

SK00-6740-DI-002-03

No. 170821

ULVAC

INSTRUCTION MANUAL

OIL MIST TRAP

MODEL

TM201

TM401

Read this manual before operation and keep it at your
hand for immediate reference

Components division

ULVAC, Inc.

Table of Contents

1. INTRODUCTION	1
2. GENERAL DESCRIPTION	2
2.1 Features	2
2.2 Specifications	2
2.3 Dimensional Drawings	3
2.4 Structure	5
3. OPERATION	6
3.1 Check	6
3.2 Mounting on Pump	6
3.3 Duct Piping	6
3.4 Treatment of Trapped Oil	7
4. INSPECTION	8
4.1 Schedule Inspection	8
4.2 Replacing the Filter Element	8
4.2.1 Removing the filter element	8
4.2.2 Reassembling the filter element	10
5. PRECAUTIONS	11
5.1 Clogging of Filter Element	11
5.2 Pressure Relief Valve	11
5.3 When the pump is used continuously at a high intake pressure	11
5.4 When using Oil Mist for a Pump that exceeds Maximum Throughput	12
6. WARRANTY	13
7. MAJOR REPLACEMENT PARTS	14
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Attached Tables and Illustrations

Fig. 1	Dimensional drawing (TM201)	3
Fig. 2	Dimensional drawing (TM401)	4
Fig. 3	Schematic diagram	5
Fig. 4	TM201/TM401 mounted in position	6
Fig. 5	Exploded view of filter element	9
Table 1	Specifications	2
Table 2	Major Replacement Parts List	14

1. INTRODUCTION

Thank you for purchasing this oil mist trap. Prior to operating this oil mist trap, read this manual carefully for optimum performance, and operate it correctly. Note that incorrect operation may cause trouble of the oil mist trap.

Also keep this manual in your file so that you can refer to it when you come across any question or trouble during operation.

2. GENERAL DESCRIPTION

2.1 Features

- (1) Removal of oil mist with high efficiency

Approx. 90% of the oil mist discharged from an oil sealed rotary vacuum pump can be removed, allowing the work environment to be kept free from contamination with oil mist.

- (2) Employment of cartridge type filter element

The cartridge type filter element can be easily replaced when it is clogged or corroded.

- (3) Pump internal pressure relief valve

If the filter element is clogged, the pressure in the pump will rise at start-up of the pump or during pumping operation, which can be dangerous.

If the pressure in the pump rises above 0.03 MPa (0.3 kg/cm²) (gauge pressure), the pressure relief valve will be activated to prevent the pump and oil mist trap from being damaged.

2.2 Specifications

Table 1 Specifications

Model		TM201	TM401
Item			
Filter element		TM201E	TM401E
Displacement	m ³ /h * ¹ (L/min)	24 (400)	48 (800)
Connecting part dia.	Pump side	VF40 * ²	VF40 * ²
	Exhaust side	G1 1/2 internal thread * ³	
Outside dimensions (mm)	Overall height	280	350
	Overall width	181	181
	Diameter	165	165
Weight (kg)		8.5	10

