

ISO 9001
ISO14001



Manufacturer

TLV CO., LTD.

Kakogawa, Japan

Is approved by LRQA Ltd. to ISO 9001:2015



Instruction Manual

Separator Filter

Model: SF1

172-65387M-10

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Introduction

Thank you for purchasing the TLV separator filter.

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 SF1 separator filter combines a high-performance filter with a cyclone separator that removes dirt, scale and condensate (entrained moisture) by means of centrifugal force and gravity. The SF1 can be used for both separator and filter applications. It is suitable for use in steam and air mains, and in applications calling for high-quality steam and air.

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 necessary not only for installation, but 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.

Cautionary items and definitions



Danger

Indicates an urgent situation which poses a threat of death or serious injury



Warning

Indicates that there is a potential threat of death or serious injury



Caution

Indicates that there is a possibility of injury or equipment/product damage

Safety Considerations for the Product



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.



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

Make sure the nut on the body clamp is fully tightened. 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 and burns or other injury due to malfunction or 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.



Caution

Use only under conditions in which no freeze-up will occur. Freezing may damage the unit, leading to fluid discharge, which may different cause burns or other injury.



Caution

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

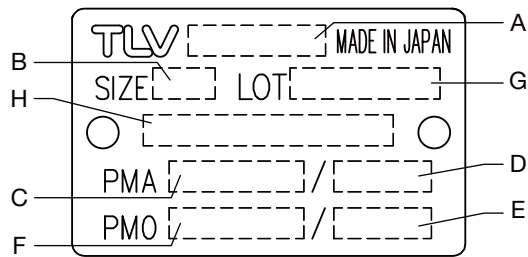


Caution

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.

Use only under conditions in which no freeze-up will occur. Freezing may damage the unit, leading to fluid discharge, which may different cause burns or other injury.

Refer to the product nameplate for detailed specifications.



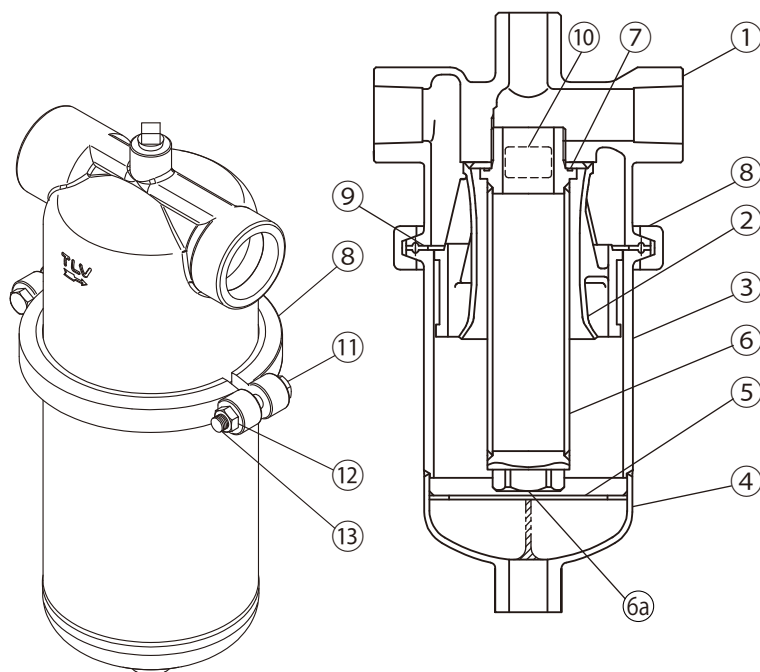
A	Model ⁰¹	E	Maximum Operating Temperature (TMO)
B	Nominal Diameter	F	Maximum Operating Pressure (PMO)
C	Maximum Allowable Pressure (PMA) ⁰²	G	Production Lot No.
D	Maximum Allowable Temperature (TMA) ⁰²	H	Valve No. ⁰³

⁰¹The filter grade (μm) is indicated by numbers at the end of the model name and on the bottom of the filter.

⁰²Maximum allowable pressure (PMA) and maximum allowable temperature (TMA) are PRESSURE SHELL DESIGN CONDITIONS, **NOT** OPERATING CONDITIONS.

⁰³Valve No. is displayed for products with options. This item is omitted from the nameplate when there are no options.

