

OERTZEN®

... for a cleaner world ☀

Operation Manual

**Cold Water High Pressure Cleaner with
Combustion Engine**

M 400

M 500



To be read carefully before start-up!

Table of Content

1. Introduction	page	3
2. Safety Instructions	pages	4 – 5
3. Configuration/Illustration	pages	6 – 7
4. Start-up/Operation/Shut-down	pages	8 – 12
5. Maintenance and Care	pages	13 – 14
6. Technical Data	page	15
7. Trouble-Shooting	pages	16
8. Declaration of Conformity	page	17

1. Introduction

By buying the OERTZEN equipment you have purchased one of the most durable and reliable high pressure cleaners available on the market. Its balanced ratio of water flow (temperature) and working pressure perfectly meets all cleaning requirements. The OERTZEN high pressure cleaners and accessories conform to all European safety regulations which is guaranteed by the CE symbol on the type plate. A Declaration of Conformity is part of this manual.

- 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 neglecting this manual.
- According to the Directive for Use of Liquid Blasters (ZH 1/406) 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. OERTZEN offers qualified service personnel to carry out safety inspections at attractive prices.
- 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 risks for personal entirety and life.



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



This warning symbol appears in the operating manual at all operating safety instructions 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 and destruction of the machine.

This manual is subject to technical alteration.

All rights reserved. Any use in other than legally authorised cases requires the written approval of ARNDT H. von OERTZEN (GmbH&Co).

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 danger should occur.

This machine must only be run by qualified adult persons who are fully aware of possible danger. Directives ZH 1/406 and BGR 500, as well as relevant national safety rules to be followed.

The machine is not suitable for unattended operation and must be operated according to specification and intended purpose. 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, footwear 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.

Machines driven by combustion engines must not be run indoors unless proper ventilation and exhaust gas evacuation are guaranteed. Exhaust gas is harmful, excessive concentration of carbon monoxide is lethal.

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 by original OERTZEN equipment in case of damage. Use of other than original OERTZEN equipment (hand nut marked with OERTZEN), results in expiry of the EC Declaration of Conformity, as well as product liability and warranty.

Used or damaged high pressure hoses must never be repaired and reused but to be replaced by original OERTZEN 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 Rules for flammable Liquids" (TfbF) to be observed.

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



Before opening the machine in case of malfunction or emergency, switch off by means of the ON/OFF respectively the EMERGENCY STOP switch.

Electric power can cause serious danger. All symptoms of defective electrical components to be taken seriously and eliminated immediately. Repair works only to be carried out by qualified personnel.

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

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

The exhaust evacuation area is hot! Do not touch!

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

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/are not delivered or expressly approved by OERTZEN results in expiry of the EC Declaration of Conformity, as well as product liability and warranty.

3. **Configuration/Illustration**

The machines of the Mobile series consist of a low speed, high pressure inline plunger pump, driven by a low-emission 4-stroke engine in V-design. In order to extend the engine lifetime, an oil shortage cut-out is installed, which switches off the engine in case the oil level drops below specified limits.

An oil-greased reduction gearbox flanged between pump and engine reduces the high pressure pump speed and as a result extends the maintenance intervals of the pump.

