

**HYDAC**

**INTERNATIONAL**

# Filtromat OF5F / OF5L

## Operating and Maintenance Instructions

English (translation of original instructions)

Document No.: 3160337e



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All details are subject to technical modifications.

Technical specifications are subject to change without notice.

HYDAC FILTER SYSTEMS GMBH  
Postfach 12 51  
66273 Sulzbach / Saar  
Germany

## Documentation Representative

Mr. Günter Harge

c/o HYDAC International GmbH, Industriegebiet, 66280 Sulzbach / Saar

Telephone: ++49 (0)6897 509 1511

Telefax: ++49 (0)6897 509 1394

E-mail: guenter.harge@hydac.com

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## Preface

For you, as the owner of a product manufactured by us, we have produced this manual, comprising the most important instructions for its **operation** and **maintenance**.

It will acquaint you with the product and assist you in using it as intended in an optimal manner.

Keep it in the vicinity of the product so it is always available.

Note that the information on the unit's engineering contained in the documentation was that available at the time of publication. There may be deviations in technical details, figures, and dimensions as a result.

If you discover errors while reading the documentation or have additional comments or suggestions, contact us at:

HYDAC FILTER SYSTEMS GMBH  
Technische Dokumentation  
Postfach 12 51  
66273 Sulzbach / Saar  
Germany

We look forward to receiving your input.

**“Putting experience into practice”**

## Customer Service

Contact our technical sales department if you have any questions on our product. When contacting us, please always include the model/type designation, serial no. and part-no. of the product:

Fax: ++49 (0) 6897 / 509 – 846

E-mail: [filtersystems@hydac.com](mailto:filtersystems@hydac.com)

## Modifications to the Product

We would like to point out that changes to the product (e.g. purchasing additional options, etc.) may mean that the information in the operating instructions is no longer applicable or adequate.

After modification or repair work that affects the safety of the product has been carried out on components, the product may not be returned to operation until it has been checked and released by a HYDAC technician.

Please notify us immediately of any modifications made to the product whether by you or a third party.

## Warranty

For the warranty provided by us, please refer to the General Terms of Sale and Delivery of HYDAC Filter Systems GmbH.

Refer to these at [www.hydac.com](http://www.hydac.com) ⇨ General terms and conditions.

## Using the Documentation



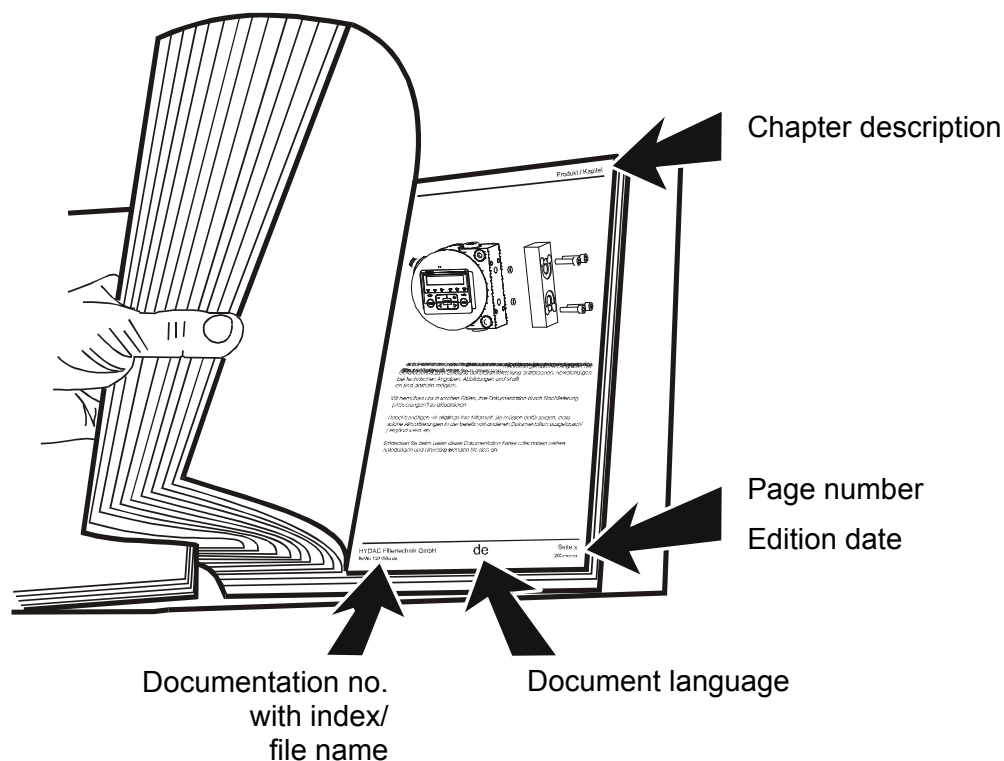
Note that the method described for locating specific information does not release you from your responsibility of carefully reading these instructions prior to starting the unit up for the first time and at regular intervals in the future.

### What do I want to know?

I determine which topic I am looking for.

### Where can I find the information I'm looking for?

The documentation has a table of contents at the beginning. There, I select the chapter I'm looking for and the corresponding page number.



The documentation number with its index enables you to order another copy of the operating and maintenance instructions. The index is incremented every time the manual is revised or changed.

## Safety Information and Instructions

These operating instructions contain the most important information for operating the OF in a proper, safe manner.

### Obligations and Liability

The basic prerequisite for the safe and proper handling and operation of the unit is knowledge of the basic safety instructions and safety regulations.

These operating instructions in general, and the safety instructions in particular, are to be adhered to by all those who work with the unit.

Adherence is to be maintained to pertinent accident prevention regulations applicable at the site where the product is used.

The safety instructions listed here are restricted to use of the unit.

The OF has been designed and constructed in accordance with the current state of the art and recognized safety regulations. Nevertheless, hazards may be posed to the life and limb of the individual using the product or to third parties. Risk of damage may be posed to the product or other equipment and property.

Ensure that the unit is used:

- solely for its designated use
- only when in a safe, perfect condition

Immediately remedy any malfunctions that might impair safety.

Our General Terms and Conditions apply. They are made available to the owner upon concluding purchase of the unit at the latest. Any and all warranty and liability claims for personal injuries and damage to property shall be excluded in the event they are attributable to one or more of the following causes:

- improper use of the unit or use deviating from its designated use
- improper assembly/installation, start up, operation and maintenance of the unit
- operating the OF when the system equipment or systems are defective
- modifications made by the user or purchaser
- Improper monitoring of unit components that are subject to wear and tear
- improperly performed repair work



## Explanation of Symbols and Warnings, etc.

The following designations and symbols are used in this manual to designate hazards, etc.:



DANGER denotes situations which can lead to death if safety precautions are not observed.



WARNING denotes situations which can lead to death if safety precautions are not observed.



CAUTION denotes situations which can lead to severe injuries if safety precautions are not observed.



NOTICE denotes situations which can lead to property damage if safety precautions are not observed.

## Proper/Designated Use

The unit is a mobile filter unit used for simultaneously circulating and filtering oil.

Any other use shall be deemed to be improper and not in keeping with the product's designated use.

