

KÄRCHER

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SB MB





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EAC



59638780 09/22

  Please read and comply with these original instructions prior to the initial operation of your appliance and store them for later use or subsequent owners. Before first start-up it is definitely necessary to read the safety indications Nr. 5.956-309.0!

Contents

About this operating instructions manual	EN	1
Environmental protection	EN	1
Safety instructions	EN	1
Operation	EN	2
Open the system	EN	4
Settings	EN	5
Filling in detergents	EN	10
Manual interventions	EN	11
Sales indicator	EN	12
Frost protection	EN	12
Shutting down	EN	14
Shutdown	EN	14
Function	EN	15
Technical specifications	EN	23
Maintenance and care	EN	26
Troubleshooting	EN	34
Accessories	EN	44
Warranty	EN	44
Transport	EN	44
Storage	EN	44
Installing the unit (only for experts)	EN	45
EU Declaration of Conformity	EN	51
Log of high pressure testing	EN	52

About this operating instructions manual

Target group for these instructions

- **All users:** Users include trained auxiliary personnel, operators and experts.
- **Experts:** Experts are individuals, who are, according to their professional education, able to install the equipment and to operate the same.

Technical terms

To understand this operating instructions manual it is first necessary to know these terms. The technical terms indicated in bold are used through out the operating instructions manual.

Fresh water

raw water, tap water, city water

Base exchanger

Water softening unit

De-hardened or softened water

Soft water

Reverse Osmosis (Abbreviation: RO)

Reverse osmosis

Concentrate

Waste water enriched with salts and minerals from the reverse osmosis process

Permeate

Osmosis water, demineralised water, fully desalinated water

Processed water

Water from an organic water treatment system.

Environmental protection



The packaging materials are recyclable. Please do not throw packaging in the domestic waste but pass it on for recycling.



Old units contain valuable recyclable materials. Batteries, oil and similar substances may not be released into the environment. Therefore please dispose of old units through suitable collection systems.

Please do not expose motor oil, fuel, diesel and gasoline into the environment. Please protect the ground and dispose of used oil properly.

Notes about the ingredients (REACH)

You will find current information about the ingredients at:

www.kaercher.com/REACH

Safety instructions

General

Mishandling or misuse can prove to be hazardous to the operator and other persons through

- high water pressure,
 - hot water,
 - Hot exhausts
 - high electrical voltage,
 - Detergent,
 - damage to stomach and food pipe by drinking large quantities of permeate.
- To avoid danger to persons, animals and property before the first operation of the system, read:
- the operation instructions
 - all safety notices
 - according to the national requirements of each country
 - that safety notices included in the cleaning agents used (normally on top of the package stated).

Please remember:

- that you have understood all the instructions
- that all users of the plant are informed about the instructions and have understood them.

All individuals, who are involved, in the installation, the operation, the maintenance and service of this equipment, must be

- qualified accordingly,
- they must know and obey the operation instructions,
- they must know the appropriate regulations, and must obey the same.

In the operation of self service, the owner must provide cleaned and well exposed notice signs, which have to state

- possible danger,
 - Safty device,
 - Operating the equipment
- If the equipment is operated in a close room
- , exhaust must be lead through appropriate pipes or chimneys,
 - and there has to be sufficient fresh air circulation.

⚠ DANGER

Risk of burns due to hot exhaust gases; hence, do not reach over the exhaust opening. Do not touch the chimney cover.

Risk of burns due to hot system parts such as pumps and motors. Be careful when opening the system; allow system parts to cool down first.

⚠ WARNING

Do not use the system in the vicinity of people, unless they are wearing protective gear. The jet must not be directed by the user at him/herself or at other persons to clean clothing or footwear.

High-pressure hoses, fixtures and couplings are important for the safety of the appliance. Only use high-pressure hoses, fixtures and couplings recommended by the manufacturer.

The system must not be used if a connecting line or important parts of the appliance, e.g. safety devices, high-pressure hoses, spray guns, are damaged.

Specifications and Guidelines

- Please follow the national rules and regulations for fluid spray jets of the respective country.
- All national laws and regulations about installation of electrical appliances must also be followed.
- Please follow the national rules and regulations for accident prevention of the respective country. Fluid spray jets must be tested regularly and the results of these tests must be documented in writing.
- The heating appliance of the machine is an ignition plant. All national laws and regulations about heating systems must also be followed.
- If the plant is operated in rooms, then there should be adequate measures for safely diverting the exhaust gases out of the room (smoke gas pipes without draught interceptors). Further, there must also be adequate supply of fresh air.
- Only Customer Service engineers trained by Kärcher may perform settings and carry out maintenance tasks and repairs.
- The local guidelines must be followed while installing the chimney.

Gas burner (option)

Before installing the machine, it is necessary to get the approval of the gas supply company and the local chief chimney cleaner.

The statutory requirements of civil engineering laws, trade laws and emission control norms must be followed at the time of installation. We wish to bring to your notice the following statutory regulations, guidelines and standards:

- The device may only be installed by a specialized company according to the national regulations.

- Installation of gas pipes - especially the gas connections to the machine - should only be done by a technical company that has been approved by the Industrial Association for Gas and Water Installations.
- Settings, maintenance tasks and repairs on the gas burner must only be performed by authorised expert staff of the burner manufacturers.

Hazard levels

⚠ DANGER

Pointer to immediate danger, which leads to severe injuries or death.

⚠ WARNING

Pointer to a possibly dangerous situation, which can lead to severe injuries or death.



⚠ CAUTION

Pointer to a possibly dangerous situation, which can lead to minor injuries.

ATTENTION

Pointer to a possibly dangerous situation, which can lead to property damage.

Symbols on the plant

	Risk of electric shock! Only electricians or authorised technicians are permitted to work on parts of the plant.
	Risk of burns on account of hot surfaces!



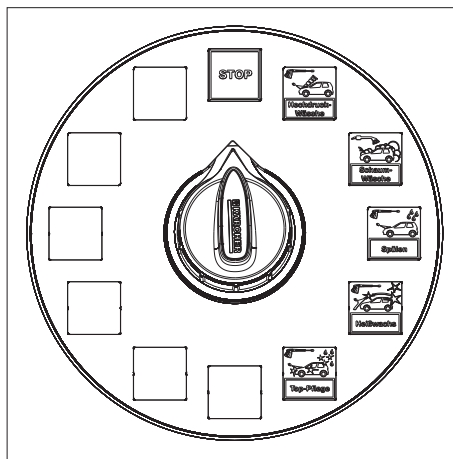
⚠ DANGER

Risk of injury from the high-pressure jet. Do not point the high-pressure jet to humans or animals. Risk of injury from electric shock. Do not point the high pressure jet towards electrical devices, cables and the system.

Hearing protection

The sound level in the plant amounts to 65 dB(A). If parts (such as large sheets) that amplify sound are shot blasted, it can give rise to higher noise levels. If so, wear ear plugs.

Behaviour in emergency situations



- ➔ Turn the programme selection switch at the operating panel to "STOP".

Proper use

This SB washing system is to be used for cleaning

- Vehicles and Trailers with water and detergents added to it. It is wrong and therefore prohibited to use the plant for cleaning
- human beings and animals. There is a high risk of injury due to the high pressure jet.
- Loose parts. These can get thrown off due to the high pressure jet and can cause damage to persons or other parts of the plant.

A category 5 system isolation must be installed between the system and the drinking water network to isolate the system from the drinking water network. Locally applicable regulations must also be observed.

ATTENTION

Risk of damage to the plant if water supply is not of suitable quality. The system must only be supplied with water in drinking water quality.

The plant may be used for diverting combustible gases only in the open. If the plant is to be housed under a roof or in a closed room, then it must be connected to a chimney to provide an outlet for the exhaust gases. If the plant is to be connected to a chimney, then the burner needs to be adjusted and the exhaust values must be checked by the concerned chimney cleaner.

ATTENTION

The system is frost-safe up to -20°C under the conditions outlined in the section "Frost-protection" and must be shut down if the temperatures fall below this limit.

Workstation

- Coins are thrown in at the control panel and the washing programme is selected.
- Cleaning is done using the hand-spray gun.

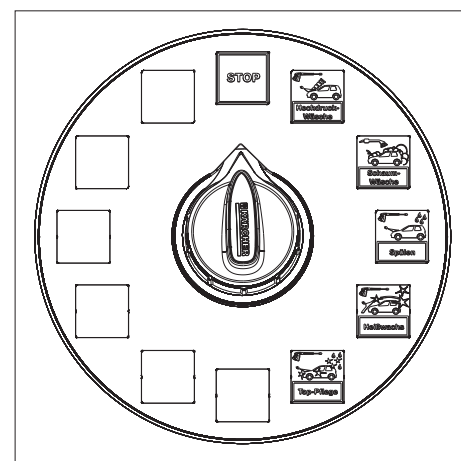
⚠ DANGER

Risk of injury, risk of burns. Washing operation only when the system is locked.

- The inner areas of the plant should only be accessed by trained persons for maintenance tasks. The door must be closed when the plant is in operation.

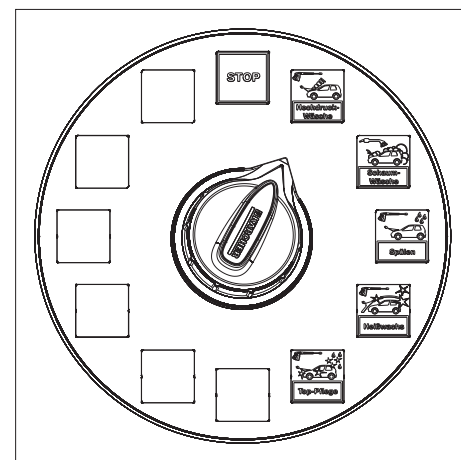
Operation

Switch-off in case of emergency



- ➔ Turn the programme selection switch at the operating panel to "STOP".

Washing programmes



The following washing programs are available:

Standard programmes

Stop

Interrupts the programme.

Basic position, washing tools in the tool holders.

Note:

"STOP" function is active in all switch positions without washing programme.

High-pressure wash

Removes coarse dirt.

Warm water with shampoo

Distance of high pressure nozzle approx 30 cm.

Foam Wash

Deep cleaning with active foam.
Only use foam brush when the programme is running and after the high-pressure wash.

Rinse

Rinse off shampoo and foam.
Distance of high pressure nozzle approx 50 cm.

Hot wax

Warm water with paint protection.
Use after rinsing.
Distance of high pressure nozzle approx 80 cm.

Top care

For Spot-free drying.
Demineralised water leaves a spot-free high gloss finish.
Distance of high pressure nozzle approx 80 cm.

Additional programmes (option)

Dirt Loosening

Removes persistent dirt.
Warm water with special detergent.
Distance of high pressure nozzle approx 30 cm.

Micro emulsion, model A

Removes persistent dirt.
Warm water with special detergent.
Distance of high pressure nozzle approx 30 cm.

Micro emulsion, model B, with external high pressure pump

Removing bitumen road coating residue.
Spraying a special detergent.

Insects Loosening

Loosens insects.
Warm water with special insect removing detergent.
Distance of high pressure nozzle approx 30 cm.

Rim cleaning, model A, with dosing pump

Loosens brake dust.
Warm water with special or increased detergent addition.
Alkaline-based detergents only.
Distance of high pressure nozzle approx 30 cm.

Application before the car wash and only on coated or painted wheels.

Rim cleaning, model B, with external high pressure pump and mixing tank

Loosens brake dust.
Cold water with special high-dose detergent addition while mixing in compressed air.
Application before the car wash and only on coated or painted wheels.

Intensive foam

Loosens persistent contamination.
Foam with special detergent addition.
Distance of foam nozzle approx 30 cm.

Under-chassis Wash

Removing coarse dirt from the underchassis.
Washing cycle begins with a delay of approx. 10 seconds; drive the vehicle backwards and forwards over the under-chassis wash.

Power foam

(for 3-tool version only)
Water with special detergent.
Loosens persistent contamination.
Minimum high-pressure jet clearance of 80 cm.

Power wheel foam

(for 3-tool version only)
Loosens brake dust.
Water with special detergent.
Dwell time max. 2 minutes. Used before the car wash and only on coated or painted wheel rims.

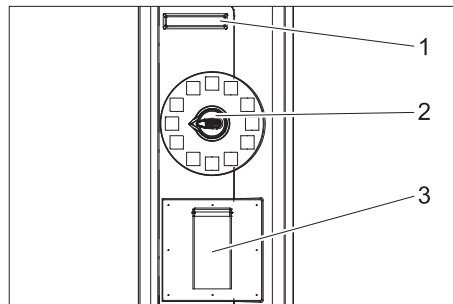
Power wax

Warm water with paint protection.
Use after rinsing.
Minimum foam jet clearance of 80 cm.

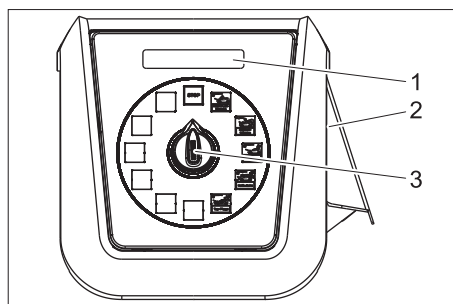
Operations procedure

Note:

While a washing programme is in progress, water will escape from the nozzle of the cleaning tool even when the trigger gun is not actuated. Due to the frost protection function, the trigger gun does not close completely.

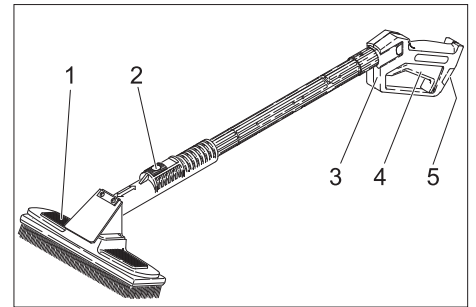


- 1 Rest value display
- 2 Program selection switch
- 3 Throwing in the coin



- 1 Rest value display
 - 2 Program selection switch
 - 3 Throwing in the coin
- Select the washing programme using the programme selection switch.
→ Throw in the coin.

Single tool version



- 1 Washing brush
- 2 Locking lever
- 3 Hand spray gun
- 4 Lever for trigger gun
- 5 Safety lever

- Press the locking lever for washing using high-pressure jet; pull the washing brush towards the rear and lock it in.
→ To wash using the washing brush, press the locking lever, push the washing brush forward and lock it in.
→ Unlock the trigger gun and pull the lever of the gun.

Double tool version (optional)

The hand-spray gun and washing brush are available as separate tools.

Hand spray gun:

- Unlock the trigger gun and pull the lever of the gun.

Washing brush:

- Clean the washing brush with the hand spray gun prior to use.
→ Set the washing programme "foam wash" and clean the vehicle.

3-tool version

There are 3 separate tools here:

- Trigger gun
- Washing brush
- Power foam lance

Note:

With the 3-tool version in the T-distributor system, leakage water escapes from the high-pressure gun when the power foam lance is used.

Washing time

- Washing time starts after the coin is thrown in.
- The remaining value display shows the remaining washing credit in washing units.

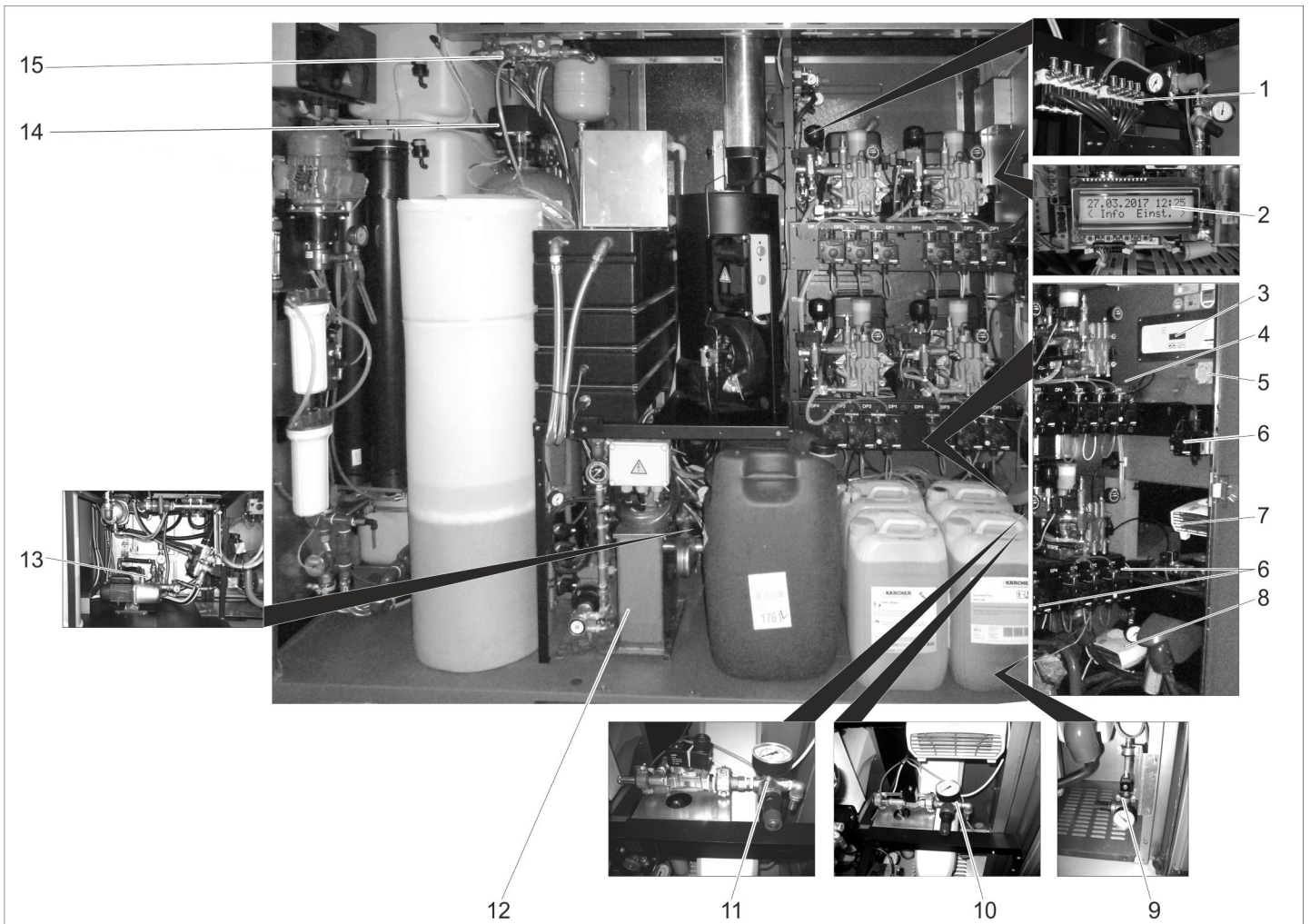
Note:

The washing time is running even if the programme selector switch is in the "STOP" position.
If more coins are thrown in during the washing time, the same are registered and added to the existing washing time.

Open the system



- 1 Coin acceptor door lock
with SB MB Comfort only
- 2 Coin cassette lock (optional)
with SB MB Comfort only
- 3 Unlock the coin acceptor door
Only for SB MB standard
Pull down to unlock.
- 4 Front door unlock
Lift up to unlock.
- 5 Unlock of left rear door
Lift up to unlock.
- 6 Unlock of right rear door
Lift up to unlock.

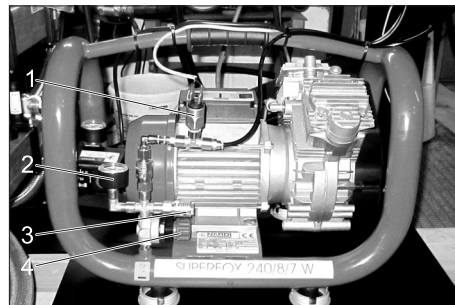


- 1 Dry foam station
- 2 Display of control (in control cabinet)
- 3 Display of control
Only for SB MB standard
- 4 Control board
- 5 Main switch
- 6 Dosing pump, dry foam station
- 7 Hot air blower
- 8 Dosing pumps
- 9 Frost protection with lost water (option),
installation site 2
- 10 Frost protection with lost water (option),
installation site 1
- 11 Emergency frost protection (option)
- 12 Rim cleaner (option)
- 13 Heat exchanger washing station heater
- 14 Head of base exchanger
- 15 Blending device (option)

Main switch

Position	
1	Plant is working. Frost protection (option) is active.
0	Entire system turned off (frost protection also).

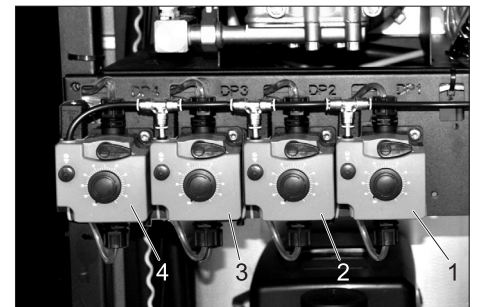
Adjust compressor



- 1 Pressure switch air
- 2 Manometer
- 3 Compressed air connection for service work
- 4 Pressure reducer

➔ Set pressure reducer to 0.4...0.5 MPa (4...5 bar).

Setting dosing pumps



- 1 Dosing pump high pressure wash (DP 1)
- 2 Dosing pump hot wax (DP 2)
- 3 Dosing pump top care (DP 3)
- 4 Dosing pump optional (DP 4), for additional programmes

The dosing pumps dose the washing water with the detergents in accordance with the wash programme and the equipment of the system.

Note:

The dosage amount is optimally set by the fitter when the system is assembled. Generally no reset is necessary.

Fine adjustments are made on the control (see Settings/Control). The standard setting of the dosing pumps remains unchanged.

Basic adjustment



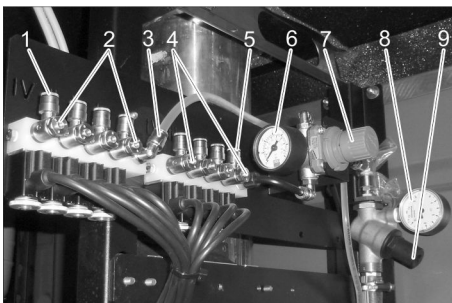
- 1 Ventilation lever
- 2 Ventilation button
- 3 Adjustment knob dosing volume

- Pull out the adjustment knob for the dosing volume.
- Press and release the ventilation button repeatedly and at the same time, rotate the adjustment knob to the desired setting.

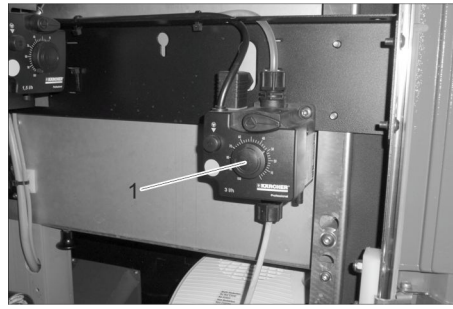
	Detergent	Position of adjustment knob (%)
High pressure wash	RM 806	50
Wet foam (Option)	RM 806	50
Dry foam (option)	RM 812	50
Hot wax	RM 820	50
Top care	RM 821	50
Contaminant removal (option)	RM 806	50
Insect removal (option)	RM 803	50
Power foam	RM 838	80
Power wheel foam	RM 802	80
Power wax	RM 820	50

- Release the ventilation key.
- Push in the adjustment knob for the dosing volume.

Dry foam station



- 1 Outlet water/detergent
- 2 Dosing valve water/detergent
- 3 Inlet water/detergent
- 4 Dosing valve air
- 5 Output air
- 6 Manometer compressed air
- 7 Pressure reducer air
- 8 Manometer water
- 9 Pressure reducer water



- 1 Dosing pump for dry foam

Basic setting water

- Open fresh water supply.
- Use wash programme "Foam wash" at a washing area.
- Set pressure reducer for water to 0.25 MPa (2.5 bar).

Basic setting water/chemicals

- Set the dosing pump for dry foam to 20%.
See "Adjusting dosing pumps" for procedure.
- Open fresh water supply.
- Remove the hose at the distribution block water/chemicals outlet and replace with a 400 mm hose piece (PVC hose 6/4).
- Use wash programme "Foam wash" for this washing area.
- Set the fluid stream from the hose piece by adjusting the dosing valve water/detergent to 300 ml/min (measure with measuring cylinder).
- End wash programme "foam wash".
- Remove the hose piece and reconnect the hose to the washing area.
- Repeat the setting of the dosing valves water/chemicals for the remaining washing areas.

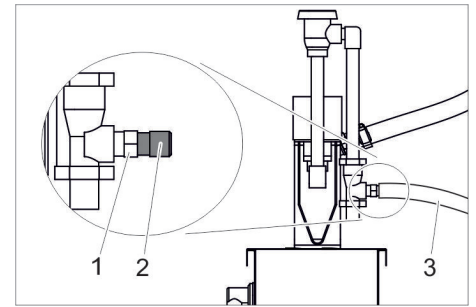
Basic setting air

- Set pressure reducer for air to 0.25 MPa (2.5 bar).
- Use the service tool 6.901-074.0 between the output air and the hose to the washing area.
- Use wash programme "Foam wash" for this washing area.
- Adjust the dosing valve air so that the pressure gauge of the service tool displays 0.15 MPa (1.5 bar).
- End wash programme "foam wash".
- Remove the service tool and reconnect the hose to the washing area to the distributor block air.
- Repeat the setting of the dosing valves air for the remaining washing areas.

Note:

After performing the basic setup, the consistency of the foam should only be changed by adjusting the dosing valves air.

