



Pall Corporation

LP00957

Installation and Operating Instructions

SUPRApak S Series Filtration Units

service instructions



EN

Installation and Operating Instructions
SUPRApak S Series Filtration Units

ENGLISH

These instructions are valid for SUPRApak Filter Units with model numbers:

SPSWANW2500	SPSWA2300	SPSSANW2500	SPSSANW250D
SPSWANW25B0	SPSWA23B0	SPSSANW25B0	SPSSANW25BD

Table of Contents

1 Safety

1.1	About this Chapter	4
1.2	Safety Warnings	4
1.2.1	Hazard Classification	4
1.3	Potential Safety Hazards	4
1.4	Hazard Sources	4
1.5	Proper Use	5
1.6	Prohibition of Unauthorized Modifications	5
1.7	Personnel Training	5
1.7.1	Target Group	5
1.7.2	Authorized Personnel	5
1.8	Operating Log	6
1.9	Safety and Protection Devices	6
1.9.1	Safety Check	6
1.10	Protective Equipment	6
1.11	Safety during Operation	6
1.12	Safety during Maintenance	7
1.12.1	Maintenance Work	7
1.12.2	Accident Report	7
1.13	Chemical Substances	7
1.14	Fire	7
1.15	Remaining Hazards	7

2 General Information

2.1	Identification	8
2.2	Operating Data, Connections, Measurements and Weights	8
2.3	Scope of Supply	8

3 Assembly and Function

3.1	About this Chapter	9
3.2	General View	9
3.3	Operating Data – Housing	9
3.4	Safety Warnings – Pressure Vessel	9
3.5	Safety Valve	9
3.6	Vent Unit	9
3.7	Inlet/Outlet Valves	9
3.8	Drain Valves	9
3.9	Reverse Pressurization	9

4 Installation

4.1	About this Chapter	10
4.2	Delivery and Storage	10
4.3	Transport	10
4.4	Unpacking, Cleaning and Installation	10
4.4.1	Requirements for the Installation Location	10
4.4.2	Unpacking	10
4.4.3	Cleaning of New Units	10
4.4.4	Installation	10
4.5	Safety Warnings --- Pressure Vessel	10
4.5.1	Feed Fluid, Filtrate, and Venting	10
4.5.2	Safety Valve	10

5 Operation

5.1	About this Chapter	11
5.2	Prior to Commissioning	11
5.3	During Operation	11
5.3.1	Safety	11
5.4	Initial Commissioning / Test Run	11
5.4.1	Test Run	11
5.4.2	Controls prior to the Test Run	11
5.5	Cleaning the Filter Unit	11
5.6	Disposal	11

6 Process Description

6.1	About this Chapter	12
6.2	Start Preparation	12
6.2.1	Installing the Filter Module	12
6.2.2	Piping	13
6.2.3	Venting and Rinsing	13
6.2.4	Filtration	13
6.2.5	Rinsing after Filtration	13

7 Service

7.1	About this Chapter	14
7.2	Safety	14
7.2.1	Preparation	14
7.2.2	Returning to Operation	14
7.3	Inspection and Maintenance	14
7.4	Repair	15
7.5	Failure	15
7.5.1	Causes of Failure and their Elimination	15
7.6	Spare Parts and Accessories List	15

8 Appendix

8.1	Warranty	16
8.2	Copyright	16
8.3	Product Observation	16
8.4	Declaration of Equipment Exposure to Contaminants	17

1 Safety

1.1 About this Chapter

This part of the operating instructions

- refers to the correct use of the filter unit
- explains the meaning and use of the warning signs listed on the following pages
- points out the hazards that might result from non-observance of these operating instructions
- informs the user how to avoid hazards.

In addition to these operating instructions, general requirements as well as all further regulations regarding health protection and accident prevention must be observed. Personnel must be trained on the proper use of the filter unit.

Safety and danger signs displayed on the filter unit must be observed.

The technical documentation must always be kept close to the filter unit.



Information

In case of any occurring problems that cannot be solved by means of the PALL documentation please do not hesitate to contact:

PALL Corporation
www.pall.com

To contact a PALL Sales Office or Distributor, go to:
<http://www.pall.com/contact>
for specific local contact information.

For any inquiries, please make use of the "Product Observation" form, which is part of the Appendix (Chapter 8.3 "Product Observation").

We will be glad to assist you.

1.2 Safety Warnings

1.2.1 Hazard Classification

The individual safety warnings are subdivided according to their meaning and significance. The following chart gives the user a view concerning the hazard symbols (pictograms) used, their meaning (signal words) and a description of the concrete hazards with their potential consequences.

Pictogram	Damage for	Signal word	Definition	Consequences
	Persons	Danger	Immediate danger	Death or serious injuries (causing disability)
		Warning	Possible dangerous situation	Possibility of death or serious injuries (causing disability)
		Caution	Less dangerous situation	Possibility of minor or slight injuries
	Objects	Attention	Possible damage	Possible damage to <ul style="list-style-type: none"> • the product • its surroundings
	-	Information	Application advice and further useful information	No dangerous or damaging consequences for persons or objects

1.3 Potential Safety Hazards

The filter unit has undergone hazard analysis. Construction and design of the filter unit complies with the current applicable state of the art.



