

# UNITOR™

Unitor™ HPCE DYNAMIS 300+

## OPERATIONS MANUAL



**Model: HPCE DYNAMIS 300+**

**WSS Part Number: 771716**

**Last Revision: February 2023 (Rev. 1.0)**

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<b><u>Technical Data HPCE Dynamis 300+</u></b>	
Nominal voltage	380V/440V 3ph
Nominal frequency	50Hz/60Hz
Nominal power rating	7,5 KW – 15,1 A @380V/50Hz 9 KW – 15,1 A @440V/60Hz
Motor protection type	CLASS F / IP 55
Recommended breaker	25 A, class D or K
Pump oil type	SAE 15W40 ISO VG100 DIN 51524
Pump oil quantity	4 liters (pump requires 0,5lt per fill)
Nominal water flow	13 lt/min @380V 16 lt/min @440V
Maximum working pressure	300 bar
Nozzle size	030 @ 380V/50 HZ 035 @ 440V/60 HZ
Admissible overpressure	330 bar
Max water intake temperature	40°C
Weight in kg	104 kg
Dimensions (LXWXH)	97x55x76 cm

**Abbreviations**
**HP - High Pressure    LP - Low Pressure**
**HPCE – High Pressure Cleaner Extreme    PPE – Personal Protective Equipment**
**Safety symbols**

The below symbols used in this manual indicate actions that should not be ignored, as they may result in human injuries or damages to the machine.



Electric shock Risk


 Read carefully **BEFORE** operating the machine


Risk for persons



Helpful tips and hints



Risk for the machine

## Important Safety Precautions



Before using the machine ensure this operations manual is fully read and understood. Always keep this manual in a safe place near to the machine.

Never let persons, who are not trained work with the machine

This machine should be operated by qualified personnel only



The operator must always wear appropriate and certified personnel protective equipment (PPE) for 300 bar.

Persons that are in the immediate proximity of the cleaning area, have to protect themselves against spurting particles by wearing appropriate personnel protective equipment (PPE) for 300 bar.

There must be **two operators** on the machine. One at the machine and the other at the spray handle, both having eye contact on each other.

The machine should be used according to relevant national safety rules.

Never direct the spray jet at yourself, other people or at the machine itself.



Never attempt to clean your clothes or footwear that you or other persons are wearing with the machine.

Keep bystanders away from the working area.

Increased hazard caused by short spray equipment (less than 750 mm from the handle to the nozzle)! Never direct the jet against parts of the body! Protect yourself from any particles splashing back against you!



Ensure you connect the machine to the proper voltage as per its specifications. When connecting extension cables, ensure you are using cable with proper minimum cross-sections. The machine must not be started if any electrical component or accessory (cable, plug, switch etc.) is defective. Only qualified personnel must carry out all electrical repairs.

Ensure you connect the machine to the correct main supply voltage, as specified by the manufacturer.

Use only watertight cable, plugs and sockets. Any electrical installation should be made only by a qualified electrician.

Always check and ensure that the machine and its accessories (hoses, cables, fittings, spray handle, nozzle etc.) are in good working condition before start-up.



The maximum permissible pressure and temperature are printed on the high-pressure hose. In case of damage, replace immediately with original approved hoses.

If during operation you observe any leakage, abnormal noise or any other malfunction, stop the machine and get it serviced.

You should not attempt to repair and reuse damaged high-pressure hoses.

You should only use original spare parts and accessories.



You should carry out only the maintenance works described in this manual and use only original parts approved by the manufacturer.

Do not make any modifications to machine and ensure it is regularly serviced as per its maintenance schedule.

Repair works to be carried out by qualified personnel only.

Never suck up solvent liquids such as thinners, petrol or oil as the resulting spray is highly inflammable, explosive and toxic.



Always ensure the machine is placed in a stable position and cannot move. Do not operate the machine without water or with insufficient quantity of water, as such shortages may result in damage of the pump.

Do not cover the machine and ensure adequate air circulation.

Always store the machine in places where it will not be exposed to frost.

Use only original spare parts for maintaining the machine. Repairs should be done only by qualified personnel.

After works, the machine should be stored not being exposed to harsh and corrosive environment and secured against unauthorized use.



Never exceed the maximum working pressure of the machine!

- **Location of equipment**

Your water jetting unit is designed to be placed and operated under normal environmental conditions according to DIN 500100-1 and DIN 50014.

When you transport the high pressure cleaner on vehicles or trucks please fasten it on a suitable transport pallet.