Wheel cleaner/intensive foam (option)



- 1 Input of detergent
- 2 Nozzle insert
- 3 Suction hose for detergent

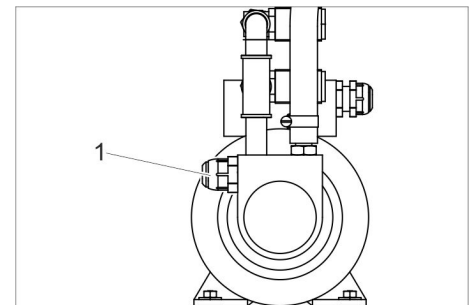
- Pull off the suction hose.
- Select the nozzle insert for the desired mixing ratio:

Nozzle colour	Water/detergent	
	Wheel cleaner	Intensive foam
no nozzle	1:1	4:1
grey	1.2:1	5:1
black	2:1	6:1
beige	4:1	8:1
red	6:1	17:1
white	9:1	23:1
blue	10:1	25:1
light brown	13:1	36:1
green	21:1	48:1
orange	26:1	64:1
brown	30:1	75:1
yellow	38:1	90:1
purple	50:1	120:1
pink	100:1	240:1

Basic setting water/chemicals

	Rim cleaner	Intensive foam
Detergent	RM 801	RM 838
Nozzle colour	blue	yellow
Mixing ratio	10:1	90:1

- Slide the nozzle insert all the way into the detergent input.
- Insert the suction hose.



- 1 Adjustment screw

- Adjust the pressure via the adjustment screw:

Rim cleaner	Intensive foam
5.5...6.5 bar	8.0...8.5 bar

Basic setting air

→ Adjust the air pressure reducer:

Rim cleaner	Intensive foam
2.5...3.0 bar	3.0 bar

ATTENTION

Risk of damage due to acidic detergents. Only use alkaline detergents for wheel cleaning.

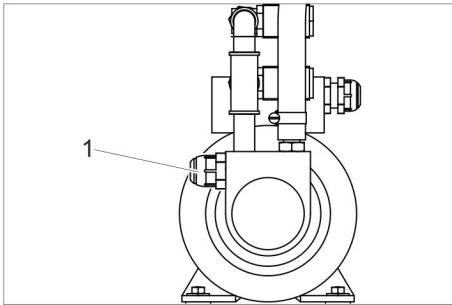
Note:

After performing the basic setup, the spray pattern should only be changed by adjusting the pressure reducer for air.

Wheel cleaner:

The uniform application onto the rims is facilitated if a suitable colouring agent is added to the rim cleaner concentrate.

Micro emulsion (option)



1 Adjustment screw

→ Adjust the pressure of the micro emulsion as needed by turning the adjustment screw.

WAT-S 202 base exchanger (option)

The current time must be set at the control head of the base exchanger in order that regeneration is carried out at night.

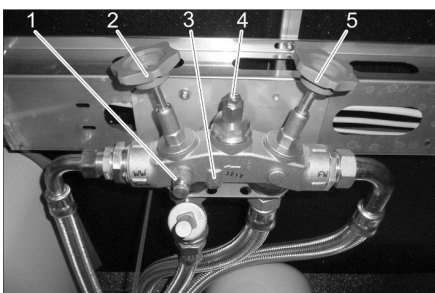


- 1 Rotary knob
- 2 Window with pointer

→ Pull out the adjustment knob and turn it until the current time is displayed.

Blending device (option)

The booster heater is supplied with partly softened water with a water hardness of 7° dH. For this purpose, the blending device mixes fresh water and softened water.

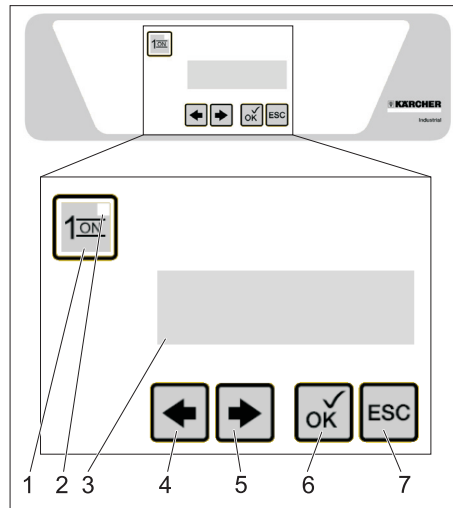


- 1 Sampling tap
- 2 Outlet valve (to the booster heater)
- 3 Adjusting screw, fine adjustment
- 4 Adjusting screw, coarse adjustment
- 5 Inlet valve fresh water

- Completely open outlet valve and inlet valve.
- Close both adjusting screws (turn in clockwise direction).
- Establish water inlet to the warm water tank.
- Open the sampling tap.
- Slightly open adjusting screw coarse adjustment.
- Collect water from the sampling tap and measure the water hardness.
- Adjust the bypass valve until it is just under 7° dH.
- Set the water hardness to 7° dH using the adjusting screw fine adjustment.
- Close the sampling tap.

Controls

SB MB standard



- 1 Key "1/ON"
- 2 Control lamp operating state
- 3 Display
- 4 LEFT key
- 5 RIGHT key
- 6 OK button
- 7 ESC button

SB MB comfort



- 1 Display
- 2 LEFT key
- 3 RIGHT key
- 4 OK button
- 5 ESC button

Normal operation

During normal operating mode, the control panel display alternates between:

Mo 09. 12. 2007
09: 52: 32 Wint

Day of the week, date, time, summer time (Som)/winter time (Wint)

Operating time
06: 00 – 22: 00

Operating time of the system on the current day

Maintenance

Maintenance work due from customer service (example).

If more than one maintenance procedure is required, these will be shown in sequence. If no maintenance procedures are required, nothing will be shown.

MP pu. floor heat
F: 243 (001)

Fault occurred (example).

If more than one fault is present, these will be shown in sequence.

The number in parentheses shows the total number of faults present.

If no faults are present, nothing will be shown.

Note:

To acknowledge faults see "Troubleshooting"

Open the menu "customer settings"

→ Press OK button for more than 2 seconds.

09. 07. 2007 09 : 52
<Info Setup >

→ Press the RIGHT button.

Setup
Customer

→ Press the OK button.

Operating time

The menu "customer settings" (see following page) has been reached.

Operating time	illumination time	Holiday fix	Holiday variable	Date / Time	Coin Value	Program run times	Plant Settings	Setting dosing pumps	System
Monday 06:00 – 22:00	Monday 06:00 – 22:00	Holiday fix 1 TT.MMXX	Holiday variable 1 TT.MMJJ	Date Fr 06.07.07	Access Password: 0***	Day Time T 2 ---- ** -	Select Language EN	Select pump typ 608 / 608ff / 908	IP Adresse 169.168.001.002
Tuesday 06:00 – 22:00	Tuesday 06:00 – 22:00	Holiday fix 2 TT.MMXX	Holiday variable 2 TT.MMJJ	Time 17:58:19	Chan Value Money 1 1 0,5	T2 Date TT.MMJJ	Prog. rinse with Warm water No	High pressure 30%	IP Maske 255.255.255.000
Wednesday 06:00 – 22:00	Wednesday 06:00 – 22:00	Holiday fix 3 TT.MMXX	Holiday variable 3 TT.MMJJ	Summer / Winter Clock change No	Chan Value Money 2 2 1,0	Select pump typ 608 / 608ff / 908	Hose heating Night mode No	wet foam wash 30%	Gateway 169.168.001.001
Thursday 06:00 – 22:00	Thursday 06:00 – 22:00	Holiday fix 4 TT.MMXX	Holiday variable 4 TT.MMJJ		Chan Value Money 3 4 2,0	↓Ok	Bay Disable -----	Hot wax 25%	DNS Server 169.168.001.001
Friday 06:00 – 22:00	Friday 06:00 – 22:00	Holiday fix 5 TT.MMXX	Holiday variable 5 TT.MMJJ		Chan Value Money 4 1 0,5	Stop T1=120s T 2=040s	Operating time External No	Top care 1%	
Saturday 06:00 – 22:00	Saturday 06:00 – 22:00	Holiday fix 6 TT.MMXX	Holiday variable 6 TT.MMJJ		Chan Value Money 5 2 1,0	HP Wash T1=060s T 2=040s	Off delay wash illuminat. 60s	Insect remover 50%	
Sunday 06:00 – 05:00	Sunday 06:00 – 05:00	Holiday fix 7 TT.MMXX	Holiday variable 7 TT.MMJJ		Chan Value Money 6 4 2,0	Foam Wash T1=060s T 2=040s	Twilight setting act =123 set =350	Dirt removal 70%	
Holiday 06:00 – 05:00	Holiday 06:00 – 05:00	Holiday fix 8 TT.MMXX	Holiday variable 8 TT.MMJJ		Chan Value Money ext 1 0,5	Hp-wet foam wash T1=060s T 2=040s	Foam automatic Temperature 25 °C		
		Holiday fix 9 TT.MMXX	Holiday variable 9 TT.MMJJ		Minimum value Undercarriage 3	Rinse T1=060s T 2=040s	Foam automatic Hysteresis -10 °C		
		Holiday fix 10 TT.MMXX	Holiday variable 10 TT.MMJJ			Hot - Wax T1=060s T 2=040s	Regener. 1234567 WS -----		
		Holiday fix 11 TT.MMXX	Holiday variable 11 TT.MMJJ			Super - Care T1=060s T 2=040s			
		Holiday fix 12 TT.MMXX	Holiday variable 12 TT.MMJJ			Insect Dissolut T1=060s T 2=040s			
		Holiday fix 13 TT.MMXX	Holiday variable 13 TT.MMJJ			Dirt Dissolution T1=060s T 2=040s			
		Holiday fix 14 TT.MMXX	Holiday variable 14 TT.MMJJ			Undercarriage T1=060s T 2=040s			
		Holiday fix 15 TT.MMXX	Holiday variable 15 TT.MMJJ			Microemulsion T1=060s T 2=040s			
		Holiday fix 16 TT.MMXX	Holiday variable 16 TT.MMJJ			Foam Polish T1=135s T 2=135s			
		Holiday fix 17 TT.MMXX	Holiday variable 17 TT.MMJJ			M_High pressure T1=090s T 2=090s			
		Holiday fix 18 TT.MMXX	Holiday variable 18 TT.MMJJ			M_Rinse T1=105s T 2=105s			
		Holiday fix 19 TT.MMXX	Holiday variable 19 TT.MMJJ			M_Top care T1=075s T 2=075s			
		Holiday fix 20 TT.MMXX	Holiday variable 20 TT.MMJJ						

- 1 Menu item
- 2 Parameter

NOTE

Only the menu items for the respective, available components and washing programmes are displayed on the device. Not all possible washing programmes are shown in the figure.

Select the parameter you want to set

- Select the menu item with the buttons LEFT and RIGHT.
- Press OK to open the parameter group.
- Use the LEFT and RIGHT buttons to select the parameter you want to set.

Set the parameter with a variable

- Press the OK button.
The selectable variable blinks.
- Use the LEFT and RIGHT buttons to select the variable value.
Press and hold the button for a swift change of the variable.
- Press the OK button to save the selected value.
or
Press ESC to abort the change.

Setting a parameter with several variables

- Press the OK button.
The selectable variable blinks.
- Use the LEFT and RIGHT buttons to select the variable value.
Press and hold the button for a swift change of the variable.
- Press OK briefly to save the value and to jump to the next variable.
- Press the OK button for more than 1 second to save set values.
or
Press ESC to abort the change.

Exiting the menu

- Press the ESC to return to the next higher menu.

Operating times

The plant is open during the operating time. The plant is locked outside the operating time.

24 hours open: Set beginning and end of the operating time to the same value.

24 hours closed: Set the end of the operating time to an earlier value than the beginning of the operating time

Lighting time

During the lighting time, the washing station lights can be adjusted by a dimmer switch.

Fixed holidays

Fixed public holidays are on the same day every year.

On the set public holidays the operating time selected for public holidays applies.

Note:

Set the date to 00.00.XX for unused public holidays.

Non-fixed holidays

Variable public holidays are on different days every year. They must newly be set every year.

On the set public holidays the operating time selected for public holidays applies.

Note:

Set the date to 00.00.00 for unused public holidays.

Date / Time

Setting date, time and summer/winter time change

Auto summer / winter time = YES:

Automatic change active. Summer time (daylight saving time) begins on the last sunday in March at 2:00 o'clock. Winter time (normal time) begins on the last sunday in October at 3:00 o'clock.

Auto summer / winter time = NO:

No automatic time change.

Note:

If automatic switching is active, either "Som" (for summer) or "Wint" (for winter) is displayed along with the date and time in the right bottom corner of the display during normal operation.

Coin value

The coin value, as well as the coins, will tell the different canals of the coin inspector, how to evaluate them.

Access
Password : 0***

Note:

Upon the initial start-up, the password is "1111". For security reasons, we recommend changing the password during the first use (see "Changing password" at the end of the chapter).

- Use the LEFT and RIGHT buttons to select the blinking location of the password.
- Confirm your entry using the "OK" key.
- Set the other characters of the password in the same fashion.
- Press the "OK" key for more than 1 second to save the password.
- Select the menu item with the buttons LEFT and RIGHT.

Value: Value of the coins in washing units.

Re: Value in currency units (e.g. Euro).

Undercarriage wash:

Minimum value
Undercarriage 3

Minimum number of required washing units to execute the undercarriage washing programme.

Programme run times

Here, the run time of the different washing programmes are set per washing unit.

If the system includes different high pressure modules, different run times can be set up of each type of pump.

Selecting pump type:

Select pump typ
XXX

Two washing times can be set up for each programme:

T1: Standard washing time

T2: Special washing time, applies to certain weekdays or to a certain date

Day 1234567
Time T 2 ---- ** -

T2 applies to weekdays marked with an "***".
1=Monday,,,7=Sunday. T1 will apply on the other days.

T2 Date
TT. MMJJ

Additionally, T2 is applied on the set date.

HP-Wash
T1=060s T 2=040s

- 1 Washing programme
- 2 Standard washing time T1 per washing unit
- 3 Standard washing time T2 per washing unit

System settings

Select
Language EN

Display language.

Prog. rinse with
Warm water No

YES: Programme "Rinse" is executed with warm water.

NO: Programme "Rinse" is executed with cold water.

Warm water
Temperature 60 °C

Temperature in the swimmer tank for warm water. Can be adjusted between 30 and 60 °C.

Note:

If the circulation pump washing station heating is in use, the water is automatically heated to 60 °C.

WW-Heater
Night mode Yes

YES: The hot water generator switches off at the end of operation and restarts 10 minutes before the start of operation.

Note:

If the recirculation pump for the washing station heating is switched on for frost protection, the hot water generator switches to operation despite night mode.

NO: The hot water generator keeps the hot water float switch at the set temperature even outside operating times.

Hose heating
Night mode No

YES: The hose heater is switched off after operation and restarts one hour prior to operation.

NO: The hose heater is also active outside the operating hours.

Bay 12345678
Disable -----

The washing stations marked with an "*" are blocked. These washing stations will not accept coins.

This function is provided for maintenance work or repairs.

Operating time
External No

YES: Operating time and lighting time are controlled externally, bypassing the settings in the control. The holiday settings are ineffective.

NO: The washing station is operated as set up in the control.

Twilight setting
act =123 set =350

actual: currently measuring dimming value.

nominal: Set dimming value, from which point forward the basic and washing station lights are switched on within the set up lighting time.

Setting the dosing pumps

- Adjustable between 1% and 100%.
- Off = pulse off (0%)

The adjustment of the dosing pumps is executed as described in the beginning of this chapter (see "Adjusting parameter with one variable").

System

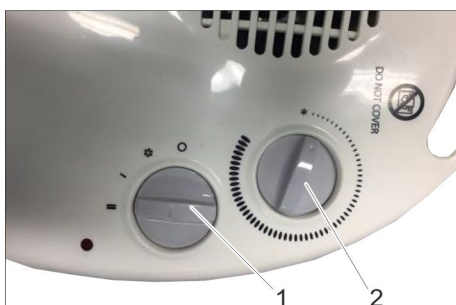
This menu item is not used.

Hot blowers

Two hot air ventilators heat up the inside room of the plant to protect it against freezing.

⚠ WARNING

Risk of fire from overheating of the fan heater. The incoming and outgoing air openings may not be covered up.

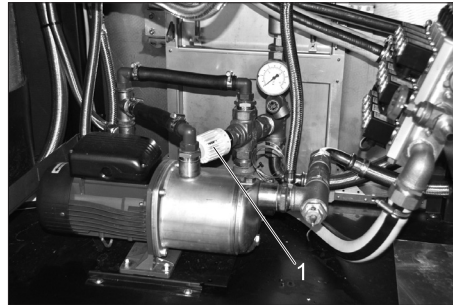


- 1 Output regulator
- 2 Thermostat

Hot air ventilator SB MB

Hot air blower		0°C...-10°C	-10°C...-20°C
Up	Output regulator	II	II
	Thermostat	II	III
Down	Output regulator	II	II
	Thermostat	*	I

Washing station heater



- 1 Thermostat mixing valve

The thermostat mixing valve regulates the feed temperature depending on the return flow temperature.

Basic setting: 22°C=Value 3 on the scale

➔ Rectify the setting, if required, according to the following table:

Value on the scale	0	1	2	3	4	5
Return flow temp °C	10	14	18	22	26	30
Value on the scale	6	7	8	9	10	–
Return flow temp °C	34	38	42	46	50	–

Frost protection with lost water

This frost protection system is activated by the control if there is a risk of frost.

Fresh water flows through the high pressure lines and hand spray guns, and these are thus protected from freezing.



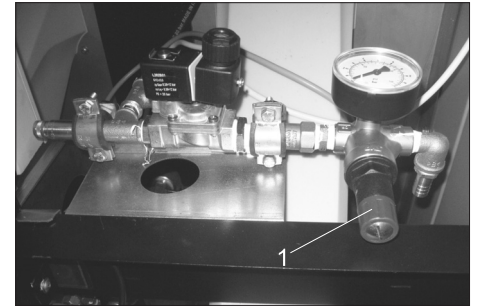
- 1 Pressure reducer

- ➔ Switch on the frost protection pump (see Chapter "Manual procedures").
- ➔ Adjust the pressure reducer so that at least 0.5 l/min of water flows from each hand spray gun.
- ➔ Switch the frost protection pump off.

Emergency frost protection

The emergency frost protection is activated in case of a power outage.

Fresh water flows through the high pressure lines and hand spray guns, and these are thus protected from freezing.



- 1 Pressure reducer

- ➔ Turn the main switch to position "0".
- ➔ Adjust the pressure reducer so that at least 0.5 l/min of water flows from each hand spray gun.

External thermostat

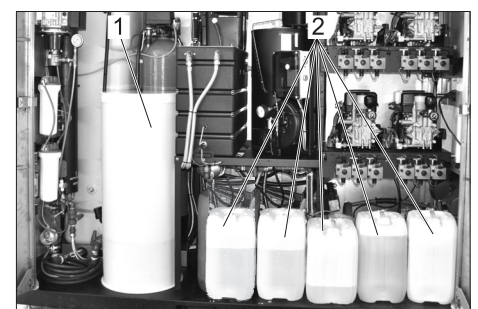
The external thermostat switches on the following anti-frost equipment depending on the external temperature:

- below +3°C:
Hose heater dry foam (option)
Heating cartridge and trace heating
ABS fuel oil tank (option)
- below +1°C:
Circulation pump for washing place heating
Circulation pump for anti-frost

Note:

The switching temperature of the exterior thermostat can be set by customer service.

Filling in detergents



- 1 Softening salt
- 2 Detergent

Provide detergent

ATTENTION

If the detergent container is empty, the high-pressure pump will draw air and can get damaged. Check the detergent tank at regular intervals.

⚠ DANGER

Risk from hazardous materials. All KÄRCHER cleaning agents to contain safety, and application notices. Notices concerning the application must be read and obeyed. Wear specified protective clothing/protective equipment.

Only use KÄRCHER-approved detergents.

	Detergent
High pressure wash / wet foam	RM 806
Dry foam	RM 812
Hot wax	RM 820
Top care	RM 821
Rim cleaner Version B*	RM 801
Intensive foam	RM 838
Contaminant removal (option)	RM 806
Insect removal (option)	RM 803
Power foam (option)	RM 838
Power wheel foam (option) Version A**	RM 802
Power wax (option)	RM 820

* wheel cleaner not via high pressure pump, (with node piece and additional pump)

** with dosing pump

This system uses undiluted detergents.

→ Hang in the detergent hose into the detergent can.

Bleed dosing pump.



- 1 Ventilation lever
- 2 Ventilation button
- 3 Adjustment knob dosing volume

The compressed air supply of the system must be operating.

- Turn the ventilation lever in an anti-clockwise direction until it stops.
- Set the dosing volume to 100%.
- Press the ventilation key until the detergent emerges from the ventilation line at the bottom of the dosing pump without bubbles.
- Set the dosing volume to the required value.
- Turn the ventilation lever in a clockwise direction until it stops.

Refill fuel

⚠ DANGER

Risk of fire. Observe local regulations for handling fuels.

Do not use unsuitable fuels, as they may be dangerous.

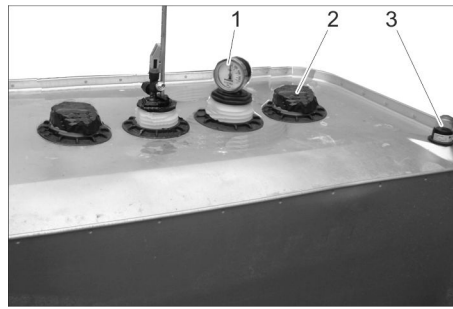
ATTENTION

If the fuel tank is empty, the fuel pump runs dry and can get damaged. Check the fuel tank regularly.

Wrong fuel can cause functional disruptions in the burner and poor combustion. Use only the fuel specified in the "Technical data" section.

Use heating oil with additives (flow promoters) while operating in winter if there is risk of frost

Fuel expands on heating and can overflow. Do not fill the fuel tank up to the brim.



- 1 Filling level display
- 2 Filling nozzle
- 3 Inspection opening

→ Close the lid of the filling nozzle.

→ Fill fuel till the filling level display indicates full level.

Note:

Ensure that no fuel overflows and goes into the inspection opening. This fuel can be taken for a leakage during subsequent inspection.

→ Close the filling nozzle.

Fill softening salts

ATTENTION

Risk of functional disturbances. While filling the softening salts, use only the softening salt in the tablet form listed in the chapter "Accessories".

- Open the salt tank.
- Fill the softening salt right until the top.
- Close the salt tank.

Note:

An empty salt tank will cause a malfunction! Fill the salt tank at the latest when water is visible in the salt tank while removing the lid. Filling the salt container to the top does not mean that there will be an increase in salt consumption.

When the system is functioning properly, the ratio of salt consumption to water consumption remains constant.

We recommend documenting the salt and water consumption in an operations log.

Manual interventions

→ In normal operating mode, press the "OK" key on the control longer than 2 seconds.

09. 07. 2007 09 : 52
<Info Setup >

→ Press the LEFT button.

Faults
Total : XXX

→ Press the RIGHT button twice.

Manual functions

→ Press the OK button.

Menu for manual interventions

→ Select the menu item with the buttons LEFT and RIGHT.

Credit
bay 1=2

Credit
bay 8=0

Every pressing of the "OK" key increases the washing credit of the selected washing station (box) by one washing unit.

Lamp test
ON = press OK

When the "OK" key is pressed, the washing station lights turn on for 3 minutes.

If the "OK" key is pressed again prior to the time elapse, the function is terminated.

Osmosis product
ON = press OK

Pressing the "OK" key activates the permeate production in the ABS WSO. Permeate production will end when the buffer tank is filled with permeate. If the buffer tank is already full when permeate production starts, the permeate production cycle will end after 3 minutes.

If the "OK" key is pressed again prior to the time elapse, the function is terminated.

WS regeneration
ON = press OK

Pressing the "OK" key activates the regeneration of the base exchanger in the ABS WSO. The regeneration cannot be exited.

Freeze prot . pump
ON = press OK

When the "OK" key is pressed, the circulation pump activates frost protection for 3 minutes.

If the "OK" key is pressed again prior to the time elapse, the function is terminated.

Floor heating
ON = press OK

When the "OK" key is pressed, the washing station heater is activated for 3 minutes.

If the "OK" key is pressed again prior to the time elapse, the function is terminated.

Hose heating
ON = press OK

When the "OK" key is pressed, the foam hose heater is activated for 3 minutes.

If the "OK" key is pressed again prior to the time elapse, the function is terminated.

Sales indicator

- In normal operating mode, press the "OK" key on the control longer than 2 seconds.

09. 07. 2007 09 : 52
<Info Setup >

- Press the LEFT button.

Faults
Total : XXX

- Press the RIGHT button three times.

Turnover

- Press the OK button.

Access
Password : 0***

Note:

Upon the initial start-up, the password is "1111". For security reasons, we recommend changing the password during the first use (see "Changing password" at the end of the chapter).

- Use the LEFT and RIGHT buttons to select the blinking location of the password.
→ Confirm your entry using the "OK" key.
→ Set the other characters of the password in the same fashion.
→ Press the "OK" key for more than 1 second to save the password.
→ Select the menu item with the buttons LEFT and RIGHT.

Total
#####,#

Total sales since start-up of the washing system.

Turnover
Bay1 #####,#

⋮

Turnover
Bay8 #####,#

Sales per washing station since start-up of the washing system.

Daily total
#####,#

Total sales since the the beginning of the day (0:00 Uhr).

Daily turnover
Bay1 #####,#

⋮

Daily turnover
Bay8 #####,#

Sales per washing station since the the beginning of the day (0:00 Uhr).

Turnover manual
Bay1 23

⋮

Turnover manual
Bay8 6

Sales from the manually increased washing units per washing station (see "Manual interventions").

Change password
Confirm = OK

Press the "OK" key to change the password.

Changing the password

Note:

Press "ESC" to cancel the change of the password.
Upon the initial start-up, the password is "1111". For security reasons, we recommend changing the password upon the first use.
For security reasons, the password may only be changed by the operator.

New Password
Confirm : 0***

- Use the LEFT and RIGHT buttons to select the blinking location of the password.
→ Confirm your entry using the "OK" key.
→ Set the other characters of the password in the same fashion.
→ Press the "OK" key for more than 1 second to save the password.