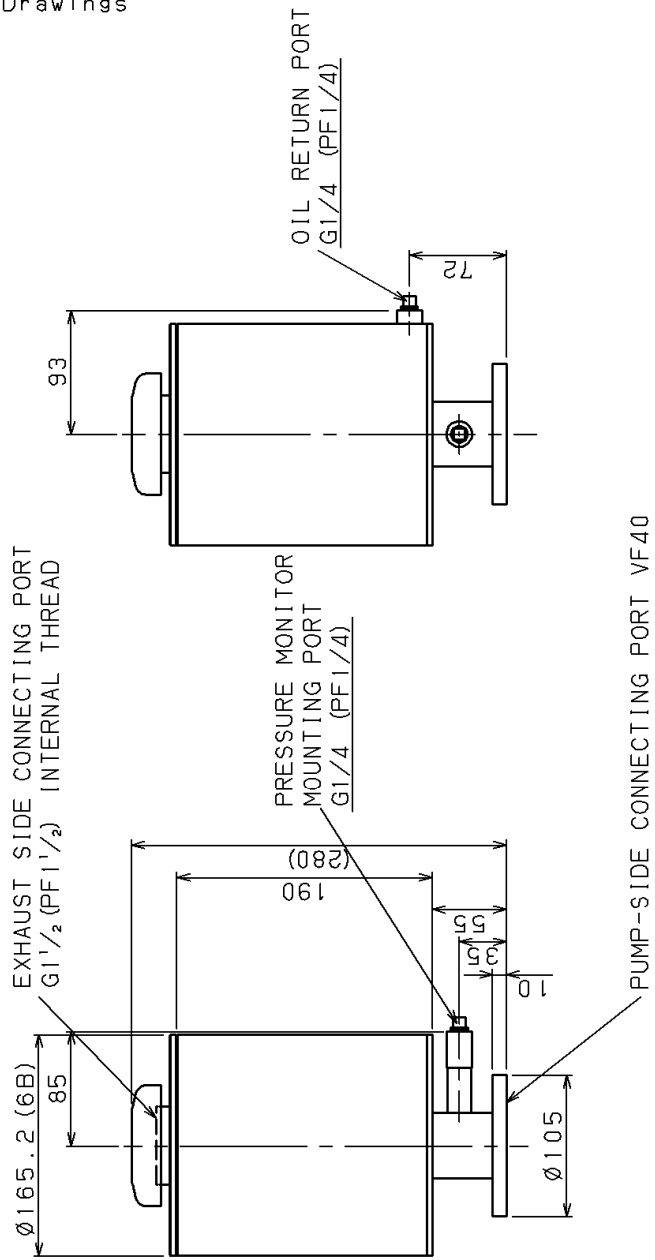
*1) Throughput under atmospheric pressure.

*2) The flange is the JIS vacuum flange (JIS B 2290).

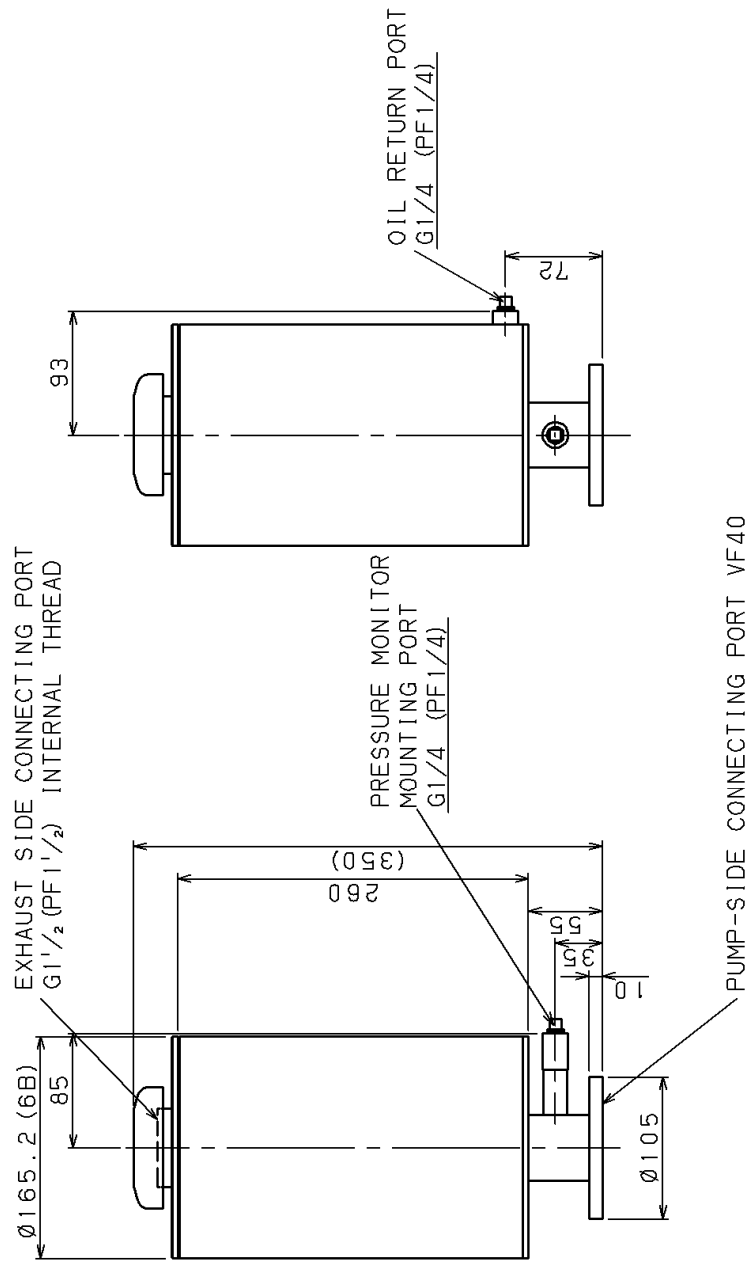
*3) Same as PF 1 1/2.

