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# **Manual**

Version 4.0\_eng2

## **Mobile Filtration System (MFS) SWK-2000/40/WSA**

HW-Version 0.3

SW-Version 2.0

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## 1 Safety Instructions

The two available circuit points for the supply voltage (Connection point 1: feeder for 115 VAC or 230 VAC. Connection point 2: feeder for 12 VDC battery operated) may not be used simultaneously. Operation with other supply voltages as shown in the technical data is not permitted. Any use in explosive and hazardous areas is strictly prohibited. The maximum ambient temperature may not exceed 40°C for the operation of the **MOBILE FILTRATION SYSTEM (MFS)**. If the electric cables show any damages the **MFS** has to be switched off immediately by the emergency switch (NOT AUS) and to be disconnected from the supply voltage (Pull the plug or with 12 VDC operation remove the battery terminals). In case of any damages to the hose system or the filter the **MFS** is not allowed to be used, as fuel/oil may harm the environment. If the **MFS** is operated with ambient temperature higher than 25°C the user interface can grow warm in a major degree.

### 1.1 Intended Application

The **MFS** SWK-2000/40/WSA has been designed for the filtration of diesel fuels and mineral oils with a dynamic viscosity < 10 mPas, a flash point > 55°C and a boiling point > 160°C only. The handling of liquids, which can harm the filter housing (aluminium), the pump (steel), plastic components (polyamide) and gaskets (NBR), is not foreseen and can result in a severe damage of the **MFS** as well as dangerous operating conditions.

When working on the **MFS** the unit has to be in a de-energized state.



## 2 Scope of Delivery

- Mobile Filtration System (**MFS**) SWK-2000/40/WSA



- 12-VDC cord with battery terminals, connecting plug, fuse carrier and fuse (50 A).





### 3 Technical Data

This manual describes the component assembly in the following configuration:

Hardware-Version: 0.3

Software-Version: 2.0

#### 3.1 Electrical data

##### 3.1.1 Operation with battery

Supply voltage: 12 VDC

Maximum operational voltage: 15 VDC

Maximum current consumption: 30 A

##### 3.1.2 Mains operation with VAC

Supply voltage: 100 VAC to 240 VAC

Mains frequency: 50 Hz to 60 Hz

Maximum current consumption: 5 A (@ 115 VAC)

