

Tramp Oil Separator Type 5404



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Instructions

Tramp Oil Separator Type 5404

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Preface

These instructions will help you to become acquainted with the machine and its specified normal operation as well as to use it at its best. The machine has been designed and built according to the state of the art correspondent to the relevant safety requirements of the EC, the relevant accident prevention regulations and the relevant rules of the DVGW and VDE, effective at the time of delivery. These instructions include important information to operate the machine safely, appropriate and economically. Careful adherence helps to avoid risks, reduce cost of repairs and downtimes as well as to increase the reliability and the service life of the machine. Therefore, read the instructions in detail and with care and contact the manufacturer with any open questions.

2 Important general information

2.1 Scope of delivery

Table 1: Scope of delivery

Description	Qty.	Note
separator unit	1	pre-assembled, plug-in ready
set of hoses	1	




2.2 Documentation

2.2.1 Notes regarding the instructions

- These instructions are to be amended with local respectively national regulations referring to accident prevention and environmental protection.
- These instructions have to be available at the site of operation at all times.
- Prior to operation read these instructions completely. Pay especially attention to the safety indications.
- These instructions address personnel with basic technical knowledge dealing with machines like the herein described one.
- Keep all documents delivered with the machine to inform yourself when required.
- Observe the operational and maintenance indications in these instructions.
- The manufacturer shall not be held liable for damage resulting from nonadherence to the operating instructions.

2.2.2 Labelling concept of text and references

Information in these instructions are labelled as follows:

	WARNING	Warning of personal injuries or environmental damages.
	CAUTION	Warning of damage to property.
	NOTICE	Supplementary details.

- Numbers in figures (1, 2, 3 ...) refer to correspondent numbers in parentheses (1), (2), (3) ... in adjoining text or position numbers in tables.
- Instructions to be performed in sequence are numbered (1., 2., 3., ...)
- Lists are labelled with a dot (•, •, ...)

3 Safety

3.1 Intended use of the machinery

3.1.1 Personnel requirements

The machine may only be operated by adequate, qualified, trained, instructed and authorized personnel. The aptitude has to be ensured and accounted for according to local applicable laws.

The operating institution of the machinery is obligated to inform the personnel about modifications of the machine and to train them as necessary.

3.1.2 Intended use

The machine may only be used in perfect technical condition, for its intended use, safety- and risk-conscious while observing the operating instructions. Especially disturbances and deficiencies possibly impairing safety must be remedied immediately. Part of the intended use is also the adherence to the maintenance instructions.

The machine has been designed for the conditions as described in chapter "5 Technical data". It serves exclusively to extract cooling lubricant contaminated with tramp oil during the production process from the production machinery, to separate the tramp oil from the cooling lubricant and to re-provide the cleared cooling lubricant to the production machinery.

Modifications to the machine are subject to written approval by Müller Gerätebau GmbH. Any modification has to be checked by Müller Gerätebau GmbH prior to use.

3.1.3 Unauthorised use

Any other use as well as use beyond to the above described shall be considered as improper, unintended and unauthorised use. Müller Gerätebau GmbH is not liable for any injuries or damages resulting of unauthorised use. In case of unauthorised use, the risk shall be borne by the operating institution.



WARNING Particularly, it is not allowed to bring the following media into the machine's closed loop:

- flammable liquids – risk of explosion!
- non-halogenated solvents – exceedance of the allowable MAC-values, acute health hazard!

3.2 General safety indications

- Regardless of the indications in this operating instruction, in either case the legal safety- and accident prevention regulations apply for the operation of the machine.
- Unauthorised modifications to the machine excludes the liability of the manufacturer for subsequent damages.
- Any modification to control or safety equipment is prohibited.
- With consideration to the installation location of the machine, further personal protective equipment (PPE) might be required. Thereby legal regulations and regulations of the operating institution have been adhered to.
- To prevent fire hazard, keep the machine clean!
- Covers and safety equipment must not be disassembled or rendered inoperatively.
- The operating institution of the machine is in charge of and responsible for that:
 - the regional and machine-specific safety regulations are adhered to and are accessible to the personnel at all times;
 - the machine is only operated in perfect technical condition;
 - the maintenance procedures as indicated in the operating instructions are observed and documented in writing.