TM201

2.3 Dimensional Drawings



TM401



2.4 Structure (Refer to Fig. 3)

The gas discharged from the oil sealed rotary vacuum pump (air, nitrogen gas, etc.) blows up the oil in the pump and is introduced to the oil mist trap along with fine particles of oil blown up. These fine particles of oil (oil mist) are trapped by the filter element when they pass through it and the condensed large oil particles gather between the oil mist trap and the filter element and are discharged through the oil return port.

Gas from which most part of the oil mist has been removed is discharged through the exhaust port of the oil mist trap.

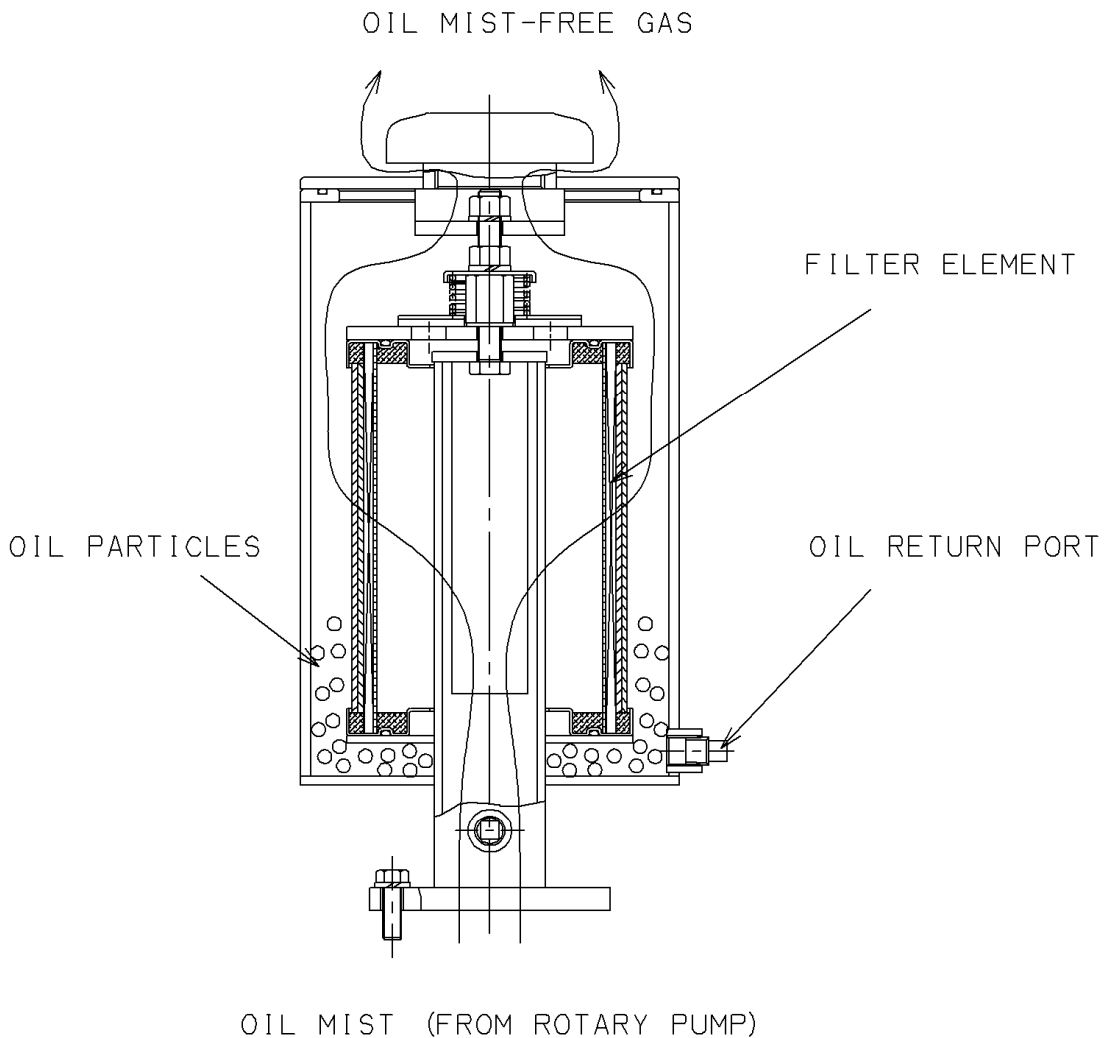


Fig.3 Schematic diagram

3. OPERATION

3.1 Check

The oil mist trap has been shipped after rigorous inspection at the factory, but check upon the following unpacking it.

- (1) Is the unit the correct model you ordered?
- (2) Are accessories (instruction manual, parts you ordered) supplied with the unit?
- (3) Is any part damaged or missing and any screw or nut loosened in transit?

If you find any problem, contact your local ULVAC organization or representative.

3.2 Mounting on Pump (Refer to Fig. 4)

To mount the oil mist trap on the pump, proceed as follows.

- (1) Verify that the exhaust port, O-ring groove and oil mist trap (TM) flange are free from scars and dust.
- (2) Mount the O-ring (V55) to the exhaust port of the pump and tighten the TM flange using an Allen screw (M8).

3.3 Duct Piping

The exhaust port of the oil mist trap has a cap as standard, but has a flange (RF-11) for duct piping as option. Use it depending on your application.

CAUTION :

- ① The flange for the duct piping (RF-11) is equivalent to VG40.

