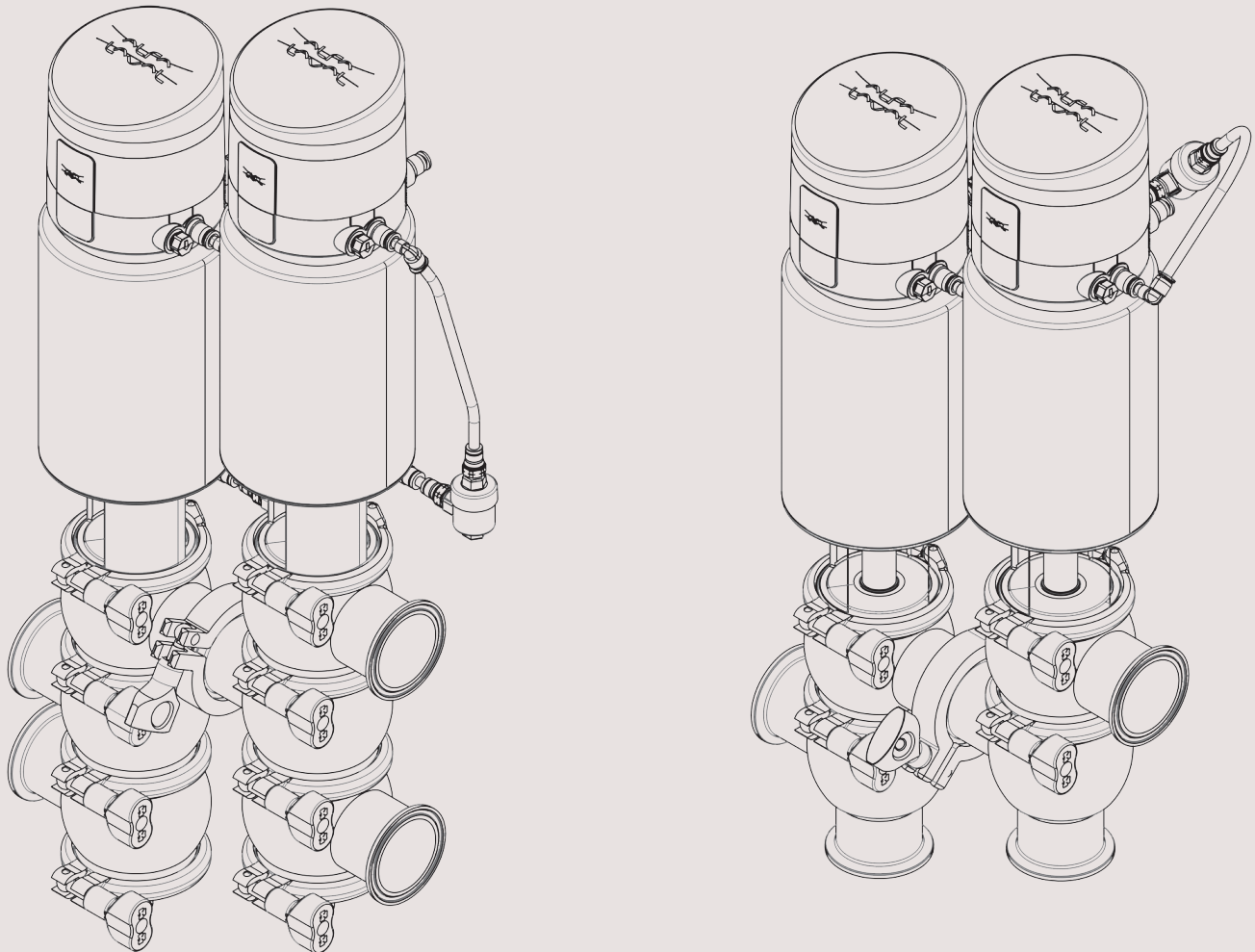


Instruction Manual

Unique SSV Flo-Diversion Valve



100001794EN2 2020-01



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The information herein is correct at the time of issue but may be subject to change without prior notice.

Thank you for purchasing an Alfa Laval Product!

This manual contains installation, operation, and repair instructions, Flo-Diversion Valves designed and manufactured by Alfa Laval Inc. It also provides a troubleshooting chart to assist in determining electrical and mechanical malfunctions, if they should occur.

READ THIS MANUAL carefully to learn how to service and reconfigure these valves. Failure to do so could result in personal injury or equipment damage.

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All warnings in the manual are summarized on this page.

Pay special attention to the instructions below so that severe personal injury and/or damage to the valve are avoided.

Installation



- **Always** read the technical data thoroughly.
- **Always** release compressed air after use.
- **Never** touch the moving parts if the actuator is supplied with compressed air.
- **Never** touch the valve or the pipeline when processing hot liquids or when sterilizing.
- **Never** dismantle the valve with valve and pipelines under pressure
- **Never** dismantle the valve when it is hot

Operation



- **Never** dismantle the valve with valve and pipelines under pressure.
- **Never** dismantle the valve when it is hot.
- **Always** read the technical data thoroughly.
- **Always** release compressed air after use.
- **Never** touch the valve or the pipelines when processing hot liquids or when sterilizing.
- **Never** touch the moving parts if the actuator is supplied with compressed air.
- **Always** rinse well with clean water after the cleaning.
- **Always** handle lye and acid with great care.

Maintenance



- **Always** read the technical data thoroughly.
- **Always** release compressed air after use.
- **Never** service the valve when it is hot.
- **Never** service the valve with valve and pipelines under pressure.
- **Never** stick your fingers through the valve ports if the actuator is supplied with compressed air.
- **Never** touch the moving parts if the actuator is supplied with compressed air.

Valve Assembly Nomenclature

Models: 7640, 7650 (optional reverse-acting tangential)

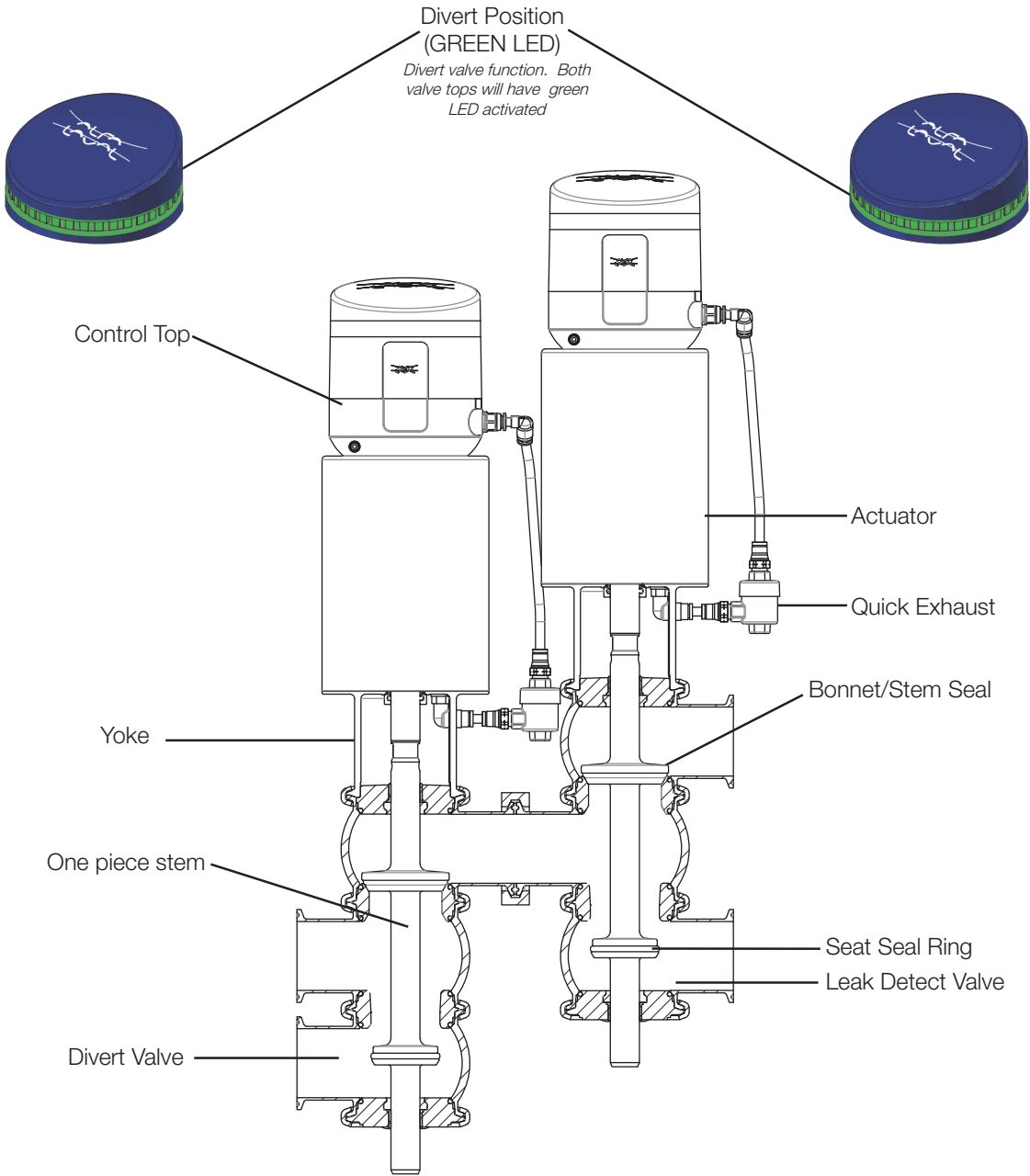
Sizes: Std. valve 1½", 2", 2½", 3"
RA 2", 2½", 3", 4"

Features: Design based on SSV Series valve.

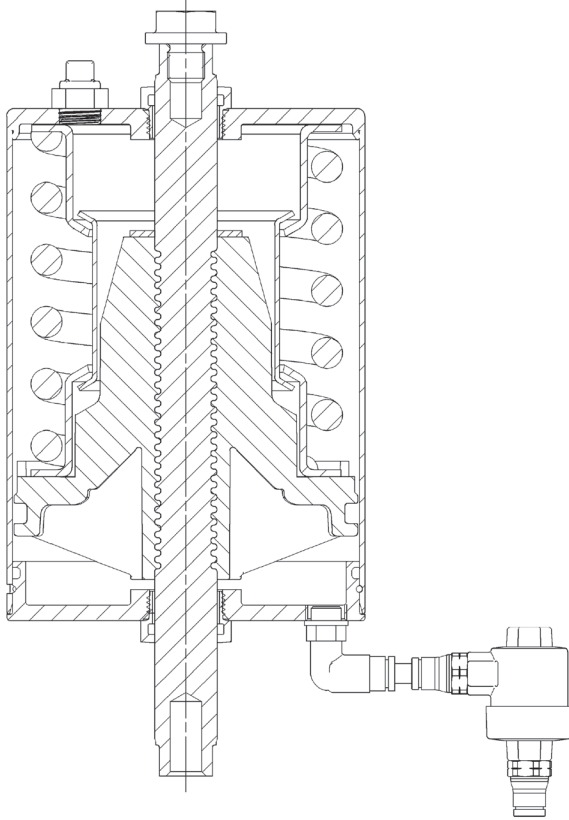
Available with either TR2 or elastomer seat rings. RA valve, elastomer seat only.

Fully maintainable.

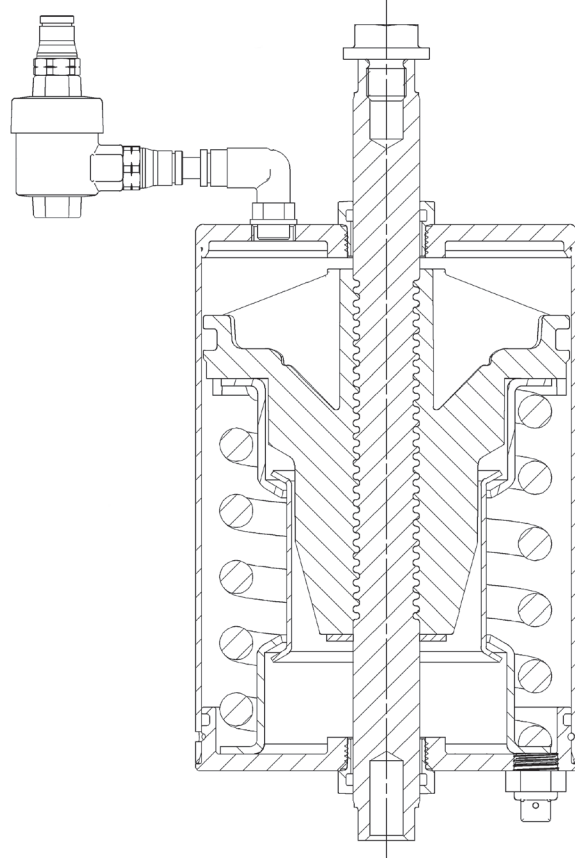
Use valves with existing control panel or new Alfa Laval PLC control panel.