The manufacturer will not assume any liability for any damage resulting from such use.

Proper or designated use of the product extends to the following:

- Maintaining adherence to all the instructions contained herein.
- Performing requisite inspection and maintenance work.

## **Improper Use**

Any use deviating from the proper/designated use described above is prohibited.

Improper use may result in hazard to life and limb.

Example of improper use:

- Commissioning without a suction strainer
- Operation with non-approved fluids

## **Informal Safety Precautions**

Make sure to always keep the operating instructions in the vicinity of the unit.

Apart from the operating instructions, any and all general and local regulations pertaining to accident prevention and environmental protection are to be made available and observance is to be maintained to them.

Make sure to keep the safety and hazard symbols and warnings on the product in a legible condition.

## **Structural modifications to the unit**

Do not make any modifications (design modifications, extensions) to the OF without the approval of the manufacturer.

Immediately replace any unit components which are not in perfect condition.

Only use original (OEM) spare parts and consumables. When using non-OEM components it cannot be ensured that they have been designed and manufactured so as to comply with loading and safety requirements.



## Training and Instruction of Personnel

The OF may only be operated by properly trained and instructed personnel. The areas of responsibility of your staff must be established in a clear-cut manner.

Staff undergoing training may not use the OF unless supervised by an experienced staff member.

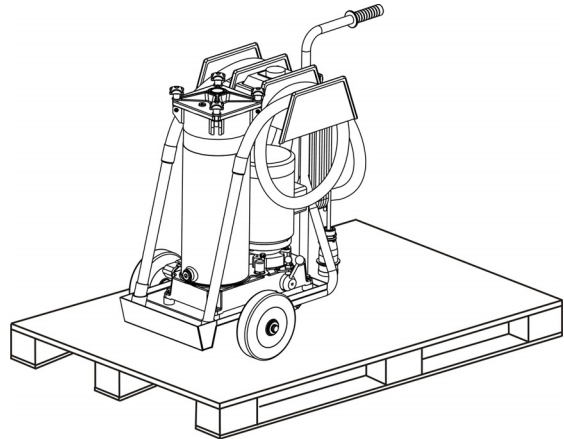
Activity	Individuals	Individuals undergoing training	Individuals with technical training/ engineering background	Electrician	Supervisor with the appropriate authority
Packing / transportation		X	X		X
Commissioning			X	X	X
Operation		X	X	X	X
Troubleshooting/ locating the source of malfunction			X	X	X
Remedying of mechanical faults			X		X
Remedying of electrical faults				X	X
Maintenance		X	X	X	X
Repair work					X
Decommissioning / Storage		X	X	X	X

## Electrical Hazards

	 <b>DANGER</b>
	<p><b>Electric shock</b></p> <p>Danger of fatal injury</p> <p>► Pull power plug before performing any work.</p>

## Transporting the OF5

Transport the unit upright on the built-in wheels or by rolling it.



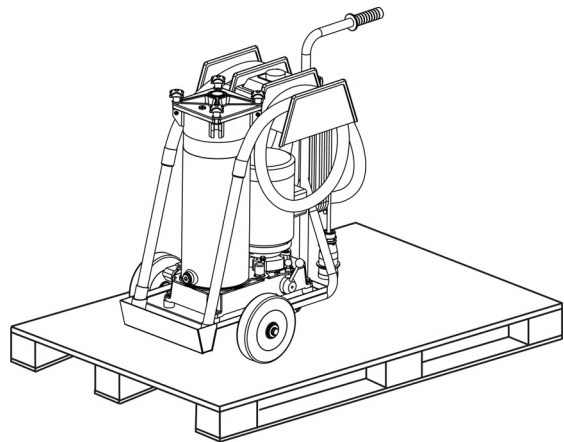
## Storing the OF5

Remove the filter element and drain the unit completely before putting it into storage.

Pull out the power plug to the unit and wind up the power cord.

Wind up the suction and pressure hoses and secure them to the unit.

Store the unit upright in a clean, dry place.



## Checking the Scope of Delivery

The filtration unit is supplied ready for connection and immediate operation with hoses and a mains connection.

Check the unit for damage upon delivery. A unit may only be put into operation if it shows no signs of damage. Report any damage in transit to the forwarding agent or responsible party.

The following items are supplied:

Item	Qty.	Description
1	1	OF5 with power cable, suction hose and pressure hose
2	1	Filter element
-	1	Operating and Maintenance Instructions



## OF5 features

The filtration unit OF 5 mobile is designed for the filling of hydraulic tanks, whilst simultaneously filtering the fluid. It also provides offline filtration and can be used for draining hydraulic tanks as well as for pumping out hydraulic and lubrication oils without filtration.

## Items supplied

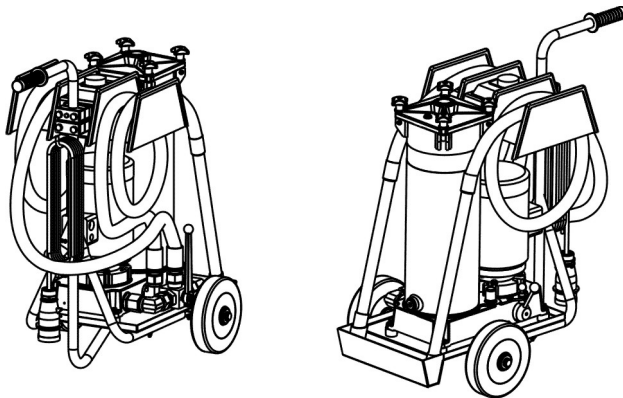
### NOTICE

#### Impermissible operating media

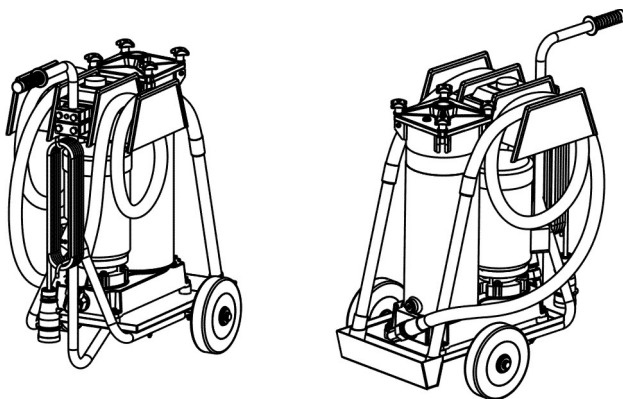
The unit will be damaged

- The unit is only to be used with mineral oils or mineral oil-based raffinates.