#### 3.2 Range of temperature

Operating temperature: -40 °C ... 40 °C

Storage temperature: -40 °C ... 85 °C

#### 3.3 Mechanical data

Maximum flow rate of the pump: approx. 40 l/min

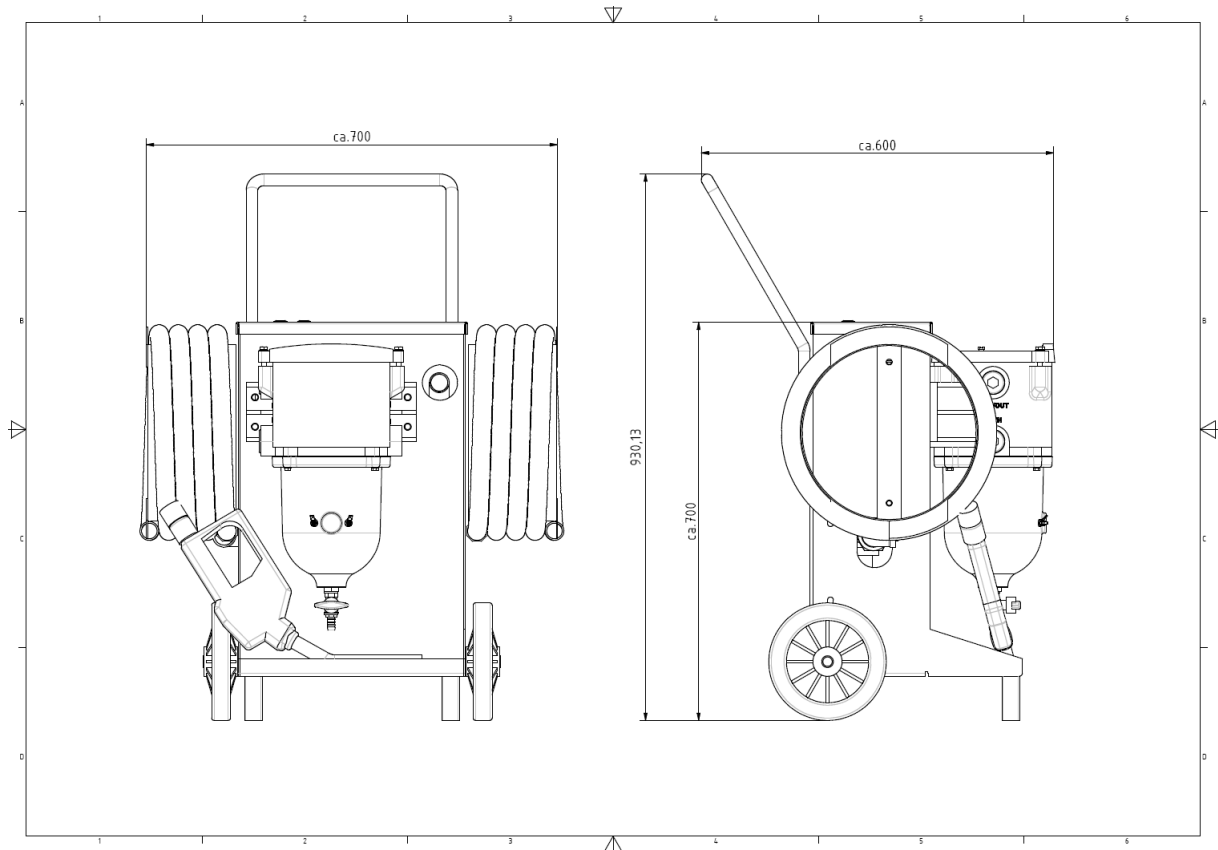
Maximum suction height: approx. 2 m



### 3.4 Weight and dimensions

Empty weight (without fluid): 65 kg

The dimensions (tolerance < 5 mm) can be gathered from the following drawing.  
[ca. = approximately]





## 4 Electrical connections

The **MFS** SWK-2000/40/WSA provides two connecting points for the supply voltage:

Connecting point 1: Power cord with safety plug  
supply voltage 115 VAC to 230 VAC

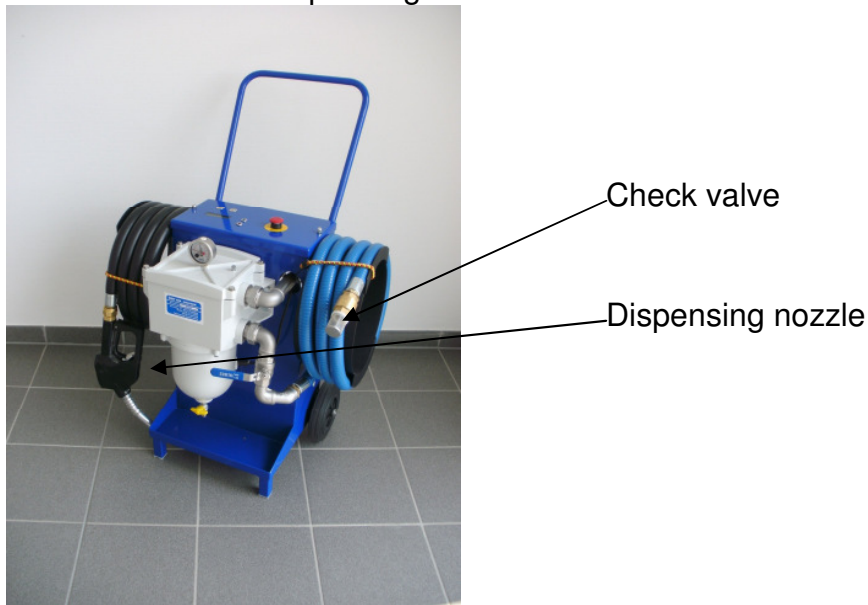
Connecting point 2: Cord with connecting plug and battery terminals  
(Operation with battery)  
supply voltage 12 VDC

The **MFS** SWK-2000/40/WSA is protected against a reversed polarity of the battery pole pins. Any operation with reversed polarity is not possible.

The **MFS** SWK-2000/40/WSA is being supplied with a power cord and safety plug as a standard. Operations with different main plug systems are possible by suitable travel adapters as long as the electric parameters are met. The cord for battery operation is attached. Different versions are available on request.

### 4.1 Mechanical connection

The **MFS** SWK-2000/40/WSA has two fluid hoses. The fluid suction line has a shut off valve installed at the filter housing and a check valve at the hose end. The return line is fitted with a dispensing nozzle.



