



To be read before start-up!

Operation manual

HPC Extreme 520 High Flow

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1. Introduction

With your Unitor HPC E520HF high pressure cleaner you have purchased one of the most durable and reliable machines available on the market. Its balanced ratio of water flow (temperature) and working pressure perfectly meets all cleaning requirements. The Unitor high pressure cleaners conform to all European safety regulations which is guaranteed by the CE symbol.

- This manual to be made available to the operating personnel and to be read completely before start-up. We point out that we cannot be held responsible for any damage or malfunctions as a result of ignoring this manual.
- The machine described in this manual to be inspected every year by qualified personnel. Inspection results to be recorded and to be made available to authorities their on request.
- The packing materials (plastic foil, wood, cardboard boxes, nails etc.) are potentially dangerous, should be kept away from children and disposed according to environmental requirements.



This symbol appears at all operating and safety instructions dealing with the dangers for personal entirety and life.



This warning symbol appears in the operating manual at all operating safety instructins dealing with risks due to electric power.



This symbol appears at all operating and safety instructions dealing with the fulfilment of rules, regulations and instructions for the proper operation to avoid destruction of the machine.

This manual is subject to technical alteration.

2. Safety Instructions



The following instructions to be followed before, during and after work:

This instruction manual to be read completely before initial start-up. If strictly followed, no dangers should occur.

This machine must only be run by qualified adult persons who are fully familiar with possible dangers. "Directives for Liquid Blasters" (ZH 1/406) and operation instructions "Working with Liquid Blasters" (BGV D 15) to be followed.

The machine is not suitable for unattended operation and must be operated according to specification. Protective clothing to be worn.

The water jet emerging from the spray pistol has a dangerous cutting effect. Therefore the water jet must never be directed onto persons, animals or electrical installations. It must never be used for cleaning of clothes, shoes and the like. Be aware of torque and recoil. Ensure stable foothold.

The max. allowed pressure which is stated on the type plate must not be exceeded. The safety/control valve opens, if the max. operating pressure is exceeded by more than 20 bar and returns the water back into the suction side of the high pressure pump. The safety/control valve is workshop-set and sealed. Adjustment must not be changed.

Unsuitable respectively defective high pressure hoses often cause severe accidents during operation. Therefore high pressure hoses to be carefully inspected before start-up and replaced with original Unitor equipment in case of damage. Use of other than original Unitor equipment results in expiration of the EC Declaration of Conformity, as well as product liability and warranty.

Repair work in the high pressure section of the machine (pump, hoses, piping) only to be carried out by qualified personnel.

Worn-out or damaged high pressure hoses must never be repaired and reused but to be replaced by original Unitor equipment.

Spray pistols with delayed closing mechanism must not be used because of risk of injuries.

Lever in open position must never be blocked or fixed in any way.

Use of spray wands of a length below 750 mm is prohibited.

The machine must not be run in areas jeopardized by fire or explosions. During operation at filling stations "Technical for flammable liquids" (TfbF) to be observed.

Consumables to be handled thoroughly according to technical rules and safety and environmental regulations to be observed.

Machine must not be started, if power cable, plug, switches, etc. are defective.

Only extension cables designed according to VDE to be used. Extension cables on reels to be reeled off during operation in order to avoid overheating of the reel. Plug, couplings to be watertight. A faulty current protection switch to be added.



Before opening the machine in case of malfunction or emergency, switch off by means of the emergency STOP, respectively the ON/OFF switch and disconnect it from electric power source.

Electric power can cause severe injuries. All symptoms of faulty electric components to be taken seriously and possible causes for accidents to be eliminated immediately. All repair work only to be carried out by qualified service personnel.

Make sure that the machine cannot move. If the machine is equipped with a brake, it must be set during working.

When using pipe cleaning hoses observe marking (approx. 50 cm). Strictly follow instructions in para "Pipe Cleaning", chapter "Operation".

During loading hoisting device to be fastened properly at jack rings. Ensure balanced load distribution.

After work the machine to be locked and secured against unauthorized/accidental operation by means of the safety lever.

Use of equipment and/or consumables which is not delivered or expressly approved by Unitor results in expiration of the EC Declaration of Conformity, as well as product liability and warranty.