New Password
Confirm : 0***

- Reenter the password as described above to confirm.

Password
Changed

The successful change of the password will be confirmed.

Frost protection

The anit freeze equipment contains:

- Recirculation blower
- Hot air blower
- Frost protection circuit or frost protection without lost water
- Washing station heater
- Emergency frost protection
- Heating cartridge in the oil tank

⚠ WARNING

Risk of accident due to ice formation. In case of ice formation the plant must be closed off to prevent ice-related accidents.

Note:

The following functions are guaranteed:

- Unrestricted washing with the high-pressure spray lance up to -15°C.
For systems with 4 washing stations it is recommended to lock one washing station at temperatures below -10 °C (for systems with 4 high-pressure modules type 908 already at a warmer temperature).
- Restricted washing operations using washing brush at temperatures sub-zero temperatures.
During restricted washing, all washing brushes must be checked for ice-formation at regular intervals. Foam wash with frozen washing brushes can damage the vehicle. Take the following steps if the washing brushes are frozen:
 - The system is frost-safe up to -20°C.
The device must be shut down at temperatures below -20°C in accordance with the instructions in "Shutdown in case of frost".

Note:

- The pre-requisites for frost protection are:
- The main switch must be in position 1.
 - The doors of the system must be closed.
 - Uninterrupted power, water and fuel supply must be ensured.
 - Water supply must also be protected against freezing.
 - The fuel supply must be protected against frost (e.g. heating cartridge in the tank, trace heating),
 - Instructions for assembling and installation are given in chapter "Installing the plant".
 - The hot air ventilators have been set correctly.
 - All maintenance steps according to "Maintenance and Care" have been carried out correctly.
 - All cleaning tools are placed back in the storage compartment.
 - The trigger guns with frost protection holes that are part of the system are installed.

Washing station heater

Note:

The washing place heating can function properly provided the washing area has been built properly according to the KÄRCHER recommendations.

The washing station area that can be heated is limited by the corresponding heating capacity of the device. If the heated area exceeds this value, frost protection is not ensured. The number of washing stations that can be heated is given in the chapter "Technical data / data depending on hot water generation".

Snow layers and large volumes of ice pieces fall from the vehicles require a very high heating capacity. It is necessary to remove these deposits.

Maintenance jobs before and during the frost period

- Before the onset of the frost period, maintenance tasks must be carried out "every year before the onset of the frost period" according to section "Maintenance and Care".

- Carry out the following tasks for keeping the frost protection intact.

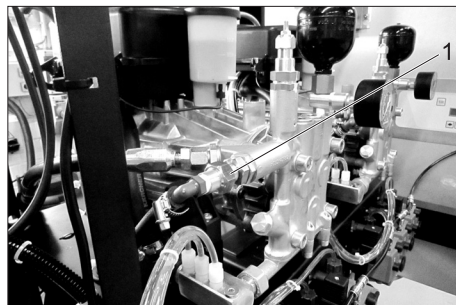
Note:

Maintenance not being done on time or from experts will mean, that there is no guarantee concerning frost damage.

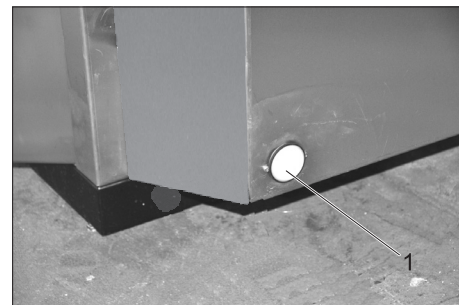
Time	Activity	Assembly affected	Performance	By whom
before the frosting period	Clean the filter	Power foam nozzle filter (option)	Clean the filter in the power foam nozzle, see "Cleaning the power foam nozzle filter". Determine the following cleaning intervals according to experience.	Operator
many times daily	opinion	Washing brush	Check for dirt and ice formation; lock foam wash if needed.	Operator
daily	Clean the filter	Filter for frost-protection pump	Clean the filter and replace	Operator
	opinion	Hot blowers	Are the hot air ventilators working (even for ABS fuel tank, option)?	Operator
		Recirculation blower	Check function.	Operator
Initially daily, later on based on experience	opinion	Filling level of the fuel tank	Will the heating oil be sufficient till next inspection? Take into account increased consumption due to anti-frost equipment. Insufficient fuel can lead to failure and damage to the system.	Operator
weekly	opinion	Heating ABS heating oil tank (option)	With temperatures below 3°C, check if the trace heating of the heating oil line between the heating oil tank and SB MB is warm.	Operator
monthly or after 200 operating hours; more frequently if needed	opinion	Quantity of frost water protection in the frost protection circuit	Target value: approx. 0.5 l/min per washing tool Water quantity is higher: Change the node piece in the hand-spray gun. ⚠ WARNING <i>Risk of injury and damage. If the frost protection water volume is bigger than the admissible value, the cleaning tool may move uncontrollably due to the exiting water stream. If the frost protection water volume is too big, replace the union piece in the trigger gun by all means.</i> Water quantity is lesser Clean filter for frost protection pump; clean sieve in throttle, clean pipes, check the rotation direction of the pump.	Operator



1 Locking valve

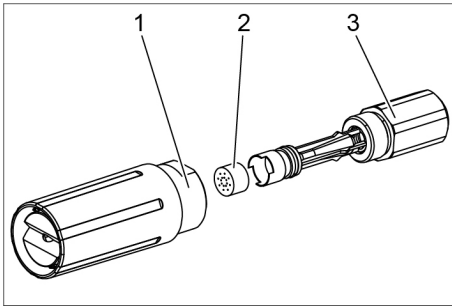


1 Throttle with sieve (marked red), 1-tool-model



1 Filter for frost-protection pump

Cleaning the power foam nozzle



- 1 Nozzle front part
- 2 Filter
- 3 Nozzle holder

- Unscrew the front part of the nozzle.
- Pull out and clean the filter.
- Insert the filter.
- Screw the front part of the nozzle on to the nozzle holder and tighten it.

Shutting down

- Turn the main switch to position "0"

Shutdown during Frost Conditions

- Turn the main switch to position "1".
- Lock the operating time at the control.
- Filling the fuel tank.

Shutdown

If the equipment is to be shut down, and there is not danger of frost,

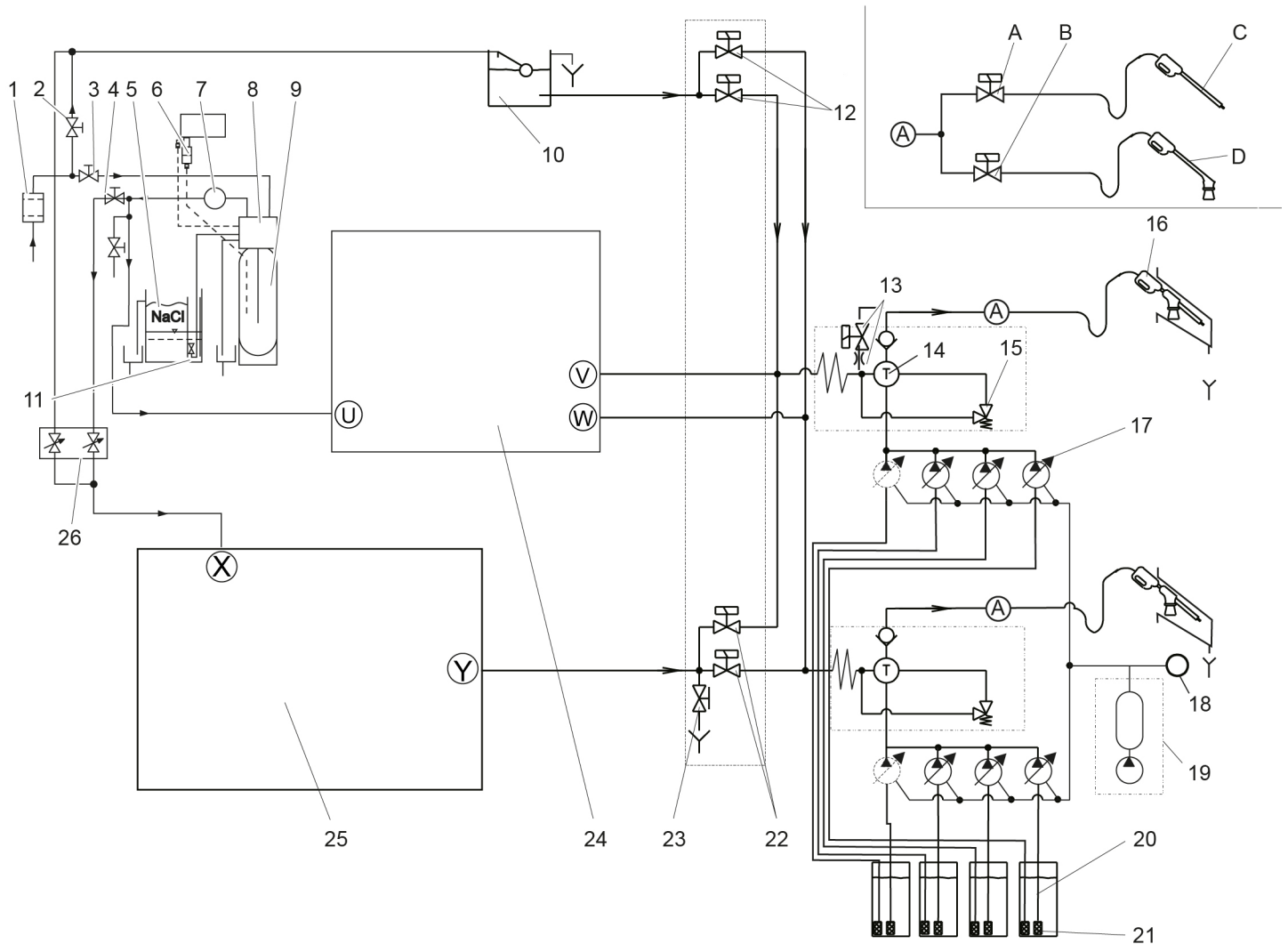
- disconnect the water input,
- disconnect the power supply.

Shutdown during frost period

- Screw off water supply hose and high pressure hose.
- Remove the RO membrane and store it under anti-freezing conditions.
- Empty all swimmer containers; unscrew the hoses and let the water drain off.
- Empty the permeate buffer tank.
- Disconnect the water pipe between base exchanger and swimmer tank for warm water.
- Rinse the plant (without base exchanger) with an anti-frost solution.
- Rinse the base exchanger with concentrated salt solution.
- Unscrew both the hoses under the boiler and let the water drain off.
- Blow out all water-carrying parts with oil-free compressed air.

Note:

All parts of the plant except the base exchanger must be rinsed with anti-frost solution during longer operational breaks to prevent the system against corrosion. In case of doubt, call Customer Service to carry out the shutdown operations.



Washing station 3 and 4 not shown.

- 1 Fine filter for fresh water (80-100 μm , option)
- 2 Locking valve for fresh water
- 3 Locking water for fresh water for softening
- 4 Locking valve for softened water
- 5 Salt tank
- 6 Hardness sensor
- 7 Water meter (for WAT-SE.../255B only)*
- 8 Control head of base exchanger
- 9 Base exchanger bottle
- 10 Swimmer tank for cold water
- 11 Solenoid valve in salt tank
- 12 Solenoid valve for cold water
- 13 Bypass valve semi load with throttle, only for high pressure module type 908
- 14 High pressure pump
- 15 Overflow valve
- 16 Hand-spray gun with washing brush
- 17 Dosing pump
- 18 Pressure switch air (optional)
- 19 Compressor
- 20 Suction hose for detergent
- 21 Detergent filter, foot valve
- 22 Solenoid valve for warm water
- 23 Drain valve
- 24 Reverse osmosis system (option)
- 25 Hot water generator

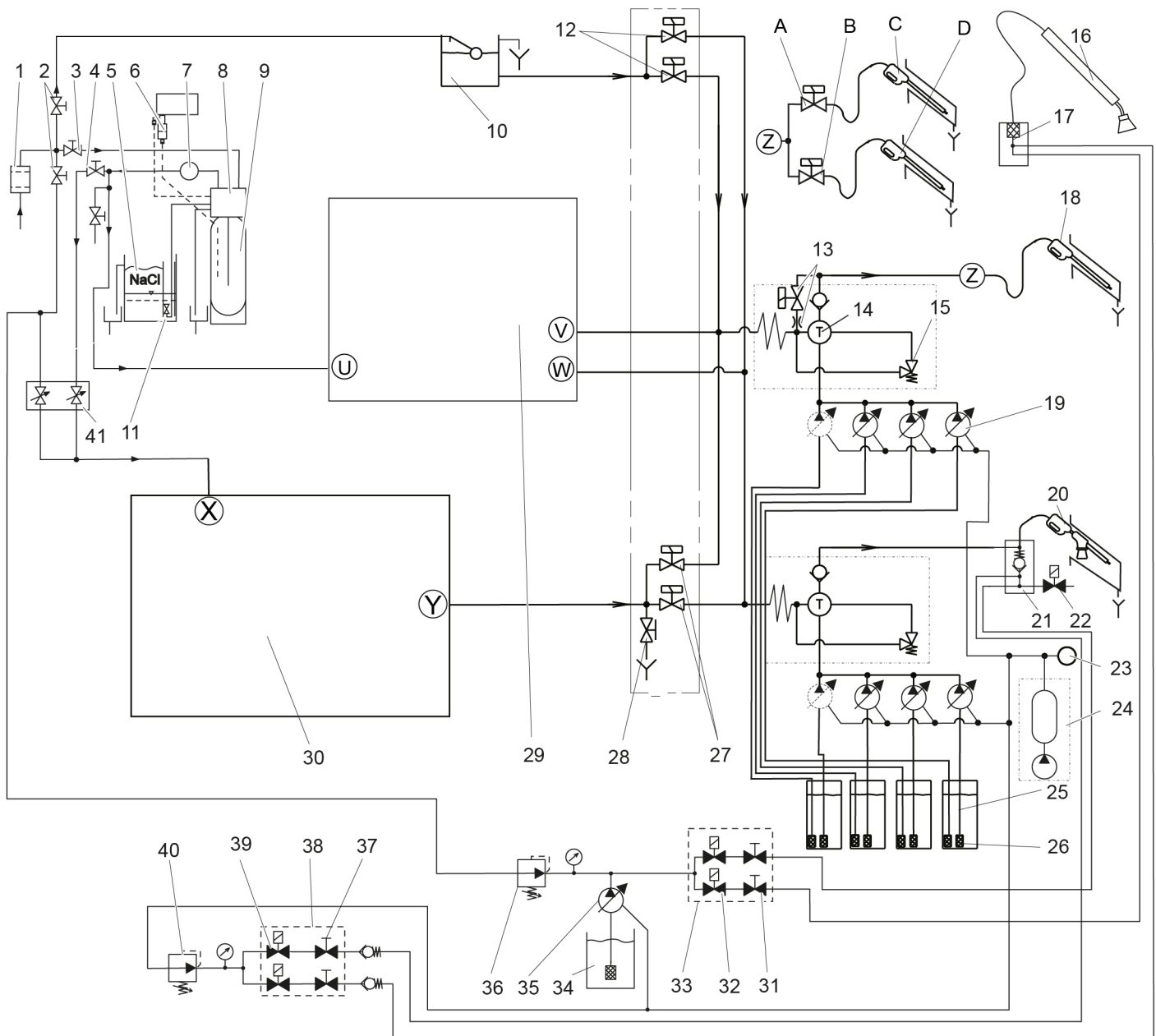
26 Blending device (option)

Double tool version (Option)

- A Solenoid valve for high-pressure
- B Solenoid valve for foam
- C Hand-spray gun with spray pipe
- D Washing brush

* Only for SB MB standard

Flowchart system with dry foam



Washing station 3 and 4 not shown.

- 1 Fine filter for fresh water (80-100 µm, option)
- 2 Locking valve for fresh water
- 3 Locking water for fresh water for softening
- 4 Locking valve for softened water
- 5 Hardness sensor
- 6 Water meter (for WAT-SE.../255B only)*
- 7 Water counter *
- 8 Control head of base exchanger
- 9 Base exchanger bottle
- 10 Swimmer tank for cold water
- 11 Solenoid valve in salt tank
- 12 Solenoid valve for cold water
- 13 Bypass valve semi load with throttle, only for high pressure module type 908
- 14 High pressure pump
- 15 Overflow valve
- 16 Foam lance (2 tool version)
- 17 Foam mixing chamber (double tool version)
- 18 Hand spray gun (2 tool version)
- 19 Dosing pump

- 20 Hand-spray gun with washing brush (single tool version)
- 21 Foam mixing chamber (single tool version)
- 22 Solenoid valve for pressure relief
- 23 Pressure switch air (optional)
- 24 Compressor
- 25 Suction hose for detergent
- 26 Detergent filter, foot valve
- 27 Solenoid valve for warm water
- 28 Drain valve
- 29 Reverse osmosis system (option)
- 30 Hot water generator
- 31 Water/chemicals dosing valve
- 32 Solenoid valve water/chemicals
- 33 Distributor water/detergent
- 34 Chemical container
- 35 Dosing pump
- 36 Pressure reducer water
- 37 Air dosing valve
- 38 Distribution block air
- 39 Solenoid valve
- 40 Pressure reducer air
- 41 Blending device (option)

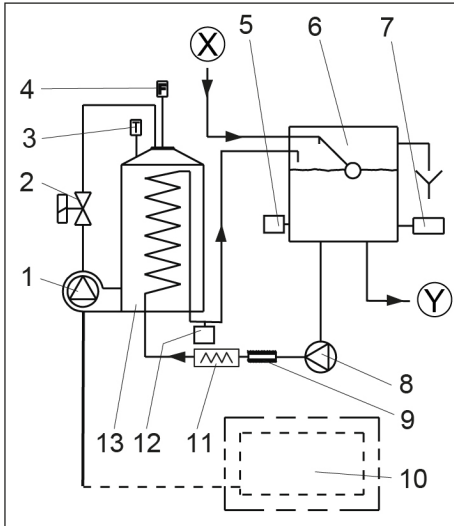
3-tool version

- A Solenoid valve, power foam lance
- B Solenoid valve for high-pressure
- C Power foam lance
- D Trigger gun

* Only for SB MB standard

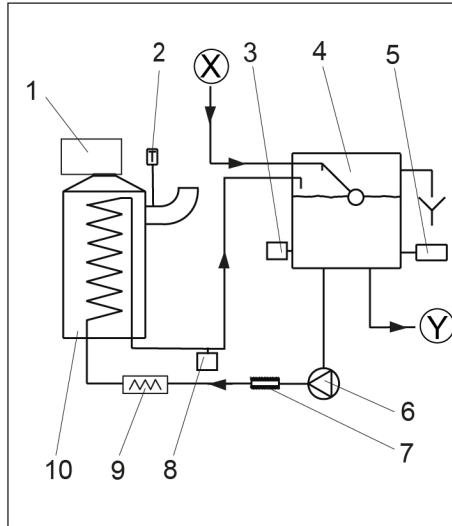
Hot-water generator

Oil burner



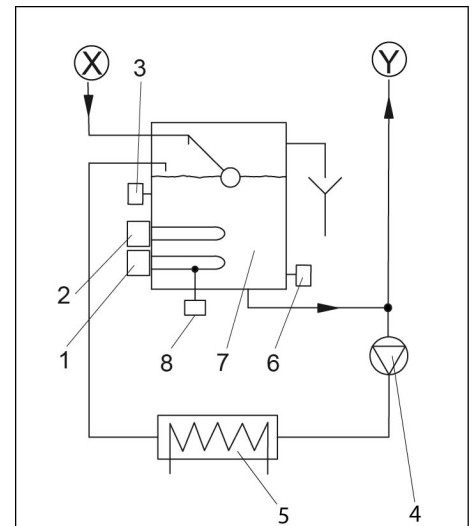
- 1 Burner blower with fuel pump
- 2 Solenoid valve for fuel
- 3 Exhaust thermostat
- 4 Flame indicator
- 5 Temperature sensor warm water
- 6 Swimmer tank for warm water
- 7 Water shortage safeguard
- 8 Circulation pump for warm water
- 9 Flow indicator
- 10 Fuel tank (Option)
- 11 Heat exchanger, washing station heating (option)
- 12 Temperature sensor for burner outlet
- 13 Burner inclusive flow-type heater

Gas burner



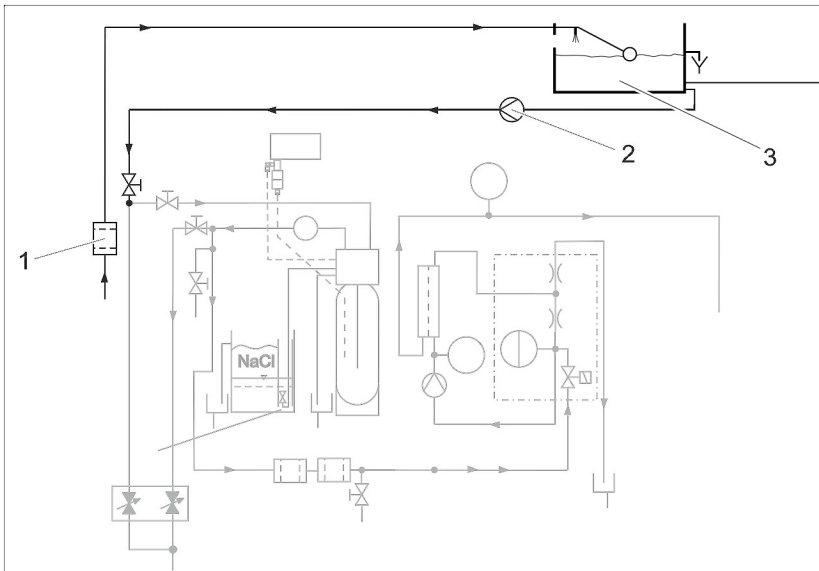
- 1 Gas burner
- 2 Exhaust thermostat
- 3 Temperature sensor warm water
- 4 Swimmer tank for warm water
- 5 Water shortage safeguard
- 6 Circulation pump for warm water
- 7 Flow indicator
- 8 Temperature sensor for burner outlet
- 9 Heat exchanger, washing station heating (option)
- 10 Continuous heater

Electrically heated

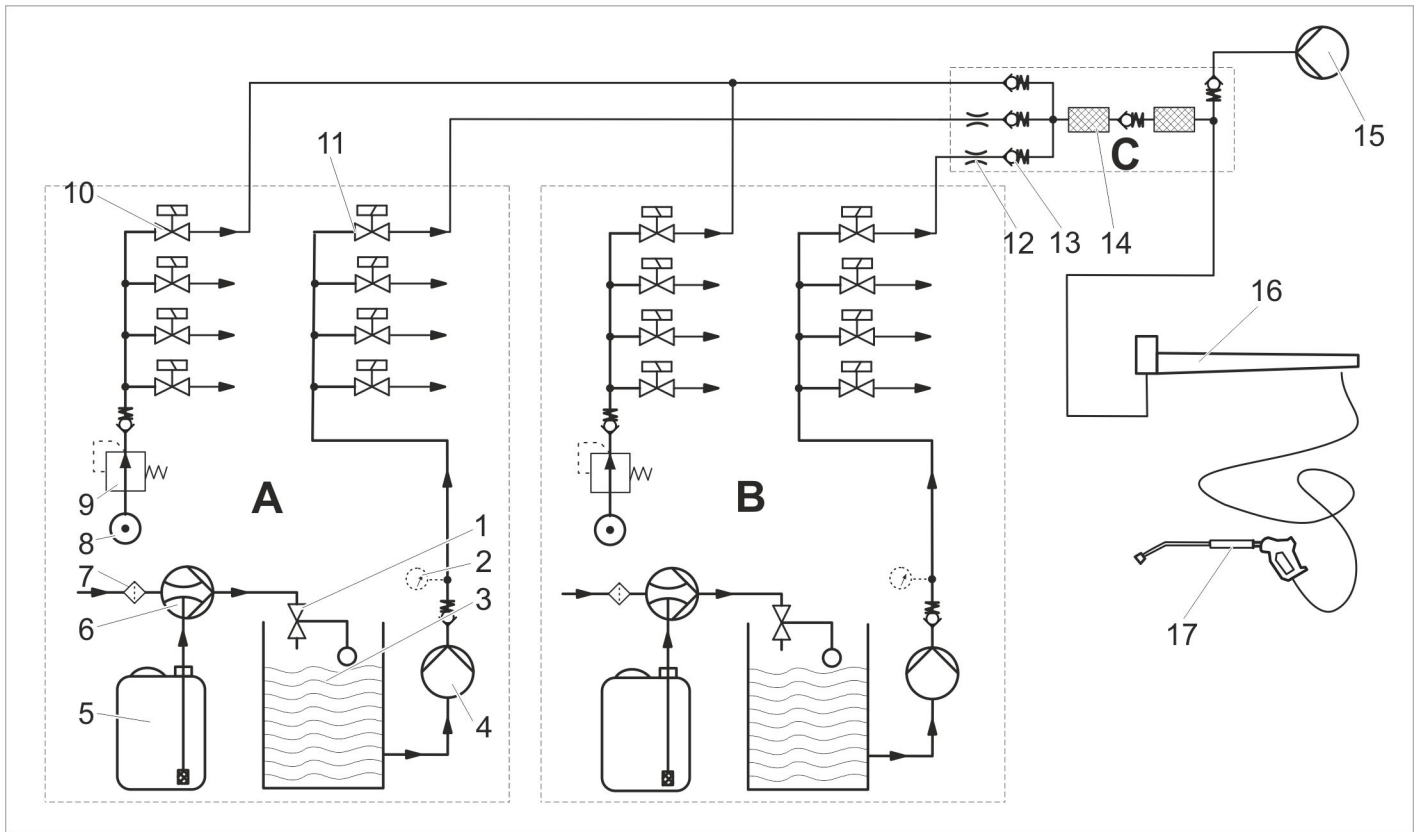


- 1 Electrical heating element
- 2 additional heating element for 48 kW version
- 3 Temperature sensor warm water
- 4 Circulation pump for washing place heating (Option for 24 kW version, standard for 48 kW version)
- 5 Heat exchanger, washing station heating (option)
- 6 Water shortage safeguard
- 7 Swimmer tank for warm water
- 8 Temperature controller

