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ISO 9001
ISO 14001

Manufacturer
TLV CO., LTD.
Kakogawa, Japan

Instruction Manual

Electro-Pneumatic Control Valve with Built-in Separator and Steam Trap

CV-COS-16

(for Valve Unit)

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Introduction

Thank you for purchasing the TLV electro-pneumatic control valve with built-in separator and steam trap.

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.

The TLV electro-pneumatic control valve with built-in separator and steam trap is a revolutionary product that combines a digital positioner, a diaphragm-type actuator, a separator and a steam trap. Steam-using equipment can achieve its intended efficiency only if the steam being used is very dry. Using steam in which matter such as condensate, scale or types of grease is entrained can not only result in problems with the steam-using equipment and in lowered productivity, but can also lead to shortened service life for and malfunction of the control valve. The CV-COS-16 is a new control valve that offers a solution for these problems by supplying high-quality steam to the process and offering maximum productivity.

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.

For details of the actuator and the electro-pneumatic digital positioner, refer to the respective instruction manuals issued by the manufacturer.

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

	**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.
	**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 the product in excess of the maximum operating pressure differential. Such use could make discharge through the steam trap impossible (blocked).
	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.
	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.

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.
	Make sure the power supply is OFF before carrying out work on the wiring or inspections involving disassembly. If such work is carried out with the power on, there is a danger that equipment may malfunction or electric shock may occur, leading to injury or other accidents.
	Make sure that wiring work requiring a special license is carried out by qualified personnel. If carried out by unqualified personnel, overheating or short circuits leading to injury, fires, damage or other accidents may occur.
	When using this product, NEVER stand close to, or leave tools anywhere near, moving parts, such as the shaft. Contact with moving parts or objects becoming caught in moving parts could lead to injury or damage or other accidents.

Specifications

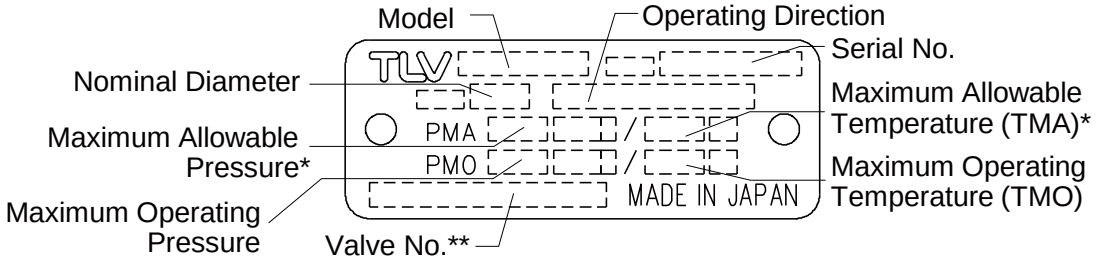
⚠CAUTION **Install properly and DO NOT use this product outside the recommended operating pressure, temperature and other specification ranges. Improper use may result in such hazards as damage to the product or malfunctions which may lead to serious accidents. Local regulations may restrict the use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

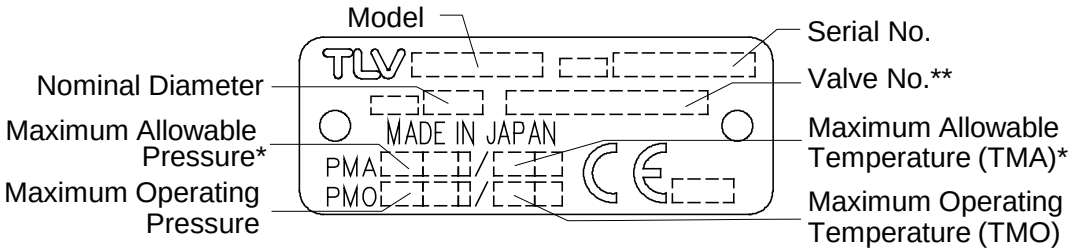
⚠CAUTION **DO NOT use the product in excess of the maximum operating pressure differential; such use could make discharge impossible (blocked).**

⚠CAUTION **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.**

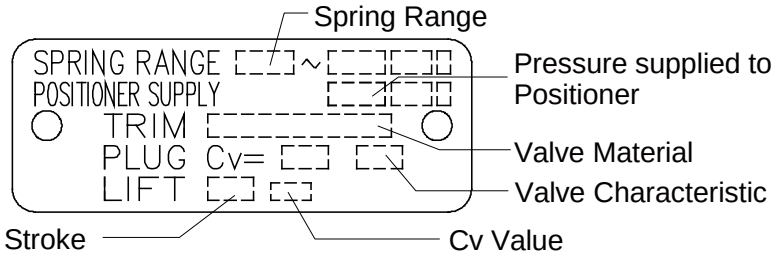
Refer to the product nameplate*** for detailed specifications.