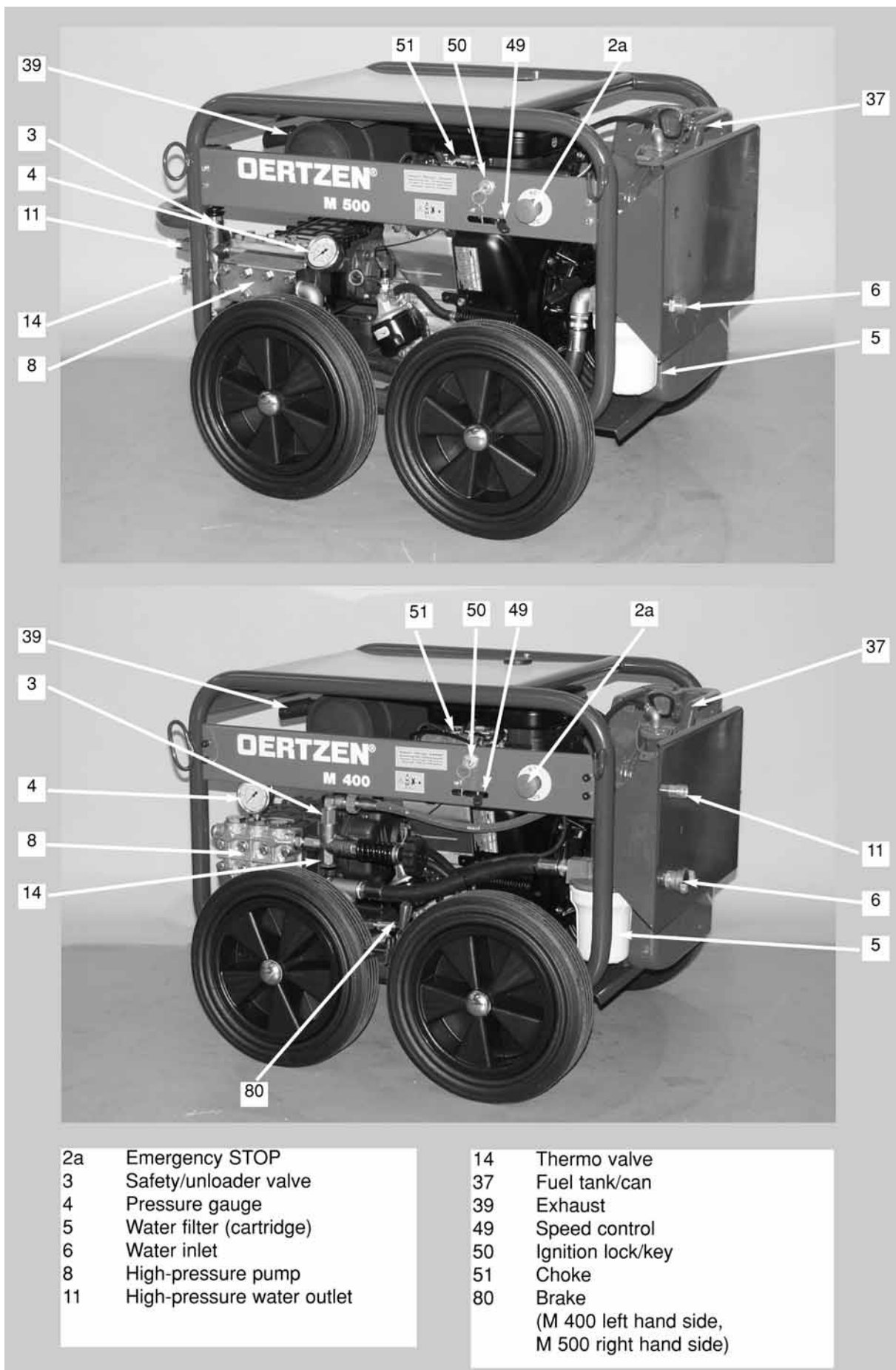
The feed water is directed with the required admission pressure via a pre-filter to the high pressure pump which – in connection with the required spray nozzle – boosts it to the stated/adjusted working pressure. In order to protect the pump against cavitation due to poor water flow, a low water cut-out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

Downstream 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. If the temperature of the circulating water exceeds 60 °C, the thermo valve opens, releases small amounts of hot water and allows cold water to enter. 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. Contact your local distributor.



4. Start-up / Shut-down

Before Initial Start-up:

In case the high pressure pump is secured against oil loss during transport with a plug, this plug to be replaced by the oil dip stick included in our scope of supply. Otherwise heavy damage on the pump set will be the result.

Water inlet (6) and high pressure outlet (11) are secured with sealing caps, which must be removed before initial start-up. It is recommended to secure inlet and outlet with the caps during extended shut-down periods.