3. Configuration, Operation, Illustration

The cold water machines of this series mainly comprise of a low speed high pressure inline plunger pump, which is driven by a 100 % duty electric motor via a maintenance-free tooth belt .

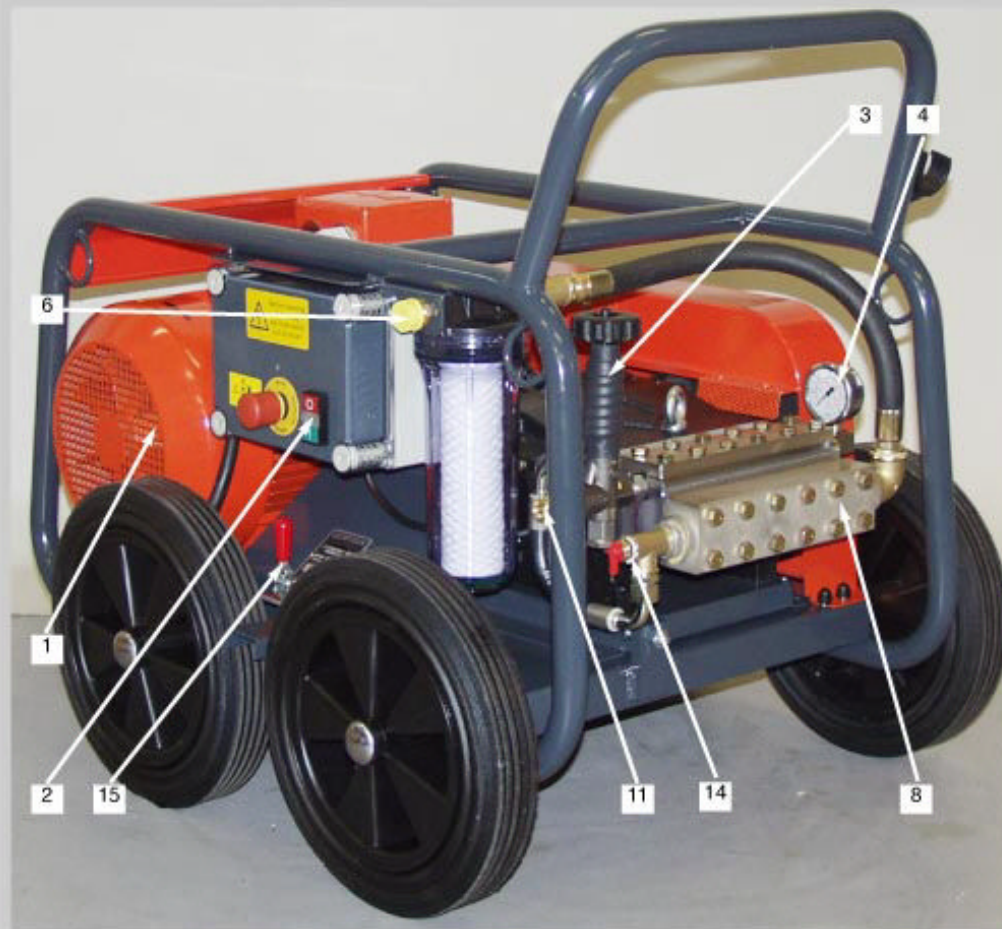
The feed water is directed via a pre-filter to the high pressure pump which – in connection with the required spray nozzle – boosts it to the stated/adjusted working pressure. In order to protect the pump against cavitation due to poor water flow, a low water cut-out is arranged which stops the machine as soon as the flow pressure drops below 2 bar.

Downstreams of the high pressure pump a locked and sealed safety/control valve is installed which opens as soon as the operating pressure is exceeded by more than 20 bar and returns the water which cannot be taken by the nozzle back into the suction line of the pump. It also allows to continuously adjust working pressure and water flow as required.

The machine is equipped with a circulation shut-off system and additionally with a thermo valve in order to protect the pump against overheating. After closing the spray pistol the safety/control valve opens, and returns the circulating water back into the suction line. Re-starting and immediate generation of required/adjusted working pressure is achieved by opening the spray pistol again, allowing to continue the cleaning task without delay.

