



Instruction Manual

Pressure Reducing Valve for Air **A-COS-10**

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Introduction

Thank you for purchasing the TLV pressure reducing valve for air, A-COS.

This product has been thoroughly inspected before being shipped from the factory. When the product is delivered, before doing anything else, check the specifications and external appearance to make sure nothing is out of the ordinary. Also be sure to read this manual carefully before use and follow the instructions to be sure of using the product properly.

Using air in which matter such as condensate, scale or types of oil is entrained can not only result in problems with the air-using equipment and in lowered productivity, but can also lead to shortened service life for and malfunction of the reducing valves.

The TLV pressure reducing valve for air, model A-COS, is a new reducing valve that eliminates these problems and makes possible the supply of high-quality air at a constant pressure.





If detailed instructions for special order specifications or options not contained in this manual are required, please contact TLV for full details.



This instruction manual is intended for use with the model(s) listed on the front cover. It is needed not only for installation, but also for subsequent maintenance, disassembly/reassembly and troubleshooting. Please keep it in a safe place for future reference.

Safety Considerations


- Read this section carefully before use and be sure to follow the instructions.
- Installation, inspection, maintenance, repairs, disassembly, adjustment and valve opening/closing should be carried out only by trained maintenance personnel.
- The precautions listed in this manual are designed to ensure safety and prevent equipment damage and personal injury. For situations that may occur as a result of erroneous handling, three different types of cautionary items are used to indicate the degree of urgency and the scale of potential damage and danger: DANGER, WARNING and CAUTION.
- The three types of cautionary items above are very important for safety: be sure to observe all of them as they relate to installation, use, maintenance and repair. Furthermore, TLV accepts no responsibility for any accidents or damage occurring as a result of failure to observe these precautions.

Symbols


	Indicates a DANGER, WARNING or CAUTION item.
	Indicates an urgent situation which poses a threat of death or serious injury
	Indicates that there is a potential threat of death or serious injury
	Indicates that there is a possibility of injury or equipment / product damage

	<p>NEVER apply direct heat to the float.</p> <p>The float may explode due to increased internal pressure, causing accidents leading to serious injury or damage to property and equipment.</p>
	<p>Install properly and DO NOT use this product outside the recommended operating pressure, temperature and other specification ranges.</p> <p>Improper use may result in such hazards as damage to the product or malfunctions that may lead to serious accidents. Local regulations may restrict the use of this product to below the conditions quoted.</p> <p>DO NOT use the product in excess of the maximum operating pressure differential.</p> <p>Such use could make discharge through the air trap impossible (blocked).</p> <p>Use hoisting equipment for heavy objects (weighing approximately 20 kg (44 lb) or more).</p> <p>Failure to do so may result in back strain or other injury if the object should fall.</p> <p>Take measures to prevent people from coming into direct contact with product outlets.</p> <p>Failure to do so may result in burns or other injury from the discharge of fluids.</p>

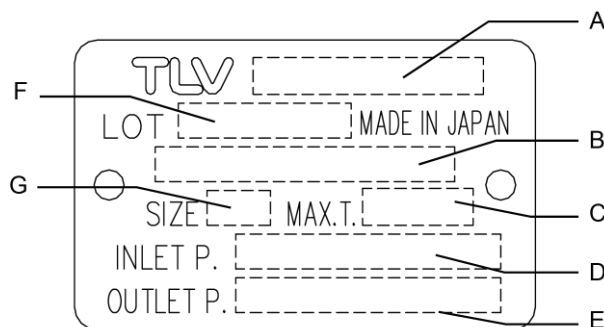
Continued on the next page

 CAUTION	When disassembling or removing the product, wait until the internal pressure equals atmospheric pressure and the surface of the product has cooled to room temperature.
	Disassembling or removing the product when it is hot or under pressure may lead to discharge of fluids, causing burns, other injuries or damage.
	Be sure to use only the recommended components when repairing the product, and NEVER attempt to modify the product in any way.
	Failure to observe these precautions may result in damage to the product and burns or other injury due to malfunction or the discharge of fluids.
	Do not use excessive force when connecting threaded pipes to the product.
	Over-tightening may cause breakage leading to fluid discharge, which may cause burns or other injury.
	Use only under conditions in which no freeze-up will occur.
	Freezing may damage the product, leading to fluid discharge, which may cause burns or other injury.
	Use only under conditions in which no water hammer will occur.
	The impact of water hammer may damage the product, leading to fluid discharge, which may cause burns or other injury.

Specifications

 CAUTION	Install properly and DO NOT use this product outside the recommended operating pressure, temperature and other specification ranges. Improper use may result in such hazards as damage to the product or malfunctions that may lead to serious accidents. Local regulations may restrict the use of this product to below the conditions quoted.
	DO NOT use this product in excess of the maximum operating pressure differential. Such use could make discharge impossible (blocked).
	Use only under conditions in which no freeze-up will occur. Freezing may damage the product, leading to fluid discharge, which may cause burns or other injury.

Refer to the product nameplate for detailed specifications.



A	Model
B	Nominal Diameter
C	Maximum Operating Temperature (TMO)
D	Primary Pressure Range
E	Secondary Pressure Adjustable Range
F	Production Lot No.
G	Valve No.*

* Valve No. is displayed for products with options. This item is omitted from the nameplate when there are no options.

Acceptable Operating Range

Model	A-COS-10
Applicable Fluid	Air
Primary Pressure Range	0.1 to 0.9 MPaG (15 to 130 psig)
Secondary Pressure Adjustable Range	0.05 to 0.7 MPaG (7 to 100 psig)
Minimum Differential Pressure	0.05 MPa (7 psi) and larger
Maximum Operating Temperature	100 °C (212 °F)
Minimum Adjustable Flow Rate	10% of rated flow rate and larger

(1 MPa = 10.197 kg/cm²)

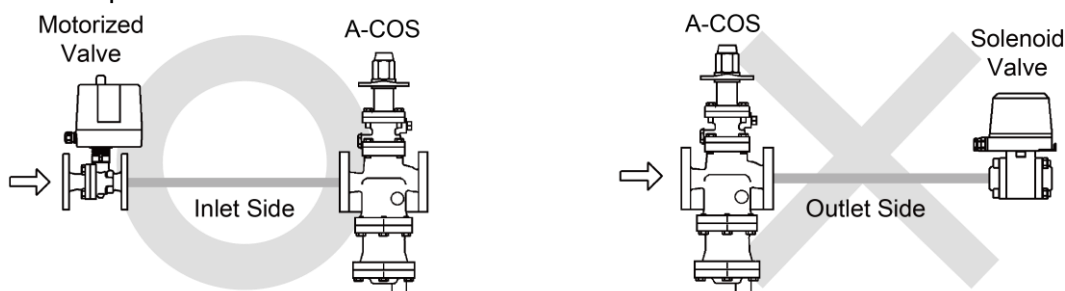
Correct Usage of the A-COS Pressure Reducing Valve