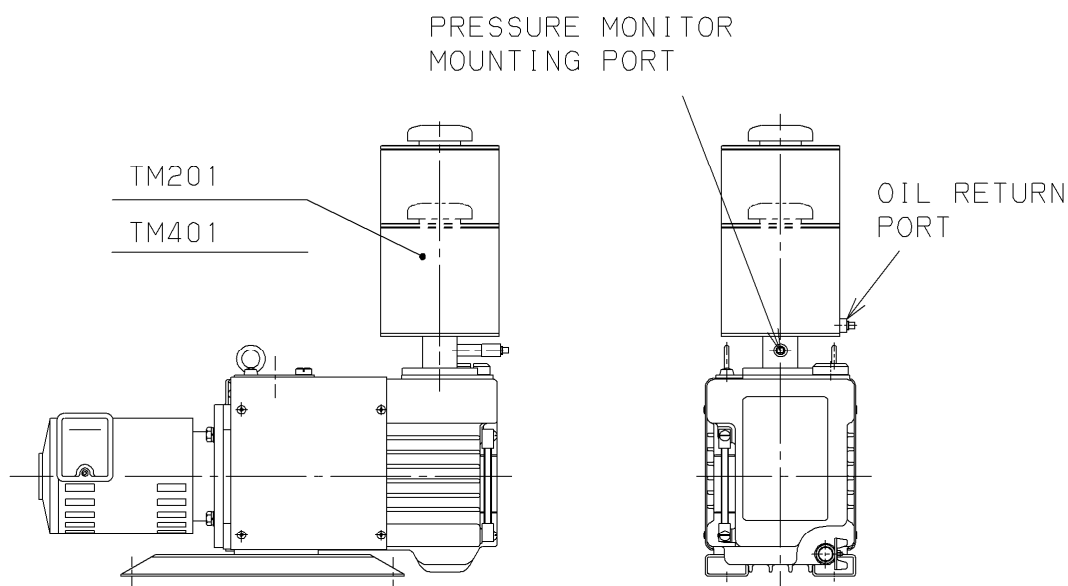


Fig.4 TM201/TM401 mounted in position

3.4 Treatment of Trapped Oil

The TM201/401 is designed to discharge the trapped oil to outside through the oil return port. Recover the discharged oil in a container and return it to the pump when the pump is operated under no load or at stop.

However, do not return the oil to the pump if the oiliness of the recovered oil is lower than the new oil used in the pump or if the oil contains water, dust or the like or if chemicals like acid is used.

It can be a cause of trouble of the pump.

CAUTIONS:

- ① If you do not dispose of the trapped oil, oil will stay between the fitter element and the oil mist trap and oil mist will come out.
- ② It is recommended to replace a filter element once immersed in oil because clogging tends to occur.
- ③ Do not connect the oil return port and the pressure monitor mounting port by means of a vinyl hose or the like. Oil mist will not be trapped.

4. INSPECTION

4.1 Scheduled Inspection

Periodically measure the pressure in the pump with the optional pressure monitor mounted to the pressure monitor mounting port.

Verify that the pressure at start of the oil sealed rotary vacuum pump or immediately after evacuation of the vacuum chamber from atmospheric pressure is 0.03 MPa (0.3 kg/cm²) (gauge pressure). If it is higher than 0.03 MPa (0.3 kg/cm²) (gauge pressure), it is necessary to replace the filter element and check the pressure relief valve.

4.2 Replacing the Filter Element (Refer to Fig. 5)

If the filter element is clogged, replace it, as a rule.

4.2.1 Remove the filter element

- (1) Stop the pump or put the pump under no-load operating condition and loosen the Allen screw (M8) that fixes the oil mist trap to the pump to remove the oil mist trap. (If piping is connected to the exhaust side, remove it.)
- (2) Loosen the hex nut (M10) at the center of the exhaust port to remove the flange.
- (3) Loosen the hex nut (M10) to remove the parts of the pressure relief valve.
- (4) Loosen the spacer nut to remove the filter keep plate.
- (5) Remove the filter element.

This completes the removal of the filter element.

CAUTIONS:

- ① Before replacing the filter element, check if the interior of the oil mist trap or the pressure relief valve is contaminated with dust or foreign matter. If so, remove it by cleaning.
- ② The seal washer can not be reused.