Attachment kit disconnection from mains (optional)

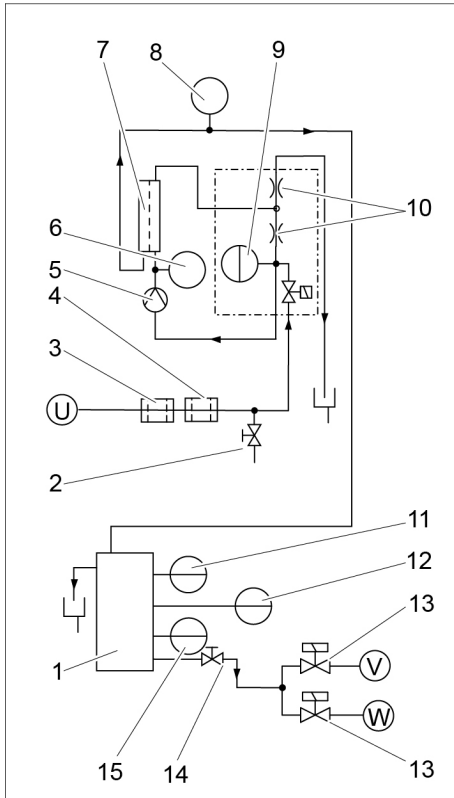


- 1 Fine filter for fresh water (80-100 µm, option)
- 2 Pump attachment kit disconnection from mains (optional)
- 3 Swimmer tank for cold water



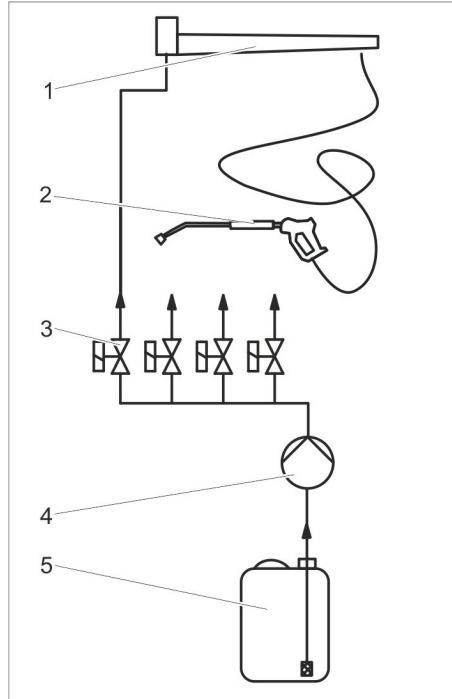
- A Rim cleaner
- B Intensive foam
- C Node piece
- 1 Swimmer valve
- 2 Manometer
- 3 Detergent solution (water + detergent)
- 4 Pump for detergent solution
- 5 Cleaning agent container
- 6 Injector
- 7 Sieve
- 8 Compressor
- 9 Pressure reducer
- 10 Solenoid valve for compressed air, washing station 1
- 11 Solenoid valve for detergent solution, washing station 1
- 12 Throttle, for volume control
- 13 Backflow valve
- 14 Foam device
- 15 High-pressure pump
- 16 Ceiling gyroscope
- 17 Trigger gun

Reverse osmosis (option)



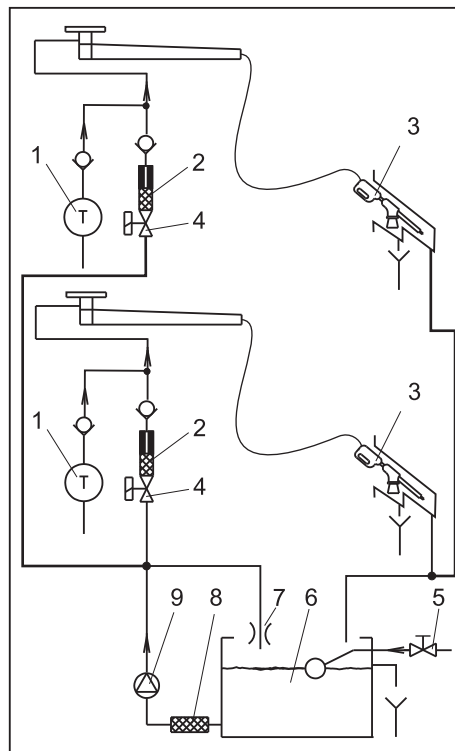
- 1 Buffer tank for permeate
- 2 Discharge valve for softened water
- 3 Finest filter
- 4 Active carbon filter
- 5 RO pump
- 6 Manometer working pressure
- 7 RO membrane
- 8 Permeate flow-meter
- 9 Pressure switch for RO water shortage
- 10 Restrictor
- 11 Level sensor BUFFER TANK FULL
- 12 Level sensor PUMP RO ON
- 13 Solenoid valve for permeate
- 14 Locking valve for permeate tank
- 15 Level sensor BUFFER TANK EMPTY

Micro emulsion (option)



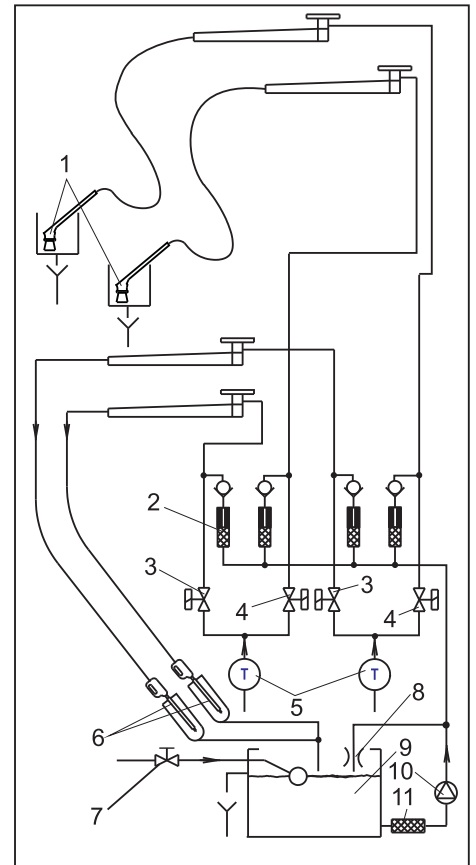
- 1 Ceiling gyroscope
- 2 Spray tool
- 3 Solenoid valve for micro emulsion, washing station 1
- 4 Micro emulsion pump
- 5 Micro emulsion container

Frost protection 1-tool (option, SB-MB 2 pump Fp only)



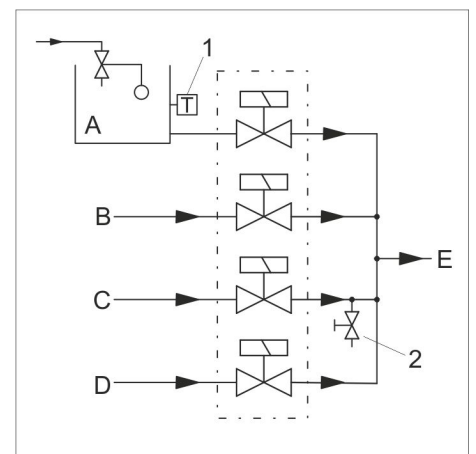
- 1 High pressure pump
- 2 Backflow valve with throttle and sieve
- 3 Hand-spray gun with washing brush
- 4 Solenoid valve, interrupts frost protection with dry foam operation
- 5 Locking valve for fresh water
- 6 Swimmer tank with anti-freeze
- 7 2.0 mm throttle
- 8 filter anti freeze pump
- 9 Anti-frost pump

Frost protection 2-tool, wet foam (option, SB-MB 2 pump Fp only)



- 1 Washing brush
- 2 Backflow valve with throttle and sieve
- 3 Solenoid valve for high-pressure
- 4 Solenoid valve for foam
- 5 High pressure pump
- 6 Hand-spray gun with spray pipe
- 7 Locking valve for fresh water
- 8 2.0 mm throttle
- 9 Swimmer tank with anti-freeze
- 10 Anti-frost pump
- 11 filter anti freeze pump

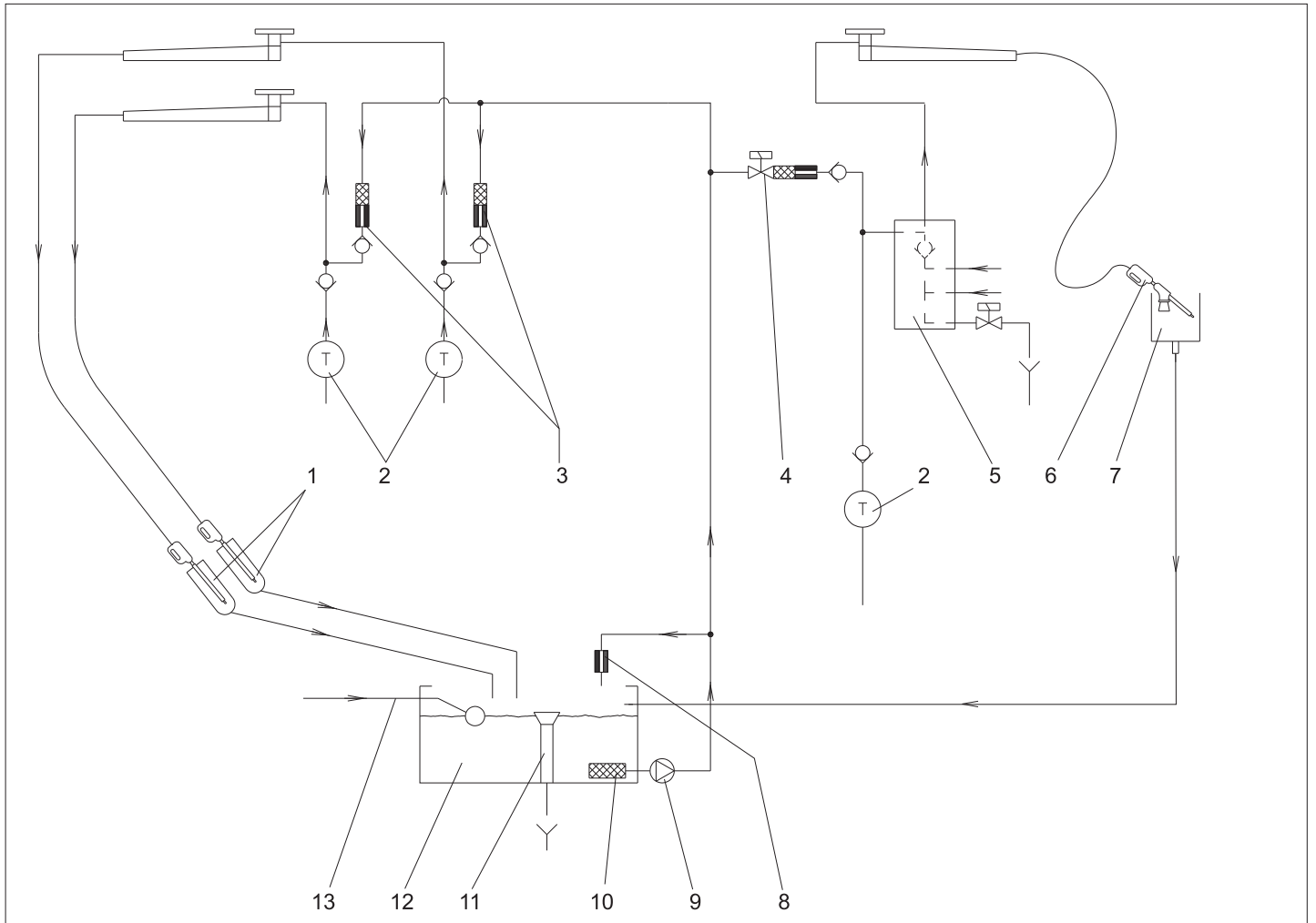
4. Type of water



- A 4. Type of water
- B Fresh water
- C Softened water, warm
- D **Permeate**
- E to high-pressure pump

- 1 Temperature sensor (option)
- 2 Drain valve float container warm water

Internal frost protection (optional)

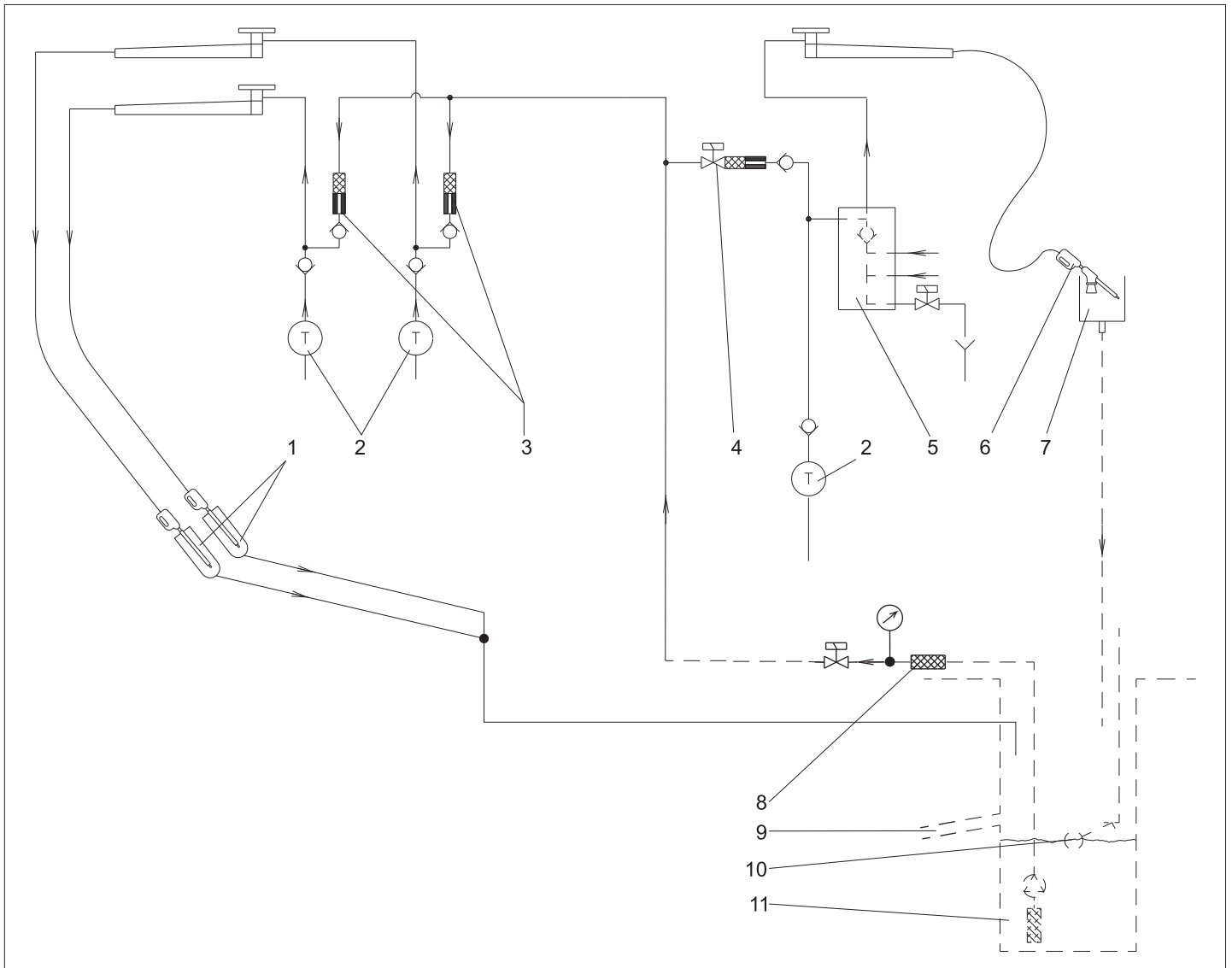


- 1 Hand spray gun (2 tool version)
- 2 High pressure pump
- 3 Backflow valve with throttle and sieve
- 4 Solenoid valve with backflow valve, throttle and sieve
- 5 Backflow valve with mixing chamber for foam and pressure release valve
- 6 Hand-spray gun with washing brush (single tool version)
- 7 Receptacle
- 8 Restrictor
- 9 Frost protection circulation pump
- 10 Filter
- 11 Overflow
- 12 Container for the anti frost circuit water
- 13 Swimmer valve for soft water supply

Note:

With the 2 tool model with dry foam, electrically heated foam hoses are used for frost protection.

For washing station 3 and 4, the frost protection water is lost.

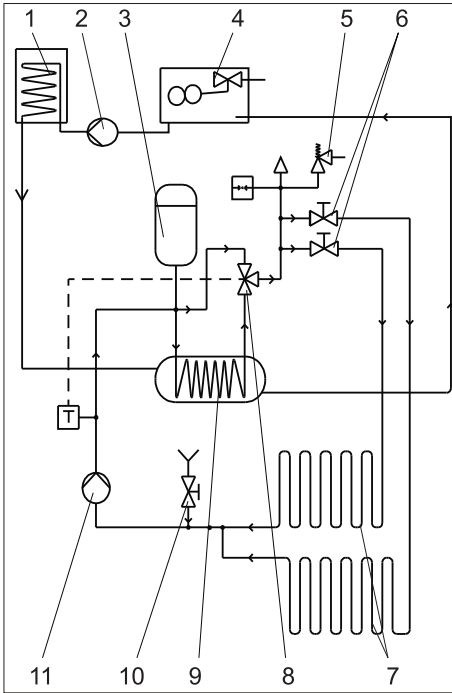


- 1 Hand spray gun (2 tool version)
- 2 High pressure pump
- 3 Backflow valve with throttle and sieve
- 4 Solenoid valve with backflow valve, throttle and sieve
- 5 Backflow valve with mixing chamber for foam and pressure release valve
- 6 Hand-spray gun with washing brush (single tool version)
- 7 Receptacle
- 8 Filter
- 9 Overflow
- 10 Swimmer valve for fresh water.
- 11 Collection box anti frost water station 3

Note:

With the 2 tool model with dry foam, electrically heated foam hoses are used for frost protection.

Washing place heating (option)



Washing station 3 and 4 not shown.

- 1 Hot water generator
- 2 Circulation pump for warm water
- 3 Balancing vessel
- 4 Swimmer tank for warm water
- 5 Safety valve
- 6 Locking valve of feeder pipe
- 7 Pipes of washing place heating
- 8 Thermostat mixing valve
- 9 Heat exchanger
- 10 Locking valve for filling pipe
- 11 Circulation pump for washing place heating

Monitoring and safety devices

Overflow valve of high-pressure pump

- Opens when the permissible operating pressure is exceeded - also even the lever for hand-spray gun is released and circulates the water. The high-pressure jet is available when the hand-spray gun is opened again.

The overflow valve is set by the manufacturer and sealed. Setting only by customer service.

Safety valve

- The safety valve protects the heating circuit of washing place heating (option) against excess pressure.

Thermostat mixing valve

- Regulates the feed temperature for the washing place heating (option) depending on the return flow temperature.

Flame monitoring

Only for devices with oil or gas burner. If the burner does not ignite or the flame extinguishes during operation, then the flame monitor closes the fuel solenoid valve and switches off the burner blower.

Exhaust thermostat

- Only for devices with oil or gas burner. If the exhaust temperature exceeds the permissible value, then the exhaust thermostat automatically switches off the burner and locks it.

Temperature controller

- Not for electrically heated devices without washing station heating. If the water temperature in the swimmer tank for warm water falls when hot water is removed and cold water flows in, the temperature sensor of the warm water circulation pump switches on and switches off again when the maximum temperature is reached.

Temperature controller

- Only for devices with oil or gas burner. Prevents the formation of steam in the boiler.

Flow monitor

- Only for devices with oil or gas burner. The flow monitor switches on the burner after the warm water circulation pump has been started.

Water shortage safeguard

- Shuts off the hot-water generator when the water level in the hot water float switch is too low.

Dry-run protection

- Only for electrically heated devices. Switches off the heating rod in case of overtemperature due to water shortage.

Motor protection switch

- The motor protection switch interrupts the electric circuit if the motor is overloaded.

Hard water sensor

SB MB standard:

If the residual hardness of the softened water exceeds a marginal value, the control will calculate the residual capacity of the base exchanger cylinder. At the latest in the following night, the regeneration of the base exchanger bottle is started.

SB MB comfort:

If the residual hardness of the softened water exceeds a limit value, the regeneration of the base exchanger bottle begins immediately.

Pressure switch for RO water shortage

If there is no water, the plant is stopped in order to prevent dry running of the pump.

Level switch Buffer tank is full

Switches off the pump when the buffer tank for permeate is full.

Level sensor pump RO on

Switches on the RO pump to produce permeate.

Level switch Buffer tank is empty

Emits a signal to the system when the permeate buffer tank is empty.

Temperature limiter 4. type of water / warm (option)

Prevents the externally added water over 60°C from being led to the HP pumps and damaging them.

In case of a malfunction, the system switches to an alternative water type (is set by the service technician upon initial startup).

Technical specifications

SB MB		5/10-2			9/12-2	SB MB 5/10-3			9/12-3	5/10-4				9/12-4	
		2	1	-	3	2	1	-	4	3	2	1	-		
High-pressure module 608, 608fl		Piece		2	1	-	3	2	1	-	4	3	2	1	-
High pressure module 908		Piece		-	1	2	-	1	2	3	-	1	2	3	4
Electrical connection															
Voltage		V/~ / Hz		400/3~/50											
Maximum allowed net impedance		Ohm		0.301 + j 0.188											
Protection version CAB (SKID version)				IP X5 (IP X1)											
Connection output, oil/gas heated		kW		10	17	13	13	14	16	17	16	17	19	20	22
Connection output, electrically heated 24 kW		kW		36	-	39	-	-	-	-	-	-	-	-	-
Connection output, electrically heated 48 kW		kW		57	59	60	60	62	63	65	63	64	66	68	69
Pre-fuse, oil/gas heated		A		35	35	35	35	35	50	50	50	50	50	50	50
Pre-fuse, electrically heated 24 kW		A		80	-	80	-	-	-	-	-	-	-	-	-
Pre-fuse, electrically heated 48 kW		A		100	100	100	100	125	125	125	125	125	125	125	125
Connection output with frost protection, oil/gas heated		kW		15	17	18	18	20	21	23	21	22	24	25	27
Connection output with frost protection, electrically heated 24 kW		kW		39	-	42	-	-	-	-	-	-	-	-	-
Connection output with frost protection, electrically heated 48 kW		kW		63	64	66	66	67	69	70	68	70	71	73	74
Pre-fuse with frost protection, oil/gas heated		A		35	35	50	50	50	50	50	50	50	63	63	63
Pre-fuse with frost protection, electrically heated 24 kW		A		80	-	80	-	-	-	-	-	-	-	-	-
Pre-fuse with frost protection, electrically heated 48 kW		A		100	125	125	125	125	125	125	125	125	125	125	125
Water connection															
Water pressure, dynamic		MPa (bar)		0.3...0.6 (3...6)											
Nominal width (DN)		mm		25											
Input amount fresh water/4. water type		m³/h		1.7	2.0	2.3	2.2	2.6	2.9	3.3	2.7	3.2	3.5	3.9	4.2
Input amount warm water by customer ²		m³/h		1.2	1.5	1.8	1.8	2.1	2.4	2.7	2.4	2.7	3.0	3.3	3.6
Container capacity															
Swimmer tank for warm water		l		80											
Swimmer tank for cold water		l		2.5			2 x 2.5								
Performance data															
Working pressure with supplied nozzle ¹		MPa (bar)		approx. 10 (100) / approx. 10 (100) / approx. 12 (120)											
Working pressure for program hot wax, foam wash ¹		MPa (bar)		approx. 3 (30) / approx. 10 (100) / approx. 4.5 (45)											
Nozzle size ¹				5004, 2504 / 5004, 2504 / 5006, 2507											
Recoil force of the trigger gun with supplied nozzle ¹		N		17 / 17 / 29											
Water consumption per washing station ¹		l/h (l/min)		approx. 500 (8.3) / approx. 500 (8.3) / approx. 900 (15)											
Water consumption for program hot wax, foam wash ¹		l/h (l/min)		approx. 250 (4.2) / approx. 500 (8.3) / approx. 450 (7.5)											
Max. hot water temperature		°C		60											
Hot water temperature for continuous operation, all high-pressure modules type 608 ³		°C		about 55			about 42			about 30					
Hot water temperature for continuous operation, all high-pressure modules type 608fl ⁴		°C		about 28			about 20			about 16					
Hot water temperature for continuous operation, all high-pressure modules type 908 ⁵		°C		about 40			about 32			about 22					
Hot water temperature for continuous operation, electrically heated ⁶		°C		53	-	38	-	-	-	-	-	-	-	-	-
¹ high-pressure module 608 / high-pressure module 608fl / high-pressure module 908 ² for customer warm water supply the fresh water requirement decreases by the corresponding amount ³ Water supply temperature +8°C, floor heating not in operation, burner power 64 kW ⁴ Water supply temperature +8°C, floor heating not in operation, burner power 40 kW ⁵ Water supply temperature +8°C, floor heating not in operation, burner power 72 kW (only oil burner) ⁶ Water supply temperature +8°C, floor heating not in operation, electric heating capacity 24 kW															
Base exchanger															
Capacity		°dH/m³		220			300			220			300		
Hardness of softened water		° dH		0...0.3											
Salt tank, CAB		l		120			150			120			150		
Salt tank, SKID		l		120			200			120			200		