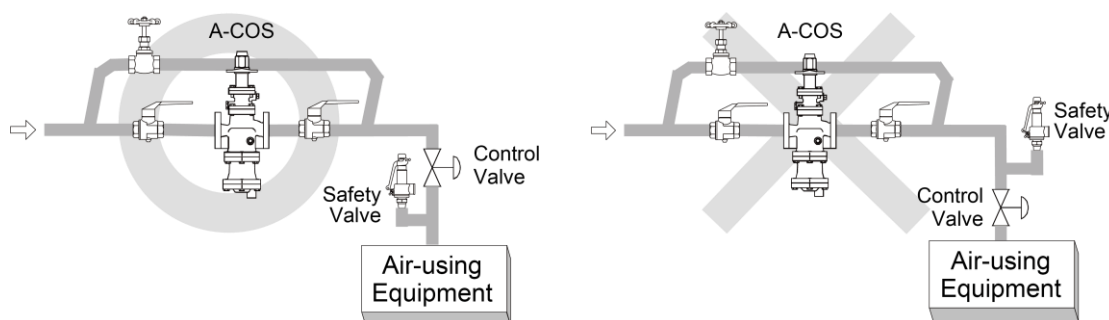
Install properly and DO NOT use this product outside the recommended operating pressure, temperature and other specification ranges.
Improper use may result in such hazards as damage to the product or malfunctions that may lead to serious accidents. Local regulations may restrict the use of this product to below the conditions quoted.

1. The product should be operated only within its specifications.
2. Installing an ON-OFF Valve (Solenoid Valve or Motorized Valve)
If an on-off valve, such as a motorized valve, is required, install it at the inlet side of the product. If a solenoid valve is installed at the outlet of the product, its opening and closing will cause heavy chattering and may lead to damage of the piston and main valve. (When the on-off valve opens, the secondary pressure of the product changes from zero to the set pressure. Passing through an area of the reducing ratio of less than 10:1, where adjustment is impossible, chattering occurs momentarily.)

NOTE: To prevent water hammer, it is recommended that a slow-acting motorized on-off valve be used. In particular, if a fast-acting on-off solenoid valve is used for frequent temperature control, the potential water hammer effect can damage the air-using equipment and the product.



3. Installing a Safety Valve and a Control Valve



When installing a safety valve to protect the air-using equipment, be sure to install it on the air-using equipment or directly before the inlet of the air-using equipment. If the safety valve is installed on the outlet side of the product between the product and a control valve, an eventual pressure rise could activate the safety valve.

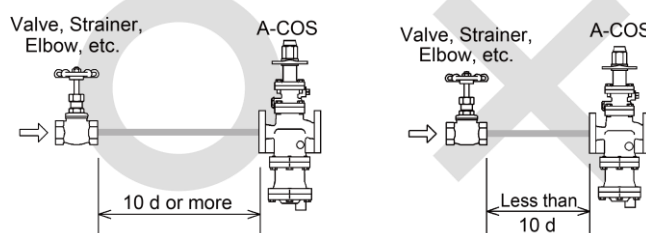
4. Precautions for the Installation of Additional Fittings Before or After the product
 In order to ensure stable air flow, the piping upstream and downstream of the product must be straight runs. If the product is installed either directly before or after an elbow or control valve, unevenness in air flow may result in chattering and unstable pressure.

To ensure stable air flow, it is recommended that the product be installed on straight runs of piping, as illustrated below.

① Inlet (primary side) of the product

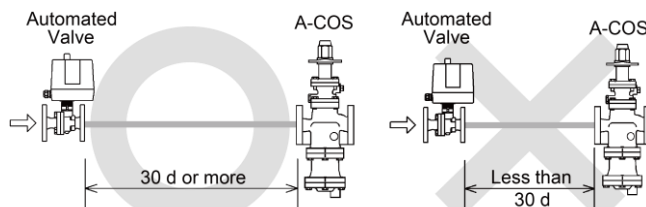
NOTE: d = pipe diameter

Maintain a straight piping run of **10 d or more** when a manual valve, a strainer or an elbow, etc. is installed.
 (Example: if nominal size is 25 mm (1 in), have 250 mm (10 in) or more)



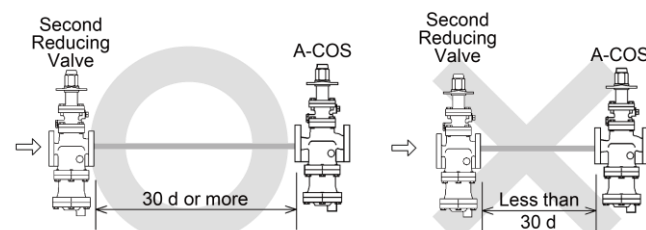
Maintain a straight piping run of **30 d or more** when an automated valve (on-off valve) is installed.

(Example: if nominal size is 25 mm (1 in), have 750 mm (30 in) or more)



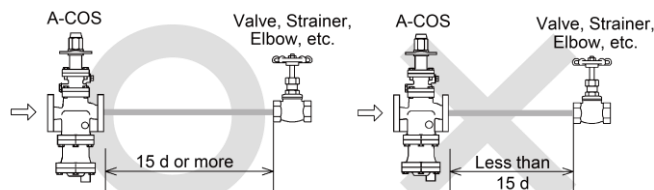
Maintain a straight piping run of **30 d or more** when another pressure reducing valve is installed. (Two-stage pressure reduction)

(Example: if nominal size is 25 mm (1 in), have 750 mm (30 in) or more)



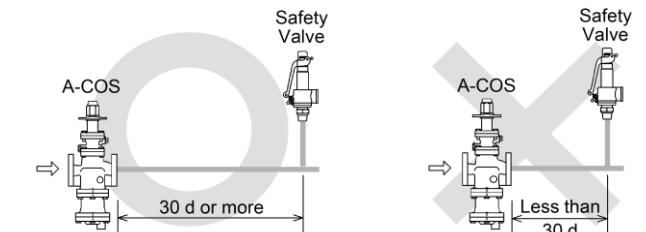
② Outlet (secondary side) of the product

Maintain a straight piping run of **15 d or more** when a manual valve, a strainer or an elbow, etc. is installed.
 (Example: if nominal size is 25 mm (1 in), have 375 mm (15 in) or more)

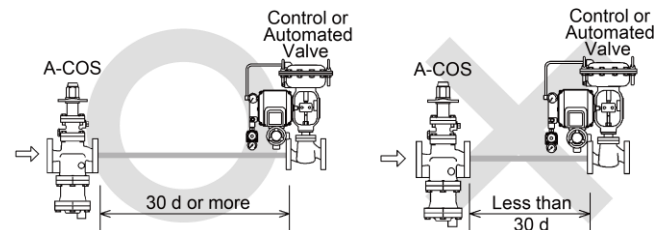


Maintain a straight piping run of **30 d or more** when a safety valve is installed.