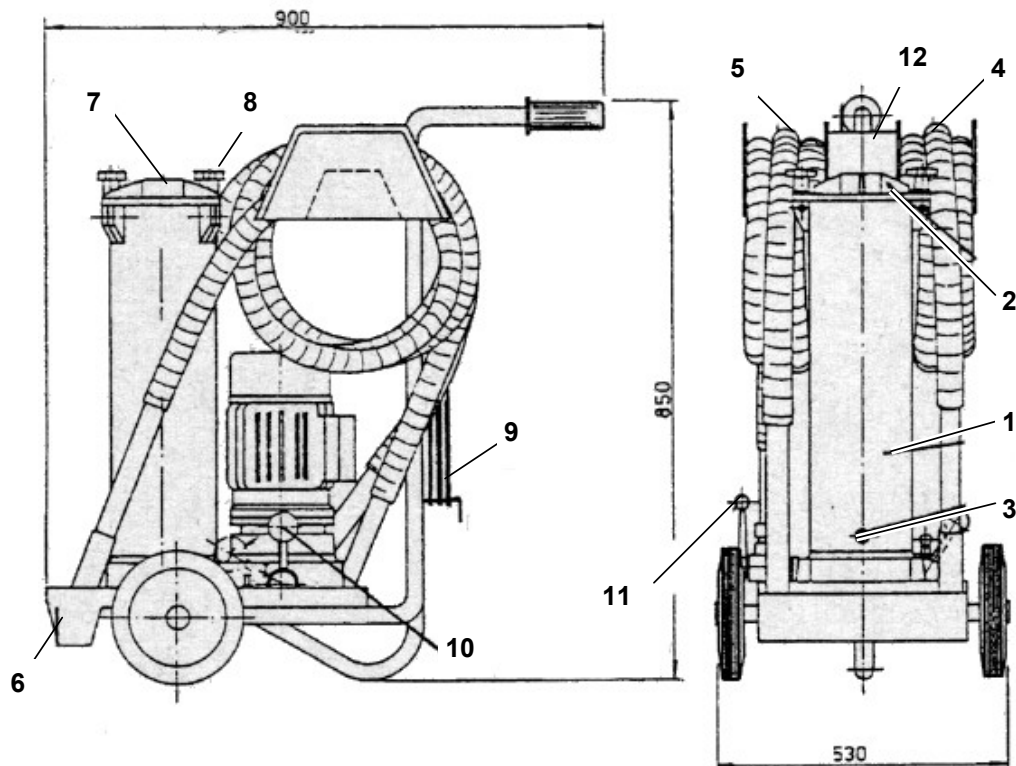
## OF5 F



## OF5 L



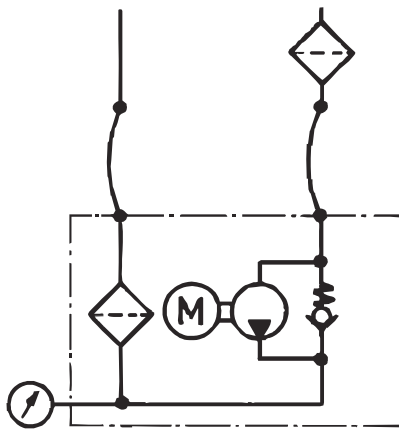
## OF5 components/dimensions



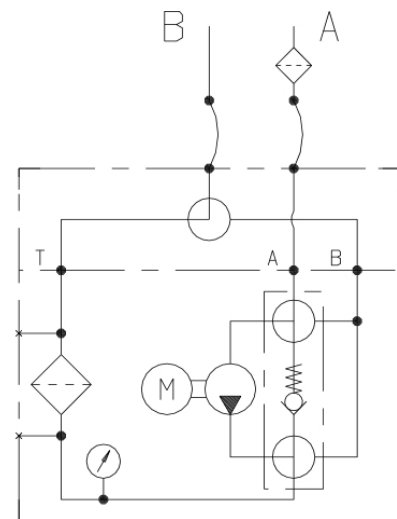
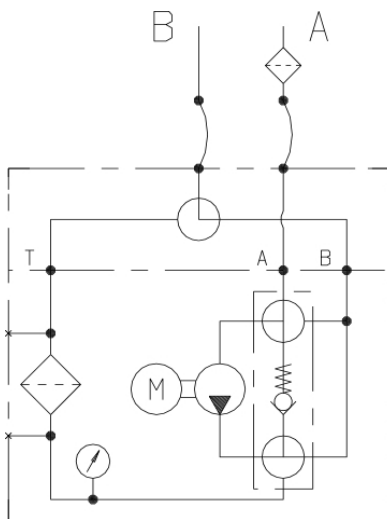
Item	Designation
1	Filter housing
2	Filter cover
3	Draining
4	Suction hose
5	Pressure hose
6	Floor plate with oil pan
7	Manometer
8	Star knob
9	Power cable
10	Lever
11	Switchover via three-way ball valve (OF 5 F only)
12	Motor Protection Switch

## Hydraulic diagram

### OF5 L



### OF5F





## Preparing the OF5 for operation

Consult and observe the following chapter in order to prepare the OF5 for operation.

### Inserting the filter element

The unit has no filter element installed upon delivery from the factory. Prior to start up, check to see whether a filter element is contained in the filter housing.

Information on changing a filter element can be found on page 26.

### Hanging / connecting the suction hose

#### NOTICE

##### Severe contamination

The unit will be destroyed

- ▶ Do not prime directly at the bottom of the tank (in the sump).



The greatest contamination is found on the bottom of the tank. All impurities and other particles are deposited on the bottom of the tank.

Pull the suction hose (thick hose) with lance out of the mounting in the floor plate.

Put the suction hose with lance, without tension and or twist, into the appropriate container and secure it.

### Hanging / connecting the pressure hose

Pull out the pressure hose (thin hose) with lance from the mounting in the floor plate and insert it in the appropriate receptacle.

Put the pressure hose with lance, without tension and or twist, into the appropriate container and secure it.



To prevent air from entering the medium, make sure that the pressure hose with lance is always below the oil level in operation.

## Electrical connection of the OF5

Check or compare the local mains voltage and frequency specifications with the specifications on the type label of the unit.

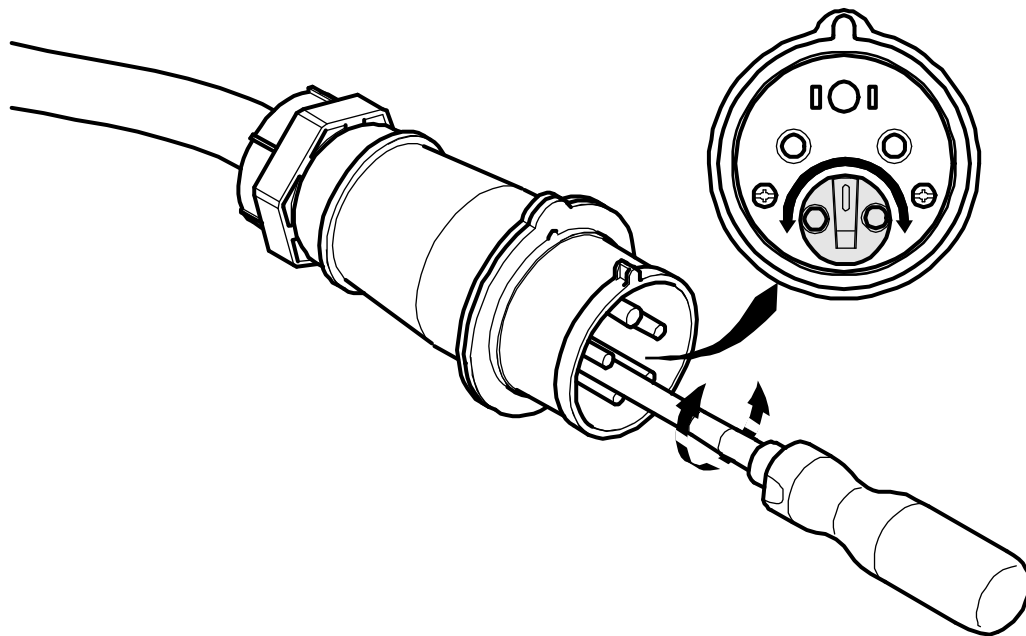
Plug the power plug of the OF5 into a suitable power outlet.