DANGER!

Prior to the first operation the operator must:

- install any necessary safety and protection devices in order to safeguard the operator or the filter unit from any sources of danger
- establish and supervise an effective job safety program for the filter unit
- introduce and supervise a necessary maintenance program for the filter unit.



DANGER!

Prior to loosening the clamping nut (tightening handle) of the filter housing it must be assured that the filter is in a depressurized state.

Prior to pressurization of the filter it is absolutely imperative that the clamping nut (tightening handle) of the filter housing is tightened.

In case of wrong operation or improper use there is danger to:

- personnel (including bodily injury or death) (i.e. due to poisoning, chemical burns, explosion, etc.)
- the unit and further material assets of the operating company
- the efficient work of the plant

Each person dealing with mounting, commissioning, operating and maintenance must:

- provide the necessary professional qualifications
- strictly observe these operating instructions

1.4 Hazard Sources

The filter unit operates with

- filtration products
- chemical substances (for cleaning purposes)
- liquids under pressure and gases with higher temperatures



WARNING!

These sources of danger might

- endanger personnel with bodily injury or death
 - endanger personnel health
 - damage the filter unit and further material assets of the operating company
 - reduce the efficiency of the plant
- Ensure that the filter unit is always depressurized and that it cannot inadvertently become pressurized with liquids or gases via the equipment connections, prior to:
- maintenance work
 - correction of defects in safety and protection devices.

The removal and shutdown of safety devices during operation of the unit is absolutely prohibited!

1.5 Proper Use

The filter unit must be operated with properly functioning safety devices and properly installed protection devices! The filter unit must be shut down immediately in case of malfunctioning or ineffectiveness of a safety or protection device.

Operator and operating company are both responsible for correct use!

Should any hazards occur during the filtration process, especially when

- handling harmful substances and materials
 - integrating the filter unit into an existing total unit
- the operating company must effectively safeguard personnel and equipment from the hazard sources in compliance with the locally prevailing regulations, laws and allowed limits.

The filter unit must be used exclusively to filter liquid products (suspensions).

The operating personnel must be given adequate handling and operating instructions.

Any application which exceeds or is not in conformance with the order details will be regarded as an improper use and thus PALL Corporation will not be held responsible for any occurrences.

The materials of construction, mainly stainless steel, are also resistant to most cleaning and disinfecting agents used. The operator is in charge of testing the susceptibility of the equipment to corrosion.

The maximum operating temperature and maximum operating pressure (Chapter 2.2 "Operating Data, Connections, Measurements and Weights) must not be exceeded.



CAUTION!

Should the filter unit be used for any other purpose than mentioned above, or should the intended capacity or process limits be exceeded, the filter unit is in danger of being damaged or even destroyed. PALL Corporation will not be held responsible or liable for damages that can be attributed to improper handling and operation; the operating company will be solely responsible. Under these circumstances, the warranty will no longer be valid.

The strict observance of the operating instructions as well as the adherence to inspection and maintenance conditions are imperative conditions for a proper use of the filter unit.

1.6 Prohibition of Unauthorized Modifications

Any modifications to the product not officially approved in writing by PALL Corporation shall be considered as not authorized, therefore not permitted. Prior to any modification PALL must be contacted for approval, and failure to do so will invalidate the warranty.



WARNING!

Modifications of the filter unit or welding at load-bearing parts of the filter housing and surrounding components which are not previously agreed upon with PALL Corporation may

- harm personnel
- lead to damage or destruction of the filter unit

1.7 Personnel Training

1.7.1 Target Group

This manual is for

- the operating company
- operators and
- service and maintenance personnel.

Therefore, all safety warnings and signs refer to operation and application of the filter unit as well as to maintenance work.

In order to avoid unauthorized use of the filter unit when it is not in operation, all feed and discharge pipes must be safeguarded at all times. The responsibilities for the individual fields of activity (operation, set up, maintenance and repair) must be clearly defined and observed. In order to guarantee clarity of responsibilities and roles, we recommend that the responsible personnel be recorded in the operation log. (Chapter 1.8 "Operating Log")

Unclear designation of personnel responsibilities represents a safety risk!

1.7.2 Authorized Personnel



Information

Knowledge of the information described herein is an indispensable condition for any handling of the filter unit!



WARNING!

There is a risk of danger for personnel, material assets and environment in case of improper operation and maintenance of the filter unit! Only authorized personnel are allowed to handle the filter unit!

Authorized personnel for operation and maintenance are the trained and skilled experts of the operating company and the manufacturer.

The operating company is responsible for

- personnel training
- personnel instruction regarding the potential hazards that may occur in the course of their activities as well as the measures to avoid such hazards; such training should be repeated at regular intervals
- documenting the trainings/instructions and confirming individual employee participation in writing
- monitoring whether personnel observe the safety procedures and the operating instructions and whether they are aware of the possible hazards.

Prior to commissioning the operator must

- have read and understood the complete operating instructions

- be familiar with all safety and protection devices as well as the safety regulations.