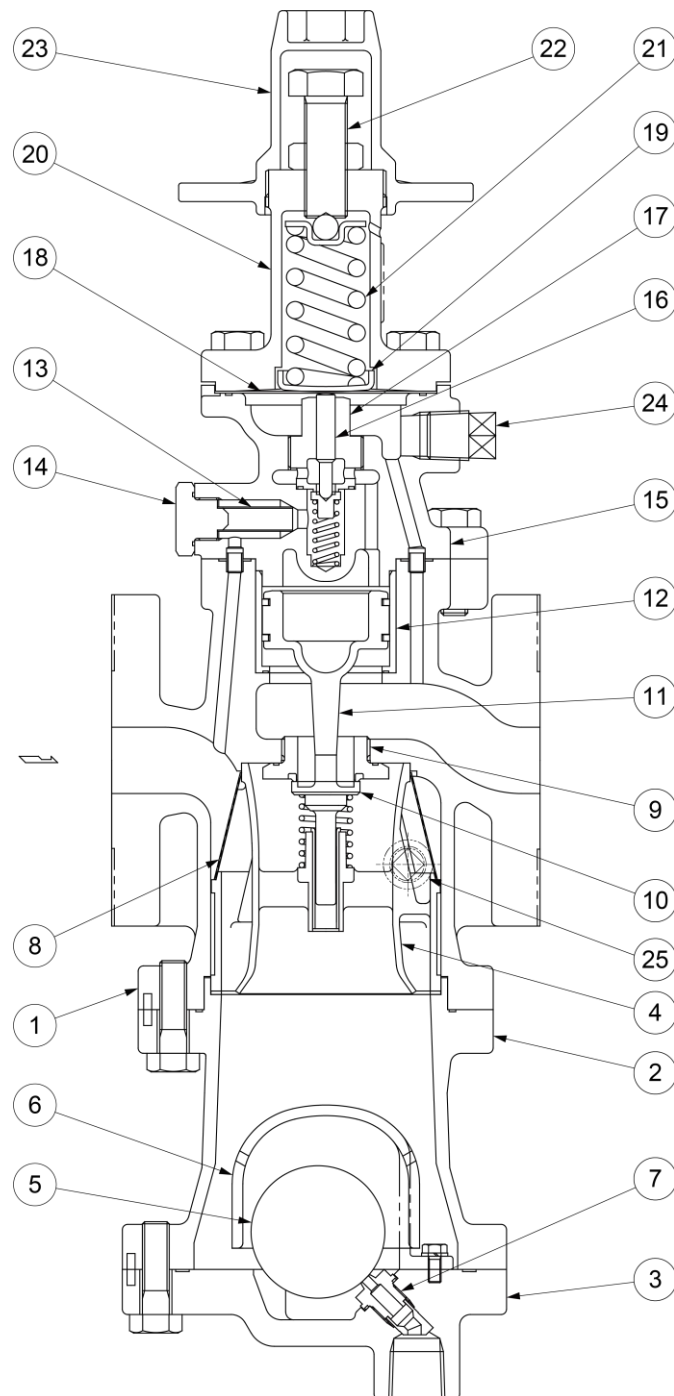
(Example: if nominal size is 25 mm (1 in), have 750 mm (30 in) or more)



Maintain a straight piping run of **30 d or more** when a control valve or an automated valve (on-off valve) is installed.
 (Example: if nominal size is 25 mm (1 in), have 750 mm (30 in) or more)




Configuration



No.	Name
1	Main Body
2	Separator Body
3	Trap Cover
4	Separator
5	Float
6	Float Cover
7	Trap Valve Seat
8	Separator Screen
9	Main Valve Seat
10	Main Valve
11	Piston
12	Cylinder
13	Pilot Screen
14	Pilot Screen Holder
15	Pilot Body
16	Pilot Valve
17	Pilot Valve Seat
18	Diaphragm
19	Diaphragm Support
20	Spring Housing
21	Coil Spring
22	Adjustment Screw
23	Spanner Cap
24	Plug – Sensing Line Port
25	Plug (option)

Installation

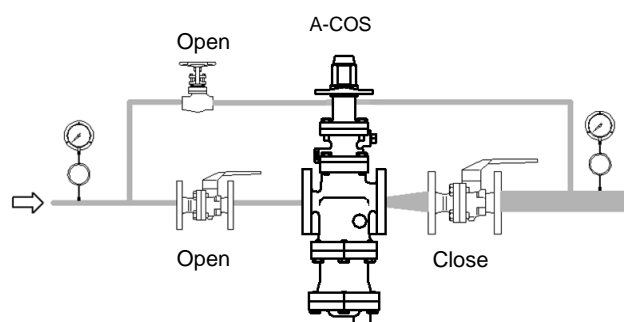
 CAUTION	Install properly and DO NOT use this product outside the recommended operating pressure, temperature and other specification ranges. Improper use may result in such hazards as damage to the product or malfunctions that may lead to serious accidents. Local regulations may restrict the use of this product to below the conditions quoted.
	Use hoisting equipment for heavy objects (weighing approximately 20 kg (40 lb) or more). Failure to do so may result in back strain or other injury if the object should fall.
	Take measures to prevent people from coming into direct contact with product outlets. Failure to do so may result in burns or other injury from the discharge of fluids.
	Do not use excessive force when connecting threaded pipes to the product. Over-tightening may cause breakage leading to fluid discharge, which may cause burns or other injury.

Installation, inspection, maintenance, repairs, disassembly, adjustment and valve opening/closing should be carried out only by trained maintenance personnel.

1. Blowdown

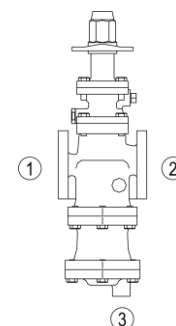
Before installing the product, be sure to blow down all piping thoroughly. If this is not possible, perform a blowdown using the bypass valve.

Blowdown is especially important for newly installed piping or after the system has been shut down for a long period of time.



2. Removing Seal and Cap

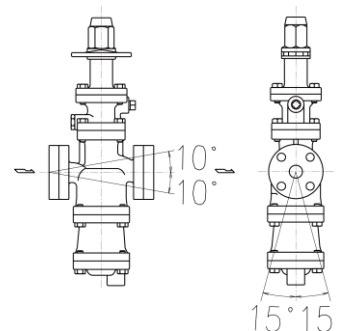
Before installation, be sure to remove all protective seals and caps. (Found in 3 locations, on the product inlet and outlets.)



3. Installation Angle

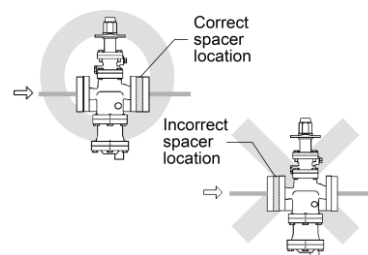
Make sure the product is installed on horizontal piping, so that the arrow mark on the body matches the direction of air flow and the adjustment section faces up.

Allowable inclination is 10 degrees in the fore-aft direction and 15 degrees in the plane perpendicular to the air flow line.



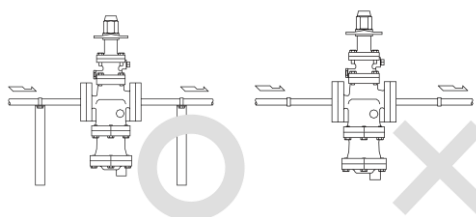
4. Spacer Installation

If spacing adjustment is necessary to accommodate installation, install a spacer on the outlet flange. The spacer should consist of a spacer, gaskets, bolts and nuts. Fit gaskets to both sides of the spacer between the product outlet and the pipe flange. Fasten with bolts and nuts.