Before operating please check that installation is proper.

- Do not operate HPCE DYNAMIS 300+ in places with explosion or fire danger.
- Secure that installation is horizontal and steady.
- Secure against rolling.
- Check oil level.

## **Type plate and serial number**

The below type plate is located on the floor plate of the machine next to the inlet water filter.

The type plate includes the manufacturing year (in this example '**2024**') and the serial number (in this example '**UD30000124**').

	
Type: HPCE DYNAMIS 300+	Part No: 771716
Power:	7,5 Kw 15,1A@380V/50 Hz
Power:	9 Kw 15,1A@440V/60 Hz
Max. Working Pressure:	300 Bar
Max. Volume:	13 lt/min @ 380 V
Max. Volume:	16 lt/min @ 440 V
Manufactured:	2023
Machine dry weight:	104 kgs
Serial Number:	UD3000124
Made in EU	

## Introduction

This manual or part of it should not be reproduced without the written approval of the manufacturer. Every effort has been made to ensure that the information in this manual is both accurate and current. However, we reserve the right to change, alter or otherwise improve the product and its documentation at any time without prior notice.

Manufacturer's warranty is limited to repair or replacement of faulty parts at the time of manufacture. To maintain the machine in perfect condition, it is important that the periodical maintenance procedure is performed.



### Warning

**Please carefully read this manual before starting the machine for the first time and keep this manual in a safe place. We cannot be held responsible for damages or malfunctions due to not reading this manual.**

This machine is a high-pressure water jetting equipment which produces a water jet under high pressure and can cause severe injuries. Complete understanding of this manual is absolutely necessary to prevent injuries and damages to persons, objects and/or the equipment.

This manual includes basic information that has to be respected at all times concerning the installation, start up, operations and maintenance of the machine. It has to be therefore read carefully by the operator and should always be on site.



### Attention

**ABSOLUTELY NO PERSON OR ANY BODY PART SHOULD BE BETWEEN THE MACHINE/SPRAY LANCE AND THE TARGET AREA FOR CLEANING WHILE THE MACHINE IS IN OPERATION. THERE IS NO SAFE DISTANCE FOR TOUCHING OR FEELING THE HIGH-PRESSURE WATER JET WITH HUMAN BODY PARTS.**

## Water quality requirements

The environment temperature during operation of HPCE DYNAMIS 300+ should be min +4°C and max +40°C.

**The STANDARD pumps work with clean, soft water, at a maximum temperature of 40°C, and only for short periods, up to 60°C**

**Temperature** : Max. 40° C inflow temperature

**PH** : The pH value must be between 6.5 and 9.5.

**Conductivity** : Conductivity at 20°C must be below 2000 µS/cm

**Purity** : The water must be free of abrasive and particulate materials

**NOTE** : It is the responsibility of the operator to ensure that water quality is according to above requirements. Prolonged usage of the machine with poor water quality will lead to severe damages of the machine.

## Details about lifting means



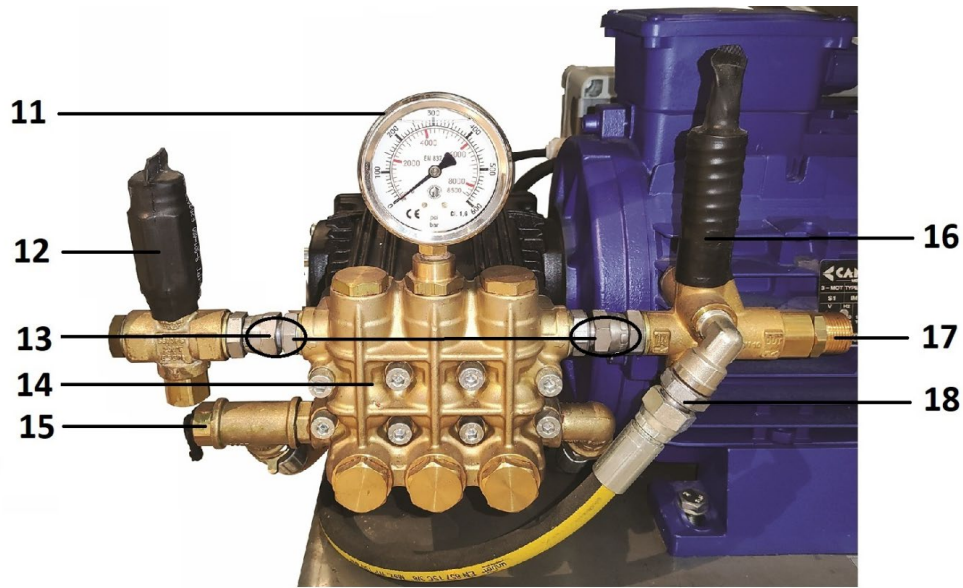
Lifting should only be done with certified lifting straps according to **EN 1492-1 (Flat woven webbing sling)**.



