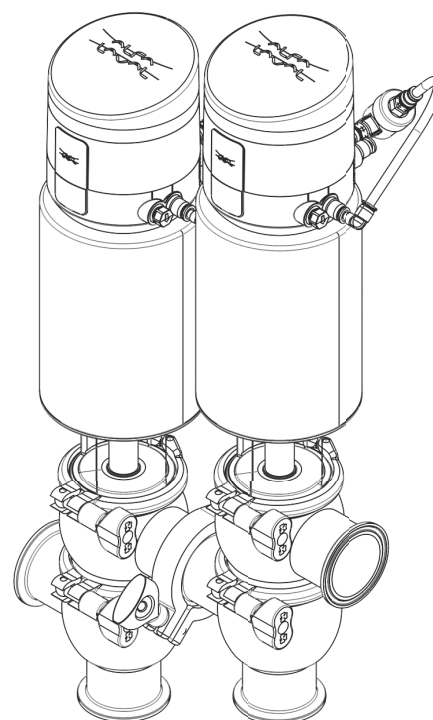
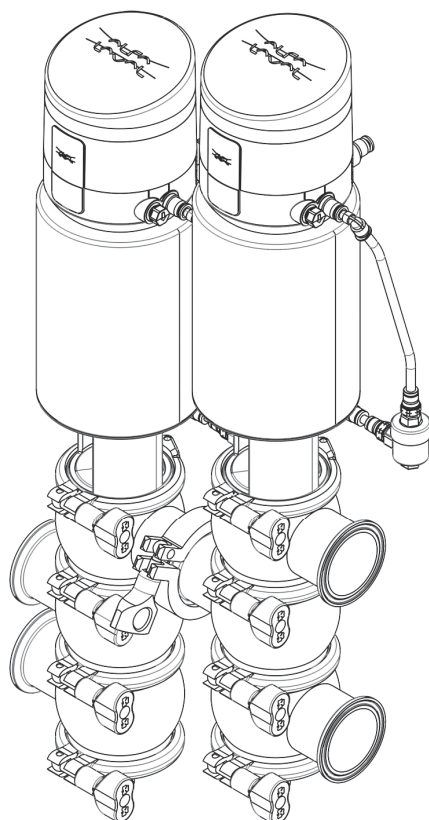


Unique SSV Flo-Diversion

Single Seat Valves



2221-0000

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Instruction Manual

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1 Safety

Read this first



This Instruction Manual is designed for operators and service engineers working with the supplied Alfa Laval product.

Operators must read and understand the **Safety, Installation and Operating** instructions of the supplied Alfa Laval product before carrying out any work or before you put the supplied Alfa Laval product into service!

Not following the instructions can result in serious accidents.

This documentation describes the authorized way to use the supplied Alfa Laval product. Alfa Laval will take no responsibility for injury or damage if the equipment is used in any other way.

This Instruction Manual is designed to provide the user with the information to perform tasks safely for all phases in the lifetime of the supplied Alfa Laval product.

The operator shall always read the chapter **Safety** first. Hereafter the operator can skip to the relevant section for the task to be carried out or for the information needed.

Always read the chapter **Technical Data** thoroughly.

This is the complete Instruction Manual for the supplied Alfa Laval product.

NOTE

The illustrations and specifications in this Instruction Manual were effective at the date of printing. However, as continuous improvements are our policy, we reserve the right to alter or modify the Instruction Manual without prior notice or any obligation.

The English version of the Instruction Manual is the original manual. Alfa Laval cannot be held responsible for incorrect translations. In case of doubt, the English version applies.

1.1 Safety Signs

Mandatory Action Signs

	General mandatory action sign.
	Refer to instruction manual.
	Use eye protection - safety glasses.
	Use protective hand wear - safety gloves.
	Wear protective equipment - safety helmet.
	Use ear protection in noisy environments - noise protector.
	Wear protective equipment - safety shoes.

Warning Signs

	General warning.
	Transportation with forklift truck or other industrial vehicles if heavy.
	Hot surface and Burn Hazard.
	Cutting danger.
	Corrosive substance.

1.2 Safety Precautions

All warnings in the Instruction Manual are summarised on these pages. Pay special attention to the instructions below so that severe personal injury and/or damage to the supplied Alfa Laval product is avoided.

Transportation and Lifting

	Never lift or elevate in any way other than described in this manual. Always use the original packaging or similar during transportation. Always ensure that personnel must have experience with lifting operations. Always ensure that all connections are disconnected before attempting to remove the valve from the installation. Always ensure that no leakage of lubricants can occur. Always drain liquid out of the valves before transportation. Always ensure sufficient fixing of the valve during transportation - if specially designed packaging material is available, it must be used. Always ensure that compressed air is released.
	Always use designated lifting points if defined. Ensure that the lifting equipment is suitable for the supplied Alfa Laval product. Always ensure that the unit is securely fixed during transportation. Always ensure the lifting point to be in line with center of gravity. Adjust lifting point if necessary. Always use appropriate lifting equipment for heavy parts when relevant. Use lifting logs when available. Always keep an eye on the load and stay clear during the lifting operation.

Installation

	If the local safety regulations prescribe that the installation has to be inspected and approved by responsible authorities before the valve is put into service, consult with such authorities before installing the equipment and have the projected installation approved by them. Always assemble the valve completely before startup and make sure everything is in place and correctly tightened.
	Always ensure that the valve and pipelines are depressurized, emptied, and cooled down to ambient temperature before installation, inspection, assembly, or dismantling of the valve.

Operation

	Never operate the valve unless a correct installation has been verified. Never dismantle the valve during operation or when pressurized.
	Never touch the valve or pipelines when hot.
	Always rinse well with clean water after cleaning. Always handle lye and acid with great care. Always follow the instructions in the safety data sheets from the suppliers of cleaning agents, detergents, oils etc.

Maintenance

	In order to optimise the operation of the supplied Alfa Laval product and to minimize the down time due repair activities, the maintenance includes: • Inspection and maintenance of the supplied Alfa Laval product: strictly follow the technical documentation • Preventive maintenance: visual inspection of the supplied Alfa Laval product followed by necessary adjustments and planned periodic replacement of wear and tear parts • Repairs: unscheduled break down of a component, often causing the system to stop. Damaged components must be replaced • Stock of Alfa Laval genuine spare parts: Alfa Laval recommend keeping a stock of genuine spare parts facilitating preventive maintenance and reducing downtime in case of unplanned break downs
	Always ensure that the valve and pipelines are depressurized, emptied, and cooled down to ambient temperature before dismantling the valve.

Storage

	Alfa Laval recommend: • Store the supplied Alfa Laval product as supplied in original packaging • Port opening(s) should be protected against any ingress • Store in a clean, dry place without direct sunlight or UV light • Temperature range -5 °C to +40 °C (23 °F - 104 °F) • Relative humidity less than 60% • No exposure to corrosive substances (including contained air)
---	---

Noise

	Under certain operating conditions, the supplied Alfa Laval product and/or the systems in which they are installed can produce high sound pressure levels. Appropriate noise protection measures should be taken when necessary and in accordance with local legislation.
---	--

Hazards



Burn Hazard

- Lubrication oil, machine parts and various machine surfaces can be hot and cause burns. Wear protective gloves



Corrosive Hazard

- Always handle cleaning liquids, lye and acid with great care and in accordance with separate instructions for those fluids
- When using chemical cleaning agents and lubricants, make sure you follow the general rules and suppliers recommendation regarding ventilation, personnel protection etc.



Cut Hazard

- Sharp edges, especially on threads, can cause cuts. Wear protective gloves

1.3 Warning Signs in Text

Pay attention to the safety instructions in this Instruction Manual.

Below are definitions of the four grades of warning signs used in the text where there is a risk for injury to personnel or damage to the supplied Alfa Laval product.

DANGER

Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

WARNING

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

CAUTION

Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate damage to the supplied Alfa Laval product.

NOTE

Indicates important information to simplify or clarify procedures.

1.4 Requirements of personnel

Operators

The operators shall read and understand this Instruction Manual.

Maintenance personnel

The maintenance personnel shall read and understand this Instruction Manual. The maintenance personnel or technicians shall be skilled within the field required to carry out the maintenance work safely.

Trainees

Trainees can perform tasks under the supervision of an experienced employee.

People in general

The public shall not have access to the supplied Alfa Laval product.

In some cases, specially skilled personnel may need to be hired (i.e. electricians, welders). In some cases the personnel has to be certified according to local regulations with experience of similar types of work.

1.5 Recycling information

Unpacking

Packing material may consist of wood, plastics, cardboard boxes and in some cases metal straps.



- Wood and cardboard boxes can be reused, recycled or used for energy recovery
- Plastics should be recycled or burnt at a licensed waste incineration plant
- Metal straps should be sent for material recycling

Maintenance

During maintenance, oil (if used) and wear parts in the supplied Alfa Laval product should be replaced.