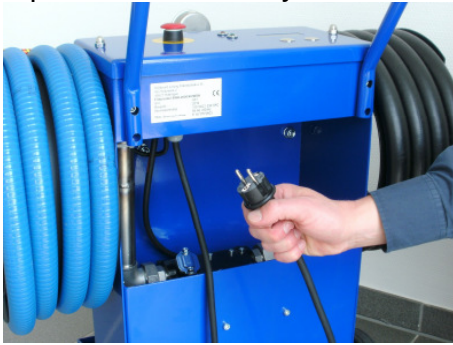




## 5 Connection

The **MFS SWK-2000/40/WSA** will be connected to a suitable power supply.

- Operation with firmly mounted cable with safety plug (115 VAC; 230 VAC):



- Connection to a battery by the attached power cord (12 VDC):



Plug in the battery cord plug in the socket below the type label.



Twist plug clock wise in the socket till latching.

Attach the battery terminals to the battery pole pins. The red terminal goes with the plus pin and the black terminal to the earth or minus pin. With batteries in series connection, ensure that the terminals are attached to one battery, only.



## 5.1 Disassembly of Battery Cord

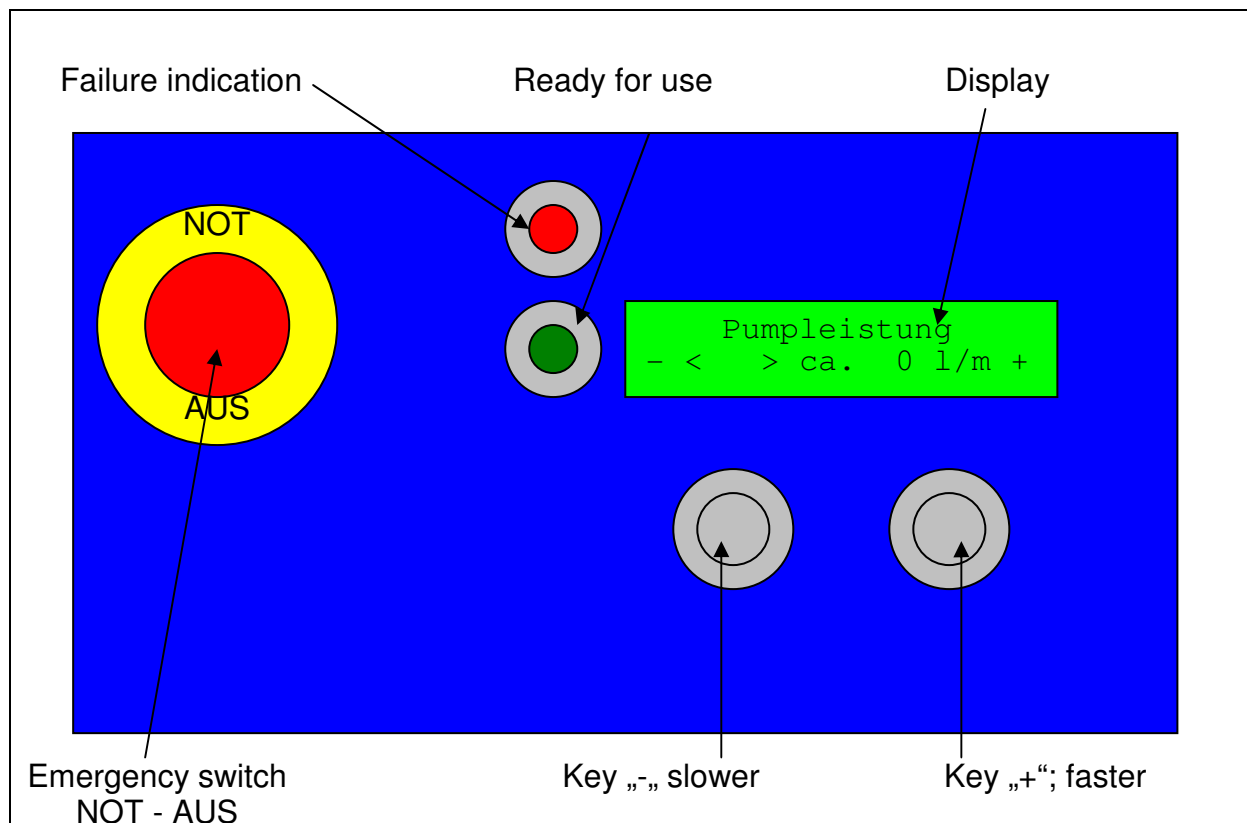
For removal of the battery cord pull the locking device down with the thumb and twist the plug counter clock wise till latching. Then pull the plug simply out of the socket.