The unit has a motor protection switch in the on / off switch. If the nominal current is exceeded, the motor protection switch trips.

## Checking the direction of rotation

Check the direction of rotation of the motor by switching it on briefly (jog mode). An arrow on the fan cover shows the correct direction of rotation for the unit.

If the direction of rotation is opposite to the direction of the arrow, correct it using the phase inverter contained in the connection plug, as shown in the diagram below.



## Switching on the OF 5

After switching on the OF5, monitor the suction action via the transparent suction hose.

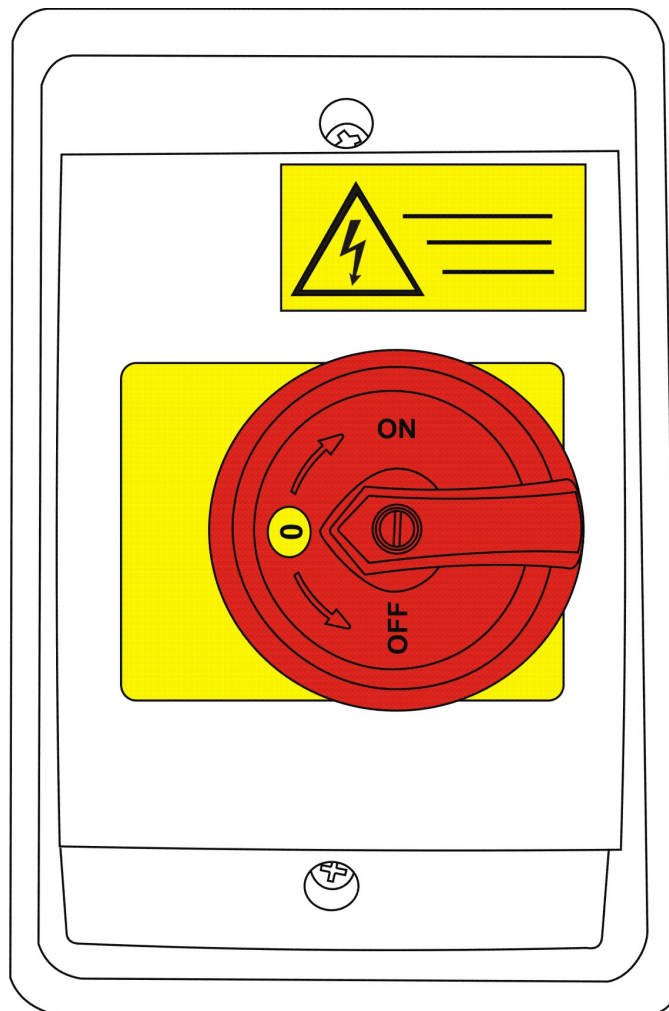
If the unit is not feeding medium after several minutes of operation, the pump must be pre-filled. Switch the motor off and fill the pump via the suction hose.

The special element receptacle renders it unnecessary to vent the filter housing.

Pay particular attention to the clogging indicator during operation. As soon as the clogging indicator enters the red zone, the filter element must be changed immediately.

The pressure relief valve in the pump returns the medium to the suction side if the maximum operating pressure is exceeded.

The motor protection switch contained in the main switch permanently monitors the nominal current and switches the unit off in case of overload.



## Switchover mode

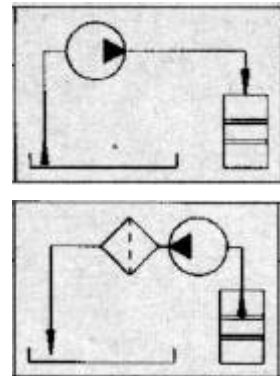
### OF5 L

The oil service unit OF 5 L has no facility for switching between operating modes. Operate this unit in the circulation pumping and filtration mode.

### OF5 F

The oil service unit OF 5 F has the following two modes.

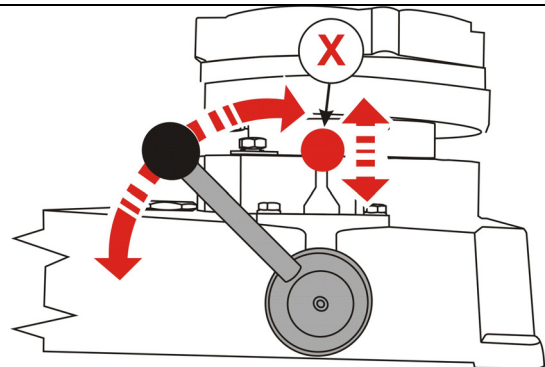
- Transfer by Pumping
- Circulation pumping and filtration



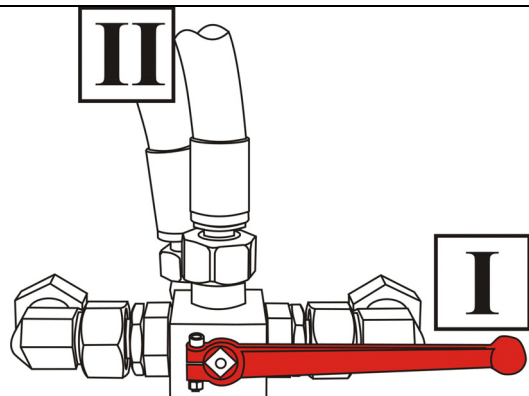
You can switch between the different operating modes via the internal and external switchovers.

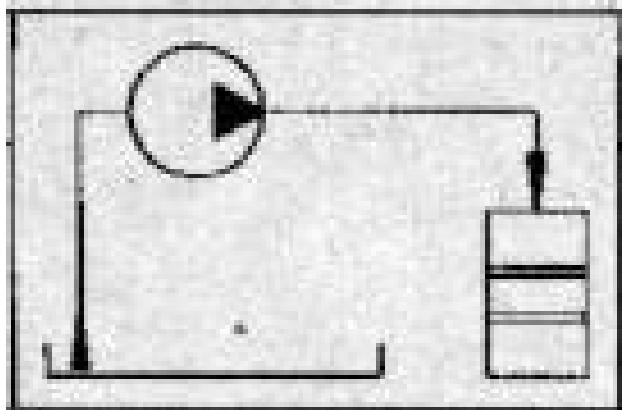
Internal switchover:

Unlock the change-over valve by pulling on the locking pin (x).