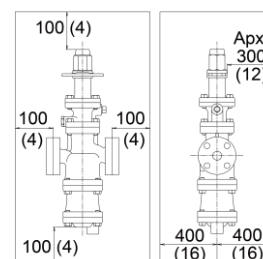
5. Piping Support

Install the product, paying attention to avoid excessive load, bending and vibration. Support the inlet and outlet pipes securely.



6. Maintenance Space

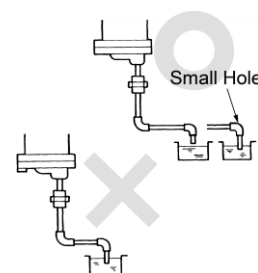
Leave sufficient space for maintenance, inspection and repair.



(Unit: mm (in))

7. Trap Outlet Pipe

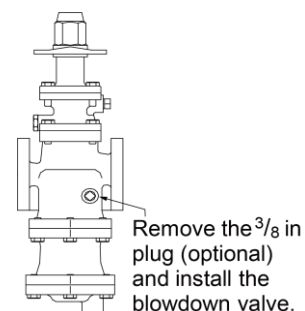
For ease of maintenance, installation of a union connection is recommended for the trap outlet pipe. Connect the outlet pipe to a condensate return line, or extend it to a trench. In the case of the latter, make sure the end of the pipe is above the waterline.



8. Blowdown Valve (requires optional plug)

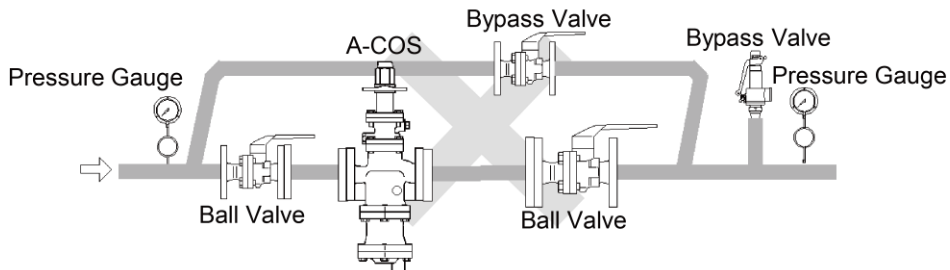
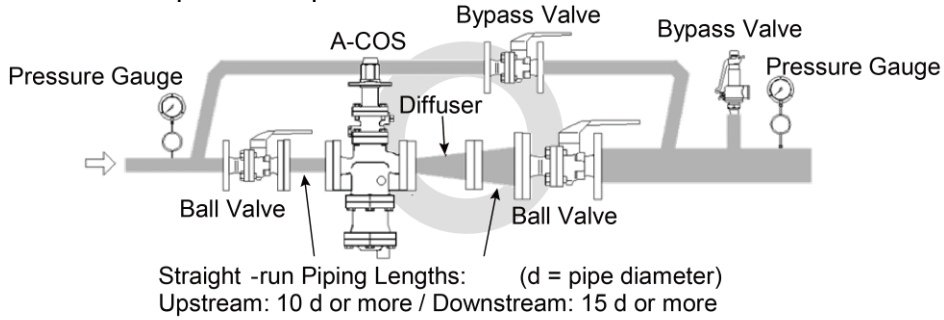
In an environment of heavy dirt or scale, or when the air equipment is used only periodically, be sure to install a strainer at the inlet of the product and a blowdown valve on the main body.

- 1) Remove the plug from the main body and install a blowdown valve.
- 2) Open the 10 mm (3/8 in) blowdown valve and blow any residual dirt and scale off of the screen.
- 3) Periodically activate the blowdown valve to keep the system free of dirt and scale.



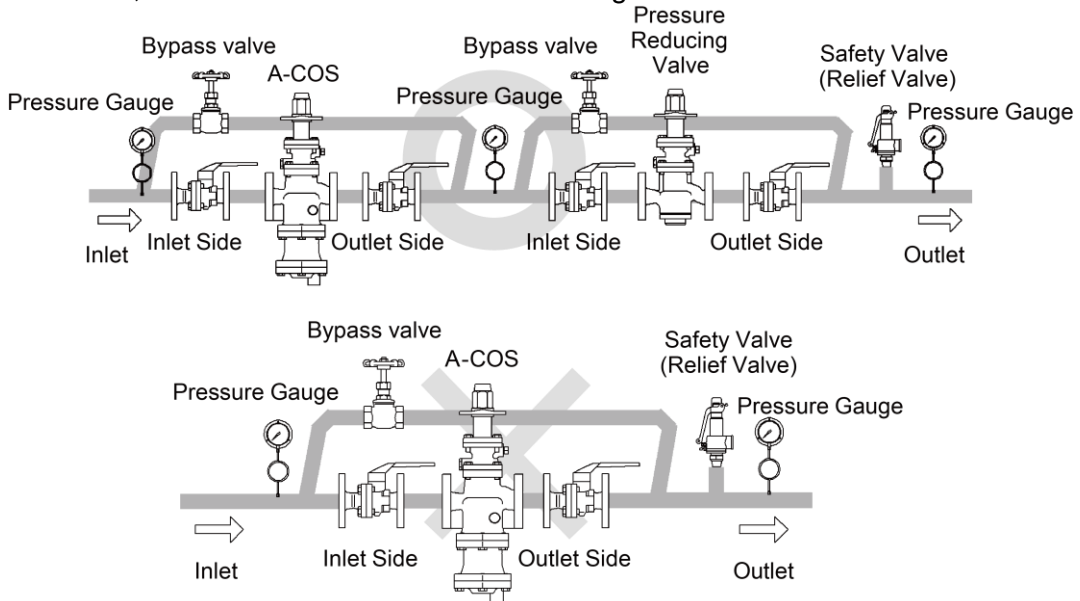
9. Piping Size/Diffuser

If it is expected that the secondary air flow velocity will be more than 30 m/s (100 ft/s), install a diffuser in order to keep the flow velocity below 30 m/s (100 ft/s). If the distance between the product and the air-using equipment is great, a possible drop in pressure should be taken into consideration when selecting the piping size. In addition, when installing the strainer, the strainer screen should be either at the 3 o'clock or 9 o'clock position to prevent condensate accumulation.