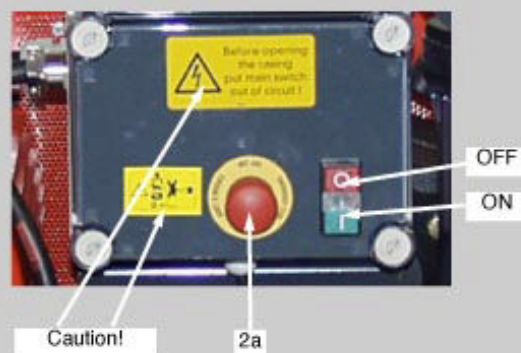
The range of applications can be extended by a variety of accessories available from Unitor, for more info contact your local Unitor office.

Illustrations



- 1 electric motor
- 2 ON/OFF-switch
- 2a emergency STOP
- 3 safety/control valve
- 4 pressure gauge
- 6 water inlet/water filter
- 8 high-pressure pump
- 11 high-pressure outlet
- 12 oil filling hole (see p. 11)
- 13 oil sight glass (see p. 11)
- 14 thermo valve
- 15 brake

electric box 2 with
emergency STOP and ON/OFF switch



4. **Start-up / Shut-down**

Before Start-up:

Read and observe operation manual.

ATTENTION

In order to guarantee proper function and trouble-free operation, the following checks to be carried out before start-up:

- General condition of the unit (connections, gaskets, etc.).
- Power cables/connections.
- High pressure hoses, hose lines, whether damaged.
- Air supply, fresh air grill must not be covered.
- Filling of consumables.
- Correct oil level of high pressure pump (sight glass/dip stick).
High pressure pump: Unitor OSP special pump oil.
- Pump/pump connections whether leaking.
- Machine only to be run with absolutely clean water. Before connecting the water supply hose, rinse it thoroughly. Depending on feed water quality, regularly check water filter in short intervals, replace if needed.
- Machine only to be run horizontally (+/- 5°).

ATTENTION

In order to guarantee proper function and trouble-free operation, the following checks to be carried out during working:

- Observe function of indicator lights/monitors.
- Observe pressure variations
- Observe leaks at high pressure pump, hose pipes, connections.
- Observe unnormal noise.

In case of malfunctions immediately stop machine, eliminate cause according to chapter „Trouble Shooting“, call qualified service.

Connections

Water Supply

Connect water inlet (6) of the machine to water source with a clean hose (diameter see table below). Before connecting water supply hose, rinse it thoroughly. In case of connection to the potable water distribution, observe DIN 1988 (for momentary connections use a backflow preventer with non-return function and ventilation).

Flow pressure	Min. flow rate *
minimum: 2 bar	≥ 15 l/min ¾" water supply hose
maximum: 8 bar	≥ 21 l/min 1" water supply hose
	≥ 30 l/min 1 ¼" water supply hose
	<small>* s. Techn. Data</small>

ATTENTION

Insufficient water supply will cause heavy damage on high pressure pump (cavitation).



Power Supply

Insert plug into a 400 V socket which is protected by 3 x 63 A (slow). Only extension cables designed according to VDE to be used. Extension cables on reels to be reeled off during operation in order to avoid overheating of the reel. Plug, couplings to be watertight. A faulty current protection switch to be added. VDE regulations to be observed.

ATTENTION

Ensure correct direction of rotation (see marking on electric motor fan cover).



High Pressure Connection

Connect high pressure hose to high pressure outlet (11) by means of the union without using tools.

Pipe Cleaning Hose Connection (optional)

Connect high pressure hose with high pressure water outlet by means of the hand nut without using tools. Other end to be connected with required pipe cleaning nozzle handtight without using tools.

Operation



From fabrication date 07/2005 on this series is equipped with an emergency STOP (2 a) which must be pushed in case of emergency. After elimination of cause emergency STOP to be unlocked by pulling it out, before machine can be re-started.



The electric motor starts in star connection and switches over to star-delta connection after a few seconds. This process is audible. After the electric motor has switched over to star-delta connection unlock spray pistol, firmly seize support handle and pull trigger of spray pistol.