Actuator Specifications



Reverse-Acting Valve
pneumatic movement upwards



Standard Valve
pneumatic movement downward

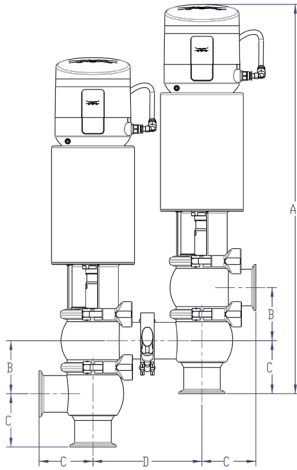
Air Supply Requirements

Minimum Air Pressure: 70 PSI
 Air Pressure Range: 70-100 PSI
 Air Volume Required:

Air Consumption (In3 Free air) for one stroke			
Valve Size	1" - 1½"	2" - 2½"	3" - 4"
NO and NC	0.96 x air pressure (PSI)	2.17 x air pressure (PSI)	5.51 x air pressure (PSI)



Performance and Dimensions

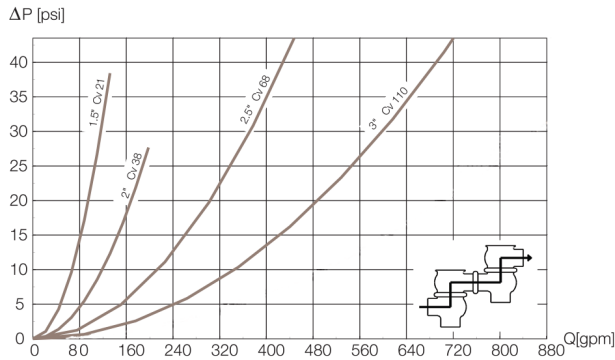


Valve Size	1½"	2"	2½"	3"
A	19.5	20.9	22.4	24.2
B	2.39	2.91	3.4	3.89
C	2.95	2.94	3.73	3.93
D	5.96	5.94	7.52	7.92
Stroke	.067	0.87	0.87	1.06

Pressure/Capacity Limits

Performance Unique 7640 Valves

Valve size	Max. Product pressure (PSI)	Required air supply (PSI)	Maximum Flow Rates
1½"		87	50 GPM
2"	125	87	85 GPM
2½"	100	87	160 GPM
3"	100	87	200 GPM



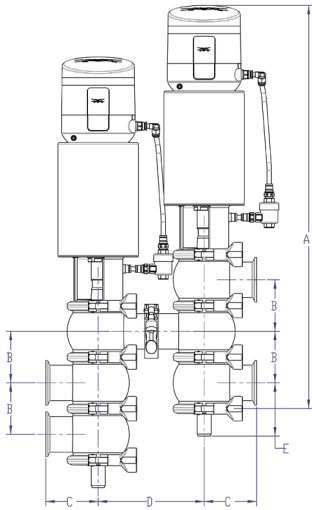
Note!

For the diagram the following applies:

Medium: Water (68°F).

Measurement: In accordance with VDI 2173.

Performance and Dimensions Reverse-Acting

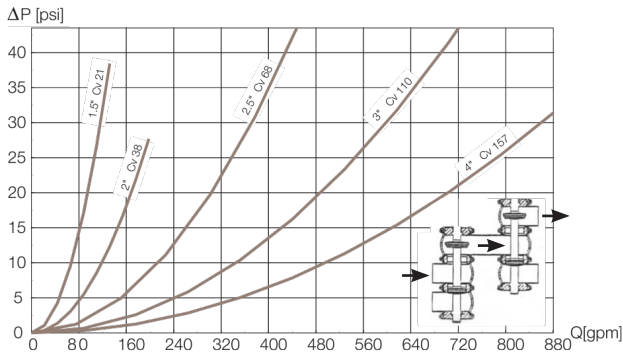


Valve Size	2"	2½"	3"	4"
A	20.9	22.4	24.2	29.2
B	2.91	3.4	3.89	4.87
C	2.94	3.73	3.93	4.72
D	5.94	7.52	7.92	10.76
E Stem Up	2.0	2.24	2.5	3.0
E Stem Down	3.0	3.22	3.68	4.2
Stroke	0.87	0.87	1.06	1.06

Pressure/Capacity Limits

Performance Unique 7640 Valves

Valve size	Max. Product pressure (PSI)	Required air supply (PSI)	Maximum Flow Rates
2"	125	87	85 GPM
2½"	100	87	160 GPM
3"	100	87	250 GPM
4"	45	87	485 GPM



Note!

For the diagram the following applies:

Medium: Water (68°F).

Measurement: In accordance with VDI 2173.

Unpacking Equipment

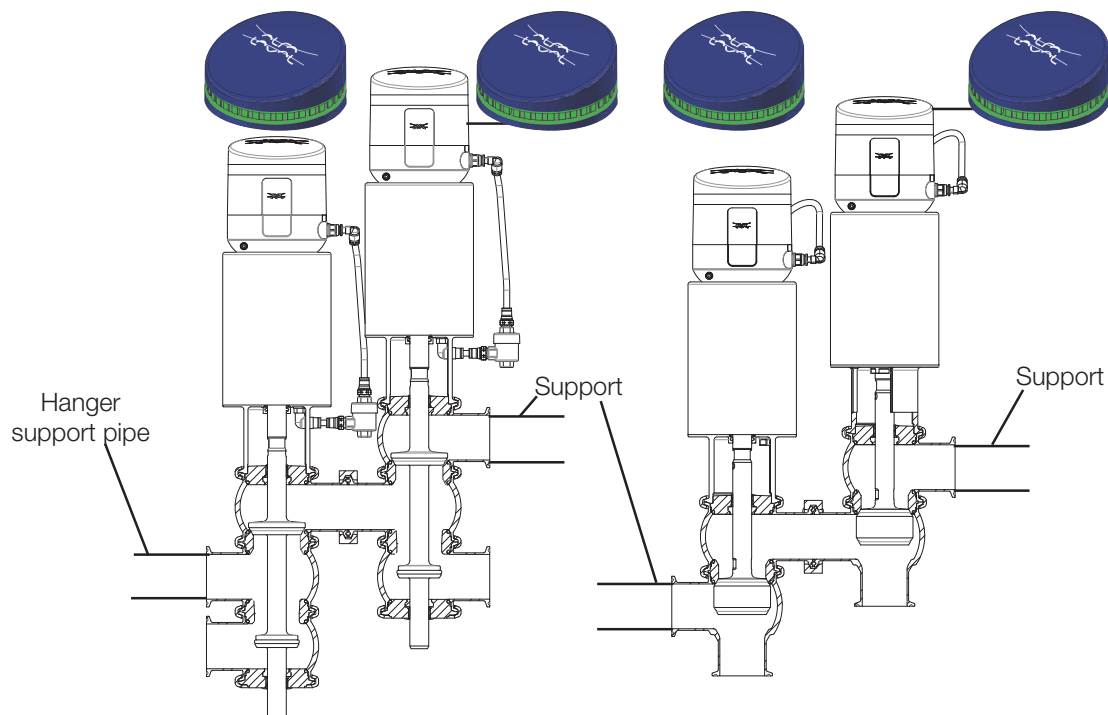
The Flo-Diversion Valve should be unpacked immediately upon receipt from the factory and carefully inspected for damage that may have occurred during shipping. The equipment should also be checked against the bill of lading to make sure there are no shortages. Any damage or shortage should be immediately reported to the carrier.

Location of Equipment

The valves are mounted at the end of the holding tube. Care should be taken, however, to locate the valves in a place where they are easily reached for maintenance and disassembly.

The control panel should be located near the valves, and positioned so it can be easily reached for changing the selector switch position, manual diversion, and when necessary, and for service of the electrical components if malfunctions should occur.

Easy access to the valve and panel is necessary for operator and regulatory agency testing. If valves are not accessible from the floor, and appropriate fixed platform may be required by state and federal regulators.



Installing the Equipment

Secure the valves to an adequate support, and connect the valves to the product piping. The valves are furnished with Tri-Clamp® fittings for simplified connections. Make sure the piping is self-supporting and that the joints at the valves are properly aligned to prevent strain on the valves.

Remove ThinkTops from their boxes and install on the valve actuators per installation instruction in ThinkTop manual section. Make air connections as described on page 12. ThinkTops have been programmed at the factory prior to shipment. Confirm set up with test procedures described in this manual.

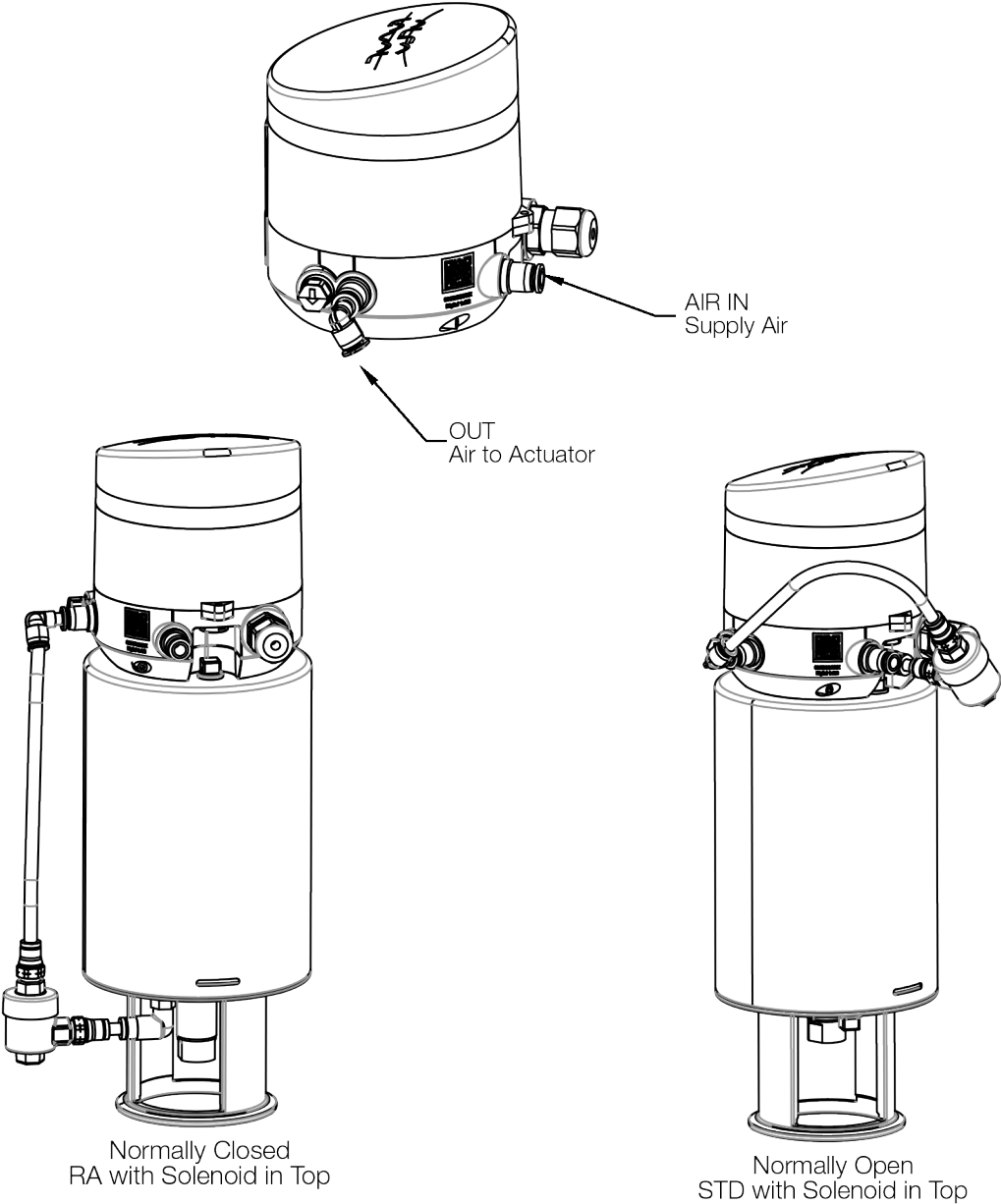
Air Supply

Connect a clean dry air supply. All air connections should be made with ¼ OD poly-flo tubing or equivalent. Black or galvanized pipe is not recommended. Before making final connections blow out all air lines to remove scale, metal fillings or other extraneous particles.

