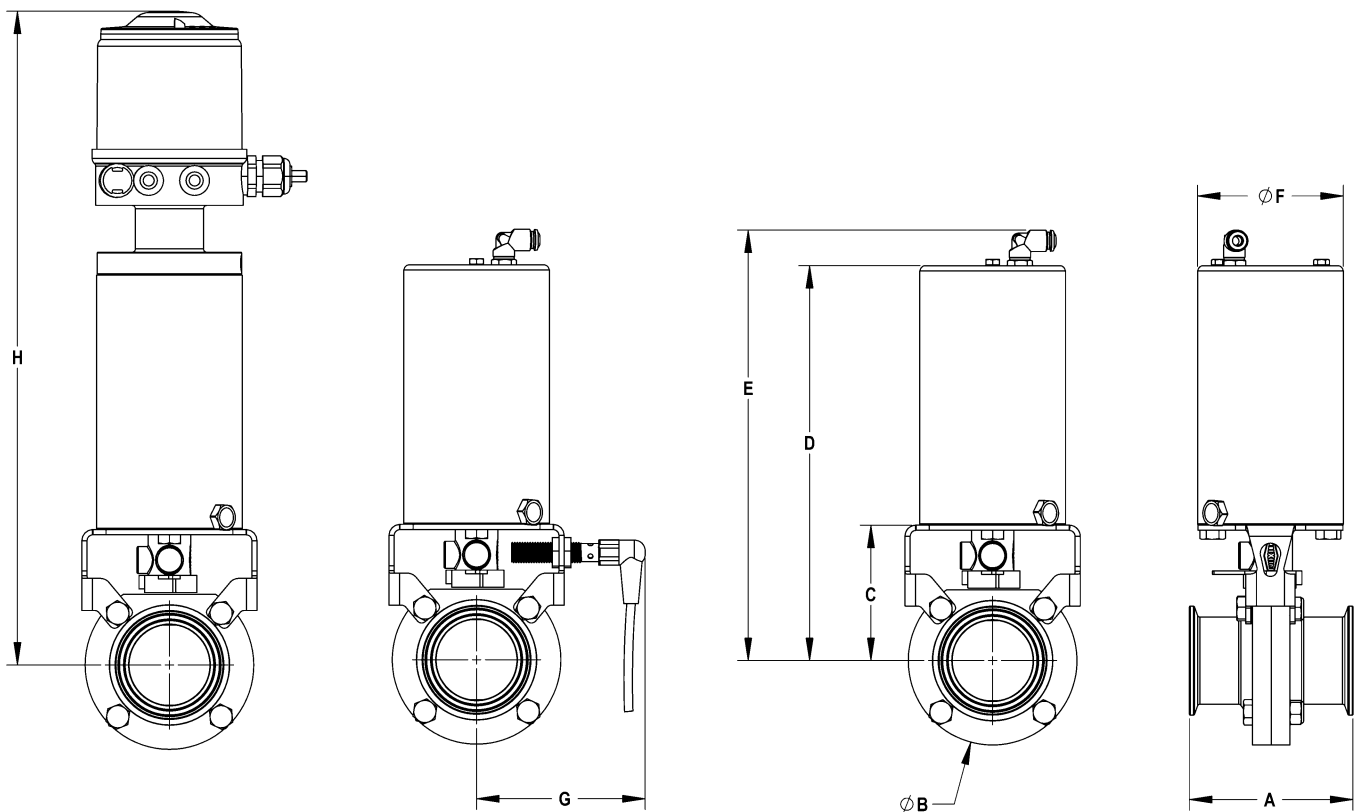
* Double acting actuators will not utilize an air filter.

** Double acting actuators will have Qty 2 air fittings.

‡ Double acting actuators do not have an inner or outer spring.