- Oil and all non-metal wear parts must be disposed of in accordance with local regulations
- Rubber and plastics should be burnt at a licensed waste incineration plant. If not available they should be disposed of in accordance with local regulations
- Bearings and other metal parts should be sent to a licensed handler for material recycling
- Seal rings and friction linings should be disposed of to a licensed land fill site. Check your local regulations
- All metal parts should be sent for material recycling
- Worn out or defected electronic parts should be sent to a licensed handler for material recycling

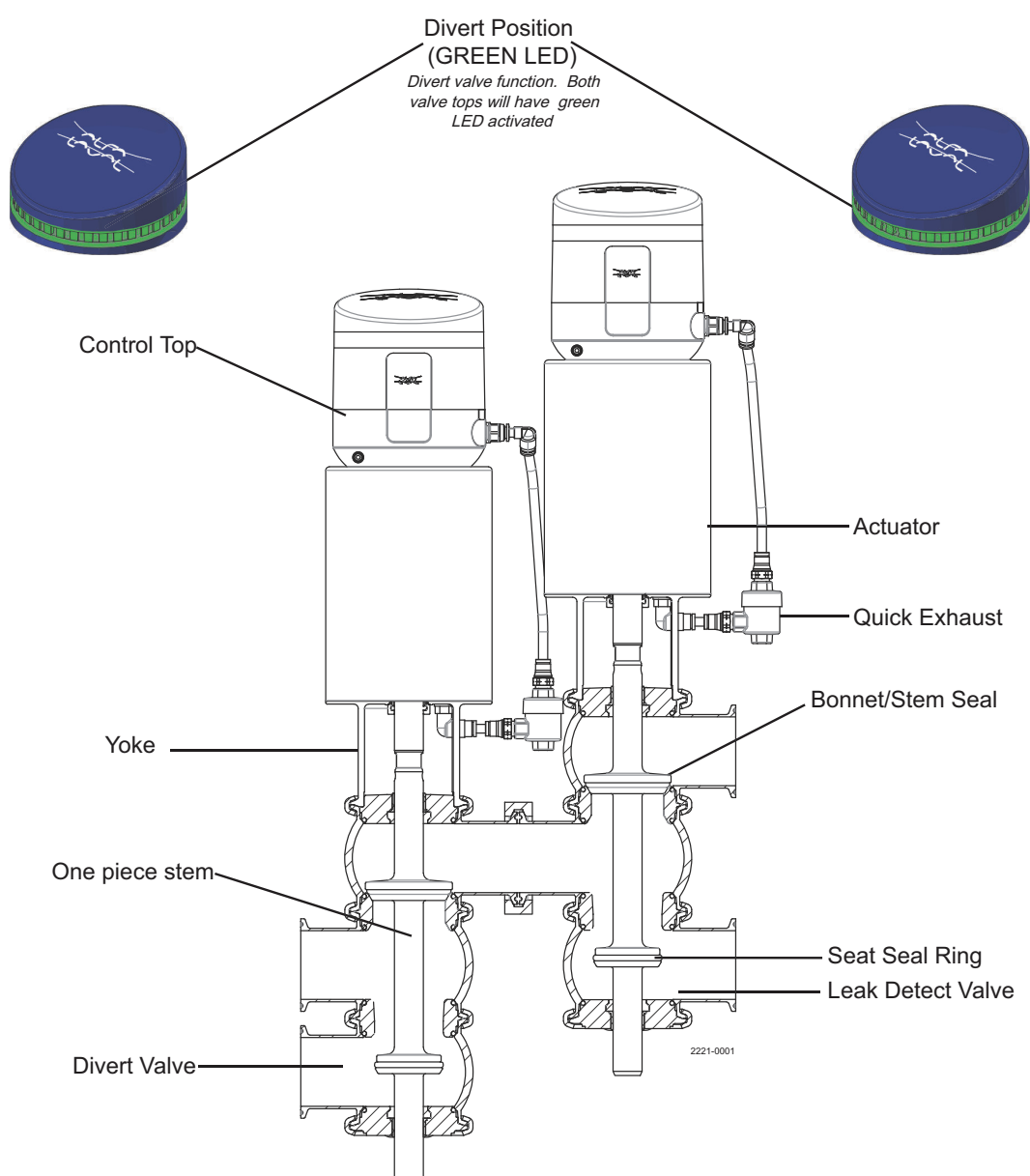
Scrapping

At end of use, the equipment must be recycled in accordance with the relevant local regulations. Besides the equipment itself, any hazardous residues from the process liquid must be considered and dealt with in a proper manner. When in doubt, or in the absence of local regulations, please contact your local Alfa Laval sales company.

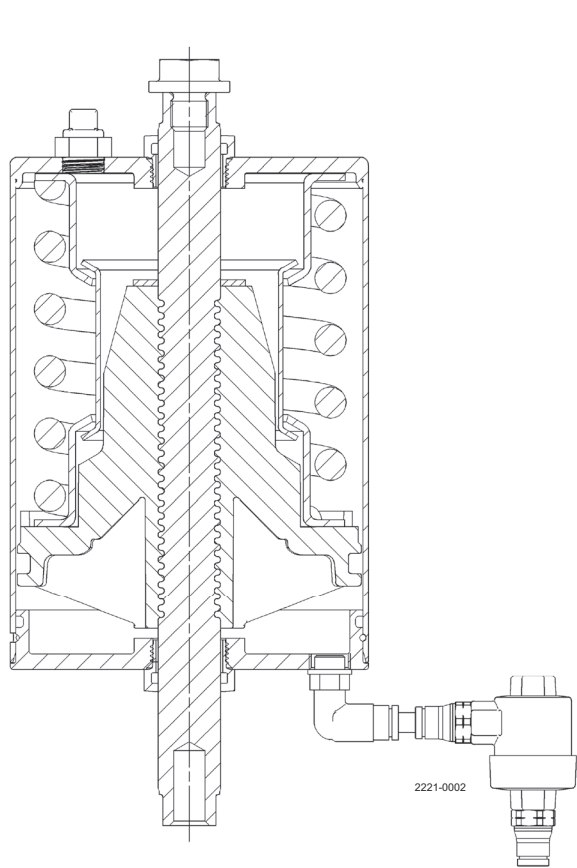
2 Introduction

2.1 Valve Assembly Nomenclature

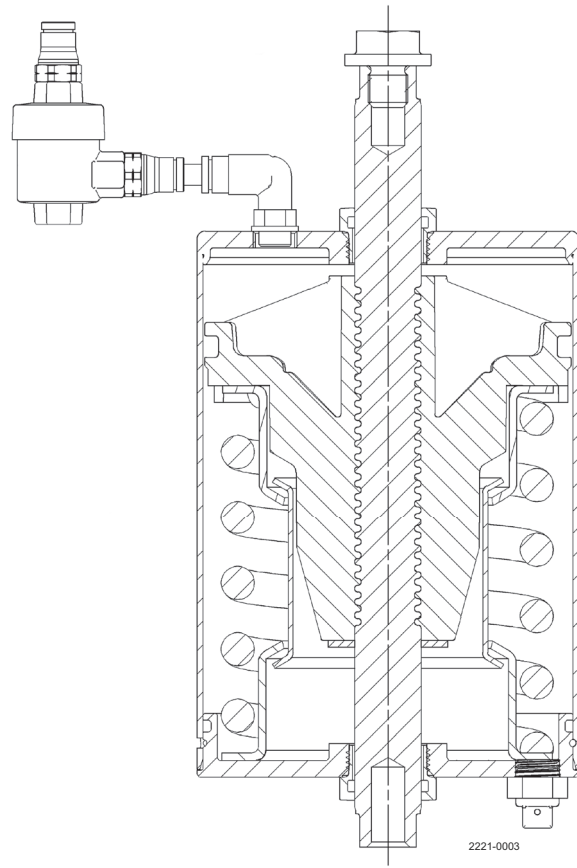
Models:	7640, 7650
	(optional reverse-acting tangential)
Sizes:	Std. valve 1½", 2", 2½", 3"
	RA 2", 2½", 3", 4"
Features:	Design based on SSV Series valve. Available with either TR2 or elastomer seat rings. RA valve, elastomer seat only. Fully maintainable. Use valves with existing control panel or new Alfa Laval PLC control panel.



2.2 Actuator Specifications



Reverse-Acting Valve
pneumatic movement upwards



Standard Valve
pneumatic movement downward

Air Supply Requirements

Air Supply Requirements	
Minimum Air Pressure:	70 psi
Air Pressure Range:	70-100 psi

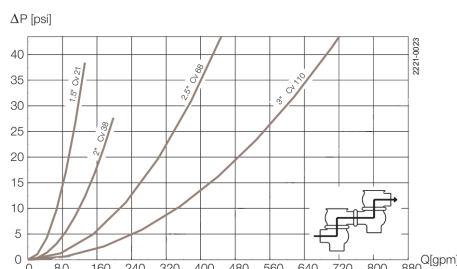
Air Volume Required:

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)

2.3 Performance

Unique 7640 Valves

Valve Size	Max. Product Pressure (psi)	Air Supply Pressure Re- quired (psi)	Max. Flow (GPM)
1½"		87	50
2"	125	87	85
2½"	100	87	160
3"	100	87	200

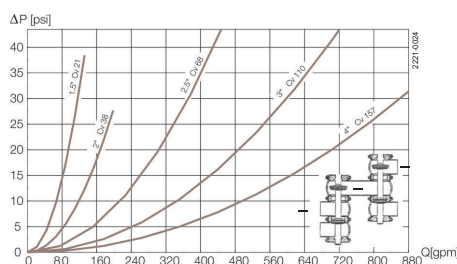


For the diagram the following applies:

Medium:	Water (68 °F)
Measurement:	In accordance with VDI 2173

Unique 7640 Valves Reverse-Acting

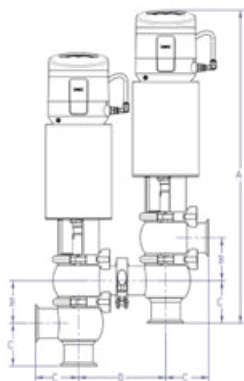
Valve Size	Max. Product Pressure (psi)	Air Supply Pressure Re- quired (psi)	Max. Flow (GPM)
2"	125	87	85
2½"	100	87	160
3"	100	87	200
4"	45	87	485



For the diagram the following applies:

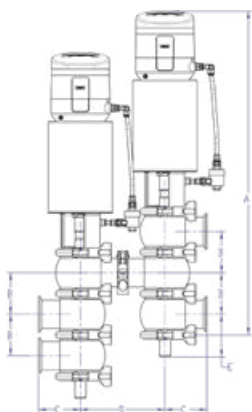
Medium:	Water (68 °F)
Measurement:	In accordance with VDI 2173