For work involving the following parts of the filter unit additional requirements apply:

- Electrical installations and machinery:
 - Work must be carried out only by an electrician or under the direction and supervision of an electrician
- Pneumatics:
 - Work must be carried out only by skilled persons with specific knowledge and experience with pneumatics

1.8 Operating Log

The operating log contains details concerning authorized personnel and their training and education. The operating company is obliged to keep an operating log.

Besides dates and names the operating log must indicate the following details:

- Occurring troubles, problems, failures and the measures that have been taken for their elimination
- Operating company-designated security checks (check list)
- Inspection, maintenance and repair work
- Updates of these operating instructions, modifications of the unit
- The "Product Observation" Form



Information

The operating log must be checked at regular intervals (e.g. monthly) by responsible management personnel.

1.9 Safety and Protection Devices

Depending on the locally applicable pressure vessel directives, the operating company must determine whether a safety or protection device must be used in conjunction with the filter unit. Such a device, if required, must be installed according to the piping schematic in Chapter 6.2.2 "Piping", Fig. 6-5.



WARNING!

It is the operating company's responsibility to ensure the equipment is protected, according to the requirements of local pressure vessel directives, with an adequately rated safety or protection device in line with the operating conditions (Chapter 2.2 "Operating Data, Connections, Measurements and Weights").

Where such devices are used, the filter unit must be shut down immediately in case of malfunctioning or ineffectiveness of the device.

Both operator and operating company are responsible for the safe condition of the filter unit!

Should a safety device be activated the filter unit may not be re-started unless

- the cause of the fault has been eliminated
- the responsible person has convinced himself that there is no more danger of bodily harm or potential for damage of material assets!

Safety devices must not be

- removed
- blocked or
- deactivated in any other way.



WARNING!

You expose yourself and everybody else in the vicinity of the equipment to potential severe injuries if you bridge or remove safety and protection devices.

Should any hazardous areas which are not sufficiently secured result from:

- the local situation, e.g. in the course of maintenance work
- or the conditions at the place of installation

These areas must be secured immediately through measures that are effective at any time.

Safety measures must always be adjusted to the local working conditions and the areas which are possibly affected by the filter unit.

1.9.1 Safety Check

Please check the filter unit at least once per shift for externally discernible damage and defects. Any observed changes (including a change of the operating behavior) must be reported immediately to the responsible service technician.

Check all safety and protection devices (pressure test in an adequate manner)

- at the beginning of each shift (in case of interrupted operation)
- once a week (in case of continuous operation)
- after each service event (maintenance or repair work).

1.10 Protective Equipment



WARNING!

The operating company is responsible for identifying proper measures for handling the fluids and gases used in the filter unit. Within this scope it must be determined:

- which protective equipment must be worn or be kept ready in case of need
- which measures must be taken to avoid dangers.

1.11 Safety during Operation



WARNING!

Prior to starting up the filter unit the operator must be sure that

- there is no danger for any personnel
- no material assets can be damaged.



WARNING!

After completion of operation, do not open the filter unit before

- it is depressurized
- it is completely drained
- all feed and discharge pipes are closed.

Avoid any risks when working with the unit.

These operating instructions do not replace a correct commissioning and introductory operator training. We recommend a training carried out by a qualified PALL employee.

1.12 Safety during Maintenance

1.12.1 Maintenance Work

Prior to maintenance and repair work it might be necessary to remove the installed safety and protection devices. After having finished the work they must be reinstalled and reinspected.

Parts of the assembly which are situated at high clearances off the ground must be accessed by secure steps, platforms, ladders and in some cases scaffoldings. Never use parts of the filter unit to climb on.

All maintenance work shall be in line with the operating company's current safe practices and applicable health and safety rules.



DANGER!

The use of damaged lifting equipment or load lifting devices or the use of equipment not providing a sufficient supporting or load capacity can cause severe, even deadly injuries.

Therefore check the lifting equipment and load lifting devices for their

- sufficient load capacity
- authorized use
- perfect condition

Fix the loads carefully!

Never step under suspended loads!

1.12.2 Accident Report

Accidents are to be reported as per the operating company's health and safety procedures and legislations, and PALL Corporation informed officially of such occurrences, sources of danger as well as "near accidents".

"Near accidents" can have many causes.

The sooner they are reported the sooner the faults can be rectified.



Information

We draw the attention of the operating company to high risks of dangers when working with and around the filter unit.

1.13 Chemical Substances

When working with

- acids
- caustic solutions
- oils
- solvents and cleaning agents
- other chemical substances

Observe the corresponding safety regulations on the packaging and in the material safety data sheets as well as in these operating instructions.

1.14 Fire

In case of fire, poisonous gas may be produced due to chemical reactions involving any synthetic materials or cleaning agents, that may be contained in the filter unit.



DANGER!

The use of unsuitable fire-extinguishing media may cause further danger. Prior to commissioning the unit, adequate and suitable fire extinguishing media must be identified, depending on which types of flammable substances are involved. If necessary, please contact your local firefighting authority for competent advice.

Should you try to extinguish a fire close to electrical installations or high voltage lines, always keep a safe distance.

1.15 Remaining Hazards

There are still remaining hazards that cannot be secured through the applied safety and protection devices.