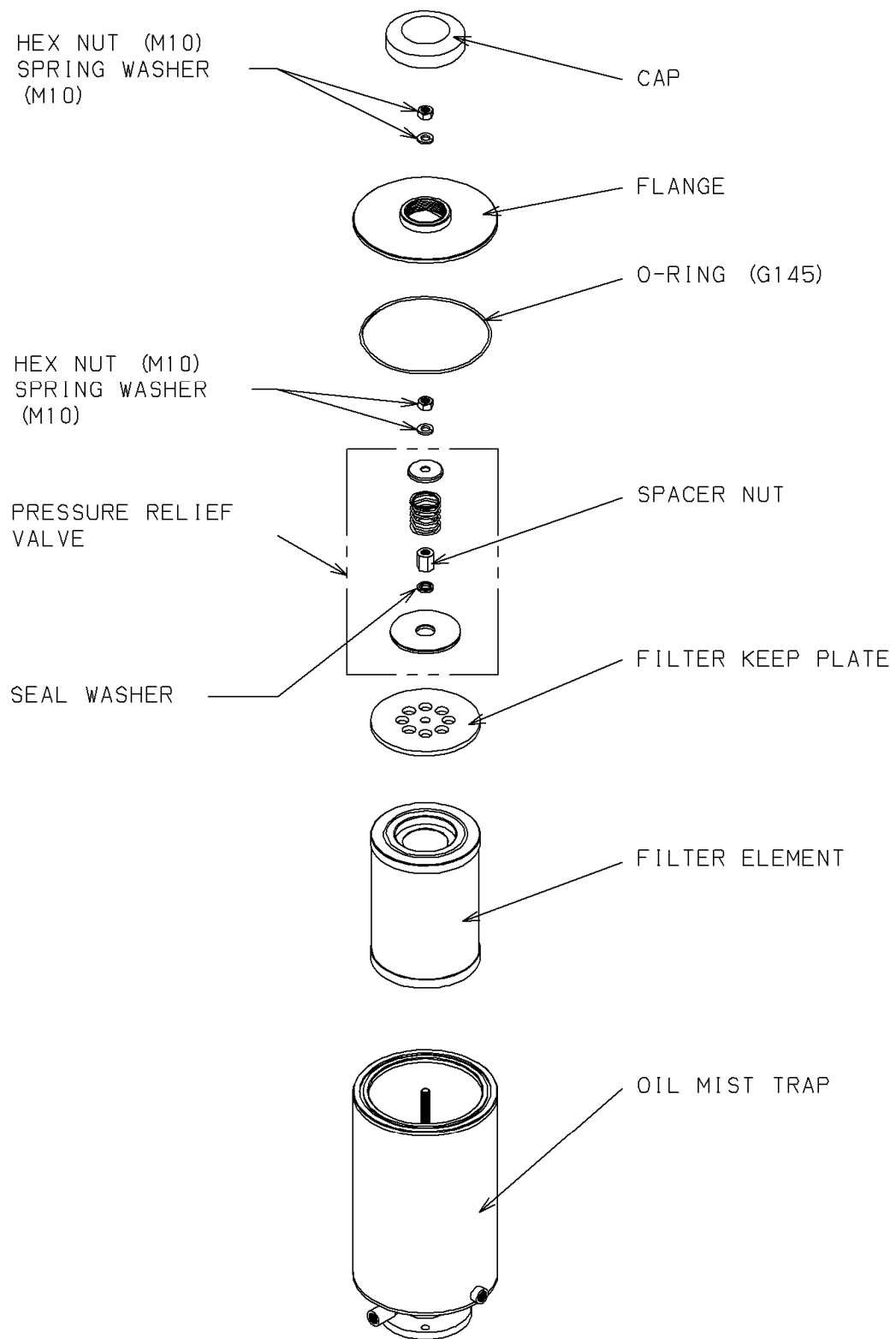


Fig.5 Exploded view of filter element

4.2.2 Reassembling the filter element

- (1) Ensure that the mounting surface of the filter element in the oil mist trap is free from foreign matter and scars.
- (2) Mount the filter element in the oil mist trap.
- (3) Mount the filter keep plate in position.
- (4) Mount the seal washer (M10) and fix the filter element using the spacer nut.
- (5) Mount the parts of pressure relief valve.

CAUTIONS:

- ① **Tighten the hex nut (M10) until it comes into contact with the spacer nut. (The pressure relief valve is activated at a pressure below 0.03 MPa (0.3 kg/cm²) (gauge Pressure)).**
- (6) Mount the O-ring in the O-ring groove of the oil mist trap. (Apply a thin uniform coat of vacuum grease until the luster of the O-ring surface changes.)
- (7) Mount the flange in position and tighten it with the hex nut (M10).
This completes the mounting of the filter element.

