



Original Operating Manual

Automatic domestic water dispenser

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1 General

1.1 About this operating manual

This operating manual contains important instructions that must be observed during installation, operation and maintenance. For this reason, ensure that it is read by specialist personnel and the responsible operator/owner prior to assembly and commissioning. The manual must be available at all times at the location where the system is used.

Please observe the safety instructions described in this operating manual, along with the relevant national accident prevention regulations and any internal work, operational and safety specifications of the operator. We assume no liability for damages and operational interruptions resulting from non-observance of this operating manual.

Pay particular attention to section 2 "Safety instructions" during commissioning and all maintenance work.

Section 2 also provides an explanation of the symbols used in this manual. Knowledge of this operating manual is essential to preventing errors and ensuring safe and uninterrupted operation.

The operating specification does not take local safety regulations into account. The owner bears full responsibility for compliance with these, including on the part of the assembly personnel used.

This operating manual:

- is part of the pump
- is valid for all type series mentioned
- describes safe and proper use in all phases of operation

1.2 Target groups

Target group	Task		
System owner	Ensure that this manual is available at the location where the system is used, including for later refer- ence.		
	► Ensure that personnel read and observe this oper- ating manual and the other valid documents, in particular the safety and warning information.		
	 Observe additional sys- tem-related regulations and specifications. 		
Specialist person- nel, assembly staff	Read, observe and fol- low this operating manual and the other valid docu- ments, in particular the safety and warning infor- mation.		

Table 1: Target groups and their tasks

1.3 Other valid documents

Document	Purpose
Installation diagram	Installation dimen- sions, connection di- mensions, etc.
Spare parts list	Ordering spare parts
Clearance certificate	Returning the pump
Declaration of conformity	Conformity with standards, content of the declaration of conformity

Table 2: Other valid documents and their purposes



Warning notice	Hazard le- vel	Conse- quences of non-obser- vance
	Immediate hazard	Death, severe physical injury
	Potential hazard	Death, severe physical injury
	Potentially dangerous situation	Minor physical injury
NOTICE	Potentially dangerous situation	Material da- mage

1.4 Warning notices and symbols

Table 3: Warning notices and consequences of nonobservance

Symbol	Meaning	
	Safety sign	
\triangle	► Follow all instructions identified with safety signs in order to avoid death or injuries.	
►	Instruction	
1. , 2. ,	Instruction with multiple steps	
\checkmark	Condition	
\rightarrow	Reference	
ĺ	Information, note	

Table 4: Symbols and their meanings

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2 Safety

The manufacturer shall not bear any liability for damages caused as a result of non-observance of this documentation.

2.1 Correct and proper use

- Only use this pump for the purposes of conveying the agreed pumping media.
- Comply with operating limits.
- The water may not contain any abrasive or long-fibered components that may damage the pump materials. Consult the manufacturer if using other media.
- Ensure that the pump is only commissioned with pumping medium and is not operated without it.
- Open the suction-side fitting, and do not use it to control the flow rate.
- Never operate the pump when the armature on the delivery side is closed.
- To avoid damaging the motor, observe the permitted number of times per hour that the motor can be switched on (→ Manufacturer information).
- Any other use must be agreed with the manufacturer.
- The temperature of the pumping medium must not exceed 40 °C.

Avoiding obvious misuse (examples)

• Observe the operating limits of the pump for temperature, pressure, flow rate and speed.

The main areas of use are:

- Water supply to single-family and multiple-family homes
- Water supply to businesses and agriculture
- Sprinkling and irrigation of gardens and other usable areas

The pump is self-priming after being filled once with water.

Do not operate the pump without water. Dry running can lead to damage to the pump.

Ensure that the foot valve is in the water at all times.

Any use that goes beyond the purposes described above shall be considered improper use. OSNA shall bear no liability for any resulting damages. The owner bears full risk for improper use.



2.2 General safety instructions

Please observe the following specifications before performing any activities.

2.2.1 Product safety

This pump is constructed according to the latest state of the art and accepted safety rules. Nevertheless, risks to life and limb for the user or third parties are still possible when using the pump, as are impairments to the pump and other material assets.

- Only use the pump in a technically perfect state and for the intended purpose. Ensure compliance with this operating manual and be aware of the hazards and safety issues during operation.
- Keep this operating manual and all other valid documents in a complete and legible state, and store in a location that is accessible at all times to personnel.
- Do not permit any activity that endangers personnel or uninvolved third parties.
- In the event of a safety-relevant fault, stop the pump immediately and have the fault rectified by responsible personnel.
- In addition to this documentation, ensure compliance with the statutory or other regulations for safety and accident prevention, as well as the relevant standards and specifications of the respective country.
- Do not remove any technical stickers.

2.2.2 Duties of the system owner

Safety-conscious work

Observe the safety specifications detailed in this operating manual, along with the occupational safety regulations and all additional internal safety regulations.

- Only use the pump in a technically perfect state and for the intended purpose. Ensure compliance with this operating manual and be aware of the hazards and safety issues during operation.
- Ensure compliance and monitoring:
 - correct and proper use
 - statutory or other safety and accident prevention regulations
 - safety specifications for handling hazardous substances
- Provide personal protective equipment.
- Do not remove contact protection during operation.
- Prevent any dangers from electrical energy (for details, please refer to the specifications of the VDE and the local energy supplier).
- Switch off the motor during all assembly and maintenance works, and secure against reactivation.
- Only work on the system when the pump is at a standstill.





Personnel qualification

The owner of the system must ensure that the personnel tasked with working on the pump have read and understood this operating manual and all other valid documents before beginning work, in particular information on safety, maintenance and repair.

Work of any kind on the machine may only be performed when it has been completely decommissioned. Reinstall and reactivate all safety mechanisms after work.

Before restarting the machine, ensure that all necessary commissioning steps have been completed.