Before every 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.).
- High pressure hoses, hose pipes, 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). Correct oil level of the reduction gear (sight glass/dip stick), correct oil level of combustion engine (dip stick). Only oil qualities approved by OERTZEN to be used. High pressure pump: special pump oil OERTZEN OSP, reduction gear: special pump oil OERTZEN OSP, combustion engine: OERTZEN special motor oil OSM.
- 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°).
- In order to extend the lifetime of the combustion engine, engine to be warmed up for a few minutes during starting procedure and to run out during shut-down for cooling purposes.

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 excessive exhaust formation/smoke development.

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 page 9). 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 maximum: 8 bar	≥ 15 l/min $\frac{3}{4}$ " water supply hose ≥ 21 l/min 1" water supply hose ≥ 30 l/min 1 $\frac{1}{4}$ " water supply hose <small>* see Technical Data</small>

ATTENTION

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

High Pressure Connection

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

Fuel Supply



Fuel tank (37) to be filled with fuel (min. 86 octane). Properly lock tank. Gasoline and gasoline vapour are highly flammable and explosive. Fire and explosions may cause severe injuries or death. Fuel never to be handled near hot engines.

ATTENTION

Fuel to be handled with care. Observe engine manufacturer's instructions.

Operation



From production month 07/2005 on the Mobile series is equipped with an **EMERGENCY STOP** switch (2 a). In case of emergency push **EMERGENCY STOP** switch. After elimination of cause **EMERGENCY STOP** switch to be released by pulling it out, otherwise machine cannot be re-started.

ATTENTION

For starting the combustion engine, observe engine manufacturer's instructions.

ATTENTION

Never disconnect starter battery when engine is running. In order to ease start-up of the engine, open safety/control valve (3) by turning the hand wheel counter-clockwise for pressure relief purposes.

- Fully open water source, respectively dip in suction hose with strainer.

Electric Start – Cold Engine:

- Put choke (51) into start position/fully pull out choke (depending on design).
- Turn gas pedal (49) into full load position.
- Turn ignition key (50) clockwise into position "Start" until motor starts. Actuate starter for max. 10 seconds. Excessive start attempts may damage the starter.
- Slowly open choke during engine warm-up in order to avoid dying down of the motor during load alternation. Open spray pistol and warm up engine at low pressure for a few minutes.
- Afterwards, increase pressure to maximum by turning the hand wheel of the safety/control valve (3) clockwise.

ATTENTION

Be aware of significant recoil. Ensure stable foothold.

Electric Start – Hot Motor:

- **Do not actuate choke (51).**
- Turn gas pedal (49) into $\frac{3}{4}$ load position.
- Turn ignition key (50) clockwise into position "Start" until motor starts. Actuate starter for max. 10 seconds. Excessive start attempts may damage the starter.
- After engine has started, turn gas pedal (49) into full load position.
- Then increase pressure to maximum by turning the hand wheel of the safety/control valve (3) clockwise.

ATTENTION

Be aware of significant recoil. Ensure stable foothold.

- Unlock and release spray pistol, bleed unit
- Push ON/OFF switch (2).
- Carry out cleaning task.

ATTENTION

The engine is additionally equipped with a recoil starter for emergency, in case e.g. the battery trips, which must be used as follows (devices to be handled as described before):

Start procedure reverse start

- Turn ignition key clockwise into position "1".
- Take handle and carefully pull out until engagement, then strongly pull out in order to start motor. Put handle back into initial position.

If the engine in operational state and at correct oil level does not start after several attempts, most likely the oil pressure is poor. In this case disconnect the cable of oil pressure switch (at the male threaded flange of the engine oil filter) upon start-up.

ATTENTION

As soon as the engine has started, cable of oil pressure switch to be reconnected, as otherwise the low oil level cut-out is disabled.

Pressure/Flow Regulation

Pressure and flow rate can continuously be adjusted as required at the hand wheel of the safety control valve.

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

Clockwise: continuous pressure and flow increase to maximum capacity

ATTENTION

When pistol is closed, machine is running in circulation mode. If water temperature exceeds 60 °C, thermo valve (14) opens, releases small amounts of hot water and cold water enters.

After Work

In order to reduce motor stressing, decrease working pressure by turning the hand wheel of the safety/control valve (3).