Configuration



No.	Part Name	No.	Part Name
1	Body	7	Filter Gasket
2	Separator	8	Body Clamp
3	Separator Body	9	Body Gasket
4	Separator Bottom	10	Nameplate
5	Baffle	11	Clamp Bolt
6	Filter	12	Spring Washer
6a	Filter rating stamp ⁰¹	13	Clamp Nut

⁰¹P0.5: 0.5 μm , P2: 2 μm , P5: 5 μm

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.

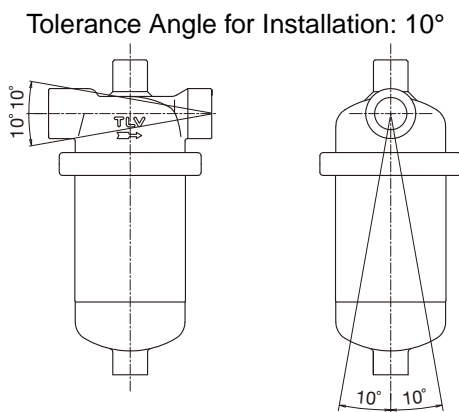
Use hoisting equipment for heavy objects (weighing approximately 20 kg (44 lb) or more). Failure to do so may result in back strain or other injury if the object should fall.

Make sure the nut on the body clamp is fully tightened. 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. Ensure the filter grade (μm) is correct by checking the numbers at the end of the model name on the nameplate and on the bottom of the filter. (P0.5: 0.5 μm , P2: 2 μm , P5: 5 μm)
2. Before installation, be sure to remove all protective seals.
3. Install the product in a location where the removal and filtration of entrained dirt, scale and condensate would be most effective. (For example, on a main or branch at the inlet of equipment requiring high-quality dry steam.)
4. Install valves (A) (B) at the inlet and outlet of the separator filter and a piping blowdown pipe/valve (C) before the inlet valve (A). (See the "Typical Piping Flow" diagram in the "For Longer Filter Life" section.)
5. Before using the product, close the inlet valve (A), open the piping blowdown valve (C) and blow out the piping to remove any piping scraps, dirt and oil. Close the piping blowdown valve (C) when finished. (See the "Typical Piping Flow" diagram in the "For Longer Filter Life" section.)
6. Install pressure gauges at the separator filter inlet and separator filter outlet or the pressure detection port in order to monitor the pressure differential.
7. Install the product so the arrow on the body is pointing in the direction of steam or air flow and the condensate outlet is on the bottom.
8. The product must be installed horizontally and with no more than 10° inclination horizontally and front-to-back.



The product should be installed so that the letters TLV on the body are horizontal.

9. Install discharge piping from the condensate discharge port, including a vertical union, dirt/scale collection piping, piping blowdown valve (E) and horizontal piping with steam, air or drain trap and an inlet valve (D) for the trap. (See the "Typical Piping Flow" diagram in the "For Longer Filter Life" section.)
10. Make sure to install a free float trap that discharges condensate continuously during operation along with the separator filter.

Example

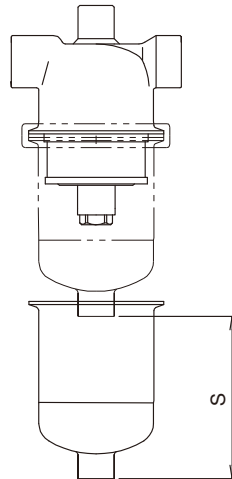
SF1 Connection Size mm	For Steam Use	For Air Use
15 to 40	SS1 Series, J3S-X, J3X	JA3, JA3D, SS1VG Series
50	JH5SL, J5S-X, J5X	JA5, JAH5RG Series



Note

At start-up, large amounts of initial condensate are generated. Also, during batch operation, a large amount of condensate may accumulate in the piping when operation stops. If there are concerns that a large amount of condensate could flow into the separator filter, make sure to install a piping blowdown valve at the inlet of the separator filter to ensure that the condensate is eliminated, or install a steam trap with sufficient discharge capacity even when the pressure differential is extremely low. (See "For Longer Filter Life" items 1, 2 and 3.)

11. Close the dirt/scale blowdown valve (E) below the dirt/scale collection piping, open the separator filter inlet valve (A), outlet valve (B) and the trap inlet valve (D), and ensure that the separator filter functions properly. (See the "Typical Piping Flow" diagram in the "For Longer Filter Life" section.)
12. After letting some live steam/air enter the filter, allow the separator filter to cool to ambient temperature, and then tighten the clamp further. Ensure the maintenance space is sufficient for maintenance (i.e. replacement of internal filter).