## Machine Description



1. HP lance and spray handle
2. Electric motor
3. HP hose bend protector
4. Front wheels
5. Handle
6. Stainless Steel frame
7. Lifting eyes
8. Water filter
9. Electrical cabinet
10. Electrical cable with plug



- 11. High pressure gauge
- 12. Safety valve
- 13. Connection set (x2)
- 14. HP pump

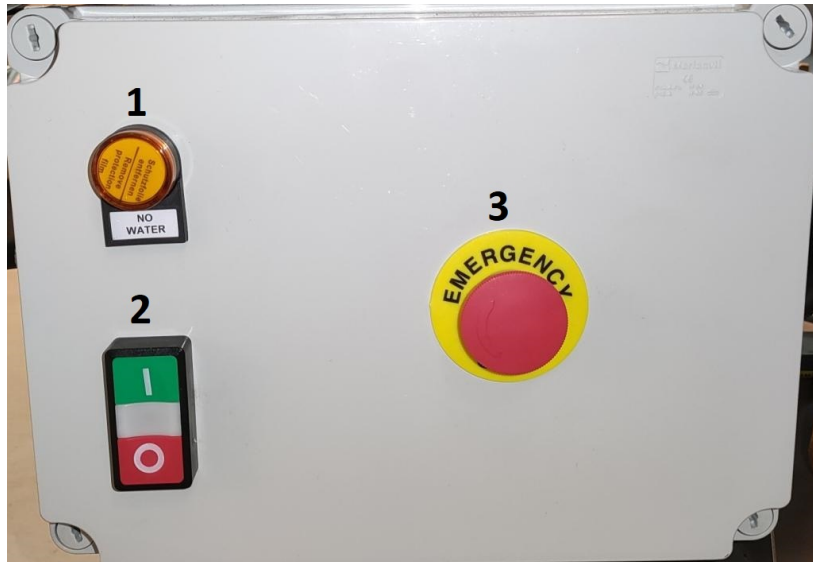
- 15. Thermal valve
- 16. Unloader – bypass valve
- 17. HP outlet fitting
- 18. By pass line to pump



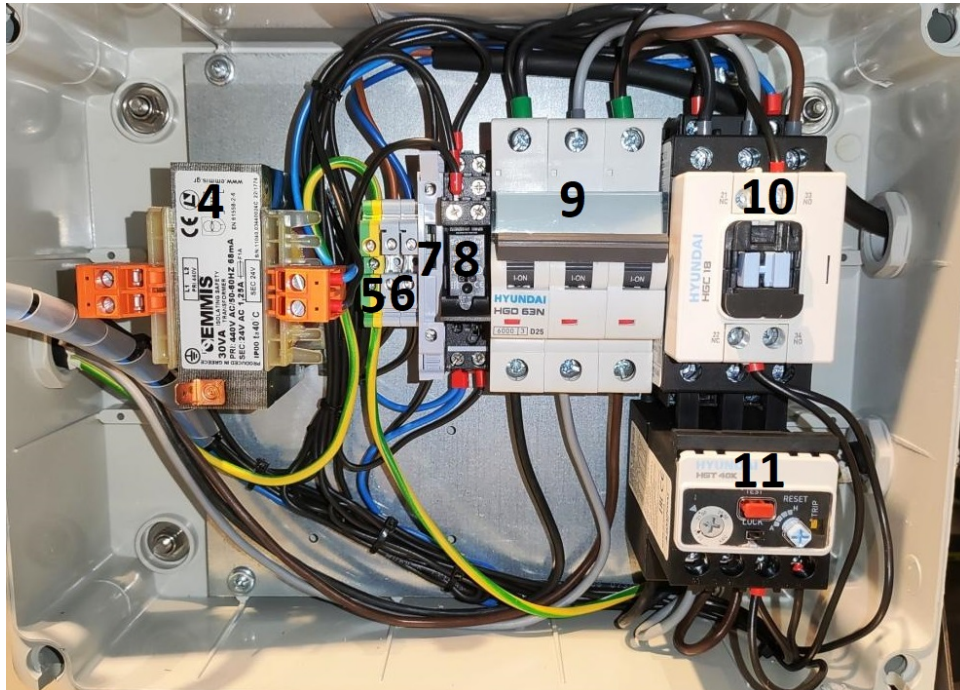
- 19. Inlet pressure switch
- 20. Water filter, inlet pressure gauge
- 21. Water filter, outlet pressure gauge
- 22. Water inlet connection 3/4" with GEKA coupling