- Determine responsibilities, tasks and monitoring for personnel.
- Only allow work of any kind to be performed by specialist technical personnel:
 - assembly, maintenance and repair work
 - work on the electrical systems
- Only allow personnel undergoing training to perform work on the pump under the supervision of specialist technical personnel.

Safety mechanisms

- Provide the following safety mechanisms and ensure that they function correctly:
 - for moving components: contact protection for the pump, installed by the customer
 - for potential electrostatic charges: provide appropriate earthing

Guarantee

- Please consult the manufacturer before carrying out any conversions, repairs or changes during the guarantee period.
- Only use original parts or parts approved by the manufacturer.

2.2.3 Duties of personnel

- Observe the information on the pump and ensure it is legible (e.g. direction of rotation arrow, fluid connection indicators).
- Do not remove the contact protection for moving parts during operation.
- Use personal protective equipment if necessary.
- Only work on the system when the pump is at a standstill.
- Switch off the motor during all assembly and maintenance works, and secure against reactivation.
- Reinstall the safety mechanisms after working on the pump according to specifications.



2.3 Dangers of non-observance of the safety instructions

- Non-observance of the safety instructions can lead to hazards to personnel, the machine and the environment.
- Non-observance of the safety instructions can also lead to the loss of any damage claims.
- In particular, non-observance can lead to the following dangers:
 - failure of important system functions
 - electrical and mechanical hazards to personnel

2.4 Unauthorized conversion and production of spare parts

Conversions or changes to the machine are only permitted following consultation with the manufacturer. Original spare parts and accessories authorized by the manufacturer help ensure safety. The manufacturer bears no liability for the consequences of the use of other parts.

2.5 Unauthorized modes of operation

The operational safety of the machine is only guaranteed when it is used for the intended purpose according to the operating manual (\rightarrow 2.1 Correct and proper use, pg 6).

Never exceed the limit values indicated in the technical data.

2.6 Special hazards

2.6.1 Explosion area

• Do not use the pump in areas where there is a risk of explosion.

2.6.2 Hazardous pumping media

- Observe the safety regulations for handling hazardous substances (e.g. toxic, hazardous to health).
- Use personal protective equipment when performing work on the pump.

2.6.3 Noise emissions

The maximum continuous sound pressure level for a correctly installed and commissioned automatic domestic water dispenser is 70 dB(A).



3 Layout and function

3.1 Labeling

This operating manual applies to automatic domestic water dispenser of the L10 to L25 and LG 100 to 400 series.

Model code:



Figure 1: Model Code

3.2 Scope of delivery, automatic domestic water dispenser

The customer can order the Automatic domestic water dispenser:

- in a preassembled state, i.e. delivery without motor, accessories enclosed unassembled. The motor is installed by the customer.
- in a fully assembled state, i.e the pump is fitted with motor ex-works.



Figure 2: Scope of delivery

Legende:

- 1 Pump
- 2 Accessories (includes items 3, 4, 5, 6, 7, 9 und 10, fully assembled in complete version)
- 3 V-belt
- 4 Belt guard with holder and clamping set
- 5 V-role pulley key for motor shaft with lock screw
- 6 Motor with motor fastening set
- 7 Poppet valve
- 8 Boiler complete with pressure line, pressure switch, pressure gauge and water level fitting
- 9 Oil dipstick
- 10 Assembly and operating manual

The scope of delivery corresponds to the scope indicated in the order. Please check that the delivery is complete upon receipt. Notify the delivery company of any transport damage immediately. Please also refer to our conditions of sale and delivery. If using other motor brands, please ensure that the motors have the



following drive torques as a multiple of the nominal torque.

Motor power	Starting torque ratio			
[kW]	Ms/Mn	Mn [Nm]		
0.25	1.9	1.7		
0.37	1.9	2.5		
0.55	1.7	3.7		
0.75	1.6	5.0		

Table 5: Starting torques

M_s = Starting torque

Mn = Nominal torque

kW = Kilowatt

Nm = Newton meter

List applies to three-phase motors. Starting torques for AC motors available upon request.



4 Transport and intermediate storage

4.1.2 Lifting

4.1 Transport

☐ Weight information (→ Other valid documents)

NOTICE

Transport the pumps carefully and secure

Avoid applying pressure to the pump-side V-

them to prevent damage.

role pulley key.

Risk of death or crushed limbs from falling transported goods!

► Choose lifting equipment that is suitable for the total weight to be transported.

► Do not stand under suspended loads.

4.2 Storage

NOTICE

4.1.1 Unpacking and checking the delivery condition

- 1. Check that the delivery is complete upon receipt.
- 2. Unpack the pump/unit upon delivery and check for transport damage.
- 3. Notify the delivery company of any transport damage immediately.
- 4. Dispose of the packaging material in line with the applicable local regulations.

Material damage due to incorrect storage!

- Ensure that the pump is correctly stored.
 - 1. Close all openings with blank flanges, blind plugs or plastic covers.
 - 2. Ensure that the storage area meets the following conditions:
 - dry
 - free of frost
 - free of vibrations
 - 3. Move the piston rod once per month.



NOTICE

Damage to bearings due to high water pressure or splashing water!

Do not use water jets or steam jet cleaners to clean the bearing areas.

4.3 Intermediate storage

Ensure during intermediate storage that the pump is not exposed to any weather conditions for a long period of time. If the pump is decommissioned for a longer period of time (approximately 2 to 3 months), ensure that it is fully drained. (\rightarrow 7.3 Decommissioning, pg 28)

4.4 Disposal

Plastic parts may be contaminated by toxic or radioactive pumping media. If this is the case, cleaning is not sufficient.

NOTICE

Damage to seals due to incorrect cleaning agent!

