Contents

1 SCOPE

1.1 CAUTION

1.1.1 For your safety, read this manual before installation or servicing.

1.1.2 Before installing or servicing, please ensure the line pressure has been relieved and any hazardous fluids have been drained or purged from the system.

1.1.3 Ensure that all Lockout and Tagout procedures for the system have been properly implemented.

1.2 USE

1.2.1 A-T Controls NS Series Resilient Seated Butterfly Valves are available in lug and wafer style designs and are compatible with ANSI B16.5 Class 125/150 flanges. Wafer style valves are also compatible with EN1092-2 PN10/16 flanges.

1.2.2 Maximum results and optimum valve life can be maintained under normal service conditions and in accordance with pressure/temperature ratings and corrosion data chart.

2 INSTALLATION

2.1 A-T Controls NS Series Resilient Seated Butterfly Valves are bi-directional and can be installed with the flow in either direction. The valve can be mounted in any position so that the handle, gear, or actuator has proper clearance, can be easily accessed, and the open/close indicator can be viewed. If the gear is equipped with a chain wheel, the valve shall be mounted in a way so that the chain does not come in contact with the valve or pipeline.

2.2 Before installation of the valves, the pipe must be flushed clean of dirt, burrs, and welding residues. Failure to do so can cause the seats and sealing surfaces to be damaged.

2.3 The pipe must be free from tension and in proper alignment.

2.4 Before installation of the valves, check to ensure that all flange seals are free from defects.

IMPORTANT NOTE: Flange gaskets shall not be used with A-T Controls NS Series Resilient Seated Butterfly Valves. The valves have a seal around the seat so that a gasket shall not be used.

2.5 Before installation of the valves, check to ensure that there is proper clearance for the disc to be able to fully open and close without being obstructed. This is especially important when using sch. 80 pipe as the clearances become smaller. See the NS Series catalog for valve dimensions.

2.6 A-T Controls NS Series Resilient Seated Butterfly Valves shall be installed in the pipeline completely assembled and open approximately 5 degrees from the closed position. The valves shall NOT be opened so that the disc is outside of the seat. Do NOT disassemble the valves or remove any handles, gears, or actuators to install.

2.7 Install the valve in the pipeline and tighten the flange bolts properly per the recommended minimum flange bolt torques in the table below. The bolts shall be torqued in a uniform pattern as to evenly compress the seat for sealing (no flange gaskets shall be used).

Recommended Minimum Flange Bolt Torques NS Series Resilient Seated Butterfly Valves			
Size	Torque (ft-lbs)	Size	Torque (ft-lbs)
2"	40-50	**10"**	95-120
2-1/2"	40-50	**12"**	120-150
3"	65-80	**14"**	225-250
4"	40-50	**16"**	215-240
5"	75-95	**18"**	300-330
6"	75-95	**20"**	275-300
8"	100-125	**24"**	440-470

2.8 DEAD-END SERVICE

A-T Controls NS Series Resilient Seated Butterfly Valves are rated for bi-directional dead-end service applications. The vulcanized molded seat design of these valves is what gives the valve its bi-directional dead-end service capability. The dead-end service rating for these valves follows the standard operating pressures and temperatures given in the catalog. The Dead-End Service White Paper on A-T Controls website can also be referenced for more information.

3 VALVE OPERATION

3.1 MANUAL

CAUTION: A-T Controls recommends a manual gear operator for all valves larger than 6".

3.1.1 HANDLES

3.1.1.1 10 Position Handles

To **OPEN** the valve; squeeze the handle to unlock it and turn it in the counter-clockwise direction. The handle can be locked in at 10 degree increments to adjust the flow. The valve will be locked into the 90 degree marker and parallel to the pipeline when fully open.

To **CLOSE** the valve; squeeze the handle to unlock it and turn it in the clockwise direction. The handle can be locked in at 10 degree increments to adjust the flow. The valve will be locked into the 0 degree marker and perpendicular to the pipeline when fully closed.

Note: The handles contain a pin that can be used to deter unwanted operation. The pin can be removed if unnecessary per the end user's requirement. A padlock (not included) can also be used through this hole in the handle to lock out operation of the handle.

3.1.1.2 Infinite Handles

To **OPEN** the valve; loosen the lock bolt & nut to unlock it and turn the handle in the counter-clockwise direction. The handle can be set in infinite positions between fully open and fully closed to adjust the flow. Once in the desired position, tighten the lock bolt & nut to hold the handle in place. The valve will be fully counter-clockwise and parallel to the pipeline when fully open.