- 23. Inlet water cartridge filter
- 24. Oil sight glass
- 25. Thermal valve
- 26. Filter to pump inlet hose

**Electrical Control Cabinet**

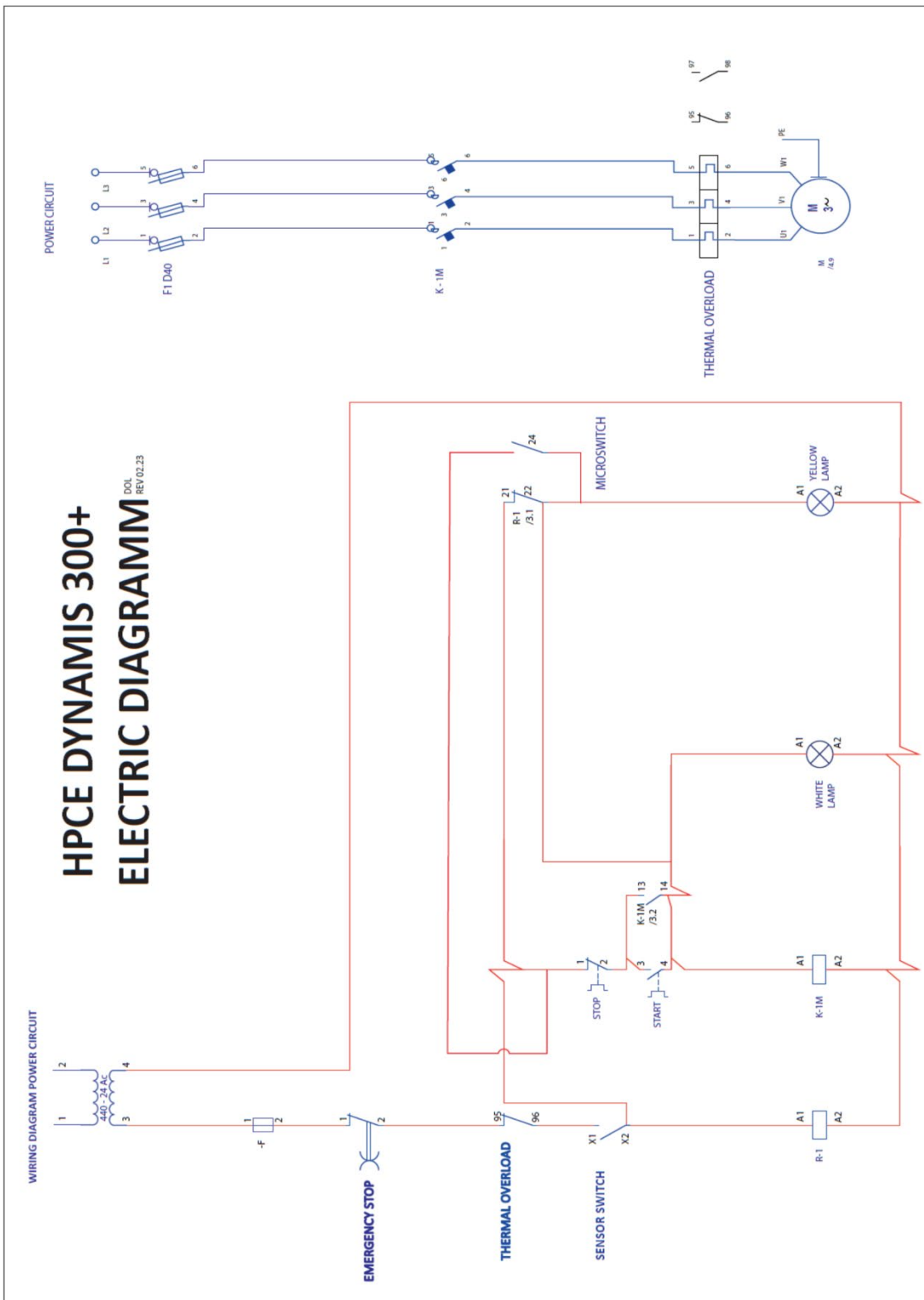


1. Low water level indication lamp
2. Start/Stop push button (with white indication lamp)
3. Emergency stop button



- |  |  |
|--|--|
| <ol style="list-style-type: none"> <li>4. Transformer 440V / 24V</li> <li>5. Terminal ground 4mm<sup>2</sup></li> <li>6. Terminal 4mm<sup>2</sup></li> <li>7. Fuse Terminal</li> </ol> | <ol style="list-style-type: none"> <li>8. Mini relay with base</li> <li>9. Breaker 3P</li> <li>10. Relay</li> <li>11. Thermal relay</li> </ol> |
|--|--|