- Ensure that the cleaning agent does not corrode the seals.
 - 1. Choose the cleaning agent according to the area of use.
 - 2. Dispose of preservatives in line with the applicable local regulations.
 - 3. When storing for longer than 6 months:
 - Check all elastomers (round seals, shaft seal rings, gaskets and gland packing) for elasticity, and replace if necessary.

Risk of poisoning and environmental damage from pumping medium!

- Use personal protective equipment when performing work on the pump.
- Before disposing of the pump:
 - Collect the oil and dispose of it in line with the applicable local regulations.
 - Neutralize any pumping medium residues in the pump.
- Dispose of the pump in line with the applicable local regulations.



5 Layout and mode of operation

5.1 Mode of operation

The OSNA piston pump is a double-acting, selfpriming piston pump that has proven itself thanks to its quiet running, long service life and good suction performance.

The OSNA piston pump can be used together with a pressurized container for household water supply.

5.2 Functional and operating elements



Figure 3: Functional elements



Figure 4: Functional elements 2

Legende

- 1 Piston pump
- 2 Motor
- 3 Safety valve (SIOS valve, checked by TÜV)
- 4 Poppet valve
- 5 Pressure gauge
- 6 Water level indicator
- 7 Pressure vessel
- 8 Pressure switch
- 9 Oil drain plug
- 10 Oil dipstick
- 11 Discharge nozzle
- 12 Belt guard
- 13 Suction nozzle
- 14 Pressure line (not included in the scope of delivery)
- 15 Shut-off fittings (not included in the scope of delivery)



5.3 Technical data



Figure 5: Dimensions in front view



Figure 6: Dimensions in side view



Figure 7 Structure of the automatic domestic water system

Key:

- 1 Consumer
- 2 Shut-off valve with water outlet
- 3 Delivery pipe
- 4 Leakage fluid outlet
- 5 Suction head (Minimum suction head 2 m or \approx -0.2 bar)
- 6 Foot valve

The items listed here are not included in delivery.



Please check the pump type on the type plate to determine the correct gap.

Pump type		L 10	L 15	L 20	L 25
Flow rate	Liters/hour	1000	1500	2000	2500
Pump pressure	bar	4/6	4/6	4/6	4/6
Motor power, output *	kW	0.25 (0.37)	0.37 (0.55)	0.37 (0.55)	0.55 (0.75)
Motor speed	rpm	1450	1450	1450	1450
Pump pipe connections suction + delivery	Inches	1	1	1 1/4	1 1/4
Cylinder - ø	mm	45	45	55	55
Electrical connection	Volt	230/400	230/400	230/400	230/400
Dimensions a [min]	mm	80	80	93	93
b [min]	mm	165	165	193	193
B [min]	mm	≈ 350	≈ 350	≈ 350	≈ 350
c [min]	mm	≈ 650	≈ 650	≈ 678	≈ 678
d [min]	mm	14	14	14	14
e [min]	mm	80	80	95	95
f [min]	mm	210	210	210	210
g [min]	mm	390	390	390	390
H [min]	mm	419	419	455	455
h [min]	mm	252	252	258	258
i [min]	mm	50	50	50	50
k [min]	mm	28	28	28	28
M [min]	mm	135	135	135	135
Suction head min ¹⁾	m	2	2	2	2
Suction head max ¹⁾	m	8	8	8	8
Total delivery head ²⁾ (4/6 bar)	m	40/60	40/60	40/60	40/60

Motor output for AC motors available upon request
 Without pipe losses
 2) The total delivery head is comprised of the suction head, the geodetic delivery head and friction losses

Table 6: Technical data L



Pump type		LG 100	LG 200
Flow rate	Liters/hour	1500	2500
Pump pressure	bar	4/6	4/6
Motor power, output *	kW	0.37 (0.55)	0.55 (0.75)
Motor speed	rpm	1450	1450
Pump pipe connections suction + delivery	Inches	1	1 1/4
Cylinder - ø	mm	55	75
Electrical connection	Volt	230/400	230/400
Dimensions a [min]	mm	85	93
b [min]	mm	170	193
B [min]	mm	≈350	≈350
c [min]	mm	≈735	≈758
d [min]	mm	14	14
e [min]	mm	80	95
f [min]	mm	300	300
g [min]	mm	470	470
H [min]	mm	399	440
h [min]	mm	232	243
i [min]	mm	140	140
k [min]	mm	40	40
M [min]	mm	110	110
Suction head min ¹⁾	m	2	2
Suction head max ¹⁾	m	8	8
Total delivery head ²⁾ (4/6 bar)	m	40/60	40/60

Table 7: Technical Data LG



6 Assembly and installation

NOTICE

Material damage due to contamination!

Only remove covers, transport caps and sealing caps immediately before connecting the pump to the pipelines.

6.1 Preparing for installation

6.1.1 Checking the surrounding conditions

- 1. Ensure that the required surrounding conditions are met (\rightarrow 6.2 Installation, pg 18).
- 2. Please consult the manufacturer when installing at altitudes over 1000 m above mean sea level.

6.1.2 Preparing the installation location

- Ensure that the installation location meets the following conditions:
 - pump is freely accessible from all sides
 - sufficient space for installing/removing piping, as well as for maintenance and repair work, in particular for installing/removing the pump and motor
 - no effects from external vibrations on the pump (bearing damage)
 - protection against frost

6.1.3 Preparing the base surface and foundations

- Ensure that the base surface and foundations meet the following conditions:
 - level
 - clean (no oils, dust or other contaminations)
 - foundations can support the weight of the pump unit and all operating forces
 - stability of the pump unit ensured

6.2 Installation

6.2.1 Installing the pump

Prior to installation, remove the packaging (if present) and check the pump for any transport damage. Ensure that the installation area is dry and free of frost.

Do not operate the pump in areas where there is a risk of explosion. Ensure that the pump is installed and connected in line with the local regulations.