2.4 Dimensions



Unique SSV Individual Flo-Diversion Valves

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



Unique SSV Reverse Acting Flo-Diversion Valve

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

3 Installation

3.1 Unpacking

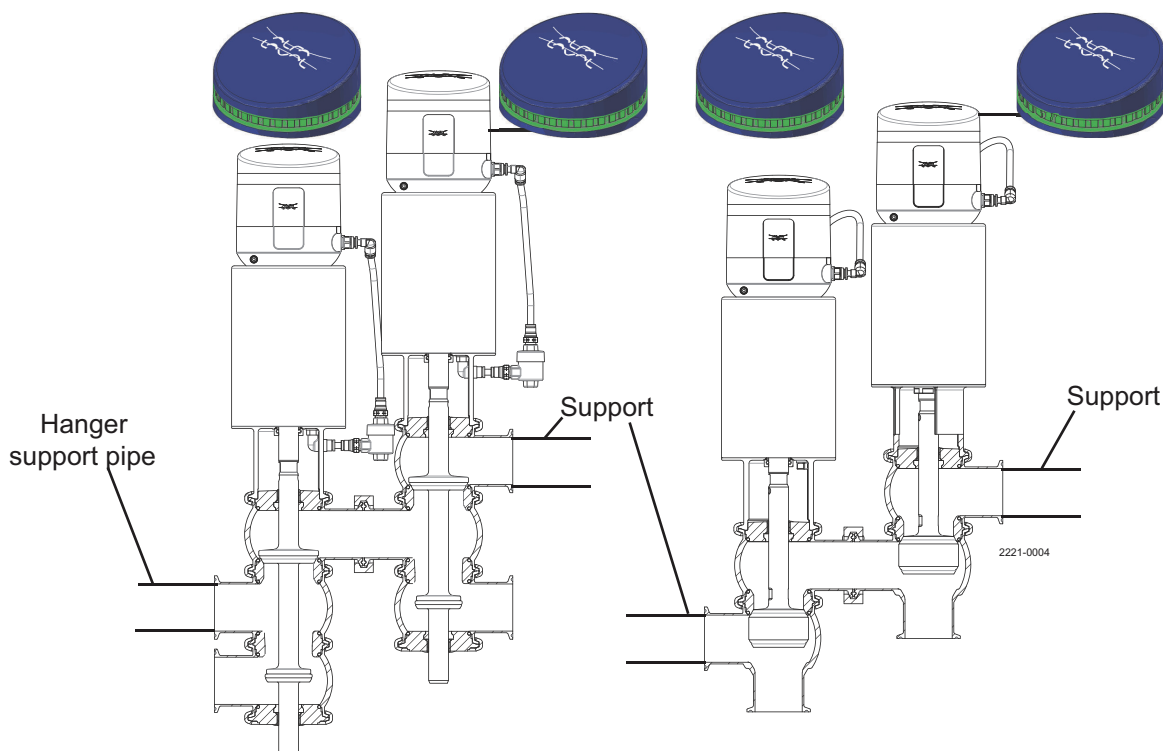
The Flo-Diversion Valve should be unpacked immediately upon receipt from the factory and carefully inspected for damage that may have occurred during shipping. The equipment should also be checked against the bill of lading to make sure there are no shortages. Any damage or shortage should be immediately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



3.2 Installation

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.

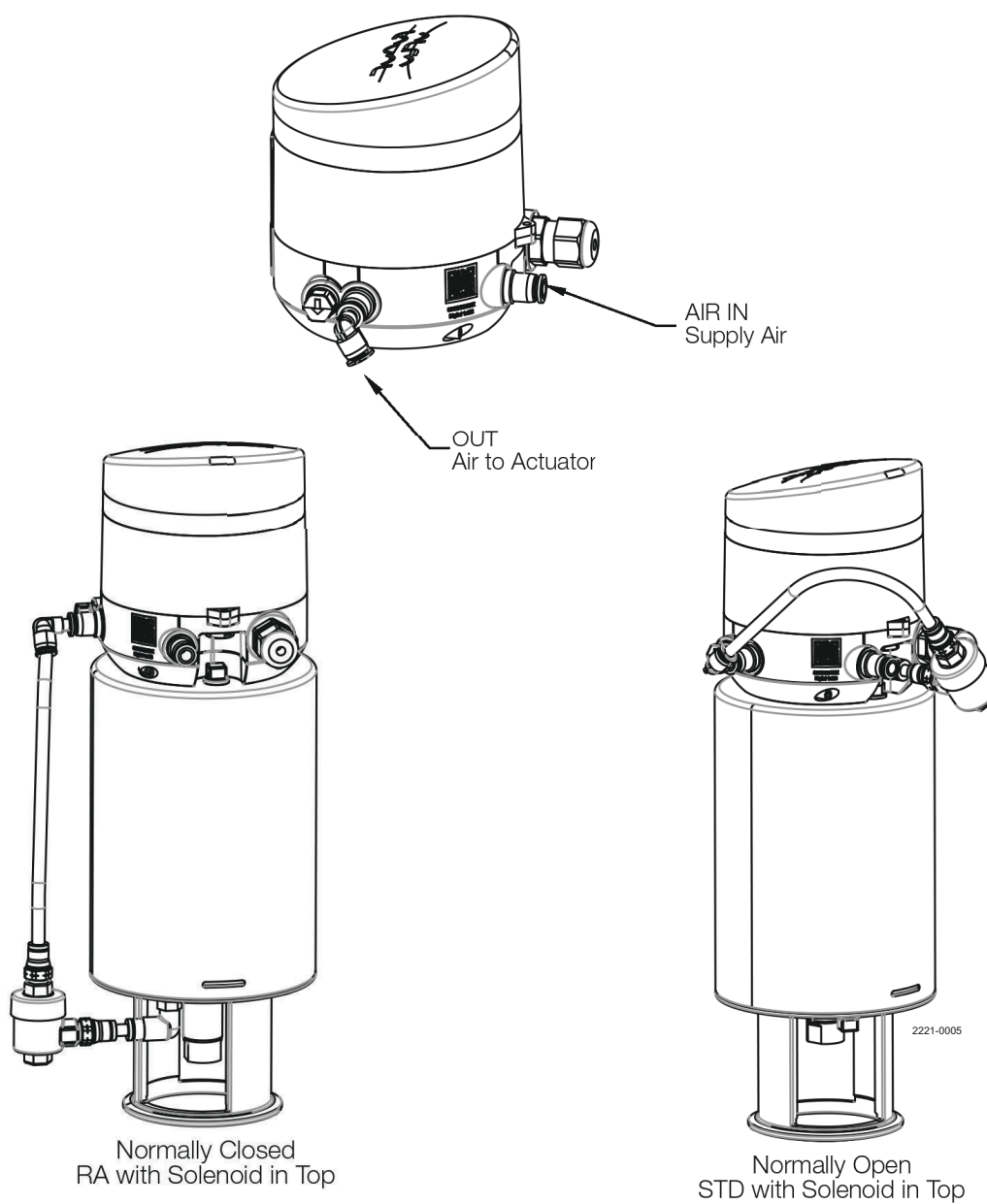
Air Supply

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.

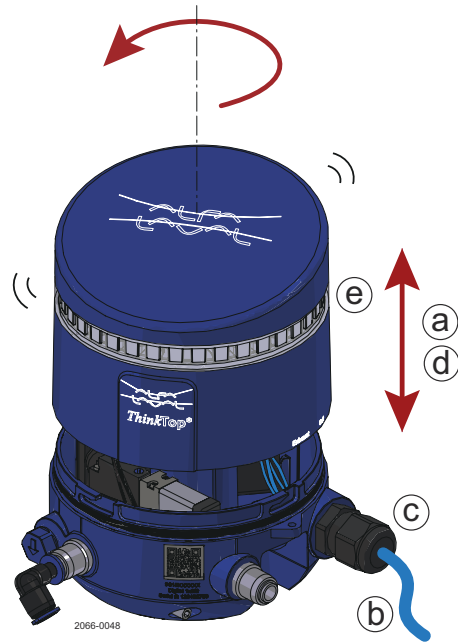
See air connections (next page) for valves with the solenoids in the ThinkTops. For valves with the solenoids at the panel, the air lines will connect directly to the quick exhaust valve.

3.3 Pneumatic Connections with Solenoid in-top



3.4 Electrical installation, Digital-IO 24V

- a** Remove the top cover by turning it counter clockwise and then lifting it upwards.
- b** Connect the cable to the ThinkTop, and then connect the wires to the terminals according to the wiring diagram.
- c** 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).
- d** Put the top cover back in place.
- e** Turn on the power supply. If installed correctly, the light guide flashes green.



TerminalsV50 Digital-IO 24V

1	Powersupply	24V	(brown)
2	Powersupply	GND	(blue)
3	out(PLC in)	StatusOK	(white)
4	out	Valvede-energised (DE-EN)	(black)
5	out	Mainvalve energised (EN)	(grey)
6	in	Solenoidvalve 1 for main valve (SV1)	(pink)

4 Operation

4.1 Operation Modes

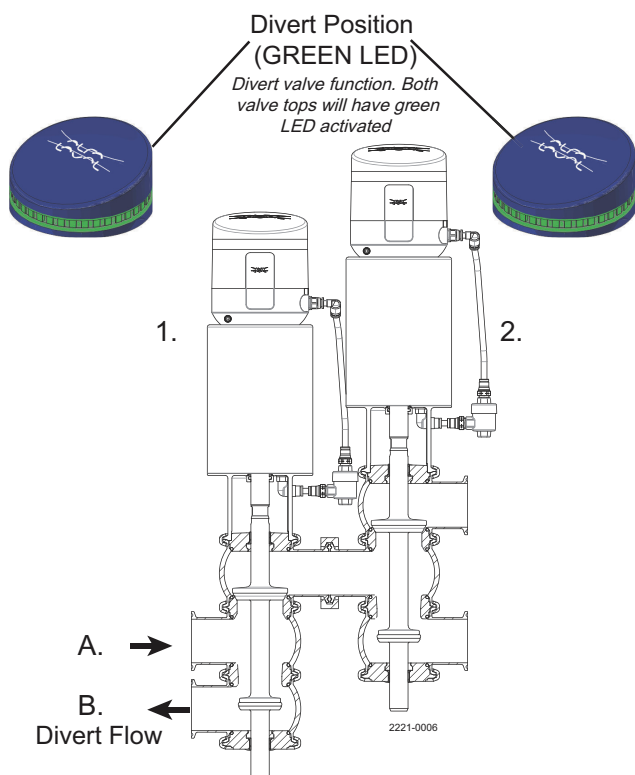
The Flow Diversion device consists of two (2) valves. Each is a two-position, three-port valve connected by a common body. This common body is the upper body of the Divert Valve and the middle body of the Leak Detect Valve. The air-to-raise actuators of the two valves are connected to independent air 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.