10. Two-stage Pressure Reduction

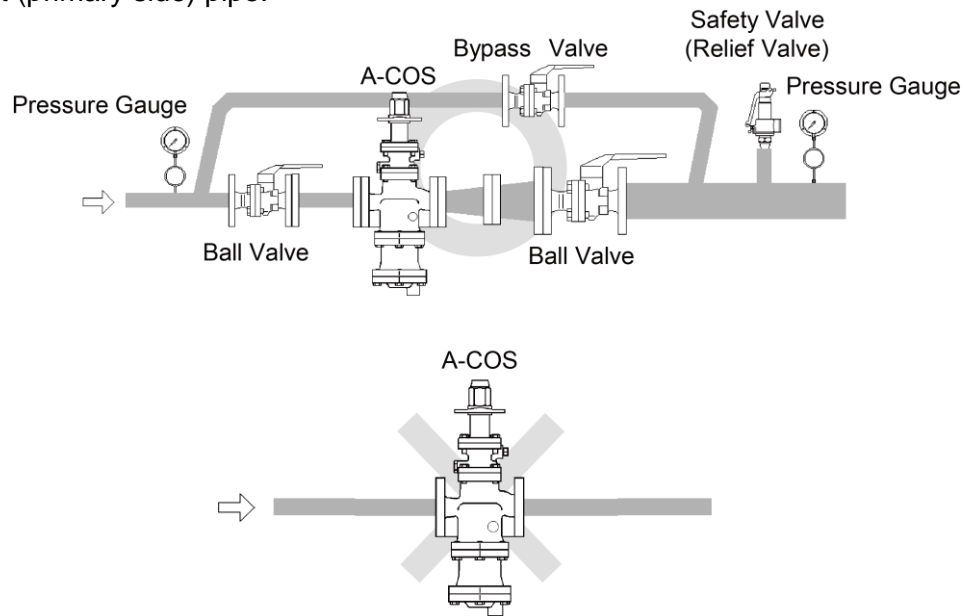
Two-stage pressure reduction should be performed whenever the pressure cannot be reduced to the desired level with the product due to operating range limitations, such as when the reduction ratio is greater than 10:1.



11. Accessories

Always install a shut-off valve, pressure gauge and bypass lines at both inlet and outlet.

Ball valves, which will not retain condensate, are recommended for inlet and outlet shut-off valves. The bypass pipe should be at least $\frac{1}{2}$ of the size of the inlet (primary side) pipe.



Adjustment

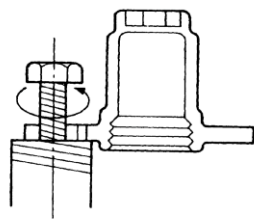


Use only under conditions in which no freeze-up will occur.

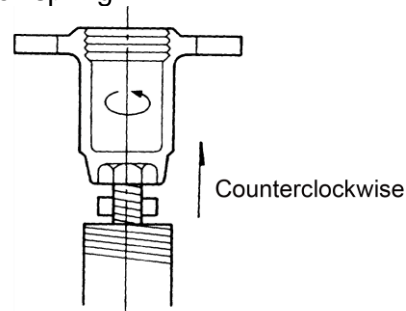
Freezing may damage the product, leading to fluid discharge, which may cause burns or other injury.

The product should be properly adjusted for protection of the air-using equipment against water hammer.

1. It is necessary to blow down all pipe lines thoroughly. The blowdown is especially important if the line is new or has been shut down for a long period of time. Take particular care to ensure that matter such as condensate and dirt does not remain inside the air-using equipment. (Stay clear of any pressurized blow-out from the safety valve.)
2. Make sure that the shut-off valve and the bypass valve located upstream and downstream of the product are completely closed.
3. Remove the spanner cap, loosen the locknut and turn the adjustment screw counterclockwise to reduce tension on the coil spring.

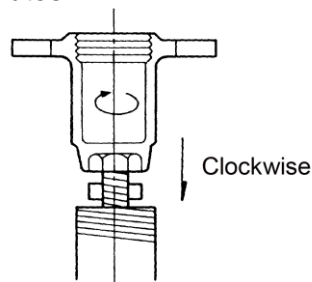


Loosen the locknut

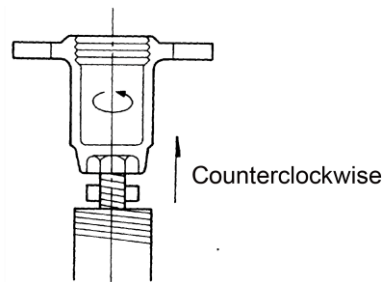


Loosen the adjustment screw

4. Slowly, fully open the shut-off valve at the inlet of the product. Allow sufficient time for condensate remaining at the inlet of the product to be discharged.
5. Slightly open the shut-off valve at the outlet of the product.
6. Turn the adjustment screw until the desired outlet pressure is obtained. Wait several minutes.




Tighten the Adjustment Screw
Increase Pressure



Loosen the Adjustment Screw
Decrease Pressure

7. Slowly, fully open the shut-off valve at the outlet of the product.
8. After setup, retighten the locknut and replace the spanner cap.
9. When shutting down the system, always close the outlet shut-off valve first and then the inlet valve.

Maintenance



	<p>Take measures to prevent people from coming into direct contact with product outlets. Failure to do so may result in burns or other injury from the discharge of fluids.</p>
	<p>Be sure to use only the recommended components when repairing the product, and NEVER attempt to modify the product in any way. Failure to observe these precautions may result in damage to the product and burns or other injury due to malfunction or the discharge of fluids.</p>

Operational Check

To ensure long service life of the product, the following inspection and maintenance is recommended to be performed regularly.

Part	Inspection and Maintenance Frequency
Screens (Separator and Pilot)	Disassemble and clean annually. If there is substantial blockage, install a strainer (approximately 60 mesh) ahead of the product.
Main Valve, Main Valve Seat, Pilot Valve, Pilot Valve Seat	Replace after approximately 15,000 hours. If there is chattering or dirt, premature wear may result.
Piston Ring	Replace after approximately 8,000 hours. If there is chattering or if scale build-up is severe, premature wear may result.
Piston	Replace after approximately 30,000 hours. If hunting or chattering takes place, premature wear may result.
Trap Valve Seat	Replace after approximately 40,000 hours. If scale build-up is severe, blockage may occur in a short period of time.
Diaphragm	Replace after approximately 30,000 hours. If hunting or chattering takes place, cracks or fatigue may develop in a short period of time.

Disassembly

 WARNING	NEVER apply direct heat to the float. The float may explode due to increased internal pressure, causing accidents leading to serious injury or damage to property and equipment.
 CAUTION	Use hoisting equipment for heavy objects (weighing approximately 20 kg (44 lb) or more). Failure to do so may result in back strain or other injury if the object should fall. When disassembling or removing the product, wait until the internal pressure equals atmospheric pressure and the surface of the product has cooled to room temperature. Disassembling or removing the product when it is hot or under pressure may lead to discharge of fluids, causing burns, other injuries or damage.