Dimensions

Valve with Canister Actuator



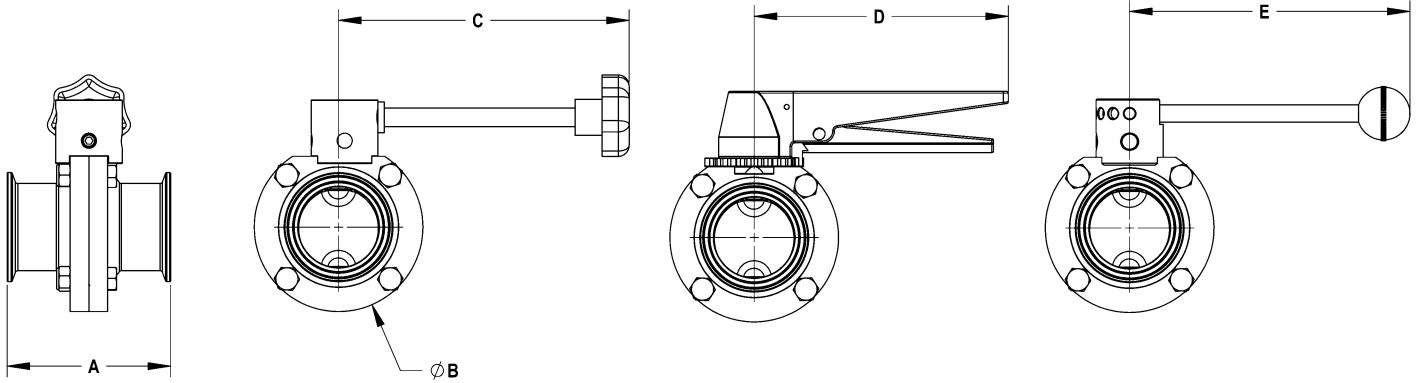
**Shown With Burkert
Control Head**

**Shown With External
Proximity Sensor**

Valve Size	Dimension (Units: in)							
	A	B	C	D	E	F	G	H
1/2"	3.5	3.1	2.7	8.7	9.6	3.4	4.0	14.7
3/4"	3.5	3.1	2.7	8.7	9.6	3.4	4.0	14.7
1"	3.5	3.1	2.7	8.7	9.6	3.4	4.0	14.7
1-1/2"	3.5	3.1	2.7	8.7	9.6	3.4	4.0	14.7
2"	3.8	3.9	3.0	9.0	10.0	3.4	4.0	15.0
2-1/2"	3.8	4.6	3.5	9.5	10.4	3.4	4.0	15.5
3"	4.1	5.2	3.6	9.5	10.5	3.4	4.0	15.5
4"	4.8	6.7	4.4	10.4	11.4	3.4	4.0	16.4

Dimensions

Valve with Manual Handles



Shown with Infinite Handle

Shown with Trigger Handle

Shown with Pull Handle

Valve Size	Dimension (Units: in)				
	A	B	C	D	E
1/2"	3.5	3.1	4.9	5.9	4.6
3/4"	3.5	3.1	4.9	5.9	4.6
1"	3.5	3.1	4.9	5.9	4.6
1-1/2"	3.5	3.1	4.9	5.9	4.6
2"	3.8	3.9	4.9	5.9	4.6
2-1/2"	3.8	4.6	4.9	5.9	4.6
3"	4.1	5.2	6.6	5.9	6.5
4"	4.8	6.7	6.6	5.9	6.5
6"	5.5	8.5	NA	NA	11.7
8"	5.0	11.2	NA	NA	18.1