These might for example be:

- suspensions or cleaning liquids squirting out of pipes and their connecting pieces
- further sources of energy (i.e. electrostatic charges)
- hot equipment surfaces
- escaping steam, solvent vapor etc.

However, these hazards do not represent any defects in connection with the manufacture of the filter unit. They rather represent sources of danger that might occur during operation by the user and when integrating the filter unit into an already existing installation.

The operating company must identify these dangers within a hazard analysis program and then take suitable measures to eliminate them.

2 General Information

2.1 Identification



Fig. 2-1: General View SUPRApak S Series WA Housing

2.3 Scope of Supply

Filter Housing Variant	Connection Type	Without Standard Accessories ¹	With Standard Accessories ²	With Base Plate	With optional Drain Valves ³	ATEX (explosion-proof environments)
SPSWANW2500	DN 25 DIN 11851	✓				yes
SPSWANW25B0	DN 25 DIN 11851	✓		✓		yes
SPSWA2300	1 inch clamp coupling	✓				yes
SPSWA23B0	1 inch clamp coupling	✓		✓		yes
SPSSANW2500	DN 25 DIN 11851		✓			yes
SPSSANW250D	DN 25 DIN 11851		✓		✓	yes
SPSSANW25B0	DN 25 DIN 11851		✓	✓		yes
SPSSANW25BD	DN 25 DIN 11851		✓	✓	✓	yes

¹ WA housings include bare housing and vent valve.

² Standard accessory package includes 2 butterfly inlet/outlet valves, 1 vent valve, 2 T-pieces with DN 25 diaphragm pressure gauges

³ Drain valves (optional): 2 optional drain valves on bottom side of each T-piece on inlet and outlet sides of unit

The necessary data for identification of the unit is etched at the side of the filter housing.

2.2 Operating Data, Connections, Measurements and Weights

Feed Fluid Housing Inlet	1 x DN 25 DIN 11851, threaded connection or 1 inch clamp coupling, ISO 2852 connection
Filtrate Housing Outlet	1 x DN 25 DIN 11851, threaded connection or 1 inch clamp coupling, ISO 2852 connection
Vent	1 x hose nipple, 6mm (0.24 inch) OD
Drain (optional)	Feed Fluid 1 x hose nipple, 6 mm (0.24 inch) OD Filtrate 1 x hose nipple, 6 mm (0.24 inch) OD
Operating Pressure	-1 to 6 bar (-14.5 to 87 psig)
Operating Temperature	-10 to 130 °C (14 to 266 °F)
Volume (housing, empty)	8 L (2.11 gal)
Empty Weight	approx. 18 kg (40 lbs) (without accessories) approx. 23.5 kg (52 lbs) (with accessories) approx. 8 kg (18 lbs) (base plate)
Dimensions and Variants	Please request general arrangement drawings.

Part Numbering Structure

SUPRApak S housings are provided in 'WA' or 'SA' design. The 'SA' design includes a standard accessory package.

1. 'WA' Design

SPSWA (1) (2) 0

(1)NW25: DN 25 DIN11851 connection
23: 1 inch clamp coupling connection

(2)0: Without base plate
B: With base plate

2. 'SA' Design

SPSSA NW25 (1) (2)

(1)0: Without base plate
B: With base plate

(2)0: Without drain valves
D: With drain valves

3 Assembly and Function

3.1 About this Chapter

In this chapter you will find all functional units of the filter described:

- where they are
- how they are identified
- what their function is
- how they work together

3.2 General View

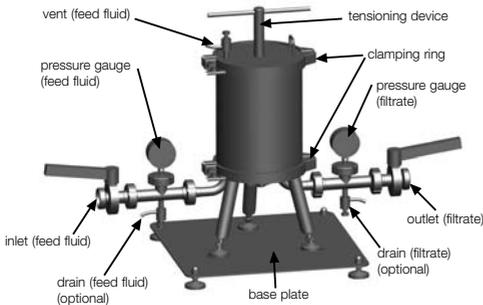


Fig. 3-1: General View SUPRApak S Series 'SA' Filter Unit (version pictured here with complete accessories, including all options)

3.3 Operating Data – Housing

(Chapter 2.2 "Operating Data, Connections, Measurements and Weights")

3.4 Safety Warnings – Pressure Vessel

The pressure unit is designed according to the Pressure Equipment Directive 97/23/EC and the AD 2000 specifications. The unit has been validated by testing by a certified supplier.



WARNING!

The operating company must assure that where local pressure directives dictate, the filter is outfitted with a suitable safety or protection device. This device consists of either a safety valve or rupture disc, to protect the system against exceeding the acceptable pressure limit (Chapter 2.2 "Operating Data, Connections, Measurements and Weights").



An authorized expert should do the legally required pressure vessel checks and inspections.

Depending on the pressure vessel category of the filter unit, a pressure vessel check must always be done:

- prior to the first commissioning
- after any modification
- after repairs of the pressure vessel
- in restricted periods (according to local requirements)



WARNING!

Note the operating limits listed on the housing identification tag. The maximum values indicated must never be exceeded under any circumstances!