SB MB		5/10-2		9/12-2	SB MB 5/10-3			9/12-3	5/10-4				9/12-4
High-pressure module 608, 608fl	Piece	2	1	-	3	2	1	-	4	3	2	1	-
High pressure module 908	Piece	-	1	2	-	1	2	3	-	1	2	3	4
RO plant													
Min. permeate output (at 15 °C water temperature), CAB	l/h	200		300	200			400	300				400
Min. permeate output (at 15 °C water temperature), SKID	l/h	200											
Operating pressure in new state, max.	MPa (bar)	1.4 (14)											
Desalination rate of membrane	%	98...99											
Water temperature range	°C	2...30											
Max. ambient temperature	°C	40											
Residual hardness of feed water	° dH	0...0.3											
Max. conductivity of permeate for stain-free drying	µS/cm	under 100											
Permeate buffer tank, CAB/SKID	l	280/700											
Miscellaneous													
Oil quantity of HP pump	l	0.7											
Oil grade		Hypoid SAE 90 (6.288-016.0)											

General

Values determined as per EN 60335-2-79

Hand-arm vibration value		
Hand spray gun	m/s ²	<2.5
Spray lance	m/s ²	<2.5
Uncertainty K	m/s ²	0.1
Sound pressure level L _{pA}	dB(A)	65
Uncertainty K _{pA}	dB(A)	3
Sound power level L _{WA} + Uncertainty K _{WA}	dB(A)	86

Dimensions SB MB CAB

Width	mm	2700
Depth	mm	900
Height	mm	2100
Empty weight, max. (with 30 kg of packaging)	kg	1100
Maximum weight	kg	1750

Data dependent on hot water generation

SB MB		5/10-2		9/12-2	SB MB 5/10-3			9/12-3	5/10-4				9/12-4
		2	1	-	3	2	1	-	4	3	2	1	-
High-pressure module 608, 608fl	Piece	2	1	-	3	2	1	-	4	3	2	1	-
High pressure module 908	Piece	-	1	2	-	1	2	3	-	1	2	3	4
Oil burner													
Heating output	kW	34.5			50			72					
Fuel consumption heating oil (11.86kWh/kg)	kg/h	3.3			4.8			6.9					
Fuel nozzle		0.85/60°			1.25/60°			1.75/60°					
Fuel pressure	MPa (bar)	1.025 (10.25)			40 kW: 1.05 (10.5) 64 kW: 1 (10)			1.05 (10.5)					
Temperature difference between exhaust and air	K	170											
Exhaust gas loss with a burner power of less than 50 kW (more than 50 kW)	%	10 (9)											
Soot figure		0...1											
Fuel		Fuel oil EL or Diesel											
ABS fuel tank heating oil	l	60/700											
max. heatable washing stations (each approx. 15 m ²)		2			3			4				3	
Gas burner													
Heating output	kW	34.5			50			max. 67					
Fuel consumption natural gas (9.4 kWh/m ³)	m ³ /h	4.1			5.9			7.6					
Fuel consumption liquid gas (25.5 kWh/m ³)	m ³ /h	1.5			2.2			2.8					
Nominal width supply line gas	Inch	3/4											
Fuel pressure (gas pressure supply line), natural gas *	mbar	>22											
Fuel pressure (gas pressure supply line), liquid gas *	mbar	>50											
Temperature difference between exhaust and air	°C	approx. 200...230											
max. heatable washing stations (each approx. 15 m ²)		2			3			3					
Electrically heated 24 kW													
Heating output	kW	24	-	24	-	-	-	-	-	-	-	-	-
Operating temperature, max.	°C	60	-	60	-	-	-	-	-	-	-	-	-
Max. water temperature	°C	65	-	65	-	-	-	-	-	-	-	-	-
max. heatable washing stations (each approx. 15 m ²)		2	-	-	-	-	-	-	-	-	-	-	-
Electrically heated 48 kW													
Heating output	kW	48											
Operating temperature, max.	°C	60											
Max. water temperature	°C	65											

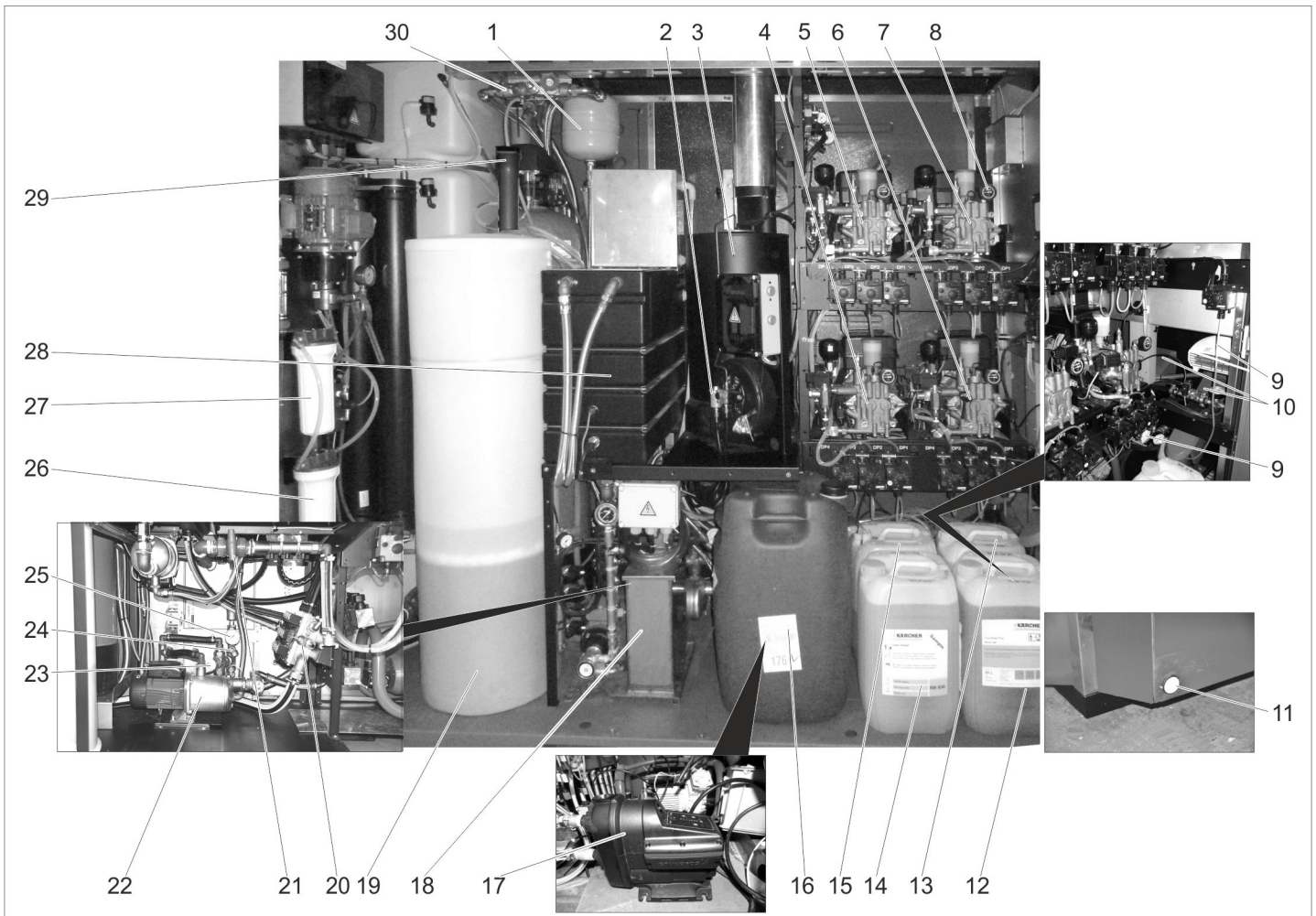
* depending on the local gas type, exact values available at the customer service

For further technical data of the gas burner, please see the operating instructions and data sheets of the burner manufacturer

Water type in the washing programme

	Fresh water	De-hardened or softened water	Permeate	Used water	warm	cold
High-pressure wash		X		O *	X	
Foam wash, wet foam				O		
Foam wash, dry foam			X			X
Rinsing		X		O		X
Hot wax		X		O *	X	
Top care			X			X
Dirt removal		X		O *	X	
Micro emulsion A		X			X	
Micro emulsion B						
Insect removal		X		O *	X	
Wheel cleaning A	X				X	
Wheel cleaning B	X					
Intensive foam	X				X	
Undercarriage						

X = Standard, O = Option, * processed water must be heated on site



- 1 Balancing vessel
- 2 Fuel filter and fuel pump
- 3 Burner inclusive flow-type heater
- 4 High pressure pump 2
- 5 High pressure pump 3
- 6 High pressure pump 1
- 7 High pressure pump 4
- 8 Manometer for high-pressure pump
- 9 Fan heater
- 10 Tool storage box
- 11 Filter anti freeze pump
- 12 Detergent reservoir for top care
- 13 Detergent reservoir hot wax
- 14 Detergent reservoir high pressure wash
- 15 Detergent reservoir dry foam
- 16 Fuel tank, 60 l (option) *
- 17 Pump attachment kit disconnection from mains (optional)
- 18 Wheel cleaner (option) *
- 19 Salt tank
- 20 Drain valve
- 21 Locking valve for fresh water
- 22 Circulation pump for washing place heating
- 23 Thermostat mixing valve
- 24 Safety valve
- 25 Manometer for washing place heating
- 26 Active carbon filter WSO
- 27 Fine filter WSO
- 28 Swimmer tank for warm water
- 29 Recirculation blower
- 30 Blending device (option)

* Depending on the equipment of the system, the assembly intensive foam can be attached in these positions.

Show system status

➔ In normal operating mode, press the "OK" key on the control longer than 2 seconds.

```
09. 07. 2007 09 : 52
<Info  Setup  >
```

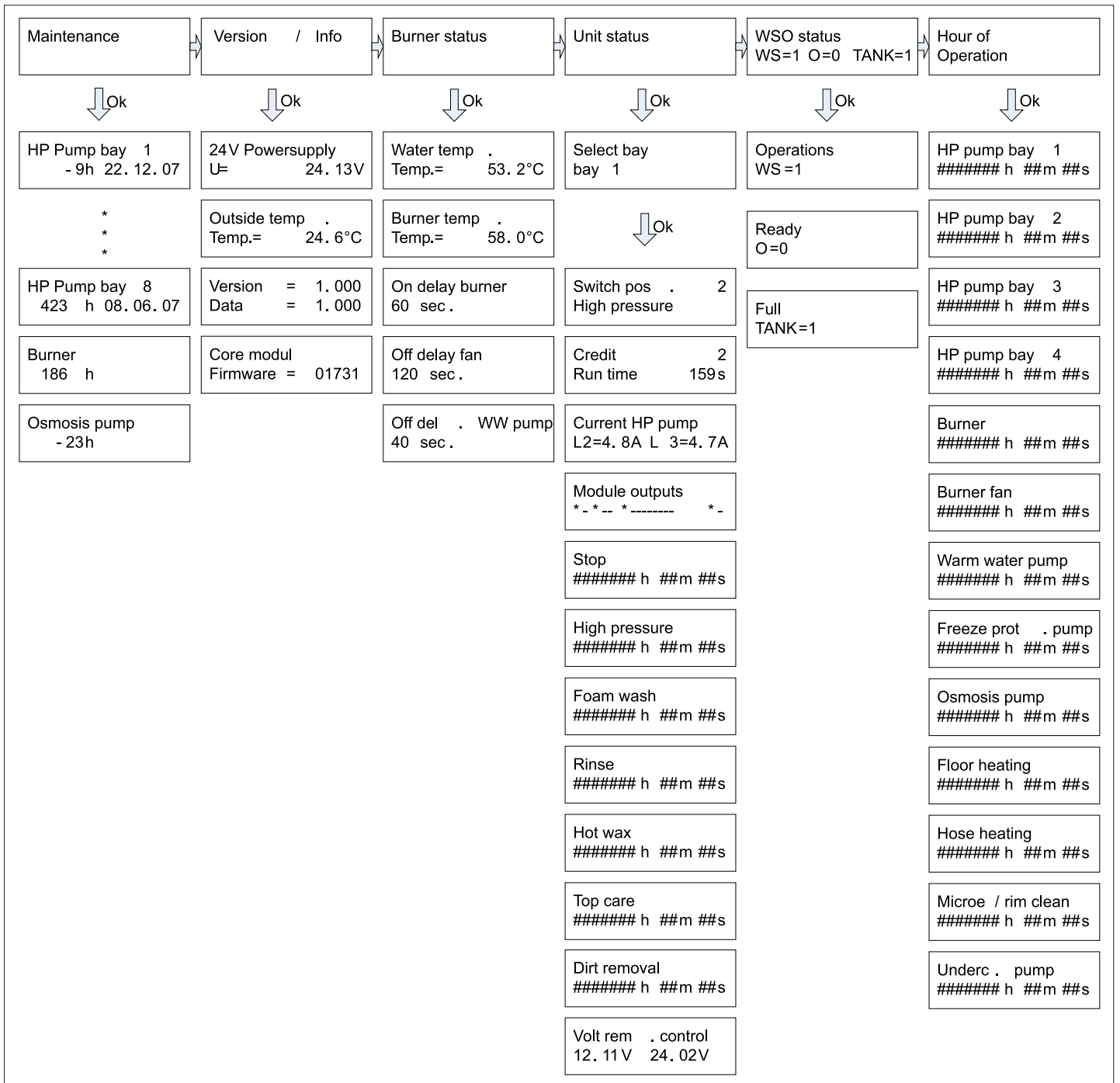
➔ Press the LEFT button.

```
Faults
Total : XXX
```

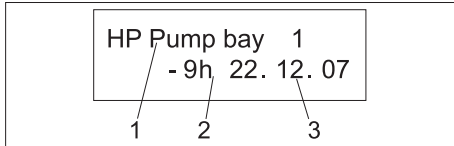
➔ Press the RIGHT button four times.

```
Maintenance
```

Menu overview on next page.



Maintenance



- 1 Appliance component
- 2 Time until next maintenance (minus symbol if maintenance is due)
- 3 Date of last maintenance

Version / info

24V Powersupply
U= 24. 13V

Current value of the control voltage

Outside temp .
Temp.= 24. 6°C

Exterior temperature measured by exterior temperature sensor.

Version = 1. 000
Data = 1. 000

Software version and data set version of control

Core Modul
Firmware = 01731

Display of the core module (processor)

Hot water generator status

Depending on the hot water generator, not all menu items are displayed.

Water temp .
Temp.= 53. 2°C

Water temperature in the swimmer tank for warm water.

Water temperature in the swimmer tank for warm water.

Water temperature at the outlet of the continuous heater. At temperatures above 96°C, the burner is turned off.

For oil and gas heated systems.

Electric heating
Temp.= 58.0°C

Temperature at the heating element of electrically heated systems.

Electric heating
Temp.= 58.0°C

Minimal break between switching the burner off and back on.

For oil and gas heated systems.

Brennerverzoeg .
60 sec .

Trailing time of the burner fan after the burner has been turned off.
For oil heated systems.

Off delay fan
120 sec .

Trailing time of the circulation pump for warm water after the burner has been turned off.
For oil and gas heated systems.

Status of washing stations

Select bay
bay 1

→ Select the washing station number (box) with the buttons LEFT and RIGHT.

→ Press the OK button.

The status of the selected washing station is shown.

Switch pos . 2
High pressure

Currently selected washing programme.

Credit 2
Run time 159s

Remaining value of the washing credit in washing units.

Remaining run time in seconds.

Current HP pump
L2=4. 8A L 3=4. 7A

Current pickup of the high pressure pump.

Module outputs
* - * - * - * - * - * -

Active outputs of the pump electronics.

Stop
h ##m ##s

High pressure
h ##m ##s

Foam wash
h ##m ##s

Rinse
h ##m ##s

Hot wax
h ##m ##s

Top care
h ##m ##s

Dirt removal
h ##m ##s

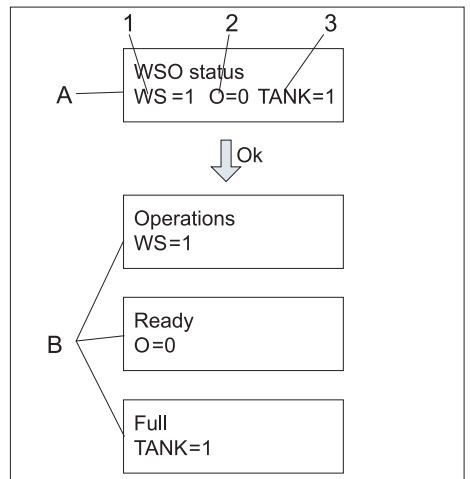
Run times of the individual washing programmes since system start-up.

Volt rem . control
12. 11V 24. 02V

Voltage supply to the remote controls.

Status WSO

WSO status
WS=1 O=0 TANK=1



A Overview of status

B Details of status

- 1 Status of base exchanger
- 2 Status of reverse osmosis
- 3 Status of buffer tank for permeate

→ Press the OK button.

→ Select the desired display using the "LEFT" and "RIGHT" keys.

Depending on the operating state, one of the displays below may appear.

Operation
WS=1 XXXX L

Base exchanger in operation, XXXX litres of water de-hardened since the last regeneration.

Remaining
WS=2 XXXX L

Calculated residual capacity until the next regeneration.

Feedback timer
WS=6 XXX sec.

Regeneration was activated, control has been waiting for response from base exchanger for XXX seconds.

Regeneration
WS=7 XXX sec.

Base exchanger has been conducting regeneration for XXX minutes.

Salt regenerat
WS=5 XXXX sec.

The salt solution in the salt tank is regenerated. The process is completed within XXX minutes. There can be no regeneration of the base exchanger before then.

Malfunction
WS=E

There was an error in the base exchanger.

Standby
O=0

Reverse Osmosis is ready.

Pre rinsing
O=3 3 sec.

The prerinse of the RO membrane will be completed in X seconds.

Produktion
O=1

The reverse osmosis produces permeate.

Final rinsing
O=2 60 sec.

The final rinse of the RO membrane will be completed in XX seconds.

Disabled
O=4

Permeate production blocked as the base exchanger is performing a regeneration.

No water press
O=7

No water pressure at inlet of the system.

Full
TANK=1

Buffer container for permeate filled with permeate to the level sensor BUFFER CONTAINER FULL.

Not full
TANK=2

Water level in the buffer container for permeate is below level sensor BUFFER CONTAINER FULL.

Empty
TANK=3

Water level in the buffer container for permeate is below level sensor BUFFER CONTAINER EMPTY.

Dry run delay
TANK=6 3599 sec.

Dry run delay active after XXX minutes. During this period, the SB-C is supplied with cold water.

Dry run
TANK=E

The buffer container for permeate is empty, the SB-C is supplied with cold water.

Operating hours

Here, the operating hours of the individual system components since system start-up are shown.

The different menu items are shown in the overview at the beginning of this chapter.

Maintenance instructions

The bases of a safe operating of the equipment is the regularly maintenance according to the following maintenance plan.

Use only original parts of the manufacturer or part suggested by him, such as

- parts and wearing parts,
- accessories parts,
- operating materials,
- cleaning agents.

⚠ DANGER

Risk of accident while working on the unit!

During all tasks:

- Turn off the water supply; close the fresh water tap,
- First switch-on in voltage-less state, switch off the emergency stop switch in the building and secure it against being switched on again.

ATTENTION

Risk of damage. Never use a high-pressure jet to clean the inside of the system.

Who may perform maintenance?

- Operator

Work designated with the sign "Operator" may only be carried out by persons who have been instructed in the safe operation and maintenance on the washing system.

- Customer Service

Work designated with the sign "Customer Service" may only be done by the fitters of Kärcher Customer Service.

Maintenance contract

In order to ensure a reliable operation of the plant, we recommend that you conclude a maintenance contract with us. Please refer to you local KÄRCHER service department.

⚠ DANGER

Risk of injury due to high-pressure jet exiting possibly defective components, risk of burns due to hot plant parts. When working on the opened plant, proceed with particular care and observe all safety instructions.

The following parts are possible to be hotter than 50 °C:

- exhaust pipe and exhaust opening
- Burner inclusive flow-type heater
- cylinder head of the high pressure pump
- high pressure hose

Maintenance schedule

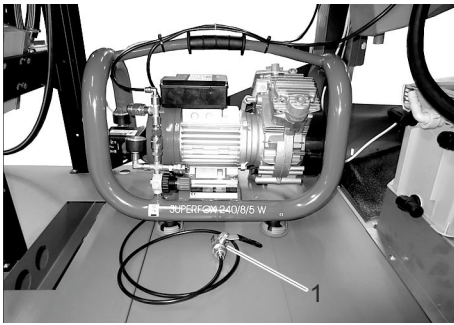
| Time | Activity | Assembly affected | Performance | By whom | |
|---|----------------------------|--|--|--|----------|
| once a year before the frosting period starts | Clean the filter | Antifreezing circulation | Empty and clean the collection chute for the frost protection water.
Clean the filter on the immersion pump.
Clean the filter of the frost protection pump (in the casing of the SB MB).
Clean the tool compartment and check for free flow.
Clean the throttle valve (in the area of the high pressure pump outlet).
Fill the collection chute for the frost protection water with fresh water. | Operator/
Customer Service | |
| | opinion | Washing station heater | Check functioning and rotation direction of the circulation pump
Check concentration of anti-freezing agent: Take out a little anti-freezing solution from the safety valve and check its correct concentration using a special tester (6.419-070.0). Target value -25°C
Check pressure in the heating circuit. Nominal value with running circulation pump of the washing station heater 0.07...0.15 MPa (0.7...1.5 bar)
Check setting of the thermostat mixing valve.
Check the function of the balancing vessel: Remove the valve flap. Press in the valve pin briefly using a matchstick. The balancing vehicle is OK if air comes out. If water comes out, then the balancing vessel needs to be replaced. If nothing comes out, then use a car air pump to pump in air in the balancing vehicle according to the values on the type plate. | | |
| | opinion | External thermostat | Check function. | Operator | |
| | opinion | Recirculation blower | Check function. | Operator | |
| | opinion | Hot blowers | Have the regulators been set correctly? (See section "Settings/hot air ventilator".) | Operator | |
| | opinion | Frost protection with lost water | Switch on the frost protection pump (see Chapter "Manual procedures").
Check if at least 0.5 l/min of water exits each hand spray gun, if necessary, readjust the pressure reducer. | Operator | |
| | opinion | Emergency frost protection | Turn the main switch to position "0".
Check if at least 0.5 l/min of water exits each hand spray gun, if necessary, readjust the pressure reducer. | Operator | |
| | Clean the filter measuring | Pass boiler
Burner | Recommendation: These half-yearly maintenance tasks are to be done before the frosting period starts. | Customer Service | |
| | daily | opinion | High pressure hoses, foam hoses (with 2 tool model) | Check high pressure hoses for mechanical damages such as scraping, visible hose duck, bends, porous and cracked rubber. Replace damaged high pressure hoses. | Operator |
| | | opinion | Information signs at the washdown yard | Check whether the warning boards for the users are available and legible. | Operator |
| opinion | | Washing station lighting | Check the function of the washing station lighting and replace defective lights. | Operator | |
| opinion | | Spray lance | Check for tightness; replace O-ring if necessary. Nozzle protection and handle pipe OK? Replace if necessary. | Operator | |
| opinion | | Hand spray gun | Check for tightness; replace O-ring if necessary.
Can the high-pressure hose be rotated, and is the lever running smoothly? Lubricate if necessary (see section „Maintenance work“). | Operator | |
| opinion | | Tool storage box | Check from the outside for foreign matters and contamination. Remove coarse contaminants. | Operator | |
| opinion | | Fill levels of the detergent container | Check filling level, refill or replace if necessary. | Operator | |
| empty | | Coins container | Open the coin acceptor doors and empty the coin container. | Operator | |
| Initially daily, later on based on experience | opinion | Filling level of the fuel tank | Will the heating oil be sufficient till next inspection? Take into account increased consumption due to anti-frost equipment. Insufficient fuel can lead to failure and damage to the system. | Operator | |
| | empty | Compressor | Drain the condensate from the pressure container of the compressor. | Operator | |
| Everyday under frost conditions | opinion | Anti frost devices | Are the hot air ventilators working (even for ABS fuel tank, option)? | Operator | |
| | Clean the filter | Filter for frost-protection pump | Clean the filter and replace | Operator | |

| Time | Activity | Assembly affected | Performance | By whom |
|--|---|---|--|----------|
| After 40 operating hours or once a week | opinion | Tightness of system | Check pumps and pipes for leaks. Inform Customer Service if there is oil under the high pressure pump, if more than 3 drops of water drop out of the high pressure pump when the pump is running. | Operator |
| | opinion | Oil condition | Milky oil indicates that it contains water. Inform Customer Service. | Operator |
| | opinion | Check oil level in the high pressure pumps | The oil level must lie between the MIN and MAX markings; else refill. | Operator |
| | opinion | Detergent hoses with filter | Visual inspection of the high-pressure jet whether it contains detergent. Clean the filter if necessary. | Operator |
| | opinion | Entire plant | Check the functions of all wash programs. | Operator |
| | opinion | Salt stock in the salt tank | Is the salt level above the water level? If required, top up softening salts. | Operator |
| | opinion | Residual hardness of softened water | Take warm water from the swimmer tank and determine its residual hardness using test set B (order no. 6.768-003). Target value: below 3 °dH. | Operator |
| | check if the chlorine content in the fresh water exceeds 0.3 mg/l | Residual chlorine content after activated carbon filter | Take a water sample between the activated carbon filter and the RO-membrane. Determine residual chlorine content. If the residual chlorine content of the water sample exceeds 0.1 mg/l renew activated carbon filter. | Operator |
| | switch on briefly | Washing station heater | Activate on the frost protection pump as described in Chapter "Manual procedures". | Operator |
| | Clean the filter | Casing exterior (stainless steel and plastic) | Mix detergent "Wash hall and tile cleaner RM 841" at 10%, apply to the surfaces, let it soak for 2 to 3 minutes, do not allow to dry. Rinse thoroughly with high pressure jet after the soak time. | Operator |
| Mix detergent "Wash hall and tile cleaner RM 841" at 20 %, apply to the surfaces, let it soak for 2 to 3 minutes. After the soak-in time, clean the surfaces with a moist pad or microfibre cloth and then rinse thoroughly by a high pressure jet. If desired, larger areas can be cleaned using a rubber edged "Squeegee". | | | Operator | |
| Splash guard tarpaulins | | Mix detergent "Wash hall and tile cleaner RM 841" at 10%, apply to the surfaces, let it soak for 2 to 3 minutes, do not allow to dry. Rinse thoroughly with high pressure jet after the soak time.
ATTENTION
<i>Risk of damage. Do not clean splash guard tarpaulins with solvents or solvent-containing detergents.</i> | Operator | |
| Care | Casing exterior (stainless steel) | Take care of the stainless steel casing using steel cleaner. | Operator | |
| weekly in case of frost | opinion | Heating ABS heating oil tank (option) | With temperatures below 3°C, check if the trace heating of the heating oil line between the heating oil tank and SB MB is warm. | Operator |
| Once, 1 month after start-up | Exchange filter | Fine filter WSO | Close the locking valve for fresh water (building site), unscrew the filter cup, replace the filter inlay, insert the new filter inlay and the filter cup back into place, open locking valve for fresh water. | Operator |
| After 80 operating hours or once every two weeks | Cleaning and preserving | All stainless steel parts of the case | Remove dirt and deposits. Preserve the parts using special steel care oil. | Operator |

| Time | Activity | Assembly affected | Performance | By whom |
|---|--------------------------------------|---|--|--|
| After 200 operating hours or once a month | Check the operating pressure | High-pressure pumps | The manometer must read 9...10 MPa (90...100 bars). Follow the instructions in the section "Help in the event of a malfunction" to repair the defect if the reading is different. | Operator |
| | opinion | Quantity of frost water protection in the frost protection circuit | Target value: approx. 0.5 l/min per washing tool
Water quantity is higher: Change the node piece in the hand-spray gun.
⚠ WARNING
<i>Risk of injury and damage. If the frost protection water volume is bigger than the admissible value, the cleaning tool may move uncontrollably due to the exiting water stream. If the frost protection water volume is too big, replace the union piece in the trigger gun by all means.</i>
Water quantity is lesser Clean filter for frost protection pump; clean sieve in throttle, clean pipes, check the rotation direction of the pump. | Operator |
| | Clean the filter | Cleaning agent filter | Remove filter and rinse it thoroughly with hot water. | Operator |
| | Clean the filter | Container for the anti frost circuit water | Clean filter. | Operator |
| | Clean the filter | Tool storage box | Clean the storage boxes. | Operator |
| | opinion | Salt tank | Check water level (approx. 5 ... 25 cm above the sieve plate).
Check for deposits; if required, empty the tank, clean it, fill it up with softening salts and start it up again. Risk of functional disturbances. While filling the softening salts, use only the softening salt in the tablet form listed in the chapter "Accessories". | Operator |
| | Clean the filter | Burner | Clean the sight glass of the flame monitor (see section „Maintenance work“).
Clean and check the ignition electrodes | Operator
Customer Service |
| | Clean the filter | Fuel filter | Clean filters (see section „Maintenance work“). | Operator |
| | lubricate | Ceiling gyroscope | Lubricate with grease gun on lubrication nipples (grease 6.288-055.0) | Operator |
| | lubricate | Door hinges | Lubricate the hinges with grease (order no.: 6.288-072). | Operator |
| | preserving | Door locks | Spray care liquid (order no. 6.288-116) into the locks. | Operator |
| | every 6 weeks | check if the chlorine content in the fresh water drops below 0.3 mg/l | Residual chlorine content after activated carbon filter | Take a water sample between the activated carbon filter and the RO-membrane. Determine residual chlorine content. If the residual chlorine content of the water sample exceeds 0.1 mg/l renew activated carbon filter. |
| Quarterly | Clean the filter | Coin acceptor | Open the coin acceptor door. Clean the coin acceptor (see section „Maintenance work“). | Operator |
| After 1000 operating hours or once every six months | opinion | Pump head | Replace all valves when the valve heads are heavily pocketed. | Customer Service |
| | Oil change | High-pressure pumps | See section "Maintenance work". | Operator |
| | remove the soot and calcium deposits | Pass boiler | Remove the soot and calcium deposits from the heating coil. | Customer Service |
| | measuring | Burner | Measure the exhaust value; clean and adjust the burner, if required | Customer Service |
| | Exchange filter | Fine filter WSO | Replace filter inlay; do not clean it. | Operator |
| once a year before the frosting period starts | Clean the filter | Power foam nozzle filter (option) | See "Frost protection/maintenance work before and during the frost period/cleaning the power foam nozzle filter". Determine the following cleaning intervals according to experience. | Operator |
| annual | Safety check | Entire plant | Safety check according to the guidelines for fluid spraying equipment / accident prevention regulations. | Customer Service |
| | Maintenance | Entire plant | Maintenance contract including the replacement of all wear parts. | Customer Service |
| | opinion | Temperature controller | Check function of both the thermostats. | Customer Service |
| | Exchange filter | Filter inlay active carbon filter WSO | Close the locking valve for fresh water (building site), unscrew the filter cup and rinse it, replace the filter inlay, insert the new filter inlay and the filter cup back into place, open locking valve for fresh water, take system into operation. | Operator/
Customer Service |
| | opinion | Pump of RO system | Inform Customer Service. Check characteristic line (flow quantity and pressure). | Customer Service |
| | Maintenance | Gas burner | Have maintenance tasks performed by the customer service of the burner manufacturer. | Customer Service |
| 5 x year or as needed. | Clean the filter | Fuel tank | Pump off remaining fuel. Empty and dispose of sediments. Clean tank from the inside. | Tank cleaning service |

Maintenance Works

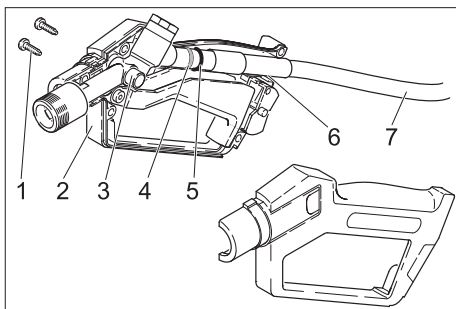
Draining condensate at the compressor



1 Condensate drain valve

- Hold the condensate drain valve over a duct or a collection container.
- Open the condensate drain valve and drain the condensate.
- Close the condensate drain valve.

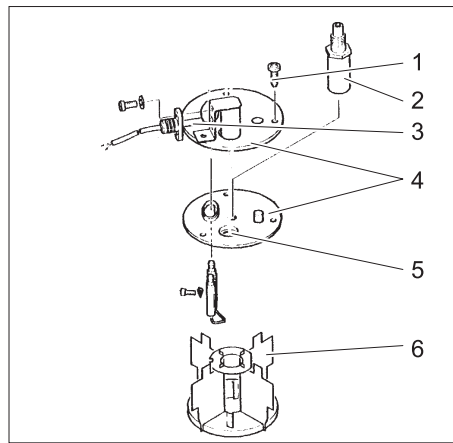
Lubricate the hand-spray gun



- 1 Screw
- 2 Halves of the handle shell
- 3 Node piece
- 4 Needle bearing
- 5 O ring
- 6 Contact surface pipe/ handle shell
- 7 high pressure hose

- Unscrew spray pipe.
- Loosen 6 screws.
- Remove the half of the handle shell.
- Fill grease in the needle bearing chamber in the handle shell.
- Grease needle bearing and O-Ring.
- Grease contact surface pipe/ handle shell.
- Screw back the two halves of the handle shell.

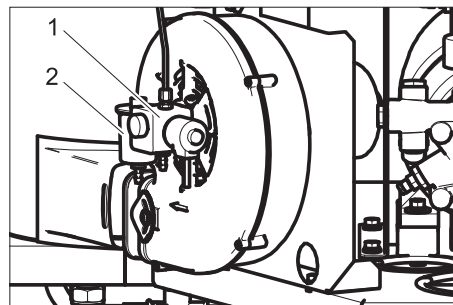
Clean looking glass for flame monitoring



- 1 Screw
- 2 Nozzle holder
- 3 Light sensor
- 4 Cover
- 5 Looking glass
- 6 Pressure plate

- Loosen fuel pipe.
- Pull out the light sensor sideways from the holder.
- Loosen 3 screws.
- Remove the lid with the holder for light sensor.
- Remove the pressure plate from the nozzle holder.
- Clean the looking glass.
- Assemble the parts in the reverse sequence.

Cleaning the fuel pump filter



- 1 Fuel pump
- 2 Filter casing

- Lock the oil supply.
- Unscrew the filter casing.
- Clean filter with compressed air.
- Assemble the parts in the reverse sequence.
- Open the oil supply.

Oil change

⚠ WARNING

Risk of burns due to hot oil or hot parts of the plant. Allow the pump to cool down for minutes before oil change.

Note:

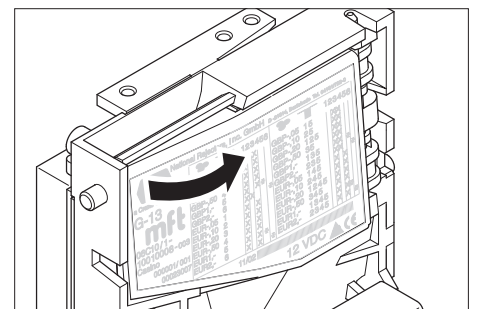
Used oil must only be disposed of by the designated collection points. Please turn in used oil there. Polluting the environment with used oil is prosecutable.



- 1 Oil container lid
- 2 Oil drain screw

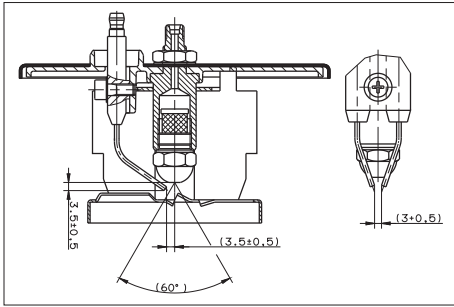
- Keep a collection basin for old oil ready.
- Remove the lid of the oil container.
- Unscrew the oil drain screw and collect used oil.
- Insert washer and turn in the oil drain screw.
- Slowly fill in new oil until the "MAX" marking on the oil container.
- Close the oil container with the lid.
- Deliver the old oil to the respective collection centres.

Clean the coin mechanism



- Open the coin acceptor, and clean the coin channel with a moist cloth and washing liquid.

Electrode setting



The correct setting of the ignition electrodes is very important for the burner to function properly. The settings have been indicated in the above drawing.

Manual regeneration of base exchanger

WAT-SE 220/255B:

→ Set at the control in the menu "Customer settings / System settings / Regener:".

WAT-S 202:



1 Programming knob

→ Press in the program knob and turn the camshaft anticlockwise until the arrow on the program knob points at "Salting + washing".

Troubleshooting

The bases of a safe operating of the equipment is the regularly maintenance according to the following maintenance plan.

Use only original parts of the manufacturer or part suggested by him, such as

- parts and wearing parts,
- accessories parts,
- operating materials,
- cleaning agents.

⚠ DANGER

Risk of accident while working on the unit!

During all tasks:

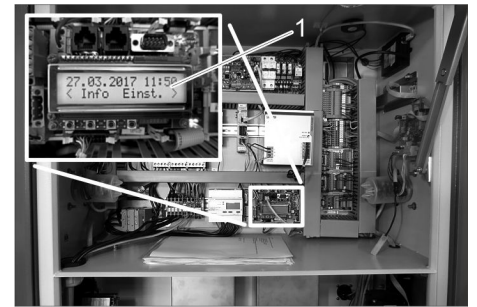
- Turn off the water supply; close the fresh water tap,
- First switch-on in voltage-less state, switch off the emergency stop switch in the building and secure it against being switched on again.

Who may remedy faults?

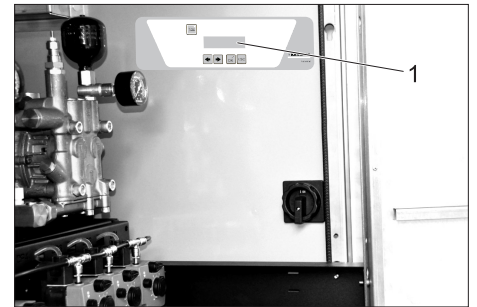
- **Operator**
Work designated with the sign "Operator" may only be carried out by persons who have been instructed in the safe operation and maintenance on the washing system.
- **Electricians**
Persons with a professional training in the electro-technical area.
- **Customer Service**
Only KÄRCHER service engineers are allowed to carry out work with the note "Customer Service".
- Customer service of the burner manufacturer
Malfunctions on the gas burner must only be rectified by the customer service of the burner manufacturer.

Fault indication

Troubleshooting in Switching Cabinet



1 Error display on display of control (in control cabinet)



1 Error display on the outside of the control cabinet (only SB MB standard)

Faults shown in the display

| Display | Cause | Remedy |
|---------|---|---|
| F 001 | Electronic outlets overloaded | Acknowledge the fault. If the fault recurs, call customer service. |
| F 002 | Site-supplied oil separator defective | Check site-supplied oil separator |
| F 004 | Dimming sensor defective | Call customer service. |
| F 005 | Protective motor switch on high pressure pumps was triggered | Reset motor protection switch; call Customer Service if the problem recurs. |
| F 006 | Connection to RDS defective | Call customer service. |
| F 007 | The pressure switch for air on the compressor does not report any pressure | Check the compressor and the compressed air lines. |
| F 008 | Cause: no connection to the electronics "MSWS". | Check the plug connection of the data cable with electronics A1 |
| F 010 | No connection to pump electronics at washing station 1 | Call customer service. |
| F 011 | Electronic outlets at washing station 1 overloaded | Acknowledge the fault. If the fault recurs, call customer service. |
| F 012 | Current pickup of high pressure pump at washing station 1 too high | Acknowledge the fault. If the fault recurs, call customer service. |
| F 013 | Current pickup of high pressure pump at washing station 1 too low | See "Faults on high pressure pumps" |
| F 014 | Contact of high pressure pump at washing station 1 stuck | Call customer service. |
| F 015 | Semiload valve at washing station 1 defective | Call customer service. |
| F 016 | Coiling protection contact of high pressure pump washing station 1 has triggered. | Acknowledge the fault. If the fault recurs, call customer service. |
| F 017 | Oil level of high pressure pump at washing station 1 too low | Refill oil, acknowledge the fault. |
| F 018 | Electronics at washing station 1 defective | Call customer service. |
| F 019 | Motor circuit breaker of high-pressure pump 1 has tripped | Reset motor protection switch; call Customer Service if the problem recurs. |
| F 020 | No connection to remote control electronics at washing station 1 | Check the connector of the data cable with the electronics of the remote control. |
| F 021 | Fault at coin acceptor at washing station 1 | Call customer service. |
| F 022 | | Check the microswitch on the mechanical coin acceptor, replace electronic coin acceptor |
| F 030 | No connection to pump electronics at washing station 2 | Acknowledge the fault. If the fault recurs, call customer service. |
| F 031 | Electronic outlets at washing station 2 overloaded | Acknowledge the fault. If the fault recurs, call customer service. |
| F 032 | Current pickup of high pressure pump at washing station 2 too high | Acknowledge the fault. If the fault recurs, call customer service. |
| F 033 | Current pickup of high pressure pump at washing station 2 too low | See "Faults on high pressure pumps" |
| F 034 | Contact of high pressure pump at washing station 2 stuck | Call customer service. |
| F 035 | Semiload valve at washing station 2 defective | Call customer service. |
| F 036 | Coiling protection contact of high pressure pump washing station 2 has triggered. | Acknowledge the fault. If the fault recurs, call customer service. |
| F 037 | Oil level of high pressure pump at washing station 2 too low | Refill oil, acknowledge the fault. |
| F 038 | Electronics at washing station 2 defective | Call customer service. |
| F 039 | Motor circuit breaker of high-pressure pump 2 has tripped | Reset motor protection switch; call Customer Service if the problem recurs. |
| F 040 | No connection to remote control electronics at washing station 2 | Check the connector of the data cable with the electronics of the remote control. |
| F 041 | Fault at coin acceptor at washing station 2 | Call customer service. |
| F 042 | | Check the microswitch on the mechanical coin acceptor, replace electronic coin acceptor |
| F 050 | No connection to pump electronics at washing station 3 | Acknowledge the fault. If the fault recurs, call customer service. |
| F 051 | Electronic outlets at washing station 3 overloaded | Acknowledge the fault. If the fault recurs, call customer service. |
| F 052 | Current pickup of high pressure pump at washing station 3 too high | Acknowledge the fault. If the fault recurs, call customer service. |
| F 053 | Current pickup of high pressure pump at washing station 3 too low | See "Faults on high pressure pumps" |
| F 054 | Contact of high pressure pump at washing station 3 stuck | Call customer service. |
| F 055 | Semiload valve at washing station 3 defective | Call customer service. |
| F 056 | Coiling protection contact of high pressure pump washing station 3 has triggered. | Acknowledge the fault. If the fault recurs, call customer service. |
| F 057 | Oil level of high pressure pump at washing station 3 too low | Refill oil, acknowledge the fault. |
| F 058 | Electronics at washing station 3 defective | Call customer service. |
| F 059 | Motor circuit breaker of high-pressure pump 3 has tripped | Reset motor protection switch; call Customer Service if the problem recurs. |
| F 060 | No connection to remote control electronics at washing station 3 | Check the connector of the data cable with the electronics of the remote control. |

| Display | Cause | Remedy |
|---------|---|---|
| F 061 | Fault at coin acceptor at washing station 3 | Call customer service. |
| F 062 | | Check the microswitch on the mechanical coin acceptor, replace electronic coin acceptor |
| F 070 | No connection to pump electronics at washing station 4 | Acknowledge the fault. If the fault recurs, call customer service. |
| F 071 | Electronic outlets at washing station 4 overloaded | |
| F 072 | Current pickup of high pressure pump at washing station 4 too high | Acknowledge the fault. If the fault recurs, call customer service. |
| F 073 | Current pickup of high pressure pump at washing station 4 too low | See "Faults on high pressure pumps" |
| F 074 | Contact of high pressure pump at washing station 4 stuck | Call customer service. |
| F 075 | Semiloading valve at washing station 4 defective | Call customer service. |
| F 076 | Coiling protection contact of high pressure pump washing station 4 has triggered. | Acknowledge the fault. If the fault recurs, call customer service. |
| F 077 | Oil level of high pressure pump at washing station 4 too low | Refill oil, acknowledge the fault. |
| F 078 | Electronics at washing station 4 defective | Call customer service. |
| F 079 | Motor circuit breaker of high-pressure pump 4 has tripped | Reset motor protection switch; call Customer Service if the problem recurs. |
| F 080 | No connection to remote control electronics at washing station 4 | Check the connector of the data cable with the electronics of the remote control. |
| F 081 | Fault at coin acceptor at washing station 4 | Call customer service. |
| F 082 | | Check the microswitch on the mechanical coin acceptor, replace electronic coin acceptor |
| F 170 | No connection to the undercarriage wash electronics | Acknowledge the fault. If the fault recurs, call customer service. |
| F 171 | Outputs of undercarriage wash electronics overloaded | |
| F 177 | Current pickup of pump undercarriage wash too high | Reset motor protection switch; call Customer Service if the problem recurs. |
| F 178 | No water pressure when undercarriage washing is in progress | Acknowledge the fault. If the fault recurs, call customer service. |
| F 190 | No connection to electronics A3 | Acknowledge the fault. If the fault recurs, call customer service. |
| F 191 | Outputs of electronics A3 overloaded | |
| F 200 | No connection between the SB MB control and the electronics of the WSO | Call customer service. |
| F 201 | Outputs of the control SB MB to the WSO overloaded | see "Water remains hard after regeneration" |
| F 202 | Hardness sensor shows hard water after regeneration | |
| F 204 | Failure in the electronics | Call customer service. |
| F 210 | Level sensor BUFFER TANK EMPTY activated | Fill the tank to the level sensor BUFFER TANK EMPTY (max. switch delay 60 minutes) |
| F 211 | Level sensor BUFFER CONTAINER EMPTY and BUFFER CONTAINER FULL switch simultaneously | Check level switch. |
| F 212 | Level sensor RO PUMP ON and BUFFER CONTAINER FULL switch simultaneously | |
| F 213 | Water pressure at the pump RO below 0.3 bar. | Check the flow pressure of the water supply
Check the water filter |
| F 214 | Site-supplied water preparation reports fault | See operating instructions of the site supplied water preparation |
| F 220 | Water shortage | See "Low water level in the swimmer tank for warm water" |
| F 221 | Exhaust temperature is too high | See "Exhaust thermostat switched off" |
| F 222 | Current pickup of circulation pump for warm water too high | Reset motor protection switch. If the fault recurs, call customer service. |
| F 223 | Burner fault | See "Burner failure" |
| F 224 | Safety thermostat of the burner has got triggered | Reset automatic fuse. |
| F 225 | Burner delay active | Wait until the delay time until the burner restart has elapsed. |
| F 226 | Flow indicator did not open within 5 seconds after the circulation pump for warm water was turned off. | Call customer service. |
| F 227 | Flow indicator did not close within 3 seconds after the circulation pump for warm water was turned off. | |
| F 228 | Hot water outlet cools off too slowly after the burner is turned off | Check the warm water circuit. |
| F 229 | Fault in warm water temperature sensor | Call customer service. |
| F 230 | Fault in burner outlet temperature sensor | |
| F 231 | Fault in warm water temperature sensor | |
| F 232 | Fault in burner outlet temperature sensor | |
| F 233 | Water temperature with external supply with warm water hotter than 60°C. | |
| | | Reduce temperature of the water supply |

| Display | Cause | Remedy | |
|---------|--|--|--|
| F 236 | Hot water overtemperature | Check water shortage safeguard (float switch), check water inlet. | |
| F 240 | Failure exterior temperature sensor | Call customer service. | |
| F 241 | Failure exterior temperature sensor | | |
| F 242 | Current pickup of circulation pump for anti frost protection too high | Reset motor protection switch or fuse. If the fault recurs, call customer service. | |
| F 243 | Current pickup of circulation pump for wash station heater too high | | |
| F 244 | Warm water temperature too low, washing station heater was turned off | Check the the continuous water heater and the warm water circuit | |
| F 245 | Current pickup of foam hose heater for dry foam too high | Reset motor protection switch. If the fault recurs, call customer service. | |
| F 247 | USB fault 1 | Acknowledge the fault. If the fault recurs, call customer service. | |
| F 248 | USB fault 2 | | |
| F 250 | Current pickup of pump for special washing programme too high | Reset motor protection switch. If the fault recurs, call customer service. | |
| F 260 | No connection to foam station electronics | Acknowledge the fault. If the fault recurs, call customer service. | |
| F 261 | Outputs of foam station electronics overloaded | | |
| F 280 | No connection to electronics A6 | Acknowledge the fault. If the fault recurs, call customer service. | |
| F 281 | Outputs of the electronics A6 overloaded | | |
| F 282 | Current consumption of pump for rim cleaner too high | Call customer service. | |
| F 283 | Current consumption of pump for rim cleaner too low | | |
| F 284 | Contactors of pump for rim cleaner is jammed | Call customer service. | |
| F 300 | No connection to electronics A7 | Acknowledge the fault. If the fault recurs, call customer service. | |
| F 301 | Outputs of the electronics A7 overloaded | | |
| F 320 | No connection to electronics A8 | Call customer service. | |
| F 321 | Outputs of the electronics A8 overloaded | | |
| F 322 | Current consumption of pump for micro-emulsion (intensive cleaning complete) too high | Call customer service. | |
| F 323 | Current consumption of pump for micro-emulsion (intensive cleaning complete) too low | | |
| F 324 | Contactors of pump for micro-emulsion (intensive cleaning complete) is jammed | Call customer service. | |
| F 340 | No connection to electronics A9 | Acknowledge the fault. If the fault recurs, call customer service. | |
| F 341 | Outputs of electronics A9 overloaded | | |
| F 342 | Power consumption of intensive foam pump too high | Call customer service. | |
| F 343 | Power consumption of intensive foam pump too low | | |
| F 344 | Contactors of intensive foam pump jammed | Call customer service. | |
| F 400 | Hot water pressure too low | Check corresponding water supply. | |
| F 401 | Fresh water pressure too low | Acknowledge the fault. If the fault recurs, call customer service. | |
| F 402 | Permeate pressure too low | | |
| F 403 | Pressure 4. Water type too low | | |
| F 404 | Temperature 4. Water type above 60 °C or malfunction in the system for providing the 4th water type | | |
| F 405 | Frost protection pressure too low | | |
| F 406 | Frost protection pressure although solenoid valve closed or frost protection pump switched off | | |
| F 410 | Malfunction F 400 four times within 24 hours. The system uses fresh water instead of hot water until the malfunction has been acknowledged. | | |
| F 411 | Fresh water shortage. If this malfunction persists for more than 5 minutes, the system is deactivated. | | |
| F 412 | Malfunction F 402 four times within 24 hours. The system uses fresh water instead of permeate until the malfunction has been acknowledged. | | |
| F 413 | Malfunction F 403 four times within 24 hours. The system uses the set, alternative water type instead of the 4th water type until the malfunction has been acknowledged. | | |
| F 414 | Malfunction F 405 four times within 24 hours. The system switches to frost protection with leakage water until the malfunction has been acknowledged. | | |
| F 420 | Fault token changer 1 | | Check token changer. |
| F 421 | Fault token changer 2 | | Acknowledge the fault. If the fault recurs, call customer service. |
| F 440 | No connection to electronics A31 | | Acknowledge the fault. If the fault recurs, call customer service. |
| F 441 | Outputs of electronics A31 overloaded | | |

Acknowledge the faults

During normal operation, active faults are shown alternating in sequence. The number in parentheses shows the total number of faults present. If a fault must be acknowledged, the display will stand still:

```
Fault Quit = ESC
F: XXX      (YYY)
```

- ➔ Fault code (F: XXX) locate the fault in the table above and follow the instructions to eliminate the fault.
- ➔ To acknowledge, press the „ESC“ key.

```
Confirmation
OK = Yes  ESC = No
```

- ➔ Press the "OK" button to confirm. The fault is acknowledged.