Valve Section





Actuator Section

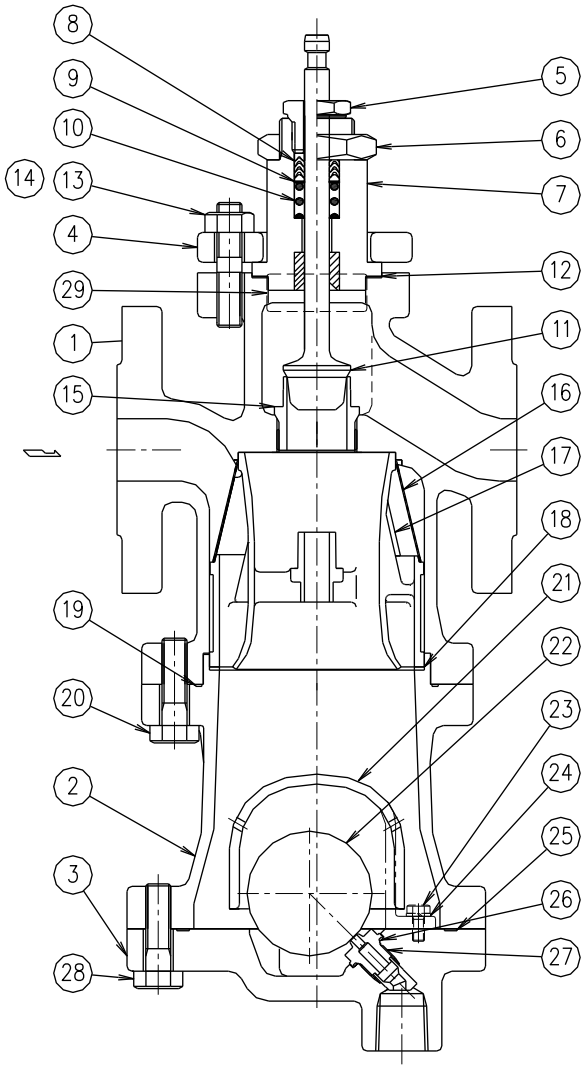


*Maximum allowable pressure (PMA) and maximum allowable temperature (TMA) are PRESSURE SHELL DESIGN CONDITIONS, **NOT** OPERATING CONDITIONS.

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

***Nameplate layout depends on product specifications.

Configuration



No.	Part Name	A*	B*	C*	D*
1	Main Body				
2	Separator Body				
3	Trap Cover				
4	Flange				
5	Guide Bushing				
6	Valve Bonnet Nut				
7	Valve Bonnet				
8	Stuffing Box V-ring Packing		✓		
9	Stuffing Box Washer		✓		
10	Stuffing Box Spring		✓		
11	Valve Plug & Stem		✓		
12	Valve Bonnet Gasket	✓	✓		
13	Bolt				
14	Nut				
15	Main Valve Seat		✓		
16	Separator Screen				
17	Separator				
18	Wave Spring				
19	Valve Seat Gasket	✓	✓		
20	Separator Body Bolt				
21	Float Cover				
22	Float				✓
23	Float Cover Bolt				
24	Spring Washer				
25	Trap Cover Gasket	✓	✓		
26	Trap Valve Seat Gasket	✓		✓	
27	Trap Valve Seat			✓	
28	Trap Cover Bolt				
29	Nameplate				

*Replacement parts are available only in the following kits:
A = Maintenance Kit
B = Repair Kit
C = Repair Kit for Trap Valve Seat
D = Float

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 which may lead to serious accidents. Local regulations may restrict the use of this product to below the conditions quoted.**

⚠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.**

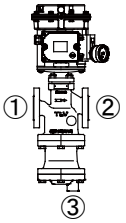
⚠CAUTION **Take measures to prevent people from coming into direct contact with product outlets. Failure to do so may result in burns or other injury from the discharge of fluids.**

⚠CAUTION **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 and adjustment and valve opening/closing should be carried out only by trained maintenance personnel.

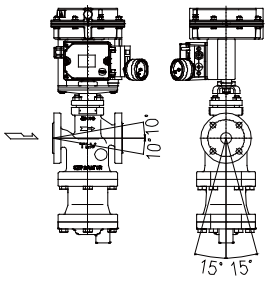
Check to make sure that the piping where the product is to be installed is constructed properly. If the piping is not correctly constructed, the valve may not perform optimally.

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.

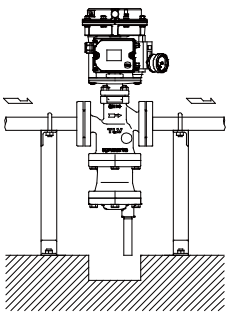


2. Removing any Protective Caps and Seals
   Before installation, be sure to remove all protective seals and caps. (Found in 3 locations, on the product inlet and outlets.)

3. Installation Angle
   Install the product so that the arrow mark on the body points horizontally in the direction of steam flow, and it should be installed horizontally in the piping with the actuator at the top. Allowable inclination is 10 degrees in the fore-aft direction and 15 degrees in the plane perpendicular to the steam flow line.

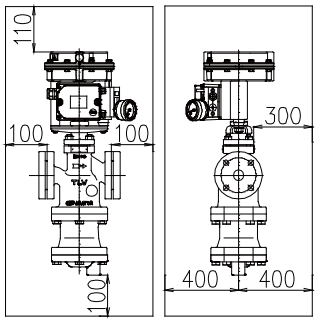


4. Piping Support
   Install the product, paying attention to avoid excessive load, bending and vibration. Support the inlet and outlet pipes securely.

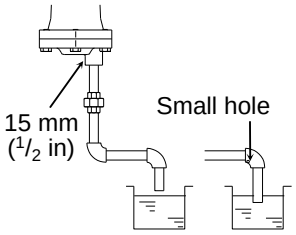


5. Maintenance Space
   Leave sufficient space for maintenance, inspection and repair. (Units: mm)

   100 mm ≈ 4"
   110 mm ≈ 4½"
   300 mm ≈ 12"
   400 mm ≈ 16"



6. 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. (Dirt and water may be sucked up by the vacuum formed during trap closure and system shutdown.) If the end must be underwater, make sure the piping has a small hole, as shown in the drawing below.

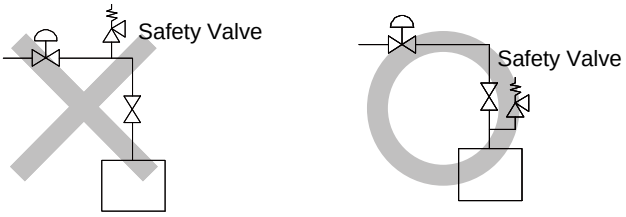


7. Accessories
   Always install a shut-off valve, pressure gauge and bypass lines at both inlet and outlet. Ball valves, which will not retain condensate, are recommended for inlet and outlet shut-off valves. The bypass pipe should be at least 1/2 of the size of the inlet (primary side) pipe.

8. Installation Environment
   Check the installation environment to make sure that the ambient temperature does not exceed the actuator ambient temperature limit and that no corrosive gasses are present.

9. Shut-off Valve Installation
   Though the product adequately performs the function of a shut-off valve initially, extended use will result in a drop in its performance as an isolation valve. Be sure to install a separate shut-off or automatic valve if complete isolation is needed.