We recommend installing the pump on a noise-insulating base, in order to prevent transmission noises to parts of the building.





Figure 8: Installation area side view



Figure 9: Installation area front view

Ensure a minimum clearance to aid maintenance work (Figure 8: Installation area side view).

Provide an outlet (1) for leakage fluid during maintenance work.



Install the pump in such a way that prevents flooding of building sections as the result of

a leak or when performing maintenance work.

6.2.2 Electrical connection



Electrical connection must be carried out by a specialist electrician, in line with the specifications of the local energy supplier or the VDE.



Figure 10: Motor protection switch

Install a motor protection switch (1) to protect the motor (Figure 10: Motor protection switch).



6.2.3 Water connection

Connect the suction pipe (1) to the suction nozzle (2). Install a check valve in the suction pipe.

Connect the discharge pipe (5) to the discharge nozzle (4).



Figure 11: Water connection

Key

- 1 Suction pipe
- 2 Suction nozzle
- 3 Water container
- 4 Discharge nozzle
- 5 Delivery pipe
- 6 Non-return valve
- 7 To consumer

We recommend installing shut-off valves (6) on the system side to make it easier to drain the pump.



Ensure compliance with all safety specifications during installation and operation.



6.3 Installation

- Screw the pump horizontally to the foundation.
- $\breve{\mathbb{I}}$ Provide a noise-insulating base

Place the motor (2) on the rocker arms (1) and tighten slightly.

• Position the V-belt and align the motor on the rocker arm until the pulleys are aligned.

6.3.1 Installing the V-belt



Figure 12: Assembly with pressurized container

Key

- 1 Rocker arm
- 2 Motor
- 3 V-role pulley key
- 4 Lock screw
- 5 Tensioning screw
- 6 Motor fastening screw
- 7 Screw



The pulleys must be aligned precisely in order to ensure that the drive runs perfectly.

(Readjustment may be necessary)

• Tension the V-belt using the tensioning screw (5).



Figure 13: Tensioning the V-belt

- Push the small V-role pulley key (3) onto the motor shaft as shown. The hub must be facing the motor.
 Drill a hole in the motor shaft to accommodate the lock screw.
 Insert the lock screw (4).
- ☐ After tensioning, it must still be possible to push the V-belt by around 1 cm.



- Tighten the motor fastening screws (6) on the motor base.
- Tighten the screws (7) on the rocker arms (1).
- Insert the oil dipstick.

6.3.2 Belt guard

Never operate the pump without the belt guard.

Always reattach the belt guard after maintenance work.



Figure 14: Belt guard for LG 100 - 400

Key

- 1 Shell halves
- 2 Screw
- 3 Clamp
- 4 Screw
- 5 Rocker shaft
- 6 Crankcase

Assembling the belt guard

- Push the clamp (3) onto the rocker shaft (5).
- Insert the shell halves of the guard (1) into the groove on the crankcase (6) and push together (snap connections).
- Loosely screw on the guard and the clamp.
- Align the guard and tighten both screws (2 and 4) on the clamp.
- Loosen and remove the screw (4).
- Pull off the belt guard.

riangle caution

During assembly, ensure that the seam of the belt guard is properly inserted in the groove on the crankcase.



6.3.3 Installing the poppet valve



Figure 15: Poppet valve

Key

1 Poppet valve

Seal the poppet valve (1) at the thread and screw it into the pump cylinder cover.



7 Commissioning

7.1 Preparing for commissioning

7.1.1 Determining the pump configuration

- ► Determine the pump configuration
- Pump configurations include, for example, the type of drive transmission or the limiting pressure.

7.1.2 Filling the drive casing with oil

We recommend only using OSNA gear oil in our piston pumps. OSNA gear oil is available from specialist retailers.

OSNA gear oil has the viscosity class SAE 10W, making it relatively thin by gear oil standards. It is equivalent to common motor oils in its flow behavior. Thicker gear oils do not distribute adequately throughout the gear unit. For this reason, do not use standard gear oils!

- Remove the screws (1) and take off the casing cover (2).
- Fill the required quantity of oil.
- Check the oil level on the dipstick marking (3).

Oil quantity:

Series L10 - L25 0.25 I

Ensure that used oil is disposed of at the waste oil collection point.

Incorrect handling and disposal of waste oil can damage the environment.

It is forbidden to add third-party oils such as solvents, brake fluid and coolant.

Waste oil can be returned to us free of charge up to the purchased quantity.



Figure 16: Drive casing

Key

- 1 Screw
- 2 Casing cover
- 3 Dipstick
- 4 Arrow (direction of rotation)



Key

1 Screwed plug



PUMPENTECHNOLOGIE

Check that there is enough water in the well or feed tank.

Do not operate the pump without water. Dry running can lead to damage to the pump.

Figure 17: Drive casing LG

7.2 Commissioning

7.2.1 Filling the pump

0

 \perp If using long suction pipes, fill the entire pipe before initial commissioning.



Figure 18: Water side



Risk of poisoning or injury due to hazardous pumping media!

 Collect any escaping pumping medium safely and dispose of in an environmentally friendly way.

NOTICE

Material damage due to dry running!

► Ensure that the pump is properly filled.



Switch-off pressure:	3,5 bar	5,5 bar
----------------------	---------	---------

- Fill approx. 3/4 I of pumping medium into both filler openings of the air vessel.
- Reinsert and tighten the screwed plugs.

7.2.2 Setting the pressure switch

The pressure switch (1) is not set at the factory. We recommend the following setting ranges when setting the pressure switch:



Figure 19: pressure switch

Key

- 1 Pressure switch
- 2 Poppet valve
- 3 Water level indicator

Pump final pressure	4 bar	6 bar
Switch-on pressure:	2 bar	4 bar



For further information, please refer to the pressure switch manufacturer's specifications (enclosed in the switch cover)

7.2.3 Checking direction of rotation



Incorrect direction of rotation

Insufficient lubrication

The cast arrow (Figure 16: Drive casing, pg 24) on the casing (opposite the pump disc) indicates the required direction of rotation.