**Electrical Diagram**



## **Description and Function of the Safety Installations**

- **Unloader Valve for Bypass Mode**

The high-pressure valve limits the operating pressure. When the maximum operating pressure is exceeded or the handle is closed, the unloader valve administrates the water over a bypass connector back to the pump.

- **Safety Valve**

The safety valve limits the maximum operating pressure to 335 Bar. If the maximum operating pressure exceeds the specified limit due to closing of the spray handle or due to nozzle clogging, the unloader valve receives a switching surge and channels the water through its bypass.

In case of excessive pressure more than the permissible limit for any other reason, the safety valve is activated and allows to leak through it, thus reducing the pressure.

- **Protection against freezing**

Freeze can destroy equipment which has not been emptied completely of water.

To protect the machine against frost it must be stored free of water. Please empty the filter from any water and use compressed air (max 8bar) at the pump entrance.



## Operating the machine



### Check points before start-up

- Place the high-pressure cleaner on a plain and secure it against rolling.
- Check the oil level of the high-pressure pump. If it is too low, refill oil. (Pump oil specification: SAE 15W40 ISO VG100 DIN 51524)
- Maximum oil level from the high-pressure pump is on the top mark of the oil dip stick or in the middle of the window.
- Do not overfill the pump with oil.
- Electrical mains voltage/frequency should be the same with the electrical data of the machine. Recommended ship-side breaker: 25A, class D or K.
- Check general condition of the machine and accessories to be in good order (cable, power & water connectors, hoses, handle, lance, nozzle etc.)



**Attention:** Use only original nozzles with the machine.



**The high pressure flat or rotor nozzle must under no circumstances touch the surface for any manual cleaning or chipping/scraping purposes!**  
High pressure nozzles and lances are not designed for such purpose and damaged components will create safety risk.

### Water connections

Connect the water intake hose on the high-pressure cleaner.

Connection installed ¾" with GEKA coupling.

Always secure sufficient water supply, keep it well above the operational water flow.

Minimum input feed water requirement is an average of **16 liters/minute or 960 liters/hour**.



Insufficient water supply will cause machine to stop.

### Connection of high-pressure hose

Screw the female M22 coupling to the high-pressure outlet of the machine, use two spanner size 27 to fasten. The male 3/8" coupling must be screw to the inlet swivel of the spray handle, use one spanner size 22 and 24.

### Electrical connection

The voltage shown on the motor plate should correspond to the source.



**1. 380 V/50 Hz/3 ph – max 25 A, class D or K. (suitable for motor starter)**

**2. 440 V/60 Hz/3 ph – max 25 A, class D or K. (suitable for motor starter)**

Use the correct dimension of electric cable wire in case you connect an extension cable. For cable extension lengths up to 50mtr, the cross section of the wire to be used is 4mm<sup>2</sup>.

## Operation

The electrical system is equipped with direct online (DOL) starter.

- Connect the 4pin plug to the appropriate power supply.
- Connect the water supply hose to the ¾" GEKA coupling.
- Ensure that the lance is connected to the high-pressure hose without a nozzle.
- Open supply water tab.
- Push the green start button, the machine will start.
- In case the machine stops after 2-3 seconds it means water supply is poor. Please ensure input feed water requirement is **16 liters/minute or more**.
- Activate spray handle trigger. The pump at first empties the machine from air and particles. After a while, water comes out of the spray lance. Hold firmly the handle until a steady amount of water is ejected.
- Release the spray handle trigger and switch off machine by pressing the red stop button.
- Connect the nozzle into the spray lance.
- Push the green start button and the machine will start.
- Your Unitor™ HPCE Dynamis 300+ is now ready for operation at 300 bar.