3.3 Safety indications installation

- To avoid hazards and accidents adhere to the assembly sequence as provided by the manufacturer.
- Use only intact and well-fitting tools. Damaged, soiled and/or inappropriate tools may put the user at risk and may lead to severe injuries.
- Prior to the assembly all components and their junctions have to be checked for potential damages and deviations. Damaged components must not be used and are to be replaced with original spare parts.
- To preserve the quality, individual components are only to be placed on clean and dry surfaces and are to be covered if necessary.
- After the assembly a function check of the machine has to be performed and documented in writing.

3.4 Safety indications initial operation

- Prior to the initial operation, all components are to be checked for correct position. Deviations are to be corrected prior to the initial operation.
- Prior to the initial operation make sure that:
 - media supplies are installed correctly;
 - all functions and mechanisms are checked by for this purpose appropriately trained personnel.

3.5 Safety indications maintenance

- Repair work, maintenance and cleaning work as well as remedial action must be performed only with the machine switched off! Secure it against being switched on again.
- On a regular basis check all nuts, bolts, hose couplings and connectors are firmly seated and tighten them where required.
- When working on the machine use appropriate tools and wear adequate PPE (protective gloves, protective shoes, protective clothing and safety goggles).
- Dispose of oil and grease properly according to local regulations.
- Prior to work on the electrical system always interrupt the power supply and apply the "5 safety rules".
- Spare parts shall match at least the requirements set by the manufacturer. This is granted for example with original spare parts.
- Perform any work only with approved and intact tools.
- For the safe operation of the machine perform the specified repair work and maintenance always on time.
- If covers or safety equipment have to be removed to perform repair work or maintenance, they have to be reinstalled prior to recommissioning.

3.6 Safety indications operation

- Only qualified, trained and instructed personnel may be ordered to work with the machine.
- Required PPE has to be set out by the operating institution according to on-site conditions and compliance has to be ensured.
- Prior to operation the operator is required to check the machine for proper condition.
- Deficiencies respectively abnormalities during operation are to be reported to the responsible person immediately and correction of the defects has to be initiated promptly.
- When realising faults and/or damages, the machine must be switched off immediately and the correction of the defects has to be ensured prior to recommissioning.
- Occurrence of on-site specific situations that could not have been foreseen at time of design of the machine and preparation of the documentation, the operating institution is responsible for the safe operation of the machine. It is recommended to suspend operation until adequate measures to restore the safety of operation have been taken.
- To provide a safe operation, the operating institution, the responsible person and the operator are responsible for the adherence of instructions at hand..

3.7 Safety marking on the machine



NOTICE: Keep all safety markings on the machine always in a readable condition. Re-place non-readable safety markings with original spare parts by Müller Gerätebau GmbH.

Safety markings indicate danger areas at the machine and warn of residual dangers that are permanently present or may occur unexpectedly.

Figure 1 and Table 2 show all safety markings and other labels and their positions used on the machine.

No.	Symbol	Standard	Description
1		ISO 7010	Warning; Electricity
2	-	-	label regarding water hardness