SF1 Connection Size mm	Min. Maintenance Space (S) mm
15, 20	100
25	150
40	300
50	350

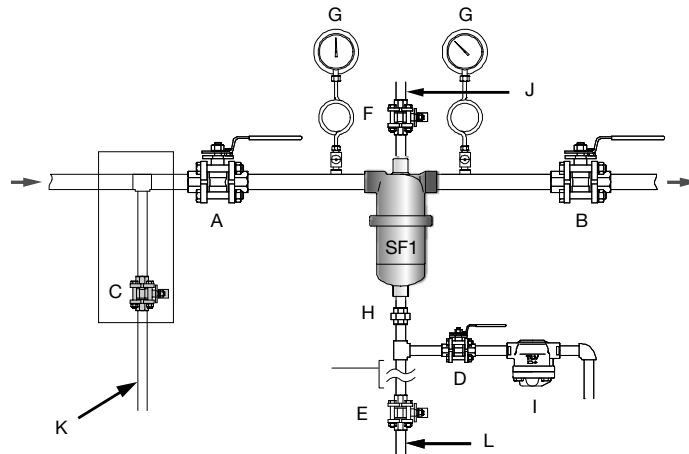
If there is a problem, determine the cause using the "Troubleshooting" section of this manual.

For Longer Filter Life

Make sure to perform the following to prevent the inflow of a large amount of condensate during start-up. (See the "Typical Piping Flow" diagram below.)

1. Operate inlet valve (A) being careful not to open it quickly.
2. If condensate accumulates when inlet valve (A) is closed, open blowdown valve (C) to blow it out.
3. If a blowdown valve has not been installed, a steam trap with sufficient discharge capacity even when the pressure differential is extremely low must be installed on the separator filter inlet side considering the initial condensate amount.
4. The trap outlet piping should not be located close to other trap outlet piping or backflow may occur. If other outlet piping is close by, install check valves close to each trap outlet.
5. If the trap outlet piping is raised, install a check valve close to the trap outlet to prevent backflow of condensate when the equipment stops.
6. The trap outlet pipe end should not be under water. If it must be under water, install a check valve close to the trap outlet or make a small hole in the outlet piping to prevent backflow of water due to vacuum formation inside the piping.

Typical Piping Flow



A	Inlet Valve	G	Pressure Gauge
B	Outlet Valve	H	Pressure Gauge
C	Blowdown Valve ⁰¹	I	Steam Trap
D	Trap Inlet Valve	J	Washing (hot/cold water, steam or air)
E	Dirt/Scale Blowdown Valve	K	Blowdown/condensate discharge
F	Valve	L	Dirt and scale blowdown

⁰¹Ahead of the inlet valve for the SF1, install a valve for piping blowdown or a steam trap with sufficient discharge capacity when differential pressure is extremely low.

To Minimize Pressure Loss Effects

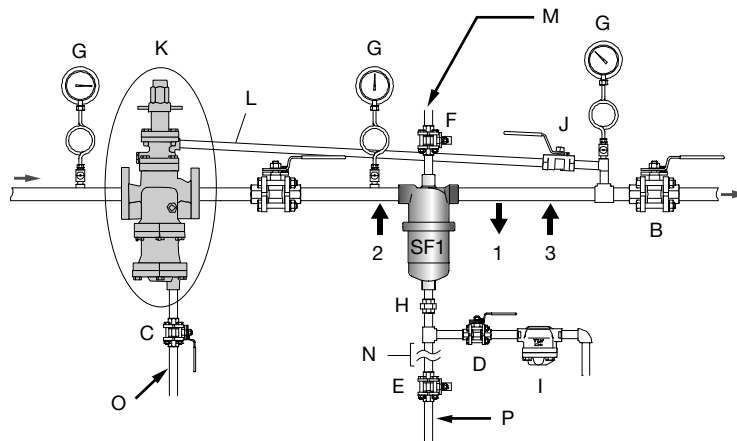
Pressure loss across the separator filter increases the longer it is in service, resulting in a continuous decrease in secondary pressure. If a slight drop in secondary pressure will affect the process, refer to the "In cases where more stable pressure is needed" piping flow diagram shown below.

The effects of gradually increasing pressure loss can be minimized. However, this does not mean that the service life of the clogging filter can be prolonged.

In cases where more stable pressure is needed

Installing a COSPECT pressure reducing valve¹ with an external pressure sensing line from the outlet of the SF1 will help supply stable pressure and minimize pressure drop, which gradually increases due to build-up of dirt/scale at the filter.

