



INSTALLATION AND OPERATION GUIDE





-
- **Before installation it is important to drain out any free water and “sludge” that might have settled in the bottom of your oil tank.**
 - **This is to prevent the filters from clogging up and prevents prematurely change of filters.**
 - **The unit might also not work properly if it gets filled by free water.**
 - **WPM-100 must be installed above the oil tank/container.**

See installation for more information.



Table of contents

1	Safety.....	4
1.1	Required action in case of:.....	4
1.1.1	Inhalation of oil steam.....	4
1.1.2	Skin contact with oil.....	4
1.1.3	Eye contact with oil.....	4
1.1.4	Swallowing oil.....	4
2	Daily Maintenance.....	5
3	Introduction.....	6
3.1	Oil flow path.....	6
4	Main Components.....	7
4.1	Back drawing.....	7
4.2	Front drawing.....	8
5	WPM-100 Operation.....	9
6	Installation manual.....	10
7	Electrical drawing.....	12
8	Technical.....	13
8.1	Technical design.....	13
8.2	Oil Contamination.....	14
8.3	Filtration.....	14
8.4	Evaporation.....	15
8.5	Summary.....	15
8.6	Filter Drawings.....	16
9	Maintenance.....	19
9.1	Regular Maintenance.....	19
9.2	Service / Repairs.....	19
10	Part list.....	20
11	Declaration of Conformity.....	21
12	Limited Warranties Statement.....	23



1 Safety

Do not use the WPM-100 to clean fuel, petroleum, diesel or any flammable liquid that can catch fire on low heat.

The WPM-100 is made for purifying oil and should not be used to filter other liquids.

Be cautious about running the machine for too long without oil. The pump will be unnecessarily worn if no oil is running through the system, and the heater top will thus reach a high temperature.

When changing the filters, use protective eye gear, and oilproof gloves (rubber gloves). Any spillage of oil on floor or surroundings must be cleaned up immediately to avoid accidents.

Make sure the datasheet for the oil in use is available.

If any severe allergic reaction, or critical situation occurs, the nearest hospital should be contacted immediately.

1.1 Required action in case of:

1.1.1 Inhalation of oil steam

Remove the person(s) from the area and let them have fresh air. Contact a doctor.

1.1.2 Skin contact with oil

Rinse thoroughly with soap and water. Contact a doctor if any sign of an allergic reaction.

1.1.3 Eye contact with oil

Rinse thoroughly with eyewash for 10 minutes, especially under the eyelids. Contact a doctor.

1.1.4 Swallowing oil

Bring the person(s) to hospital and bring the datasheet for the oil with you.



- Do not use the WPM-100 to clean fuel oil, diesel, petroleum, or other types of flammable liquid or fuel.
 - Do not run the unit without oil for too long.
 - Do not change or open any part of the unit while the unit is running.
-



2 Daily Maintenance

Instructions for the daily maintenance of WPM-100 single & Twin units.

1. Daily check if the power is "ON" and the machine is running.
2. Oil flow from the filter system is operating normally
 - Can be observed in the inspection glass on the filter.
3. Replace filters at 1800 hours / 3-4 months.

(This is based on normal oil contamination)

Main filter: WP-100FC

4. Check that all seals and O-rings are installed correctly on the replacement filter.

If any problems:

1. Check the filter for contamination (if not replaced) Replace if necessary.

(Although they seem to be OK and the filter range is not yet reached.)

2. Check the nozzle inside / bottom of the main filter tank.
(Blocked)
 - a. Are the filter canisters in the correct position?



3 Introduction

This installation and operation guide provide the required information to install and maintain the unit under different circumstances.

The Purifier WPM-100 is an oil purifier that is used on pressure free systems. WPM-100 is used to clean oil in a pressure free system or directly from an oil tank. WPM-100 removes particles down to 1-3 μm and water down to 100 PPM.

Wågene Purifier Technology Type WPM is an oil maintenance system for use on engine lube oil. The WPM-100 must be mounted above the oil tank as the oil leaving the unit is pressure free.

The WPM-100 will also remove free and emulsified water, acids and corrosive gases in the oil. The filtration system is a long strand cotton filter that does not absorb water, the water passes through the filter and is evaporated in the evaporation chamber. As long as water is present in the oil, the unit will continuously remove water. For this system to work in the best way possible, a slow flow through the filter is required.