When opening the spray pistol, full working pressure is achieved within a few seconds. At 500 bar the high pressure hose shortens by approx. 3 %. Particularly when working with extra long hoses or on scaffolds, take care that operators will not be jeopardized.



Observe torque and recoil, as well as shortening of high pressure hose. Ensure stable foothold.

- Fully open water source
- Open spray pistol, bleed unit.
- Push ON/OFF switch (2).

ATTENTION

Be aware of significant recoil. Ensure stable foothold.

- Carry out cleaning task.

Pressure/Flow Regulation

Pressure and flow rate can continuously be adjusted as required at the regulation handle of the control valve (3).

Counter-clockwise: continuous pressure and flow reduction until minimum capacity

Clockwise: continuous pressure and flow increase up to Maximum capacity

After Work



- Switch off machine by means of the ON/OFF switch (2).
- Depressurize spray pistol by shortly opening and closing.
- Lock spray pistol.
- Disconnect machine from water and power source.
- Thoroughly clean high pressure hose. In case of (cuts, abrasions, kinks, etc.) replace high pressure hose for safety reasons.
- Only original Unitor high pressure hoses (marked) to be used. Otherwise EC Declaration of Conformity and warranty will expire.
- Reel up high pressure hose properly without any loops.
- Store machine and accessories in a dry, frost-protected area.
- Drain pump completely in case of extended shut-down periods.



Particularly note:

In case of malfunctions, eliminate cause according to chapter „Trouble Shooting“, call qualified service.

In case frost is likely, frost protection to be carried out (see chapter „Maintenance and Care“), otherwise severe damage will be the result.

5. Maintenance and Care

Every machine is only as reliable as maintenance is carried out

ATTENTION

In order to guarantee reliability and trouble free operation of the machine, it is of vital interest to follow the instructions below:

ATTENTION

If the required maintenance intervals are disregarded, warranty will expire.

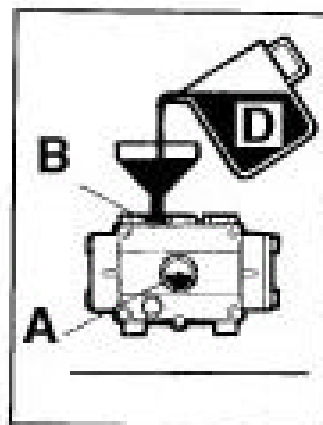
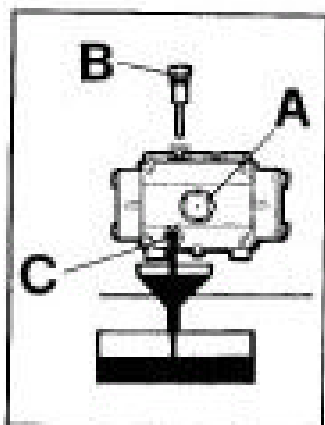
High Pressure Pump

First oil change after 50 operating hours, further oil changes after every 500 operating hours, minimum once per year. In case the oil becomes milky due to condensate formation, stop the machine immediately and carry out oil change. If this happens repeatedly, arrange replacement of all pump seals by qualified personnel.

ATTENTION

For Unitor high pressure pumps only Unitor OSP special pump oil to be used, as otherwise you will lose your right to claim under guarantee. Unitor OSP special pump oil is available from your Unitor office.

Oil Control/Oil Change



- | | |
|--------|--|
| A (13) | Oil window, level center |
| B (12) | Oil filler/dip stick |
| C | Oil discharge screw |
| D | OSP-Special pump oil
Art.-Nr. 10.802.002
(to be used only) |

Pre-Filter (micro filter 25/50 µm)

ATTENTION

Upstreams of the high pressure pump there is a micro filter (6) installed. The filter cartridge to be replaced whenever required (automatic shut-down initiated in case of low water supply by the low water cut-out). Especially in case of excessive pressure in the water supply line and clogged filter cartridge, the filter may crack, so allowing polluted water to enter the pump, which would result in heavy damage of the pump system, the proportional control valve (3) and the spray pistol.