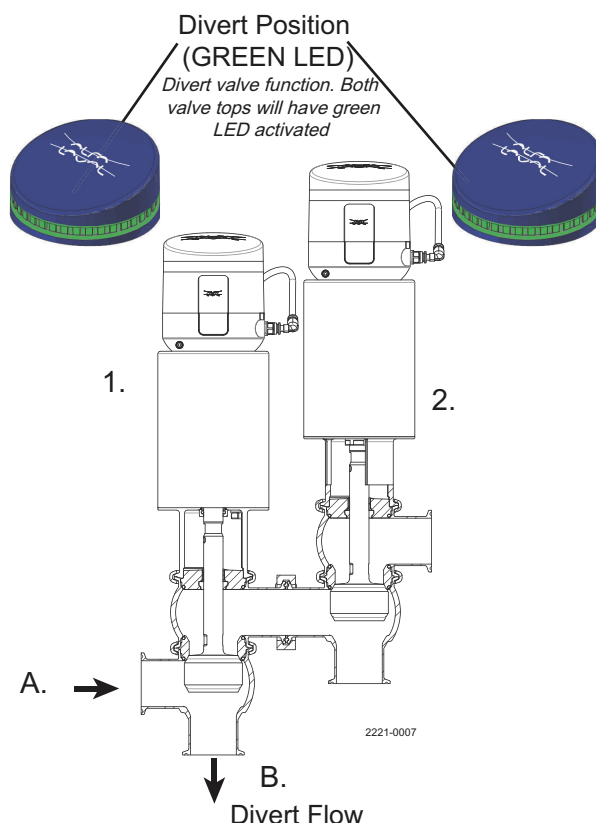
The Divert Valve should be in the divert position when:

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.

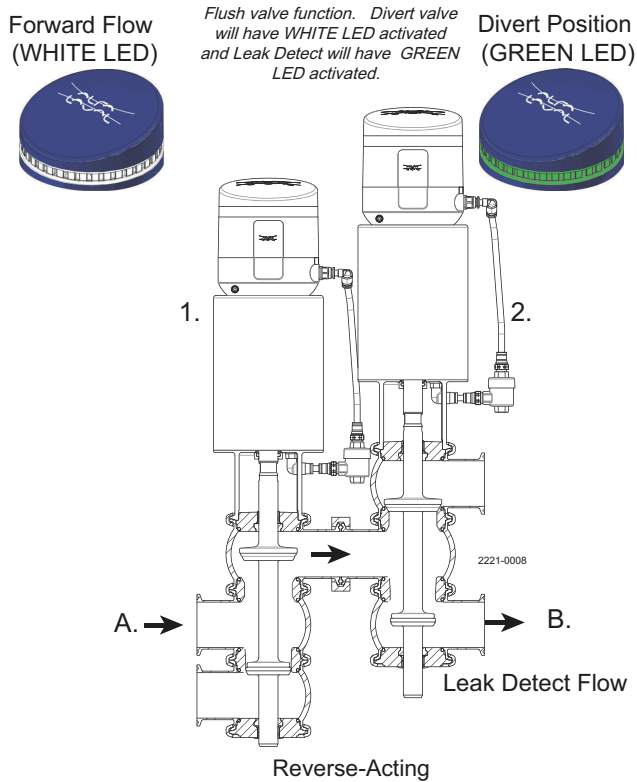
Product that flows through the valves in the Flush mode is returned to the Balance Tank through the Leak Detect Valve and the Return Line. This line must be separate from the Divert Product Return Line, but both of these lines return the product to the Balance Tank.

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



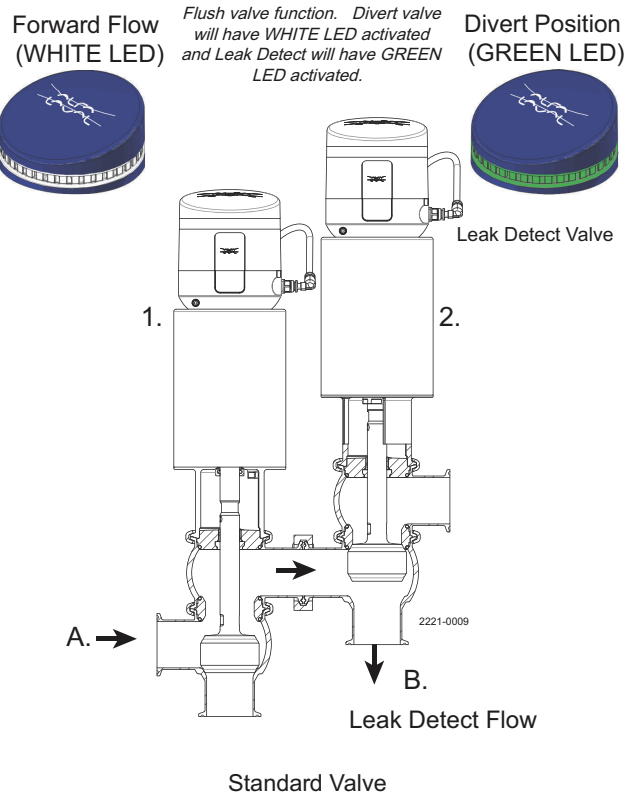
NOTE

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.



Reverse-Acting

1. Divert Valve
2. Leak Detect Valve
 - a. Product Inlet
 - b. To Balance Tank



Standard Valve

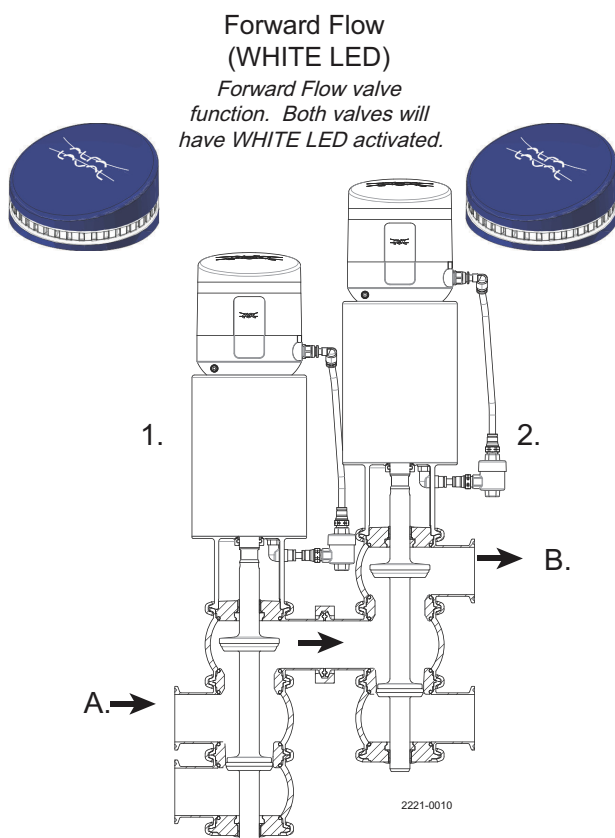
1. Divert Valve
2. Leak Detect Valve
 - a. Product Inlet
 - b. To Balance Tank

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.

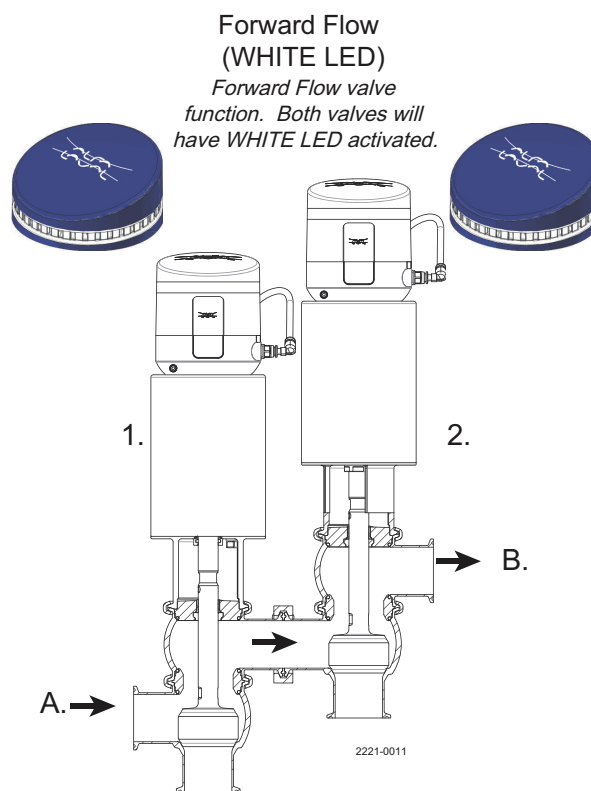
For the Forward Flow mode to be maintained:

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

4.2 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 tolerance 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 Check the control board revision located on the lower right corner of the board.

If the version is AF or newer, FDV tolerance band must be enabled:

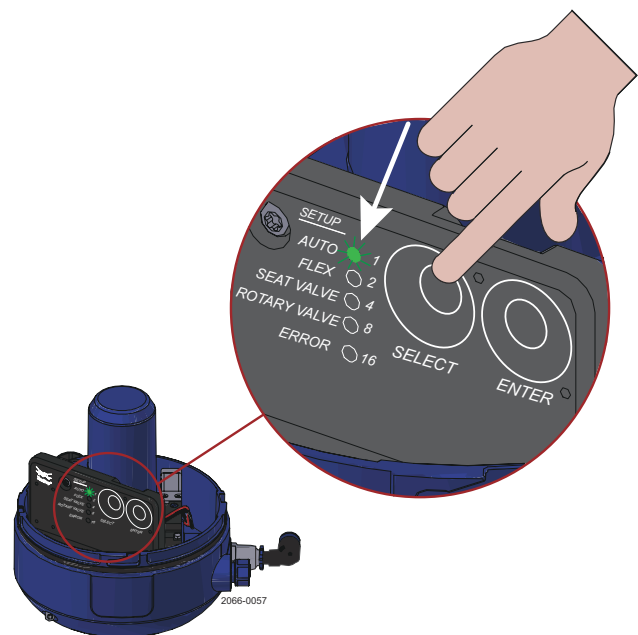
Navigate the menu until the LED 8 (Rotary valve) flashes by pressing SELECT four times, and then press ENTER to toggle the option ON.