5. PRECAUTIONS

5.1 Clogging of Filter Element

Clogging of the filter element will raise the pressure in the pump and may damage the pump parts or the filter element. Therefore, when using the filter element in the following application, be sure to mount a pressure monitor (optional) to monitor the pressure.

- ① When the pump is used for continuous evacuation at a high suction pressure or continuous pumping of high temperature gas

The pump temperature rises and the oil viscosity lowers, tending to cause clogging. In this case, a large volume of oil, discharged from the exhaust port of the pump, will be trapped by the filter, but if the pump is operated under the above operating conditions for an extended time, the oil deposited on the fine fiber of the filter element will form an oil film, leading to clogging.

- ② When the pump is used to pump liquid with high viscosity or fine powder at ambient temperature, it will be deposited on the fiber of the filter element, leading to clogging.
- ③ When reaction products are generated

5.2 Pressure Relief Valve

This device is designed to operate when the pressure in the pump exceeds the maximum continuous operating pressure of 0.03 MPa (0.3 kg/cm²) (gauge pressure). If this valve is activated, the oil mist discharged from the pump will not be trapped by the filter element, but will be discharged directly through the exhaust port of the oil mist trap.

If this happens, replace the filter element with a new one.

5.3 When the pump is used continuously at high intake pressure

If the pump is operated continuously at a high intake pressure (6500 Pa or more) for an extended time, the pump temperature will rise and the oil viscosity will lower. This increases the amount of oil mist (including fine oil drops) discharged through the exhaust port of the pump and tends to clog the filter element. Foreign matter sucked into the pump during evacuation and the sludge generated by deteriorated oil can also be a cause of the clogging of the filter element.

If the filter element is clogged and the pressure in the pump exceeds the maximum continuous operating pressure of 0.03 MPa (0.3 kg/cm²) (gauge pressure), the pressure relief valve will operate to lower the internal pressure, but it is necessary to replace the filter element.

If it is necessary to replace the filter element frequently, the use of an oil mist trap one class larger than the current one is recommended.

5.4 When using Oil Mist Trap for a Pump that exceeds Maximum Throughput

Do not operate the pump continuously at a high intake pressure of 6500 Pa or more when the TM201 is used for a pump with a throughput of 20 m³/h or more (30 m³/h, 40 m³/h) or when the TM401 is used for a pump with a throughput of 40 m³/h or more (60 m³/h, 80 m³/h).

The pressure relief valve will operate and oil mist be generated even with a new filter element. Also the life of the filter element will be extremely shortened.

For more information, contact your local ULVAC organization or representative.

6. WARRANTY

- (1) The warranty period of this oil mist trap is one year from the date of delivery.
- (2) Should the oil mist trap fail under normal operating condition during this warranty period, its repair will be carried out free of charge.

The normal operating conditions are as follows.

- a) Ambient temperature: 10°C to 40°C
 - b) Suction gas: Dry air or dry nitrogen (0°C to 40°C)
 - c) Operation in conformity with instruction manuals.
- (3) Troubles caused by the following are out of warranty.
- a) Acts of God and force majeure.
 - b) Special atmosphere, such as pollution or the like.
 - c) Operation not in conformity with the instruction manual.
(Specifications, maintenance, inspection and others.)
 - d) Troubles judged by ULVAC engineer to be attributable to operating conditions not appropriate for this oil mist trap.

7. MAJOR REPLACEMENT PARTS

Table 2 Major Replacement Parts List

No.	Description	Material	Q'ty	Remarks
1	Filter element		1 set	TM201 : TM201E TM401 : TM401E
2	O-ring (G145)	NBR	1	JIS B 2401
3	Seal washer (M10)	NBR	1	

The exhaust port of the TM201 and TM401 are provided with the following.

Standard type : Cap

Option : RF-11 (equivalent to VG40)