Make sure that the air lines are connected to the proper valves. Quick couplers are not acceptable as air connection joints.

See air connections (next page) for valves with the solenoids in the ThinkTops. For valves with the solenoids at the panel, the air lines will connect directly to the quick exhaust valve.

Pneumatic Connections with Solenoid in-top

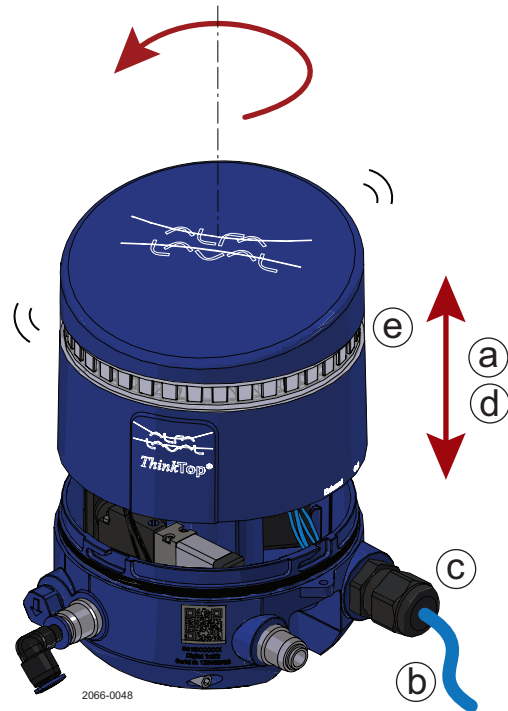


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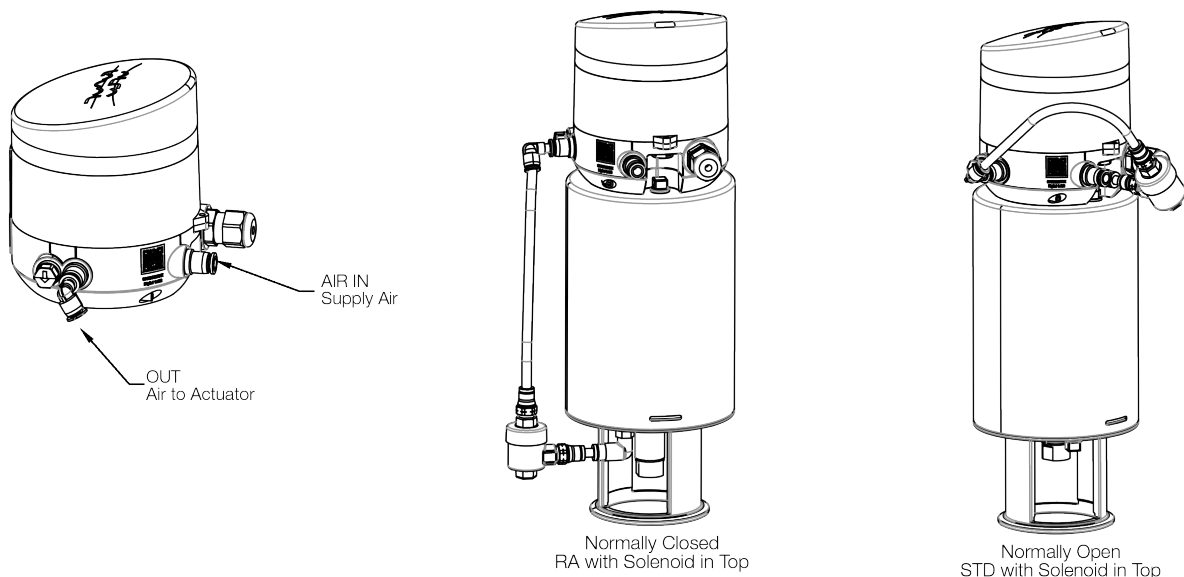
Electrical installation, Digital-IO 24V

- Remove the top cover by turning it counter clockwise and then lifting it upwards.
- Connect the cable to the ThinkTop, and then connect the wires to the terminals according to the wiring diagram.
- Tighten the cable gland using a 19 mm wrench (3 Nm). Or tighten the M12 connector using a 14 mm wrench (0.6...1.5 Nm).
- Put the top cover back in place.
- Turn on the power supply. If installed correctly, the light guide flashes green.



Terminals V50 Digital-IO 24V			
1	Power supply	24V	(brown)
2	Power supply	GND	(blue)
3	out (PLC in)	Status OK	(white)
4	out	Valve de-energised (DE-EN)	(black)
5	out	Main valve energised (EN)	(grey)
6	in	Solenoid valve 1 for main valve (SV1)	(pink)

Pneumatic Connections with Solenoid in ThinkTop



Operating Modes

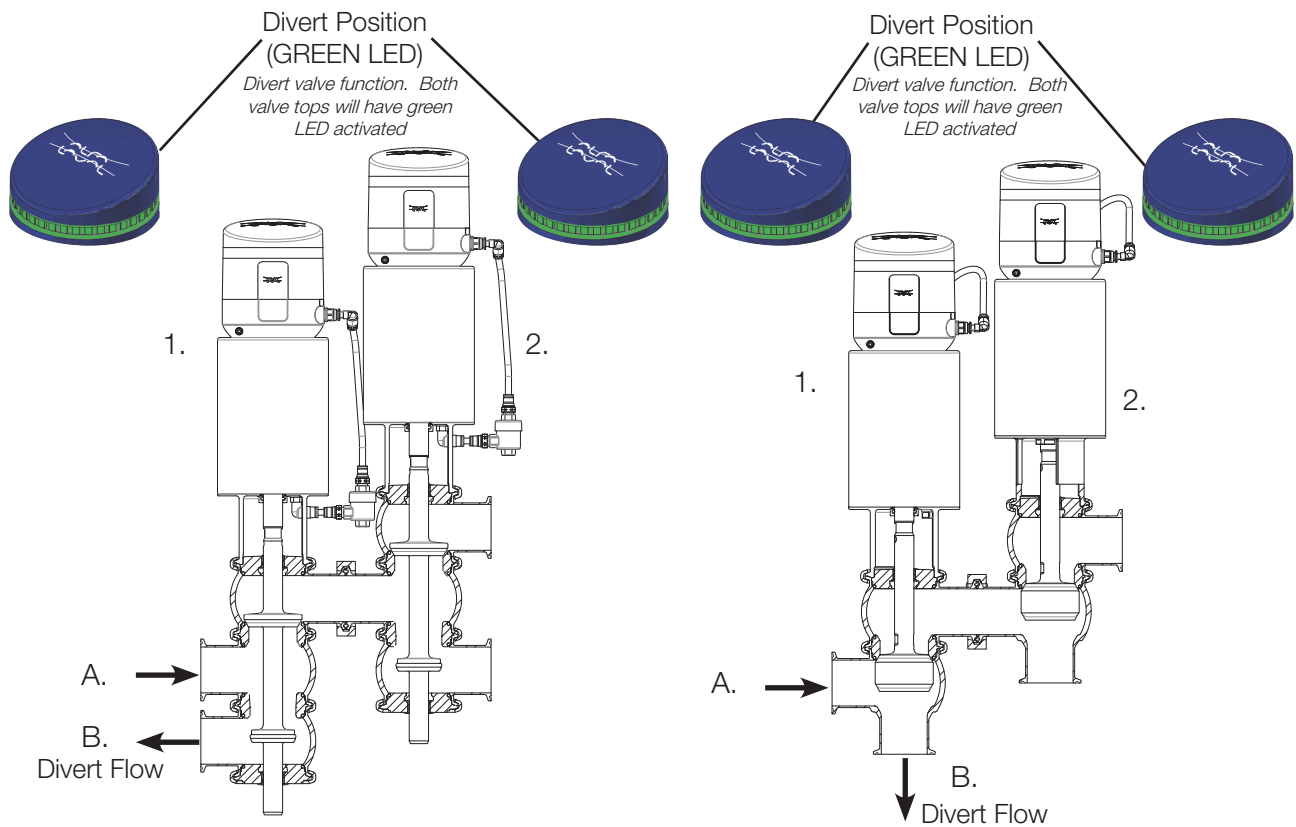
The Flow Diversion device consists of two (2) valves. Each is a two-position, three-way valve connected by a common body. This common body is the upper body of the Divert Valve and the middle body of the Leak Detect Valve. The air-to-raise actuators of the two valves are connected to independent air supplies which cycle the valves to the three operating modes; Divert, Flush and Forward Flow. A description of the three modes follows:

Divert Mode

Divert is the first mode of operation assumed by the Flow Diversion Valve in the start-up procedure. Until a legal product temperature is reached and normal system operation is established, the product is diverted to the Balance Tank. Stem position can be seen by checking the valve stem in the open yoke portion of the valve.

The Divert Valve should be in the divert position when:

1. The control panel selector switch is in the Divert Position
2. The control panel selector switch is in the "off" position.
3. The power supply is interrupted.
4. The air supply is interrupted.
5. If meter base timing system (MBTS) equals non legal flow condition
6. If temperature is below the STLR cut out set point



Reverse-Acting

1. Divert Valve
2. Leak Detect Valve
- A. Product Inlet
- B. To Balance Tank

Standard Valve

1. Divert Valve
2. Leak Detect Valve
- A. Product Inlet
- B. To Balance Tank



Flush Mode

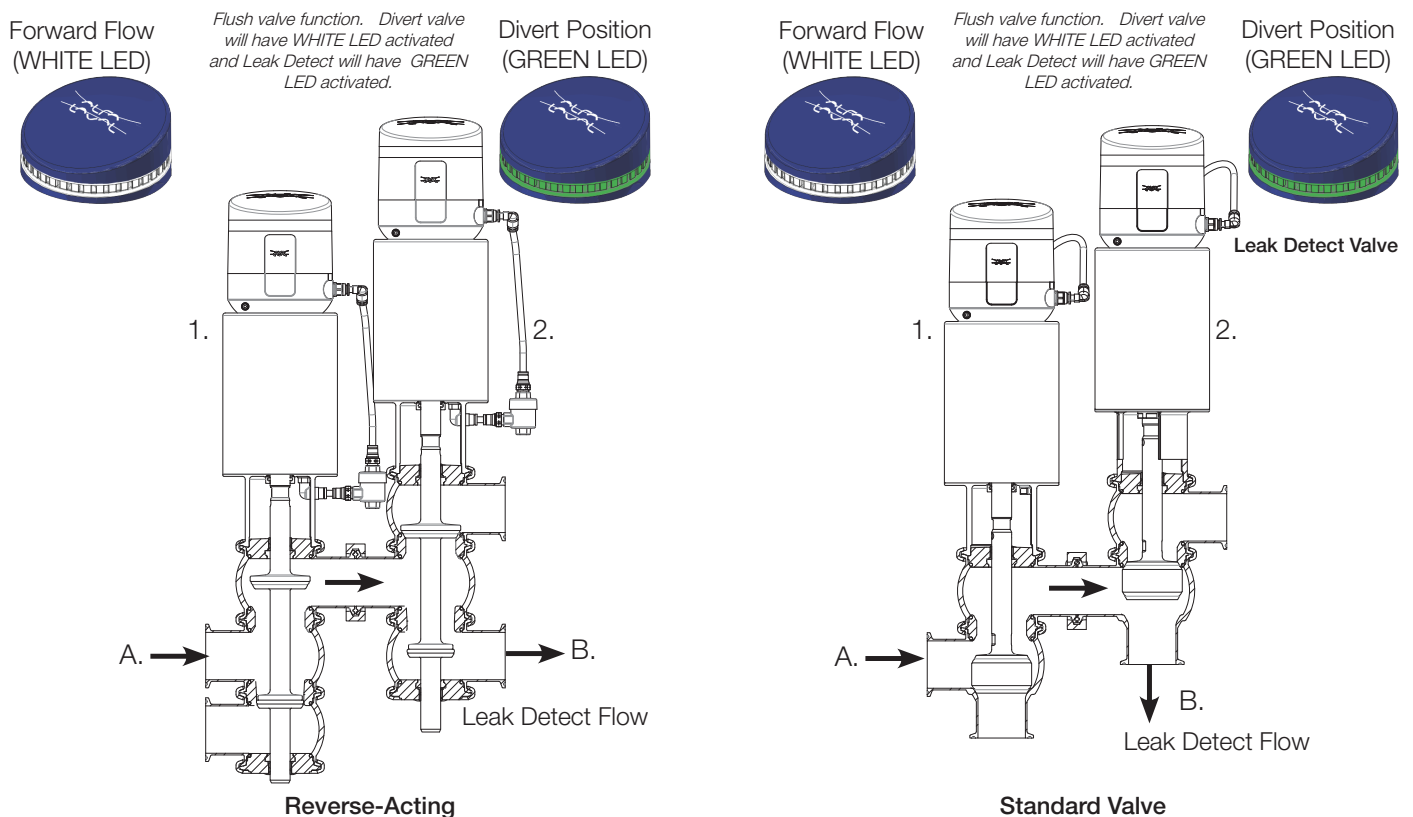
In this mode, correctly pasteurized product flushes and clears the common body between the Divert Valve and the Leak Detect Valve, by opening the divert valve for a set amount of time.