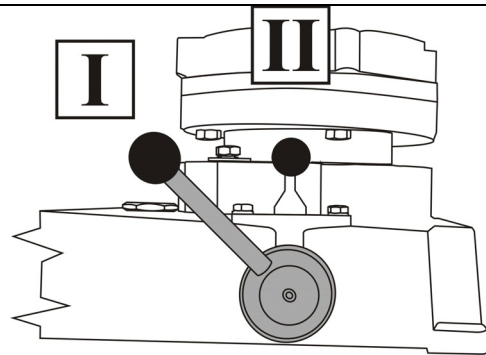
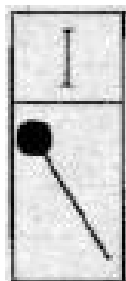
External switchover:



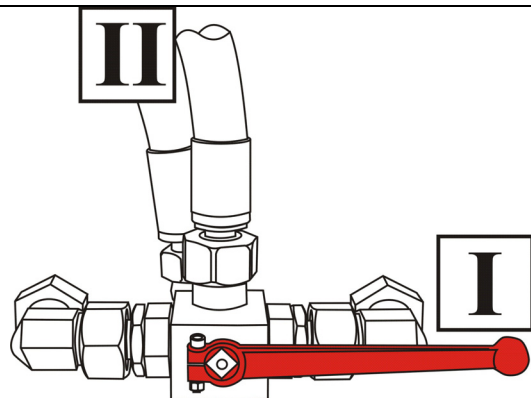
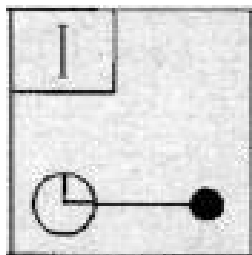
**Setting the circulation pumping operating mode**

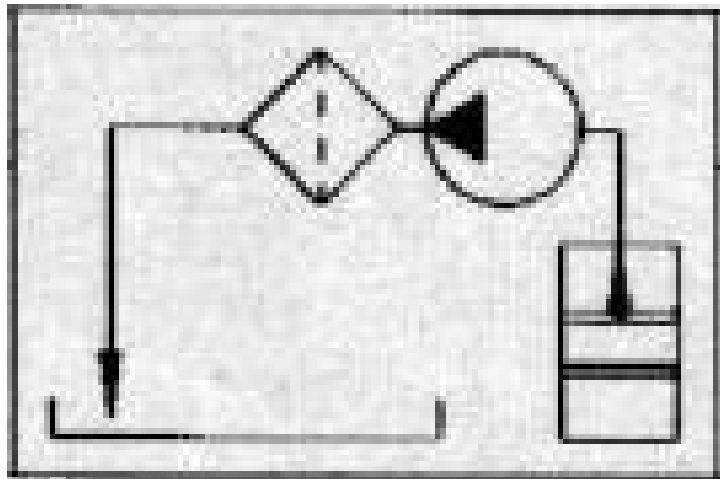
For the circulation pumping operating mode, the switchovers must be set as follows:

Internal switchover:



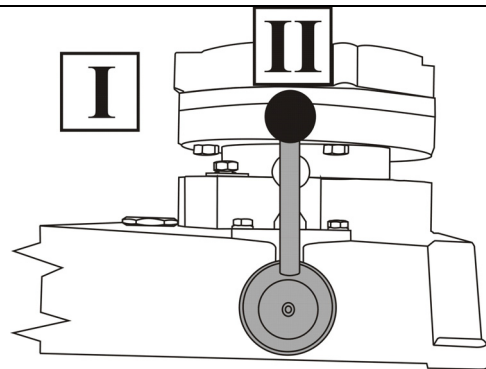
External switchover:



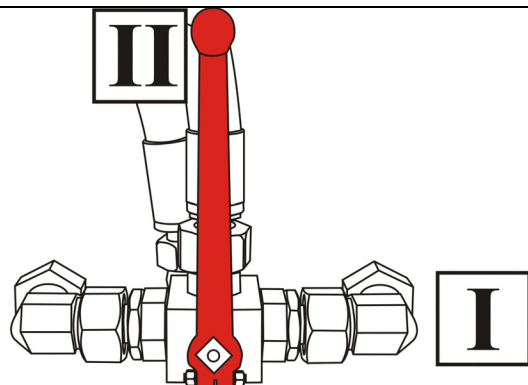
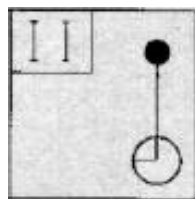
**Operating mode – circulation pumping and filtration**

For the circulation pumping and filtration operating mode, the switchovers must be set as follows:

Internal switchover:



External switchover:



## Performing Maintenance

	<div data-bbox="699 315 1093 405"> <b>WARNING</b></div> <div data-bbox="703 443 1380 667"><p><b>The unit is pressurized</b></p><p>Danger of bodily injury</p><ul style="list-style-type: none"><li>▶ Depressurize the system before performing any work on it.</li></ul></div>
	<div data-bbox="686 705 1050 795"> <b>DANGER</b></div> <div data-bbox="703 833 1342 1057"><p><b>Electric shock</b></p><p>Danger of fatal injury</p><ul style="list-style-type: none"><li>▶ Disconnect the power plug before performing any work on the unit.</li></ul></div>

## Cleaning the Suction Screen

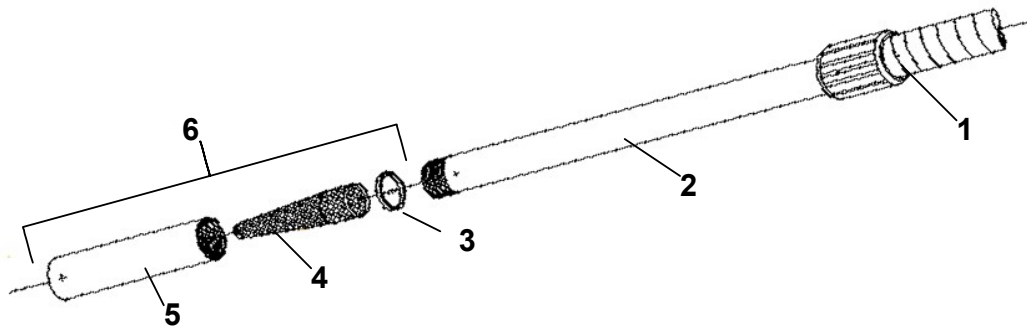
### NOTICE

#### Operation without a suction screen

The unit will be destroyed

- ▶ Never operate the filtration unit without a suction screen.
- ▶ Clean the suction screen regularly.

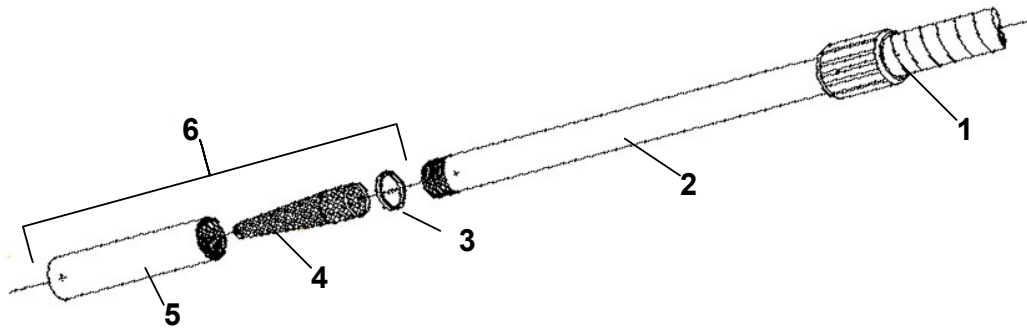
To protect the pump from coarse contamination or foreign bodies, a suction screen is installed in the suction lance. Clean the suction screen regularly and check it immediately in the event of insufficient suction or delivery action.