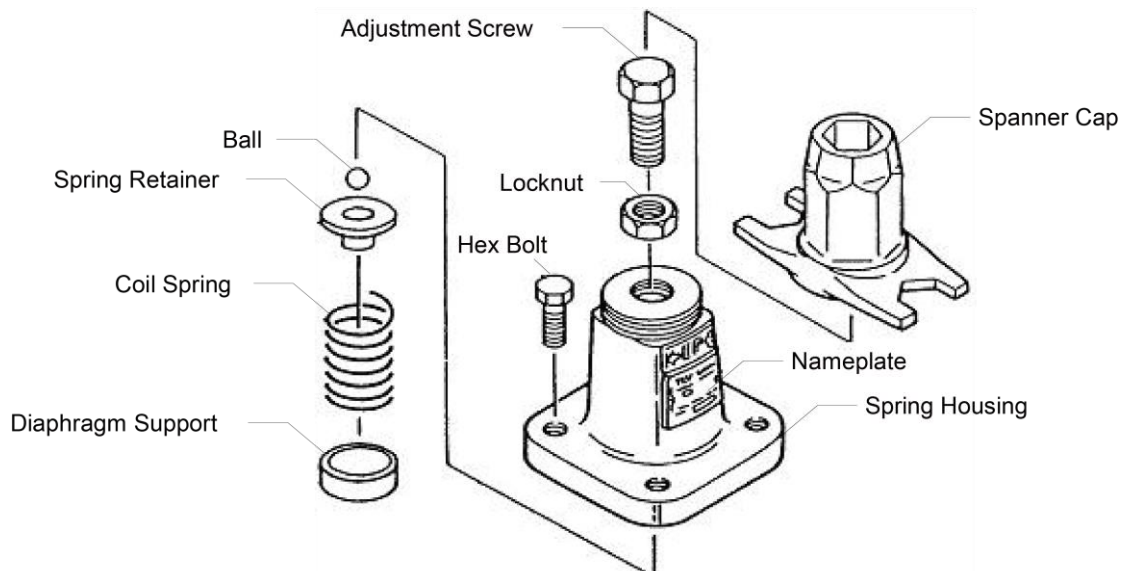
It is a recommended practice to dismantle and inspect the product once a year for preventive maintenance purposes. It is especially important to perform an inspection immediately after the initial run of a new line or before or after equipment that is out of service for a long period of time. (Installation, inspection, maintenance, repairs, disassembly, adjustment and valve opening/closing should be carried out only by trained maintenance personnel.)

Remove all pressure from the piping (both upstream and downstream). Then remove inlet and outlet flange retaining bolts and nuts to permit removal of the product. Secure the product in a vise to perform the inspection.

Disassembling the Adjustment Section

Loosen the adjustment screw completely and remove the hex bolts. Having removed the spring housing, you will see the diaphragm support, coil spring and spring housing.

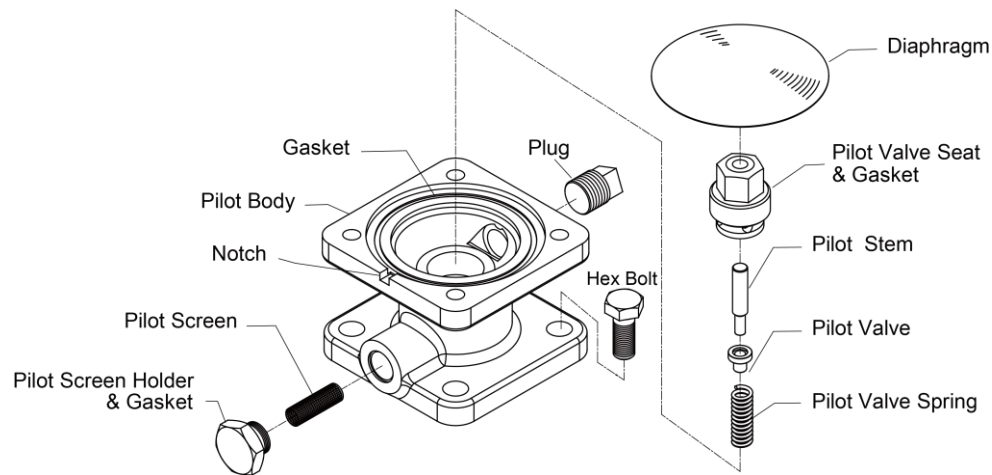
⇒ Check for seizure or any damaged screw threads.



Disassembling the Pilot Section

The diaphragm is removed by utilizing the notch in the pilot body. Loosen the pilot valve seat with a box wrench and remove it. Lift the pilot valve spring up and out with a pair of tweezers. Then loosen and remove the screen holder to remove the screen.

⇒ Check for any fault on the pilot valve seat, the seat of the pilot valve, flaws on the gaskets, and clogging of the screen. Check for deformation, corrosion or faults on the diaphragm. The diaphragm should be convex (open downward), with the printed UP mark on the top.

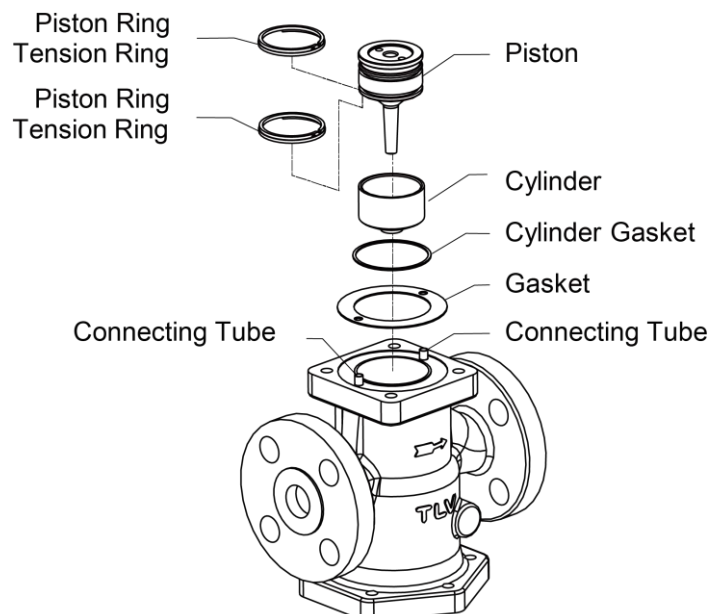


Disassembling the Piston Section

Remove the pilot body after loosening and removing the hex bolts (stud bolts). During this process, pay attention not to lose the connecting tubes (2).

Remove the piston and the cylinder from the body. Then remove the piston rings and the tension rings from the piston. Do not apply too much force when removing the piston rings and tension rings.

⇒ Check for the interior of the cylinder, the exterior of the piston rings, the small hole on the piston and the cylinder gasket for any fault or abnormality.

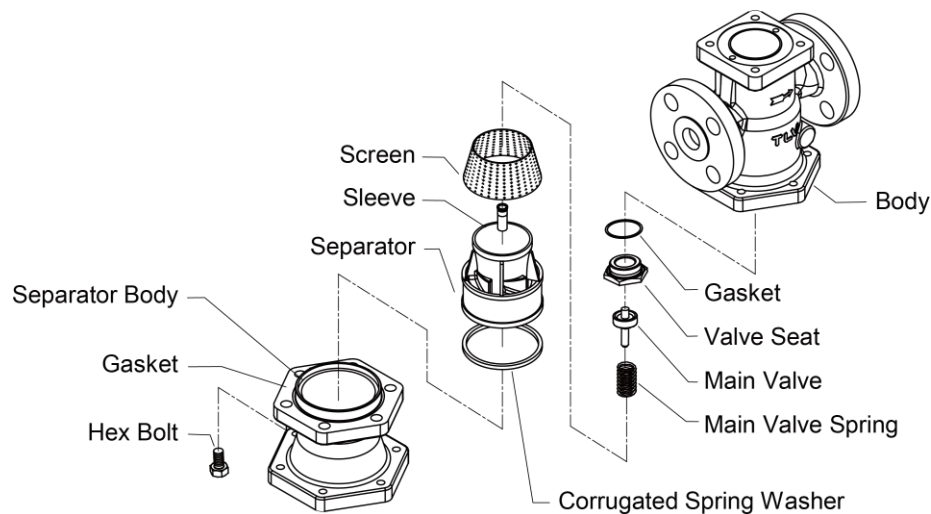


Disassembling the Separator and Main Valve Section

Turn the product upside down for easy dismantling of the separator and main valve. Loosen the hex bolts and remove the separator body. Be careful, as the separator may drop off when the product is returned to the normal attitude.