3.1 Oil flow path

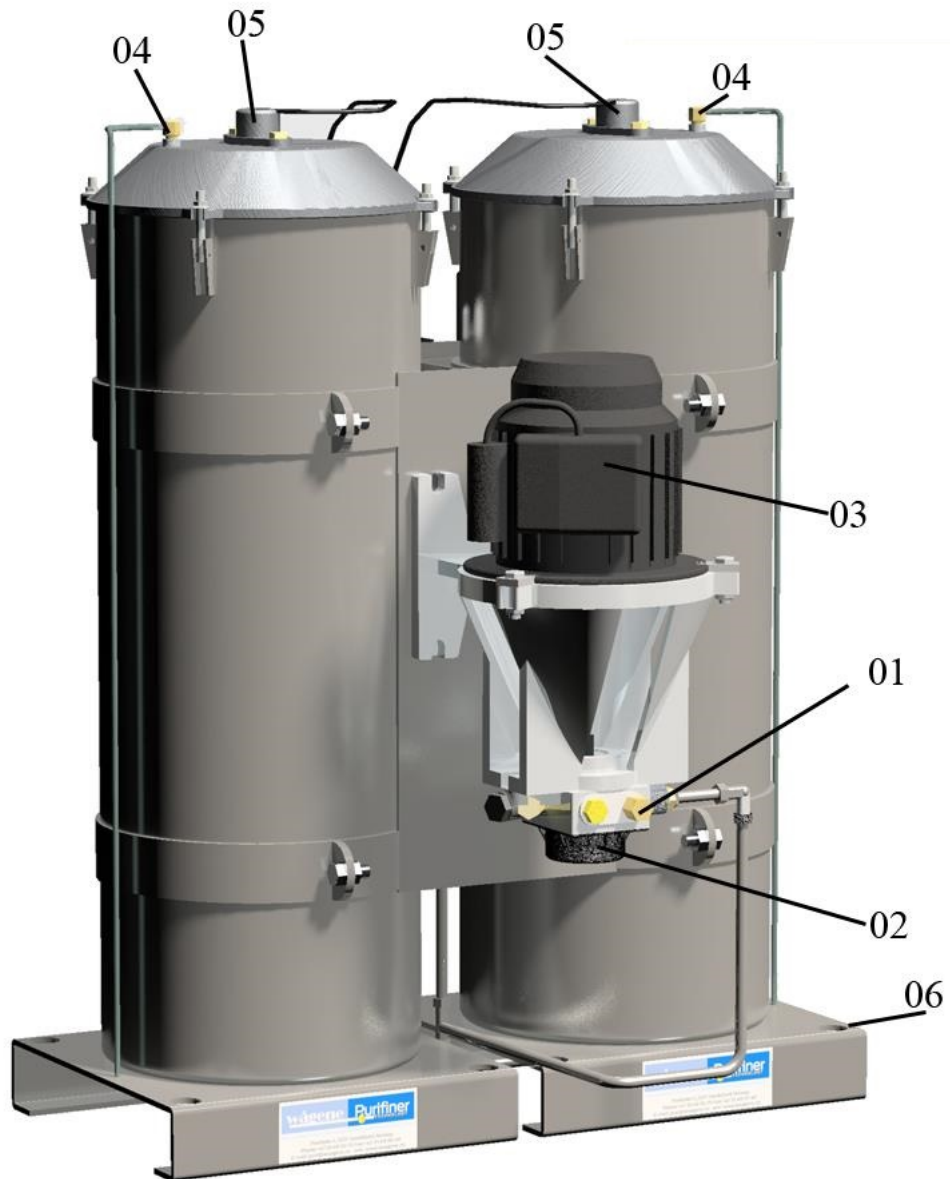
From oil tank \rightarrow Oil Inlet \rightarrow Pump \rightarrow Main Filter \rightarrow Flow Meter \rightarrow Oil Outlet



- Large debris may block the flow into the unit if the oil is severely contaminated. The oil running through the system must not be so contaminated that it will block the intake.
-