## Stopping

- Close spray handle.
- Push the red stop button.
- Shut off water supply.
- Pull spray handle trigger to release the line from remaining pressure.
- **Disconnect the machine's electric plug from the electric power source.**
- Store the machine and its accessories in a safe, frost protected and dry area away from harsh, corrosive environment



### Danger – Caution

**The machine should not run on standby mode for more than 20 minutes.**

**If the machine is no longer in use it must be switched off.**

- When spray handle is closed, machine is running in circulation-by pass mode. If in this working condition the water temperature exceeds 55°C the thermal valve opens, releases small amounts of hot water.
- This is a safety component and should not activate in daily base.

## Maintenance Plan

In order to achieve a long and trouble-free service life the machine requires a minimum amount of care and maintenance.

**Maintenance works must be carried out only with stopped motor, disconnected power supply and pressure-free hoses. Danger of injury!**

### Daily inspection – Testing

**For the safety of the machine and operator, please check visually following points:**



- Oil level at the pump.
- Visual inspection of the machine and its equipment/accessories (hoses, handle, lance, fittings, electrical components, other equipment).
- Inspection for proper air ventilation from the back of the motor.
- High pressure pump.
- Pressure gauge.
- High pressure hoses.
- High pressure handle.
- Electric cable.
- Function of Emergency stop button.
- **Water filter, check and replace if contaminated or differential pressure exceeds 1bar.**
- Check for leakages.

### Weekly inspection – Testing



- **First oil change of high-pressure pump after 50 hours or 5 working days (8-10 hour shift) and then every 500 hours or 50 working days (8-10 hour shift).**
- Checking of oil level of high-pressure pump.
- Checking of oil quality.
- Replacing of water filter.

### 6-Month inspection



- Inspect pump oil appearance and change oil after every 50 hours or 50 working days (8-10 hour shift), after the first change.
- Check electrical board screws and tight in case of loose screws.



**12-Month inspection**

- Pump oil seals and valves should be replaced at least once a year as a part of preventive maintenance for efficient machine performance.

**Replacement of Water Filter**

- Unscrew the plastic transparent cover of the filter housing with the included tool/spanner.
- Remove the old dirty filter and insert the new original 7" cartridge filter.
- Screw back filters housing with the supplied filter tool/spanner.

Time interval for replacing the filter depends on supplied water quality. In case of poor water quality and existence of particles and soil, the filter change should be done frequently – maybe even daily.



Disposal of oil from pump crankcase and disposal of parts and components of the machine should be done according to local regulations.

## Troubleshooting

PROBLEM	POSSIBLE CAUSE	CORRECTIVE ACTION
Pump motor does not run	Incorrect power supply	Check power supply (breaker 25 A)
	Missing one phase	Motor protection activated, check reason for motor overload
	Empty water tank ('No Water' lamp is activated in the control panel)	Ensure sufficient feed water supply to the tank
High pressure shock in case of release trigger from hand	Unloader valve did not operate correct	Replace Unloader valve – please note that Unloader valve settings are fixed, and unloader valve must not be repaired
		Replace seal kit
Unloader valve switched all the time during handle is closed	Leak in HP-hose, handle or in the check valve of the unloader valve	Seal the leak by changing O-rings of HP-handle or unloader valve
HP-pump is very noisy	Supply water temperature too high	Supply water with lower temperature
Water Clogging at the Filter	Poor feed water quality	Check and replace filter cartridge and always ensure a differential pressure of less than 1 Bar
Lower/No water jet pressure	Suction pressure valves are dirty	Clean the valves
	Gaskets are dry and brittle	Replace gaskets
	Suction pipe coupling is leaking	Replace and ventilate
	Clogged or worn-out high-pressure nozzle	Clean/replace high pressure nozzle

## Declaration of Conformity

<b>DECLARATION OF CONFORMITY</b> 	
<b>Company</b>	Wilhelmsen Ships Service AS 1366 Lysaker, Norway
<b>Product</b>	Unitor™ HPCE Dynamis 300+
<b>Type</b>	High Pressure Water Jetting Machine
<b>Product Number</b>	771716
<b>Year of CE Marking</b>	2023
We herewith ensure and declare that this product has been designed, manufactured, tested and is compliant to meet the requirements of the following European Directives and Standards:	
<b>Standards</b>	EN 1829-1:2021 EN ISO 12100:2010
<b>Related to Applicable Directives</b>	2006/42/EC (MD) 2014/35/EU (LVD) 2014/30/EU (EMC) 2009/125/EC (ECO DESIGN)
<b>Date: 01/09/2023</b>	Kounnamas Nikolaos Head of Product Management - Cleaning