To **CLOSE** the valve; loosen the lock bolt & nut to unlock it and turn the handle in the clockwise direction. The handle can be set in infinite positions between fully open and fully closed to adjust the flow. Once in the desired position, tighten the lock bolt & nut to hold the handle in place. The valve will be fully clockwise and perpendicular to the pipeline when fully closed.

3.1.2 GEAR

To **OPEN** the valve; turn the hand wheel counter-clockwise. The indicator will be pointing to the open position and stop rotating when fully opened. The flow can be adjusted by stopping the indicator anywhere between open and close.

To **CLOSE** the valve; turn the hand wheel clockwise. The indicator will be pointing to the close position and the hand wheel will stop rotating when fully closed. The flow can be adjusted by stopping the indicator anywhere between open and close.

Note: The gears contain a locking device that allows handwheel operation to be locked out through the use of a padlock (not included). The locking device can be removed if unnecessary per the end user's requirement.

3.2 AUTOMATED

A-T Controls NS Series Resilient Seated Butterfly Valves can be mounted with quarter turn actuators. Valves with actuators shall be checked for proper valve stem alignment. Angular or linear misalignments may result in high operational torque and unnecessary wear on the valve stem. See the actuator IOM for information on operating the actuator.

Note: When closing the valve, the disc will begin to seal on the seat before it is perfectly perpendicular to the pipeline/flow. In certain circumstances this may be desired to reduce the torque required to "close" the valve or when moving from the closed to open position. Gear or actuator stops can be adjusted to achieve the new "closed" position. This would only be recommended for lower pressure applications as A-T Controls only rates the valves to the full pressure differential in the fully closed position.

4 DISASSEMBLY

A-T Controls NS Series Resilient Seated Butterfly Valves are not designed to be repaired and shall be replaced with a new valve in the case of valve failure. This is due to the vulcanized molded seat design which is not able to be separated from the body and replaced.

5 STORAGE

A-T Controls NS Series Resilient Seated Butterfly Valves should be clean and bagged sufficiently to prevent contamination and stored in a cool, dark place.

6 REPAIR KITS

Repair kits are not available for A-T Controls NS Series Resilient Seated Butterfly Valves as they are not repairable due to the seat being molded to the body.

8 BILL OF MATERIALS

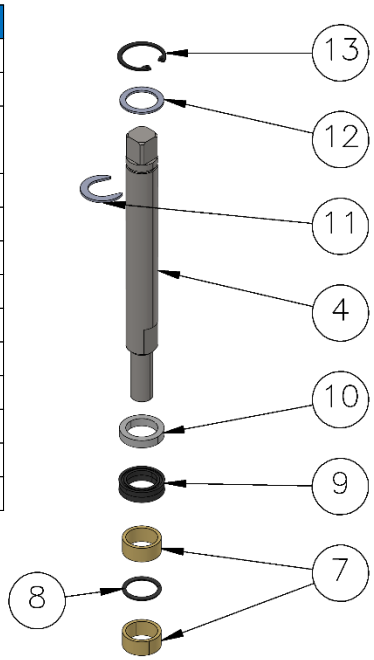
Bill of Materials (2"-14")

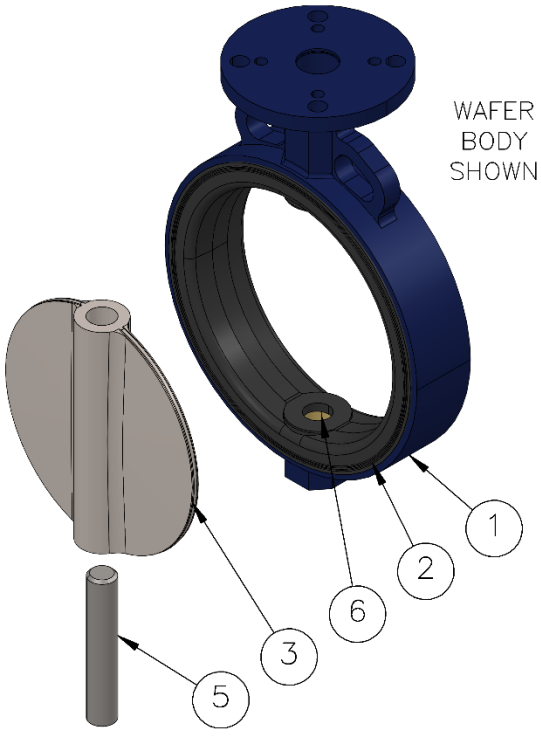
Item No.	Description	Material	Qty
1	Body	ASTM A395 / A351 CF8M	1
2	Seat	EPDM (NSF) / Buna-N / (FKM / Viton®)	1
3	Disc	A351 CF8M (NSF) / Nylon Coated DI (NSF) / Aluminum Bronze / Nickel Plated DI	1
4	Upper Stem*	17-4 PH	1
5	Lower Stem*	17-4 PH	1
6	Flange Bushing	Brass #	2
7	Bushing	Brass #	3**
8	O-Ring	Buna-N #	1
9	X-Ring	Buna-N #	1
10	Bushing	PTFE #	1
11	Stem Retainer	ASTM A276 304	1
12	Thrust Washer	ASTM A276 304	1
13	Snap Ring	SK7 Steel	1

**2"-3" valves have a one-piece stem.*

***one bushing(7) not shown is located below lower stem flange bushing(6).*

 # Under normal operation, the O-Ring and Bushings are not subjected to internal media & pressure.



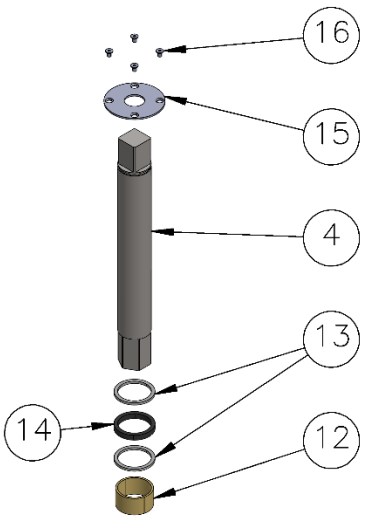


Bill of Materials (16"-24")

Item No.	Description	Material	Qty
1	Body	ASTM A395 / A351 CF8M	1
2	Seat	EPDM (NSF) / Buna-N / (FKM / Viton®)	1
3	Disc	A351 CF8M (NSF) / Nylon Coated DI (NSF) / Aluminum Bronze / Nickel Plated DI	1
4	Upper Stem	17-4 PH	1
5	Lower Stem	17-4 PH	1
6	Bottom Cover Bolt	A2-70	4*
7	Bottom Cover Lock Washer	ASTM A276 304	4*
8	Bottom Cover Flat Washer	ASTM A276 304	4*
9	Bottom Cover O-Ring	Buna-N #	1
10	Bottom Cover	ASTM A395 / A351 CF8M	1
11	Flange Bushing	Brass #	2
12	Long Bushing	Brass #	2
13	Short Bushing	PTFE #	2
14	Packing	Buna-N #	1
15	Gland	WCB / ASTM A276 316	1
16	Gland Bolt	A2-70	4

**16"-20" valves have quantity 2.*

 # Under normal operation, the O-Ring and Bushings are not subjected to internal media & pressure.



9 STUD & BOLT SIZING

NS Series Resilient Seated Butterfly Valve Stud & Bolt Sizing							
Class 150							
Valve Size	Thread Size	Wafer Studs		Lug Studs		Lug Bolts	
		Qty	Length	Qty	Length	Qty	Length
2"	5/8 - 11	4	5.00	4	2.50	4	1.25
2-1/2"	5/8 - 11	4	5.50	4	2.75	4	1.50
3"	5/8 - 11	4	5.50	4	2.75	4	1.50
4"	5/8 - 11	8	5.75	8	3.00	8	1.75
5"	3/4 - 10	8	6.25	8	3.25	8	1.75
6"	3/4 - 10	8	6.50	8	3.25	8	1.75
8"	3/4 - 10	8	6.75	8	3.50	8	2.00
10"	7/8 - 9	12	7.50	12	3.75	12	2.25
12"	7/8 - 9	12	8.00	12	4.00	12	2.50
14"	1 - 8	12	8.75	12	4.50	12	2.50
16"	1 - 8	16	9.75	16	5.00	16	3.00
18"	1 1/8 - 7	16	10.75	16	5.50	16	3.50
20"	1 1/8 - 7	20	11.50	20	5.75	20	3.75
24"	1 1/4 - 7	20	13.25	20	6.75	20	4.50

• Lengths are based on basic heavy hex nuts and flange thicknesses per ANSI B16.5.

• Lug Stud and Bolt quantities are per side.

• A-T Controls recommends using studs to ensure full engagement in tapped holes.

• This table is provided by A-T Controls for reference only, it is the end user's responsibility to select the correct material, grade, and size of fasteners for their application.

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