1. When dirt and scale build up, SF1 outlet pressure drops.
2. Pressure reducing valve detects the pressure drop and automatically increases SF1 inlet pressure.
3. The SF1 outlet pressure rises to maintain set pressure².



A	Inlet Valve	I	Steam Trap
B	Outlet Valve	J	Valve
C	Valve	K	COSPECT Pressure Reducing Valve
D	Trap Inlet Valve	L	Secondary Pressure Sensing Line
E	Dirt/Scale Blowdown Valve	M	Washing (hot/cold water, steam or air)
F	Valve	N	Dirt and scale collection
G	Pressure Gauge	O	Blowdown/condensate discharge
H	Union	P	Dirt and scale blowdown

¹If a pressure reducing valve other than COSPECT (with built-in strainer, separator, and steam trap) is installed, a pipe tee and piping with a valve for condensate discharge must be installed ahead of the pressure reducing valve for the SF1 inlet.

²If it becomes impossible to adjust the pressure with the pressure reducing valve due to build-up of dirt/scale, clean or replace the filter.

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.

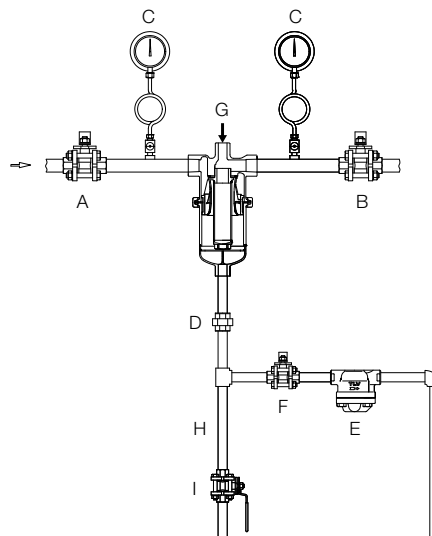
Be sure to use only the recommended components when repairing the product, and NEVER attempt to modify the product in any way. Failure to observe these precautions may result in damage to the product and burns or other injury due to malfunction or the discharge of fluids.

Operational Check

Make sure that there is sufficient steam or air flow from the separator filter outlet by checking the difference in inlet and outlet pressures (pressure loss) or any available flow meters. If the differential pressure is too large (pressure loss is several times more than when the product was new) or there is too little flow, the filter may be clogged. Disassemble, inspect and clean the filter, or replace as necessary.

Filter Cleaning & Replacement

When cleaning is required, first use back flow cleaning by supplying hot or cold water, steam, or air through the washing port on the top of the separator filter (details below). When the clogging is more severe, disassemble and apply high-pressure water cleaning, ultrasonic cleaning, acid cleaning, or other appropriate method directly to the filter. Replace with a new filter when cleaning is ineffective. We recommend having spare filters on hand for this purpose.



A	Inlet valve is closed	F	Trap inlet valve is closed
B	Outlet valve is closed	G	Hot/cold water, steam, or air (valve open)
C	Pressure Gauge	H	Dirt and scale collection
D	Union	I	Blowdown valve is open
E	Steam Trap		

Disassembly/Reassembly



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.

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.)

Removing/Reattaching the Separator Body and its Components

Part Name & No.	During Disassembly	During Reassembly
Body Clamp 8	Hold the separator body so that it will not fall; loosen the nut	Insert the clamp bolt from the side which has a rotation stopper. Consult the table of tightening torques and tighten the nut to the proper torque so that there is no seal leakage. Open the inlet valve and let steam/air to enter the filter, then close the inlet valve; after internal and atmospheric pressures have equalized and the separator filter body has cooled, tighten nut again.
Body 1 Separator Body 3	Remove the clamp and pull the separator body down and off, being careful not to scratch the gasket sealing surfaces	Gently rejoin being careful to insert the raised part of the body gasket into the housing on the body. Reattach the body clamp.
Body Gasket 9	Remove, being careful not to scratch the sealing surfaces	Replace with a new gasket if warped or damaged. Place on the separator body.