The legal flush delay timer is controlled by a Flow Divert Valve controller. This control system is separate from the Divert and Leak Detect Valves, but works in conjunction with them. The control system can be from several sources and of several designs but must be approved by the FDA prior to use.

Product that flows through the valves in the Flush mode is returned to the Balance Tank through the Leak Detect Valve and the Return Line. This line must be separate from the Divert Product Return Line, but both of these lines return the product to the Balance Tank.

The valve stems will be in the position as shown in below. Note: ThinkTop LED activated.

NOTE: The Divert and Leak Detect valves are not considered self draining, so the "FLUSH MODE" position must be held for not less than 1 second, no more than 5 seconds per PMO, before the valves are placed in the full forward flow position.



- 1. Divert Valve
- 2. Leak Detect Valve
- A. Product Inlet
- B. To Balance Tank

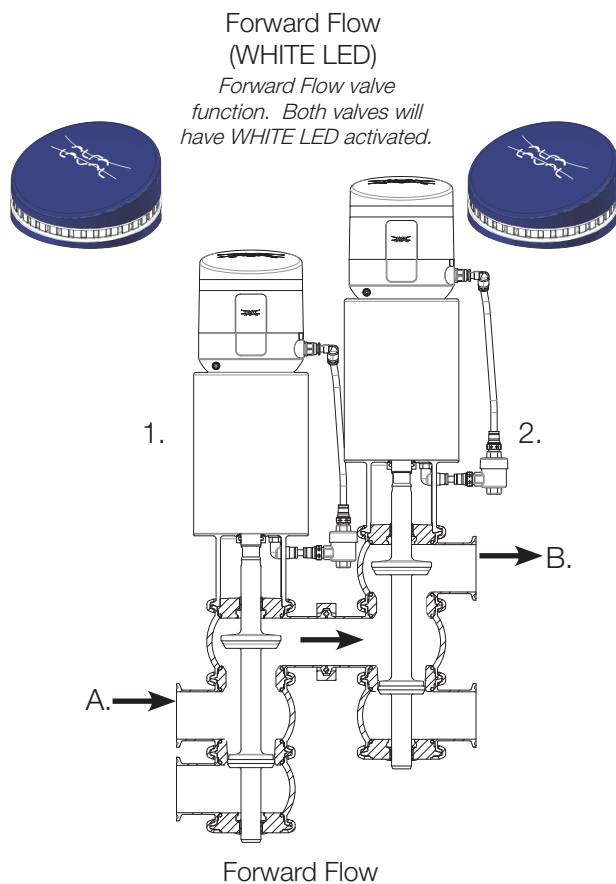


Forward Flow Mode

Forward Flow is the final operating mode of the Flow Diversion Valve. Product flows through both valves to the cooling sections of the pasteurization system.

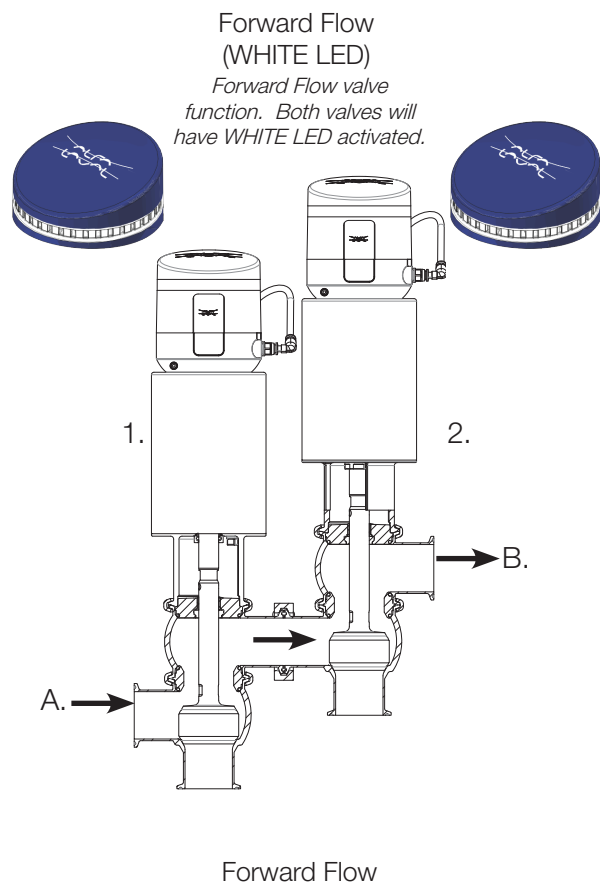
For the Forward Flow mode to be maintained:

1. The legal set temperature is above the legal divert set point.
2. The power supply and air supply must be maintained.
3. If meter base timing system (MBTS) is maintaining legal flow condition



Reverse-Acting

1. Divert Valve
 2. Leak Detect Valve
- A. Product Inlet
B. Forward Flow



Standard Valve

1. Divert Valve
 2. Leak Detect Valve
- A. Product Inlet
B. Forward Flow

ThinkTop Indication Specifications

ThinkTops use micro chip sensor technology which provides a more accurate position sensing than mechanical switches. The micro chips in the sensor, utilizing a principle called the Hall Effect, calculate the position of the indicating target to a very high degree of accuracy. This enables the sensor to detect even the slightest change in stem position.

The ThinkTop provides a sensor band width of 1.5 mm (0.059") accurate to 0.004". In contrast, a micro-switch roller can travel more than 1.6 mm (0.063") without an indication signal change. See Figure A, next page.

Further, the ThinkTop sensor has no moving parts to contacts to wear or break, so there is very little maintenance required.

The ThinkTop also provides visual indication lights to show valve position.

Auto Setup

Auto Setup activates all available pilot valves and automatically completes the setup. Proper power and air supply must be connected to the top prior to performing the Auto Setup

Perform Auto Setup

- 1 Remove the top cover by turning it counter clockwise and then lifting it upwards. If necessary, break seal wire.
- 2 Press the SELECT button and then the ENTER button to initiate the Auto Setup functionality.

When Auto Setup has completed successfully, the following happens:

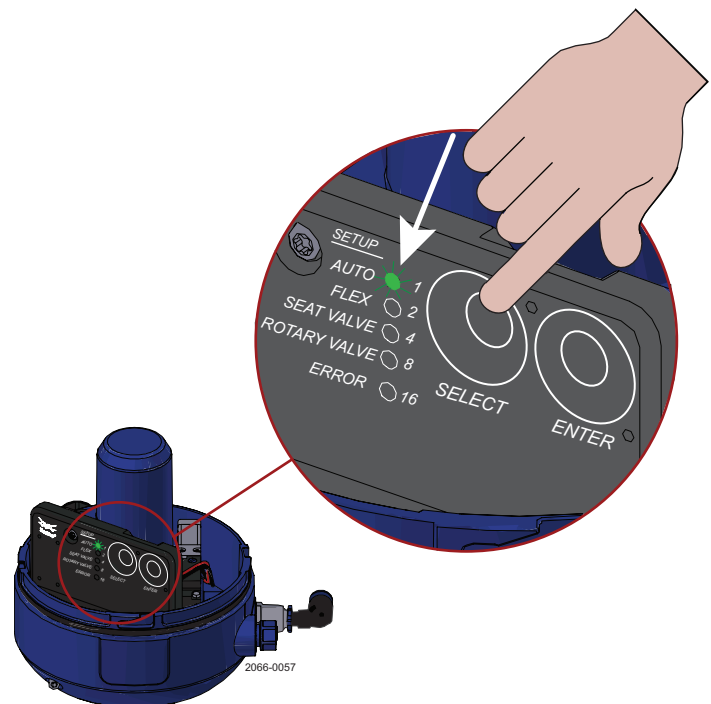
- The light guide lights steady green.
- The control unit is now in operation mode.

- 3 Put the top cover back in place.
- 4 Run an IO test to verify that the system returns the correct feedback.

Canceling Auto Setup

Press the SELECT button, to cancel Auto Setup.

NOTE: Please refer to page 17 for Valve Assembly Test and Sealing Instructions if necessary



Valve Assembly Test and Sealing Instructions

The ThinkTop sensors on these valves are safety devices. They are adjusted so that the flow promoting device will not run, at sub-legal pasteurization temperatures, unless the valves are completely and properly assembled.

To test the sensor adjustment:

Note: Test can be performed without breaking 'seal wire' if ThinkTop does not need to be reprogrammed. If ThinkTop needs to be reprogrammed refer to page 16 for Auto Setup instructions.

- A. Make certain the valves are properly assembled, paying particular attention to the actuator mounting, yoke bonnet and body clamps, and the valve stem to actuator stem connection.
- B. Make sure the temperature sensing element of the Safety Thermal Limit Recorder Controller is below legal pasteurization temperature.
- C. Momentarily turn on the flow promoting device (timing pump) to make sure it is operating properly, and then turn it off.
- D. Unscrew 2 Allen screws (2.5mm) and remove ThinkTop (Figure A).
- E. Test spacer is installed beneath the magnet in operation mode. (Figure 1)
- F. Unscrew sensor target and flip test spacer 180° between the stem and magnet. (Figure 2-3)
- G. Assemble sensor target and test spacer for Test Mode per Figure 4. Reassemble ThinkTop to top of actuator and screw in the 2 Allen screws (2.5 mm).
- H. Turn the selector switch to the "Product" position and the flow promoting device (timing pump) should not start.
- I. Flip the spacer 180° and reassemble the valve in Operation Mode (Figure 1). Ensure valve is properly and completely assembled.
- J. Repeat steps D - I with the leak detect valve.
- K. When positive test results are obtained, if necessary attach new seal wire Through the hole on ThinkTop cover as noted in Figure A, Detail B.

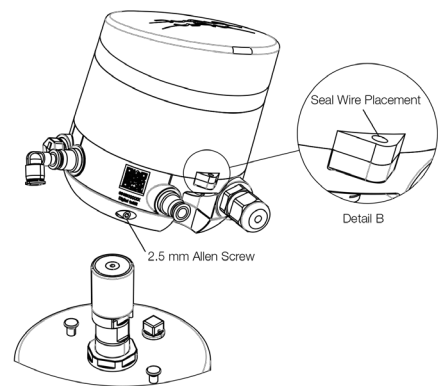
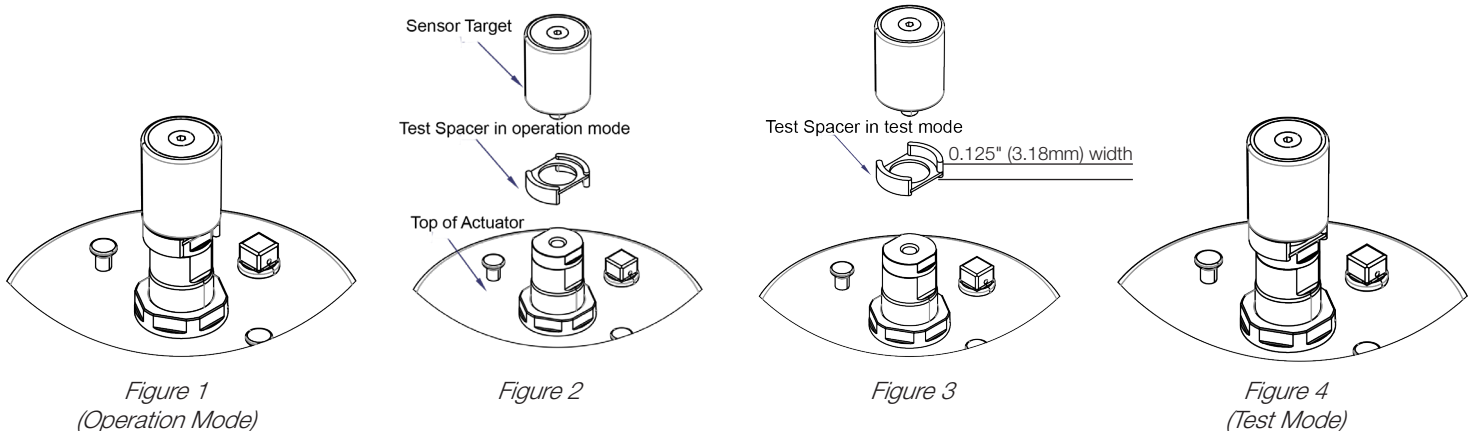


Figure A



Note: Figure 1 displays the sensor target and test spacer the operation mode. Figure 4 displays the the test spacer in test mode which produces a gap between the sensor target and the top of the actuator stem.