Locking device

## 6 Display and System Elements

For operation of the **MFS SWK-2000/40/WSA** two momentary keys, one emergency switch, two indicator LED's, one display and one shut off valve are available.



Picture 1: Display and System Elements



The **MFS** SWK-2000/40/WSA is equipped with a vacuum gauge. The dirt load of the filter element can be detected by the increase of the vacuum by this instrument in time. The vacuum gauge is positioned on the lid of the filter housing.



Vacuum gauge

## 7 Function

Attention! Prior to the start of the pump the shut off valve has to be opened.



Shut off valve  
closed



Shut off valve  
opened



## 7.1 Dispensing Nozzle

The dispensing nozzle is equipped with a latching device. In latched position the dispensing nozzle is opened. As soon as the nozzle will get in contact with the fluid the latching device will snap back and the dispensing nozzle will be closed.



Pull the trigger of the dispensing nozzle



Lock latching device. Dispensing nozzle is open now.

## 7.2 Pump and Filtration Operation

After connecting the supply voltage pull the red top of the emergency switch up towards you and the system will boot up. The “green ready for use” LED and the display will light up.

On the display the following message will appear for about 2 seconds:

```
Lösing - Filtermobil  
HW-V 0.1    SW-V 3.0
```

The version number could be different due another configuration.

When the self test is successful the display shows:

```
Pump flow rate  
- < > ca. 0 l/m +
```

The “-“ symbol in the second line at the left side shows the function of the left key and the “+“ symbol in the second line at the right side shows the function of the right key



(Depending of the display set up the symbols at the left and right side of the second line might slightly vary). Before the start of the pumping and filtration operation open the shut off valve and the dispensing nozzle. Now the **MFS** is ready for use.

To start the filtration process press the right key “+” shortly. The pump starts subtle to a flow rate of approximately 15 l/min. Lower flow rates can not be adjusted. If the “+” key will be pressed for a longer period the flow rate of the pump can be increased up to a maximum of 40 l/min. The momentary flow rate can be gathered from the display (second line) after the brackets in l/min. The effective flow rate is influenced by multiple ambient influences, therefore it can deviate from the shown flow rate. Pressing the “-“ key reduces the flow rate. If the display shows a flow rate of 15 l/min and the “-“ key will be pressed again the pump will be switched off. If both keys will be pressed simultaneously the pump will be disengaged, too. For the time of the key engagement the function will be shown within the brackets.

Key „+“ pressed:

```
Pump flow rate  
- < + > ca. 24 l/m +
```

Key „-“ pressed:

```
Pump flow rate  
- < - > ca. 22 l/m +
```

Key „-“ and key „+“ engaged simultaneously:

```
Pump flow rate  
- <+ -> ca. 0 l/m +
```

When the emergency switch is pushed in direction of the front plate, the pump operation will be stopped immediately and the electric and the electronics will be cut off of the supply voltage.

### 7.2.1 Failure codes

If the display is not lighting up when the supply voltage is correctly connected and the top of the emergency switch is pulled towards you the unit has an internal defect. In this case the repair has to be done by the manufacturer.

### 7.2.2 Too high supply voltage

If with the battery operation a higher supply voltage than 15 VDC will be connected (for example 24 VDC due to serial connection of two 12 VDC batteries) the following failure code is shown in the display:



A T T E N T I O N  
Failure: > 12V !!

The failure code will be deleted if the correct supply voltage has been connected and the system rebooted.

### 7.2.2.1 Too high temperature of the pump

When the pump is being operated and the temperature exceeds the permissible limit the pump will be deactivated and the following failure code is shown in the display:

A T T E N T I O N  
Drive too hot

The pump can be reactivated again only if the drive of the pump has cooled down sufficiently.

### 7.2.2.2 Too high temperature of the electronic control

If the temperature of the electronic control exceeds the permissible limit the pump will be disengaged and the following failure code appears in the display:

A T T E N T I O N  
Electronic too hot

The pump can be reactivated again only if the electronic control has cooled down sufficiently.

An excessive amount heat with the pump or electronics can have various reasons; amongst those are too high ambient temperature and a too high viscosity of the pumped and filtered media.





### 7.3 Water probe

After switching on the operational current the water sensing system – independently from the fluid, in which the probe surface is submersed – indicates no water. Approximately 1 second later the monitoring process starts.