Item	Description
1	Hose
2	Suction lance
3	O-ring
4	Suction screen
5	Protection pipe
6	Suction strainer set



To clean the suction screen, proceed as follows:



1. Rotate the protection pipe (5) away from the suction lance (2) in a clockwise direction.
2. Remove the suction screen (4) from the protection pipe.
3. Clean the suction screen (4) by washing it out and then blowing it dry with compressed air.
4. Insert the suction screen (4) into the protection pipe (5) with the tip facing forwards.
5. Screw the protection pipe (5) on to the suction lance (2) in a counterclockwise direction.

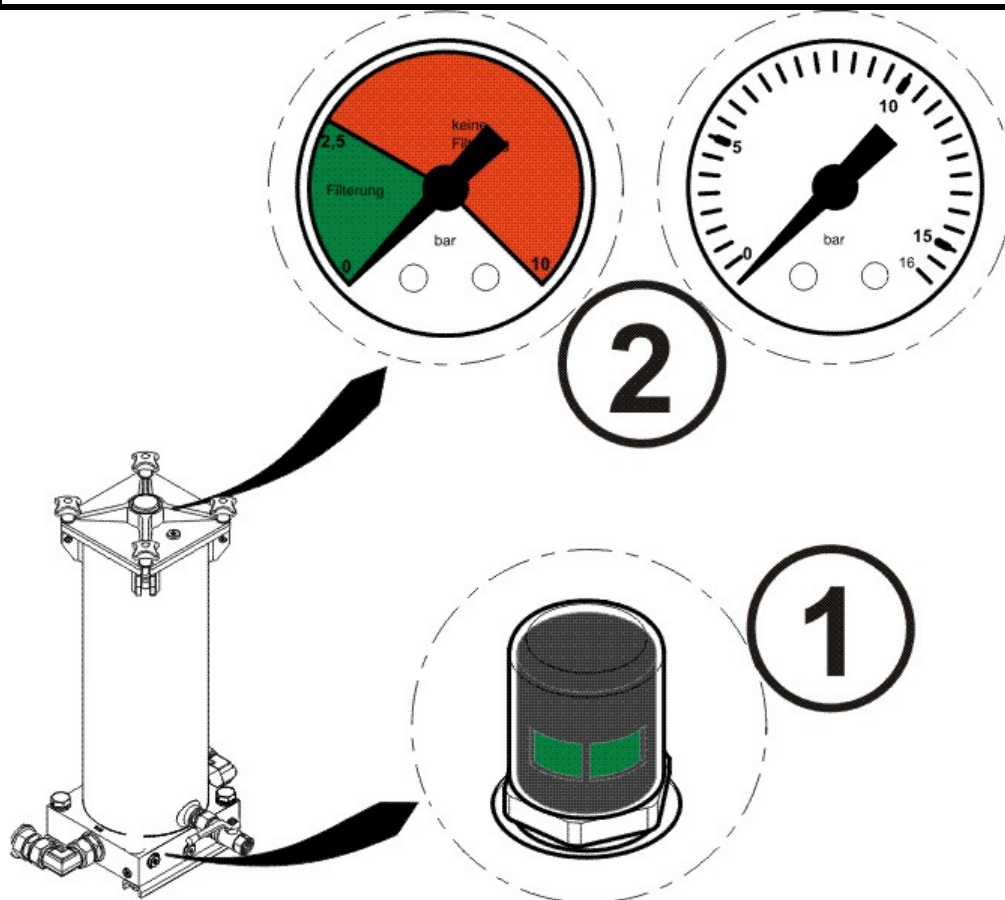
## Changing the Filter Element

### NOTICE

#### Unsuitable/incorrect filter element

The medium is not filtered

- Use only filter elements with the type code suffix -KB  
(for example: 1300 R 003 BN4HC **-KB**)

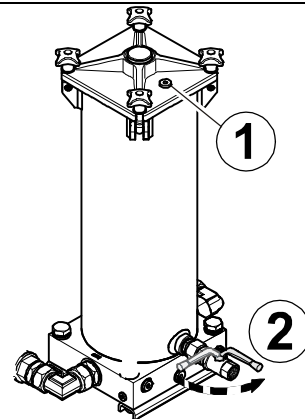


Depending on the version, the unit has an optical back-pressure indicator (2) (red/green) or a scale in the filter cover. The version with switchover may have an optional differential pressure gauge (1).

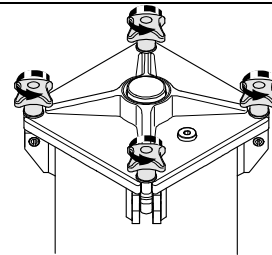
Change the filter element as soon as the back-pressure indicator or differential pressure gauge is in the red area.

To change the filter, proceed as follows:

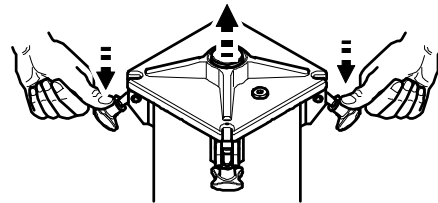
1. Switch the unit off.
2. Depressurize the filter housing.  
Remove the air bleed plug (1) in the filter cover for this purpose.  
  
The residual oil is drained through the drain ball valve (2) into a suitable container.



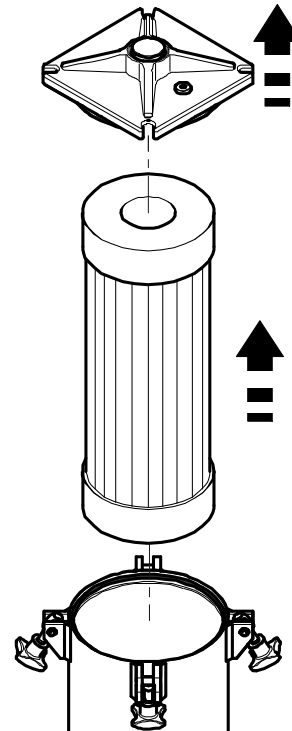
3. Loosen the four screws on the cover counterclockwise.



4. Fold the screws down and press them against the filter housing.  
  
This pushes the cover of the filter housing up.