CORRECTIVE ACTION: If the flow promoting device (timing pump) fails to respond as indicated in the above described procedure, an immediate check of the Flow Diversion Valve assembly, ThinkTop adjustment and wiring is required to locate and correct the cause.



Recommended Cleaning

The valve is designed for cleaning in place (CIP). CIP = Cleaning In Place. Study the instructions carefully and pay special attention to the warnings! NaOH = Caustic Soda. HNO₃ = Nitric acid.

Step 1



Always handle lye and acid with great care.

Caustic danger!



Always use rubber gloves!

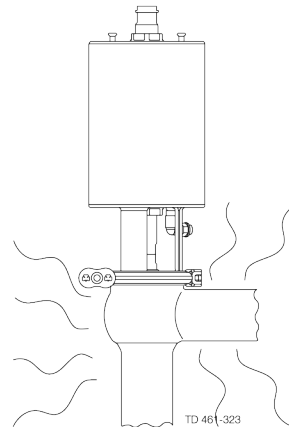


Always use protective goggles!

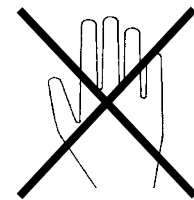
Step 2



Never touch the valve or the pipelines when sterilizing.



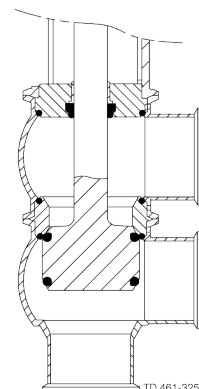
Burning danger!



Step 3

Clean the plug and the seats correctly.
Pay special attention to the warnings!
Lift and lower valve plug momentarily!

Change-over valve



Recommended Cleaning

Step 4

Examples of cleaning agents:

Use clean water, free from chlorides.

1. 1% by weight NaOH at 158°F

2.2 lb NaOH	+	26.4 gal water	= Cleaning ag
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0.6 gal 33% NaOH	+	26.4 gal water	= Cleaning ag
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2. 0.5% by weight HNO₃ at 158°F

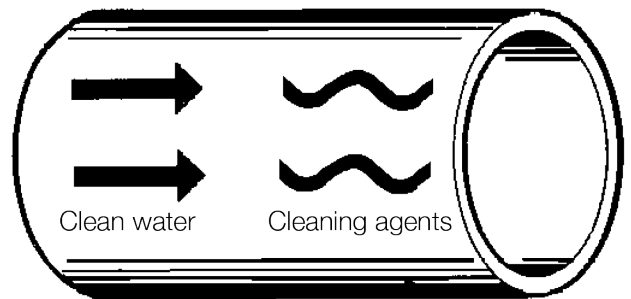
0.2 gal 53% HNO ₃	+	26.4 gal water	= Cleaning ag
---------------------------------	---	-------------------	---------------

Step 5



1. Avoid excessive concentration of the cleaning agent
2. Adjust the cleaning flow to the process
3. **Always** rinse well with clean water after the cleaning.

Always rinse!



Step 6

NOTE!

The cleaning agents must be stored/disposed of in accordance with current rules/directives.



Troubleshooting Guidelines

The Flo-Diversion valve is relatively maintenance free with the exception periodic inspection. As with any precision equipment, however, occasional problems can arise. The troubleshooting chart provides a means of determining and correcting most mechanical and electrical problems.

Note: The troubleshooting chart is divided into two parts, one mechanical and electrical.

Mechanical trouble

Problem	Probable Cause	Remedy
1. Response time above one second.	<ul style="list-style-type: none"> a. Faulty Quick Exhaust. b. Defective solenoid valve. c. Broken diaphragm on quick exhaust valve. d. Actuator not functioning properly 	<ul style="list-style-type: none"> a. Inspect air lines for leaks or obstructions and take necessary corrective action. b. Test Filter-Regulator and repair or replace if defective. c. Test solenoids. Replace if necessary. d. Replace diaphragm. e. Check for excessive back pressure. f. Service actuator.
2. Valves will not assume forward flow position at any selection switch setting.	<ul style="list-style-type: none"> a. Inadequate air supply to actuator. b. The pressure thermo switch capillary tube or controller has failed or leaking. c. Electrical difficulties. d. Actuator not functioning properly 	<ul style="list-style-type: none"> a. Check air system as described above. b. Replace switch, refer to controller manual. c. Refer to electrical troubleshooting chart and take corrective action. d. Service actuator
3. Valve will not assume divert position.	<ul style="list-style-type: none"> a. Quick exhaust valve is not functioning properly. b. Obstruction in divert or leak detector valve. 	<ul style="list-style-type: none"> a. Inspect quick exhaust valve and remove obstruction or replace valve. b. Disassemble valve and remove obstruction.
4. Timing pump will not start.	<ul style="list-style-type: none"> a. Timing pump switch is not on. b. One or both valve plug assemblies are not properly connected to actuator stem. 	<ul style="list-style-type: none"> a. Turn on switch. b. Assemble valve stems to actuator stems correctly. c. Check for proper adjustment of ThinkTop.
5. Valves slamming or banging	<ul style="list-style-type: none"> a. Hydraulic shock caused by high differential pressure. b. Pressure or flow rate exceeds valves published maximum limits. 	<ul style="list-style-type: none"> a. Review system pressure before and after valves. b. Lower process flow rate and pressure. c. Convert to Reverse Acting FDV. d. Contact Alfa Laval tech. support to review options.



General Maintenance

Maintain the valve regularly.

Study the instructions carefully and pay special attention to the warnings! Always keep spare rubber seals and lip seals in stock.

Step 1



- **Always** read the technical data thoroughly
- **Always** release the compressed air after use.

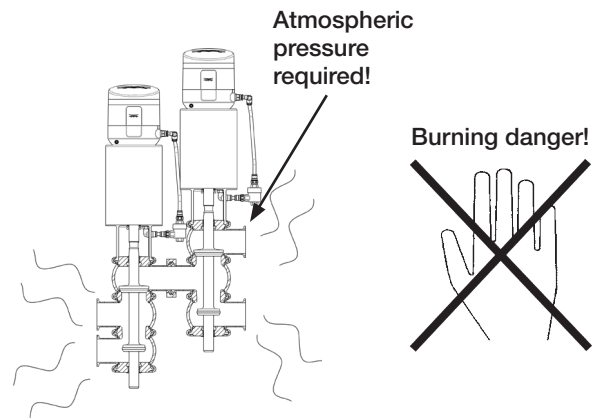
Caution!

All scrap must be stored/disposed of in accordance with current rules/directives.

Step 2



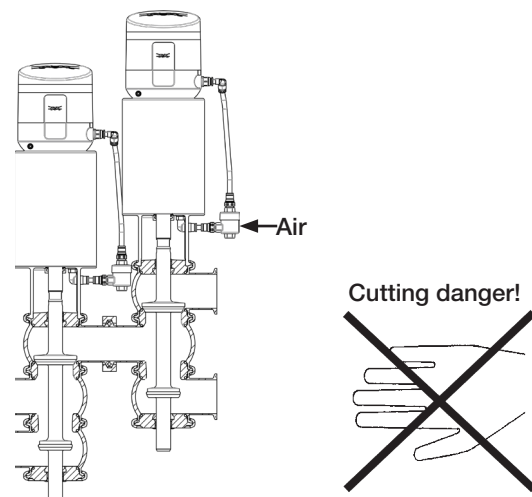
- **Never** service the valve when it is hot.
- **Never** service the valve with valve and pipelines under pressure.



Step 3



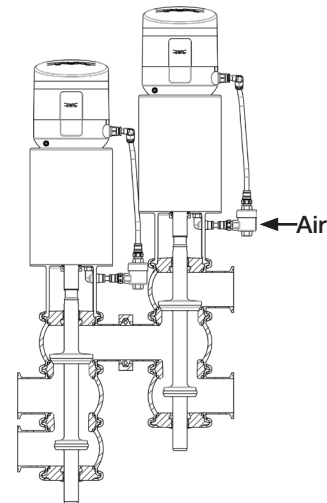
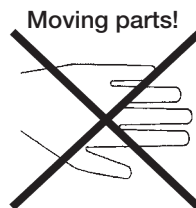
Never stick your fingers through the valve ports if the actuator is supplied with compressed air.



Step 4



Never touch the moving parts if the actuator is supplied with compressed air.



Below are some guidelines for maintenance and lubrication intervals. Please note that the guidelines are for normal working conditions in one shift.

	Product wetted seals	Actuator bushings complete
Preventive Maintenance	Replace after 12 months depending on working conditions	Replace after 5 years depending on working conditions
Maintenance after leakage (leakage normally starts slowing)	Replace immediately	Replace when possible
Planned maintenance	<ul style="list-style-type: none"> - Regular inspection for leakage and smooth operation - Keep a record of the value - Use the statistics for planning of inspections <p>Replace after leakage</p>	<ul style="list-style-type: none"> - Regular inspection for leakage and smooth operation - Keep a record of the actuator - Use the statistics for planning of inspections <p>Replace after leakage</p>
Lubrication	<p>Before fitting</p> <p>USDA H1 approved oil/grease</p>	<p>Before fitting</p> <p>Molykote longterm 2 plus</p>

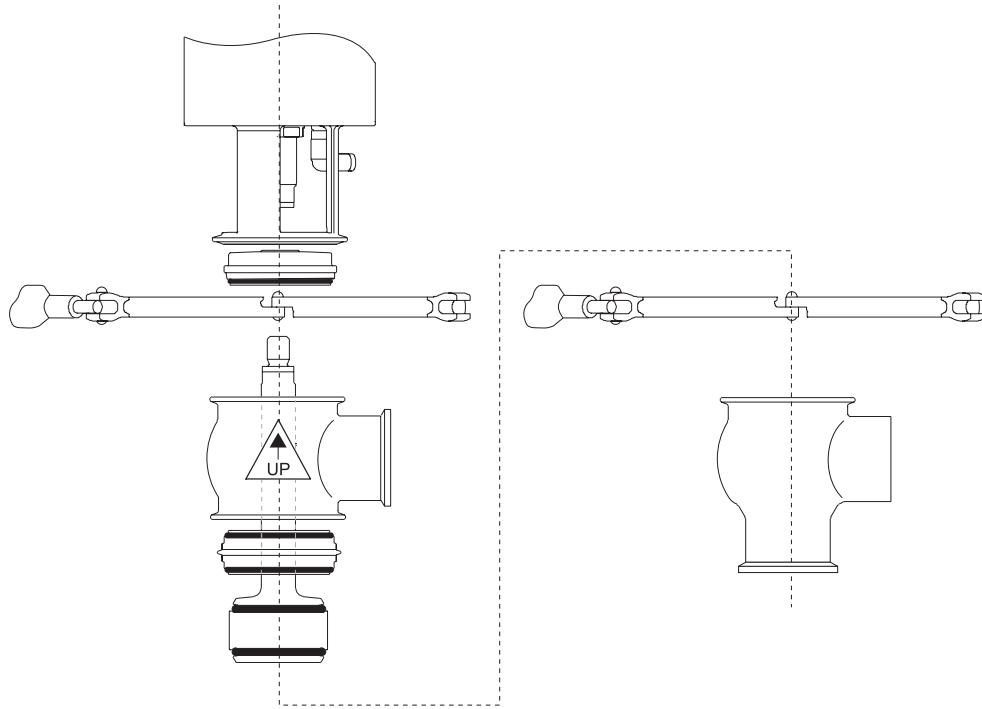
Pre-use check:

1. Supply compressed air to the actuator.
2. Open and close the valve several times to ensure that it operates smoothly.

Pay special attention to the warnings!