3.5 Safety Valve



WARNING!

In case an excess pressure safety valve is activated due to an overpressure situation, steps must be taken to avoid uncontrolled leaking of the product (in case of corrosive or toxic fluid escape) (refer to the operating company's safety handling procedures).



ATTENTION!

Should the safety valve be activated due to an overpressure situation, a spraying of fluid (i.e. caustic solutions or acids) may occur. Position the safety valve in such a way that any escaping fluids do not cause a hazardous situation (i.e. directed to drain, or extending with a hose to drain!)

3.6 Vent Unit

Venting is accomplished on the feed fluid side by Valve 3 (Chapter 6.2.2 "Piping").

Valve 3 is supplied as a standard with all SUPRApak S Series housing types.

Connect an adequate hose to drain the liquid.

3.7 Inlet/Outlet Valves

The inlet/outlet valves are manually operated butterfly valves (valve 1 for inlet and valve 2 for outlet, (Chapter 6.2.2 "Piping"), used to isolate the filter unit.

Valves 1 and 2 are supplied as part of the standard accessory package on SUPRApak S Series 'SA' housing types only.

3.8 Drain Valves (optional)

Drain valves allow draining on both feed fluid and filtrate sides, below the respective pressure gauges (Chapter 6.2.2 "Piping"). Connect an adequate hose to drain the liquid.

Drain valves are optionally supplied on SUPRApak S Series 'SA' housing types in addition to the standard accessory package.

3.9 Reverse Pressurization



ATTENTION!

The filter must neither be backflushed nor pressurized from the discharge side. If this occurs, the SUPRApak modules would be damaged.

Pressurization is only allowed in a forward flow (filtration) direction.

If the possibility exists that pressurization could occur in the reverse flow direction, a downstream non-return valve should be installed to avoid damage to the modules.

4 Installation

4.1 About this Chapter

In this chapter you will be informed about:

- the transport
- the installation
- the connecting of the filter unit.



WARNING!

Improper installation of the filter unit may

- endanger personnel
- result in material damage.

Only qualified and experienced assemblers should execute the activities described in this chapter.

4.2 Delivery and Storage

When delivered, immediately check the filter unit for:

- completeness (according to the delivery documents)
- damage



Information

Immediately inform the forwarder in case of missing parts or transport damage. Request the forwarder to confirm the damage in writing.

In case the filter unit is not installed immediately after delivery store it

- dry
- free from dirt and dust
- in a non-corrosive environment

In case of a longer storage period, use suitable long term storage procedures.

Should you have any questions please use the "Product Observation" form.

(Chapter 8.3 "Product Observation").

4.3 Transport



Information

The filter unit is either delivered in a suitable cardboard box or a light shipping crate.

The weight of the filter unit is indicated in the delivery documents.

4.4 Unpacking, Cleaning and Installation

4.4.1 Requirements for the Installation Location

Configure the working area around the filter unit according to the general applicable health and safety regulations.

The working area for operation, commissioning and maintenance must not be confined.

Surrounding conditions and environmental conditions

- Surrounding temperature: -10°C to +80°C (14°F to 176°F)
- Operation is only permissible in non-corrosive surroundings

4.4.2 Unpacking

Remove the shipping package and all transportation safety devices. Remove all packing materials and adhesive tape residue from the filter unit.

4.4.3 Cleaning of New Units

New filter units must be carefully cleaned before the first commissioning, especially if used in critical pharmaceutical applications. Disassemble units for cleaning. Clean individual parts with a soft brush or paint brush in a bowl with hot cleaning solution (cleaning solution: hot water with neutral detergent). The filter inlet and outlet pipes, fluid connecting passages as well as the sealing grooves must be cleaned with special care. After cleaning, rinse with clear water, especially the product-wetted parts. In case of critical applications, i.e. in pharmaceutical applications, rinse with demineralized water.

4.4.4 Installation

The filter unit will be delivered disassembled and must be installed.

The installation area must correspond to the applicable health and safety regulations. The load-bearing capacity of the ground must be considered, taking into account the weight of the unit when filled.

The installation location should be flat and dry.

Level the filter by means of the adjustable feet, then fix the feet in place with the counter nuts.



CAUTION!

Exercise caution to ensure that the heavy accessory fittings are supported properly to avoid tipping of the relatively light filter (~20kg).

4.5 Safety Warnings – Pressure Vessel

4.5.1 Feed Fluid, Filtrate and Venting

The user pipework which connects to the filter unit must be fitted with compatible connection pieces.



ATTENTION!

Should the filter unit be hard piped to surrounding pipework, axial and radial forces acting on the filter unit connections should be avoided.



ATTENTION!

If fluid is leaking from the filter housing or the fittings, this is an indication that the housing lid or the fittings are not correctly mounted or the seals are defective. Immediately stop filtration and look for the cause of the leakage.

A suitable hose or a pipe must be connected by the operating company at the vent and drain connections (Chapter 2.2 "Operating Data, Connections, Measurements and Weights") to direct fluid to the ground or into a suitable vessel.

4.5.2 Safety Valve



WARNING!