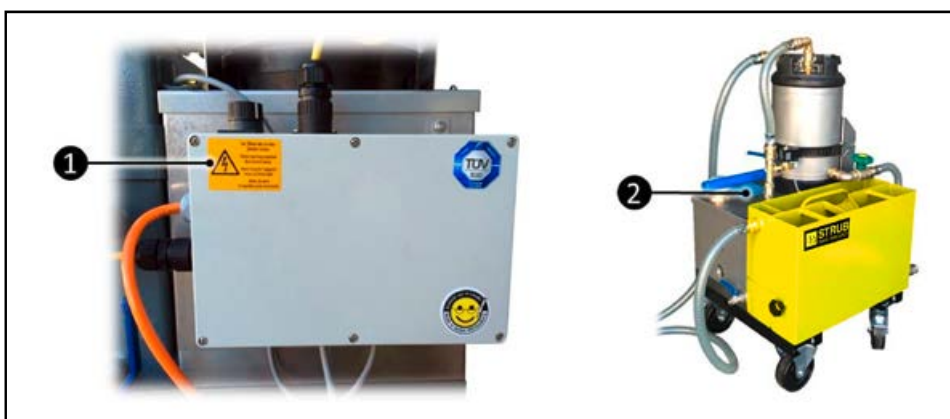


Figure 1: Safety markings and labels on the machine

4 Layout and function

4.1 Process description

The machine works in cycle operation. By means of underpressure generated by a water jet pump, liquid is siphoned off from the liquid surface of the cooling lubricant reservoir of the production machinery via a telescopic skimmer and pumped into the vacuum receiver tank until it is full. Then the receiver tank is aerated and the liquid flows into the oblique plate filter. Tramp oil contained in the liquid surfaces and flows over the spill into the tramp oil collection container. The cleared cooling lubricant flows back to the production machinery via the drainage hose. After the vacuum receiver tank has been drained the cycle starts again.

4.2 Layout

The layout is shown in Figure 2 in conjunction with Table 3.