B5107-Series Butterfly Valve Part Number Key Example: B5107E050CC-A		Series	Seat Material	Valve Size	Connection End	Connection End	*	Actuation	Control Unit/ Feedback	Alt. Finish Option
Series	Code	B5107	E	050	C	C	-	A		
5107	B5107									
Seat Material	Code		E							
EPDM	E									
Silicone	S									
FKM	V									
Valve Size	Code			050						
1/2"	050									
3/4"	075									
1"	100									
1-1/2"	150									
2"	200									
2-1/2"	250									
3"	300									
4"	400									
6"	600									
8"	800									
Connections (choose connection for each side of valve)	Code									
Clamp	C									
Weld	B									
Female I-Line	F									
Male I-Line	M									
Threaded Bevel	T									
Plain Bevel	P									
Q-Line	Q									
Actuation	Code									
Manual Handle - 4 Position Standard Handle	A									
Manual Handle - Infinite Position Handle	B									
Manual Handle - 13 Position Trigger Handle	C									
24VDC Electric (Power Open/Power Close)	D									
110VAC Electric (Power Open/Power Close)	E									
Normally Open Linear Pneumatic Vertical Canister (Cannot Be Used On Valves Over 4")	F									
Normally Closed Linear Pneumatic Vertical Canister (Cannot Be Used On Valves Over 4")	G									
Air to Air Linear Pneumatic Vertical Canister (Cannot Be Used On Valves Over 4")	H									
Air to Air Pneumatic Rack & Pinion SS	J									
Normally Closed Pneumatic Rack & Pinion SS	K									
Normally Open Pneumatic Rack & Pinion SS	L									
Air to Air Pneumatic Rack & Pinion AL	M									
Normally Closed Pneumatic Rack & Pinion AL	N									
Normally Open Pneumatic Rack & Pinion AL	P									
Normally Closed, Dead Man Handle	Q									
220VAC Electric (Power Open/Power Close)	R									
Control Unit / Feedback	Code									
None	blank									
<i>Only available to be used with the following Actuation Codes: C, F, G, & H</i>										
10-30VDC 12mm External Prox, PNP, Open/Close, (Qty 2), flying leads	01									
10-30 VDC 12mm External Prox, NPN, Open/Close, (Qty 2), flying leads	02									
10-30VDC 12mm External Prox, PNP, Open, (Qty 1), flying leads	03									
10-30VDC 12mm External Prox, PNP, Close, (Qty 1), flying leads	04									
10-30 VDC 12mm External Prox, NPN, Open, (Qty 1), flying leads	05									
10-30VDC 12mm External Prox, PNP, Open/Close, (Qty 2), M12 Quick Disconnect	06									
10-30 VDC 12mm External Prox, NPN, Open/Close, (Qty 2), M12 Quick Disconnect	07									
10-30VDC 12mm External Prox, PNP, Open, (Qty 1), M12 Quick Disconnect	08									
10-30VDC 12mm External Prox, PNP, Close, (Qty 1), M12 Quick Disconnect	09									
10-30 VDC 12mm External Prox, NPN, Open, (Qty 1), M12 Quick Disconnect	10									
<i>Only available to be used with the following Actuation Codes: F, G, & H</i>										
Burkert 8691, Single Acting, DeviceNet, Multipin	11									
Burkert 8691, Single Acting, AS-i, Multipin	12									
Burkert 8691, Single Acting, 24VDC, Multipin	13									
Burkert 8691, Double Acting, DeviceNet, Multipin	14									
Burkert 8691, Double Acting, AS-i, Multipin	15									
Burkert 8691, Double Acting, 24VDC, Multipin	16									
Burkert 8691, Without Solenoid, 24VDC, Multipin	17									
Burkert 8692 Positioner, 24VDC, 4-20mA, Multipin	18									
<i>Only available to be used with the following Actuation Codes: A, J, K, L, M, N, & P</i>										
Limit Switch Box, OPEN/CLOSE Beacon, (2) SPDT Mech. Switches	19									
Limit Switch Box, OPEN/CLOSE Beacon, (2) Proximity SPDT Switches	20									
Limit Switch Box, OPEN/CLOSE Beacon, AS-I Interface	21									
<i>Only available to be used with the following Actuation Codes: J, K, L, M, N, & P</i>										
Rotary Pneumatic Positioner 3-15psi input, no feedback	22									
Rotary Pneumatic Positioner 3-15psi input, (2) SPDT Mech. Switches for Feedback	23									
Rotary Pneumatic Positioner 3-15psi input, 4-20mA for Feedback	24									
Rotary Electropneumatic Positioner 4-20mA input, no Feedback	25									
Rotary Electropneumatic Positioner 4-20mA input, (2) SPDT Mech. Switches for Feedback	26									
Rotary Electropneumatic Positioner 4-20mA input, 4-20mA for Feedback	27									
Rotary Electropneumatic Positioner 0-10v input, no Feedback	28									
Rotary Electropneumatic Positioner 0-10v input, (2) SPDT Mech. Switches for Feedback	29									
Rotary Electropneumatic Positioner 0-10v input, 4-20mA for Feedback	30									
Single Coil Solenoid, 12VDC	31									
Single Coil Solenoid, 24VDC	32									
Single Coil Solenoid, 24VAC	33									
Single Coil Solenoid, 110VAC	34									
Single Coil Solenoid, 220VAC	35									
Single Coil Solenoid, 12VDC + Option 19 Limit Switch	36									
Single Coil Solenoid, 12VDC + Option 20 Limit Switch	37									
Single Coil Solenoid, 24VDC + Option 19 Limit Switch	38									
Single Coil Solenoid, 24VDC + Option 20 Limit Switch	39									
Single Coil Solenoid, 24VAC + Option 19 Limit Switch	40									
Single Coil Solenoid, 24VAC + Option 20 Limit Switch	41									
Single Coil Solenoid, 110VAC + Option 19 Limit Switch	42									
Single Coil Solenoid, 110VAC + Option 20 Limit Switch	43									
Single Coil Solenoid, 220VAC + Option 19 Limit Switch	44									
Single Coil Solenoid, 220VAC + Option 20 Limit Switch	45									
Limit Switch Box with Integral Solenoid, AS-i, 24VDC	46									
Aluminum Prox Ring With Red Poly Tube Indicator	47									
Rotary Electropneumatic Positioner 4-20mA input, no Feedback, Explosion Proof	48									
Alt. Finish Option	Code									
None	blank									
25R _s Mechanical	B									
20R _s Mechanical	C									
15R _s Electropolish	D									