10. Safety Valve Installation
    When installing a safety valve, be sure not to install it between the control valve and the shut-off valve
    It must be installed near the equipment it is to protect, on the outlet side of the shut-off valve.



11. Avoid Foreign Matter and Water Hammer
    Do not install in locations in the piping where foreign matter accumulates or where impact from water pressure (water hammer) occurs.

12. Piping Gaskets
    Be careful that the piping gaskets do not protrude outside the inner bore of the flange.
    The type of medium being used and the temperature must be taken into account in order to select a gasket of a suitable material.

13. Air Line Blowdown/Purge
    Before connecting the air lines for the motive air that is to be piped to the actuator, blow out the air in the lines to purge any dirt, foreign matter, oil or water from inside of the piping.

14. Quality of Motive Air
    Supply to the actuator only clean air that does not contain water, oil or foreign matter.
    To prevent malfunction due to contamination of the air supply, installation of the optional air filter regulator (5 µm filter) and mist separator (0.3 µm filter) as a set is recommended.
    If air quality results in operation failure, the entire actuator unit (including the integrated positioner) must be replaced.

If there is a problem in operation, determine the cause using the “Troubleshooting” section in this manual.

Maintenance

⚠CAUTION **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.**

⚠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.**

⚠CAUTION **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 or burns or other injury due to malfunction or the discharge of fluids.**

Operational Check

An inspection of the following items should be done on a daily basis to determine whether the product is operating properly or has failed. Periodically (at least biannually) the operation should also be checked.
In the event of failure (malfunction), also refer to the "Troubleshooting" section for remedies.

Inspection Item	Inspection Points	Remedy for Failure (Malfunction)
Leakage from valve (when the valve is closed)	Visual inspection or stethoscope inspection; is the outlet side pressure or temperature elevated, or is there the sound of the medium flowing?	Adjust the zero/span; if that does not solve the problem, replace with a new valve plug & stem and valve seat
Leakage from gland area	Visual inspection; is fluid leaking from the gap between the guide bushing and the valve stem, or are there signs it has leaked previously?	Coat the guide bushing and the valve stem with grease; if that does not solve the problem, replace with new V-ring packing
Leakage from the gaskets between any pressurized parts	Visual inspection; is fluid leaking from the gasket areas on pressurized parts?	Apply additional tightening (refer to recommended torque) or replace with new gaskets
Leakage from pressurized parts such as body and valve bonnet	Visual inspection; is fluid leaking from pressurized parts such as the body or valve bonnet?	Replace any pressurized parts at leak locations
Leakage from the trap area	Visual inspection or stethoscope inspection; is live steam being discharged from the trap outlet piping, or can the sound of a steam leak be heard?	Clean the sealing surface of the trap valve seat or replace the valve seat

Parts Inspection

When parts have been removed, use the following table to inspect the parts and replace any that are found to be defective.

Inspection Item
Gasket(s): Check for warping and damage (Graphite gaskets MUST be replaced if disassembled)
Stuffing Box V-ring Packing: Check for warping or damage
Valve Plug & Stem, Valve Seat: Check for damage or scratches
Separator screen: Check for clogging and corrosion
Trap Valve Seat: Check for scratches, dents, etc.
Float: Check for scratches, dents, etc.

Disassembly/Reassembly

⚠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.**

⚠CAUTION **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 or burns or other injury due to malfunction or the discharge of fluids.**

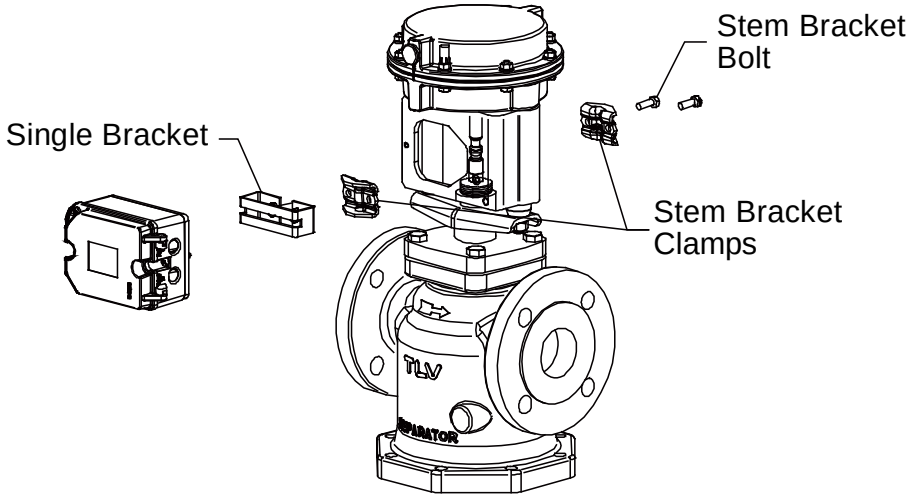
Use the following procedures to remove components. Use the same procedures in reverse to reassemble. (Installation, inspection, maintenance, repairs, disassembly, adjustment and valve opening/closing should be carried out only by trained maintenance personnel.)
Refer to “Disassembling/Reassembling the Valve and Actuator Sections” on the following page when removing the actuator section.
Consult the table of tightening torques when mounting the actuator section on the valve section.

NOTE: Be sure to coat all threaded portions of the valve seat and bolts with anti-seize.

Removing/Reattaching the Stem Bracket Clamps

Part	During Disassembly	During Reassembly
—	Set the actuator air supply pressure to 0 MPaG (0 psig) to maintain the valve in the fully closed position.	Set the actuator air supply pressure to 0 MPaG (0 psig) to maintain the valve in the fully closed position. Check to make sure the valve stem and actuator stem are in firm contact with each other.
Stem Bracket Bolts	Remove with a socket wrench	Consult the table of tightening torques and tighten to the proper torque
Stem Bracket Clamps	Take the bracket apart (separates into 2 clamps)	After aligning the clamps, tighten the nuts and bolts while making sure the gap between the plates is even on both sides

NOTE: Be careful not to pinch your fingers between the valve stem and actuator stem!