Should the feed pump or pressurized gas be capable of exceeding the maximum allowable operating pressure of the filter unit, a safety valve must be installed on the inlet pipework to the filter unit. See pressure limits (Chapter 2.2 "Operating Data, Connections, Measurements and Weights").

5 Operation

5.1 About this Chapter

In this chapter you will be informed about the safe operation of the filter unit.

5.2 Prior to Commissioning

Start the filter unit only if all of the following conditions are fulfilled:

- technically perfect condition of the unit
- correct intended use
- related work activities heed safety warnings and exercise awareness of potential hazards
- operating instructions are followed
- all safety and protection devices are available and ready for use
- access by unauthorized personnel is forbidden
- commissioning is done only by skilled personnel.



WARNING!
Immediately eliminate failures that could compromise safety.

5.3 During Operation

5.3.1 Safety



WARNING!
Avoid any work activities which could compromise safety!
Immediately eliminate failures or have them eliminated!
Immediately inform the responsible personnel about occurring changes!
Immediately stop the filter unit in case of any functional trouble, and protect it against unauthorized use!

5.4 Initial Commissioning / Test Run

5.4.1 Test Run

During the test run observe the tightness and the pressure of the unit and surrounding installation.

5.4.2 Controls prior to the Test Run

Check whether

- all protection and safety devices are firmly fixed and functioning
- all potential hazard sources are secured
- all hoses and connections are firmly tightened
- all valves are closed
- the feed and discharge pipework for the unfiltrate and the filtrate is connected correctly.



WARNING!
Several process steps can cause heating of equipment parts and surfaces. If touched, this can cause burns. Place warning signs at the filter unit and block off the area surrounding the filter unit as long as it is hot.

5.5 Cleaning the Filter Unit



WARNING!
Before opening the filter housing confirm that it is absolutely depressurized.
Hot equipment surfaces can cause burns. Let the filter unit cool down.

Cleaning the filter unit must be done as necessary in the absence of product and filter modules, by means of detergents suitable for stainless steel and any elastomeric materials. An additional cleaning with a soft brush is possible. (Chapter 4.4 "Unpacking, Cleaning and Installation"). We recommend rinsing the filter housing with sufficient water after the cleaning to completely remove any remaining detergent residues

5.6 Disposal



ATTENTION!
When disposing of used filter modules:
Please follow locally applicable disposal directions.

6 Process Description

6.1 About this Chapter

In this chapter the use of the filter unit is described.

The SUPRApak S Filter Unit is a filter unit (supplied with or without accessories) for closed sheet filtration with SUPRApak S filter modules.

The design data for the housing is found in Chapter 2.

Read Section 6.2 "Start Preparation" before you work with the SUPRApak Filter Unit !

6.2 Start Preparation

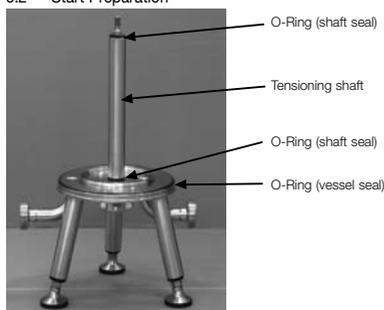


Fig. 6-1: Assembly of tensioning shaft and o-rings



Fig. 6-2: Assembly of vessel shell and lower clamping ring (V-band)

6.2.1 Installing the Filter Module

Place the SUPRApak S module into the housing (Fig. 6-3). Make sure that the drainage core of the SUPRApak module is centered on the base plate. Check this by a radial alternate motion of the module (approx. 1/4 rotation).

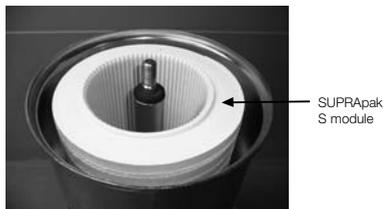


Fig. 6-3: Installation of the SUPRApak S module

Lubricate the thread (using food grade grease) before screwing the spindle onto the winding.

Check that the O-ring seal in the upper lid is exactly positioned in the intended groove. Put the lid onto the housing. The lid and the vessel shell are then firmly connected by means of the tensioning device (tightening handle). The tightening handle must be turned until the housing lid is seated onto the flared pipe end of the vessel shell so that the upper clamping ring (V-band) can be mounted.

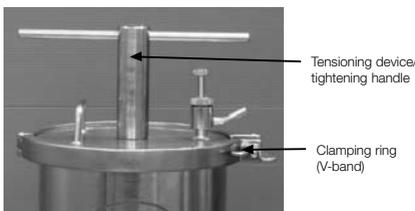


Fig. 6-4: Assembly of top lid/V-band and tensioning of the module

Now hand-tighten the butterfly nut of the clamping ring (V-band). Afterwards adjust the tightening handle by about 1 rotation.

Note: When retightening the tensioning device an increased power input is necessary - therefore the housing has to hold up accordingly.

Hand-tighten the butterfly nut of the clamping ring (V-band) alternately with the tightening handle of the tensioning device.

Finally, connect the pipework / hoses for filtration.