LED 8 light must be steady.

- 3 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.



- 4 Put the top cover back in place.

- 5 Run an IO test to verify that the system returns the correct feedback.

 NOTE

Please refer to [page 17 for Valve Assembly Test and Sealing Instructions](#), if necessary.

4.3 Valve Assembly Test and Sealing Instructions

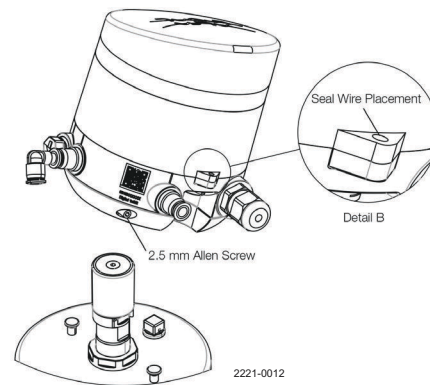
The ThinkTop sensors on these valves are safety devices. They are adjusted so that the flow promoting device will not run, at sub-legal pasteurization temperatures, unless the valves are completely and properly assembled.

To test the sensor adjustment:

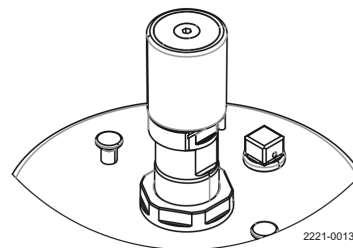
NOTE

Test can be preformed witout 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.

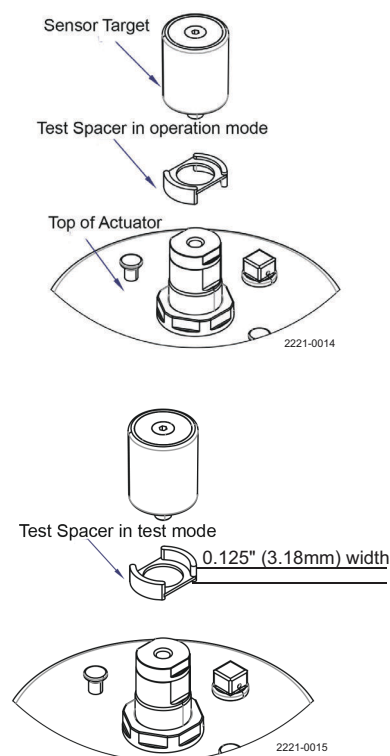
- 1 Make certain the valves are properly assembled, paying particular attention to the actuator mounting, yoke bonnet and body clamps, and the valve stem to actuator stem connection.
- 2 Make sure the temperature sensing element of the Safety Thermal Limit Recorder Controller is below legal pasteurization temperature.
- 3 Momentarily turn on the flow promoting device (timing pump) to make sure it is operating properly, and then turn it off.
- 4 Unscrew 2 Allen screws (2.5mm) and remove ThinkTop (Figure A).



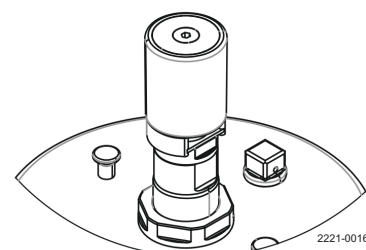
- 5 Test spacer is installed beneath the magnet in operation mode. (Figure 1)



- 6 Unscrew sensor target and flip test spacer 180° between the stem and magnet. (Figure 2-3)

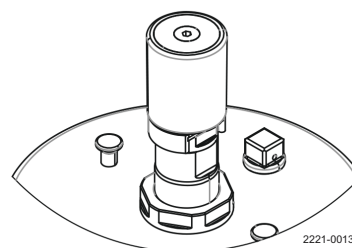


- 7 Assemble sensor target and test spacer for Test Mode per Figure 4. Reassemble ThinkTop to top of actuator and screw in the 2 Allen screws (2.5 mm).



- 8 Turn the selector switch to the "Product" position and the flow promoting device (timing pump) should not start.

- 9 Flip the spacer 180° and reassemble the valve in Operation Mode (Figure 1). Ensure valve is properly and completely assembled.



- 10 Repeat steps D - I with the leak detect valve.

- 11 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.

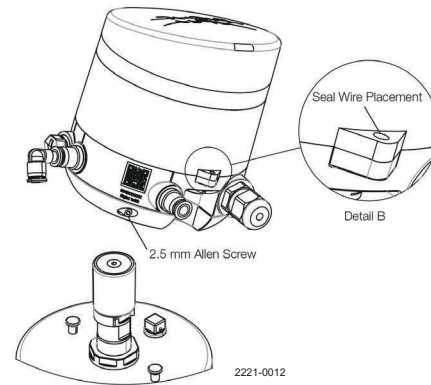
**NOTE**

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.

NOTE**CORRECTIVE ACTION:****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.

4.4 Recommended Cleaning

WARNING Risk of burns!

Never touch the supplied product or the pipelines when sterilizing.



CAUTION

Always handle lye and acid with great care.



NOTE

The supplied product is designed for cleaning in place (CIP).

NaOH = Caustic soda.

HNO₃ = Nitric acid.

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

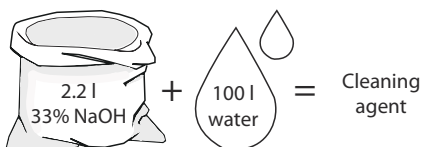
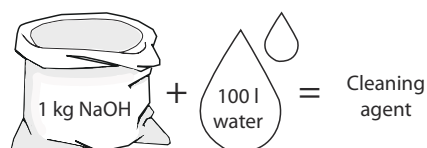
Examples of cleaning agents

NOTE

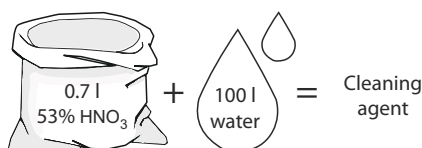
Use clean water free from chlorides.

Metric System

1. 1% by weight NaOH at 70°C

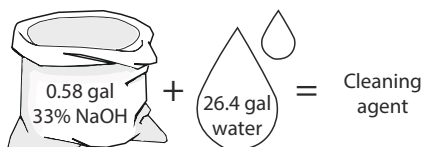
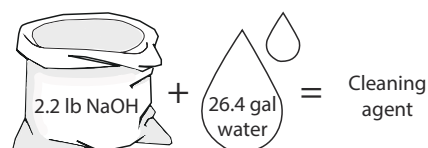


2. 0.5% by weight HNO₃ at 70°C

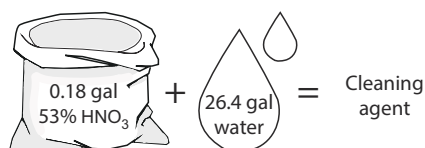


Imperial System

1. 1% by weight NaOH at 158°F



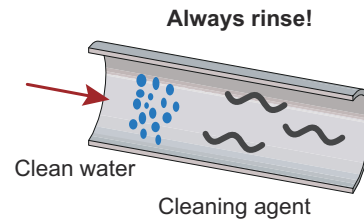
2. 0.5% by weight HNO₃ at 158°F



1. Avoid excessive concentration of the cleaning agent ⇒ **Dose gradually!**
2. Adjust the cleaning flow to the process
Milk sterilization/viscous liquids ⇒ Increase the cleaning flow!



Always rinse well with clean water after the cleaning.



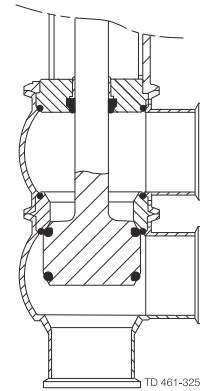
4.5 Additional cleaning

Clean the plug and the seats correctly.

Pay special attention to the warnings!

Lift and lower valve plug momentarily.

Change over valve



5 Troubleshooting

5.1 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.



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

Problem	Probable Cause	Remedy
Response time above one second.	- Faulty Quick Exhaust. - Defective solenoid valve. - Broken diaphragm on quick exhaust valve. - Actuator not functioning properly	- Inspect air lines for leaks or obstructions and take necessary corrective action. - Test Filter-Regulator and repair or replace if defective. - Test solenoids. Replace if necessary. - Replace diaphragm. - Check for excessive back pressure. - Service actuator.
Valves will not assume forward flow position at any selection switch setting.	- Inadequate air supply to actuator. - The pressure thermo switch capillary tube or controller has failed or leaking. - Electrical difficulties. - Actuator not functioning properly	- Check air system as described above. - Replace switch, refer to controller manual. - Refer to electrical troubleshooting chart and take corrective action. - Service actuator
Valve will not assume divert position.	- Quick exhaust valve is not functioning properly. - Obstruction in divert or leak detector valve.	- Inspect quick exhaust valve and remove obstruction or replace valve. - Disassemble valve and remove obstruction.
Timing pump will not start.	- Timing pump switch is not on. - One or both valve plug assemblies are not properly connected to actuator stem.	- Turn on switch. - Assemble valve stems to actuator stems correctly. - Check for proper adjustment of ThinkTop.
Valves slamming or banging	- Hydraulic shock caused by high differential pressure. - Pressure or flow rate exceeds valves published maximum limits.	- Review system pressure before and after valves. - Lower process flow rate and pressure. - Convert to Reverse Acting FDV. - Contact Alfa Laval tech. support to review options.

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6 Maintenance

6.1 General Maintenance

NOTE

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.

Always read the technical data thoroughly.

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

CAUTION

Always release the compressed air after use.