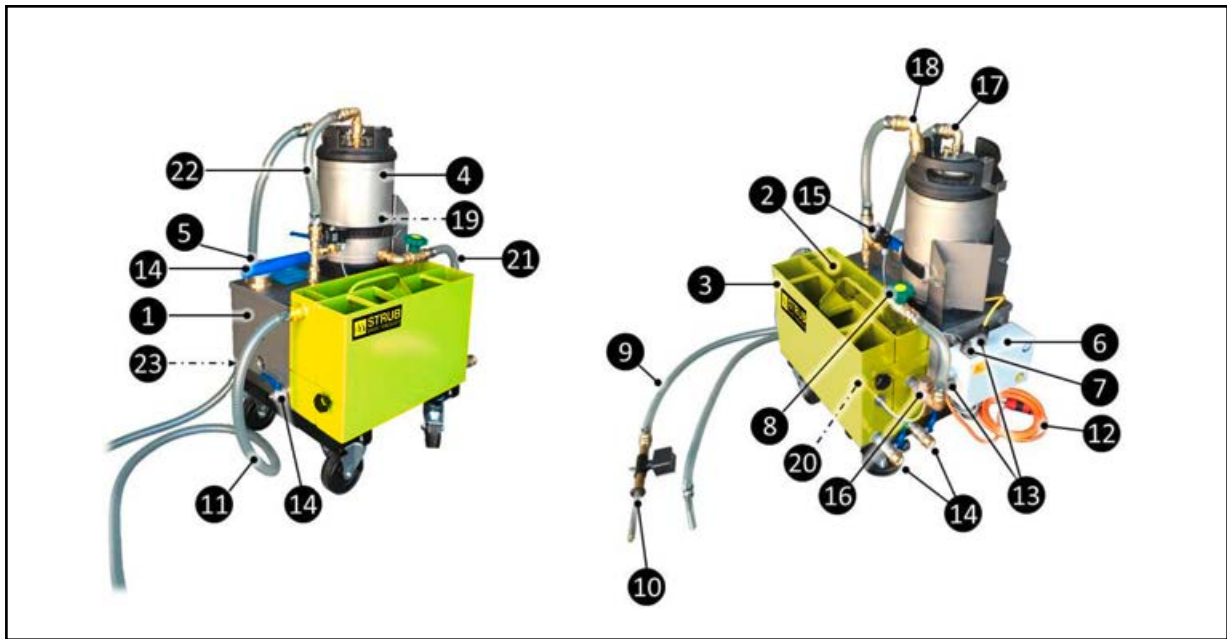


Figure 2: Layout of the machine

Pos	Description	Order No.	Pos	Description	Order No.
1	water container	S161	13	plug connector	S216
2	oblique plate filter ¹	S014	14	cleaning drainage with ball valve	S184 + 11010500
3	tramp oil collection container	S036	15	solenoid valve - without T-fitting - with T-fitting, complete	S101 S180
4	vacuum receiver tank	S169	16	check valve, complete	S100
5	air vent 2"	26010801	17	connection angle, complete	S217
6	electric control cabinet	S162	18	safety valve	S119
7	ON-/OFF switch	S214	19	floating switch receiver tank	47080400
8	rotary knob control valve	59040100	20	floating switch tramp oil collection container	47080400
9	suction hose	S117	21	hose NS 19x230mm	S106
10	telescopic skimmer - with magnetic holder - without magnetic holder	S037 S070	22	hose NS 19x350mm	S182
11	drainage hose	S118	23	pump BCTM 61	S091
12	electrical power cable	S215			

Table 3: Layout of the machine

4.3 Safety equipment

The pump is fused by a motor protection switch, the control and electrical system is tested according to VDE 0701-0702. The tramp oil collection container is equipped with a safety floating switch, that switches the machine off when a specific oil level is exceeded. Should plug connectors be disconnected, the machine will also be switched off. Safety markings are attached to the machine according chapter 3.7.

5 Technical data

Table 4: Technical data

Capacities		
water container (fill-up quantity)	[l]	~24
vacuum receiver tank	[l]	~18
tramp oil collection container	[l]	~15
Performance data process technology		
suction output	[l/h]	max. 250
tramp oil discharge	[l/h]	max. 35
Dimensions		
length x width x height	[mm]	~750 x 500 x 950
Mass		
separator unit, complete, empty	[kg]	~40

¹The oblique plate filter is protected by patent DE102004019871.

Approvable media		
water-mixed cooling lubricants (emulsions), mineral oil based or synthetic in usual concentration		
Airborne noise emission		
emission sound pressure level at workstation	[db(A)]	<70
Electrical power supply		
connection	[V AC / PH / Hz]	230 / 1 / 50
implementation	[-]	PE+N
connection power	[kW]	0,45
current consumption	[A]	3,5
fuse protection in supply line	[A]	16
Ambient conditions		
operating temperature	[°C]	+5 - +40
interior, industrial environment		

6 Delivery, unpacking, storage

6.1 Safety

- Always pay attention to the steadiness of the machine during all delivery, unpacking or storage operations.
- The delivery, unpacking and storage location shall be dry and shall have an adequately stable, flat and dry floor. Cover the machine with a clean and dry tarpaulin if necessary.



WARNING Risk of injury by overstressing when performing manual lifting or transport operations.

6.2 Delivery and unpacking

The machine will be delivered pre-assembled. On delivery check the machine immediately for transport damages. Transport damages have to be reported at once to Müller Gerätebau GmbH. Prior to installation of the machine, packing material (cardboard, plastic sheets or the like) has to be removed. Thereby the machine has to be checked again for any damage and has to be cleaned if necessary.



WARNING If the machine is damaged, all damages have to be repaired accordingly prior to initial operation.

6.3 Storage conditions

The machine must be stored above 0°C (frost-proof), dry and protected from weather exposure. For long-term storage confer with the manufacturer Müller Gerätebau GmbH about suitable preservation measures.

7 Assembly and installation, initial operation

Refer to Figure 2 to identify the following position numbers.

7.1 Assembly and installation

1. Roll the separator to the desired location and activate the roller arrestor.
2. Connect the suction hose (9) with the separator at the correspondent connection angle (17) and with the telescopic skimmer (10).
3. Fix the telescopic skimmer with magnetic holder to the cooling lubricant reservoir of the production machinery in such a way that the movable telescopic tube submerges half way into the liquid.
4. Connect the drainage hose (11) to the connection of the oblique plate filter (2) and run the hose back to the cooling lubricant reservoir. Take care that the hose has always downward slope and that the bend cannot slide out of the cooling lubricant reservoir.

7.2 Initial operation or recommissioning

7.2.1 Safety



WARNING It is not allowed to operate the machine with missing, damaged or worn out safety devices.



CAUTION After longer periods of standstill, prior to recommissioning check, if the pump impeller has been blocked by dirt, settling sediment or other causes. If necessary clean the pump by appropriate means.

7.2.2 Procedure

1. Check all hose couplings are firmly seated.
2. Check all connectors (13) for correct installation.
3. Make sure, all ball valves (14) are closed.
4. Open the air vent (5) and fill the water container (1) with water up to the middle of the upper sight glass (refer to Figure 4). Reattach the air vent.



CAUTION Use soft water only (< 5° d.H. - German water hardness)! When using water with a water hardness > 5° d.H. expect furring. To prevent seizing of the pump, descaling is required on a regular basis (depending on the degree of furring). Nonobservance may lead to damages to the pump and may void the warranty.

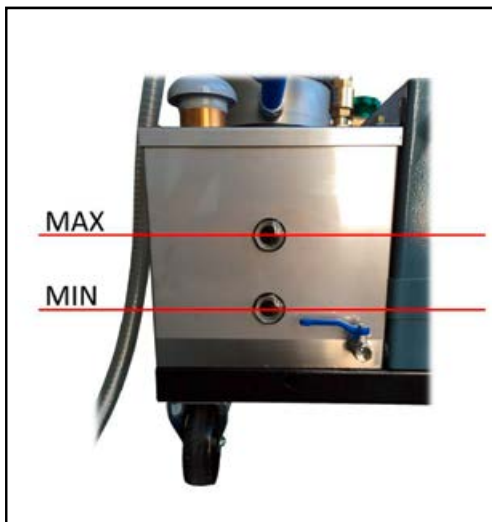


Figure 4: Filling level of water container

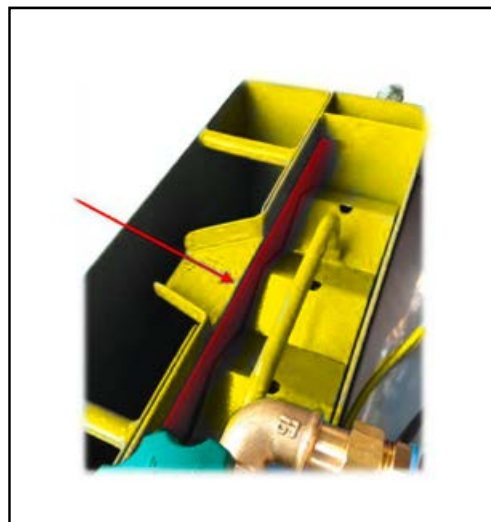


Figure 3: Filling level of cooling lubricant in oblique plate filter

5. Fill the oblique plate filter (2) up to the spill with clean cooling lubricant.
6. Plug in the plug of the power cable (12) into a properly installed and fused power outlet.

7. Switch on the separator using the ON/OFF switch (7). Now, the separator will fill up the vacuum receiver tank.



CAUTION Operate the machine only with the water container filled according 4. to prevent dry running of the pump. Non-observance may lead to damages to the pump and may void the warranty!

8. During the silent part of the cycle (pump is off, polluted cooling lubricant is flowing from the receiver tank into the plate filter) adjust the control valve (8) such, that the clean cooling lubricant level is just at the spill (refer to Figure 3) and the tramp oil coming to the surface flows over the spill into the tramp oil collection container (3) - adjustment of the control valve can only be performed during the silent part of the process cycle.

8 Operation

8.1 Safety



WARNING Only authorised personnel may operate the machine.



WARNING Prior to each operation, the operator is required to make sure that the machine is ready for operation and is in perfect technical condition, to prevent any endangerment of persons and objects.



WARNING Operators must report detected defects, damages, accidents, malfunctions and other irregularities to the foreman immediately.



WARNING In case of imminent danger to persons or the machine, perform all necessary measures immediately to neutralise any cause of danger or damage..



NOTICE The operating institution is obligated to determine and appoint the tasks of the person responsible for the proper operation of the machine and all corresponding equipment.



NOTICE The responsibilities for operation, maintenance and repair have to be clearly defined by the operating institution.

8.2 Switch-on

1. Check and make sure all hose couplings are properly established and all drain units are closed.
2. Plug in the plug of power cable into the power outlet.
3. Switch on the separator using the ON/OFF switch..

8.3 Continuous operation

In principle, there is no operator intervention required during continuous operation. However the separator has to be checked on a regular basis for unusual noise, leakage and the filling level of the tramp oil collection container.

8.4 Automatic shutdown

In case the machine shuts down because of overfilling of the tramp oil collection container, drain or extract the tramp oil into appropriate containers. In case of unexpected shutdown of the pump, follow the indications in chapter 9.3.

8.5 Switch-off

1. Switch off the separator using the ON/OFF switch.
2. Disconnect the plug from the power outlet.

For longer periods of standstill, drain and clean the machine and follow the procedure according chapter 7.2 for recommissioning.



CAUTION Especially in case of risk of frost, make sure to drain also the pump.

9 Malfunctions

During the daily inspections, it is recommended to check for unusual noise and leakage of the machine. In case of doubt, switch off the machine and confer with the manufacturer.

9.1 Safety


 WARNING Remedy of disruptions only with the machine switched off - disconnect the power cable to prevent unintentional restart.

 WARNING Prior to work on the electrical system disconnect the power supply and adhere to the "5 electrical safety rules".

9.2 Power outage

After a power outage, the machine will continue to operate automatically.

9.3 Troubleshooting

 NOTICE Should the machine appear to have stopped, check first, whether the separator is in the silent process cycle (polluted cooling lubricant is flowing from the receiver tank into the plate filter), respectively check the filling level of the tramp oil collection container and drain it if necessary.

In case of doubt, confer with the manufacturer and call the service!






Table 5: Troubleshooting

Indication	Cause	Remedy
no suction	machine out of operation	check, if power cable is plugged in, if necessary plug in respectively check power supply (fuse) and restore; switch on machine
	machine in silent cycle	wait until receiver tank has drained and machine switches to suction cycle
	tramp oil collection container full	extract or drain tramp oil collection container
	plug connectors not correctly connected	check plug connectors
	telescopic skimmer not submerged in liquid	check telescopic skimmer for free movement; check and correct position
	pump is running even though receiver tank is empty	check pump; check filling-level sensor receiver tank

Indication	Cause	Remedy
inadequate suction	water level in water container too low	refill water up to upper sight glass
	water level in water container too high	drain water down to upper sight glass
	foam generation in water container	change water
	safety valve polluted/blocked	clean safety valve
	swarf/abrasion in connection angle of suction hose	clean connection angle
cooling lubricant in tramp oil collection container	oblique plates blocked	clean plate filter, see chapter 10.3
vacuum receiver tank will not drain completely	control valve wrongly adjusted	adjust control valve
	bleed valve does not open	check bleed valve
	vacuum receiver tank polluted	clean receiver tank
	plate filter polluted	clean plate filter
plate filter is extracted during suction cycle	check valve does not close completely due to swarf/pollution	clean check valve

10 Inspection and maintenance

10.1 Indications

-  WARNING Always adhere to the general safety indications (see chapter 3), the relevant accident prevention regulations and all other applicable regulations when performing inspections or maintenance!
-  WARNING The described maintenance work, if not specifically demanded differently, is only to be performed with the machine switched off!
-  WARNING If the disassembly of safety equipment is required to perform maintenance or repair, reassembly and testing has to be performed immediately after finishing maintenance or repair!
-  WARNING All work has to be coordinated between the foreman and personnel performing the work.
-  WARNING Always tighten bolted connections and check leak tightness if applicable after maintenance and repair!

Malfunctions caused by insufficient or inadequate maintenance may cause high repair costs and long standstill periods of the machine. Maintenance on regular basis is therefore essential.

Chapter 10.2 includes indications for regular maintenance for normal use of the machine.

Refer also to the relevant documentation of the individual components (see chapter 13).

Our service will be available to help you with further advice.

The inspection and maintenance procedures laid out in this instruction have to be adhered to and documented in writing!

Should nevertheless an extensive or unusual repair be required, ask Müller Gerätebau GmbH for advice or ask for support of Müller Gerätebau GmbH.

In case a repair is deemed necessary, only original spare parts shall be used as other spare parts may have negative effect on the safety of the machine. Müller Gerätebau GmbH cannot assume any liability for unauthorised spare parts.

Observe all relevant regulations for disposal of disassembled, defective components.

10.2 Regular maintenance and inspection

The maintenance and inspection procedures to be performed on a regular basis are specified hereinafter.



CAUTION The operating institution is responsible for the preparation of a maintenance cycle that is adapted to the actual contamination and for the adherence to these procedures.

1. daily

- Checking for unusual noise and leakage.
- Check the correct level of the liquid in the oblique plate filter and if necessary establish the correct level by re-filling and/or adjustment of the control valve (refer to 7.2.2).
- Check the water level (above the lower sight glass) and condition of the water (no foam generation, no turbidity) in the water container. If necessary proceed as described under 2.

2. as required (depends on the degree of contamination)

- Checking of the liquid level of the tramp oil collection container. If necessary extract or drain the tramp oil and dispose of according environmental and local regulations..
- If the water level in the water container is too low, refill the container with soft water up to the middle of the upper sight glass.
- Should foam generation or turbidity occur in the water container, drain the water and refill the container again with clean, soft water up to the middle of the upper sight glass.
- Clean the separator (refer to chapter 10.3).

10.3 Cleaning



WARNING Collect sewage generated during cleaning, as it might be contaminated with oil and additives of the cooling lubricant.

Clean the separator according the following order:

1. Switch off the machine (see 8.5) and bring it to a suitable washing area (i.e. a washing area that meets environmental regulations).
2. Drain liquids from the vacuum receiver tank, from the plate filter and from the tramp oil collection container via the drain units into appropriate containers and dispose of according the relevant regulations.
3. Clean outer dirt.
4. Cleaning of the tramp oil collection container:
 - a. disconnect the plug connector;
 - b. take off the container by loosening the star grips;
 - c. clean the container with a high-pressure cleaner.
5. Cleaning of the vacuum receiver tank:
 - a. unscrew the hose connections;
 - b. disconnect the plug connector;
 - c. loosen the clamping rubber;
 - d. open the cover plate by loosening the wingnut;
 - e. clean the tank with a high-pressure cleaner.
6. Cleaning of the oblique plate filter:
 - a. remove the rubber seal and afterwards the oblique plate filter block (make sure you have drained the liquid beforehand), see Figure 5;
 - b. clean the oblique plates and the container with a high-pressure cleaner.



Figure 5: Removal of the oblique plate filter block

7. Reassembly of the separator - part 1:
 - a. insert the oblique plate filter block and the rubber seal - pay attention to the correct seating of the rubber seal, see Figure 6;
 - b. assemble the tramp oil collection container;
 - c. close the vacuum receiver tank and fasten it with the clamping rubber;
 - d. reconnect all plug connectors;
 - e. close all ball valves.