4 Main Components

4.1 Back drawing



1 Inlet connection 3/8 BSP

2 Pump

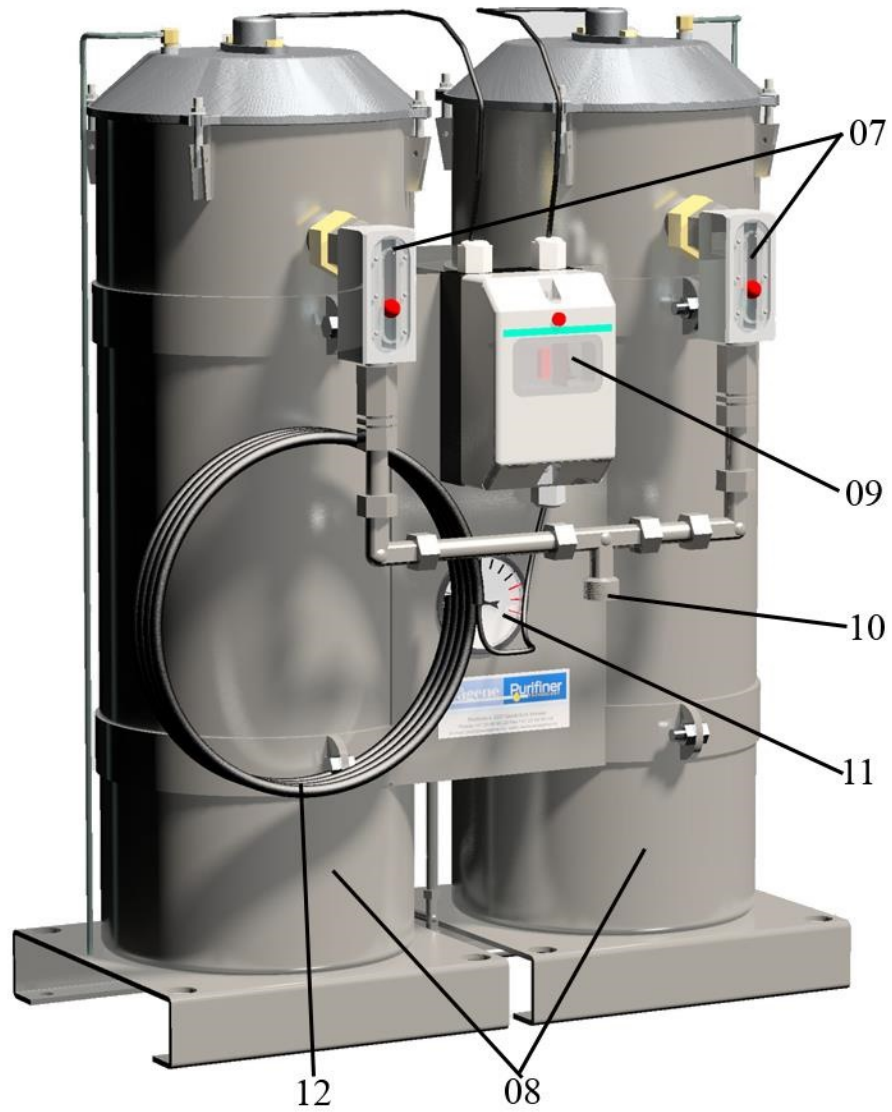
3 Motor

4 Vapor valve

5 150W Heater element

6 Hole for mounting

4.2 Front drawing



07 Inspection Glass

08 Purifiner Filter

09 El. Box Start/Stop

230V 50/60Hz

10 Return to system

11 Pressure Gauge

12 230V 50/60Hz

Weight = 60kg

H=700, W= 540, L= 510



5 WPM-100 Operation

Assuming the WPM-100 is connected to the electrical main:

Pre-Installation:

- 1) Empty the used oil from the system.
- 2) Install sump or reservoir suction line for WPM-100 using 3/8 BSP connectors, pipe & hard piping is highly recommended. Make sure the suction line is installed low enough on the reservoir or sump to get the contamination on the bottom of the reservoir or sump.
- 3) Add new oil to the system.
- 4) Turn ON the WPM-100 and run for 15-40 minutes under supervision until you can see a flow in the flow meter.
- 5) Shut off the unit and wait 10 minutes, then check the oil level on the dipstick and top up as necessary.

Repeat step 4 and 5 after changing filters.

Make sure the pressure on the unit is between 3-4 bars by checking the pressure gauge.



6 Installation manual

1. Place or fasten the unit on a safe and secure spot. The unit needs to be installed above oil tank since the oil leaving the unit is pressure free. *¹
2. The unit is shipped with main filters installed.
3. Connect the oil inlet to the lowest area of the tank or system you want to purify. (This is the area water and particles accumulate).
4. Connect the oil outlet to the highest area of the tank or system you want to purify. See picture on page 11 for oil outlet installation example.
5. Connect to a power source.
6. Push the start button, the motor and the pump will make some noise. This should quiet down a little after some minutes.
7. At first start-up, and after any main filter change it may take 20 to 40 minutes before oil starts flowing through the main filters. The time varies depending on the oil viscosity.
8. Do not touch the main filter canister after unit have been running for a longer time as this can be hot.
9. Once oil has passed through the main filter (look for oil in the flow meter), the pressure on the pressure gauge should stay between 3-4 bar (+/- 0.25 bar). This is the required pressure for the unit to have optimal filtration.
10. On first time installations we recommend that you check the unit after a couple of hours to ensure the pressure is stable, and that there is no oil leakage from any connections.