Disassembly/Reassembly of the Filter


Part Name & No.	During Disassembly	During Reassembly
Filter 6	Remove with a wrench  Note The separator comes off with the filter. Make sure not to drop the separator.	Check for dents and damage, etc. to both threads in order to prevent seizing, and clean the threads by blowing them out with air. Then manually screw the filter into the body carefully until it hits the bottom. Next, consult the table of tightening torques and tighten to the proper torque Coat thread portions with a small amount of food grade anti-seize (such as “NEVER-SEEZ PTFE White Food Grade” made by Bostik, Inc.). Avoid using too much as anti-seize may ooze out of the thread.
Separator 2	Remove the separator; clean sealing surface on the separator and body	Assemble the separator onto the body together with the filter.
Filter Gasket 7	Remove, being careful not to scratch the surface	Replace with a new gasket if warped or damaged.

Table of Tightening Torques

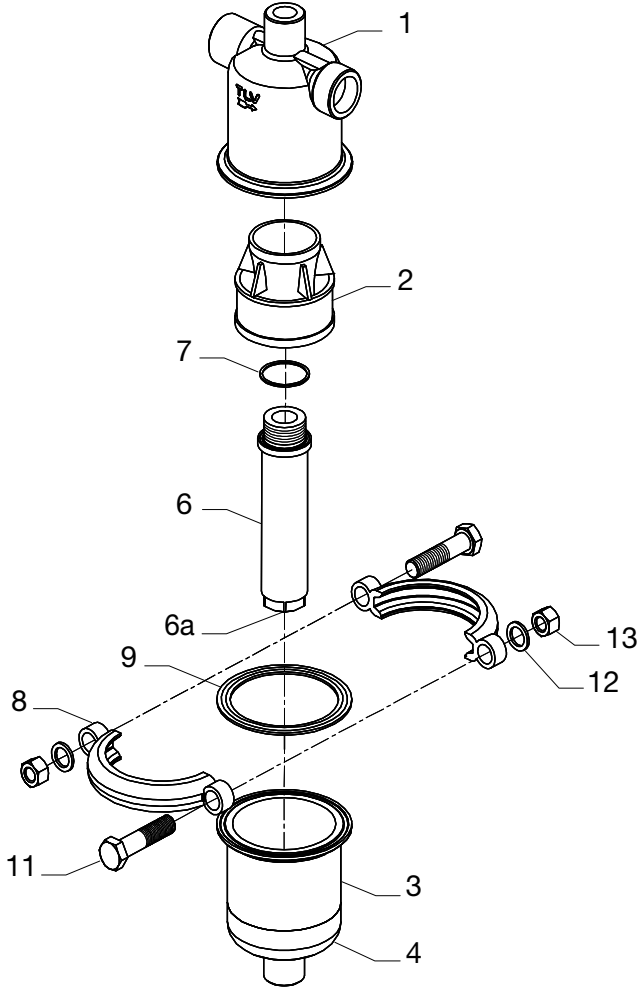
Part Name & No.	SF1 Connection Size mm	Torque N-m	Distance Across Flats mm
Filter 6	15, 20	30	32
	25	40	36
	40	50	50
	50	60	60
Clamp nut 13 (for Body Clamp 8)	15,20	15	Clamp Bolt: 14 Clamp Nut: 16
	25	20	
	40	25	
	50	50	



Note

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

Exploded View



No.	Part Name	No.	Part Name
1	Body	7	Filter Gasket
2	Separator	8	Body Clamp
3	Separator Body	9	Body Gasket
4	Separator Bottom	10	Nameplate
5	Baffle	11	Clamp Bolt
6	Filter	12	Spring Washer
6a	Filter rating stamp ⁰¹	13	Clamp Nut

⁰¹P0.5: 0.5 µm, P2: 2 µm, P5: 5 µm

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.

If the product fails to operate properly, use the following table to locate the cause and remedy.

Problem	Cause	Remedy
Matter larger than the specified filter grade passes through the separator outlet	The filter rating is incorrect	Replace with a filter of the correct rating
	The filter is broken	Replace with a new filter
Outlet side steam or air retains entrained condensate	The flow rate is too high or flow velocity is too fast for the separator filter	Make corrections to the piping to reduce flow rate and velocity
	Improper installation	Correct the installation
The outlet pressure is too low or the specified flow rate cannot be achieved	The pressure loss through the filter is too large	Clean or replace with a new filter
	The filter is clogged	
Steam or air is leaking between the body and separator body	Gasket deterioration or damage	Replace with a new gasket
	The nut on the clamp is not fully tightened	Tighten the nut to the proper torque

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.

Exclusive Remedy

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.

Exclusion of Consequential and Incidental Damages

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.

Exclusion of Other Warranties

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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