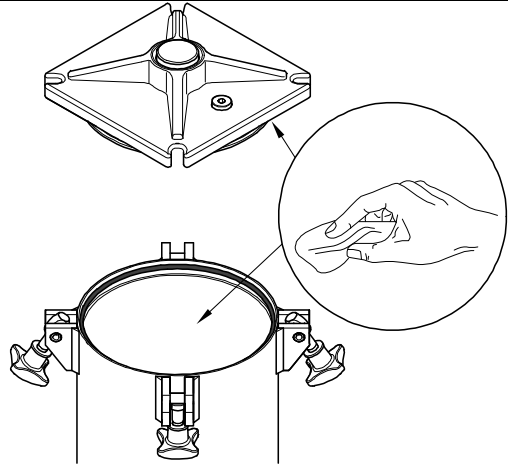


5. Take the cover off and remove the filter element.



## 6. Clean:

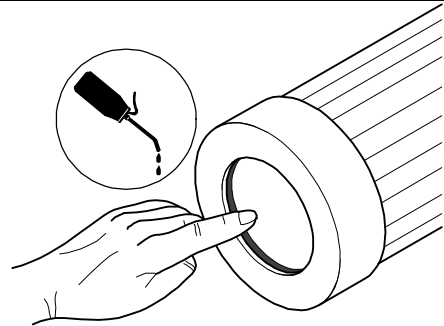
- the inside of the filter bowl of coarse dirt
- the sealing surfaces on the filter head and on the cover.



## 7.



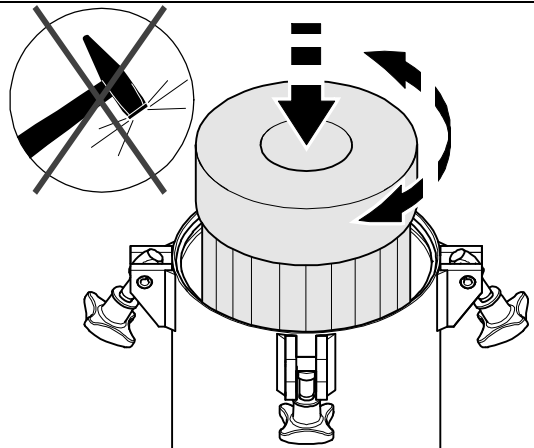
For easier installation of the filter element, wet the O-ring on the filter element with the operating medium.



## 8. Press the new filter element down into the filter mount by turning it slightly.

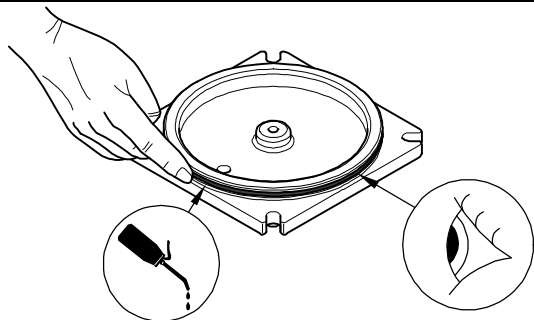


Do not use excessive force or a hammer, etc.



## 9. Check the O-ring on the cover for damage and replace it if necessary.

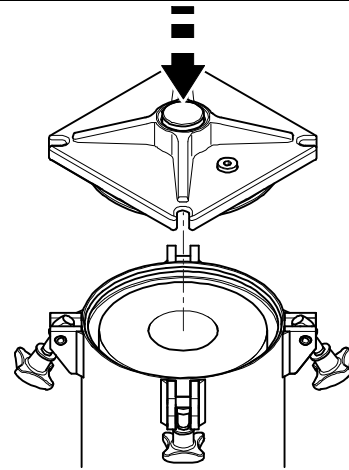
Lightly wet the O-ring on the cover with medium.



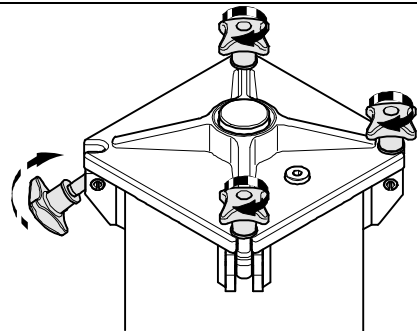
- 
10. Put the cover on.



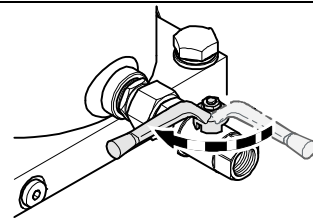
Observe correct placement of the O-ring on the filter cover while doing so. It must not be damaged.



- 
11. Fold the four screws up and turn them clockwise evenly crosswise.

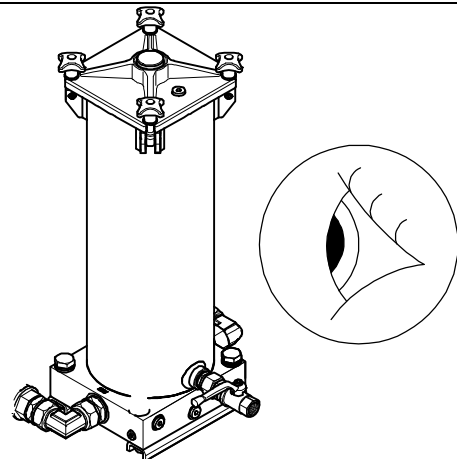


- 
12. Close the drain valve.



- 
13. Switch the unit on.

- 
14. Check the unit for any leaks.



- 
15. The unit is ready for operation.
-

## Errors and Troubleshooting

Error	Cause(s)	Remedy
Differential pressure > 2.5 bar	The fluid is heavily contaminated.	Replace the filter element.
	The contamination retention capacity of the filter element has been reached.	Replace the filter element.
	The viscosity of the fluid is too high.	Warm the oil.
No flow	The pump is conveying in the wrong direction.	Check the direction of rotation of the motor. If necessary, rotate the phases using the phase inverter in the connection plug.
	The suction hose is positioned above the fluid.	Sufficiently immerse the suction hose in the medium.
No function	No electrical connection. No voltage available.	Check the electrical connection; plug, cable and socket.

## Spare Parts List

Description					Part no.
Suction strainer set for suction lance					349759
Suction screen for suction lance					250 µm 380385
Filter element	0330 R 003 BN4HC/-V-KB	3 µm	NBR		1262999
Filter element	0330 R 003 BN4HC/-KB	3 µm	FPM		1263640
Filter element	0330 R 005 BN4HC/-KB	5 µm	NBR		1263000
Filter element	0330 R 005 BN4HC/-V-KB	5 µm	FPM		1263641
Filter element	0330 R 010 BN4HC/-KB	10 µm	NBR		1263001
Filter element	0330 R 010 BN4HC/-V-KB	10 µm	FPM		1263642
Filter element	0330 R 020 BN4HC/-KB	20 µm	NBR		1263002
Filter element	0330 R 020 BN4HC/-V-KB	20 µm	FPM		1263643
Filter element	0330 R 040 AM/-KB	40 µm	NBR		1272067
Filter element	0330 R 040 AM/-KB	40 µm	FPM		1266563
Filter element	0330 R 003 BN/AM/-KB	3 µm	NBR		1272069
Filter element	0330 R 003 BN/AM/-V-KB	3 µm	FPM		1276690
Filter element	0330 R 010 BN/AM/-KB	10 µm	NBR		1272068
Filter element	0330 R 010 BN/AM/-V-KB	10 µm	FPM		301227
Filter element	1300 R 003 BN4HC/-KB	3 µm	NBR		1263059
Filter element	1300 R 003 BN4HC/-V-KB	3 µm	FPM		1263760
Filter element	1300 R 005 BN4HC/-KB	5 µm	NBR		1263060
Filter element	1300 R 005 BN4HC/-V-KB	5 µm	FPM		1263761
Filter element	1300 R 010 BN4HC/-KB	10 µm	NBR		1263061
Filter element	1300 R 010 BN4HC/-V-KB	10 µm	FPM		1263762
Filter element	1300 R 020 BN4HC/-KB	20 µm	NBR		1263062
Filter element	1300 R 020 BN4HC/-V-KB	20 µm	FPM		1263763
Filter element	1300 R 040 AM/-KB	40 µm	NBR		1267699
Electric motor	230V / 50Hz, 1 Ph				3041675
Electric motor	400V / 50Hz, 3 Ph				3038709
Vane pump		80/20	NBR		721206