* Only use a dash (-) in the part number if using a manual handle with no options, otherwise the dash is eliminated.

Troubleshooting

Problem	Possible Cause	Solution
VALVE IS NOT OPENING SMOOTHLY	Valve seal is sticking to the disc and jamming.	Lubricate with food grade grease.
	Excessive pressure on line.	Check line for proper support and correct as necessary.
	Actuator is not operating properly.	Confirm the supply pressure to the actuator is adequate Replace in necessary
VALVE WILL NOT OPEN OR CLOSE	Valve seat has deformed.	Replace the valve seat.
	Actuator is not being used properly.	Check air connections.
	Actuator is clogged with debris.	Check the actuator & clean.
	Actuator component is worn out.	Replace worn components.
WATER HAMMER	The valve is closing too fast.	Install a flow regulator to adjust the closing speed of the actuator
VALVE IS LEAKING AROUND THE SHAFT	The seal has worn or degraded.	Replace the seat.
		Change the seats to another material that is more compatible with the process fluid.
VALVE IS LEAKING INTERNALLY PASSED THE DISC IN THE CLOSED POSITION	Seats worn by product.	Change the valve seat.
	Excessive external stress on the valve body.	Support line properly
	Process fluid temperature exceeds valve rating.	Lower the fluid temperature.
	High cycling in short amount of time.	Decrease cycle times.
	Valve body bolts are loose.	Tighten all fasteners.

Limited Warranty

DIXON VALVE AND COUPLING COMPANY (herein called "Dixon") warrants the products described herein and manufactured by Dixon to be free from defects in material and workmanship for a period of one (1) year from date of shipment by Dixon under normal use and service. Its sole obligation under this warranty being limited to repairing or replacing, as hereinafter provided, at its option any product found to Dixon's satisfaction to be defective upon examination by it, provided that such product shall be returned for inspection to Dixon's factory within three (3) months after discovery of the defect. The repair or replacement of defective products will be made without charge for parts or labor. This warranty shall not apply to: (a) parts or products not manufactured by Dixon, the warranty of such items being limited to the actual warranty extended to Dixon by its supplier; (b) any product that has been subject to abuse, negligence, accident, or misapplication; (c) any product altered or repaired by others than Dixon; and (d) to normal maintenance services and the replacement of service items (such as washers, gaskets and lubricants) made in connection with such services. To the extent permitted by law, this limited warranty shall extend only to the buyer and any other person reasonably expected to use or consume the goods who is injured in person by any breach of the warranty. No action may be brought against Dixon for an alleged breach of warranty unless such action is instituted within one (1) year from the date the cause of action accrues. This limited warranty shall be construed and enforced to the fullest extent allowable by applicable law.

Other than the obligation of Dixon set forth herein, Dixon disclaims all warranties, express or implied, including but not limited to any implied warranties of merchantability or fitness for a particular purpose, and any other obligation or liability. The foregoing constitutes Dixon's sole obligation with respect to damages, whether direct, incidental or consequential, resulting from the use or performance of the product.

Some products and sizes may be discontinued when stock is depleted or may require a minimum quantity for ordering

Dixon, founded in 1916, is a premier manufacturer and supplier of hose couplings, valves, dry-disconnects, swivels, and other fluid transfer and control products. The company's global reach includes a wide range of products for numerous industries including petroleum exploration, refining, transportation, chemical processing, food & beverage, steel, fire protection, construction, mining and manufacturing. Dixon's strategic objective is to create solutions that make products safer, leak-free, longer lasting, and always available.



The Right Connection®

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