Note:

If more faults should be displayed without confirming the displayed fault, press the key RIGHT.

Viewing the list of faults

The control can store a maximum of 256 occurred faults. When the fault list is full, the oldest message will be overwritten by the newest one. ➔ Press the "ESC" key repeatedly until the following display appears:

```
Mo 09. 07. 2007
09: 52: 32      Sum
```

- ➔ Press OK button for more than 2 seconds.

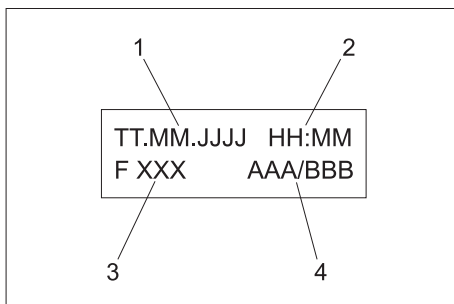
```
09. 07. 2007 09 : 52
<Info Setup  >
```

- ➔ Press the LEFT button.

```
Faults
Total  : XXX
```

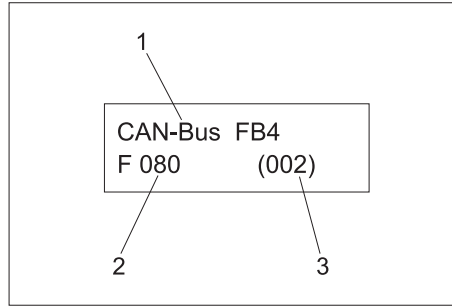
Sum of archived fault messages

- ➔ Press "OK" in order to get into the most recently archived fault message.



- 1 Date of fault occurrence
- 2 Time of fault occurrence
- 3 Error code
- 4 List position/number of same faults in the fault list

- ➔ Browse through the fault list using the "LEFT" and "RIGHT" keys.
- ➔ Details of the currently displayed fault can be viewed via the "OK" key.



- 1 Error description
- 2 Error code
- 3 Number of same faults in the fault list

Clearing the error memory

- ➔ Press the keys LEFT and RIGHT simultaneously.

```
Erase faultlist
Confirm = OK
```

- ➔ Press "OK" in order to delete the fault list
- or
- ➔ Press "ESC" in order not to delete the fault list

Viewing the event list

The control can store a maximum of 256 occurred faults (e.g. activities in water preparation). When the event list is full, the oldest message will be overwritten by the newest one. ➔ Press the "ESC" key repeatedly until the following display appears:

```
Mo 09. 07. 2007
09: 52: 32      Sum
```

- ➔ Press OK button for more than 2 seconds.

```
09. 07. 2007 09 : 52
<Info Setup  >
```

- ➔ Press the LEFT button.

```
Faults
Total  : XXX
```

- ➔ Press the RIGHT button.

```
Events
Total  : 007
```

The subsequent operation is done in the same way as with "Viewing the fault list".

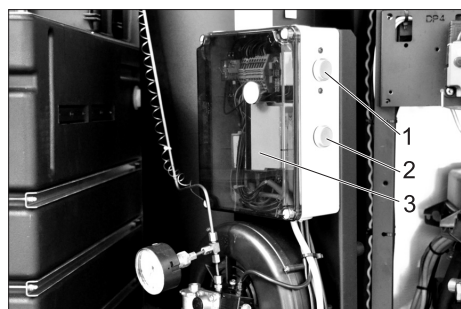
Interruptions in warm water circulation

| Fault | Possible cause | Remedy | By whom |
|---|---|--|------------------|
| Low water level in the swimmer tank for warm water | Water supply blocked | Open locking tap for fresh water | Operator |
| | Sieve in the water shortage safe guard is dirty | Clean or replace the filter inlay. | Operator |
| | Swimmer valve in the swimmer container for warm water is not opening | Check swimmer valve; repair, if needed. | Operator |
| | Safeguard against water scarcity in the swimmer container for warm water is jammed or defective | Check the water scarcity safeguard, replace if necessary. | Operator |
| | Hose pipe is burst or has come off | Check the hose lines, replace if necessary. | Operator |
| | Pump disconnection from mains (optional) not working | Check supply voltage.
Check pump. | Customer Service |
| Water temperature is too low / too high | Thermostat defective. | Check the thermostat, replace if necessary. | Customer Service |
| The hot-water generator does not start or stops heating | Flow monitor is defective (Not for electrically heated device) | Check and clean the flow monitor, replace if necessary. | Customer Service |
| | Warm water circulation has calcium deposits | Check water preparation, decalcify circuit. | Customer Service |
| | Air in the circulation pump for warm water | Deaerate the pump at the deaeration screw. | Operator |
| | Rotation direction of the circulation pump for warm water is wrong | Check direction of rotation, modify, if required. | Customer Service |
| | Thermostat defective. | Check the thermostat, replace if necessary. | Customer Service |
| | Protection for the circulation pump for warm water is defective | Check the contactor, replace if necessary. | Customer Service |
| | The motor protection switch of the circulation pump for warm water has been triggered as the circulation pump is blocked or the pump is defective | Check circulation pump; repair or replace if necessary. Reset motor protection switch. | Customer Service |

Malfunctions of the washing station heater

| Fault | Possible cause | Remedy | By whom |
|--|---|--|---------------------------|
| Circulation pump for washing station heater out of order | Temperature in the warm water tank below 10 °C (fault display "F 244"). | Look for the malfunction in the warm water circuit and fix it. | Operator/Customer Service |

Burner malfunctions with oil-heated devices



- 1 Unlocking key for exhaust gas thermostat
- 2 Unlock button of oil firing unit
- 3 Electrical box of burner control

| Fault | Possible cause | Remedy | By whom |
|--|---|--|--|
| Fault in oil firing (oil firing unit) has triggered in the electrical box of the burner control) | No ignition sparks exist (can be detected through the looking glass in the burner lid). | Check electrode setting, ignition transformer and ignition cable. Clean the electrodes, replace defective parts.
Press the unlock button des oil firing unit. | Customer Service |
| | Looking glass for flame monitoring is contaminated | Clean the sight glass of the flame monitor (see section „Maintenance work“).
Press the unlock button of the exhaust thermostat. | Operator |
| | Light sensor of flame monitor not in holder or is defective | Refasten or replace the light sensor.
Press the unlock button of the exhaust thermostat. | Operator, Customer Service |
| | Heating oil level is too low | Filling the fuel tank.
Press the unlock button of the exhaust thermostat. | Operator |
| | No flame is formed due to lack of fuel | Clean the fuel filters on the fuel pump.
Press the unlock button of the exhaust thermostat. | Operator |
| | | | Clean the fuel nozzle, replace if necessary.
Press the unlock button of the exhaust thermostat. |
| Press the unlock button of the exhaust thermostat.
Fuel solenoid valve, fuel pump or coupling is defective. | | Customer Service | |
| No flame is formed due to lack of air | Check blower sleeve for damage and ensure that the belts are sitting correctly.
Press the unlock button of the exhaust thermostat. | Operator | |
| | Blower is defective; replace.
Press the unlock button of the exhaust thermostat. | Customer Service | |
| Heavy smoke formation during start and during operations | Ignition electrode is lying in the fuel stream. | Check electrode setting and correct it. | Operator, Customer Service |
| | Fuel pressure setting was changed (see "Technical Specifications") | Check fuel pressure, reset, if necessary | Customer Service |
| | Heavy soot formation on the heating coil. | Dismantle boiler and clean heating coil. | Customer Service |
| Exhaust thermostat (S5) has triggered. | Warm water circulation has calcium deposits | Check water preparation, decalcify circuit.
Unlock the exhaust thermostat by pressing the key. | Customer Service |
| | Heavy soot formation on the heating coil. | Dismantle boiler and clean heating coil.
Unlock the exhaust thermostat by pressing the key. | Customer Service |
| | Burner settings wrong | Correct the burner settings.
Unlock the exhaust thermostat by pressing the key. | Customer Service |

Burner malfunctions with gas-heated devices

Malfunctions on the gas burner must only be rectified by authorised expert staff of the burner manufacturer.

Malfunctions at coin mechanism

| Fault | Possible cause | Remedy | By whom |
|--|--|---|----------|
| All coin acceptors reject all coins | Main switch is switched off. | Set main switch to "1". | Operator |
| | Incorrectly adjusted time of day or operating times. Night operation lock active | Check the adjustments on the control. | Operator |
| | Lack of water (F 220) | Check water supply. | Operator |
| | Motor protection switch of the high pressure pumps was triggered | Reset motor protection switch.
Determine the cause if it reoccurs. | Operator |
| A single coin acceptor rejects all coins | Coin acceptor dirty | Clean the coin acceptor (see section „Maintenance work“) | Operator |
| | Overcurrent on the high pressure pump | Acknowledge the fault on the control. | Operator |

Faults on high pressure pumps

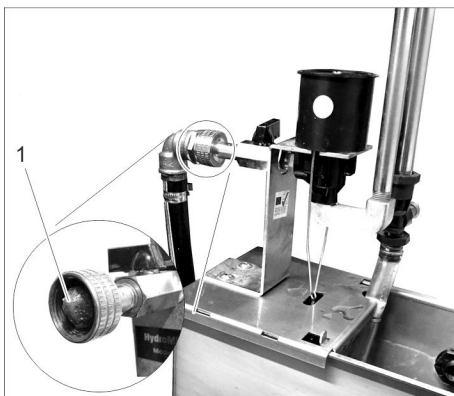
| Fault | Possible cause | Remedy | By whom |
|---|--|---|------------------------------|
| Irregular water jet on the hand spray gun | High-pressure nozzle clogged | Clean high-pressure nozzle. | Operator |
| | Amount of water supply is too low. | Check water supply level (refer to technical data). | Operator |
| | Suction hose kinked | Check suction hose. | Operator |
| Reduced pressure at the high-pressure pump | High-pressure nozzle flushed | Replace the high-pressure nozzle. | Operator |
| | Incorrect high pressure nozzle installed. | Check/replace high-pressure nozzle. | Operator |
| | Amount of water supply is too low. | Check water supply level (refer to technical data).
Check flushing solenoid valve, swimmer valve and water quality solenoid valve. | Operator
Customer Service |
| Pressure does not build up in the pump | High-pressure hose to the washdown yard leaking | Check the high-pressure line, replace if necessary. | Operator, Customer Service |
| | Overflow valve misadjusted or leaking | Check and repair the overflow valve. | Customer Service |
| | The high pressure pump sucks air from the empty detergent tank | Refill detergent. Bleed the suction line (to speed up the bleeding process briefly squeeze the suction hose to the pump repeatedly during operation). | Operator |
| High pressure pump is knocking; manometer is swaying wildly | High pressure pump is sucking in air. | Check suction pipes for water and detergent and ensure that they are leak-proof. | Operator |
| | | Detergent container empty? (see above) | Operator |
| | Vibration dampener is defective | Replace vibration dampener. | Operator |
| | Valve in pump head defective or contaminated. | Replace defective valves. | Customer Service |
| The pump does not run | Overcurrent on the high pressure pump | Acknowledge the fault on the control. | Operator |

Disturbed detergent supply

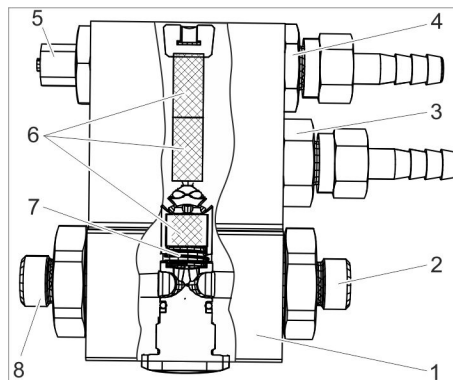
| Fault | Possible cause | Remedy | By whom |
|------------------------------------|--|---|----------------------------|
| Inadequate or no flow of detergent | Filter or hose is blocked | Clean the parts. | Operator |
| | Leaky detergent hose | Replace the hose | Operator |
| | Dosing pump incorrectly adjusted or defective. | Check the dosing pump and the setting. | Operator, Customer Service |
| | Dosing pump obstructed by condensate. | Drain the condensate from the pressure container of the compressor. | Customer Service |

Malfunctions on the wheel cleaner/intensive foam

| Fault | Possible cause | Remedy | By whom |
|--|--|---|----------------------------|
| Inadequate or no flow of water/detergent | Sieve in the water inlet is dirty | Clean sieve. | Operator |
| | Nozzle insert in the injector clogged. | Clean the nozzle insert. | Operator |
| | Throttle in node piece obstructed. | Clean the parts. | Operator, Customer Service |
| | Foam device in the hub clogged. | Blow out the hub using compressed air or replace the foam device. | Operator, Customer Service |



1 Sieve



- 1 Node piece
- 2 Inlet high pressure with check valve
- 3 Throttle wheel cleaner (0.6 mm) with check valve
- 4 Throttle intensive foam (1.3 mm) with check valve
- 5 Inlet compressed air with check valve

- 6 Foam device
- 7 Backflow valve
- 8 Output high-pressure

Faults in the compressor

| Fault | Possible cause | Remedy | By whom |
|--|--|---|---------------------------|
| Compressor switches on and off frequently. | Condensate level in pressure container too high. | Drain the condensate from the pressure container of the compressor. | Operator/Customer Service |

Faults at the dry foam production (option)

| Fault | Possible cause | Remedy | of whom |
|---|---|---|----------------------------|
| Bad dry foam quality, foam too dry or too wet | Detergent container is empty | Replace the container. | Operator |
| | Suction filter of dosing pump plugged | Rinse the filter with warm water | Operator |
| | Water supply is too low | Re-establish the water supply, set pressure reducer foam station to 0.25 MPa (2.5 bar). | Operator |
| | Compressor does not supply air | Check the compressor
Drain the condensate from the pressure container of the compressor. | Customer Service |
| | Compressor overheated | After cooling off, the compressor will automatically start operating again. | Operator |
| | Pressure reducer foam station contaminated | Clean pressure reducer | Operator |
| | Solenoid valve water/chemicals does not open | Check the voltage using a magnetic field tester, clean solenoid valve, replace if required | Operator, Customer Service |
| | Setting of dosing valves water/chemicals or air incorrect | Perform basic setup (see chapter B Operation and Settings) | Customer Service |
| | incorrect detergent, detergent contaminated or old | Replace detergent | Operator |

Interruptions in water preparation

| Fault | Possible cause | Remedy | By whom |
|--|---|--|---------------------------|
| Base exchanger is not regenerating | No power supply | Check power supply (fuse, plug, switch). | Operator/Customer Service |
| | Hardness sensor defective | Check hardness sensor, replace if required | Customer Service |
| Water remains hard after regeneration | No salt in the salt tank | Refill salt, wait for brine formation (approx. 2 hours). Start new regeneration.
Do not allow the salt level to fall below the water level. | Operator |
| | Injector filter is blocked | Clean the filter | Customer Service |
| | Water flow to the salt tank is inadequate | Check the brine filling duration; clean the brine filling aperture, if required. | Customer Service |
| | Rising pipe is leaky | Check rising pipe, pilot pipe | Customer Service |
| too high salt consumption | too much water in the water tank | see below | Customer Service |
| | wrong salt quantity setting | Check salt consumption and salt settings | Customer Service |
| Pressure loss | Deposits in water inlet | Clean the filter | Customer Service |
| | Deposits in base exchanger | Clean valve and resin board | Customer Service |
| Too much water in the salt tank | Rinsing aperture is blocked | Clean rinsing aperture | Customer Service |
| | Injector is blocked | Clean injector and filter | Customer Service |
| | Foreign particles in the solenoid valve | Clean the solenoid valve, change the valve seat | Customer Service |
| | Power failure while filling brine | Check power source | Customer Service |
| Brine is not getting sucked in | Water inlet pressure is too low | Increase water pressure to at least 0.3 MPa (3 bar). | Operator |
| | Rinsing aperture is blocked | Clean rinsing aperture | Customer Service |
| | Injector is blocked | Clean injector and filter | Customer Service |
| | Leak inside the valve | Replace valve flaps | Customer Service |
| There is always water in the drainage, even after regeneration | Valve does not execute the correct cycles | Check timer programme; replace the valve controls, if required | Customer Service |
| | Foreign particle in the valve | Remove the valve control, take out the foreign particle, check valve in all the positions | Customer Service |

| Fault | Possible cause | Remedy | By whom |
|--|---|---|---------------------------|
| RO Pump does not start | Buffer tank for permeate is full | Wait until the permeate is consumed. | Operator |
| | Level sensor "Buffer container full" defective | Check level switch. | Customer Service |
| | Start-up time of the control has not yet been completed | Wait. | Operator |
| | The pressure switch for water shortage has tripped. | Fine filter or active carbon filter dirty
Check filter; replace the filter inlay, if required | Operator |
| | Pressure switch for water scarcity is defective | Check pressure switch; replace it, if required. | Customer Service |
| | Regeneration of the base exchanger is running | Wait for regeneration to end. | Operator |
| | No softened water is coming from the base exchanger | Check the base exchanger. | Operator/Customer Service |
| | Pump disconnection from mains (optional) not working | Check supply voltage.
Check pump. | Customer Service |
| RO pump starts only after several rinsing cycles | Too low mains water pressure | Check mains water supply; open the inlet valve fully, if required. | Operator |
| | Fine filter or active carbon filter dirty | Check filter; replace the filter inlay, if required | Customer Service |
| Permeate output is too low; buffer tank of permeate is often empty | Water inlet temperature is too low | Measure the temperature of the softened water and compare it with the technical data. | Operator |
| | Operating pressure is too low | Reset the operating pressure. | Customer Service |
| | There are calcium or mineral deposits on the filter surface of the RO membrane. | Decalcify the membrane; replace it, if necessary | Customer Service |
| | Level switch Buffer tank is "full" is defective | Check level switch. | Customer Service |
| There are stains on the car paint during Top Care (permeate has not been adequately demineralised) | There are bacteria or algae deposits on the filter surface of the RO membrane. | Rinse the membrane thoroughly for a long time; replace it if necessary. In future remember: Water is of potable quality; avoid long idling periods. | Customer Service |
| | The mineral content of the softened water is too high | Check conductivity of softened water. | Customer Service |
| Top Care (permeate has not been adequately demineralised) | RO membrane has ruptured; defective sealing | Replace washer or membrane. Check conductivity | Customer Service |
| | Mixing of permeate and softened water | Comparison of conductivity of the permeate from the spray pipe and water from the buffer tank of permeate. | Customer Service |

Faults on the frost protection units)

| Fault | Possible cause | Remedy | By whom |
|--|--|--|----------------------------|
| Convactor is not running | Convactor set incorrectly | Check adjustment (see Chapter "Settings") | Operator |
| | Convactor defective | Replace the convactor. | Customer Service |
| Frost protection is not working | Power supply has been interrupted | Check power supply and ensure proper supply. | Operator |
| | Exterior temperature sensor installed incorrectly. | See section "Installing system". | Customer Service |
| Spray pipe, hand-spray gun and high-pressure hose are frozen | Sieve with throttle plugged (marked red) | Open the screw connection. Clean sieve. Check to see whether the throttle boring moves freely. | Operator |
| | Filter of the anti frost pump plugged | Clean the filter and replace | Operator |
| Wash station heater will not work during frost | Exterior temperature sensor installed incorrectly. | See section "Installing system". | Customer Service |
| | Heat exchanger or circulation pump is defective | Check heat exchanger, pump and pipe system; repair, if required. | Customer Service |
| | Burner fault | Fix burner fault. | Operator |
| | Motor protection switch for circulation pump of washing station heater has triggered | Unlock the motor protection switch; find out the cause if fault occurs. | Operator, Customer Service |

Accessories

Attachment sets

Water filter G 1"

Order no. : 6.761-284.0

Test kits

Test set A

Order no. 6.768-004.0
for determining the fresh water hardness.

Test set B

Order no. 6.768-003.0
For determining the residual hardness of the softened water.

Test set C

Order no. 6.548-066.0
to determinate the residual chlorine content of the softened water and the fresh water.

Fuel

Water softening salt in form of tablettts

Order no. : 6.287-016.0

Engine oil Hypoid SAE 90

Order no. : 6.288-016.0

Heavy duty grease

Order no. : 6.288-055.0

Silicon grease

Order no. : 6.288-028.0

Lock grease

Order no. : 6.288-116.0

Steel care product

Order no. : 6.290-911.0

Moisture protection spray

Order no. : 6.228-001.0

Detergent

Intensive dirt dissolver CP930 ASF, 20 l

Order no. : 6.295-515.0

HP wash CP 935 ASF, 20 l

Order no. : 6.295-517.0

Active foam CP 940 ASF, 20 l

Order no. : 6.295-519.0

Thermal wax CP 945 ASF, 20 l

Order no. : 6.295-521.0

Top care CP 950 ASF, 20 l

Order no. : 6.295-523.0

HP wash RM 806, 20 l

Order no. : 6.295-553.0

Hot wax RM 820 ASF, 20 l

Order no. : 6.295-428.0

Foam cleaner RM 838 ASF, 20 l

Order no. : 6.295-838.0

Appliance care

Wash hall and tile cleaner RM 841, 20 l

Order no. : 6.295-419.0

Squeegee

Order no. : 6.907-200.0

Spray bottle 1 l

Order no. : 6.394-374.0

RM Sprayer 5 l

6.394-255.0

Telescoping bar

Order no. : 6.999-023.0

Pad holder

6.999-080.0

White pads

6.999-046.0

Micro fibre cloth, blue

Order no. : 6.999-017.0

Lime solvent

RM 100 ASF

RM 101 ASF

Warranty

The warranty terms published by our competent sales company are applicable in each country. We will repair potential failures of your accessory within the warranty period free of charge, provided that such failure is caused by faulty material or defects in fabrication. In the event of a warranty claim please contact your dealer or the nearest authorized Customer Service center. Please submit the proof of purchase.

Transport

⚠ CAUTION

Risk of personal injury or damage! Mind the weight of the appliance during transport.

➔ When transporting in vehicles, secure the appliance according to the guidelines from slipping and tipping over.

Storage

⚠ CAUTION

Risk of personal injury or damage! Consider the weight of the appliance when storing it.

Installing the unit (only for experts)

Note:

- The equipment may only be installed by
- KÄRCHER service engineers
- persons authorized by KÄRCHER

Preparing the installation place

⚠ **WARNING**

Please ensure that there are no exhaust emissions near the air inlets.

Sufficient ventilation is very important and exhaust gases must be ventilated as instructed by local regulations.

The following requirements are necessary in order to install the equipment:

- Horizontal, even foundation according to separate drawing (ask for it at KÄRCHER).
- For electrical connection refer to technical specifications.
- For water connection refer to technical specifications.
- Ensure adequate insulation / heating for water and fuel pipes while operating in winter.
- Drain water shaft and required drain water disposal.
- Adequate lighting at washing place to ensure safe working for the customers using the washing system.

Unpack the equipment

Unpack the equipment and dispose of the packing material properly.

Aligning the unit and installing it

- ➔ Align the system on an even and horizontal installation site using the adjusting screws on the base frame.

Assemble the installation parts

Exhaust nozzle

- ➔ Place the exhaust nozzle from outside on the roof and fasten it from inside using the enclosed screws.

Cleaning tools

- ➔ Connect the high pressure hose to the system.
- ➔ Connect high pressure hose to hand spray gun
- ➔ Connect spray lance to trigger gun.
- ➔ Tighten all covering nuts firmly by hand.

Water connection

A category 5 system isolation must be installed between the system and the drinking water network to isolate the system from the drinking water network. Locally applicable regulations must also be observed.

Note:

Impurities in the inlet water can damage the system. Kärcher recommends the use of a water filter (see "accessories").

ATTENTION

Risk of damage to the plant if water supply is not of suitable quality. The system must only be supplied with water in drinking water quality.

Quality requirements for tap water:

| Parameter | Value |
|-------------------------|-----------------|
| pH value | 6.5...9.5 |
| electrical conductivity | max. 1000 µS/cm |
| Hydrocarbons | < 0,01 mg/l |
| Chloride | < 250 mg/l |
| Calcium | < 200 mg/l |
| Total hardness | < 28 °dH |
| Iron | < 0,2 mg/l |
| Manganese | < 0,05 mg/l |
| Copper | < 0,02 mg/l |
| Sulphate | < 240 mg/l |
| Active chloride | < 0,1 mg/l |
| free of bad odours | |

For connection values refer to technical specifications.

- ➔ Insert the inlet hose from the bottom through the plant opening and connect it.

4. type of water (option)

When a water distributor block 4. type of water is used, processed water can also be used with certain washing programmes.

Requirements on the quality for processed water:

| Parameter | Value |
|--------------------------|---|
| pH value | 6.5...9.5 |
| electrical conductivity | < Measured value fresh water + 1200 µS/cm, max 2000 µS/cm |
| removable materials | <0.5 ml/l* |
| total suspended solids** | < 50 µm |
| Hydrocarbons | <20 mg/l |
| Chloride | < 300 mg/l |
| Calcium | < 200 mg/l |
| Total hardness | < 28 °dH |
| Iron | < 0.5 mg/l |
| Manganese | < 0,05 mg/l |
| Copper | < 2 mg/l |
| Sulphate | < 240 mg/l |
| Active chloride | < 0.3 mg/l |
| free of bad odours | |

* Test volume 1litre, Settling time 30 minutes

** no abrasive substances

Electrical connection

⚠ **DANGER**

Risk of electric shock!