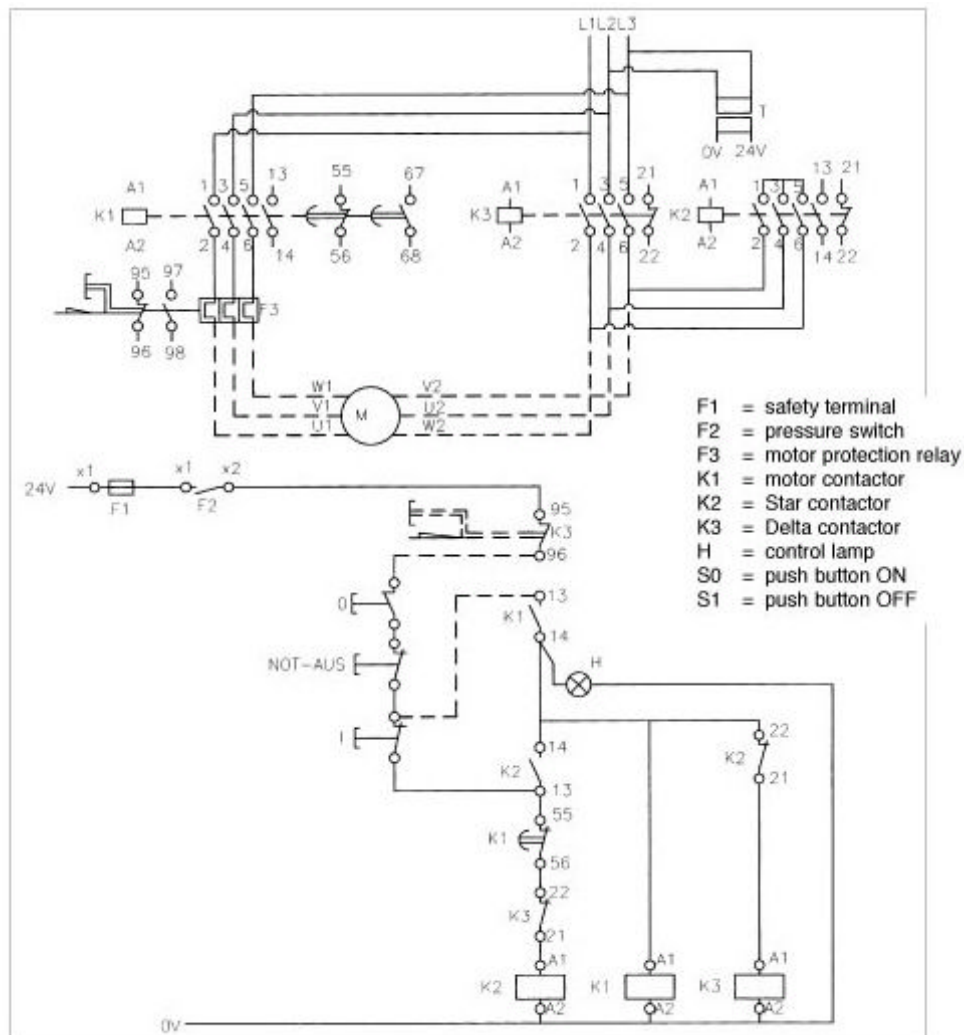
Frost Protection

ATTENTION

Frost protection of the entire water system during storage and transport is a must, as otherwise heavy damage on the system and severe dangers during operation may occur.

The best frost protection is to store the machine and accessories in a frost-protected room.

6. Electric Wiring Diagrams



7. Technical Data

Technical Data	
Water flow/adjustable	800 - 1800 l/h
Unloading pressure	520 bar
Working pressure/adjustable	150 - 500 bar
Normal current (50 Hz)	3 ~ 400 V
Power output	30 HP/22 kW
Pump speed	1450 1/min
Power consumption	43 A
Starting device	automatic Star Delta
Noise level Lp/Lw acc. to DIN EN ISO 3744	70/82 dB(A)
Recoil	145 N
Dimensions (L x W x H mm)	960 x 780 x 860
Weight	260 kg
Spray nozzle	2038 HIP

8. Trouble Shooting



Electrical energy can cause severe injuries. Defective electrical components to be immediately replaced, possible causes for accidents to be eliminated without delay. Any repair work must only be carried out by qualified personnel.