After the evaluation the result will be shown by the display and the illuminated red LED. The result will be delayed always to avoid flickering of the display and LED due to unsteady media.

Regular operation: The probe is exposed to the fluid. The red LED is not illuminated. The display shows no extraordinary code.

Water in media: The probe is exposed to water. The pump will be shut down. The red LED lights up and the following code is shown in the display.



A T T E N T I O N  
too much water

This code stays on the display till the operational current is switch off even if no water is in touch with the sensor anymore. The MFS can be restarted again if the water has been drained out of the bowl as described under chapter 8.1.1.

Defects of probes: The red LED changes in to flashing mode. In the display the code “too much water” is shown in the same flashing frequency. After elimination of the defect, the red LED and the display show the result of the evaluation process.

## 8 Application notes

The **MFS** SWK-2000/40/WSA may not be used with damages to the filter housing, connecting cables and cords. In those cases the unit has to be repaired by the manufacturer.

The water probe may not be used with damaged monitoring tip. For easier identification of damages the monitoring tip is painted with green lacquer. Scratches or lacquer free areas might indicate defects of the probe and make a probe replacement necessary.



## 8.1 Maintenance

Before any maintenance work will take place the **MFS** has to be disconnected from the supply voltage, the shut off valve has to be closed and both fluid lines may not be drowned in liquids.

### 8.1.1 Draining of water

If the filter bowl is filled with water up to installation height of the water probe an alarm of the red LED is triggered on the top plate of the **MFS** and indicated by the display, too. Now the collected water has to be drained from the bowl.

For the detailed description of the process please see:  
„Installation instruction SEPAR english.pdf“

### 8.1.2 Replacement of filter element

The filter element has to be replaced depending on the dirt load in intervals as indicated by the vacuum gauge. Prior to any replacement water and contaminants, which are in the filter system, have to be drained into a suitable container. Contents have to be disposed according to the environmental regulations.

For the detailed description of the process please see:  
“Installation instruction SEPAR english.pdf“

### 8.1.3 Detection system

The water probe is wear and maintenance free. Attention has to be paid that the tip of the probe and the surfaces show no contamination or any damages to achieve precise evaluation results. If the probe shows any damages it has to be replaced. Any repair is impossible.

#### 8.1.3.1 Probe disassembly and assembly

Prior to the probe disassembly the filter has to be drained completely from any fluid (please see chapter replacement of filter element). The probe is fixed by glue, but can be removed with a corresponding spanner out of the filter bowl easily. The removed probe can be checked for contamination or defects. If no fault can be detected, the probe can be reinstalled after cleaning it (please see chapter 8.3).

Sealing of the removed probe will be affected by the attached O-ring. The thread of the probe will be coated with a thin layer of a thread locker (for example: Delo-ML 5298) which is suitable and does not contain alcohol and is unlockable. By this procedure the probe is protected against getting loose and has a perfect seal. The so prepared probe will be refitted into the bowl hand tight. In any case recommissioning may take place only after complete curing of the bond. The curing time of the bonding system can be gathered from the corresponding material data sheets.





## **8.2 Cleaning of filter bowl**

Only clean diesel fuel should be used to clean the filter bowl.  
For the detailed description of the process please see:  
“Installation instruction SEPAR english.pdf“

## **8.3 Cleaning of water probe**

After disassembly of the water probe it can be cleaned with a smooth cloth. Sticky contaminates can be removed by pouring an alcohol free commercial household detergent on the cloth. The cleaning detergent has to be removed from the tip surfaces completely and carefully thereafter. Reassembly of the water probe can be done after thorough drying of the probe, as described in chapter 8.1.3.1.

The use of aggressive cleaning detergents or sharp and pointed tools can result in harm to the Tipp surfaces of the probe and has to be avoided.



## 9 Keyword listing

<b>C</b>		<b>O</b>	
cleaning detergents .....	17	Operating temperature .....	6
<b>D</b>		<b>R</b>	
Dimensions .....	7	reverse polarity .....	8
dispensing nozzle .....	12		
Display .....	10	<b>S</b>	
<b>E</b>		shut off valve .....	11
emergency switch .....	10	Software-Version .....	6
Empty weight .....	7	Storage temperature .....	6
		Supply voltage .....	6
<b>H</b>		<b>T</b>	
Hardware-Version .....	6	thread locker .....	16
<b>M</b>			
monitoring tip .....	15		



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Notes: