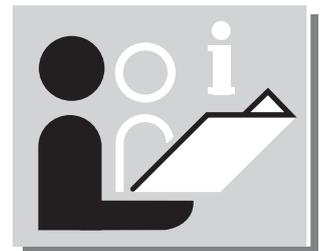
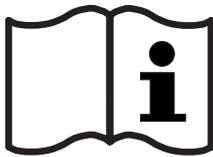
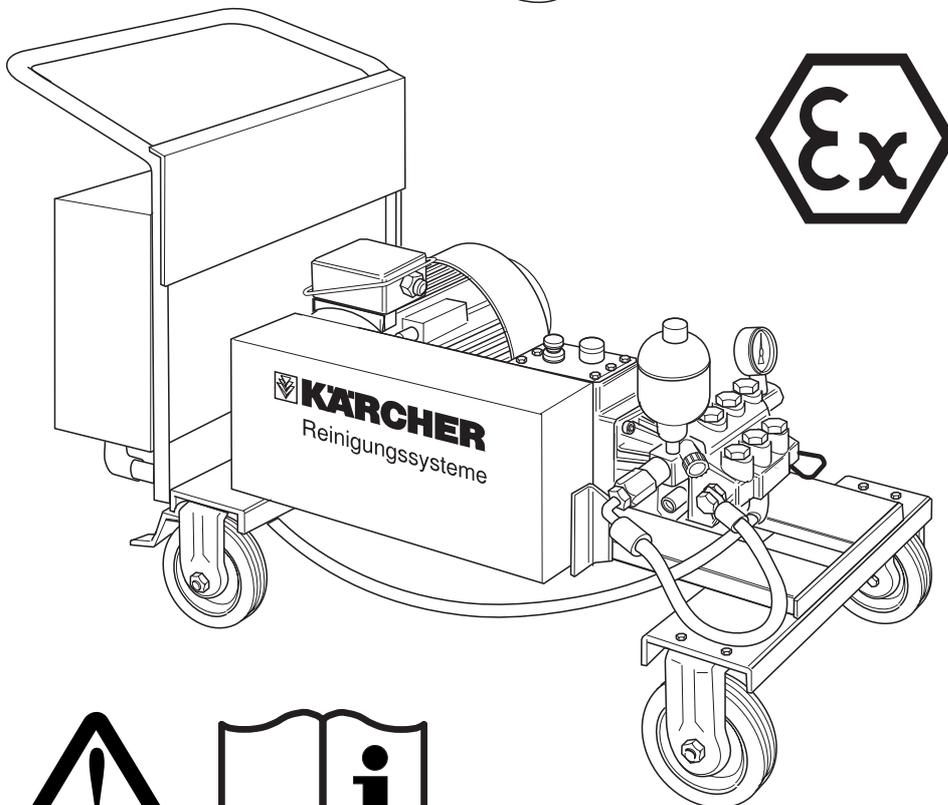
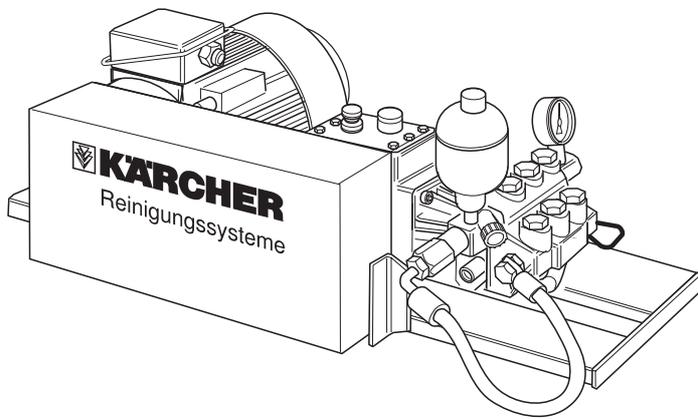




KÄRCHER

SHD-R 3000 Betriebsanleitung



Operating Instructions

To be handed to the operator

Read these instructions carefully before starting up the unit

Retain for future reference

Notes about these operating instructions

Before starting up the interior cleaner for the first time, please carefully read through these instructions. In particular, you should note all the safety information. Store these instructions in a safe place for future use.

For whom are these instructions intended

■ All users

Users are persons who have received instruction on how the system functions, operators and trained specialists.

■ Trained specialists

Trained specialists are persons who are professionally qualified to install and commission this type of system.

Environmental protection

Please dispose of the packaging in an environmentally friendly way.

The packaging materials are recyclable. Please do not throw the packaging into the domestic waste but in the appropriate recyclable waste collection containers instead.

Please dispose of old units in an environmentally friendly way

Old units contain valuable recyclable materials, which should be reused. You should never allow oil and similar materials to get into the environment. Therefore, please dispose of old units via suitable collection systems.

Cleaning liquids

Please do not allow them to get into the environment. Please protect the soil and dispose of waste oil in an environmentally friendly way.

Waste water containing mineral oil (i.e. petrol, etc.)

Please do not allow this waste water to get into the ground, bodies of water or the sewers.

Mineral oil in the high-pressure pump

Mineral oil is used to lubricate the high-pressure pump. The waste oil resulting from an oil change, any oil and water mixture that may occur, and rags that have been soaked in oil should be delivered to a proper collection point for disposal.

Important!

Waste oil may only be disposed of by the operators of special collection points. Please deposit your waste oil at one of these locations. Polluting the environment with waste oil is a criminal offence.

Detergents

KÄRCHER detergents possess demulsifying properties (ASF). This means that they do not interfere with the function of an oil separator.

Important

These instructions contain descriptions of different types of system, accessory kits and other supplementary components. There are significant differences between the various parts so that you should not encounter any problems with identifying all the parts in your particular type of system.

A. For your safety	E. Care and maintenance
1. Safety information and instructions	1. General information
2. Noise protection	2. Maintenance schedule
3. Authorized operators	3. Maintenance tasks
4. Personal protective equipment	
5. Emergency drill	F. Troubleshooting
6. Safety devices	1. Fault-finding
7. Applicable regulations	
8. Using the system for its intended purpose	G. Mounting kits and accessories
9. Special conditions in hazardous area	1. Mounting kits (non-hazardous area)
10. Schematic diagram of area classification	2. Mounting kits (hazardous area)
11. Area classification	3. Accessories
	H. Warranty
B. Types of system, and operating information	I. System installation
1. Types of system	
2. System start-up	J. Declaration of Conformity
3. System shut-down	
C. System functions	K. Test record
D. Technical specifications	

1. Safety information and instructions

The following symbols are used throughout these Operating Instructions:



Denotes an immediate and present danger. Failure to observe this notice could lead to severe injury or death.



Denotes a potentially hazardous situation. Failure to observe this notice could lead to minor injuries or damage to property.



Denotes operating hints and important information.

Errors in operation or misuse can result in danger to the operator or other persons due to:

- high water pressure,
- hot liquids,
- high voltages,
- detergents and solvents,
- Explosion hazard.

In order to avoid errors in operation or potentially dangerous situations, read the following before starting the system up for the first time:

- all safety information in the enclosed brochure "Safety information for high-pressure cleaning units" No. 5.951-949,
- these operating instructions,
- the legal requirements that are currently applicable in your country.

All persons charged with the installation, commissioning, operation, maintenance or service of the machine are required:

- to be appropriately qualified,
- to read and observe these operating instructions,
- to be aware of and observe associated regulations.

2. Noise protection

The sound level generated by the system is 80 dB(A).

A noise hazard can occur if the water jet is directed at resonating components (e.g. large metal panels). In this case a hearing protection device must be worn.

3. Authorized operators

The operation of the system is restricted to persons over the age of 18 who have received proper instruction as to how this system is to be used (For exceptions for trainees see BGV D15 Art. 6).

4. Personal protective equipment



Health hazard due to cleaning fluids.

Wear the prescribed protective equipment for the cleaning liquid to be used, e.g.

- *protective clothing/overalls,*
- *protective goggles or face mask,*
- *watertight gloves,*
- *watertight shoes.*

5. Emergency drill

- Turn mains supply voltage off at system master switch.
- Turn off supply of cleaning liquid.
- If a handgun is being used, release any remaining pressure in the system by pressing the lever on the handgun.

6. Safety devices

Safety valve



Danger!

Injury hazard due to excessive pressure within system. Do not adjust safety valve. The safety valve has been preset and sealed in the factory. Adjustments should only be made by a Kärcher Customer Service engineer.

7. Applicable regulations

Accident prevent regulations

- Working with liquid sprayers BGV D15.

If water is used as the cleaning liquid:

- Observe local regulations for disposal of waste water.
- Waste water should be directed into the main drainage system in accordance with local regulations.

If the water to be used is drawn from the main supply network:

- Install a mains disconnect to EN 1717 (e.g. float tank with float valve),
- BetrSichV (industrial safety regulations).

If acids, alkaline solutions or solvents are to be used:

- Observe the legal requirements that are currently applicable in your country. In Germany the regulations of the industrial employer's liability insurance associations apply (BGI 504).
- Observe instruction leaflets provided by manufacturers of the detergent concentrates that are to be used with this system.



Important!

According to the UVV (accident prevention) Guidelines (BGV D15, Art. 23), high-pressure sprayers must be checked by an expert with the initial startup and at least every 12 months thereafter. Kärcher Customer Service engineers are qualified to carry out the prescribed tests on your system.

The results of the test procedures must be recorded in writing. A form into which the test results can be entered is shown in Chapter K: Test Record.

8. Using the system for its intended purpose

This system is used for pumping a cleaning liquid at high-pressure, for the purpose of:

- with the handgun attached – cleaning containers, boxes, cases and equipment parts, etc.
- with the interior cleaner attached – cleaning enclosed containers, drums, barrels, etc.

Cleaning the following is considered to be contrary to the intended purpose, and is strictly forbidden:

- Persons and animals
The high-pressure jet represents a serious injury hazard.
- Loose objects
Such items could be catapulted away by the high-pressure jet, causing damage to property or injury to persons.

If water is used as the cleaning liquid, the system must be protected against freezing temperatures. Damage could be caused if water freezes inside the system.



9. Special Conditions in a hazardous area

1. The pump may only be used in zones which correspond to the type of explosion protection given on the rating plate.
2. The cleaning liquid must not contain more than 1% by weight of undissolved solids.
3. The interior cleaner must be electrostatically grounded.
4. The cleaning liquid pump may only be run if it is filled with liquid.
5. The nominal pressure of the pump must not exceed 50 bar when used with solvents.

6. The pump's flow rate must not exceed 50 l/min when used with solvents.

7. The operating temperature of the cleaning liquid, made up of water with cleaning agent, must not exceed 60 °C.

8. The operating temperature of the cleaning liquids must not exceed 20 °C where solvents, lyes (alkali solutions) and acids are used.

9. The pump must be inspected after a reasonable operating time to ensure it has a faultless condition and function (among other things, bearings for wear, pump for leaks, tension in the V-belt). Repair if necessary.

10. The pump may only be operated with cleaning liquids against which the materials from which the pump is made have adequate resistance.

11. Cleaning liquids, which contain combustible solvent fractions, must correspond to the temperature classes IIA and IIB. Solvents in the temperature class IIC must not be sprayed.

12. The pump may only be operated in Zone 1 during cleaning. Ensure compliance with the conditions applicable within the scope of the BetrSichV (industrial safety regulations) and other national conditions.

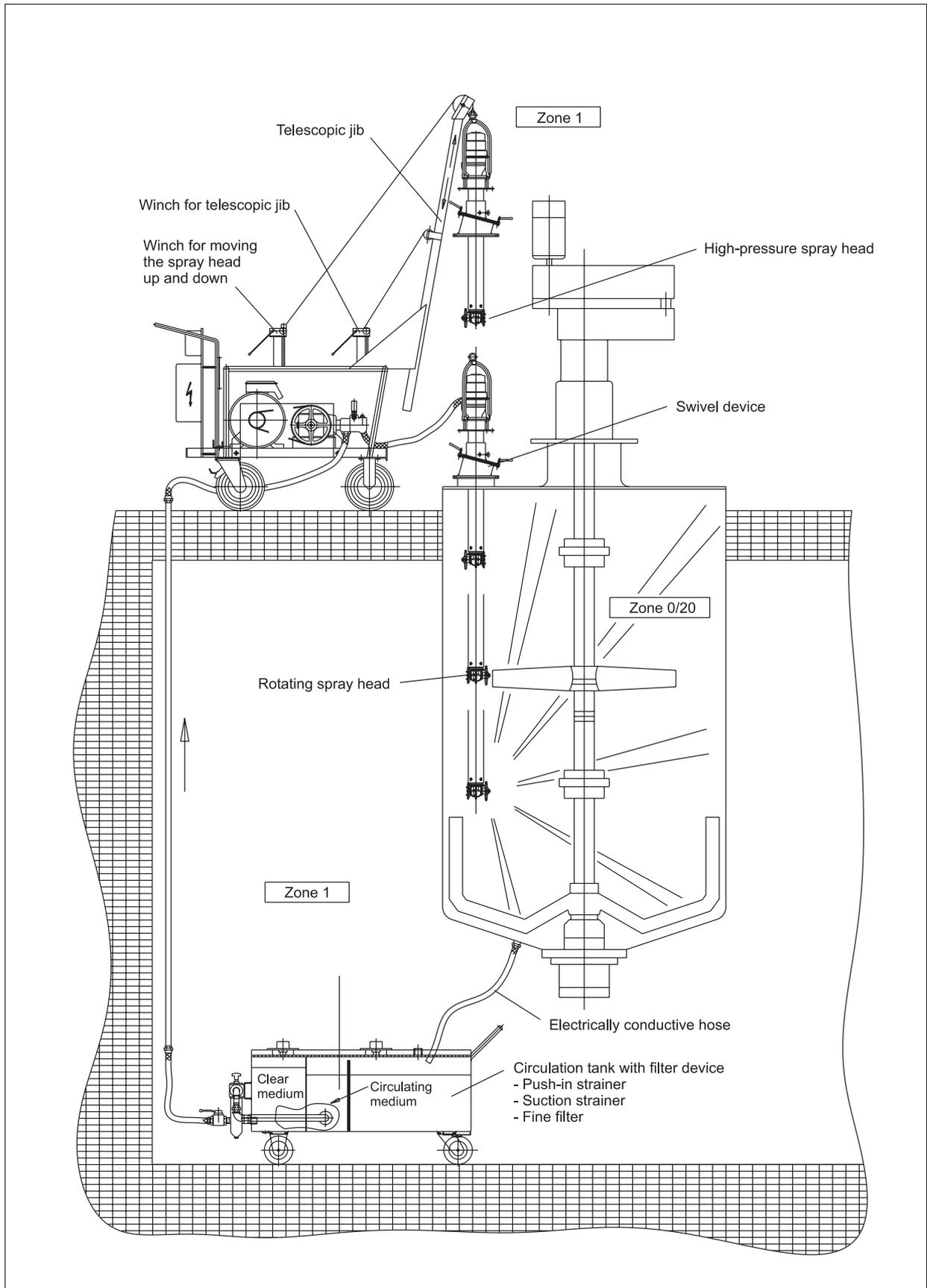
13. Hoses must be electrostatically conductive (resistance $R < 1 \text{ M}\Omega$).

14. Only use cleaning liquids with a conductivity $G > 1000 \text{ pS/m}$.

15. All parts in contact with the media are to be connected to the earth connection system.

16. The electric motor used must have a prescribed type testing certificate to 94/9/EC.

10. Schematic diagram of area classification





11. Area Classification

In the BetrSichV and EN 1127-1, hazardous (potentially explosive) areas are classified into zones according to the frequency and duration of the occurrence of hazardous, potentially explosive atmospheres.

It is the responsibility of the owner/operator to define these zones.

Notes on area classification are given in the BetrSichV, EN 1127-1, BGR 104 - Ex-Guidelines of BG Chemie and in DIN EN 60 079-10.

Zone 0

is an area in which hazardous, potentially explosive atmospheres exists constantly, for long periods of time or frequently as a mixture of air and combustible gases, vapours or mists.

Zone 1

is an area in which hazardous, potentially explosive atmospheres consisting of a mixture of air and combustible gases, vapours or mists can occasionally form during standard operation.

Zone 2

is an area in which hazardous, potentially explosive atmospheres consisting of a mixture of air and combustible gases, vapours or mists do not normally occur during standard operation or only for a short time.

Zone 20

is an area in which hazardous, potentially explosive atmospheres in the form of a cloud of combustible dust contained in the air exist constantly, frequently or for long periods of time.

Zone 21

is an area in which hazardous, potentially explosive atmospheres in the form of a cloud of combustible dust contained in the air can occasionally form during standard operation.

Zone 22

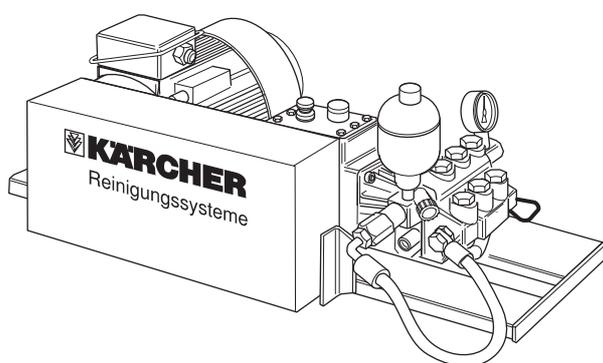
is an area in which hazardous, potentially explosive atmospheres in the form of a cloud of combustible dust contained in the air do not form during standard operation or only for a short time.

1. Types of system

Static or mobile systems

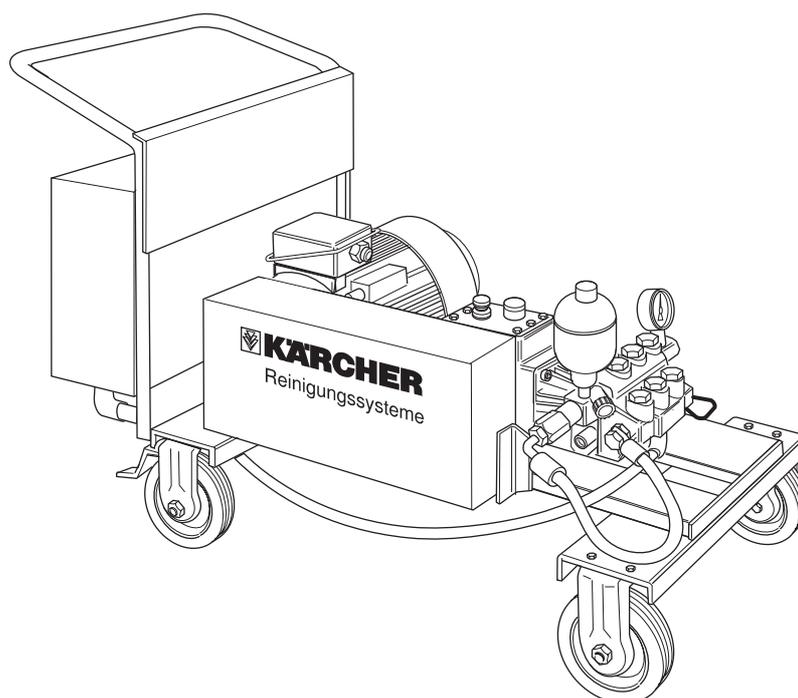
The static system

- is intended to be installed on a base,
- has been mounted onto a rigid steel frame,
- is most suitable for use in conjunction with fixed-installation high-pressure lines.



The mobile system

- has been mounted onto a trolley,
- can be used in different locations.



Cleaning liquids			
Type of system (see rating plate)	Cleaning liquid	Working pressure/ Pressure setting for safety valve [bar]	Comments
SHD-R 3000 (F)	- Water - VE-water* - Water with Kärcher-RM	50/65	Standard version
SHD-R 3000 (F) S	- Water - VE-water* - Water with Kärcher-RM	85/100	Standard version with increased working pressure
SHD-R 3000 (F) SVA	- Water - VE-water* - Water with Kärcher-RM	85/100	Pump parts that come into contact with the cleaning liquid are made from stainless steel.
VE	Fully demineralised water		
*	Conditionally resistant, use possible, however Cu and Zn ions in the medium		
RM	RM Alkali cleaning agent: e.g. RM31 (max. 0 - 2%) Acidic cleaning agent: e.g. RM25 (max. 0 - 1%) Max. temperature + 60°C (Higher temperatures available on request - precompression pump required!)		
(F)	Mobile system		

Other cleaning liquids may only be used after being released by Kärcher!

Cleaning liquids			
Type of system (see rating plate)	Cleaning liquid	Working pressure/ Pressure setting for safety valve [bar]	Comments
SHD-R 3000 (F) SSR	- Water - VE-water - Water with Kärcher-RM - Acids ¹⁾ - Alkali solutions ²⁾	85/100	- The pistons are made from ceramic materials, other pump parts that come into contact with acids are made from stainless steel. - Ex-versions possible. 
VE	Fully demineralised water		
RM	RM Alkali cleaning agent: e.g. RM31 (max. 0 - 2%) Acidic cleaning agent: e.g. RM25 (max. 0 - 1%) Max. temperature + 60 °C (Higher temperatures available on request - precompression pump required!)		
¹⁾	 Caution! Increased material removal in hydrochloric and sulphuric acid, therefore rinse/neutralise immediately after use! Reduced resistance against contaminated acids! If necessary contact Kärcher! Acids (max. temperature + 20 °C) Nitric acid max. 10% Acetic acid max. 10% Formic acid max. 10% Phosphoric acid max. 10% Citric acid max. 10% Sulphuric acid max. 0.5% Hydrochloric acid max. 0.5%		
²⁾	Sodium hydroxide solutions max. 10%, without hypochlorite fractions (max. temperature + 20 °C) Potassium hydroxide max. 10%, without hypochlorite fractions (max. temperature + 20 °C)		
(F)	Mobile system		

Other cleaning liquids may only be used after being released by Kärcher!

Cleaning liquids			
Type of system (see rating plate)	Cleaning liquid	Working pressure/ Pressure setting for safety valve [bar]	Comments
SHD-R 3000 (F) SLA	<ul style="list-style-type: none"> – Water – VE water* – Water with Kärcher-RM – Alkali solutions²⁾ 	85/100	<ul style="list-style-type: none"> – Version with increased working pressure. – Leaked liquid is collected in a pipe (leakage recycling). – Ex-versions possible. 
SHD-R 3000 (F) LM 	<ul style="list-style-type: none"> – Water – VE water* – Water with Kärcher-RM – Alkali solutions²⁾ – Solvents³⁾ 	50/65	<ul style="list-style-type: none"> – Explosion-proof version. – Leaked liquid is collected in a pipe (leakage recycling). – Additional pressure switch as safety device (optional).
VE	Fully demineralised water		
*	Conditionally resistant, use possible, however Cu and Zn ions in the medium		
RM	Acidic cleaning agent: e.g. RM25 (max. 0 - 1%) Max. temperature + 60 °C (Higher temperatures available on request - precompression pump required!)		
²⁾	Sodium hydroxide solutions max. 10%, without hypochlorite fractions (max. temperature + 20 °C) Potassium hydroxide max. 10%, without hypochlorite fractions (max. temperature + 20 °C)		
³⁾	Solvents (max. temperature + 20 °C) <ol style="list-style-type: none"> 1. Hydrocarbons, e.g.: petroleum 2. Aromatic compounds, e.g.: benzene, toluol 3. Ketones, e.g.: MEK (methyl ethyl ketones), acetone 4. Esters, e.g.: butyl acetate, methyl acetate 5. Glycols, e.g.: butyl glycol 6. Mixed solvents, e.g.: butyl acetate 85, isobutyl acetate 85 (85=85% butyl acetate + 15% n-butanol) 7. Regenerates, distillates made from various solvents which have already been used for cleaning purposes or similar. 		
(F)	Mobile system		

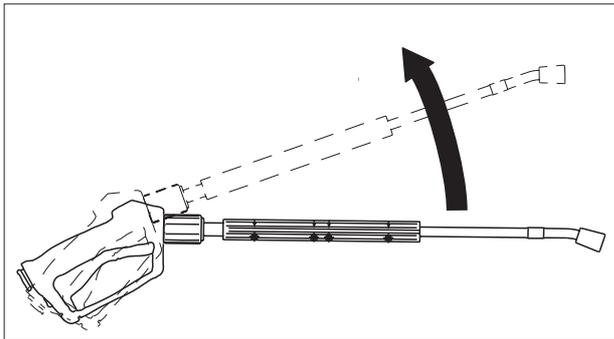
Other cleaning liquids may only be used after being released by Kärcher!

2. System start-up

Emergency drill

- Turn mains supply voltage of at system master switch.
- Turn off supply of cleaning liquid.
- If a handgun is being used, release any remaining pressure in the system by pressing the lever on the handgun.

Working with the handgun



Danger!

The high-pressure jet produces a recoil effect.

- You could lose your balance.
- You could fall over.

Therefore:

- Ensure that you have a firm footing.
- Keep a tight grip on the handgun.
- Do not wedge the handgun fast in the open position.

If the lever is wedged fast, the recoil effect causes the high-pressure hose to twist and turn in various directions, which result in damage to other equipment or persons.

Starting up the system

Mobile system

- Place system on a horizontal, solid surface.
- Lock wheel brakes.

Mobile and static system

- Turn on cleaning liquid supply.
- Switch system on at master switch.
- Commence cleaning with high-pressure jet.



Important !

In types LM, SLA and SSR the stuffing boxes must be retightened after the initial startup. The tension should be regulated one, two, four and 10 hours after initial start-up. (For the running-in phase of the seals, see E.3 Maintenance work).

3. System shut-down

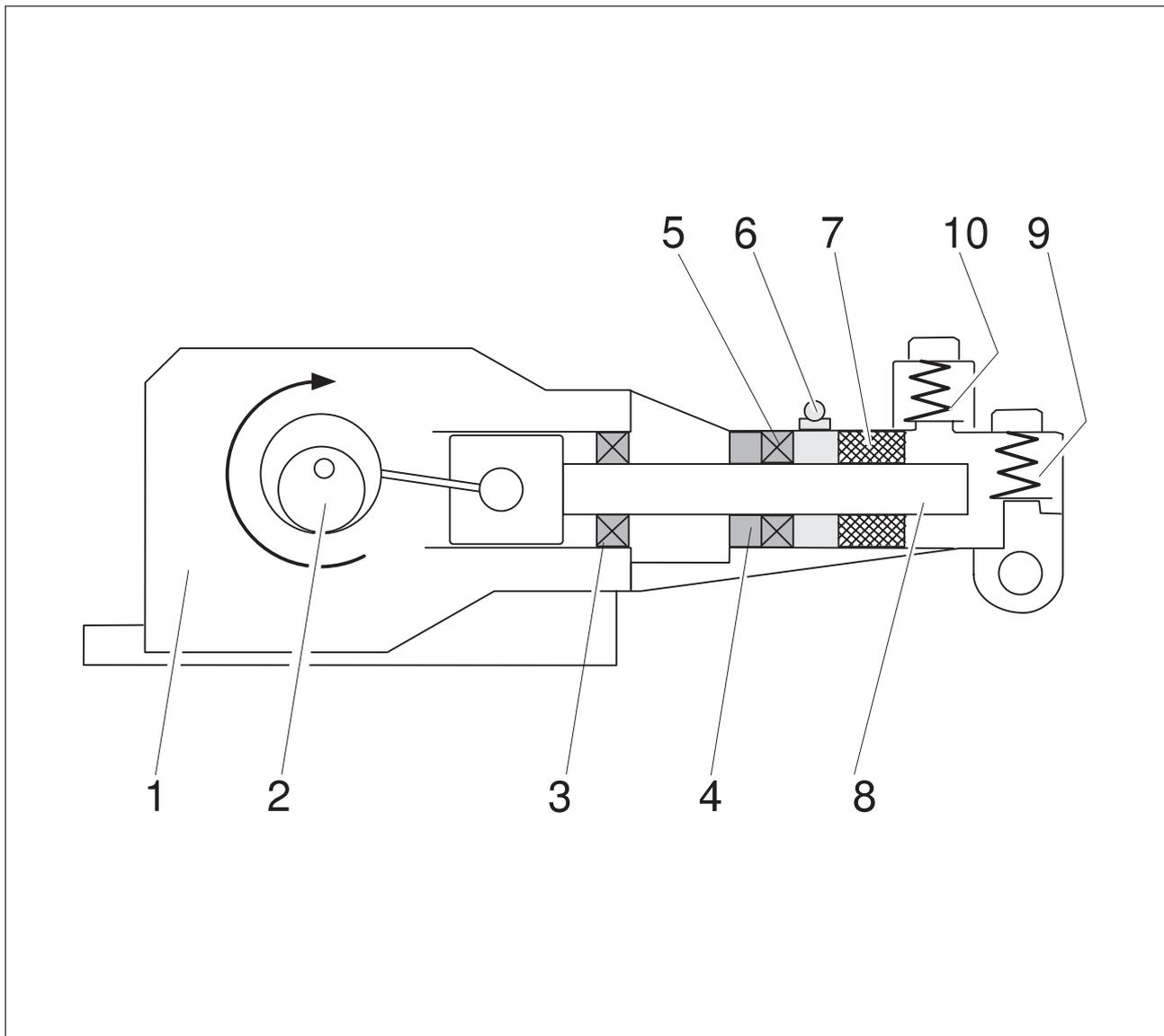


Important!

Before carrying out the shut-down procedures, flush through without adding cleaning agents. This prevents a crust forming on the seals or that they become stuck fast, either of which would lead to premature wear.

During the recirculation operation with solvent, the system must be rinsed through thoroughly using clean solvent before the shut-down procedure takes place.

- Switch system off at master switch.
- Turn off cleaning liquid supply.
- If a handgun is being used, release any remaining pressure in the system by pressing the lever on the handgun.



- | | |
|------------------------------------|---|
| 1 Transmission casing | 6 Lubrication nipple or leakage pipe |
| 2 Crankshaft with drive | 7 Sealing pack (high-pressure) |
| 3 Seal (oil compartment) | 8 Piston |
| 4 Gland | 9 Suction valve |
| 5 Seal (grease compartment) | 10 Pressure valve |

Operational sequence of the high-pressure pump

- Cleaning liquid is taken in by the piston.
- Suction valves (9) prevent cleaning liquid from flowing backwards.
- Action of piston pumps cleaning liquid onwards.
- Pressure valves (10) prevent cleaning liquid from flowing backwards.
- Action of piston takes in cleaning liquid again.

Features of the high-pressure pump

- Horizontal construction.
- Drive runs in an oil bath.
- Oil compartment for drive unit is separated from pressure chamber for cleaning liquid.
- Pump has three cylinders, each with a pressure chamber, and one suction chamber.

Drive for the high-pressure pump

- The high-pressure pump is driven by an electric motor.
- V-belts attached to the electric motor provide the actual drive to the high-pressure pump.

Safety valve

Injury hazard due to excessive pressure within system. Do not adjust safety valve. The safety valve has been pre-set and sealed in the factory. Adjustments should only be made by a Kärcher Customer Service engineer.

The safety valve opens if the pressure exceeds the prescribed maximum level. Cleaning liquid is allowed to escape, thereby avoiding damage to the pump and high-pressure hoses due to too much pressure in the system.

Pulsation damper

The pulsation damper compensates for the variations or peaks in pressure. This reduces the wear on pump components.

	Unit	SHD-R 3000 (F)	SHD-R 3000 (F) S SHD-R 3000 (F) SSR ¹⁾ SHD-R 3000 (F) SLA ¹⁾ SHD-R 3000 (F) SVA	SHD-R 3000 (F) LM
Electrical connection				
Type of current		3~	3~	3~
Frequency	Hz	50*	50*	50*
Voltage	V	400**	400**	400**
Motor rating with				
Class of protection IP55	kW	5.5	11	–
Class of protection IP55 Ex	kW	–	13.5 	6.8 
Mains fuse Direct starting	A	25	35	25
Mains fuse Star-delta starting	A	16	35	16
Performance data				
Pump flow rate	L/h	3000	3000	3000
Working pressure	bar	55	85	50 
Pressure setting Safety valve	bar	65	100	65
Max. inlet temperature for water with detergents	°C	60	60	60
Max. temperature for solvents, alkalis, acids	°C	–	20	20
Noise pressure level (EN 60704-1)	dB(A)	80	80	80
Dimensions and weight				
Length approx.	mm	1200	1200	1200
Width approx.	mm	600	600	600
Height approx.	mm	500	500	500
Weight approx.	kg	125	165	135
Miscellaneous				
Ambient conditions, temperature	°C	+2 ... +40	+2 ... +40	+2 ... +40
Type of protection		–	 ¹⁾ possible II 2 G ck T3	 II 2 G ck T4
Oil capacity	L	3	3	3
Type of oil		Oil 40 Special Order no. 6.288-003 (3 x 1 litre pack)		
* Available as special version with 60 Hz				
** Versions for other voltages available				

1. General information

It is a fundamental requirement for ensuring that this system functions safely and reliably that maintenance is carried out regularly in accordance with the following schedule.

Use only original spare parts supplied by the manufacturer or recommended alternatives, for example:

- replacement and wearing parts
- accessories
- fuels, lubricants, etc.
- detergents.



Danger!

*Injury hazard while working on the system.
Before commencing any work:*

- *Turn mains supply voltage off at system master switch, and ensure that it cannot be turned back on again unintentionally.*
- *Turn off supply of cleaning liquid.*
- *If a handgun is being used, release any remaining pressure in the system by pressing the lever on the handgun.*

Who is permitted to carry out maintenance tasks?

■ Operator

Tasks that are marked “Operator” may only be carried out by persons who have been instructed in the safe operation and maintenance of high-pressure systems.

■ Customer service

Tasks that are marked “Customer service” may only be carried out by Kärcher Customer Service engineers.

Maintenance agreement

In order to ensure that the system functions reliably, we recommend that you conclude a service agreement. Please contact your local authorized Kärcher Customer Service agent.

2. Maintenance schedule

Frequency	Type of pump SHD-R 3000 (F)	Action	Procedure	By whom?
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1, 2, 4, 10 hours after initial start- up.	LM SLA SSR	Regulate tension in compression glands	See Maintenance Tasks	Operator
Once only after first 100 operating hours	all	Check tension of V-belt	See Maintenance Tasks	Operator
	all	Oil change	See Maintenance Tasks	Operator

Weekly or after every 40 operating hours	all	Check oil level	Oil level must be between MIN and MAX marks. If level below MIN, fill up with oil.	Operator
	Standard S / SVA SLA SSR	Check oil condition	If oil is milky-white, change oil and tighten piston seal (See Maintenance Tasks)	Operator
	LM	Check oil condition	If oil has thinned out or is discoloured, change oil and tighten piston seal (See Maintenance Tasks)	Operator
	all	Check high-pressure hoses	Visual check of high-pressure hoses for signs of damage such as – wear due to abrasion – inner fabric is visible – creases due to bending – porous and split rubber Replace any damaged hoses	Operator

2. Maintenance schedule

Frequency	Type of pump SHD-R 3000 (F)	Action	Procedure	By whom?
Monthly or after every 160 operating hours	Standard S / SVA	Check pump for leaks	If during operation more than 5 droplets per minute leak from the pump, tighten piston seal	Operator
	Standard S	Lubrication	Lubricate with 2 pump strokes of grease gun per nipple	Operator
After every 200 operating hours	LM	Oil change	See Maintenance Tasks	Operator
Six-monthly or after every 500 operating hours	Standard S / SVA SLA SSR	Oil change	See Maintenance Tasks	Operator
After every 1000 operating hours	all	<ul style="list-style-type: none"> – Check and clean valves on pump – Check piston – Replace set of seals if required – Oil change – Check for correct functioning 		Customer service
Annually	all	Check tension of V-belt	See Maintenance Tasks	Operator
	all	Formal test	Inspection in accordance with Directive on "Working With Liquid-spraying Devices"	Specialist

3. Maintenance tasks

Changing the oil



Danger!

Burns hazard due to hot oil and hot system components. Allow pump to cool down for 15 minutes before changing oil.



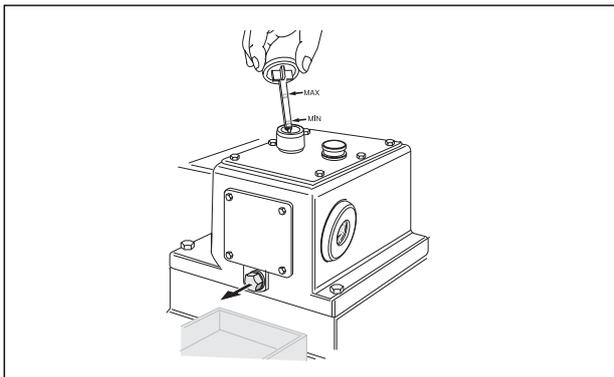
Important!

Waste oil may only be disposed of by the operators of special collection points. Please deposit your waste oil at one of these locations. Polluting the environment with waste oil is a criminal offence.

Oil type: Oil 40 special

Order no. 6.288-003 (3 x 1 litre pack)

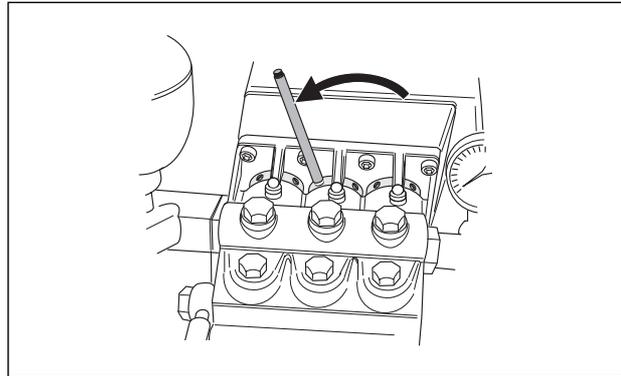
Oil capacity per pump: 3 L



Oil change procedure:

- place drip pan under pump to collect waste oil
- remove oil drain plug, and collect waste oil in drip pan
- wash out pump casing with diesel
- allow diesel to drain thoroughly
- fit new sealing ring (A18 x 22), and refit oil drain plug
- slowly fill up with fresh oil as far as MAX mark
- deliver waste oil to an appropriate collection point.

Tightening the piston seals



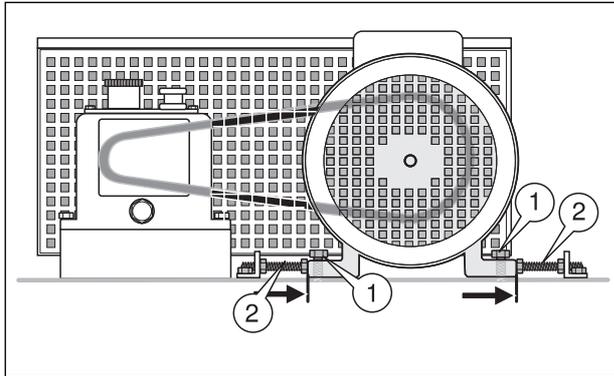
Important!

If the piston seal is held too tight by the gland, it will be subjected to increased wear.

- Insert rod into gland and turn in direction indicated by arrow. This increases the tension on the piston seal.
- Tighten all three piston seals uniformly, by turning the glands until they are hand-tight.

Relieving tension on piston seal:

- Insert rod into gland and turn **in opposite direction to that indicated by arrow**. This relieves the tension on the piston seal.
- Relieve the tension on all three piston seals uniformly.

V-belt

Test tension of V-belt and adjust as follows:

- Switch off system, and ensure that it cannot be switched back on again unintentionally.
- Remove guard over V-belt.
- Test belt tension.
Press down on belt which should not move by more than 1 cm. If necessary, adjust as follows:
- Slacken off mounting bolts (1).
- Tension V-belt by adjusting bolts (2).
- Ensure that V-belt runs in a straight line.
- Tighten mounting bolts (1).
- Refit belt guard.

Replacing the V-belt:

- Switch off system, and ensure that it cannot be switched back on again unintentionally.
- Remove guard over V-belt.
- Slacken off mounting bolts (1).
- Unscrew bolts (2) fully, and push motor towards pump.
- Replace V-belt.
- Tension belt by adjusting bolts (2).
- Ensure that V-belt runs in a straight line.
- Tighten mounting bolts (1).
- Refit belt guard.

**Danger!**

*Injury hazard while working on the system.
Before commencing any work:*

- *Turn mains supply voltage off at system master switch, and ensure that it cannot be turned back on again unintentionally.*
- *Turn off supply of cleaning liquid.*
- *If a handgun is being used, release any remaining pressure in the system by pressing the lever on the handgun.*

Who is permitted to repair faults on the system?**■ Operator**

Tasks that are marked “Operator” may only be carried out by persons who have been instructed in the safe operation and maintenance of high-pressure systems.

■ Qualified electrician

Persons who have a professional qualification in an electrical engineering discipline.

■ Customer Service

Tasks that are marked “Customer Service” should only be carried out by a Kärcher Customer Service engineer.

1. Fault-finding

Problem	Component	Possible cause	Remedy	By whom?
System does not start up	Control circuitry	No voltage supply to system or control circuitry	Check mains voltage	Electrician
	Control circuitry	Fault on – motor contactor – fuses	Check	Electrician
	Control circuitry	Bimetal relay has switched off	Wait for motor to cool down, and then re-set relay. Measure motor current. If current consumption is too high, relieve tension on piston seal (see Maintenance Tasks).	Electrician
	Pressure switch (Accessory kit)	Defective or wrongly adjusted pressure switch	Release pressure from system, and check pressure valve.	Customer service
System does not build up pressure	V-belt	No tension in V-belt	Tighten V-belt (see Maintenance Tasks)	Operator
	Filter or strainer (Accessories)	Blocked filter or strainer in supply line	Remove and clean filter or strainer.	Operator
	Inlet hose	Supply volume too small	Test whether the correct amount of cleaning liquid is being supplied to system.	Operator
	High-pressure pump	Worn out valves or broken valve spring	Replace defective part.	Operator
	High-pressure pump	Defective piston, seal or valve	Replace defective part.	Customer service
	Detergent reservoir (Accessory kit)	Pump taking in air due to empty detergent container	Fill detergent reservoir.	Operator
Screeching noise	V-belt	Incorrect V-belt tension	Tighten V-belt (see Maintenance Tasks).	Operator

1. Fault-finding

Problem	Component	Possible cause	Remedy	By whom?
Knocking noise	V-belt	V-belt has snapped	Replace V-belt (see Maintenance Tasks)	Operator
	Detergent metering on suction side of pump (Accessory kit)	Pump is taking in air	<ul style="list-style-type: none"> – Fill up with cleaning liquid. – Check hoses to establish whether they are taking in air 	Operator
	Cleaning liquid	Cleaning liquid is too warm	Check supply temperature of cleaning liquid	Operator
	High-pressure pump	Broken valve spring	Replace valve springs	Operator
	High-pressure pump	Flange has come loose	Tighten flange (see Maintenance Tasks)	Operator
	Pulsation damper (Accessory kit)	Defective pulsation damper	Replace pulsation damper.	Customer service
Leaking pressure switch	Pressure switch (Accessory kit)	Defective seal	Replace seal.	Customer service
Leaking pump	High-pressure switch	Too much free play in piston seal	Tighten piston seal (see Maintenance Tasks)	Operator
System does not switch off although handgun is closed	Pressure switch/Volume control valve (Accessory kit)	Wrongly adjusted pressure switch or volume control valve	Re-adjust pressure switch and volume control valve.	Customer service
Float tank overflows	Float tank (Accessory kit)	Wrongly adjusted closing force or maximum filling level	Re-adjust closing force and filling level, see Chapter G1: Float tank.	Operator
	Float tank (Accessory kit)	Defective seal on float valve	Replace seal.	Operator

Hazard!

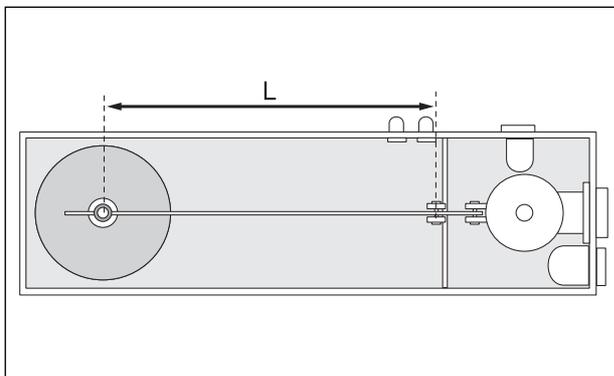
The following mounting and accessory kits must not be used for operation with solvents or in a hazardous (potentially explosive atmosphere) area.

1. Mounting kits (non-hazardous area)

Float tank with float valve

Function

- The float valve fitted inside the float tank controls the level of liquid.
- The float tank serves as a service reservoir for the cleaning liquid.
- If water is used as the cleaning agent, the float tank corresponds to mains disconnection according to EN 1717.
- In the case of the mobile systems, the float tank is fitted to the trolley.



Settings

Closing force

Extending the length of L increases the amount of closing force, i.e. even when the cleaning liquid is fed in at quite high pressure the float valve is able to shut off the supply.

Technical specification

Capacity up to overflow: 30 litres.

Volume control valve

Function

If only a part of the pump delivery volume is required, the remainder is fed back to the suction side of the pump via the volume control valve.

This item is required when the system is used with handguns.

Pressure switch

Danger!

Danger due to high voltage. The pressure switch has been pre-set in the factory, adjustments should only be made by a Kärcher Customer Service engineer.

Function

The pressure switch

- switches the system off if the working pressure is exceeded.
- switches the system back on when the pressure drops again.

Pulsation damper

Caution!

As the membrane in the pulsation damper is not suitable for solvents, do not use the pulsation damper for operation with solvents.

Function

The pulsation damper evens out variations or peaks in pressure while the system is in operation.

Important!

Volume control valve, pressure switch and pulsation damper are usually employed together as an automatic volume control system.

Pressure-relief valve

Function

- The pressure-relief valve is an integrated solenoid valve.
- The pressure-relief valve is only active during the start-up phase when the system is configured for star-delta starting.
- When the pressure-relief valve is opened, the liquid delivered by the pump flows back to the suction side. As a result, no pressure is built up, and the load on the motor is reduced during the start-up phase.

Detergent metering at the suction side of the pump



Danger!

If the detergent reservoir is empty and the metering valve is open, the pump takes in air. This can lead to damage to the pump, therefore:

- *check detergent reservoir regularly,*
- *do not open metering valve until actual work commences,*
- *close metering valve as soon as work has ended.*

Function

- A diaphragm has been inserted into the pump intake connection,
- detergent is taken in from an external reservoir,
- the amount taken in is determined by a metering valve,
- metering is switched on or off by a solenoid valve.

Detergent metering at the pressure side of the pump

Function

- Detergents are taken in from an external reservoir and fed to the output from the pump,
- an injector mixes the detergent with the high-pressure jet (double spray lance required for detergent metering),
- detergents can also be metered by means of a high-pressure metering pump.

2. Mounting kits (hazardous area)

Please contact Kärcher about mounting kits for hazardous (potentially explosive atmosphere) areas.

For representations, please refer to figures A 170/1, A 172, A 173, A 161 and A 154.

3. Accessories

Lubricants:

Oil for pump: Oil 40 special
Order no. 6.288-003 (1 litre pack)

Lubricating grease for: SHD-R 3000 (F)
SHD-R 3000 (F) S/
SHD-R 3000 (F) SVA
(6.288-034)

For normal use:
Order no. 6.288-015 (Tin with 1 kg)

The following grease is prescribed for food-processing operations:
Order no. 6.288-034 (Tin with 1 kg)

High-pressure hoses, nozzles, detergents

Ask your dealer for further details about these or any other accessories, or contact Kärcher Plant Engineering.

Figure A 170/1

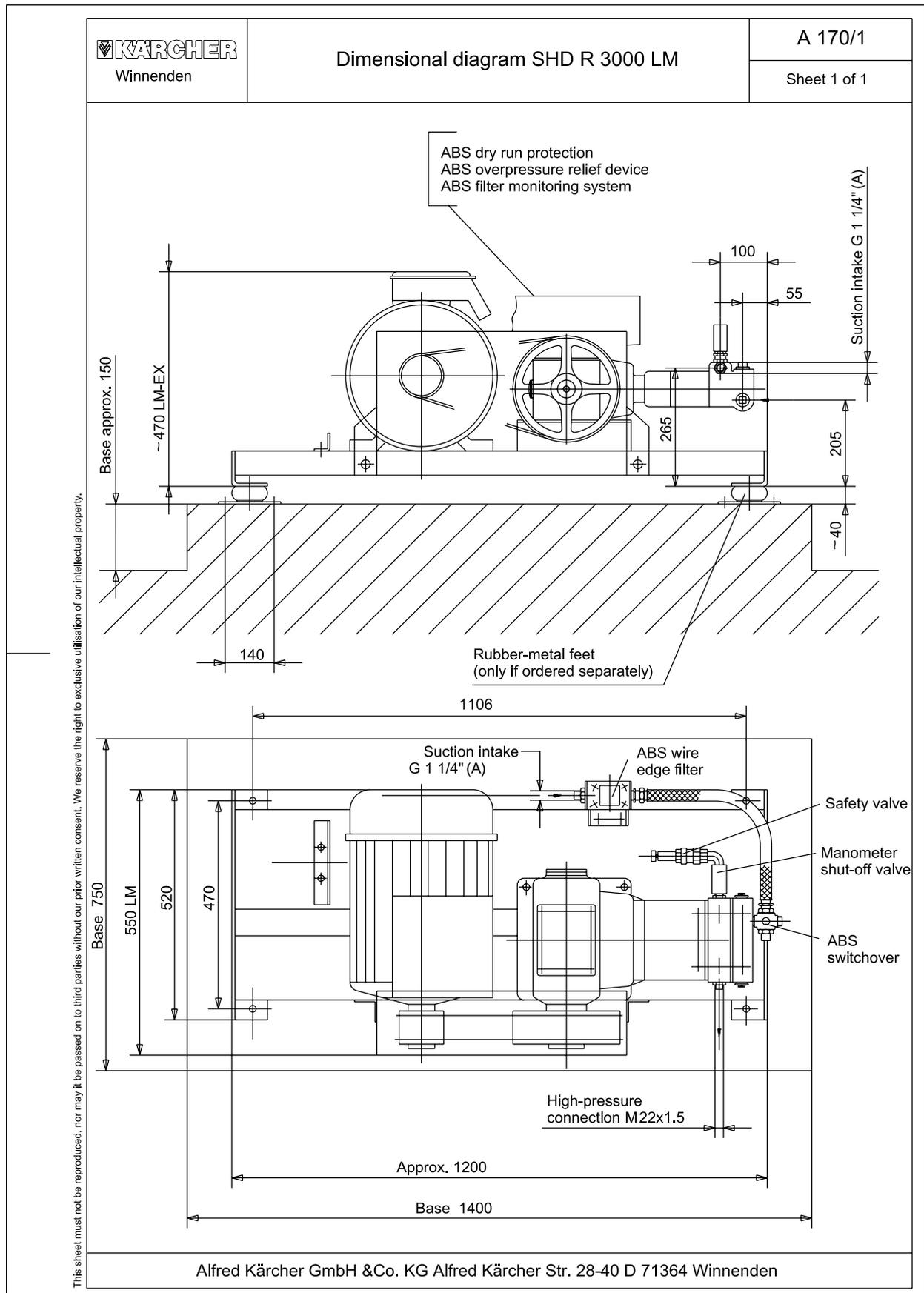
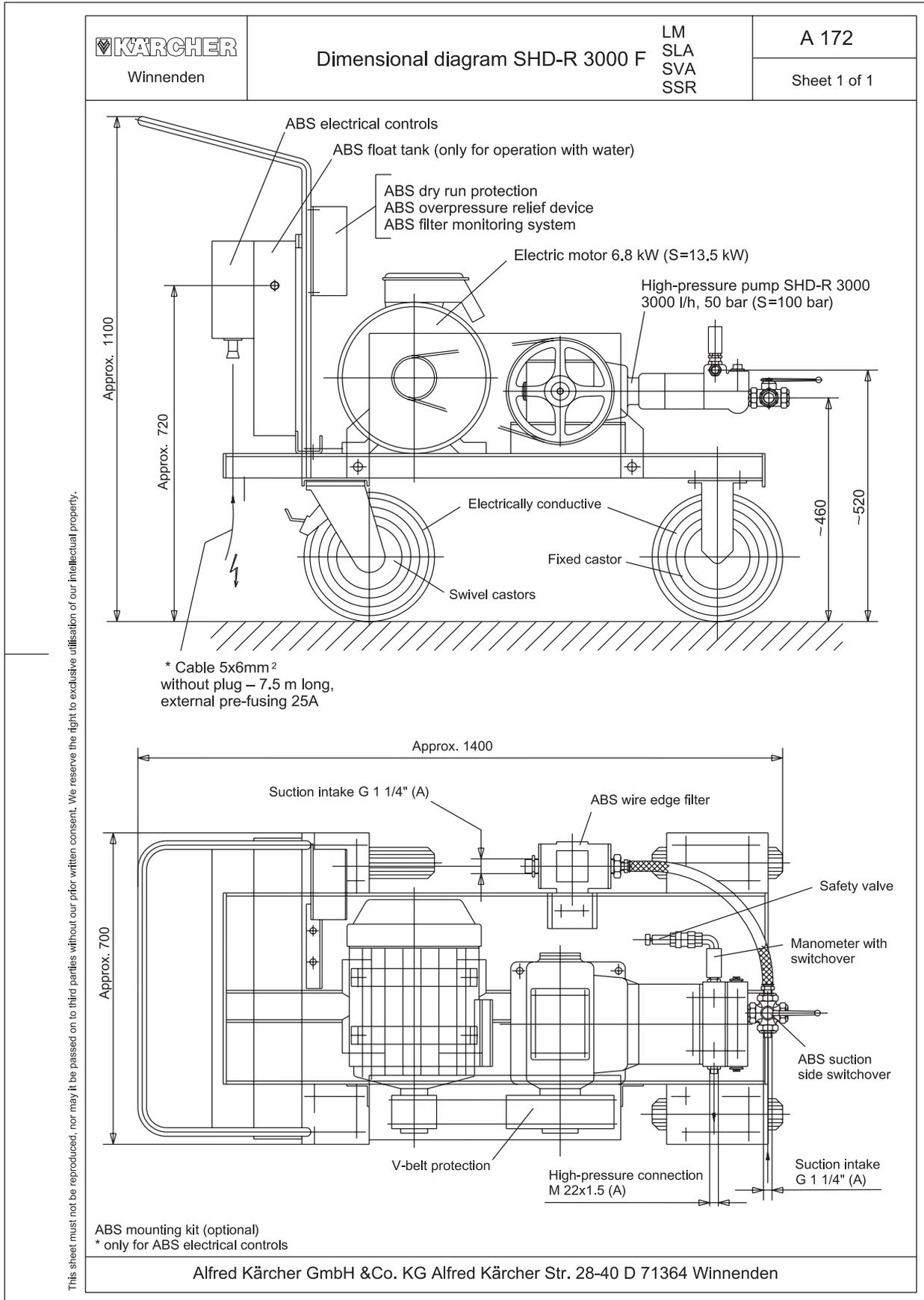


Figure A 172



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Figure A 173

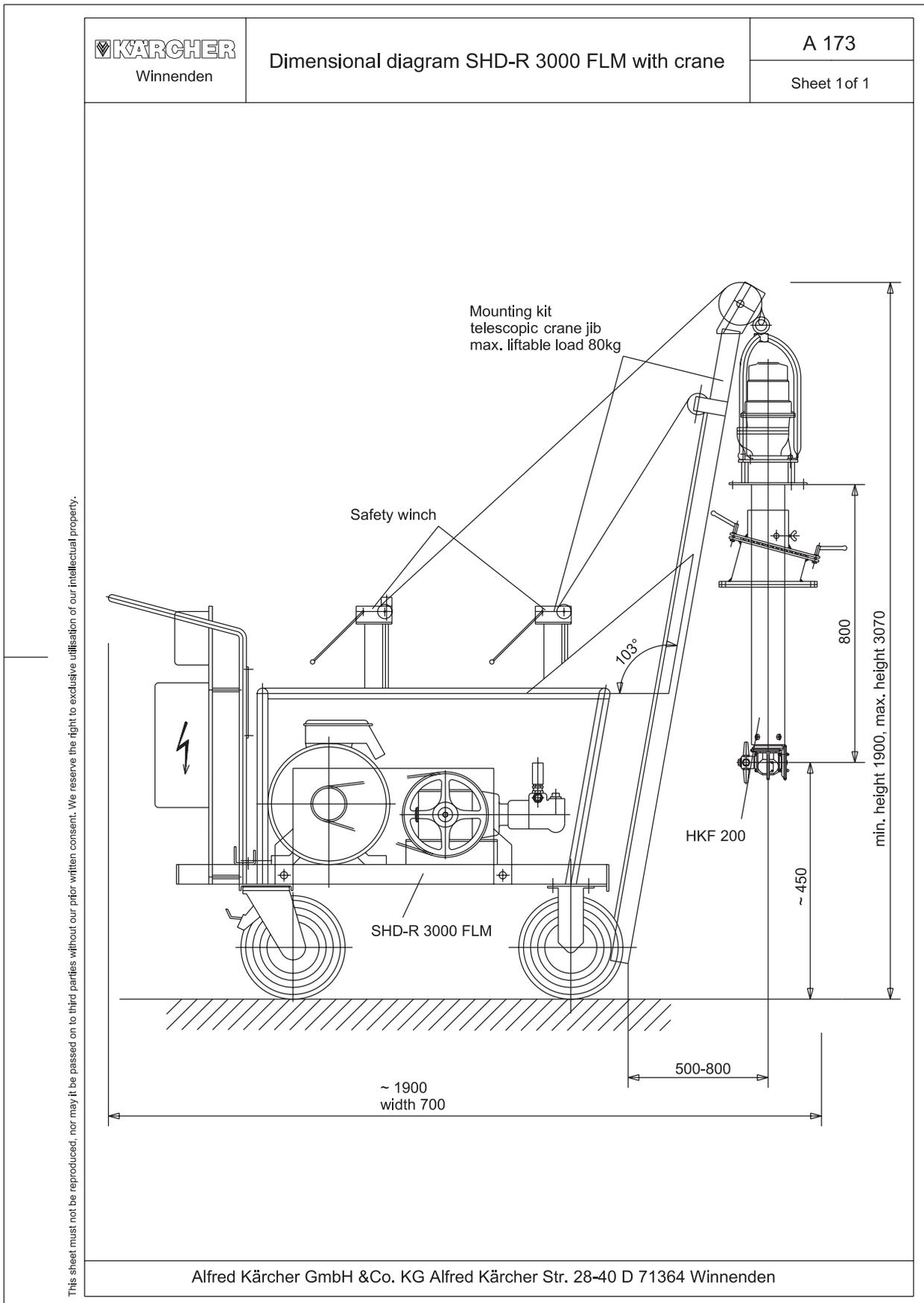


Figure A 161

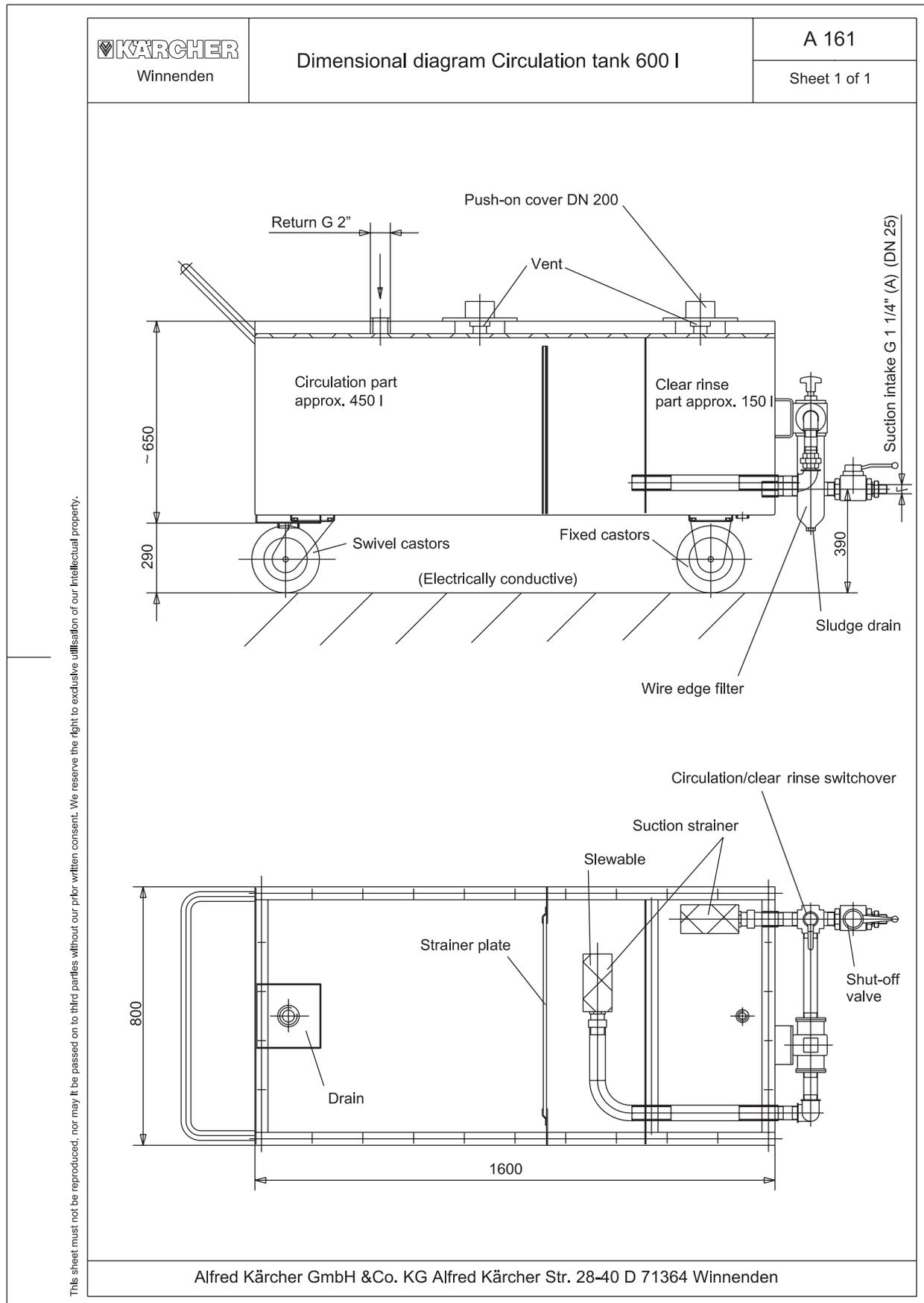
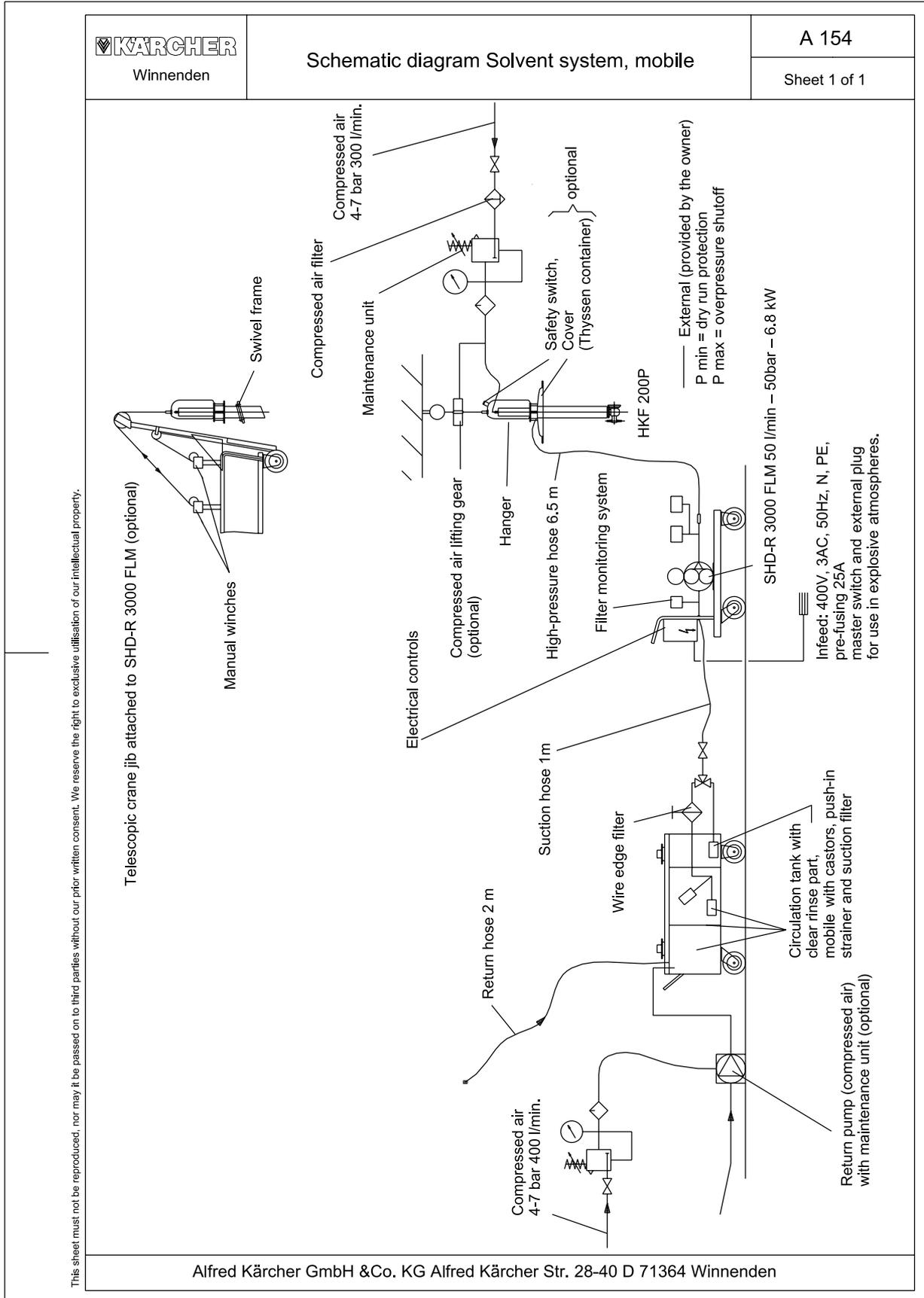


Figure A 154



The applicable warranty conditions in different countries are issued by the respective national distributor of KÄRCHER products.