Disassembly - Standard Flow Diversion Valve

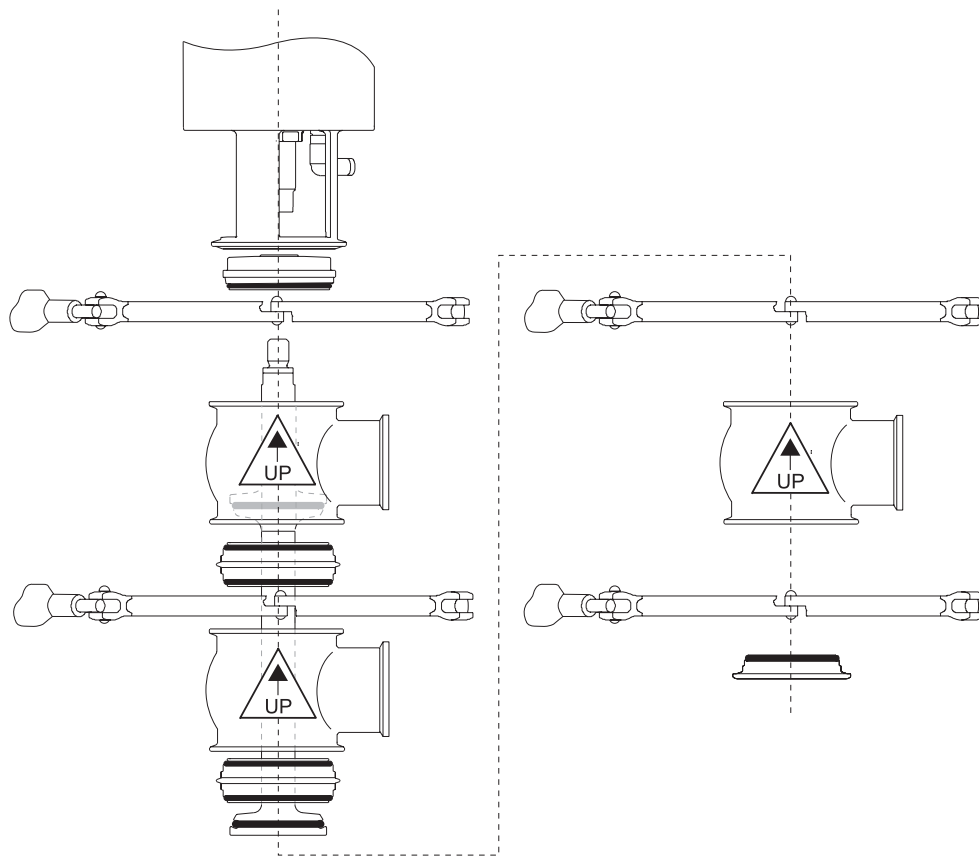


1. Loosen and remove lower clamp - Remove lower body.
2. Supply compressed air to the actuator - **CAUTION - stay clear of moving parts.**
3. Unscrew and remove valve stem/plug.
4. Remove compressed air from actuator - **CAUTION - Stay clear of moving parts.**
5. Loosen and remove upper clamp.
6. Remove upper body.
7. Remove and replace bonnet and seat ring o-rings, bonnet lip seal.
8. Inspect bonnet bushing for wear/damage. Replace if needed - see instructions.
9. Follow instructions for removal of plug seats/seals and replace - see instructions.
10. Reverse order and reassemble valve.

**Remember to tighten spindle and plug to a torque of 22 ft lb
(used two 17mm wrenches)**

Alfa Laval recommends the using of Loctite no. 243.

Disassembly - Reverse-Acting Valve



1. Loosen and remove lower clamp between “Lower” and middle body. Remove lower body.
2. Apply compressed air to actuator - CAUTION - Stay clear of moving parts
3. Remove middle clamp and body - Pulling straight down carefully guiding stem through lower seat ring.
4. Loosen and remove upper body clamp.
5. Unscrew valve stem/plug from actuator.
6. Remove compressed air from actuator - CAUTION - Stay clear of moving parts.
7. Remove upper body and bonnet from yoke.
8. Loosen and remove body clamp between middle and lower body - remove seat ring.
9. Loosen and remove body clamp - remove lower bonnet.
10. Remove and replace o-rings from upper and lower bonnets.
11. Remove and replace lip seals from upper and lower bonnets.
12. Inspect bonnet bushings for wear and damage, replace as needed - see instructions.
13. Follow instructions for removal and replacement of plug seals - see instructions.
14. Reverse order and reassemble valve.

**Remember to tighten spindle and plug to a torque of 22 ft lb
(used two 17mm wrenches)**

Alfa Laval recommends the using of Loctite no. 243.

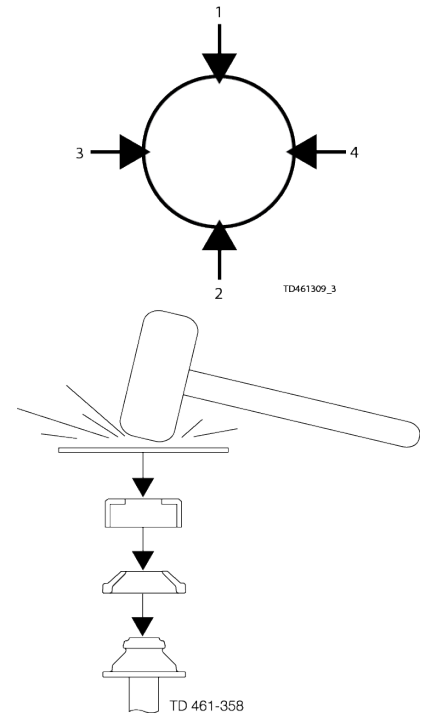
Bushing and seat/seal replacement

TR2 and Elastomer seat ring replacement

1. Remove old seal ring using a knife, screwdriver or similar. Be careful not to damage metal parts.
2. Pre-mount plug seal without pressing it into the groove.
3. Squeeze plug seal into the groove using opposite pressure points.
4. Release compressed air behind plug seal.

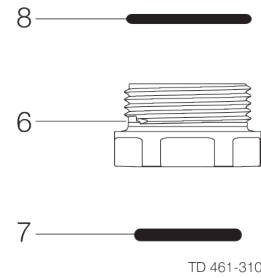
1. Place the plug element on a firm support.
2. Using a utility knife, partially AND CAREFULLY cut through the upper ring Portion of the TR2 plug avoiding contact with stainless steel stem.
3. Force apart both cut ends of the plug for removal from stem.
4. TR2 plugs are installed by applying uniform pressure on all sides. (Pressure can be applied by using the seat assembly tool.)
5. Using a piece of metal and a rubber mallet, place a precise tab to make the TR2 plug snap on to the stem. Reverse the tool and tab again to secure proper fit.
6. Examine seat assembly to be sure the TR2 plug is properly mounted, holding the seat assembly in one hand – rotate the TR2 plug. (For proper CIP cleaning the TR2 plug should turn freely on the stem.)

For more explicit instructions, please refer to the maintenance video.



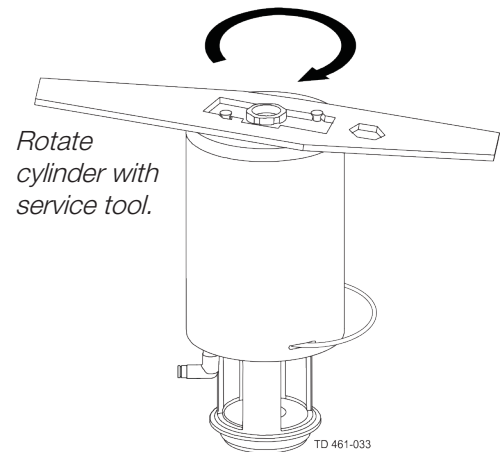
Actuator bushing replacement

1. Unscrew and remove top and bottom bushings with O-rings
2. Lubricate O-rings with Molykote Longterm 2 plus before fitting.
3. Fit bushings and O-rings. Tighten brushing with a torque = 7 lbf-ft (10Nm).
Be careful not to overtighten.



Dismantling of maintainable actuator

1. Rotate cylinder.
2. Remove lock wire and pull away cylinder.
3. Unscrew nuts and remove yoke.
4. The nuts must be tightened again to $M = 12$ lbf-ft. (17 Nm). Be careful not to over tighten.
5. Unscrew top and bottom bushings.
6. Remove piston with O-ring and spring assembly.
7. Remove O-rings and support disc.

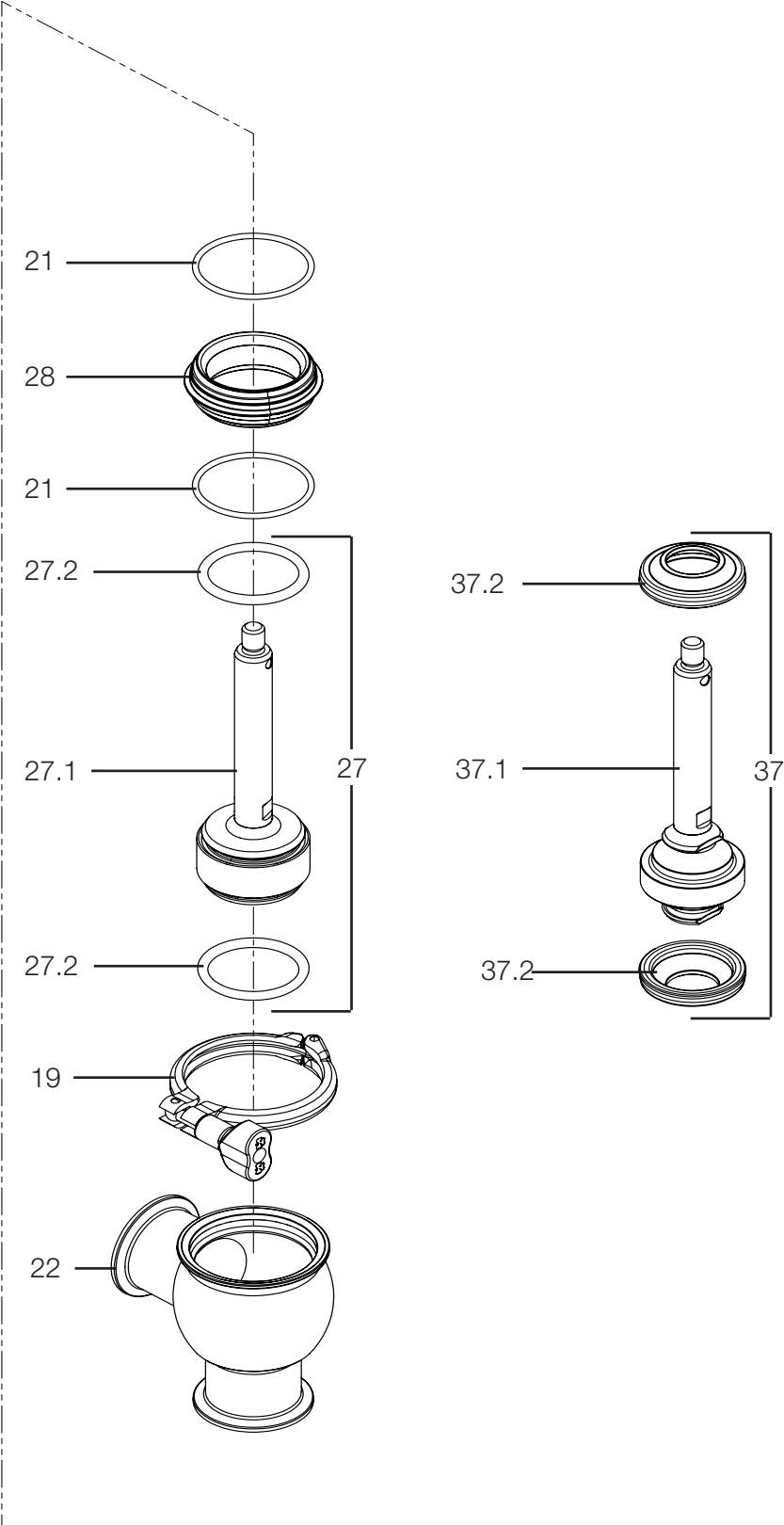
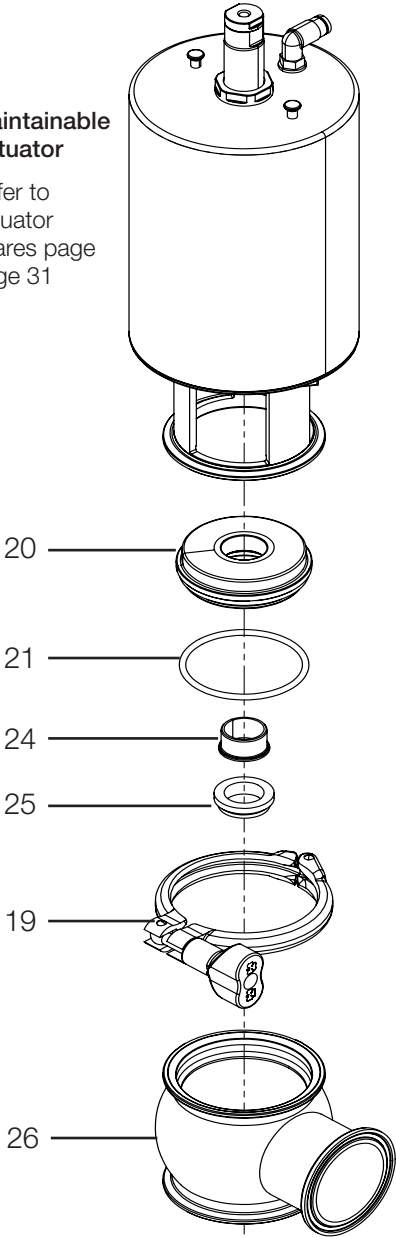


Assembly of maintainable actuator

Reverse order of 5.6. Dismantling of actuator.
Lubricate O-ring (3, 7, 11) with Molykote Longterm 2 plus before fitting.

Unique SSV Standard Flow Diversion Valve Exploded View

Maintainable Actuator
Refer to actuator spares page 31



Unique SSV Standard Flow Diversion Valve Part Numbers

Pos	Qty	Denomination	1-½"	2"	2-½"	3"
Clamp						
19	2	Clamp.....	9612939316	9612939317	9612939318	9612939319
Bonnet						
20	1	Bonnet.....	9613127102	9613127103	9613127104	9613127105
21	◆ 3	O-ring, EPDM.....				
	3	O-ring, HNBR.....				
	3	O-ring, FPM.....				
		O-ring, set (10 pcs.) EPDM.....	9614059422	9614059425	9614059428	9614059431
		O-ring, set (10 pcs.) HNBR.....	9614059423	9614059426	9614059429	9614059432
		O-ring, set (10 pcs.) FPM.....	9614059424	9614059427	9614059430	9614059433
24	1	Bushing.....	9613125002	9613125002	9613125002	9613125002
25	◆ 2	Lip Seal, EPDM.....				
	2	Lip Seal, HNBR.....				
	2	Lip Seal, FPM.....				
		Lip Seal, set (10 pcs.) EPDM.....	9614059419	9614059419	9614059419	9614059419
		Lip Seal, set (10 pcs.) HNBR.....	9614059420	9614059420	9614059420	9614059420
		Lip Seal, set (10 pcs.) FPM.....	9614059421	9614059421	9614059421	9614059421
Seat						
28	1	Seat, Upper.....	9613127502	9613127503	9613127504	9613127505
Valve Body						
26	1	Valve body, upper, 1 port, clamp.....	9634095550	9613161505	9613161507	9613161509
22	1	Valve body, lower, 2 port, clamp.....	9634095549	9613161605	9613161607	9613161609
Valve Plug - Elastomer (STD)						
27	1	Plug, ISO, complete, EPDM.....	9613127702	9613127703	9613127704	9613127705
	1	Plug, ISO, complete, HNBR.....	9613127714	9613127715	9613127716	9613127717
	1	Plug, ISO, complete, FPM.....	9613127726	9613127727	9613127728	9613127729
27.1	1	Plug, ISO.....	9613140002	9613140003	9613140004	9613140005
27.2	◆ 2	Plug seal, EPDM.....				
	2	Plug seal, HNBR.....				
	2	Plug seal, FPM.....				
		Plug seal, set (10 pcs.) EPDM.....	9614059404	9614059407	9614059410	9614059413
		Plug seal, set (10 pcs.) HNBR.....	9614059405	9614059408	9614059411	9614059414
		Plug seal, set (10 pcs.) FPM.....	9614059406	9614059409	9614059412	9614059415
Valve Plug - TR2 (Optional)						
37	1	Plug, complete.....	9613155502	9613155503	9613155504	9613155505
37.1	1	Plug.....	9613155401	9613155502	9613155403	9613155404
37.2	◆ 2	Plug seal, PTFE TR-2.....				
		Plug seal, set (10 pcs.) PTFE TR-2.....	9614059449	9614059450	9614059451	9614059452

1-½"

2"

2-½"

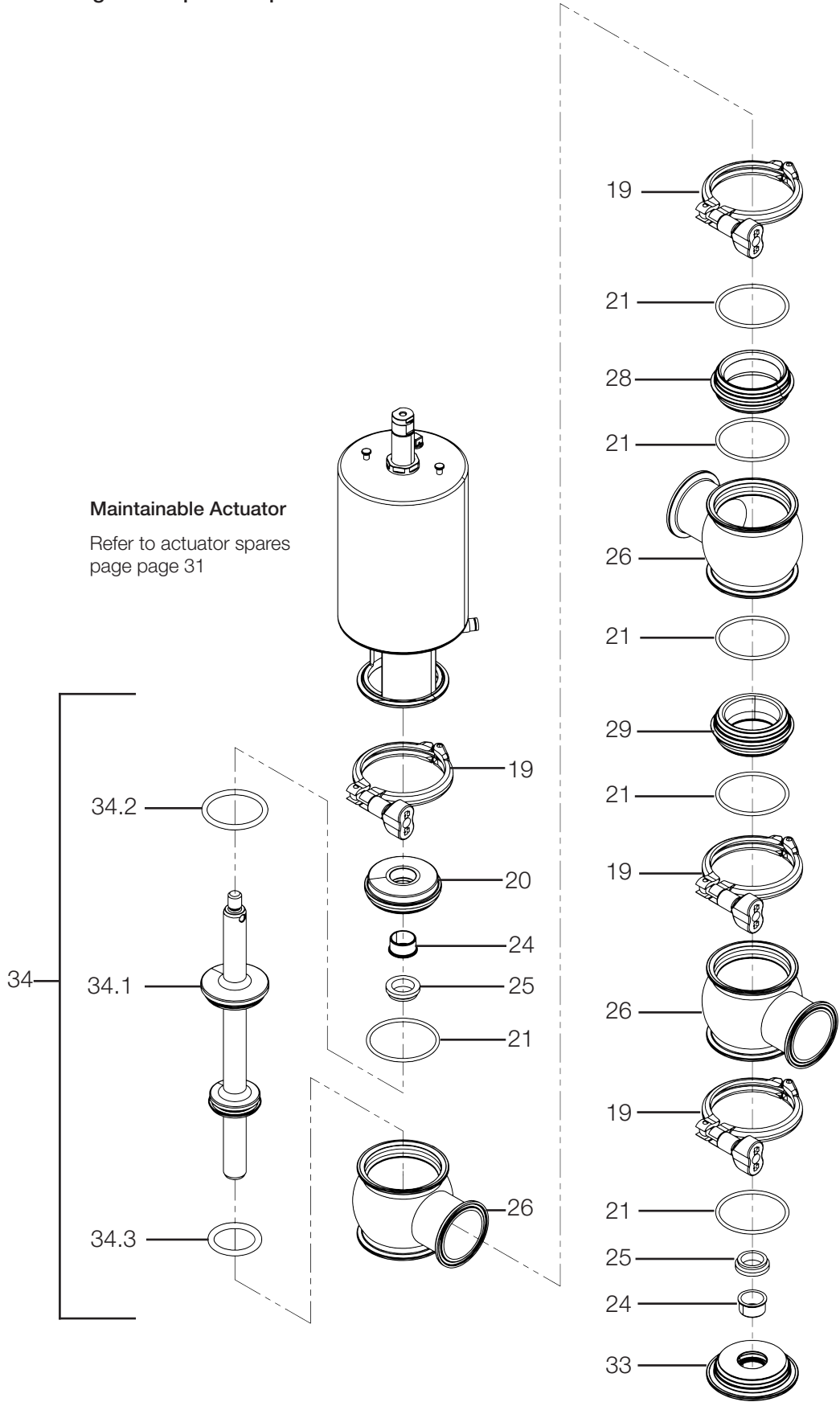
3"

Product wetted parts service kit (Note: 1 Service Kit is needed for each valve.)

◆	Service Kit, EPDM.....	9611926580	9611926581	9611926582	9611926583
◆	Service Kit, HNBR.....	9611926586	9611926587	9611926588	9611926590
◆	Service Kit, FPM.....	9611926592	9611926593	9611926594	9611926595
◆	Service Kit, TR2 w/ EPDM.....	9611926633	9611926634	9611926635	9611926636
◆	Service Kit, TR2 w/ HNBR.....	9611926638	9611926639	9611926640	9611926641
◆	Service Kit, TR2 w/ FPM.....	9611926643	9611926644	9611926645	9611926646



Reverse-Acting Valve Spares Exploded View



Reverse-Acting Valve Spare Part Numbers

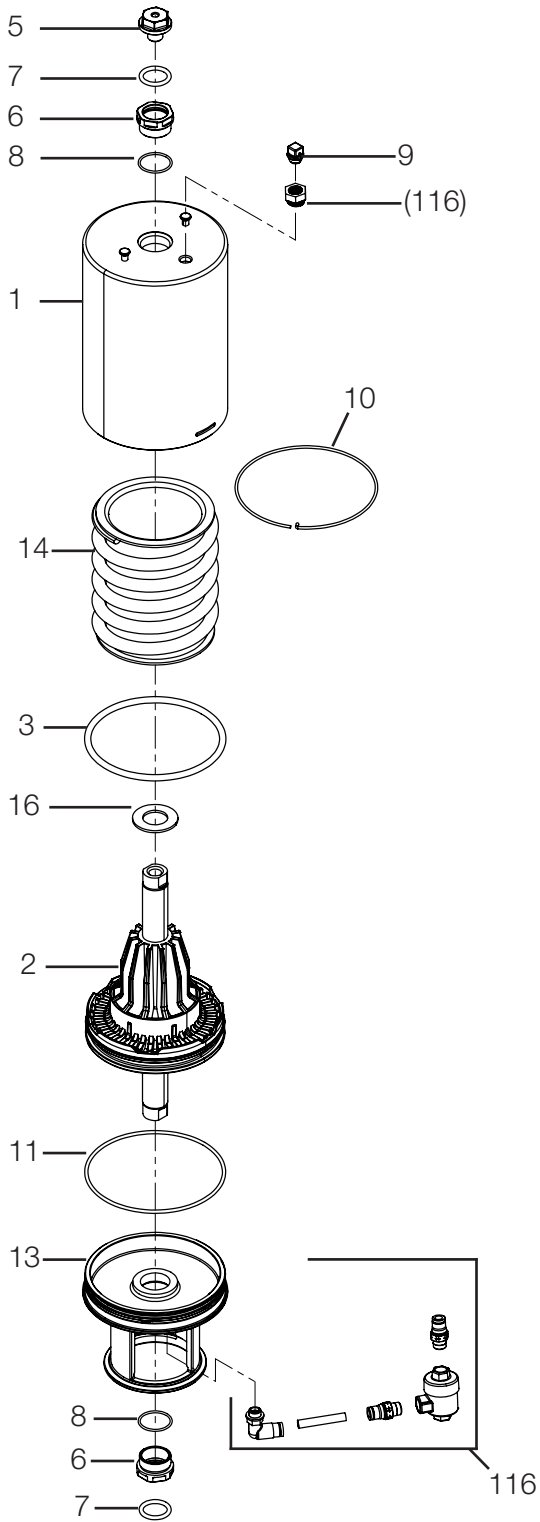
Pos	Qty	Denomination	2"	2-½"	3"	4"
Clamp						
19	4	Clamp.....	9612939317	9612939318	9612939319	9612939320
Bonnet						
20	1	Upper Bonnet	9613127103	9613127104	9613127105	9613127106
21	◆ 6	O-ring, EPDM				
	6	O-ring, HNBR				
	6	O-ring, FPM.....				
		O-ring, set (10 pcs.) EPDM	9614059425	9614059428	9614059431	9614059434
		O-ring, set (10 pcs.) HNBR	9614059426	9614059429	9614059432	9614059435
		O-ring, set (10 pcs.) FPM.....	9614059427	9614059430	9614059433	9614059436
24	2	Bushing	9613125002	9613125002	9613125002	9613125002
25	◆ 2	Lip Seal, EPDM.....				
	2	Lip Seal, HNBR.....				
	2	Lip Seal, FPM				
		Lip Seal, set (10 pcs.) EPDM.....	9614059419	9614059419	9614059419	9614059419
		Lip Seal, set (10 pcs.) HNBR.....	9614059420	9614059420	9614059420	9614059420
		Lip Seal, set (10 pcs.) FPM	9614059421	9614059421	9614059421	9614059421
33	1	Lower Bonnet	9634092101	9634092102	9634092103	9634092104
Seat						
28	1	Seat, Upper	9613127503	9613127504	9613127505	9613127506
29	1	Seat, Lower	9634092001	9634092002	9634092003	9634092004
Valve Body						
26	3	Valve body, upper, 1 port, clamp.....	9613161505	9613161507	9613161509	9613161511
	3	Valve body - tangential, upper, 1 port, clamp	9613169002	9613169004	9613169006	9613169008
Valve Plug						
34	1	Plug, RA-FDV, complete, EPDM.....	9614258701	9614258702	9614258703	9614258704
	1	Plug, RA-FDV, complete, HNBR.....	9614258705	9614258706	9614258707	9614258708
	1	Plug, RA-FDV, complete, FPM	9614258709	9614258710	9614258711	9614258712
34.1	1	Plug, RA-FDV	9634091101	9634091102	9634091103	9634091104
34.2	◆ 1	Plug seal, Upper, EPDM.....				
	1	Plug seal, Upper, HNBR.....				
	1	Plug seal, Upper, FPM				
		Plug seal, Upper, set (10 pcs.) EPDM.....	9614059407	9614059410	9614059413	9614059416
		Plug seal, Upper, set (10 pcs.) HNBR.....	9614059408	9614059411	9614059414	9614059417
		Plug seal, Upper, set (10 pcs.) FPM	9614059409	9614059412	9614059415	9614059418
34.3	◆ 1	Plug seal, Lower, EPDM.....				
	1	Plug seal, Lower, HNBR.....				
	1	Plug seal, Lower, FPM				
		Plug seal, Lower, set (10 pcs.) EPDM.....	9614059404	9614059407	9614059410	9614059413
		Plug seal, Lower, set (10 pcs.) HNBR.....	9614059405	9614059408	9614059411	9614059414
		Plug seal, Lower, set (10 pcs.) FPM	9614059406	9614059409	9614059412	9614059415

Product Wetted Parts (Note: 1 Service Kit is needed for each valve)

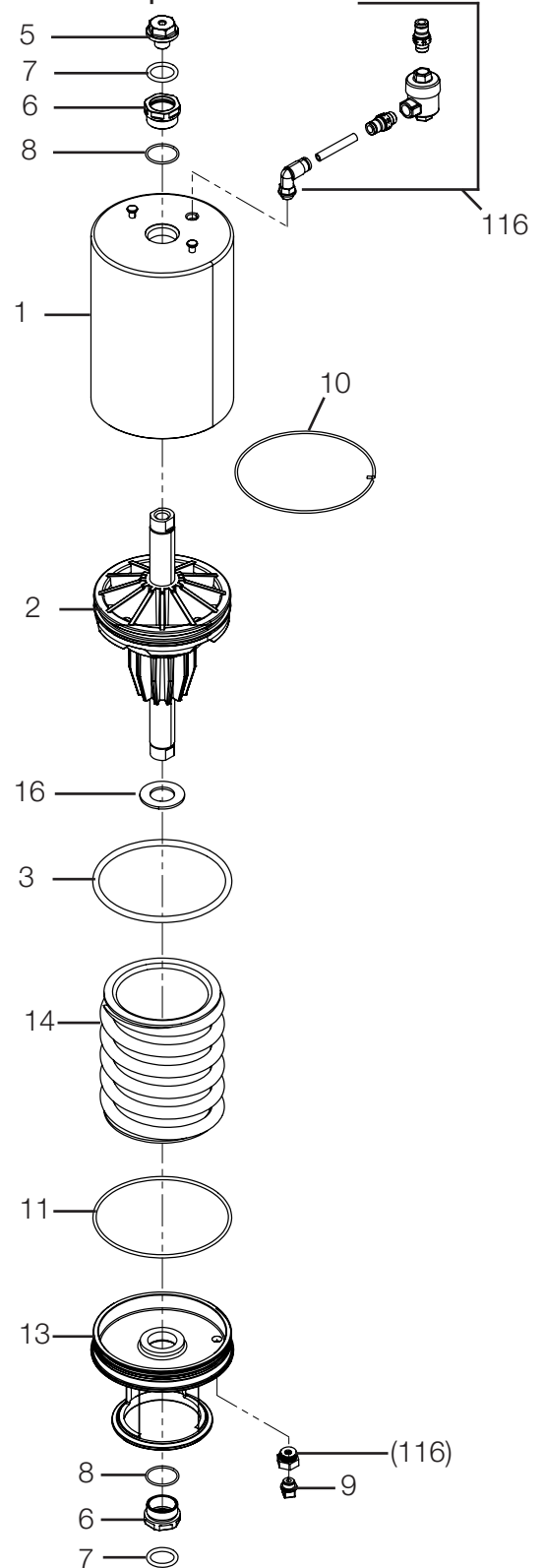
◆	Service Kit, EPDM	9611928567	9611928568	9611928569	9611928570
◆	Service Kit, HNBR.....	9611928571	9611928572	9611928573	9611928574
◆	Service Kit, FPM	9611928575	9611928576	9611928577	9611928578



Failed Closed Actuator for Reverse Acting
Exploded View



Failed Open Actuator for Standard
Exploded View

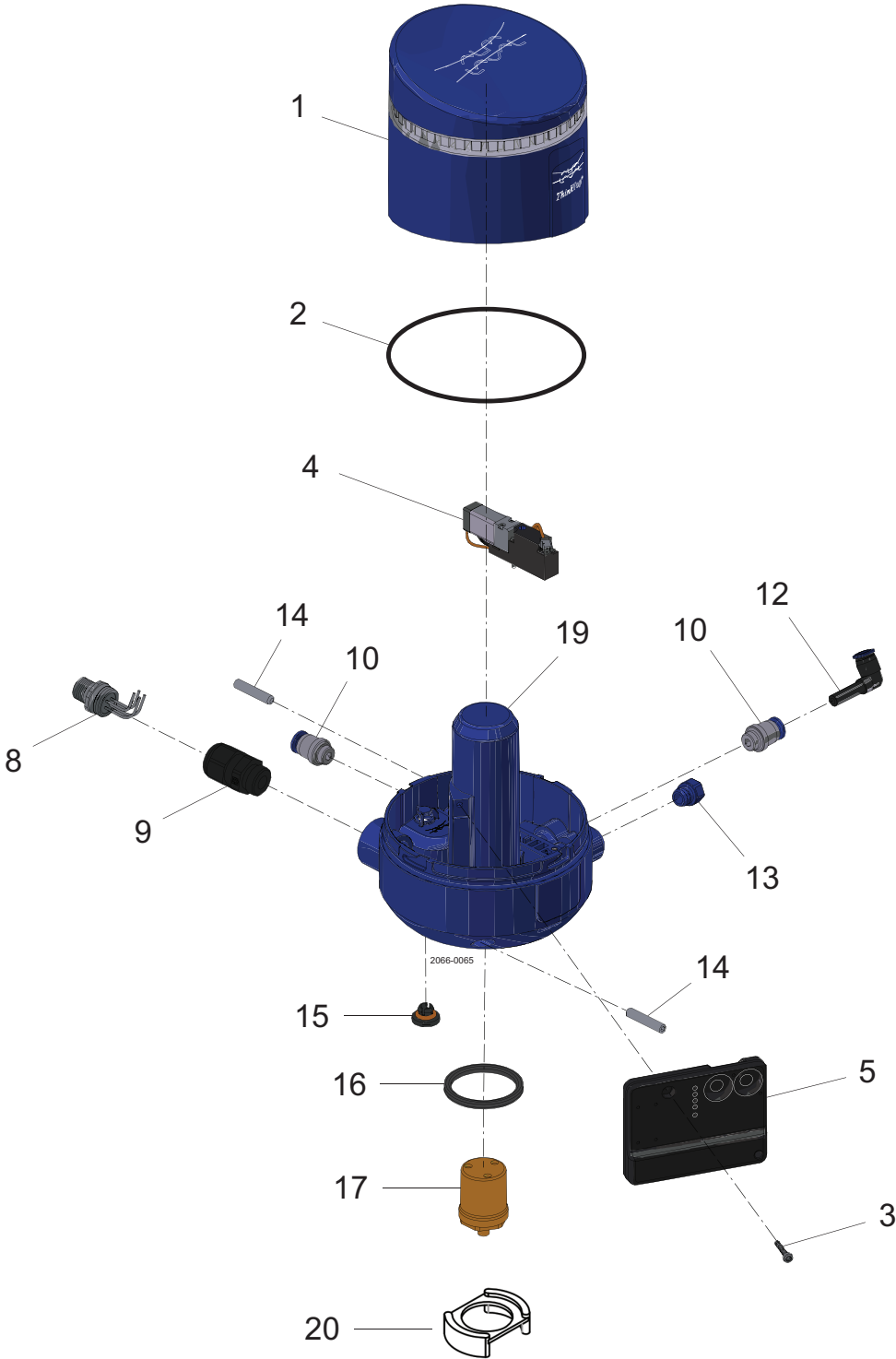


Unique SSV Maintainable Actuator - Flow Diversion Valve Part Numbers

Pos	Qty	Denomination	1-½"	2"	2-½"	3"	4"
Actuator							
		Actuator, - complete (NC)	NA	9634093801	9634093802	9634093803	9634093804
		Actuator, - complete (NO)	9634093805	9634093806	9634093807	9634093808	NA
1	1	Cylinder, (polished)	9615220404	9615220405	9615220405	9615220406	9615220406
2	1	Piston	9613132201	9613132301	9613132301	9613132401	9613132401
3	◆ 1	O-ring					
5	1	Adapter, steel	9614065301	9614065301	9614065301	9614065301	9614065301
6	◆ 2	Bushing					
7	◆ 2	O-ring					
8	◆ 2	O-ring					
9	1	Plug	9613414101	9613414101	9613414101	9613414101	9613414101
10	1	Lock wire	9613143201	9613143202	9613143202	9613143203	9613143203
11	◆ 1	O-ring					
116	1	Kit, Quick Exhaust	9615228201	9615228201	9615228201	9615228201	9615228201
14	1	Spring assembly	9613132501	9613132502	9613132502	9613132503	9613132503
15	1	Bottom	9615220501	9615220502	9615220502	9615220503	9615220503
16	◆ 1	Support disc					
Yoke							
13	1	Yoke	9613154301	9613154402	9613154502	9613154603	9613154703
Service Kit for Actuator							
	◆	Service kit, NO , NC	9611926497	9611926498	9611926498	9611926499	9611926499



ThinkTop Exploded View



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ThinkTop V50 Part Numbers

Pos	Qty	Denomination	Description
50 Series			
1	1	Cover	9615376201
2	1	V-ring	9615451401
3	1	Screw	9611996072
4	1	Solenoid valve 1x3/2.....	9615395701
5	1	Control board, 24V Digital	9615394901
6	1	Spacer	
7	4	Base screw	
8	1	M12 plug, 4 pins	
	1	M12 plug, 8 pins	
9	1	Cable gland, Main entry, Ø4-10mm.....	9611996063
	2	Air fitting, straight, 1/4"	9611996074
11	3	Blind plug air	
12	1	Air fitting, elbow, 1/4"	9611996076
13	1	Exhaust plug	9615389001
14	2	Set screw	9611996070
15	1	Gore vent	9611996065
16	1	X-ring	9612569601
17	1	Sensor target	9615397601
19	1	Base	
20	1	Test spacer	9634098301





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