6.2.2 Piping

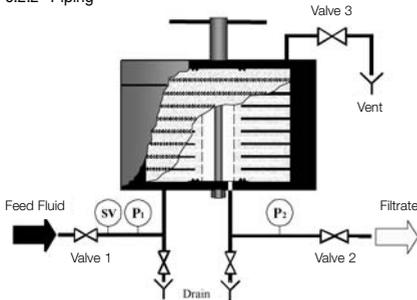


Fig. 6-5: Piping: Connection of all piping, pressure gauges and valves

- P1: Pressure Gauge Inlet (Feed Fluid)
- P2: Pressure Gauge Outlet (Filtrate)
- SV: Safety Valve (not included in Pall Scope of Supply)

Pall Scope of Supply:

1. SUPRApak S Series 'WA' Design
 - Housing without accessories: includes filter housing and Valve 3
 - DIN 11851 or clamp coupling-type connections
 - With or without base plate
2. SUPRApak S Series 'SA' Design
 - Housing with standard accessory package, which includes:
 - (a) Valves 1, 2, 3
 - (b) Pressure gauges P1 and P2
 - With or without drain valves
 - DIN 11851-type connections only
 - With or without base plate

6.2.3 Venting and Rinsing

Prior to operation, we recommend venting the SUPRApak S filter unit, and depending on the application, rinsing it with water.

Open valve 3 and fill the filter unit with room temperature water (~20 °C / 68 °F) via valve 1. As soon as water flows out of the vent valve 3, open valve 2. Then close valve 3. Rinse the SUPRApak housing for at least 20 minutes with a constant flow rate of 100 l/h.

During the rinsing procedure open vent valve 3 for sufficient deaeration several times to remove the accumulated air. Then close the valve again.

Filtration can start right after the rinsing procedure. Alternatively the rinsing water that remains in the housing can be discharged by opening valves 2 and 3. (Optional: open drain valves.)

6.2.4 Filtration

After venting and rinsing: Fill the housing with unfiltered product via valve 1, keep valve 2 open. Adjust the desired flow rate, and if required vent again.

Alternatively after draining: Open valve 3 and fill the housing with unfiltered product via valve 1. As soon as unfiltered product flows out of the vent valve 3, open valve 2 and close valve 3. Adjust the desired flow rate. **Filtration begins now.**

For quality measurements take a sample of the filtered and unfiltered product after 5 minutes. Afterwards take a sample every 30 minutes or in appropriate intervals.

Record the flow rate and the pressure increase during filtration. Stop the filtration when the predetermined maximum applicable differential pressure for the specific application has been reached, based on filtrate quality. (See Operating Instruction SUPRApak S Modules).

6.2.5 Rinsing after Filtration

After filtration, stop the pump or the pressure source. Wait awhile to allow the pressure to equalize between inlet and outlet. Then, carefully open all valves to drain the housing. (Optional: open drain valves.)

Close valve 2 and fill the housing with warm water via valve 1. As soon as water flows out of vent valve 3, close valve 3. Then rinse the SUPRApak S housing with 80°C hot water for 10 minutes at a constant flow rate of 100 l/h.

Open all valves to drain the housing (Optional: open drain valves for draining the piping). Prior to opening the housing, make sure that it is depressurized. Dispose of the filter module.

Depending on the application, rinsing fluids other than water may be used.

7.1 About this Chapter

This chapter deals with servicing the filter unit. Activities are organized according to:

- Inspection
- Maintenance
- Repair

Fig. 7-1 below gives a suggested overview:

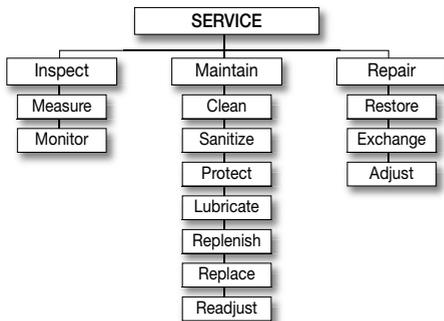


Fig 7-1: Organization of Service Activities



ATTENTION!

Regularly, properly executed service is an essential condition for:

- operational safety
- trouble-free operation
- long service life of the filter unit.



ATTENTION!

Even devices and units of other manufacturers being used around the unit must also be in perfect condition.

Please note the instructions of the respective manufacturers!

7.2 Safety



WARNING!

Improperly executed service and maintenance may lead to:

- serious personnel injuries
- damage of the unit

Only qualified skilled personnel are allowed to service the unit.



WARNING!

All safety valves if provided by PALL Corporation are adjusted to the correct pressure and sealed.

Do not

- take them out of operation.
- alter or adjust them unless PALL Corporation has been consulted.

7.2.1 Preparation



WARNING!

Do all maintenance and repair work only when the filter unit is

- not in operation and
- depressurized.

Safeguard unauthorized product feed by separating the feed and discharge pipes from the filter unit.

7.2.2 Returning to Operation



WARNING!

Prior to starting the filter unit ensure there is

- no danger for personnel
- no danger for material assets.

7.3 Inspection and Maintenance



WARNING!

If a defect has been identified which could cause

- danger for personnel
- damage to equipment, you must
- immediately stop the unit,
- inform a maintenance technician.