Removal of the separator and pressed-in sleeve permits removal of the main valve spring, the main valve and screen. Loosen the valve seat with a box wrench and remove it from the body.

⇒ Check for damage on the seating and sliding surfaces of the main valve, the seating surface of the valve seat, the gaskets, and for clogging of the screen. At start-up following shutdown for a long period, always blow down the piston section of the body through the plug (option).

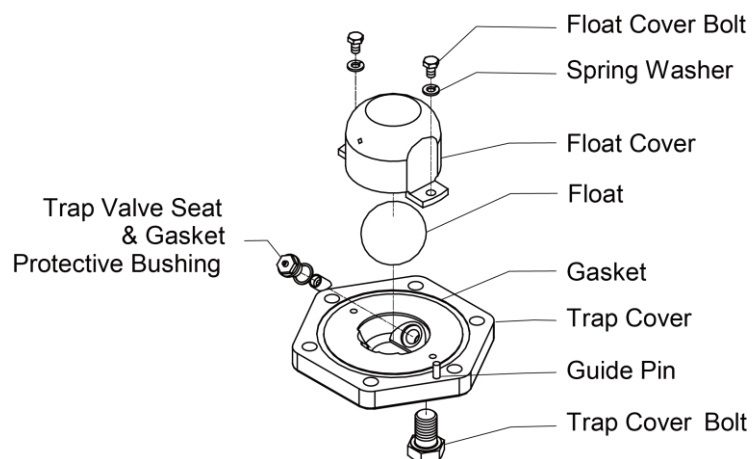


Disassembling the Air Trap Section

Loosen the trap cover bolts and remove the trap cover. Be careful, as hot condensate may splash out.

Remove the float cover bolts from the float cover to reveal the float. Remove the float, remove the trap valve seat with a box wrench.

⇒ Check to make sure that there is no deformation of the float, abnormality in the trap valve seat or dirt accumulation in the trap cover.



Cleaning

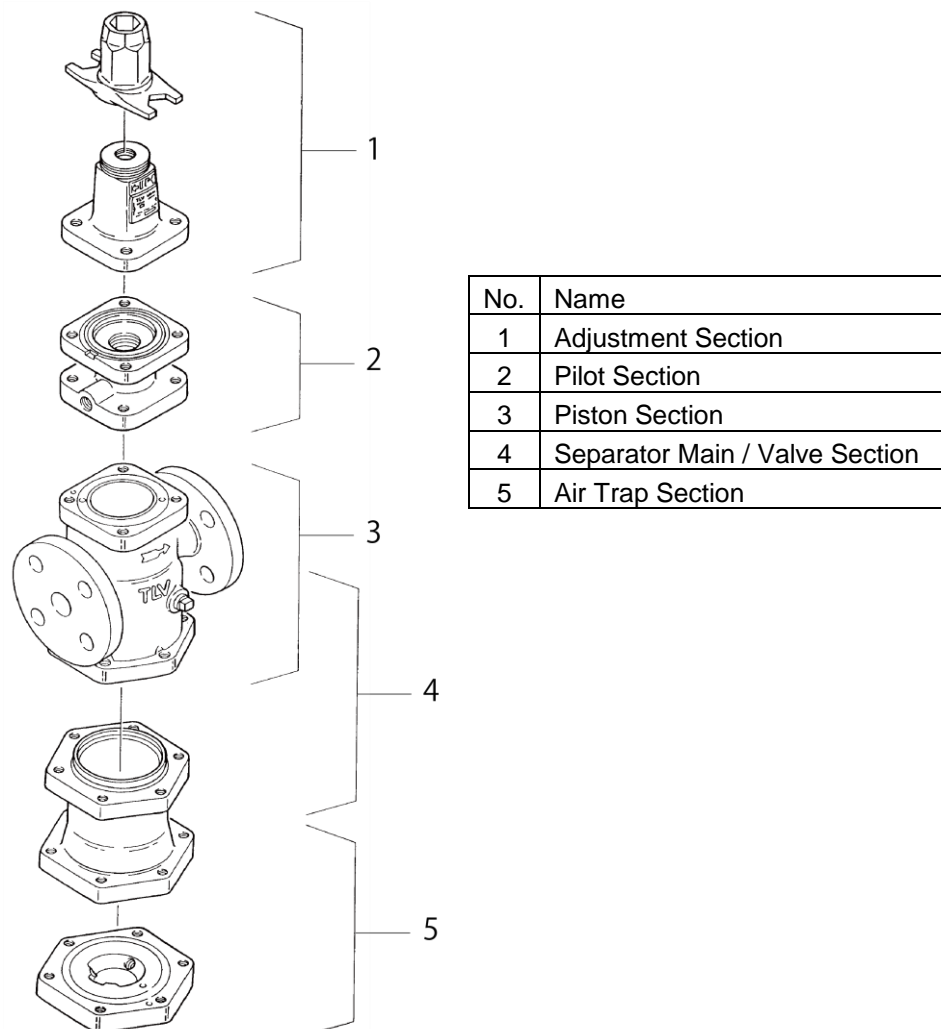
After inspection and removal of any abnormality, clean and reassemble the parts.
The following parts will require cleaning before reassembly:

Trap Cover	Piston
Float	Piston Ring
Trap Valve Seat	Cylinder
Pilot Screen	Separator Screen
Main Valve Seat	Pilot Valve
Main Valve	Pilot Valve Seat
Main Valve Holder	Adjustment Screw

It is permissible to clean using water, however cleaning with a mild detergent is recommended for more effective cleaning.

(Coat threaded position with anti-seize after cleaning.)

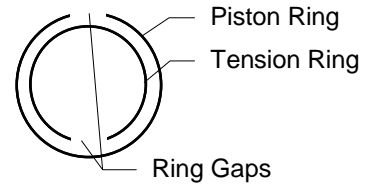
Exploded View



Reassembly

Assemble the unit using the same procedure as used for disassembling it; but in reverse order. Observe the following precautions:

1. The PTFE gaskets may be re-used if free from fault, crushing or deformation.
2. Apply anti-seize to the threaded portion of screws and bolts, the spring housing, ball and adjustment screw. Apply a small amount of anti-seize to the threads of the valve seat, pilot valve seat and screen holder. Apply anti-seize carefully to ensure it does not come into contact with other parts.
3. Fasten the bolts one at a time in an alternating diagonal pattern to provide uniform seating.
4. After assembly, make sure that the piston and the pilot guide operate smoothly without binding.
 - 1) Fit the piston ring to the outside of the tension ring.
 - 2) The ring gaps should be opposite each other.
5. Standard fastening torque and the width across flats for the tools to be used are as follows:



Assembling the Piston Ring

Part	A-COS Connection Size		Width Across Flats		Tightening Torque	
	mm	(in)	mm	(in)	N·m	(lbf·ft)
Spring Housing Bolt	All		17	(²¹ / ₃₂)	40	(29)
Pilot Valve Seat	All		19	(³ / ₄)	70	(51)
Screen Holder	All		24	(¹⁵ / ₁₆)	40	(29)
Pilot Body Bolt	15 – 40	(¹ / ₂ – 1 ¹ / ₂)	17	(²¹ / ₃₂)	60	(44)
	50	(2)	19	(³ / ₄)	70	(51)
Trap Cover Bolt	15 – 40	(¹ / ₂ – 1 ¹ / ₂)	17	(²¹ / ₃₂)	60	(44)
	50	(2)	19	(³ / ₄)	70	(51)
Valve Seat	15, 20	(¹ / ₂ , ³ / ₄)	36	(¹⁷ / ₁₆)	100	(73)
	25	(1)	41	(¹⁵ / ₈)	125	(92)
	32, 40	(1 ¹ / ₄ , 1 ¹ / ₂)	60	(²³ / ₈)	250	(185)
	50	(2)	70	(²³ / ₄)	300	(220)
Float Cover Bolt	15, 20	(¹ / ₂ , ³ / ₄)	8	(⁵ / ₁₆)	7	(5)
	25 – 40	(1 – 1 ¹ / ₂)	10	(³ / ₈)	10	(7)
	50	(2)	13	(¹ / ₂)	20	(15)
Trap Valve Seat	15, 20	(¹ / ₂ , ³ / ₄)	11	(⁷ / ₁₆)	10	(7)
	25 – 40	(1 – 1 ¹ / ₂)	13	(¹ / ₂)	15	(11)
	50	(2)	17	(²¹ / ₃₂)	40	(29)



(1 N·m ≈ 10 kg·cm)

NOTE: -If a torque greater than that recommended is applied, the body or its components may be damaged.

-Coat all threaded portions with anti-seize.

-If drawings or any other special documentation were supplied for the product, any torque given there takes precedence over the values shown here.

Troubleshooting

 WARNING	NEVER apply direct heat to the float. The float may explode due to increased internal pressure, causing accidents leading to serious injury or damage to property and equipment.
 CAUTION	When disassembling or removing the product, wait until the internal pressure equals atmospheric pressure and the surface of the product has cooled to room temperature. Disassembling or removing the product when it is hot or under pressure may lead to discharge of fluids, causing burns, other injuries or damage.

This product is shipped after stringent checks and inspection and should perform its intended function for a long period of time without failure. However, should there be any problem encountered in the operation of the product, consult the troubleshooting guide below.

Problems are classified as follows:

1. The secondary pressure does not increase.
2. The secondary pressure cannot be adjusted or increases abnormally.
3. Hunting (fluctuation of the secondary pressure) occurs.
4. Chattering (a heavy mechanical noise) occurs.
5. Air leaks from the air trap or condensate is not discharged.
6. Abnormal noises.

Major causes for the above problems are usage under non-specified conditions (out of specification), insufficient pressure or flow rate, and clogs by dirt and scale. To ensure performance for a long period of time, it is recommended that the "Acceptable Operating Range", "Correct Usage of the A-COS Pressure Reducing Valve" and "Adjustment" sections be reviewed.

It is a recommended practice to dismantle and inspect the product once a year for preventive maintenance purposes. It is especially important to perform an inspection immediately after the initial run of a new line or before or after equipment such as a heater is out of service for a long period of time. (Installation, inspection, maintenance, repairs, disassembly, adjustment and valve opening/closing should be carried out only by trained maintenance personnel.)

Problem	Symptom	Cause	Remedy
The secondary pressure does not rise	The pressure does not increase	No air is being supplied or the inlet valve is closed	Check the valves and piping at the primary side
		The entrance to the screens or strainer is clogged	Clean or blow down
The secondary pressure cannot be adjusted or increases abnormally	Adjustment is difficult, and set pressure varies	The pilot screen is clogged	Clean
		There is insufficient air flow	Check the flow, replace the product if necessary
		The piston is clogged with dirt	Clean Check the piston ring
		The piston ring is worn	Replace with a new piston ring

Continued on the next page

Problem	Symptom	Cause	Remedy
The secondary pressure cannot be adjusted or increases abnormally (continued)	Adjustment is difficult, and set pressure varies	There is a build-up of dirt on the sliding surfaces of the pilot, piston or main valve	Clean
		The adjustment screw has seized	Replace with a new adjustment screw
		The small hole on the piston is clogged	Clean
		The diaphragm is distorted or damaged	Replace with a new diaphragm
		There is fluctuation in air consumption	Check the flow rate, replace the product if necessary
		The selected model is inappropriate for the service conditions (specifications)	Check the model selection, replace the product if necessary
	Upon closing the valves on the secondary side, the secondary pressure abruptly rises as high as the primary pressure	The bypass valve is leaking	Check, clean, and replace with a new valve if necessary
		There is a build-up of dirt on or damage to the pilot valve seat or main valve seat	Clean Align Replace if necessary
Hunting or chattering occurs	Occurs at low air demand	It is being operated below the lower flow rate limit	Check the volume of air supply, replace with a smaller diameter valve
	Hunting never stops	There is too high a reduction ratio (operated at below 10% of the primary pressure)	Change to an acceptable operating range
		The selected model is inappropriate for the service conditions (specifications)	Check the model selection, replace the product if necessary
	Chattering never stops	Condensate is contained, or the trap is blocked	Check the trap Check the piping
		The selected model is inappropriate for the service conditions (specifications)	Check the model selection, replace the product if necessary
	Abnormal noises	Makes a high-pitched noise	There is too high a reduction ratio
The flow is too great			
There is a high-speed open/close valve nearby			
Faulty air trap	Air is blowing	There is a build-up of dirt on the trap valve seat or at the float base	Clean
		The body is installed tilted	Check the piping
		The float is deformed	Check for water hammer Replace with a new float

Continued on the next page

Problem	Symptom	Cause	Remedy
Faulty air trap (continued)	Air is blowing	There is vibration in the piping	Secure the piping
	No condensate is discharged	The primary pressure exceeds the trap valve seat maximum working pressure	Adjust primary pressure
		Water is inside the float	Replace with a new float
		The outlet piping is clogged	Check the piping Clean
		The trap valve seat is clogged	Clean Replace with a new trap valve seat

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10. use of the Products with Hazardous Fluids (fluids other than steam, air, water, nitrogen, carbon dioxide and inert gases (helium, neon, argon, krypton, xenon and radon)); or
11. failure to follow the instructions contained in the TLV Instruction Manual for the Product.

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