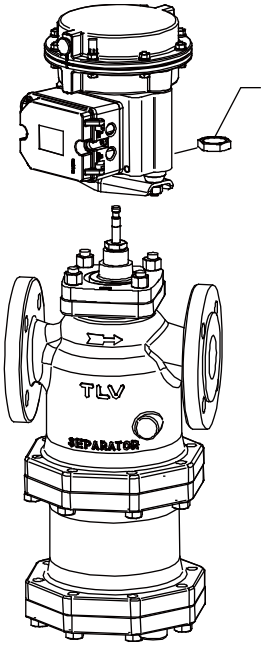
Disassembling/Reassembling the Valve and Actuator Sections

Perform the following procedure before beginning disassembly:

1. After connecting the air piping, operate the air pressure reducing valve to maintain the positioner air supply pressure at 0.38 MPaG (54 psig).
2. Connect a current generator or a controller for an operation signal input of 4 to 20 mA.
3. Switch the positioner/actuator to manual mode to separate the valve from the actuator. See the instruction manual for the positioner and actuator for details.

Part	During Disassembly	During Reassembly
—	Set the operation signal input to 12 mA (50%) Make sure the gap between the valve stem and the actuator stem is open	Set the operation signal input to 12 mA (50%) Make sure the gap between the valve stem and the actuator stem is open
Valve Bonnet Nut	Remove with an open-end wrench	Consult the table of tightening torques and tighten to the proper torque

NOTE: Be careful not to pinch your fingers between the valve stem and actuator stem!

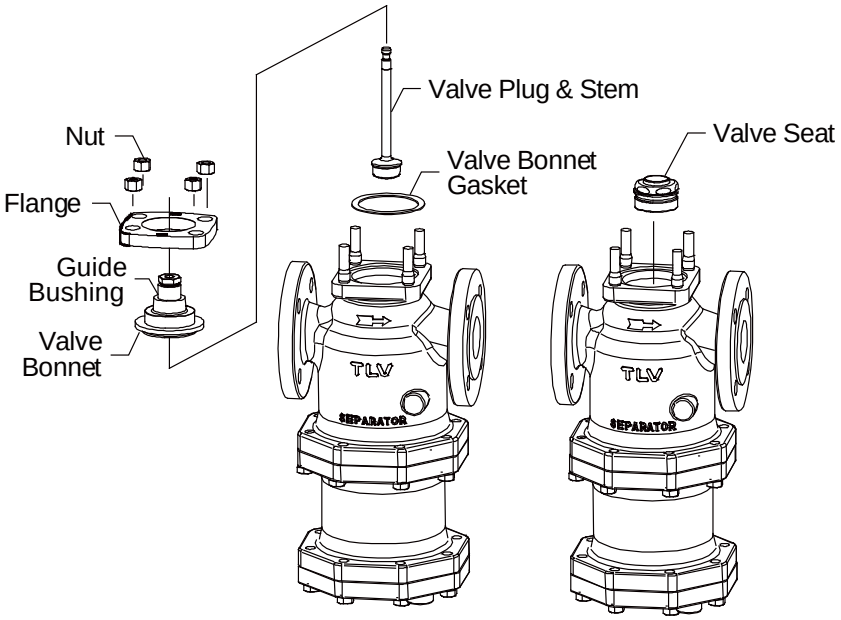


Disassembling/Reassembling of the Body Section

Part	During Disassembly	During Reassembly
Guide Bushing	Loosen slightly with a socket wrench to make the following procedure easier	Consult the table of tightening torques and tighten to the proper torque
Nuts for flange	Remove with a socket wrench	Tighten the nuts evenly, while checking to make sure that there is no catching or biting when the valve plug is seated in the valve seat; after tightening to the rated torque, check to make sure that the valve plug & stem moves up and down smoothly; make sure to tighten them evenly