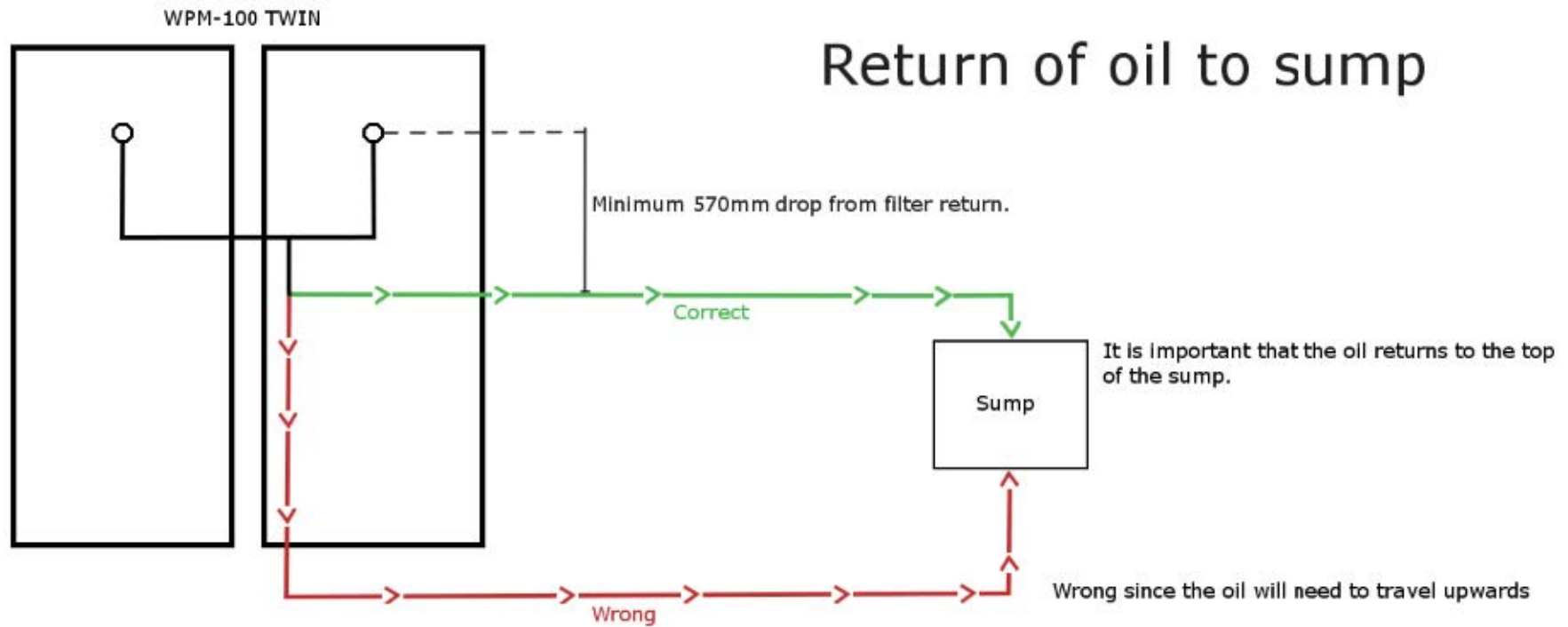


*¹The suction height of the pump is maximum 5 meters in free height.

•

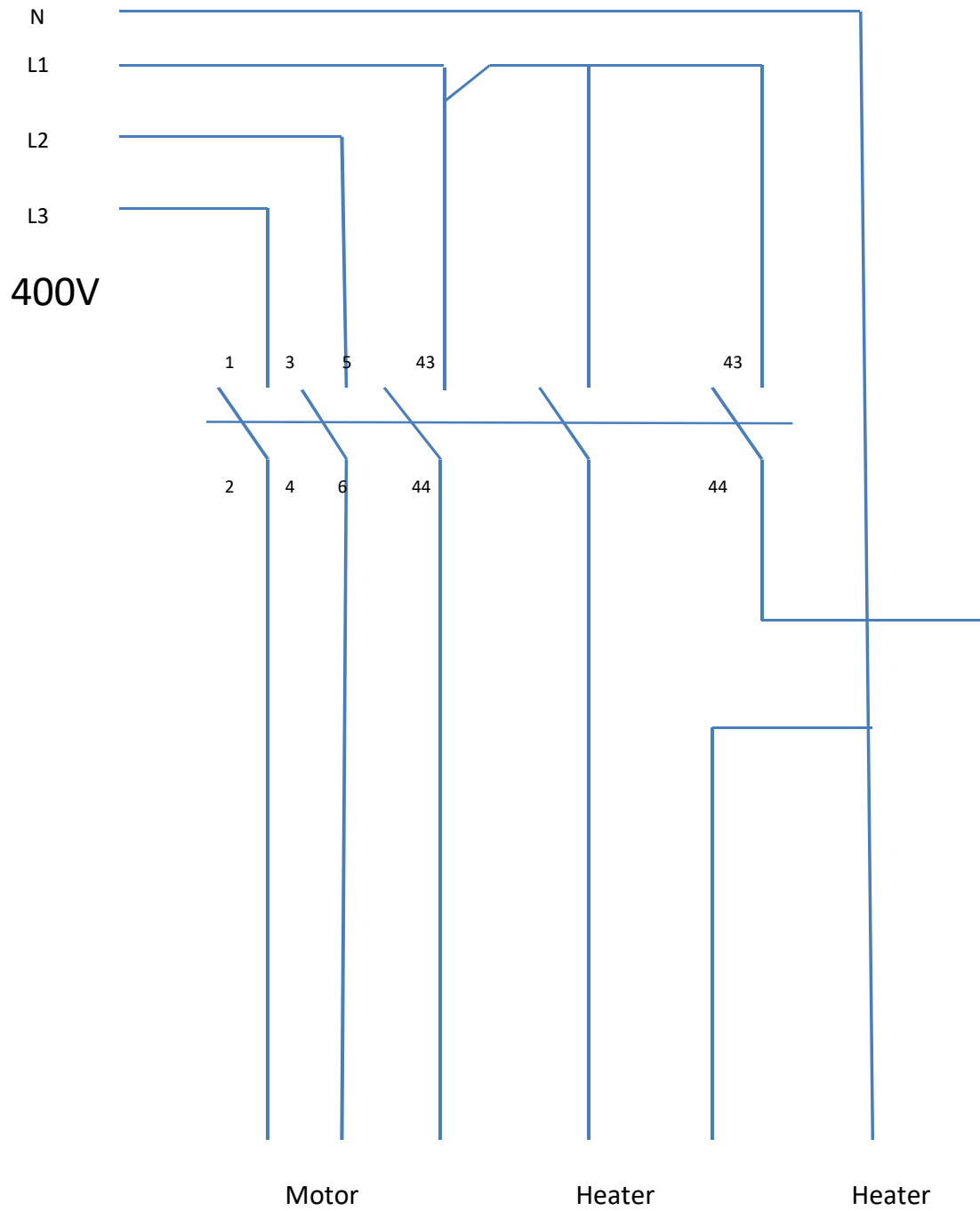


Important information regarding the oil return back to sump





7 Electrical drawing





8 Technical

8.1 Technical design

- Continuously oil maintenance
- Removes particles from oil
- 1-3 Micron
- Evaporates out water
- Down to 100 ppm