7.2.4 Starting the piston pump

- ✓ Pump correctly installed and connected
- ✓ Motor correctly installed and connected
- ✓ Motor and belt precisely aligned
- $\checkmark~$ All connections established, sealed and free of tension
- ✓ All safety mechanisms installed and function tested
- $\checkmark\,$ Pump correctly prepared, filled and vented

[•] Unscrew the screwed plugs (1).



• Check before commissioning that all pipe connections are fitted and



pressure tight. Ensure that the poppet valve on the pump is closed.

• Open any system-side consumers (2) if present.

NOTICE

Do not activate the piston pump when the armatures are closed.

 Switch on the electric motor and check whether there is suction from the pump. If suction is insufficient, switch off the pump and repeat the filling process (→ 7.2.1 Filling the pump, pg 25).

NOTICE

Do not exceed the maximum authorized pressure of 4 bar (6 bar).

- 1. Open the suction-side armature.
- 2. Open the delivery-side armature.
- 3. Switch on the motor and ensure that it runs quietly.

- 4. After the first pressure loads, check whether the pump is tight.
- 5. Set a slight leakage on the gland packing.

For optimal system operation, ensure a minimum suction head of 2 m or -0.2 bar.

For other modes of operation, we recommend contacting OSNA customer service.

7.3 Decommissioning



Risk of injury from hazardous pumping media!

- Collect any escaping pumping medium safely and dispose of in an environmentally friendly way.
- Take the following measures in the event of operating interruptions:

Pump to be	Measure
Shut down for longer period	 Take measures according to the pumping medium
Drained	 Close suction and delivery- side fittings.
Disassemb- led	 Deactivate motor and secure against unauthorized reactivation.
Put into sto- rage	 Observe storage measures (→ 4.2 Storage, pg 12).

Table 9: Measures in the event of operational interruption



Flow medium behavior	Duration of operating inter- ruption (depending on pro- cess)	
	short	long
Solid compo- nents settle	Flush pump.	 Flush pump.
Solidified/fro- zen, non-corrosive	► Heat or drain pump and contain- ers.	► Drain pump and containers.
Solidified/fro- zen, corrosive	Heat or drain pump and contain- ers.	 Drain pump and containers. Apply pre- servative to pump and containers.
Remains fluid, non-corrosive	_	-
Remains fluid, corrosive	_	 Drain pump and containers. Apply pre- servative to pump and containers

 Table 10: Measures depending on the behavior of the pumping medium

Drain the pump completely if shutting down for a longer period (approx. 2 - 3 months), or if there is a danger of frost.



This work must be carried out by a specialist company.

Disconnect the pump from the electricity supply if shutting down for a longer period.

Draining the pump and protecting against frost



Figure 21: Draining the pump

Key

- 1 Cylinder cover screw
- 2 Cylinder
- 3 Tie bolt
- 4 Drive side
- 5 Screwed plug



- Turn off the pump, then unscrew the upper screwed plug on the suction side (5).
- Disconnect the suction and delivery pipes.
- Loosen the cylinder cover screws (1) and tie bolts (3) between the drive side (4) and the cylinder (2) until the remaining water in the pump drains out on both sides.
- Re-tighten the loosened screws and reattach the suction and discharge pipes.
- Reinsert the suction-side screwed plug (5) and check for tightness.

7.3.1 Draining the boiler

Unscrew the screw plug (1) on the boiler or open the drain cock (2) and drain the boiler contents completely.

If all connections of the boiler are covered with piping, it is recommended to install an additional drain valve for easier draining of the boiler.

- After remaining drainage, retighten the _ loosened screws on the pump and boiler.
- Screw the screw plug on the suction side back in tightly.

7.4 Recommissioning



The pump must move easily for recommissioning.



Figure 22: Empty machine

Key

- 1 Screw plug
- 2 Drain cock

- Check the oil level before recommissioning. Top up with oil if necessary (\rightarrow 8.1.1 Oil level, pg 31).
- Check that the seal parts of the stuffing box are in good condition (\rightarrow 8.1.4 Stuffing box, pg 33).
- Perform all further work steps in line with 7.2 Commissioning (pg 25).

For operating interruptions > 1 year:

Shut down time	Measure	
> 1 year	 Check visually for leaks 	
> 2 years	 Replace elastomer seals (gaskets, round seals, shaft seal rings and gland packings). Replace anti-friction bea- rings. 	

Table 11: Measures following longer shut down times



8 Maintenance and repair

We can provide trained customer service technicians for assembly and repair work. Please present proof of the conveyed goods upon request.

(DIN safety data sheet or clearance certificate)

DANGER



Risk of death from electric shock!

- Only allow work on the electrical systems to be carried out by a qualified electrician.
- Ensure that the supply of electricity is switched off and secured against reactivation when performing all maintenance work.

Risk of injury due to running pump!

- ► Do not touch the running pump.
- Do not perform any work on the running pump.

8.1 Maintenance

OSNA piston pumps are virtually maintenance free as far as their main components are concerned. To ensure higher operational safety, however, perform the following checks at intervals of 2-3 months.



Risk of poisoning or injury due to hazardous pumping media!

Use personal protective equipment when performing work on the pump.

8.1.1 Oil level



Figure 23: Oil level



Key

- 1 Dipstick
- 2 Tensioning screw
 - Check the oil level using the dipstick (1). Perform the first oil change after one month of operation.
 - Change the oil every 3 years thereafter.

8.1.2 V-belt



Only perform the inspection when the system is switched off and secured.



Figure 24: V-belt guard

Re-tension new V-belts after around 4-5 weeks of running time using the tensioning screw (2) (Figure 23: Oil level)

The V-belt and pulley must remain free of oil and grease, as the belt could otherwise slip and be destroyed.

Check the V-belt tension during all maintenance intervals. This check can be performed without disassembling the belt guard. Use a thin object (such as a screwdriver) to push the V-belt through the slot in the belt guard. It should be possible to push the belt by around 1 cm.

8.1.3 Adding air

Once the system's shut-down pressure is reached, the normal air/water ratio is 1/3 air to 2/3 water. You can add more air by opening the poppet valve (Figure 25: Adding air).



Figure 25: Adding air

A sufficient air cushion is required in the pressurized container to maintain the switching cycles. Air must be added if the pump switching intervals are short.





Ensure the poppet valve is closed after adding air.

8.1.4 Stuffing box

The stuffing box has a grooved ring packing. The packing seals automatically, requiring just a slight tightening of the domed nut (3) by hand.

Excessive tightening places too much tension on the grooved rings. This leads to loss of tightness in the stuffing box.

Replace the gland packing if the stuffing box leaks. Check at the same that the piston rods are in a good condition. Any worn or scored piston rods can lead to premature destruction of the packing.

Assembly sequence:

Tallow ring

Grooved ring

Grooved ring

Tallow ring



Figure 26: Stuffing box

Key

- 1 Stuffing box barrel
- 2 Gland packing (tallow ring)
- 3 Gland nut
- 4 Piston rod
- 5 Stuffing box
- 6 Grooved ring
- 7 Neck bush

8.2 Maintenance service

NOTICE

Have the pump inspected every 3 years by a specialist service provider or the OSNA customer service.



8.2.1 Oil change



Figure 27: Oil change

• Unscrew the oil drain plug (1) and drain the oil.

Collect the oil in a container in an environmentally friendly way, and dispose of it according to specifications.

• Re-tighten the oil drain plug.

 \square Re-seal the oil drain plug!

• Fill with oil as described in section 8.1.1 Oil level (pg 31).

8.2.2 Sending the pump to the manufacturer

- ✓ Pump depressurized
- ✓ Pump completely drained
- Electrical connections disconnected and motor secured against reactivation
- Manometer removed together with supply lines and holders
- 1. Only send pumps or individual components to the manufacturer together with a verifiable and completely filled out clearance certificate. Request a clearance certificate from the manufacturer if required.
- 2. Using the following table, take the action required for returning the pump according to the necessary repair.

Repair	Action for return
At customer	Return defective compo- point to manufacturer
At manufacturer	 Flush pump.
	Send complete pump (not disassembled) to manu-
	facturer.
At manufacturer, with guarantee	 Only if using hazardous pumping medium: flush
claim	pump.
	(not disassembled) to manu- facturer.

Table 12: Measures for return

8.3 Safety valve

OSNA piston pumps are fitted with a TÜV-approved OSNA - SIOS safety valve (Figure 28: Safety valve), located in the pump's air vessel. This component is type tested and therefore compliant with safety specifications.



OSNA-SIOS valve 4 bar:

Nominal pressure:	4.0 bar
Max. shut-off pressure:	3.5 bar
Pumping medium:	Water
Temperature range:	0-40°C

OSNA-SIOS valve 6 bar:

Temperature range:

Red cap	
Nominal pressure:	6.0 bar
Max. shut-off pressure:	5.5 bar
Pumping medium:	Water



0-40°C

Figure 28: Safety valve



Do not operate the piston pump without a safety valve.

All warranty claims are void if the seal is removed. If using a piston pump without OSNA-SIOS safety valve, the system should be protected against vacuums by means of a TÜV-appropriate safety valve.

To ensure the installed OSNA-SIOS safety valve remains fully functional over the long term, it is necessary to manually operate the valve approximately every 6 months (pull the valve toggle horizontally).

The SIOS valve responds when there is 4 or 6 bar of pressure in the piston pump's air vessel. Do not judge by the manometer display on the vessel. This is because the manometer does not measure the resistances through the discharge pipe, the inertia of the push switch, and pressure peaks. This response can also occur prematurely if the air cushion in the air vessel is too low.

Always fit the suction pipe rising to the pump.

The SIOS valve opens if there is inlet pressure.

Pump type	SIOS 4 bar	SIOS 6 bar	Comments
L10	х	х	
L15	х	х	
L20	х	х	
L25	х	х	
LG 100	Х	Х	
LG 200	х	Х	

Table 13: Selection SIOS-valves



9 Faults and troubleshooting

following table, or that cannot be traced back to the described causes.

Please consult the manufacturer should you experience any faults that are not described in the

Fault	Cause	Remedy
No pump suction, pump conveys little to no wa-ter.	Pump is insufficiently filled.	Decommission pump and repeat filling pro- cess, multiple times if necessary.
	Suction pipe not vacuum tight.	Re-seal suction pipe.
	Valves jammed or leaky.	Remove air vessel and clean valves, replace rubber valve discs if necessary, consult spe- cialist.
		During assembly, ensure that the valve plate, valve retainer and seals are fitted in the correct position.
		(Valve retainer with borehole \rightarrow discharge side)
	Suction head too high.	Check with mano-vacuummeter, consult spe- cialist.
	Stuffing box leaks.	Tighten or replace stuffing box if necessary, check piston rod.
	Piston and cylinder worn.	Consult specialist, possibility of sand being conveyed by pump, improve conditions in water supply.
Pump knocks	No air cushion in air vessel.	Check air vessel tightness, replace screwed plug seal if necessary.
		Increase suction head or consult specialist.
		Check non-return valve in discharge pipe.
		Rubber lip of poppet valve jammed, replace.
	Suction pipe too long. Suction head too high.	Have suction pipe fitted with next-largest pipe dimension, if possible.
	No air cushion in pressur- ized container.	Check for leaks with soap and remedy. Top up air cushion.
OSNA-SIOS safety valve responds.	Insufficient air cushion in air vessel, poppet valve not functioning properly.	Reduce switching pressure, add air by opening the poppet valve.
	Discharge-side re- sistances too high.	Check system for suction. Consult specialist.



Fault	Cause	Remedy
Oil leak on pump or bearing.	Shaft seal potentially defec- tive.	Consult specialist.
Drive knocks.	Drive components defec- tive.	Have drive components replaced by special- ist.
	Damage can be caused by: - insufficient lubrica- tion - oil saponified by spray water	Change oil and improve ventilation of installa- tion area.
	Incorrect direction of rota- tion.	Have inspected by specialist.
Water leak on poppet valve.	Rubber lip of poppet valve defective.	Replace rubber lip.
Pump switches on after slightest water extrac- tion. (When operating with additional pressurized container)	No air cushion in pressur- ized container.	Check for leaks with soap and remedy. Top up air cushion.
Air leak on tap.	Air volume in pressurized container too high. (When operating with additional pressurized container)	Vent air from pressurized container.
	Air intake on suction side.	Consult specialist.
	Extraction may be greater than pump output.	Consult specialist.
	Poppet valve may be open.	Close valve.

Table 14: Fault causes



10 Appendix

10.1 Service, spare parts, accessories

Please note in particular that spare parts and accessories not delivered by the manufacturer are also not checked and approved by the manufacturer. The installation and/or use of such products can therefore, under certain circumstances, have a negative effect on the properties of the piston pump specified in the design. This can in turn jeopardize safety. Any liability and guarantee on the part of OSNA for damages resulting from the use of non-original spare parts and accessories is excluded.

Any faults that cannot be rectified by the owner may only be rectified by OSNA customer service or specialist service providers. Please provide a precise description of the fault, so that our service technician can prepare and bring the required spare parts. You can reach our customer service via the address on the last page.

Spare parts can be ordered via specialist retailers. Please refer to the type plate for the type designation.

In the event of any guarantee claims, please provide the machine number on the housing.

The following spare parts diagrams are intended solely to ease the process of finding and procuring the spare parts.



Do not use the spare parts diagrams as assembly instructions.

Notes on ordering spare parts:

In order to prevent incorrect deliveries, please ensure that the information you provide when ordering is as precise as possible:

- Type designation
- Designation
- Required quantity
- Required shipping method (e.g. post, freight, express freight, courier delivery)
- Precise delivery address





10.2 Individual parts of the L piston pump

Figure 29: Explosion diagram of the L piston pump



ltem	Designation	Item	Designation
1	Casing	47	Air vessel with SIOS valve,
2	Casing cover		complete with no. 48-55
3	O-Ring	48	Screwed plug
4	Oil level dipstick	49	Joint ring
5	Plug	50	Valve seat
6	Hexagon head bolt	51	Membrane
7	Plug	52	Safety valve (SIOS), 4 bar,
8	Crankshaft		complete with no. 51
9	Circlip		Safety valve (SIOS), 6 bar,
10	Radial grooved ball bearing		complete with no. 51
11	Radial grooved ball bearing	53	Stud
12	Hexagon socket head cap screw with slot	54	Hexagon nut
13	Radial shaft seal ring	55	Hexagon head bolt
14	Connecting rod	56	Flange
15	Crosshead	57	Gasket
16	Crosshead small end	58	Hexagon head bolt
17	V-role pulley key pump side,	59	Disc
	complete with no. 18	60	Gasket
18	Hexagon head bolt with nut	61	Stuffing box barrel with neck bush, no. 62
19	Cover with oil preventer cover	62	Neck bush
20	Bearing cover	63	Gland packing, complete with no. 64
21	Circlip	64	Grooved ring
22	Gasket	65	Stuffing box
23	Rocker axis without hole	66	Gland nut
24	Rocker axis with hole	67	Piston
25	Hexagon head bolt	68	Piston rod
26	Hexagon nut	69	Hexagon nut
27	Rocker arm	70	Thrower
28	Hexagon head bolt	71	V-role pulley key motor side,
29	Hexagon head bolt with nut		complete with no. 72
30	Disc	72	Grub screw
29	Hexagon head bolt with nut	73	V-belt
30	Disc	74	Hexagon head bolt with nut
31	Hexagon head bolt with nut	75	Disc
32	Pump cylinder with liner, no. 33		Seal set, complete with
33	Liner		no. 38, 41, 45, 46, 49, 57, 60
34	Pump cylinder cover		
35	Rubber lip	Conf	iguration A
36	Snifter valve (incl. 35 rubber lip)	100	Gasket
37	Stud	101	Bearing cover
38	Joint ring	102	Valve plate
39	Domed nut	102	Valve body
40	Valve seat	104	Air vessel with SIOS valve
41	Valve plate	104	complete with no. 48-55
42	Valve stop delivery side	105	Gasket
43	Valve stop suction side	106	Gasket
44	Retaining nut	100	Seal set complete with
45	Gasket		no. 38, 41, 49, 57, 60, 105, 106
46	Gasket		
1			