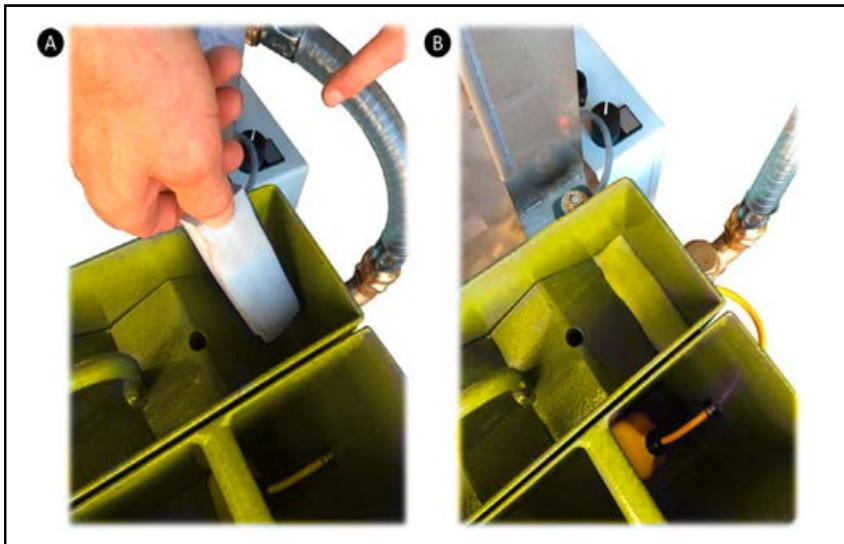


Figure 6: Placing of the rubber seal in the oblique plate filter

8. Disinfection:

- a. establish a hose connection between the drain unit of the oblique plate filter and the connection angle of the suction hose of the vacuum receiver tank;
- b. fill the oblique plate filter with disinfectant up to the spill;
- c. open the ball valve of the drain unit of the plate filter;
- d. connect the separator with the power supply, switch it on and wait for two complete cycles;
- e. switch the separator off and disconnect it from the power supply;
- f. disconnect the hose connection established in a.;
- g. drain the disinfectant from the vacuum receiver tank and the plate filter into appropriate container.

9. Reassembly of the separator - part 2:

- a. re-establish correctly all hose connections (see Figure 2);
- b. proceed according to chapter 7.1 and 7.2.

11 Disassembly and disposal

Separate and environmentally conscious disposal of material supports the reusability of recyclable material. Therefore, at the end of the period of use provide the machine itself, all individual components, lubricants, wear parts, packing material, etc. to the recyclable material collection.

Packing materials, machine and accessories consist of recyclable material and should be disposed of accordingly.

Make sure that disused devices are dismantled prior to disposal.

Prior to disassembly all container, tanks, hoses and pipes have to be drained, the machine has to be purged respectively cleaned. As the case may be, filter and seals have to be disposed of as hazardous waste. **Make sure that when draining, cleaning, disassembling or disposing of the machine the local regulations for sewage treatment and disposal are adhered to.**



WARNING: If you don't have the required expertise, order a specialist for disassembly and disposal.

12 Additional documents

12.1 EC-Declaration of conformity



The machine is in accordance with the European Directives 2006/42/EC and 2014/30/EU.
For details refer to the attached complete declaration of conformity.

12.2 List of spare parts

- see chapter 4.2 -

12.3 Electrical circuit diagram

- see separate attachment -

13 Documentation of supplier components

Deposited as separate attachment:

- Original instructions of the pump

Revision list

Revision	Description	Author	Date
A	first version	A. Prinzing*	23.04.2016

*Ludwig Prinzing Ingenieure, Freudenstadt, Germany

Impressum

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Representative: Walter Müller
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**14 Accessoires /
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Scissors Lifting Table



200 Feets 5404



400 Feets für 5404