	WPM-100 Single	WPM-100 Twin
Capacity (24hr)	600 Liters	1200 Liters
Sump size	500 Liters	500-1000 Liters
Power Consumption	400W	550W
Applications	Engine oil or hydraulic systems	Engine oil or hydraulic systems
Dimensions (L.W.H)	61x33x70	51x54x70
Voltage	230V or 400V	230V or 400V
Weight	40kg	60kg



8.2 Oil Contamination

The Purifier system is unique in its inherent ability to address all forms of contaminants that occur in oils used in lubrication and hydraulic systems.

These contaminants can be divided into:

- Solid contaminants – for example wear metal, soot (carbon), dirt (silicon, sludge, etc.).
- Liquid contaminants – water, fuel (NB light hydrocarbons, etc.).
- Gaseous contaminants – Sulphur dioxide, Sulphur trioxide, nitrous oxide.
- Acidic contaminants – sulphuric acid, nitric acid. (Typically present as a result of reaction between liquid and gaseous contaminants).

To effectively remove these contaminant groups – and (of critical importance to oil quality) prevent the formation of certain contaminants – the Purifier system incorporates the actions of:

- Fine filtration.
- Flash evaporation.

8.3 Filtration

On entering the Purifier system, oil will initially pass through a filter consisting of long strand, unprocessed cotton.

We need to recognize the reasons for using this cotton filter medium as well as the effect of fine filtration combined with essential chemical reactions that take place in the cotton filter.

Unprocessed cotton provides an excellent filtration material and is the basis for the ability of the Purifier system to provide an absolute filtration capability down to 1 micron.

Why 1-micron filtration

1. Particles size of less than one micron will not have an abrasive effect in hydraulic or lubrication oils.
2. Most quality oils will keep solid contaminants (such as sludge) in suspension to a particle size of 3 - 4 microns. When the particle size agglomerates to greater than this the contaminant will fall out of suspension to be deposited in the sump or other areas of the system, with resultant detrimental effect on the qualities of oil and system performance.



8.4 Evaporation

Equally important to the effect of filtration is that of evaporation.

Removal of liquid and gaseous contaminants

It is known that water is present in oil due to condensation or other conditions. The evaporation action takes time because there is usually a large quantity of oil in a hydraulic or lubrication system.

We create the effect with the heated diffuser plate in the Purifier system – i.e. a small volume of oil relative to surface area – this is known as the “thin film evaporation effect” and is critical to the performance of the Purifier system in removing and, vitally, preventing the formation of harmful contaminants. We have discussed the effect of the cotton filter in the Purifier system in addressing acid contamination, however, it would obviously be of greater benefit to oil condition (in terms of maintaining alkali additive levels and the fundamental ability of the oil to flow and shear) if acid build up was prevented in the first place. This is achieved by the Purifier system due to the evaporation chamber – water and Sulphur dioxide / trioxide will still pass through the filter and flow over the diffuser plate. This is where the thin film evaporation effect will allow the release of both liquid contaminant (water) and gaseous contaminant (SO₃). Liquid and gases are evaporated by the same process, preventing the formation of Sulphur acid; the same will also apply to nitric or other acids that might be formed. In general terms: - prevention is better than cure.

Due to this effect alkali additive in oil – calcium and magnesium – will not be depleted and condition of the oil will remain stable.

Aluminum is the material used in the evaporation chamber due to its ability to quickly and uniformly radiate heat generated by the heating element. Note: - the Purifier system will not add heat to engine or hydraulic oil – tests have proven that hydraulic oil entering the system at 50 degrees C will exit at the same temperature.

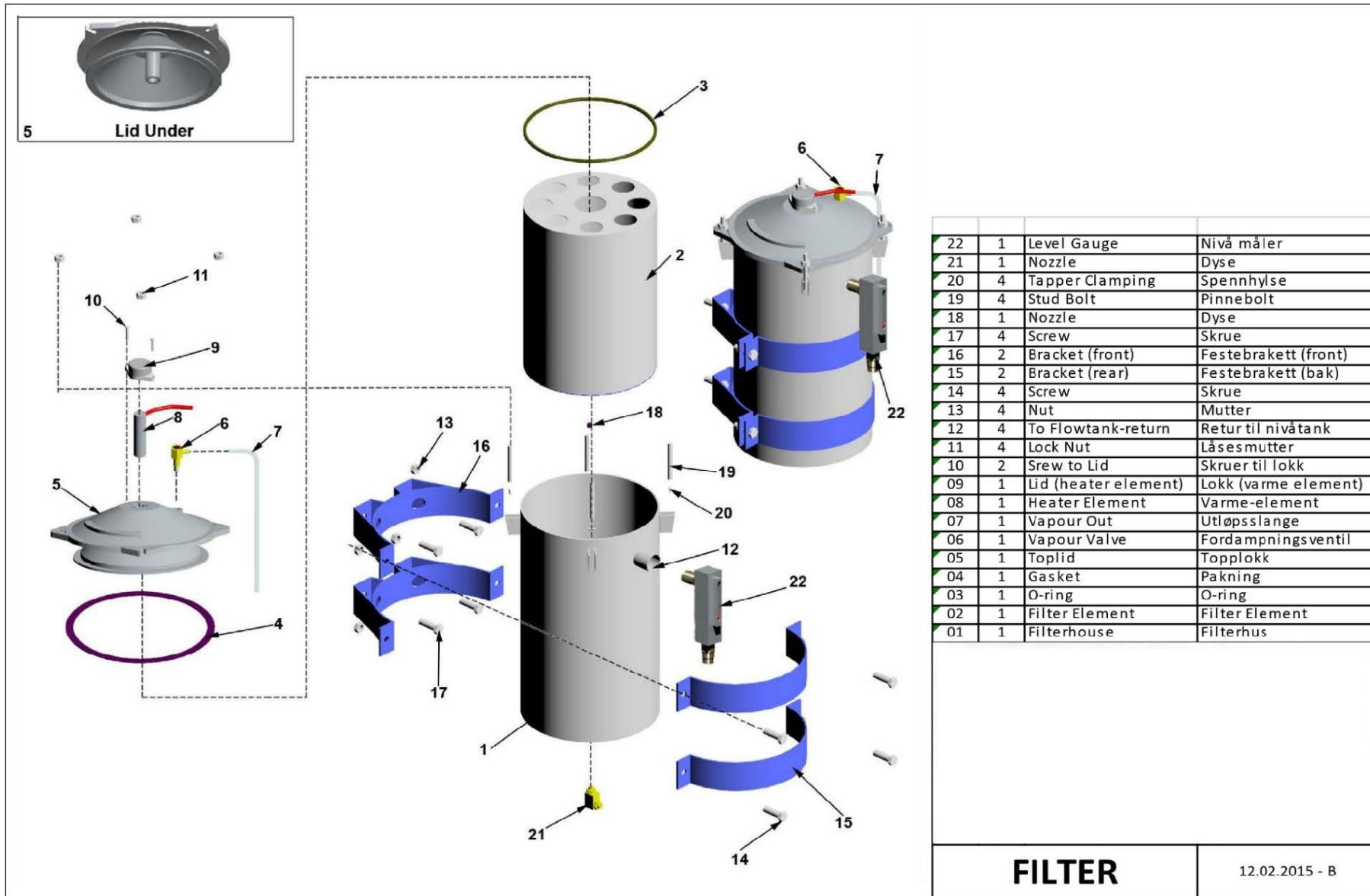
8.5 Summary

The Purifier system is unique in its ability to: -

- Filter solid contaminants
- Retain acid contaminants
- Evaporate liquid and gaseous contaminants
- Prevent the accumulation of harmful contaminants in the oil

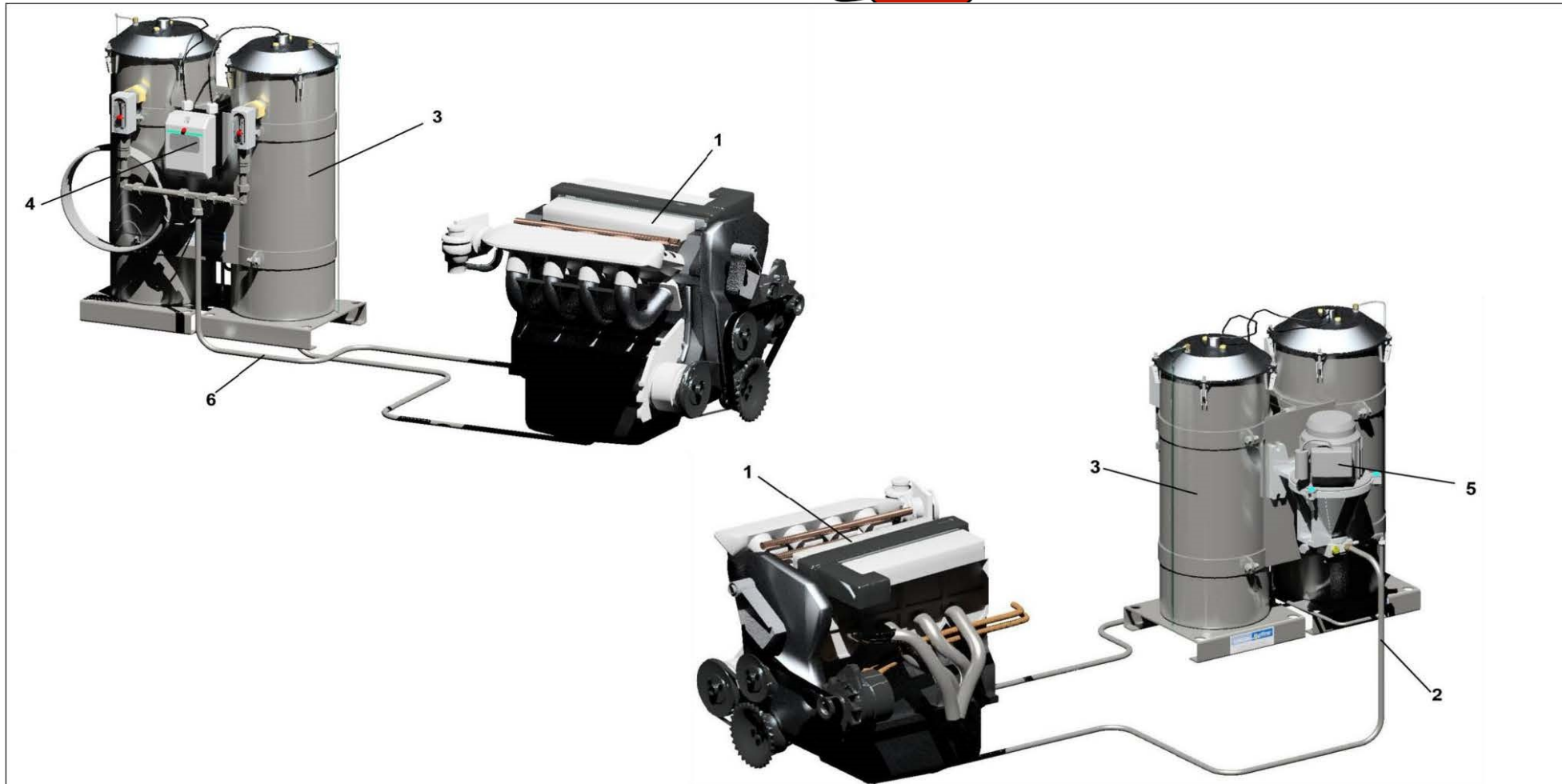


8.6 Filter Drawings



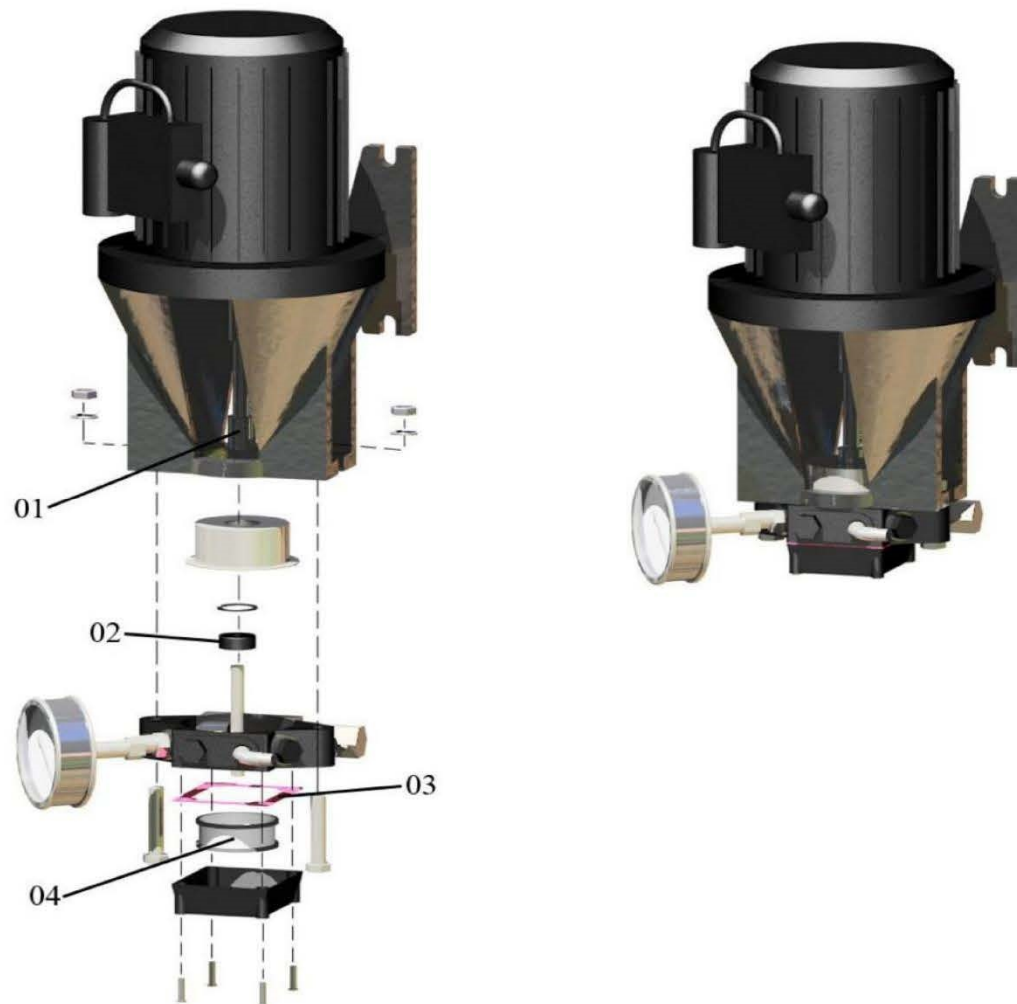
FILTER

12.02.2015 - B



	6	Oil Return	Olje Retur	
	5	Framo Pump	Framo Pumpe	
	4	El. Box	El. Boks	
	3	Filter WP-100	Filter WP-100	
	2	Oil Suction	Olje Sug	
	1	Engine	Motor	
Ant	Pos Nr.	English Text Part Nr.	Norsk Tekst Dele Nr.	Ordre Nr. Part Nr.

Drawn by: Jan Aune	Appr. by:
Date: 23.04.2015	
Engine, WP-100	



Ant	Pos Nr.	English Text Parts	Norsk Tekst Deler	Ordre Nr. Art. Nr.
1	04	Filter (Sift)	Filter (Sil)	1667520
1	03	Lid Seal	Lokkpakning	1667310
1	02	Seal (Simring)	Pakning (Simring)	1667110
1	01	Main Axcel	Drivaksel	1083820
Drawn by: Jan Aune		Appr. by:		
Date: 26/08-2014				
Fremo Pump			Drawing file: Flowtank.dgn/jpg/doc/psd/ © Åge S. Wågøene	



9 Maintenance

9.1 Regular Maintenance

Minimum once a week, check on oil return flow to ensure that the filter is not clogged.

9.2 Service / Repairs

The service or repairs required to the WPM-100 system are few and far between. The main service includes changing filter elements and cleaning the mesh filter below the pump.

Refer to drawings on page 17.

Pump / Motor The pump is assembled to the motor housing and is driven directly by the 1/4 hp motor. The pump is a simple gear pump and it is possible to adjust the pumps outlet pressure. This is achieved by adjusting the screw in the pump body. This is set by the factory and should not require further adjustment. The pressure reading on the gauge should be between 3 to 4 Bar.

The pump has a filter at the bottom, and this has to be cleaned occasionally. This is easily done by removing the four screws holding the filter housing to the pump. Make sure that a new gasket is properly installed when reinstalling the filter. Occasionally checks for bearing noise that may indicate excessive wear.

The Main Filter Element has to be replaced from time to time and this can be determined as the flow in the flow gauge decreases. Replacement is a simple case of removing the filter lid, removing the evaporation plate and the main filter element. **Note - When the filter element is replaced, make sure new gaskets are installed and that they are installed correctly.** While changing the filter, the operation of the heating element should be checked. This can be checked by using a thermometer. Occasionally the flow jet at the base of the filter element should also be taken out and cleaned.



10 Part list

Part	Part number	Quantity
Filter canister	WP-100	2
Filter Element	WP-100FC	2
Pump/Motor 400v	1083075	1
Pump/Motor 230v	1081075	1
Gauge	96839-10	1
El. Box IP55 GV2MC02	4320327	1
Main switch GV2ME06 400v	4321721	1
Main Switch GV2ME07 230v	4321722	1
Contactor	4321708	2



12 Limited Warranties Statement

All products manufactured or distributed by Wågene are subject to the following, and only the following, LIMITED EXPRESS WARRANTIES,

- 1-year purchase of a new product.

Wågene warrants and guarantees only to the original purchaser-user that such a product shall be free from defects of materials and workmanship in the manufacturing process. The warranty period for pumps and motors is specifically limited to 365 days from date of purchase.

A product claimed to be defective must be returned to the place of purchase.

It can be repaired at location for if's terms:

- After contact and approval of Wågene Purifiners Technology AS
- Only use original filters and spare parts.

Wågene at its sole option shall replace defective product with a comparable new product or repair the defective product. This express warranty shall be inapplicable to any product not properly installed and properly used by the purchaser-user or to any product damaged or impaired by external forces.

THIS IS THE EXTENT OF WARRANTIES AVAILABLE ON THIS PRODUCT. WÅGENE SHALL HAVE NO LIABILITY WHATSOEVER FOR CONSEQUENTIAL DAMAGES FLOWING FROM THE USE OF ANY DEFECTIVE PRODUCT OR BY REASON OF THE FAILURE OF ANY PRODUCT. THE PURIFIER SPECIFICALLY DISAVOWS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED INCLUDING, WITHOUT LIMITATION, ALL WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE WARRANTIES OF DESCRIPTION, WARRANTIES OF MERCHANTABILITY, TRADE USAGE OR WARRANTIES OR TRADE USAGE.

Warning

Failure or improper selection or improper use of the products and/or systems described or related items can cause death, personal injury and property damage.

This document and other information from Wågene Purifier Technology AS, its subsidiaries and authorized distributors provide product and/or system options for further investigation by users having technical expertise.

It is important that you analyze all aspects of your application and review the information Concerning the product or system in the current product catalog. Due to the variety of operating conditions and applications for these products or systems, the user, through its own analysis and testing, is solely responsible for making the final selection of the products, systems and assuring that all performance, safety and warning requirements of the applications are met.

The products described herein, including with limitation, product features, specifications, designs, availability and pricing, are subject to change by Wågene Purifier Technology AS, and its subsidiaries at any time without notice.

This product may contain trace of oil after a test run at our production.