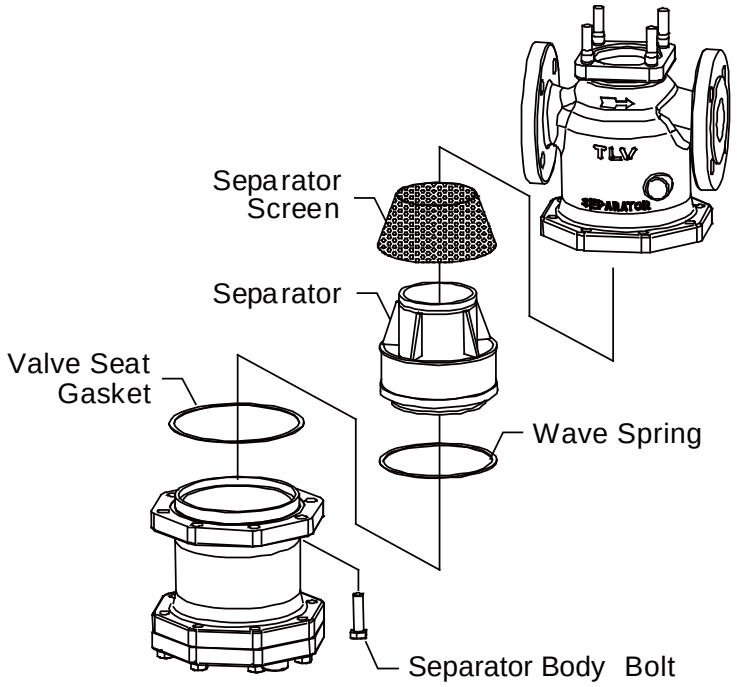
Continued on the next page

Part	During Disassembly	During Reassembly
Flange/ Valve Bonnet	Pull up and off, being careful not to damage the valve plug & stem or valve seat	Reattach, being careful not to damage the valve plug & stem or valve seat Insert the valve bonnet into the gasket housing securely and without tilting
Valve Bonnet Gasket	Remove the gasket and clean sealing surfaces	Replace with a new gasket; do not coat with anti-seize
Valve Bonnet Guide	Pull up and off, taking care not to damage the valve plug & stem or valve seat The difference between the inner diameter of the body and the outer diameter of the valve bonnet guide is very small, so make sure that it does not tilt and get caught when pulling the valve bonnet guide up and off	Reattach, being careful not to damage the valve plug & stem or valve seat The difference between the inner diameter of the body and the outer diameter of the valve bonnet guide is very small, so make sure that it does not tilt and get caught when inserting the valve bonnet guide
Valve Bonnet Guide Gasket	Remove the gasket and clean sealing surfaces	Replace with a new gasket if warped or damaged
Valve Plug & Stem	Pull up and out, being careful not to damage the plug & stem	Reattach, being careful not to damage the plug & stem
Valve Seat	15 to 25 mm ($^1/_2$ to 1 in): Remove with a socket wrench 40 to 50 mm ($1^1/_2$ to 2 in): Remove with a thin wall socket fitted to a socket wrench or a power wrench; when using a power wrench, refer to its instruction manual	Overtightening the valve seat may lead to damage the valve seat and/or body; consult the table of tightening torques and tighten to the proper torque
Valve Seat Gasket	Remove the gasket and clean sealing surfaces	Replace with a new gasket if warped or damaged



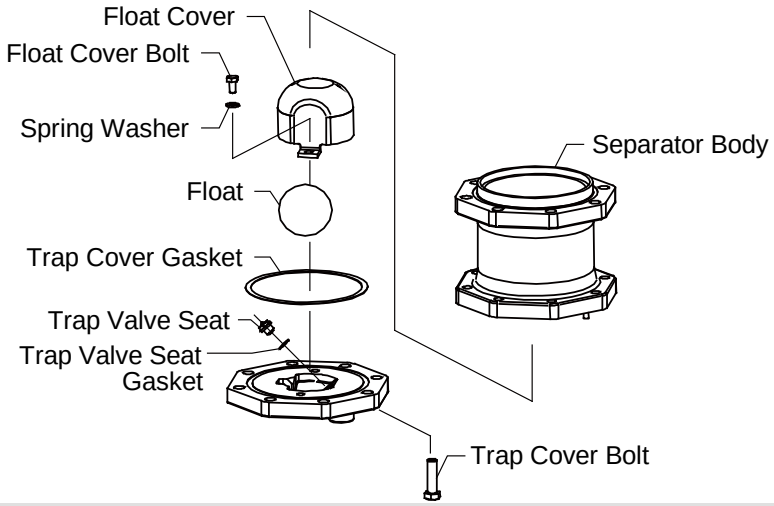
Removing/Reattaching the Separator and its Components

Part	During Disassembly	During Reassembly
Bolts for the Main and Separator Body	Remove with a socket wrench When lifting the main body, be careful not to let the separator fall out	Consult the table of tightening torques and tighten to the proper torque
Separator Screen	Remove the separator screen	Being careful not to bend it, insert it securely onto the slanted part of the separator
Separator	Remove the separator	Insert it into the groove in the main body
Wave Spring	Remove the wave spring	Insert it into the groove in the trap body



Removing/Reattaching the Trap and its Components

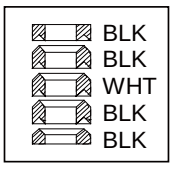
Part	During Disassembly	During Reassembly
Bolts for Trap Cover/Float Cover Bolt & Spring Washers	Remove with a socket wrench	Consult the table of tightening torques and tighten to the proper torque
Float Cover	Pull up and off	Replace with a new float cover
Float	Take care not to scratch or misshape the surface of the float	Take care not to scratch or misshape the surface of the float
Trap Valve Seat	Remove with a socket wrench	Consult the table of tightening torques and tighten to the proper torque
Trap Valve Seat Gasket	Remove the gasket and clean sealing surfaces	Replace with a new gasket if warped or damaged
Trap Cover Gasket	Remove the gasket and clean sealing surfaces	Replace with a new gasket if warped or damaged



Disassembling/Reassembling the Gland and its Components

In the procedure below, first <u>partially loosen</u> the guide bushing and then remove the valve plug & stem before removing the other parts. (The procedure is most easily performed if the bushing is loosened while it is attached to the valve body.)

Part	During Disassembly	During Reassembly
Guide Bushing	Remove with a socket wrench	Consult the table of tightening torques and tighten to the proper torque
Stuffing Box V-Ring Packing	Pull up and out	Make sure to reassemble the V-ring packing in the proper orientation; coat the groove with heat-resistant silicon grease; <u>reattach the V-ring packing with the grooves facing downward</u>
Stuffing Box Washer/ Stuffing Box Spring	Pull up and out	Reinsert



Sectional View of Stuffing Box V-ring Packing

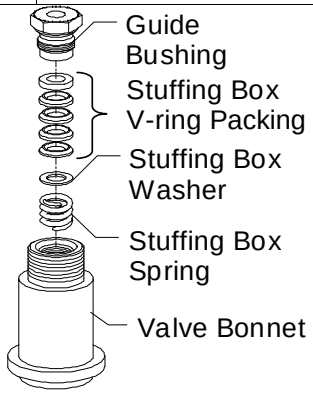
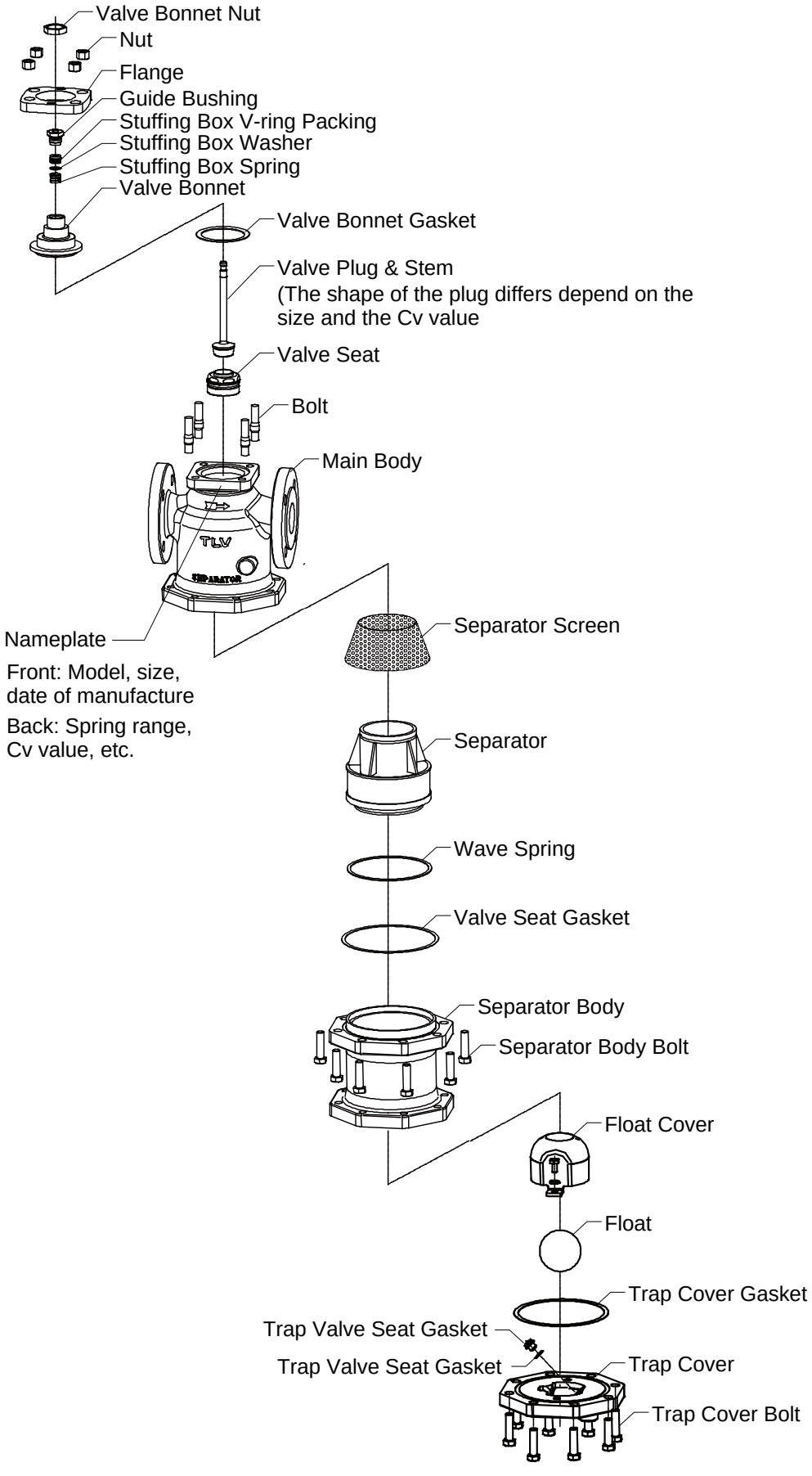


Table of Tightening Torques

	Size		Torque		Distance Across Flats	
	mm	(in)	N·m	(lbf·ft)	mm	(in)
Guide Bushing	15 to 50	(1/2 to 2)	50	(37)	24	(15/16)
Nuts for Flange	15 to 25	(1/2 to 2)	40	(29)	16	(5/8)
					17	(21/32)
	40, 50	(1 1/2 to 2)	50	(37)	18	(11/16)
					19	(3/4)
Valve Seat	15 to 25	(1/2 to 2)	170	(124)	27	(1 1/16)
	40, 50	(1 1/2 to 2)	500	(185)	55	(2 5/32)
Separator Body Bolt	15 to 40	(1/2 to 1 1/2)	60	(44)	16	(5/8)
					17	(21/32)
	50	(2)	70	(51)	18	(11/16)
					19	(3/4)
Float Cover Bolt	15 to 20	(1/2 to 3/4)	7	(5.1)	8	(5/16)
	25 to 40	(1 to 1 1/2)	10	(7)	10	(3/8)
	50	(2)	20	(15)	13	(1/2)
					14	(9/16)
Trap Valve Seat	15 to 20	(1/2 to 3/4)	10	(7)	11	(7/16)
	25 to 40	(1 to 1 1/2)	15	(11)	13	(1/2)
					14	(9/16)
	50	(2)	40	(29)	16	(5/8)
					17	(21/32)
Trap Cover Bolt	15 to 40	(1/2 to 1 1/2)	60	(44)	16	(5/8)
					17	(21/32)
	50	(2)	70	(51)	18	(11/16)
					19	(3/4)
Valve Bonnet Nut	15 to 50	(1/2 to 2)	150	(72)	36	(1 13/32)
Stem Bracket Bolt	15 to 50	(1/2 to 2)	5	(4)	8	(5/16)

NOTE: -Coat all threaded portions with anti-seize. (1 N·m ≈ 10 kg·cm)
-If drawings or other special documentation were supplied for the product, any torque given there takes precedence over values shown here.

Exploded View



Troubleshooting

⚠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.**

When the valve unit fails to operate properly, use the following table to locate the cause and remedy. When the actuator and positioner fail to operate properly, refer to the applicable manual.

Valve Section

Problem	Cause	Diagnosis	Remedy (Countermeasure)
Valve Leakage	The pressure of the air supply to the actuator or positioner is too high	Check the pressure of the air supply to the actuator and positioner (confirm product specifications on the nameplate)	Adjust the pressure of the air supply for the positioner to match the pressure in the product specifications Refer to the instruction manual for the positioner for zero point adjustment
	The positioner's zero point is miscalibrated	Check the actuator air supply pressure (on the positioner's pressure gauge) when the operation signal is at zero point	If the pressure on the pressure gauge is elevated, adjust the positioner's zero point (refer to the instruction manual for positioner)
	The inlet pressure for the control valve is too high	Check the inlet pressure for the control valve	Decrease the inlet pressure (Cv value and the spring range must be changed)
	The valve plug and valve seat are off-center	Move the valve plug & stem up and down and check to see if it catches	Reassemble the valve bonnet section correctly
	Wear of the sealing surfaces of the valve plug and valve seat	Check the valve plug and valve seat	Replace the valve plug and valve seat. Consider replacing with a valve plug and valve seat of a more durable material.

Steam Trap Section

Problem	Cause	Diagnosis	Remedy (Countermeasure)
Steam is blowing	There is a build-up of dirt on the trap valve seat or on the float	Check the trap valve seat and the float	Clean or replace with a new trap valve seat or float
	The body is installed tilted	Check the installation conditions	Correct the installation
	The float is deformed	Check the float	Replace with a new float (Inspect for water hammer or freezing)
	There is vibration in the piping	Check the piping conditions	Remove the source of the vibration or reinforce the piping supports
No condensate is discharged	The primary pressure exceeds the trap valve seat maximum working pressure	Check the primary pressure	Decrease the inlet pressure to the maximum operating pressure (PMO) or less
	Water is inside the float	Check the float	Replace with a new float (Investigate to see if the flow medium contains corrosive substances)
	Output piping is clogged	Check the outlet piping	Clean or modify the piping
	The trap valve seat is clogged	Check the trap valve seat	Clean or replace with a new trap valve seat

TLV EXPRESS LIMITED WARRANTY

Subject to the limitations set forth below, TLV CO., LTD., a Japanese corporation ("**TLV**"), warrants that products which are sold by it, TLV International Inc. ("**TII**") or one of its group companies excluding TLV Corporation (a corporation of the United States of America), (hereinafter the "**Products**") are designed and manufactured by TLV, conform to the specifications published by TLV for the corresponding part numbers (the "**Specifications**") and are free from defective workmanship and materials. The party from whom the Products were purchased shall be known hereinafter as the "**Seller**". With regard to products or components manufactured by unrelated third parties (the "**Components**"), TLV provides no warranty other than the warranty from the third party manufacturer(s), if any.

Exceptions to Warranty

This warranty does not cover defects or failures caused by:

1. improper shipping, installation, use, handling, etc., by persons other than TLV, TII or TLV group company personnel, or service representatives authorized by TLV; or
2. dirt, scale or rust, etc.; or
3. improper disassembly and reassembly, or inadequate inspection and maintenance by persons other than TLV or TLV group company personnel, or service representatives authorized by TLV; or
4. disasters or forces of nature or Acts of God; or
5. abuse, abnormal use, accidents or any other cause beyond the control of TLV, TII or TLV group companies; or
6. improper storage, maintenance or repair; or
7. operation of the Products not in accordance with instructions issued with the Products or with accepted industry practices; or
8. use for a purpose or in a manner for which the Products were not intended; or
9. use of the Products in a manner inconsistent with the Specifications; or
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.

Duration of Warranty

This warranty is effective for a period of one (1) year after delivery of Products to the first end user. Notwithstanding the foregoing, asserting a claim under this warranty must be brought within three (3) years after the date of delivery to the initial buyer if not sold initially to the first end user.

ANY IMPLIED WARRANTIES NOT NEGATED HEREBY WHICH MAY ARISE BY OPERATION OF LAW, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE AND ANY EXPRESS WARRANTIES NOT NEGATED HEREBY, ARE GIVEN SOLELY TO THE INITIAL BUYER AND ARE LIMITED IN DURATION TO ONE (1) YEAR FROM THE DATE OF SHIPMENT BY THE SELLER.

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THE EXCLUSIVE REMEDY UNDER THIS WARRANTY, UNDER ANY EXPRESS WARRANTY OR UNDER ANY IMPLIED WARRANTIES NOT NEGATED HEREBY (INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE), IS **REPLACEMENT**; PROVIDED: (a) THE CLAIMED DEFECT IS

REPORTED TO THE SELLER IN WRITING WITHIN THE WARRANTY PERIOD, INCLUDING A DETAILED WRITTEN DESCRIPTION OF THE CLAIMED DEFECT AND HOW AND WHEN THE CLAIMED DEFECTIVE PRODUCT WAS USED; AND (b) THE CLAIMED DEFECTIVE PRODUCT AND A COPY OF THE PURCHASE INVOICE IS RETURNED TO THE SELLER, FREIGHT AND TRANSPORTATION COSTS PREPAID, UNDER A RETURN MATERIAL AUTHORIZATION AND TRACKING NUMBER ISSUED BY THE SELLER. ALL LABOR COSTS, SHIPPING COSTS, AND TRANSPORTATION COSTS ASSOCIATED WITH THE RETURN OR REPLACEMENT OF THE CLAIMED DEFECTIVE PRODUCT ARE SOLELY THE RESPONSIBILITY OF BUYER OR THE FIRST END USER. THE SELLER RESERVES THE RIGHT TO INSPECT ON THE FIRST END USER'S SITE ANY PRODUCTS CLAIMED TO BE DEFECTIVE BEFORE ISSUING A RETURN MATERIAL AUTHORIZATION. SHOULD SUCH INSPECTION REVEAL, IN THE SELLER'S REASONABLE DISCRETION, THAT THE CLAIMED DEFECT IS NOT COVERED BY THIS WARRANTY, THE PARTY ASSERTING THIS WARRANTY SHALL PAY THE SELLER FOR THE TIME AND EXPENSES RELATED TO SUCH ON-SITE INSPECTION.