- Close and lock spray pistol.
- Stop motor: Turn ignition key into position "0".
- Remove key in case machine is not in operation unattended or remains unattended.
- Thoroughly clean high pressure hose. In case of damage (cuts, abrasions, kinks) replace high pressure hose for safety reasons.
- Only original OERTZEN high pressure hoses to be used. Otherwise 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.
- Drain pump 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:

Ignoring the required maintenance intervals voids all warranty.

Combustion Engine

Maintenance instructions of engine manufacturer to be strictly followed.

ATTENTION

Exclusively OERTZEN OSM motor oil to be used. Use of oil qualities not approved by OERTZEN results in expiry of warranty.

Reduction Gearbox

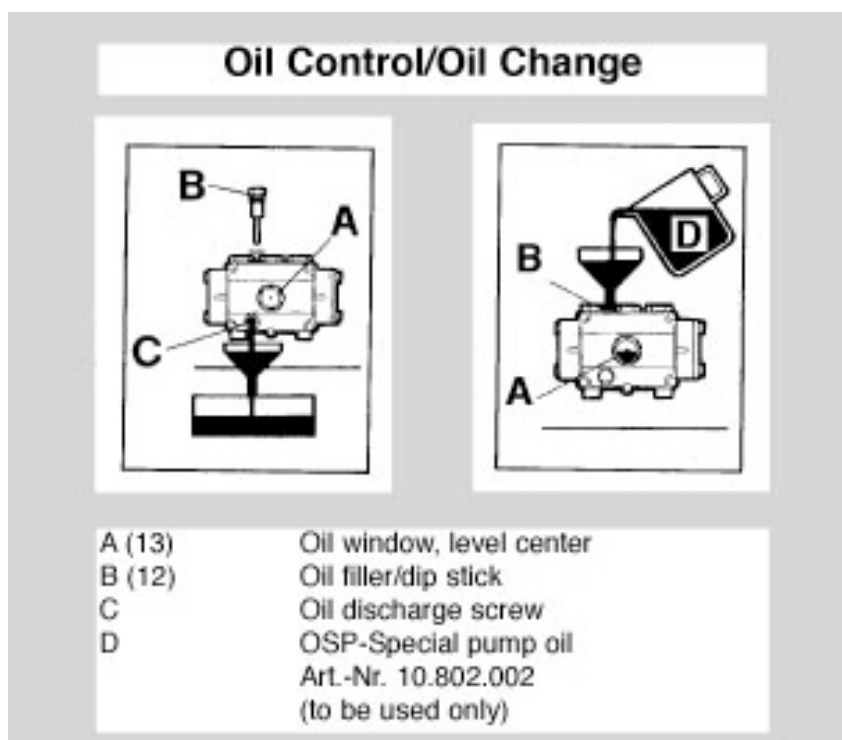
First oil change after 50 operating hours, all further oil changes every 500 operating hours, min. once a year. Correct oil level to be checked every day. Exclusively OSP pump oil to be used. Use of oil qualities not approved by OERTZEN results in expiry of warranty.

High Pressure Pump

First oil change after 50 operating hours, all further oil changes every 500 operating hours, min. once a year. In case the oil is getting turbid, stop the machine and carry out oil change. If oil is getting turbid again, call qualified service personnel

ATTENTION

Exclusively OSP pump oil to be used. Use of oil qualities not approved by OERTZEN results in expiry of warranty.



Battery

Maintenance work to be carried out according to manufacturer's instructions. Check acid level every week. Refill distilled water whenever needed.

Water Filter

The cartridge filter (5) is arranged in the water inlet (6) and must be inspected prior to start up. Change filter cartridge, if needed.

ATTENTION

Supply of polluted water or dirty strainer will cause severe damage on the pump and safety/control valve.

Frost Protection

ATTENTION

Proper frost protection of the machine during storage and transport is essential, in order to avoid severe damages and consequently dangers during operation..

The best frost protection is to store the unit in a permanently frost-free area.