Description			Part no.
Vane pump	90/30	FPM	721207
Vane pump	80/20	NBR	721317
Vane pump	90/30	FPM	721281
Pressure hose	L= 3 m		381465
Pressure hose	L= 5 m		349004
Pressure hose	L= 10 m		91061
Suction hose	L= 3 m		381464
Suction hose	L= 5 m		349070
Dynamic pressure gauge	Green/red		36198
Dynamic pressure gauge	0 - 16 bar		39173
Differential pressure gauge - version 1	VM 2 B.1	NBR	303191
Differential pressure gauge - version 1	VM 2 B.1	FPM	303197
Differential pressure gauge - version 2	VM 2 C.0	NBR	311645
Differential pressure gauge - version 2	VM 2 C.0	FPM	304632
Differential pressure gauge - version 3 (230V)	VM 2 D.0	NBR	307847
Differential pressure gauge - version 3 (230V)	VM 2 D.0	FPM	304651
Differential pressure gauge - version 3 (24V)	VM 2 D.0	NBR	312682
Differential pressure gauge - version 3 (24V)	VM 2 D.0	FPM	316556

## Disposing of the OF5

When decommissioning and/or disposing of the unit, observe all local guidelines and regulations pertaining to occupational safety and environmental protection. This applies in particular to the oil contained in the unit, to components coated in oil and to electronic components.

After disassembling the unit and separating the various materials, reuse them or dispose of them properly in accordance with local regulations.



## Technical data

Power supply voltage	1x 230V, 50 Hz 3x 380 / 420V, 50 Hz 3x 500 / 600V, 50 / 60 Hz
Power consumption	0.75 kW 1.5 kW
Maximum flow rate	30 l/min 40 l/min
Pump types	Vane pump
Operating pressure	4.5 bar max.
Permissible suction pressure at suction port	-0.4 – +0.6 bar
Viscosity range	15 ... 250 mm <sup>2</sup> /s 15 ... 800 mm <sup>2</sup> /s
Fluid temperature	-10 ... +80°C
Ambient temperature	-10 ... +40°C
Seals, gaskets	NBR / FPM
IP class	IP 54
Power cable, length	6 m
Length of suction / pressure hose	3 m (standard)
Hose connections	Suction hose NW30 with lance Pressure hose NW 25 with lance
Weight	~ 75 kg
Filter element type	Betamicron (BN4HC) Aquamicron (BN/AM)(AM)
Filter element size	0330 / 1300
Clogging indicator	Differential pressure gauge

## Model Code

	OF5	F	10	P	6	N	2	B	05	E
<b>Basic type</b>	OF 5									
<b>Version</b>		F = Mobile with switchover L = Mobile without switchover								
<b>Type code</b>			10 = Standard Special models on request							
<b>Sealing material</b>				P = NBR (Perbunan) V = FPM (Viton)						
<b>Motor-pump group</b>					3 = 30 l/min / to max. 250 mm <sup>2</sup> /s / 0.5 kW 4 = 40 l/min / to max. 800 mm <sup>2</sup> /s / 1.5 kW					
<b>Electromotor voltage</b>						M = 230 V / 50 Hz (1 Ph + PE) N = 380 - 420 V / 50 Hz (3 Ph + PE) 440 - 480 V / 60 Hz (3 Ph + PE) S = 500 - 600 V / 50 Hz (3 Ph + PE) 500 - 600 V / 60 Hz (3 Ph + PE) X = other voltage				
<b>Filter size</b>							1 = Filter size 0330 2 = Filter size 1300			
<b>Filter material of element</b>								B = Betamicron (BN4HC) A = Aquamircon (BN/AM), (AM)		
<b>Filtration rating</b>									03 = 3 µm BN4HC, BN/AM 05 = 5 µm BN4HC, BN 10 = 10 µm BN4HC, BN/AM 20 = 20 µm BN4HC, BN 40 = 40 µm, AM	
<b>Clogging indicator</b>										E = Standard, pressure gauge B = Differential pressure indicator - visual (VM2B.1) C = Differential pressure indicator - electrical (VM2C.0) D = Differential pressure indicator, visual/electrical (VM2D.0) B, C and D not available for version "L"

## EC declaration of conformity



### FILTER SYSTEMS

#### HYDAC FILTER SYSTEMS GMBH

Postfach 12 51  
66273 Sulzbach / Saar  
Germany

Industriegebiet  
66280 Sulzbach / Saar  
Germany

Telefon: ++49 (0) 6897 509 01  
Internet: www.hydac.com



### EC declaration of conformity

**FS / 37 / 09**

No.

**We hereby declare that the following designated product, on the basis of its design and construction, and in the version which we have brought to market, corresponds to the fundamental safety and health requirements contained in the standards listed below.**

**Any modification of this product that is not coordinated with us in writing will cause this declaration to lose its validity.**

Designation	Filter aggregate
Type	OF 5 mobile series
Part no.	-
Serial-no.	-
EU Machinery Directive	2006/42/EC
EU Electrical Equipment Regulations	2006/95/EC
EMC Guideline	2004/108/EC
Safety of machinery and devices	EN 12100-1/2

2009-12-22

Dr. Andreas Schunk

Date

Name

(CE-authorized person)

Executive director:  
Mathias Dieter, Dipl.Kfm. Wolfgang Haering  
Registered seat of company: 66280 Sulzbach / Saar - Germany  
Registry Court: Saarbrücken, HRB 17216  
Value added tax identification number : DE 815001609  
Tax number : 040/110/50773

Documentation Representative:  
Mr. Günter Harge  
c/o HYDAC International GmbH, Industriegebiet , 66280 Sulzbach / Saar  
Telephone: ++49 (0) 6897 509 1511  
Fax: ++49 (0) 6897 509 1394  
E-mail: guenter.harge@hydac.com

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# INTERNATIONAL

HYDAC FILTER SYSTEMS GMBH

Industriegebiet  
66280 Sulzbach/Saar  
Germany

Postfach 1251  
66273 Sulzbach/Saar  
Germany

Phone: +49 (0) 6897 509 01

Fax: +49 (0) 6897 509 846

Fax: +49 (0) 6897 509 577

Central

(Technical Department)

(Sales Department)

Internet: [www.hydac.com](http://www.hydac.com)

E-Mail: [filtersystems@hydac.com](mailto:filtersystems@hydac.com)