Table 15: Parts list for the L piston pump







Figure 30: Explosion diagram of the LG 100-400 piston pump



Item	Designation	ltem	Designation	
1	Casing	47	Valve seat	
2	Casing cover	48	Valve plate	
3	O-Ring	49	Valve stop delivery side	
4	Oil level dipstick	50	Valve stop suction side	
5	Hexagon head bolt	51	Retaining nut	
6	Plug	52	Gasket	
7	Rocker axis without hole	53	Gasket	
8	Rocker axis with hole	54	Air vessel	
9	Hexagon head bolt	55	Screwed plug	
10	Hexagon nut	56	Joint ring	
11	Rocker arm	57	Valve seat	
12	Hexagon head bolt	58	Membrane	
13	Cover with oil preventer cover	59	Valve body with functional parts	
14	Bearing cover	60	Stud	
15	Bearing cover	61	Hexagon nut	
16	Gasket	62	Hexagon head bolt	
17	Hexagon head bolt	63	Flange	
18	Disc	64	Gasket	
19	Radial grooved ball bearing	65	Hexagon head bolt	
20	Radial shaft seal	66	Disc	
21	Pinion shaft bearing	67	Gasket	
22	Gear wheel "L"	68	Stuffing box body	
23	Gear wheel "R"	69	Neck bush	
24	Eccentric cam	70	Grooved ring	
25	Connecting rod	71	Gland packing	
26	Hexagon head bolt	72	Stuffing box	
27	Spring washer	73	Gland nut	
28	Hexagon nut	74	Piston	
29	Crosshead	75	Piston rod	
30	Crosshead small end	76	Hexagon nut	
31	Stub shaft	77	Thrower	
32	Square-head bolt	78	V-role pulley key, motor side	
33	Push-on sealing cap	79	Grub screw	
34	V-role pulley key pump side	80	V-belt	
35	Hexagon head bolt with nut	81	Hexagon head bolt with nut	
36	Hexagon head bolt with nut	82	Disc	
37	Disc	83	Circlip	
38	Hexagon head bolt with nut	84	Circlip	
39	Pump cylinder	85	Disc	
40	Liner			
41	Pump cylinder cover	Confi	onfiguration A	
42	Snifter valve (incl. 43 rubber lip)	100	Valve plate	
43	Rubber lip	101	Valve body	
44	Stud	102	Air vessel with SIOS valve	
45	Joint ring	103	Gasket	
46	Domed nut	104	Gasket	

Table 16: Parts list for the LG 100-400 piston pump





10.3 Individual parts automatic domestic water dispenser

Figure 31: Exploded view of the dosmetic water dispenser





Item	Designation	ltem	Designation
1	Bow	12	shim washer
2	Pipe nipple thread one-sided	13	Hexagon bolt w. nut
3	Tube KMT plastic	14	washer
4	Hose clamp	15	Motor
5	Pressure vessel	16	Belt guard
6	Plug	17	Bracket for belt guard
7	Water level fitting	18	Hexagon head screw
8	Water level pipe	19	washer
9	Pressure gauge	20	Hexagon bolt with nut
10	Pipe double nipple	21	washer
11	Pressure switch	22	Reduction nipple

 Table 17: Parts list automatic domestic water heater



10.4 Motor assembly



Figure 32: Explosion diagram of motor assembly

Item	Designation	Item	Designation
1	Motor (optional)	5	Disc
2	Belt guard	6	Hexagon head bolt with nut
3	Belt guard holder	7	Disc
4	Hexagon head bolt		

Table 18: Motor assembly parts list



10.5 Declaration of Conformity as per EC Directive 2006/42/EC, Annex IIA

We hereby declare under our sole responsibility as manufacturer that the following machine series of the type, as well as the configurations distributed by us, conform to the relevant specifications of the EC Machinery Directive 2006/42/EC.

> HWA L10/15/20/25, HWA LG 100/200 Designation:

170500-200000 Pump number:

The machine also corresponds with the following directives published in the Official Journal of the European Union:

- Niederspannungsrichtlinie (2014/35/EU) •
- EMV-Richtlinie (2014/30/EU)
- Druckgeräterichtlinie (2014/68/EU) •

This declaration shall cease to be valid in the event of any modifications to the machine and/or its protective mechanisms not agreed with us and approved in writing.

Applied harmonized standards and their references in the Official Journal of the European Union:

- DIN EN 809 : 2012 •
- DIN EN ISO 12100 : 2011 •
- DIN EN ISO 13849-1 : 2008 •
- DIN EN ISO 13857-1 : 2008 •
- DIN EN 60034 : 2007 •
- DIN EN 60204-1 : 2009 •
- DIN EN 55024 : 2011

Authorized representative for the composition of technical documentation for OSNA-Pumpen GmbH:

Mr. Christopher Schmidt Brückenstrasse 3 49090 Osnabrück, Germany

Osnabrück, 19.12.2022 *i. A. C*

Christopher Schmidt (B.SC.)



10.6 Clearance Certificate

Please copy and send with the pump.

Clearance Certificate

Legal provisions oblige all businesses to protect their employees, other persons and the environment from damaging effects when handling hazardous substances. Products and their components may therefore only be repaired or inspected when the following declaration has been fully and correctly filled out and singed by an authorized and qualified specialist. Please provide the necessary information should safety measures on the part of the system owner still be required despite complete draining and cleaning. This clearance certificate is part of the repair or inspection order.

We hereby assure that the enclosed device

Type: _______Serial no.:

is free of substances that are hazardous to health. No special safety measures are required for further handling. The device was fully drained and thoroughly cleaned inside and outside before dispatch.

Company/institute:				
Address:				
Town/city, ZIP code:				
Phone:				
Name:				
Position:				
Date:				
Signature, company stamp:				
.	•			



Notes



Notes





S

Note



10 Appendix



PUMPS SYSTEMS WATER TREATMENT ENGINEERING SERVICES

OSNA-Pumpen GmbH Brückenstrasse 3 49090 Osnabrück, Germany Phone: +49 541 1211 – 0 Fax: +49 541 1211 – 220 Internet: http://www.osna.de E-mail: info@osna.de

Your no. 1 choice for the solution you need:

- Consulting

- Planning
- Project management
- Assembly

- Training
- Maintenance
- Repair

OSNA customer service Tel.: +49 54 Emergency service Tel.: +49 17

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