Only original Unitor equipment to be installed, as otherwise warranty and Declaration of Conformity will cease, health and safety standards are not guaranteed.

During repair or maintenance work, unit to be disconnected from electrical network.

Malfunction	Cause	Remedy
Electric motor does not start.	<ul style="list-style-type: none"> - Machine not connected to power source. - Fuse burnt. - Low water cut-out activated. - Emergency STOP locked (after production date 07/2005). - ON/OFF switch not pressed. - Phase missing. - Insufficient water supply. 	<ul style="list-style-type: none"> - Connect machine to power source, switch on main switch. - Replace fuse. If it burns again, call qualified service. - Ensure sufficient water supply. - Unlock emergency STOP. - Press ON/OFF switch. - Phase to be mounted as per electric wiring diagram. - Ensure sufficient water supply.
Electric motor suddenly stops, motor protection switch trips.	<ul style="list-style-type: none"> - Low water supply - Fuse burnt. (phase missing). - Low voltage. 	<ul style="list-style-type: none"> - Eliminate cause and re-start machine with ON/OFF switch. - Replace fuse. If it burns again or motor gives noise, call qualified service. - Ensure correct power supply.
Electric motor gives noise upon start-up.	<ul style="list-style-type: none"> - Fuse burnt. (phase missing). - Fault in electrical network 	<ul style="list-style-type: none"> - Replace fuse. If it burns again, call qualified service. - Check phases in electric plug.
Operating pressure not achieved/varies	<ul style="list-style-type: none"> - Nozzle worn. - Incorrect nozzle. - Nozzle partly clogged. - Water filter dirty. - Unloader valve leaking. - Suction valves sticking/dirty. 	<ul style="list-style-type: none"> - Replace nozzle. - Install correct nozzle. - Remove/clean/re-install nozzle. - Replace filter cartridge. - Call qualified service. - Remove/clean/re-install valves.
Vibrations on high pressure hose and spray pistol	<ul style="list-style-type: none"> - Air in unit 	<ul style="list-style-type: none"> - Bleed unit. Open pressure regulating handle and pistol, until continuous pressure is reached.



EC-Konformitätserklärung Declaration of Conformity

Geräteart: Unbeheiztes Hochdruck-Reinigungssystem
Description: Cold water high-pressure cleaning system

Gerätetyp: E 500-30 (Elektromotor / electric drive, 3-400 V/50 Hz) 500 bar
Model:

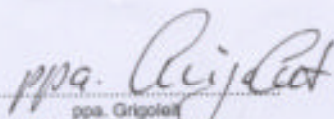
Serien Nr.:
Serial No.:

Wir bestätigen, daß das oben genannte Erzeugnis nachfolgenden Anforderungen entspricht:
We hereby declare that above mentioned product is in conformity with the following provisions:

- | | | |
|--|--|---------------------------------|
| • EG-Maschinenrichtlinie | EC-Machinery Directive | 98 / 37 EG (98 / 79) |
| • EG-Niederspannungsrichtlinie | EC-Low Voltage Directive | 73 / 23 EG (93 / 78) |
| • EG-Richtlinie EMV | EC-EMC Directive | 89 / 336 EG (92 / 31) (93 / 68) |
| • ZH 1/406 (RFI) | | |
| • EN 292 Teil 1 und 2 | | |
| <input checked="" type="checkbox"/> EN 55014 | <input type="checkbox"/> EN 60335-2-67 | |
| <input type="checkbox"/> EN 50081-1 | <input type="checkbox"/> EN 60335-2-69 | |
| <input type="checkbox"/> EN 60 335-2-79 | <input type="checkbox"/> EN 60335-2-72 | |
| <input checked="" type="checkbox"/> EN 1829 | | |

Bei nicht von uns genehmigten Änderungen der Maschine verliert diese Erklärung ihre Gültigkeit.
This declaration is ceased in case of alterations of the product not approved by us.

Ammersbek, 25. August 2005


ppa. Grigoleit
Technischer Leiter/Technical Manager
ARNDT H. von OERTZEN (GmbH&Co)