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IT IS SPECIFICALLY ACKNOWLEDGED THAT THIS WARRANTY, ANY OTHER EXPRESS WARRANTY NOT NEGATED HEREBY, AND ANY IMPLIED WARRANTY NOT NEGATED HEREBY, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, DO NOT COVER, AND NEITHER TLV, TII NOR ITS TLV GROUP COMPANIES WILL IN ANY EVENT BE LIABLE FOR, INCIDENTAL OR CONSEQUENTIAL DAMAGES, INCLUDING, BUT NOT LIMITED TO LOST PROFITS, THE COST OF DISASSEMBLY AND SHIPMENT OF THE DEFECTIVE PRODUCT, INJURY TO OTHER PROPERTY, DAMAGE TO BUYER'S OR THE FIRST END USER'S PRODUCT, DAMAGE TO BUYER'S OR THE FIRST END USER'S PROCESSES, LOSS OF USE, OR OTHER COMMERCIAL LOSSES. WHERE, DUE TO OPERATION OF LAW, CONSEQUENTIAL AND INCIDENTAL DAMAGES UNDER THIS WARRANTY, UNDER ANY OTHER EXPRESS WARRANTY NOT NEGATED HEREBY OR UNDER ANY IMPLIED WARRANTY NOT NEGATED HEREBY (INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE) CANNOT BE EXCLUDED, SUCH DAMAGES ARE EXPRESSLY LIMITED IN AMOUNT TO THE PURCHASE PRICE OF THE DEFECTIVE PRODUCT. THIS EXCLUSION OF CONSEQUENTIAL AND INCIDENTAL DAMAGES, AND THE PROVISION OF THIS WARRANTY LIMITING REMEDIES HEREUNDER TO REPLACEMENT, ARE INDEPENDENT PROVISIONS, AND ANY DETERMINATION THAT THE LIMITATION OF REMEDIES FAILS OF ITS ESSENTIAL PURPOSE OR ANY OTHER DETERMINATION THAT EITHER OF THE ABOVE REMEDIES IS UNENFORCEABLE, SHALL NOT BE CONSTRUED TO MAKE THE OTHER PROVISIONS UNENFORCEABLE.

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THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, AND ALL OTHER WARRANTIES, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE EXPRESSLY DISCLAIMED.

Severability

Any provision of this warranty which is invalid, prohibited or unenforceable in any jurisdiction shall, as to such jurisdiction, be ineffective to the extent of such invalidity, prohibition or unenforceability without invalidating the remaining provisions hereof, and any such invalidity, prohibition or unenforceability in any such jurisdiction shall not invalidate or render unenforceable such provision in any other jurisdiction.

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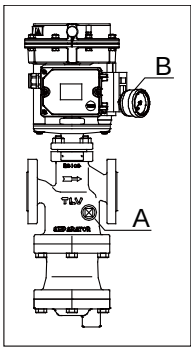
Options

⚠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 which may lead to serious accidents. Local regulations may restrict the use of this product to below the conditions quoted.**

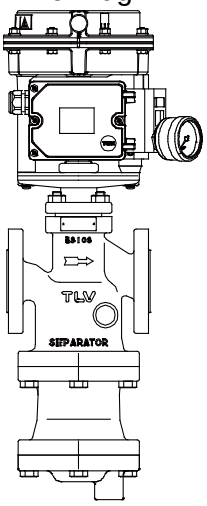
⚠CAUTION **Take measures to prevent people from coming into direct contact with product outlets. Failure to do so may result in burns or other injury from the discharge of fluids.**

The following options are available to meet individual specification requirements, so please verify your particular product.

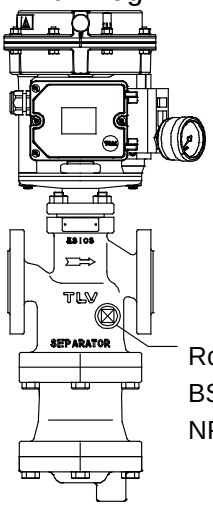


Body Options (Section A) (Standard: No Plug)

No Plug



With Plug



Rc(PT) $^3/_8$
BSPT $^3/_8$
NPT $^3/_8$

Torque		Dist. Across Flats	
N·m	(lbf·ft)	mm	(in)
30	(22)	12	($^1/_2$)

(1 N·m ≈ 10 kg·cm)

NOTE: Wrap sealing tape 3 – 3.5 times around the threaded portions.

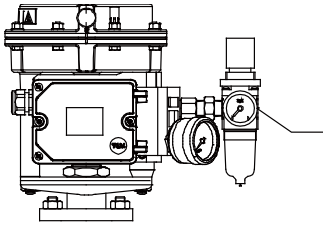
Applications for Use

Where there are large amounts of dirt or scale, or for applications such as heating in which the equipment is shut down for long periods of time, be sure to install a blow/purge valve.

1. Remove the plug (optional) from the main body and install the blow/purge valve.
2. Open the blow/purge valve and blow any residual dirt and scale off of the screen.
3. Periodically activate the blow/purge valve to keep the system free of dirt and scale.

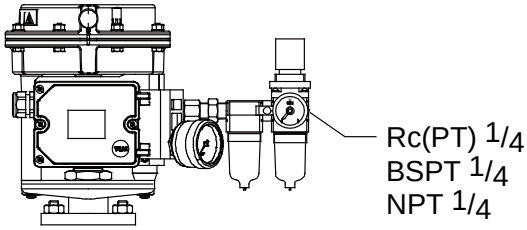
Actuator Unit Option (Section B)

With Filter Regulator
(Manual Condensate Discharge)



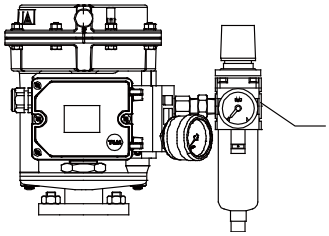
Integrated Filter: 5 µm

With Mist Separator + Filter Regulator
(Manual Condensate Discharge)



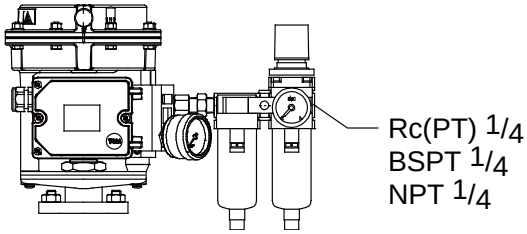
Integrated Filter: 0.3 µm + 5 µm

With Filter Regulator
(Automatic Condensate Discharge)



Integrated Filter: 5 µm

With Mist Separator + Filter Regulator
(Automatic Condensate Discharge)



Integrated Filter: 0.3 µm + 5 µm