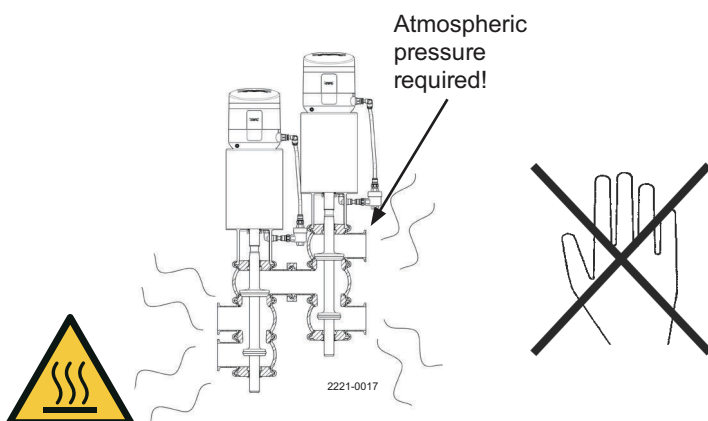


WARNING

Burn Risk!

Never service the valve when it is hot.

Never service the valve with valve and pipelines under pressure.



WARNING

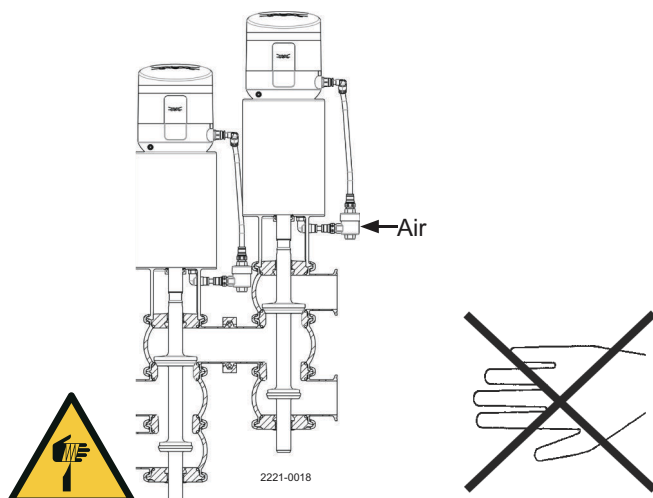
Never service the valve with valve and pipelines under pressure.

Atmospheric pressure required!

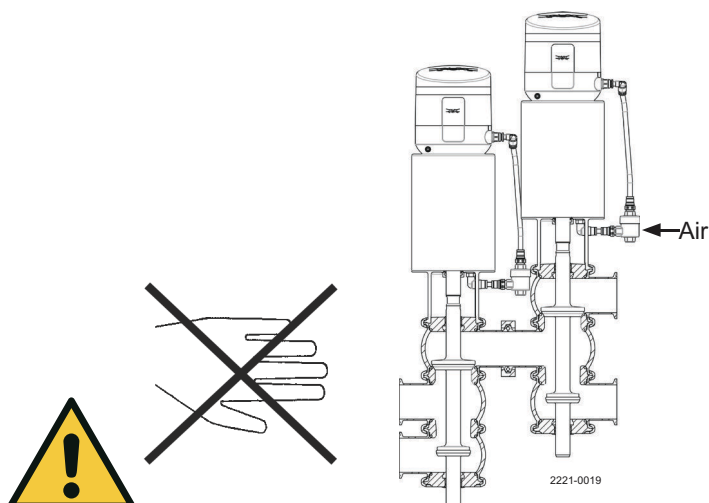


! WARNING Cutting danger!

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

**! WARNING Moving parts!**

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.

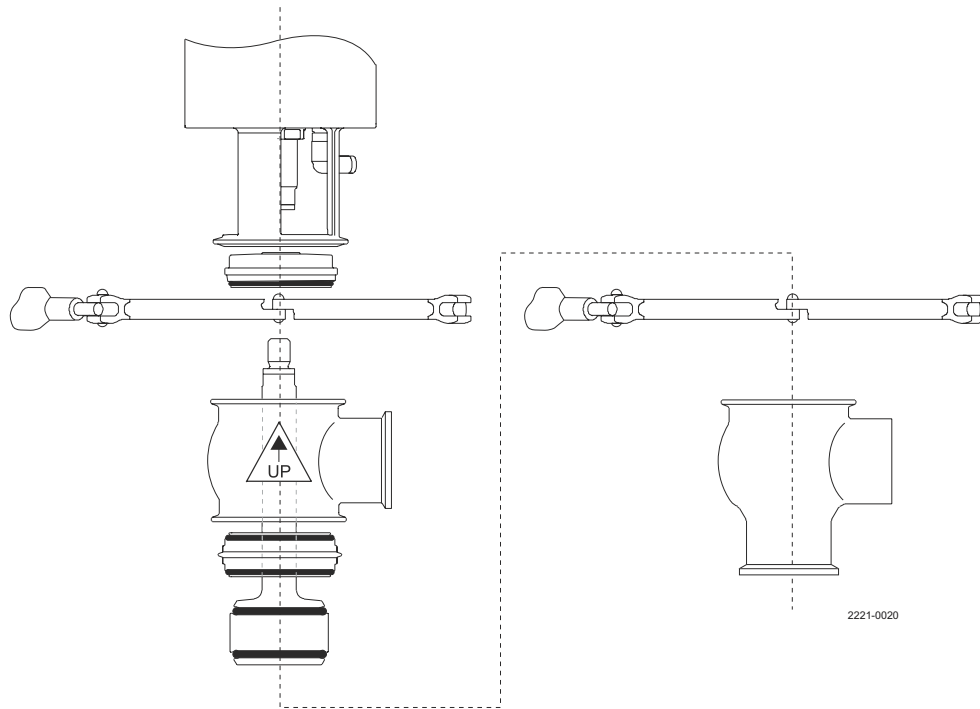
	Product wetted seals	Actuator bushings complete
Preventive Maintenance	Replace after 12 months depending on working conditions	Replace after 5 years depending on working conditions
Maintenance after leakage (leakage normally starts slowing)	Replace immediately	Replace when possible
Planned maintenance	• Regular inspection for leakage and smooth operation • Keep a record of the value • Use the statistics for planning of inspections Replace after leakage	• Regular inspection for leakage and smooth operation • Keep a record of the actuator • Use the statistics for planning of inspections Replace after leakage
Lubrication	Before fitting USDA H1 approved oil/grease	Before fitting Molykote longterm 2 plus

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!

6.2 Disassembly - Standard Flow Diversion Valve



1 Loosen and remove lower clamp - Remove lower body.

2 Supply compressed air to the actuator.



Stay clear of moving parts.

3 Unscrew and remove valve stem/plug.

4 Remove compressed air from actuator.



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.

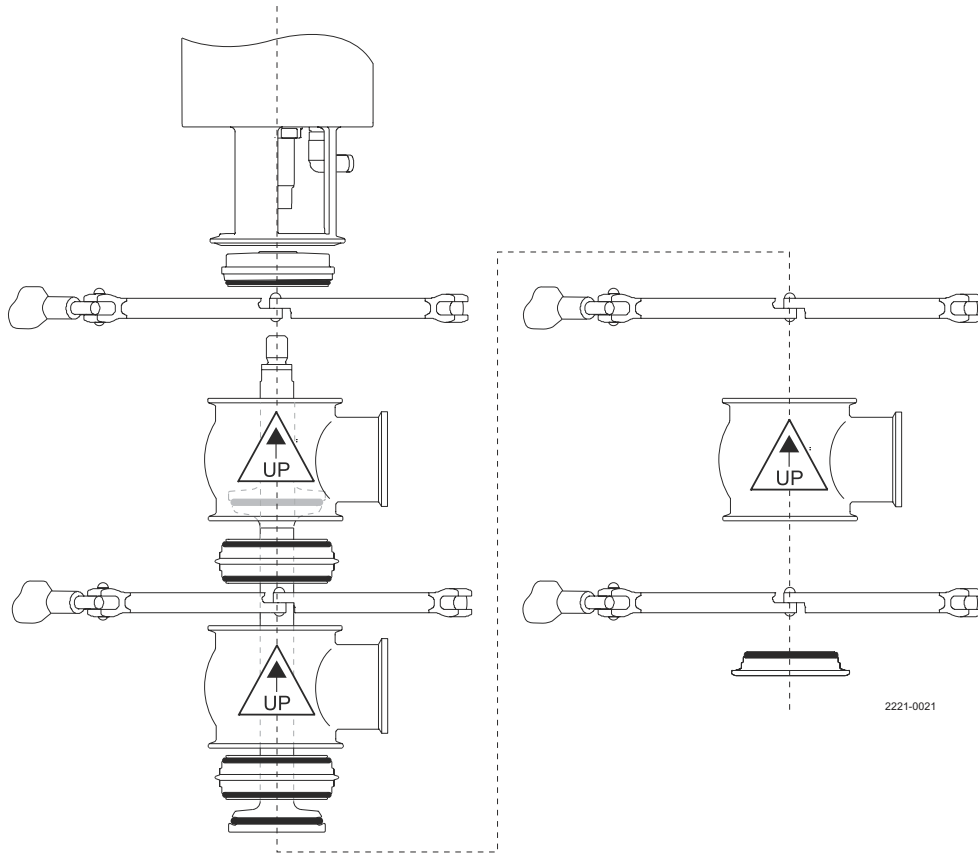
9 Follow instructions for removal of plug seats/seals and replace - see instructions.

10 Reverse order and reassemble valve.

 NOTE

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.

6.3 Disassembly - Reverse-Acting Valve



- 1 Loosen and remove lower clamp between “Lower” and middle body.
Remove lower body.

- 2 Apply compressed air to actuator.



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.



Stay clear of moving parts.

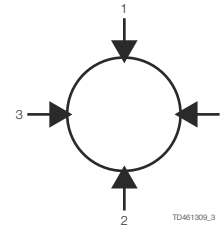
- 7 Remove upper body and bonnet from yoke.

-
- 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.
-

6.4 Bushing and seat/seal replacement

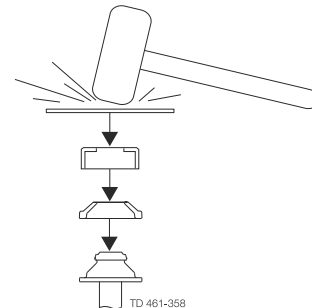
TR2 and Elastomer seat ring replacement

- 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.
- 5 Place the plug element on a firm support.
- 6 Using a utility knife, partially AND CAREFULLY cut through the upper ring Portion of the TR2 plug avoiding contact with stainless steel stem.
- 7 Force apart both cut ends of the plug for removal from stem.
- 8 TR2 plugs are installed by applying uniform pressure on all sides. (Pressure can be applied by using the seat assembly tool.)