In the event of a warranty claim, please contact your original dealer or the nearest authorized customer service centre.

This system should only be installed by

- Kärcher Customer Service engineers,
- persons who have been specially authorized by Kärcher.

Unpacking the system

Unpack the system and deliver the packaging materials to an appropriate collection point for recycling.

For static systems

Preparing the installation site

- A horizontal, flat area or base of 1400 x 750 mm is required for installing the system.
- Place the system on the designated area or base and align it exactly.
- Install the unit in such a way as to ensure that it can be easily accessed for maintenance work.
- Secure in position with suitable materials.

For static and mobile systems

Connecting hoses for supply of cleaning liquid



Caution!

Vibrations generated by the system during operation could cause damage to the main water supply network, therefore connect the system by means of flexible hoses.

- Connect the supply hose for cleaning liquid to the system (Thread R 1 1/4").
- Connect the high-pressure hose for the cleaning liquid output to the system (Thread M22 x 1.5).

Check the oil level

The level of oil in the reservoir on the high-pressure pump should be between the MIN and MAX marks. Fill up with oil if the level is below the MIN mark.

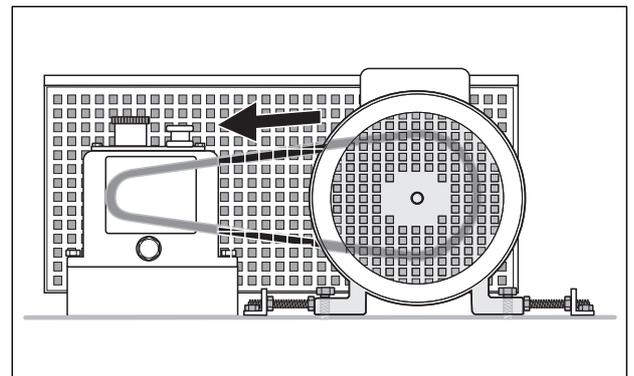
Electrical connections



Danger!

Dangerous voltage. The electrical installation should only be carried out by a qualified electrician in accordance with current local regulations.

- Connect the electric motor into the terminal strip.
- Switch on motor briefly, and check direction of rotation.



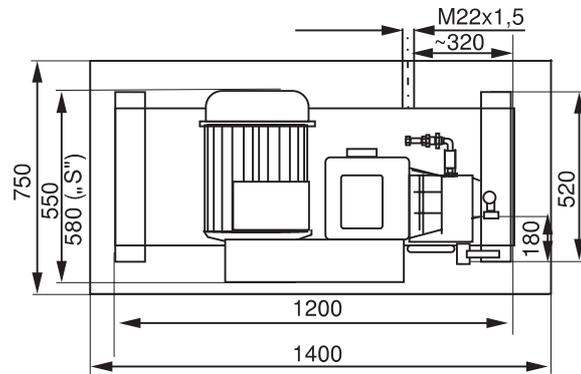
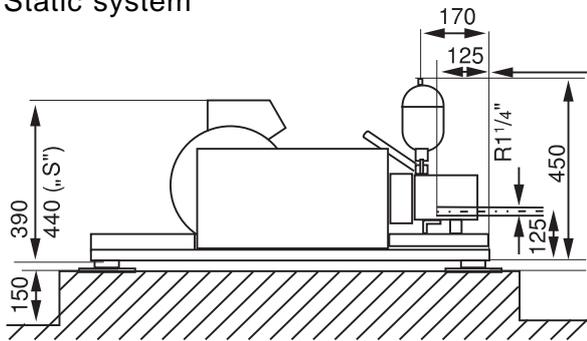
Start up the system

Switching off in an emergency

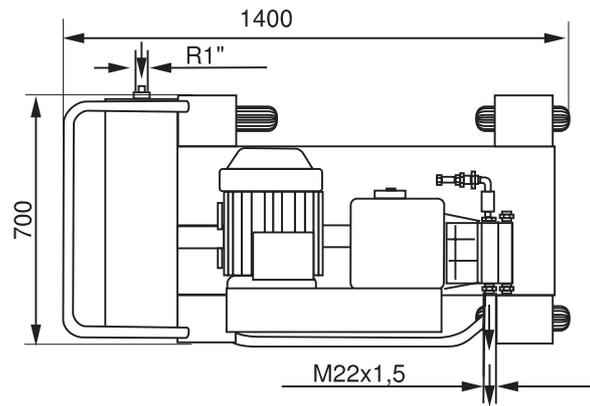
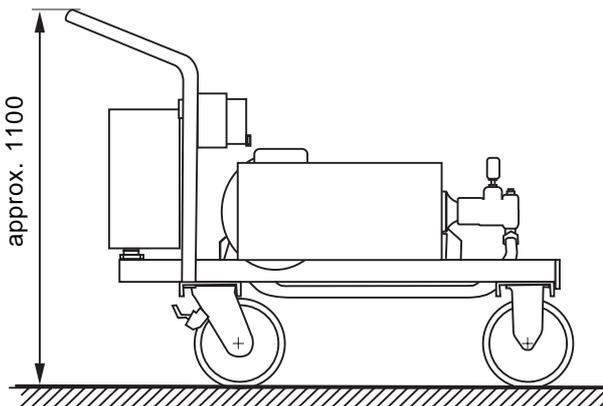
(see Chapter B)

Dimensional diagram:

Static system



Mobile system



EC Declaration of Conformity

We herewith declare that the design and type of machine named in the following as well as the model marketed by us complies with the relevant fundamental health and safety requirements of the EC Directives. This declaration becomes invalid if modifications are made to the machine which have not been previously agreed with us.

Product: **High-pressure cleaner**
Type: **SHD-R 3000 (F), S, SVA**

Relevant EC Directives:
EC Machinery Directive (98/37/EC)
EC Low Voltage Directive (73/23/EEC), amended by 93/68/EEC
EC Electromagnetic Compatibility Directive (89/336/EEC), amended by 91/263/EEC, 92/31/EEC, 93/68/EEC

Harmonised standards used:
DIN EN 60 335 - 1
DIN EN 60 335 - 2 - 79
DIN EN 55 014 - 1:2000 + A1 : 2001
DIN EN 55 014 - 2 : 1997
DIN EN 61 000 - 3 - 2 : 2000
DIN EN 61 000 - 3 - 3 : 1995 + A1 : 2001

National standards used: –

Internal measures ensure that serial production units always comply with the requirements of the current EC Directives and the standards used.

The undersigned act on behalf of and with power of attorney issued by the Management.



S. Reiser



H. Jenner

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Cleaning Systems
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D-71349 Winnenden
Tel.: ++ 49 71 95 14-0
Fax: ++ 49 71 95 14-22 12

5.957-383 (01/02)

Alfred Kärcher Kommanditgesellschaft.
Registered offices: Winnenden.
Register court: Waiblingen, HRA 169.
Personally liable shareholder: Kärcher
Reinigungstechnik GmbH.
Registered office: Winnenden, 2404
Waiblingen register court, HRB
Managing Directors: Dr. Bernhard Graf,
Hartmut Jenner, Georg Metz

EC Declaration of Conformity

We herewith declare that the design and type of machine named in the following as well as the model marketed by us complies with the relevant fundamental health and safety requirements of the EC Directives. This declaration becomes invalid if modifications are made to the machine which have not been previously agreed with us.

Product: **High-pressure cleaner**

Type: **SHD-R 3000 (F), LM, SSR, SLA**

Relevant EC Directives:

EC Machinery Directive (98/37/EC)

EC ATEX Directive (94/9/EC)

Harmonised standards used:

DIN EN 60 335 - 1

DIN EN 60 335 - 79

DIN EN 13463 - 1 : 2002

prEN 13463 - 5 : 2002

EN 1127 - 1 : 1997

National standards used: –

No. of nominated test institute: **0123**

Test report No. **070039582**

Type LM designation: **Ex II 2 G ck T4**

Type SSR, SLA designation: **Ex II 2 G ck T3**

Internal measures ensure that serial production units always comply with the requirements of the current EC Directives and the standards used.

The undersigned act on behalf of and with power of attorney issued by the Management.

S. Reiser

H. Jenner

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5.957-384 (06/03)

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Register court: Waiblingen, HRA 169.
Personally liable shareholder:
Kärcher Reinigungstechnik GmbH.
Registered office: Winnenden, 2404
Waiblingen register court, HRB
Managing Directors: Dr. Bernhard Graf,
Hartmut Jenner, Georg Metz

Type no.:

Factory no.:

Commissioned on:

Tests carried out on:

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Results

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Signature

Tests carried out on:

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Results

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Signature

Tests carried out on:

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Results

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Signature

Tests carried out on:

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Results

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Signature