If the process step can be continued despite the identified defect without endangering personnel or equipment:

- shut down the unit after process completion
- inform a maintenance technician.

Interval	Where?	What?	How?
Daily	Whole unit	<ul style="list-style-type: none"> • externally noticeable damage and defects • leakage 	Visual inspection for <ul style="list-style-type: none"> • damage • leakage
		<ul style="list-style-type: none"> • connections, leakage 	Check for leakage and retighten. In case of screw connections not being tight, dismantle gaskets, check them and exchange them if necessary
Weekly	Whole unit	<ul style="list-style-type: none"> • wear points • leakage 	Inspection of hoses
Monthly	Filter housing gaskets	dirt, abrasion, damage	After opening the filter housing, clean o-ring, check for cracks and abrasion and exchange if necessary
Annually	Gaskets	dirt, abrasion, damage	Replace all gaskets in the filter unit

7.4 Repair

Recommendation:

For all repairs please request a service technician from PALL Corporation (Chapter 1.1 "About this Chapter").

Should qualified personnel of the operating company handle their own repairs these operating instructions must be observed in all aspects.

PALL Corporation assumes no liability and does not warrant against any damages and operating troubles which result from a non-observance of these operating instructions.



DANGER!

There is risk of injury due to

- unexpected movement of parts *i.e.* butterfly valves
- hot surfaces
- unit parts and hose lines being under high pressure
- leakage or bursting of hoses

Prior to repair, separate the unit from all energy sources. Ensure that all fittings are depressurized.



WARNING!

There is risk of injury or dangerous situations.

Protection and safety devices removed prior to repair must be reinstalled before restarting the filter unit.

For repairs, please use

- only functioning and suitable tools.
- only original spare parts or serial parts explicitly released by PALL Corporation
- the points detailed in these operating instructions.

7.5 Failure

7.5.1 Causes of failure and their elimination

Failure	Cause	Actions
Pressure difference too high between feed fluid inlet and filtrate outlet	Filter module is plugged	Regenerate or rinse filter module or insert a new one
Filter module does not have the desired capacity	Filtration characteristics of the product have changed.	Check the prefilter; re-adjust the filtration steps.
Fibers in filtrate	Insufficient pre-rinsing	Repeat pre-rinsing

7.6 Spare Parts and Accessories List

Part No.	Description	Details
ACS1002EM	Housing O-Ring Kit	EPDM
ACS1003EM	Housing O-Ring Kit	Fluorocarbon
ACS1000AM	DN 25 Seal Ring (1 pc)	DN25 DIN 11851 EPDM
ACS1001AM	DN 25 Seal Ring (1 pc)	DN25 DIN 11851 Fluorocarbon
SAN1TS23J	1 inch sanitary gaskets (10 pcs)	EPDM
SAN1TS23H	1 inch sanitary gaskets (10 pcs)	Fluorocarbon
ACS0700FA	DN 25 pressure gauge	DN25 DIN 11851 diaphragm pressure gauge
25590-0226-01	SUPRApak Hot fluid core (Z1) ¹	Stainless steel
066001-025-02	Hook Spanner (DN 25-65)	Tool

¹ required for continuous hot fluid filtration (>40 °C / > 104 °F)

8.4 Declaration of Equipment Exposure to Contaminants

Company:			
Street:			
ZipCode/City/Country:			
Department:			
Contact person:			
Phone:		Telefax:	
The indications in the table below are valid for:			
Return Authorization No.:			
Unit/assembly group:			
Id-no.:			
Serial-no.:			

We are aware that radioactive contaminated units have to be decontaminated prior to dispatch according to the Radiation Protection Ordinance. The sender has arranged for a risk-free dispatch and a safe handling of this order. These indications are complete, correct and are confirmed with a legally binding signature.

Date: _____ Signature: _____

The unit has been exposed to the following contaminants:

Type of Contaminant	Contaminant *	Method of detoxification / decontamination*	Date
<input type="checkbox"/>  Toxic			
<input type="checkbox"/>  Corrosive			
<input type="checkbox"/>  Explosive			
<input type="checkbox"/>  Radioactive/ ionizing			
<input type="checkbox"/>  Biologically dangerous			
<input type="checkbox"/>  Unknown whether dangerous			

The unit is free from contaminants.

* The relevant material safety data sheets must be provided.



Pall Corporation

Pall Food and Beverage

New York - USA
+1 516 484 3600 telephone
+1 866 905 7255 toll free

foodandbeverage@pall.com

Visit us on the Web at www.pall.com

Pall Corporation has offices and plants throughout the world. For Pall representatives in your area, please go to www.pall.com/contact

Please contact Pall Corporation to verify that the product conforms to your national legislation and/or regional regulatory requirements for water and food contact use.

Because of technological developments related to the products, systems, and/or services described herein, the data and procedures are subject to change without notice. Please consult your Pall representative or visit www.pall.com to verify that this information remains valid.

© Copyright 2010, Pall Corporation. Pall,  and SUPRApak are trademarks of Pall Corporation.

® Indicates a trademark registered in the USA. *Filtration. Separation. Solution.SM* is a service mark of Pall Corporation.