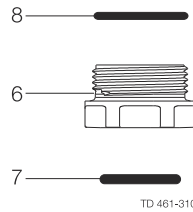
- 9 Using a piece of metal and a rubber mallet, place a precise tab to make the TR2 plug snap on to the stem. Reverse the tool and tab again to secure proper fit.



- 10 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.

6.5 Actuator bushing replacement

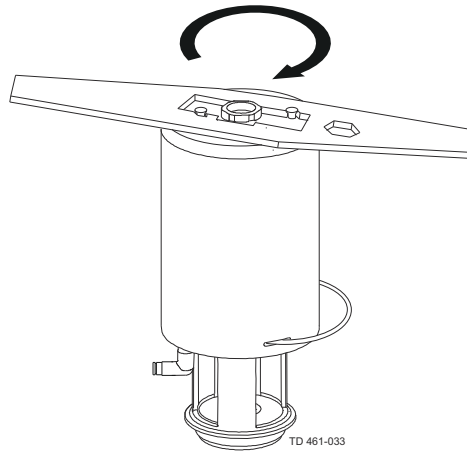


- 1 Unscrew and remove top and bottom bushings with O-rings.
- 2 Lubricate O-rings with Molykote Longterm 2 plus before fitting.
- 3 Fit bushings and O-rings. Tighten brushing with a torque = 7 lbf-ft (10Nm).

NOTE

Be careful not to overtighten.

6.6 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 $M = 12 \text{ lbf-ft. (17 Nm)}$. 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.

6.7 Assembly of maintainable actuator

- ① Reverse order of [Dismantling of maintainable actuator](#) on page 42.
- ② Lubricate O-ring (3, 7, 11) with Molykote Longterm 2 plus before fitting.

7 Spare parts

For every delivered Alfa Laval Product, a spare part list is available.

This spare part list contains a range of the most common wear parts for the machinery. If any component not mentioned is required, please contact your local Alfa Laval representative for availability.

You can find our spare part catalogue at <https://hygienicfluidhandling-catalogue.alfalaval.com>.

Always use Alfa Laval genuine spare parts. The warranty of Alfa Laval products is dependent on use of Alfa Laval genuine spare parts.

7.1 Ordering spare parts

When ordering spare parts, please always state:

1. Serial number (if available)
2. Item number/spare part number (if available)
3. Capacity or other relevant identification

7.2 Alfa Laval service

Alfa Laval is represented in all larger countries of the world.

Do not hesitate to contact your local Alfa Laval representative, with any questions or requirement of spare parts for Alfa Laval equipment.

7.3 Warranty - Definition



The rules of Intended use are absolute. Use of the supplied Alfa Laval product is allowed only when in compliance with the technical data supplied with the Intended use.

Differing utilisation, other than agreed with Alfa Laval Kolding A/S, exclude any liability and warranty.

No modification or alteration of the supplied Alfa Laval product is allowed, unless explicit permission is granted by Alfa Laval Kolding A/S.



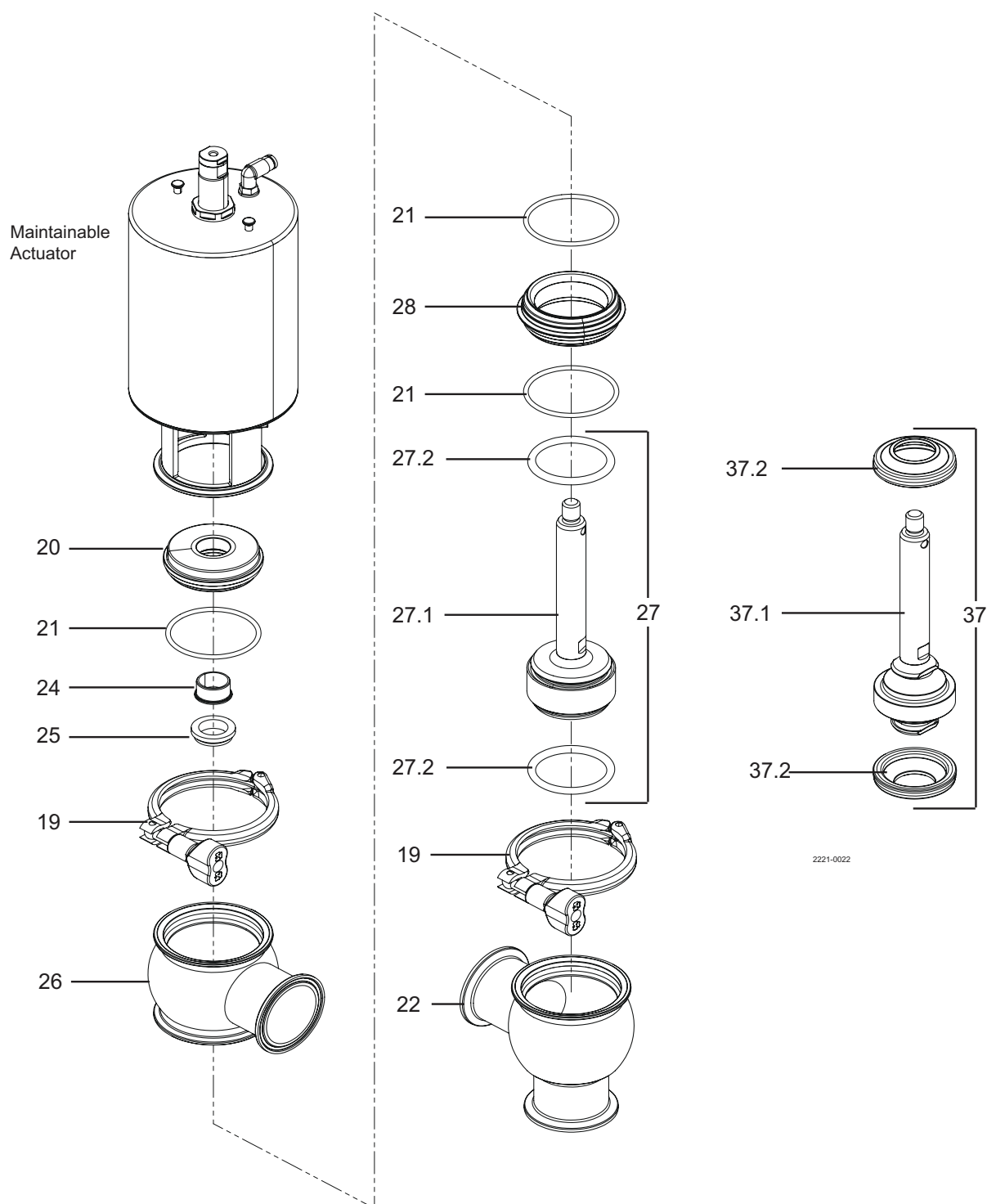
Liability and warranty are excluded:

- If advice and instruction of operating instructions are ignored
- For incorrect operation or for insufficient maintenance of the supplied Alfa Laval product
- For any kind of change of function of the supplied Alfa Laval product without prior written agreement by Alfa Laval Kolding A/S
- If supplied Alfa Laval product is modified by non-authorised persons
- If using the supplied Alfa Laval product without attention of appropriate safety regulations, (see [Safety](#) on page 5)
- If protection equipment is not used and vessel process / ancillary equipment is not brought to a standstill
- If the supplied Alfa Laval product and ancillary parts are not properly maintained (to be executed in intervals and including fitting of prescribed replacement parts)

When exchanging parts, only original replacement parts, released from the manufacturer, must be used.

8 Parts lists and exploded views

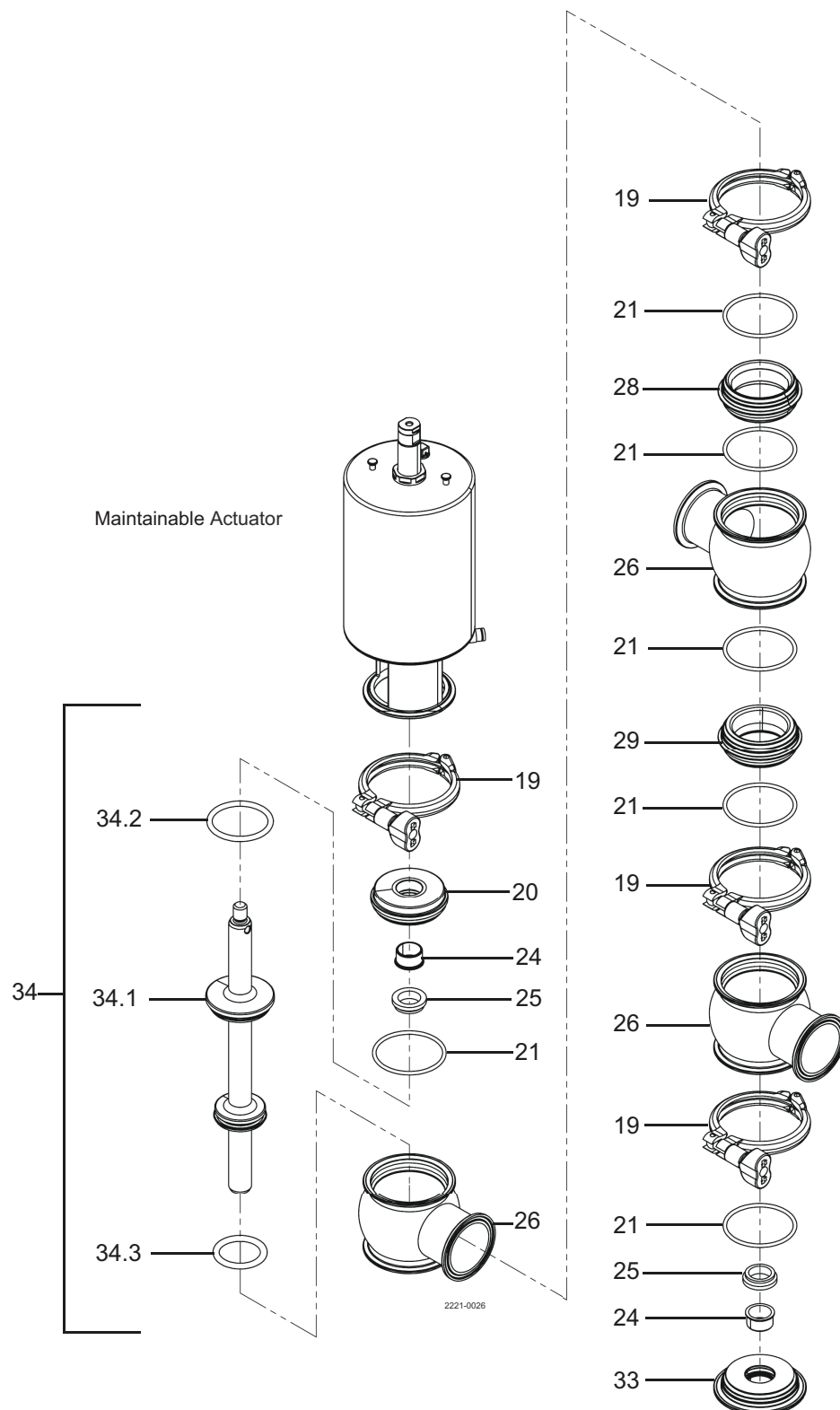
8.1 Unique SSV Standard Flow Diversion Valve Exploded View



Pos.	Qty.	Denomination
19	2	Clamp
20	1	Bonnet
21	3	O-ring (EPDM, HNBR, FPM)
22	1	Valve body, lower, 2 port, clamp
24	1	Bushing
25	2	Lip seal (EPDM, HNBR, FPM)
26	1	Valve body, upper, 1 port, clamp

Pos.	Qty.	Denomination
27	1	Plug, ISO, Complete (EPDM, HNBR, FPM)
27.1	1	Plug ISO
27.2	2	Plug seal (EPDM, HNBR, FPM)
28	1	Seal, upper
37	1	Plug, Complete (EPDM, HNBR, FPM)
37.1	1	Plug
37.2	2	Plug seal PTFE TR-2

8.2 Unique SSV Standard Flow Diversion Reverse-Acting Valve

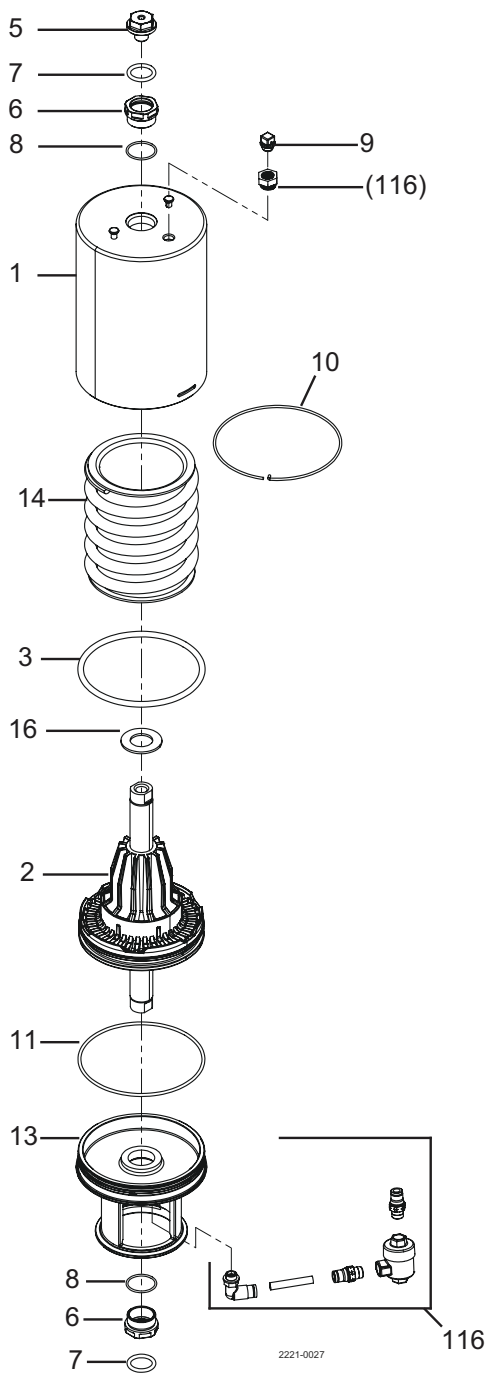


Pos.	Qty.	Denomination
19	4	Clamp
20	1	Upper bonnet
21	6	O-ring (EPDM, HNBR, FPM)
24	2	Bushing
25	2	Lip seal (EPDM, HNBR, FPM)
26	3	Valve body, upper, 1 port, clamp
28	1	Seal, upper

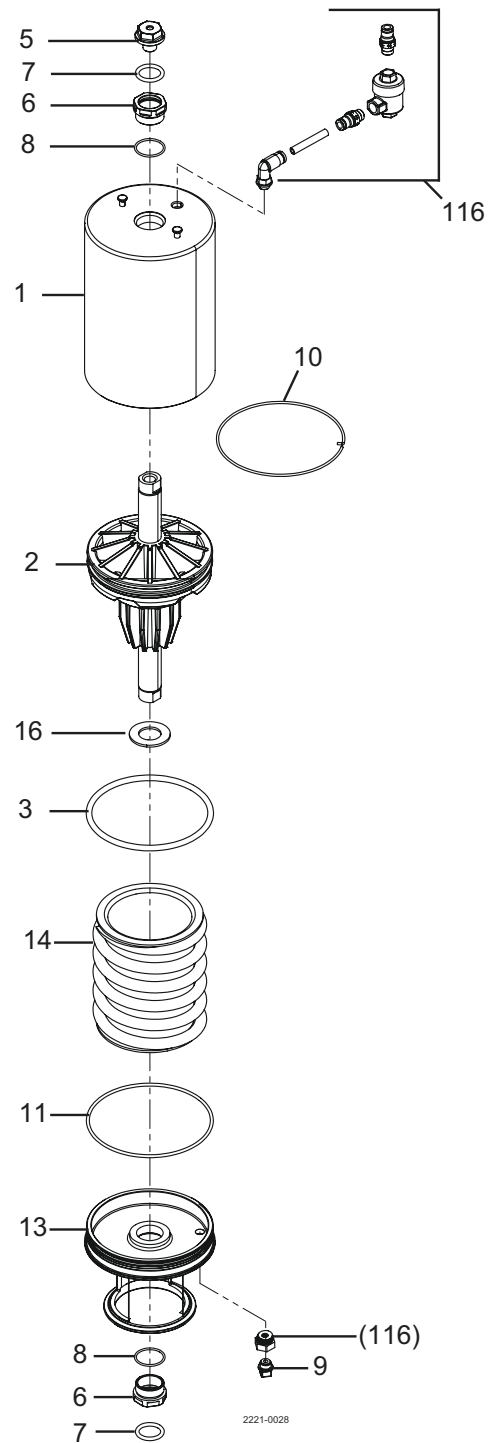
Pos.	Qty.	Denomination
29	1	Seat, lower
33	1	Lower Bonnet
34	1	Plug, RA-FDV, Complete (EPDM, HNBR, FPM)
34.1	1	Plug, RA-FDV
34.2	1	Plug seal, Upper (EPDM, HNBR, FPM)
34.3	1	Plug seal, Lower (EPDM, HNBR, FPM)

8.3 Actuator

Failed Closed Actuator for Reverse Acting



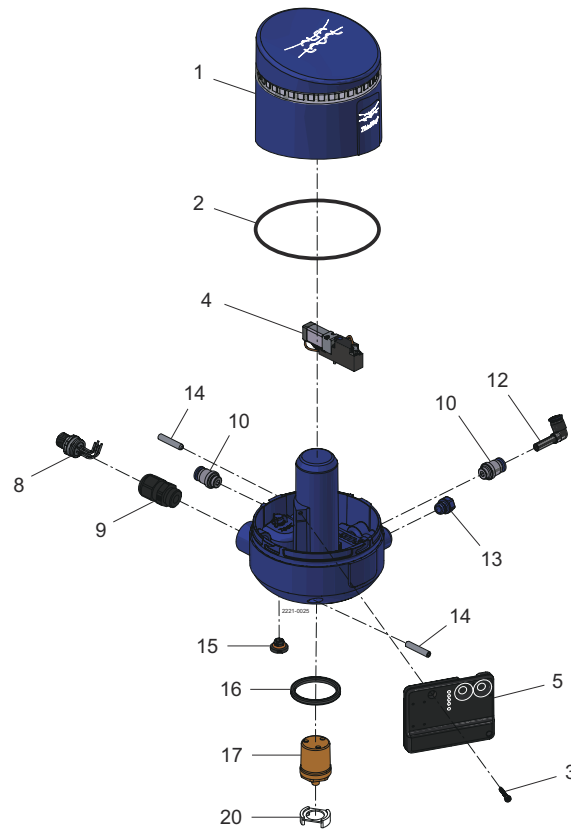
Failed Open Actuator for Standard



Pos.	Qty.	Denomination
1	1	Cylinder, (polished)
2	1	Piston
3	1	O-ring
5	1	Adapter, steel
6	2	Bushing
7	2	O-ring
8	2	O-ring
9	1	Plug

Pos.	Qty.	Denomination
10	1	Lock wire
11	1	O-ring
13	1	Yoke
14	1	Spring assembly
15	1	Bottom
16	1	Support disc
116	1	Kit, Quick Exhaust

8.4 ThinkTop



Pos.	Qty.	Denomination
1	1	Cover
2	1	V-ring
3	1	Screw
4	1	Solenoid valve
5	1	Control board
6	1	Spacer
7	4	Base screw
8	1	M12 plug (4 pins, 8 pins)
9	1	Cable gland, Main entry, Ø4-10mm

Pos.	Qty.	Denomination
11	3	Blind plug air
12	1	Air fitting, elbow, 1/4"
13	1	Exhaust plug
14	2	Set screw
15	1	Gore vent
16	1	X-ring
17	1	Sensor target
19	1	Base
20	1	Test spacer