If there is a risk of frost during storage and/or transport, the machine to be protected as follows:

- 2 l of a 1 : 1 water/frost protection liquid to be mixed in a clean vessel, water connecting hose to be dipped into vessel, pump to be started.
- Spray pistol to be opened and frost protection liquid to be returned into the vessel, so circulating the liquid through the system.
- Spray pistol to be opened and closed several times, in order to also fill the unloader valve with the liquid.
- High pressure pump to be stopped, all hoses to be disconnected.
- Machine is now protected against frost of approx. – 30 °C.



Neglecting the above instructions will cause severe damage on the entire system.

ATTENTION

In order to avoid pollution of the environment, frost protection liquid must not be dumped, but collected and reused respectively disposed as per relevant regulations.

6. Technical Data

Technical Data	Mobil 400	Mobil 500
Water consumption/adjustable	500 – 1320 l/h	500 – 1020 l/h
Unloading pressure	405 bar	520 bar
Working pressure/adjustable	385 bar	500 bar
Power rating	22 PS/16,2 kW	22 PS/16,2 kW
Fuel consumption at full load	7,7 l/h	7,7 l/h
Tank volume	20 l	20 l
Low oil level cut-out	standard	standard
Starting device	battery start	battery start
Emergency start	recoil start	recoil start
Dimensions (L x W x H mm)	910 x 780 x 690 mm	1004 x 780 x 690 mm
Weight (net)	153 kg	152 kg
Nozzle	2338 HIP	3538 HIP
Recoil	106 N	99 N
Noise level Lp/Lw acc. to DIN EN ISO 3744	61/74 dB(A)	61/74 dB(A)
Order No.	10.000.566	10.000.521

7. Trouble Shooting



Electric power 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 equipment expressly approved by the manufacturer to be installed, as otherwise warranty and Declaration of Conformity will expire, health and safety standards are not guaranteed.

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

Faiure	Cause	Remedy
Engine does not start	<ul style="list-style-type: none"> - Emergency Stop switch engaged - Low oil level - Counter pressure too high - Battery exhausted - Ignition switch in pos. "Off/0" - Choke open 	<ul style="list-style-type: none"> - Release Emergency Stop switch - Refill oil up to maximum - Release unloader valve - Charge battery - Put ignition switch into pos. "On/1". - Close choke. Check items under "Engine stops".
Engine trips	<ul style="list-style-type: none"> - No fuel. - Low oil level. - Fuel filter clogged. - Sparking plug burnt. 	<ul style="list-style-type: none"> - Fill fuel tank. - Refill oil up to maximum - Clean fuel filter. - Replace sparking plug.
Pump pressure high	<ul style="list-style-type: none"> - Nozzle clogged 	<ul style="list-style-type: none"> - Clean remove and nozzle. Flush spray wand.
Operating pressure not achieved/ varies	<ul style="list-style-type: none"> - Air in unit - Insufficient water supply - Nozzle worn - Incorrect nozzle - Nozzle clogged - Water strainer blocked - Safety/control valve leaking - Suction side of pump leaking - Suction valves sticking 	<ul style="list-style-type: none"> - Bleed unit - Supply line to be min. 3/4" - Replace nozzle - Install correct nozzle - Remove/clean nozzle - Clean filter - Call service - Tighten hose clamps - Carefully loosen valves by means of a screw driver, if needed, remove and clean valves.
Vibrations on high pressure hose and spray pistol	<ul style="list-style-type: none"> - Air in unit 	<ul style="list-style-type: none"> - Disconnect HP hose at connection (11) and run machine unless continuous pressure is achieved.
Heavy vibrations on unit	<ul style="list-style-type: none"> - Plunger blocked 	<ul style="list-style-type: none"> - Stop unit immediately, call qualified service.



EC-Konformitätserklärung Declaration of Conformity

Geräteart Description	Hochdruck-Aggregat mit verbrennungsmotorischem Antrieb High-pressure cleaner with combustion engine drive		
Gerätetyp Model	M 400	(Benzinmotor / Petrol drive, 16,2 kW)	385 bar
	M 500	(Benzinmotor / Petrol drive, 16,2 kW)	500 bar

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 checked="" 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, 21. Oktober 2005

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