The mains must be connected by an experienced electrician and the requirements of the IEC 60664-1 must be fulfilled.

The plant must be secured through a wrong current protection switch with a triggering current lesser than or equal to 30 mA.

Note:

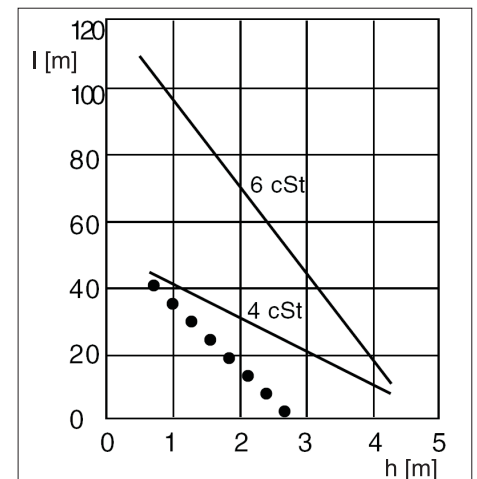
A clearly noticeable EMERG STOP switch must be installed in the supply line to the system, which can be used to turn the entire system off.

- ➔ After connecting the system, check the rotating direction of the warm water circulation pump and the circulation pump for heating the washing place (optional).

Fuel pipe to the external fuel tank

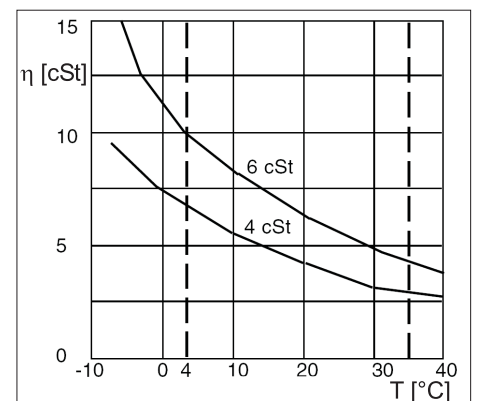
Note:

The maximum permissible vacuum in the fuel pipe (measured between the fuel filter and the fuel pump) is 0.4 bar.



The underpressure depends on:

- Length of pipe
- Suction height
- Fixtures, branchings and angles in the suction pipe (dotted line in the diagram)
- Pipe cross-section (from +4°C the heating oil EL will separate the paraffin that will then get deposited on the insides of the pipe)



- Viscosity of the heating oil (depending on temperature)

Measures against very high level of under-pressure are:

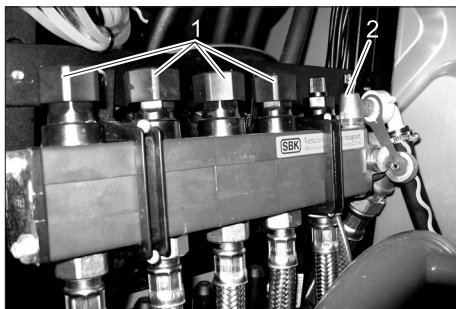
- Minimum inner diameter of pipe 6 mm
- Short, straight pipes (as far as possible)
- Maximum viscosity 4...6 cSt at 20°C
- In extreme cases, use separate fuel pipe with pump
- Pre-heat the heating oil; use heating for the suction pipe
- Use heating oil with additives (flow promoters) (winter heating oil) if there is risk of frost

Connect the washing station heater and start it up

Note:

The washing place heating can function properly provided the washing area has been built properly according to the KÄRCHER recommendations.

- Connect the site-supplied pipelines of the washing station heater to the distributors in the system .
- Install the external temperature sensor:
 - protected from direct sunlight (north of the equator on the northern hemisphere, south of the equator on the southern hemisphere),
 - protected against warm walls,
 - protected against warm air currents.

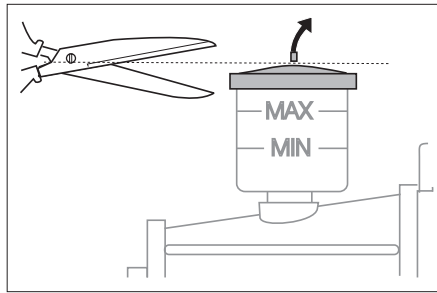


- 1 Locking valve of feeder pipe
- 2 Filling valve

- Connect the submersion pump to fill the washing station heater with the fill valve (on the red distributor).
 - Return line from the fill valve to the blue distributor to the container with the frost protection solution.
 - Open the locking valves of feeder and return pipes.
 - Pump frost protection mixture for a frost safety for up to -25°C into the system.
 - Switch on the floor heating pump (see Chapter "Manual procedures").
 - Perform the filling process until there are no more bubbles in the return line.
 - Close the fill valve for the return line (on the blue distributor) and fill in more frost protection until the manometer shows approx. 1.5 bar.
 - Close locking valve of feeder pipe.
 - Let the pump of the floor heating run for at least 15 more minutes.
- If necessary, fill in more frost protection until the manometer shows 1.5 bar.
- Remove the hose; while doing so collect the residual frost protection solution and dispose of it.

- Check hose and pipe screws for absence of leakiness.
- Adjust the thermostat mixing valve; see Chapter "Settings/Washing station heater",

Check oil level



- The oil level in both the high-pressure pumps must lie between MIN and MAX.
- Cut off tip of oil container.

Filling in detergents

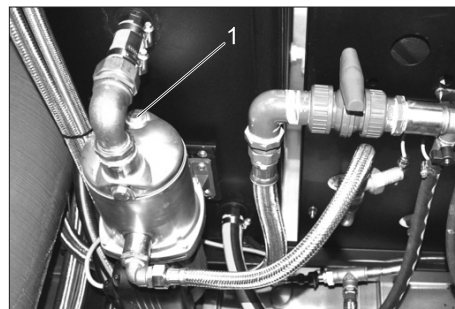
See section "Filling fuel" in the earlier part of the Operating Instructions.

Note:

The softening salt is added to the salt tank while starting up the base exchanger. Hence, do not fill in any softening salt yet.

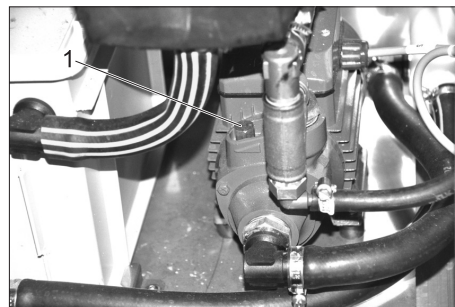
Initial startup

- Open the water supply.



- 1 Deaeration screw

- Deaerate the warm water circulation pump; loosen first the deaeration screw and then tighten it again.
- Set main switch to "1".



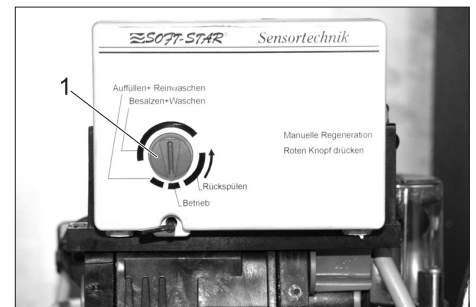
- 1 Deaeration screw

- Deaerate the frost protection circulation pump; loosen first the deaeration screw and then tighten it again.

Putting the base exchanger into operation (WAT-SE.../255B)

Backwash

- Insert the overflow hoses of base exchanger and salt tank in the drainage pipe of the building.
- Fill the salt tank with water (approx. 10 cm above top edge of the sieve) **Do not add any salt yet!**
- Open the locking valve for fresh water slowly and wait until the pressure tank is filled with water.
- Remove the covering lid of the control valve.



- 1 Programming knob

- Press the programme button and select the function "Backwash" by turning the button in the direction of the arrow. *Water and air escapes through the drainage connection until the plant is completely deaerated.*

Note:

Restrict backwashing to the absolute minimum because otherwise the sensor measuring cell can get exhausted and this may necessitate a complete regeneration of the concerned exchange tank.

- Pull out the suction sieve fitted at the brine hose from the guide pipes in the salt tank.
- Press the valve flap (NR1) (directly behind the programming system) using a screw-driver. *The air closure valve gets filled and air escapes through the suction sieve. When air no longer escapes from the suction sieve, release the valve flap.*
- Insert the suction sieve back into the guide pipes.

Regeneration

- Press the programme button and select the function "Salt+Wash" by turning the button in the direction of the arrow. *Water level in the salt tank falls continuously.*

Note:

The suction system needs to be deaerated if there is air formation in the air closure valve before the salt tank is empty (residual level in the salt tank, when empty, is approx. 7 cm) and the ball floating in the air closure glass falls down.

Refill / Clean washing

- Press the programme button and select the function "Fill+Rinse clear" by turning the button in the direction of the arrow.

The control valve automatically moves to the function "Operations". The salt tank is filled with water.

Filling the salt tank

- When the water level is correct, fill the salt tank with salt tablets according to DIN 19604 (also see chapter on Accessories).

The plant is ready for operations when these jobs are completed. Conclude the start-up activities by doing a soft water test.

Start-up of the RO plant

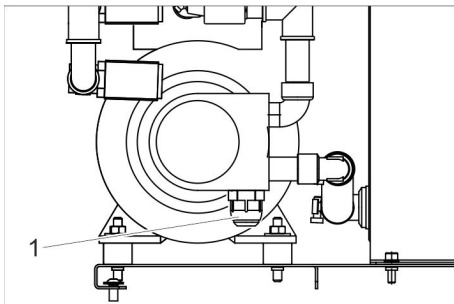
During first start-up:

- Fill the membrane with initial tap water pressure (net it).
- Rinse the membrane for 10 ... 20 minutes (foam formation during this procedure is normal).

During fresh start-up after shutdown:

- Let the rinsing run until there are no bubbles to be seen at the throughflow meter of the permeate.

Check the pressure of rim cleaner (option)



1 Adjustment screw

- Check the pressure of the detergent solution.
Target value: 0.9...1.0 MPa (9...10 bars).
- Adjust the pressure as needed by turning the adjustment screw.

Check the function of the system

- Check burner setting.
- Check all functions of the system.
- Check all washing programmes on all washing stations.
- Check the plant for leaks; tighten screws if required.

Starting up the gas burner (option)

The initial startup of the gas burner must only be performed by authorised expert staff of the burner manufacturer.

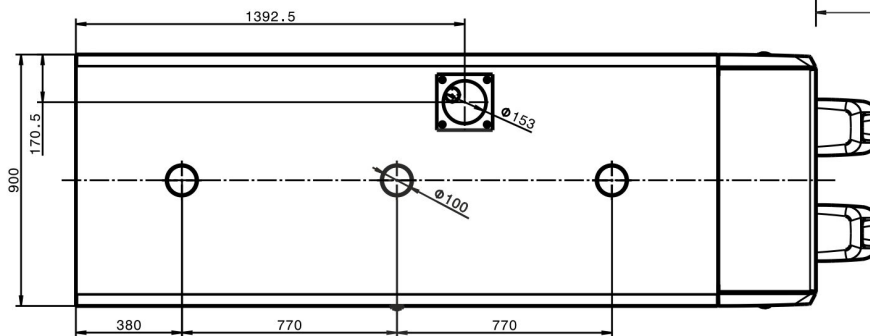
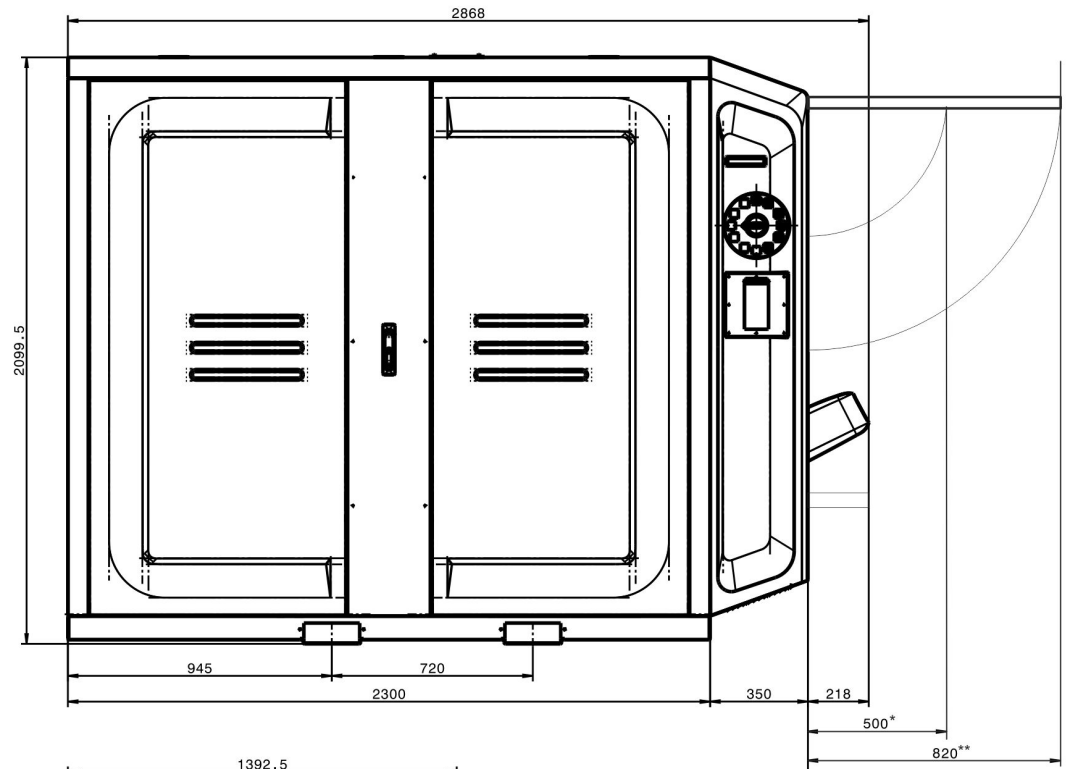
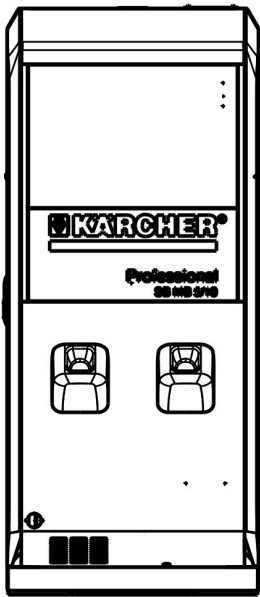
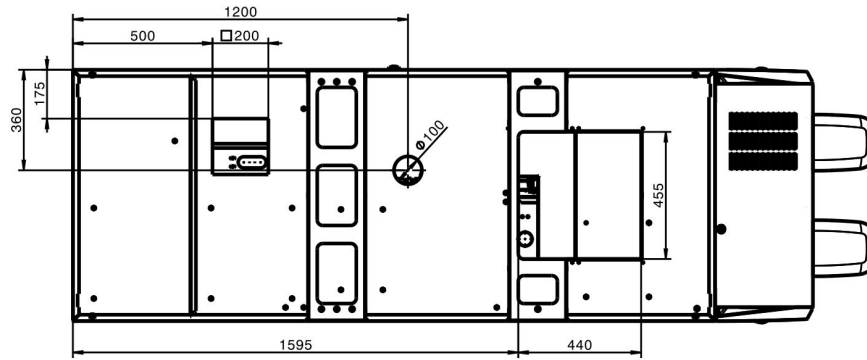
- The device must be connected to a separate chimney.
- The exhaust system must be designed according to the local rules and regulations after consulting the concerned chimney expert.

Gas appliances with an exhaust system that sucks out the combustion air from the installation room

Type B23

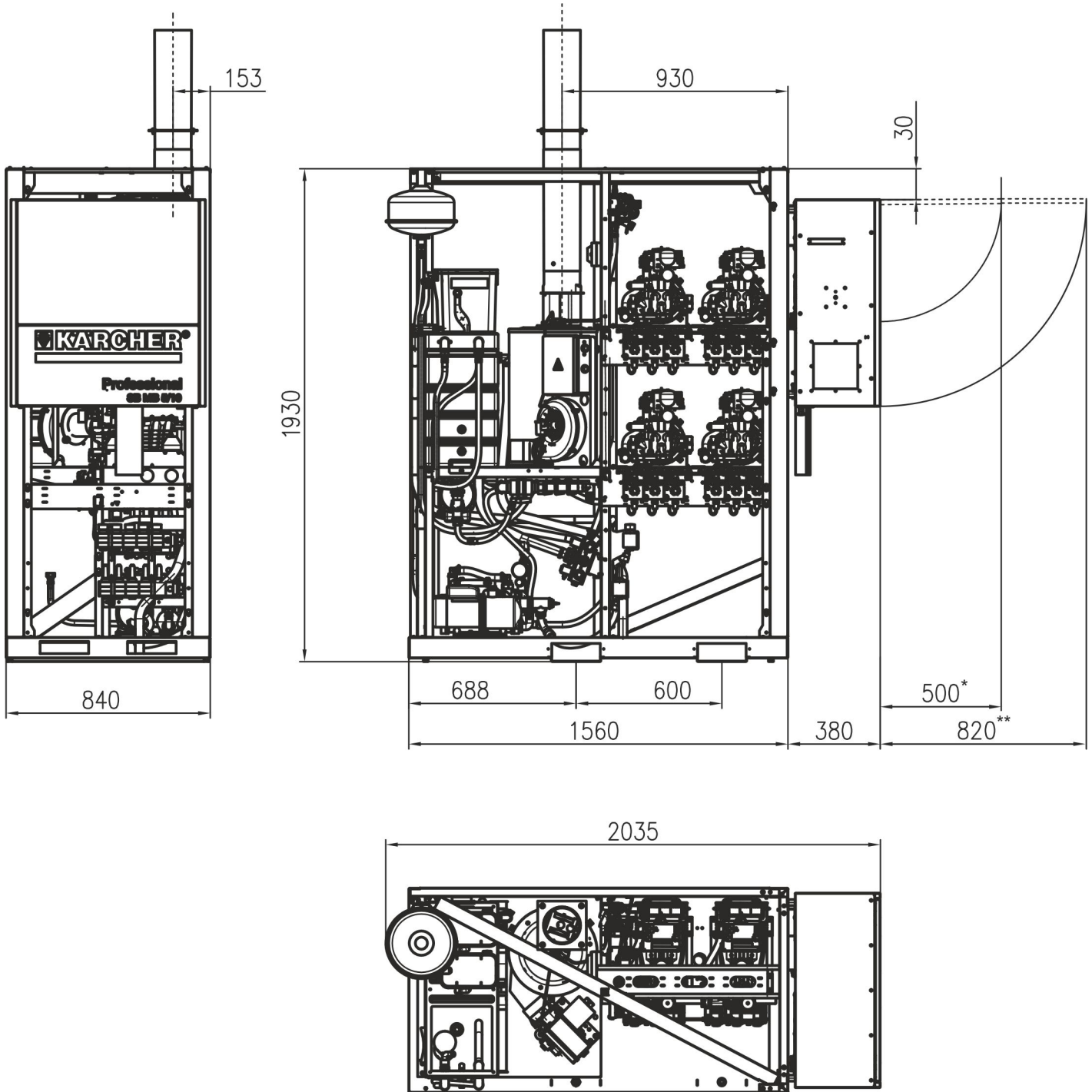
Gas appliances without flow controller where all parts of the exhaust system that are subjected to excess pressure are free of combustion air. The B23 installation opens new options of connecting the appliance to a traditional single-draught chimney according to DIN 18160 and operating it depending on the air conditions in the room. The only requirement is that the chimney must be suitable for being connected to combustion devices (i.e. it has been cleaned by inserting a stainless steel pipe).

Dimension drawing for CAB model



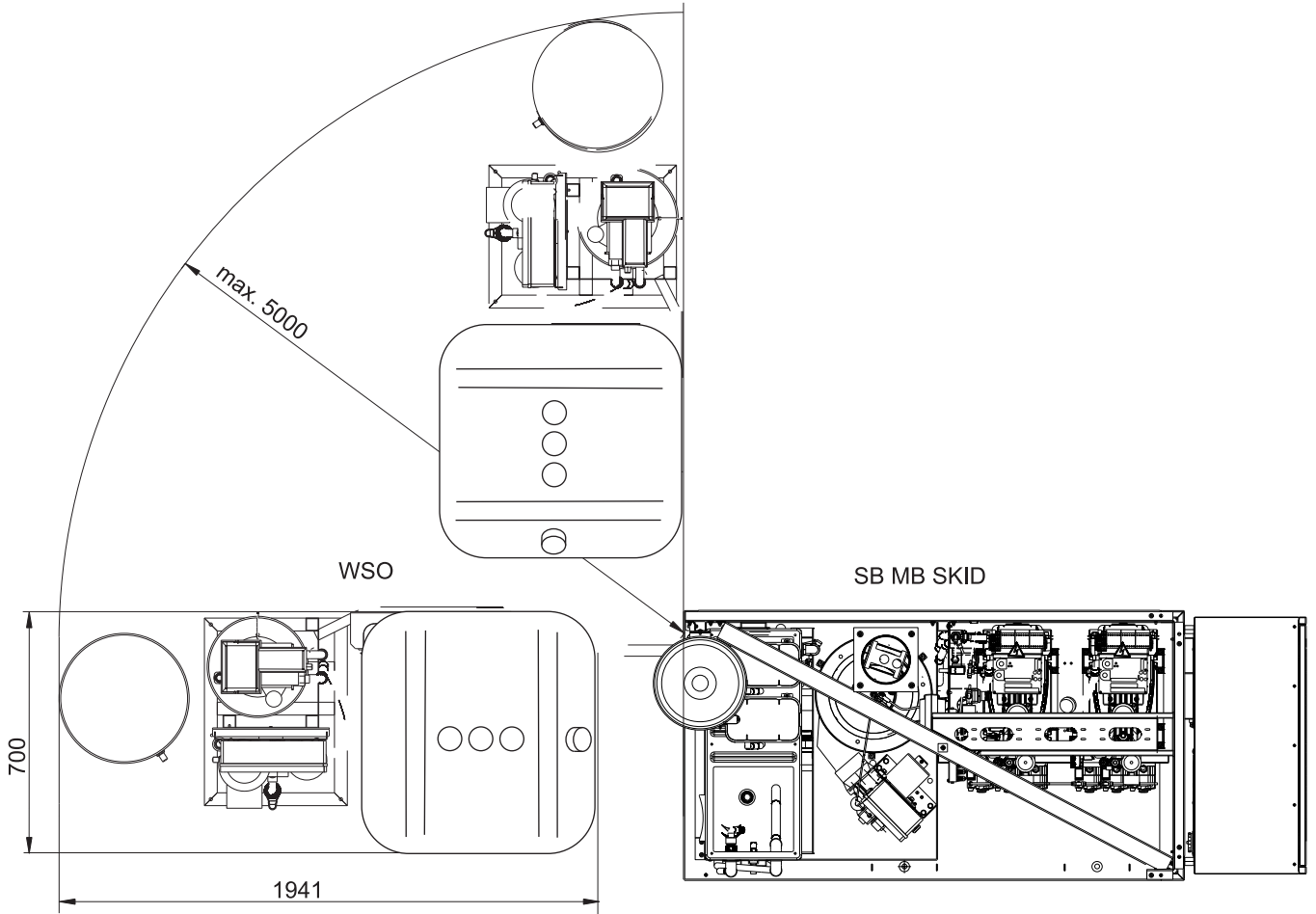
* SB MB standard
 ** SB MB comfort

Dimension drawing for SKID model



* SB MB standard

** SB MB comfort



EU Declaration of Conformity

We hereby declare that the machine described below complies with the relevant basic safety and health requirements of the EU Directives, both in its basic design and construction as well as in the version put into circulation by us. This declaration shall cease to be valid if the machine is modified without our prior approval.

Product: High pressure cleaner

Type: 1.070-xxx

Relevant EU Directives

2000/14/EG

2006/42/EG (+2009/127/EG)

2014/30/EU

2009/125/EG

2011/65/EU

Commission regulation(s)

(EU) 2019/1781

Applied harmonized standards

EN 60335-1

EN 60335-2-79

EN 55014-1: 2017 + A11: 2020

EN 55014-2: 2015

EN 61000-3-2: 2014

EN 61000-3-3:2013

EN 62233: 2008

EN IEC 63000: 2018

Applied conformity evaluation method

2000/14/EC: Appendix V

Sound power level dB(A)

Measured: 86

Guaranteed: 88

The signatories act on behalf of and with of the authority of the company management.



H. Jenner
Chairman of the Board of Management



S. Reiser
Director Regulatory Affairs & Certification

Documentation supervisor:

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71364 Winnenden (Germany)
Tel.: +49 7195 14-0
Fax: +49 7195 14-2212

Winnenden, 2021/04/01

Declaration of Conformity

We hereby declare that the product described below complies with the relevant provisions of the following UK Regulations, both in its basic design and construction as well as in the version put into circulation by us. This declaration shall cease to be valid if the product is modified without our prior approval.

Product: High pressure cleaner

Type: 1.070-xxx

Currently applicable UK Regulations

S.I. 2001/1701 (as amended)

S.I. 2008/1597 (as amended)

S.I. 2016/1091 (as amended)

S.I. 2010/2617 (as amended)

S.I. 2012/3032 (as amended)

Commission regulation(s)

(EU) 2019/1781

Applied harmonized standards

EN 60335-1

EN 60335-2-79

EN 55014-1: 2017 + A11: 2020

EN 55014-2: 2015

EN 61000-3-2: 2014

EN 61000-3-3:2013

EN 62233: 2008

EN IEC 63000: 2018

Applied conformity assessment procedure

S.I. 2001/1701 (as amended): Schedule 8

Sound power level dB(A)

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Winnenden, 2021/04/01

Log of high pressure testing

| Plant type: | Manufact. no.: | Start-up on: |
|-------------|----------------|--------------|
| | | |

Testing done on:

Findings:

Signature

Testing done on:

Findings:

Signature

Testing done on:

Findings:

Signature

Testing done on:

Findings:

Signature