OWNER'S MANUAL
SPARE PARTS &
MAINTENANCE
ACCESSORIES

CARETECH HPC 280

Water Blaster 280 Bar

3x400 / 50Hz - 3x440 / 60Hz

MARINE CARE

Symbols used in this manual

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

Read carefully before operating the machine

Electric shock risk

Risk for persons

Risk for the machine

Environmental protection

Tips & Hints

Safety Instructions

Only qualified people should operate the HPC machine. You should never allow children or people who are not properly instructed on its use, to operate the machine. Use of the HPC machine is subject to the applicable local regulations and provisions.

Before operating, check and ensure the machine and all its accessories are in good & proper working condition & free of defects. In case you observe any abnormal noise, leakage, malfunction or defect, stop the machine, unplug the mains power supply and have the machine serviced.

Never direct the jet towards yourself, other people, animals, electrical installations or the machine itself. You should never attempt to clean your clothes or footwear with the machine. Do not attempt to clean delicate parts, in order to prevent their damage and to ensure the cleaning operation will not result in dangerous substances being washed off the object, harming the environment. Always wear appropriate clothing and eye protectors.

The machine may only be connected to a correctly installed plug socket. An electrician must install a 3-phase plug, 16Amps, with an earth conductor. Ensure you connect the machine to the proper voltage as per its specifications. When connecting extension cords, 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. In case of emergency or malfunction, switch off the machine and unplug from the electric power source. Only qualified personnel must carry out all electrical repairs.

High-pressure hoses must be thoroughly inspected before start-up. The maximum permissible pressure and temperature are printed on the high-pressure hose. In case of damage, replace immediately with original hoses approved by the manufacturer.

Do not cover the machine and ensure adequate air circulation. Always store the machine in places where it will not be exposed to frost. Do not operate the machine without water or with insufficient water quantity, as such shortages may result in damage of the pump.

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 the machine and ensure it is regularly serviced as per its maintenance schedule. Repair works to be carried out by qualified personnel only.

USER'S OPERATION MANUAL

CARETECH HPC 280

Description

CARETECH HPC 280 has been designed and manufactured for professional use under the toughest conditions. It is suitable for use in the Marine Industry. You may extend the range of applications and cleaning effectiveness by using various accessories.

Always use the machine according to this operations manual. Any use different than in this operations manual, may result in machine damage, surface damage or even severe personal injury.

Disposal of the machine or its parts should be done according to the regulations and must not be thrown away in the environment.

CARETECH HPC 280 integrates the edge of HPC machines technology, combined with our long experience in the field. It is a state of the art HPC machine, providing safety for the operator and protection for the machine itself.

The machine is equipped with 10mtr heavy duty-oil resistant electric cable H07RFN 4G2.5, 10mtr high-pressure hose, Spray gun with 1000mm double-lance, Sst High pressure 15^0 flat nozzle & Low pressure nozzle.

High pressure extension hoses, rotating nozzles (turbo-nozzle), draining-sewage nozzles& systems, sandblasting equipment, long lance, and electric extension cables, chemical/detergent injector, rotating brushes, telescopic pole and other optional accessories are available.

Technical specification

Model / Type		CARETECH HPC 280	
Voltage / Frequency	V/Hz	3X400/50	3X440/60
Pressure	bar/mpa	280/28	
Water flow	ltr/min	15.0	
Motor power rating	kW/HP	7.5/10	
Max water temperature	^{0}C	60	
Minimum and Maximum water inlet pressure	bar	0.2-2.0	
Minimum Water inlet hose diameter	Inch	1/2”	
Noise Level	db(A)	70	
Dimensions	mm	L700 x W600 x H850	
Weight	kg	85	
Pump oil quantity	ltr	~1	
Oil grade		SAE 15W40	

Components overview

Stainless Steel 304 chassis

CARETECH HPC 280 is built on robust Sst304 chassis to resist the toughest environmental conditions & last for life.

High pressure pump

The machine is equipped with one of the most reliable European high-pressure plunger pumps, with **nickel plated head**, running with 3 ceramic pistons. Its design is based on long experience, offering extreme reliability and making any maintenance and repair job easy.

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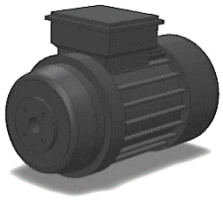
Electric motor



The electric motor is running on low RPM to ensure long life. Its innovative flange design permits direct coupling with the pump shaft. Mechanical precision and high reliability are granted by decades of experience. The motor has **F-class** insulation & S1 continuous run duty.

Unloader valve with micro switch

You may adjust the pressure of your machine (pressure range: 25-280 bar) by twisting the regulation nut of the **Unloader Valve.**
While the trigger of the spray gun is not pressed, the **UNLOADER VALVE** switches to by-pass mode, re-circulating overpressure, back to the pump.
If the machine is idle for 20 seconds, the motor will stop automatically. It will re-start when the trigger is pressed again.

Never exceed the maximum operating pressure of the machine!

Electrical switchboard

The machine is equipped with DOL starter, consisting of Contactor, Thermal Overload Relay and Delay Timer. All components of the electrical circuit are of highest quality.

Spraying equipment

CARETECH HPC 280 is equipped with 10mtr heavy duty high pressure hose, quick screw coupling, spray gun, double Lance 1000mm long, nozzle holders& nozzle protectors, flat fan HP Nozzle &LP nozzle.

Operating the machine

Before operating

1. Inspect the general condition of the machine. Check high-pressure hoses, hose & pipe connections, and spray gun & lance whether damaged or worn. Check cables, plugs & sockets to be free of defects and damages or worn.

2. Check the oil level in the pump by the sight glass or by the dipstick. If necessary, add oil.

3. Connect the high-pressure hose to the high-pressure outlet of the machine.

You should not use tools to tighten the couplings of the high-pressure hoses.

4. Rinse the water supply hose to prevent dirt particles entering into the machine or clogging the water filter and connect it to the inlet of the machine, by using the hose barb provided with the machine. Ensure the diameter of the supply hose is correct and the water supply flow and pressure is adequate.

5. Open water tap and supply water to the machine before connecting to the electric power. Pull the trigger of the spray gun till water comes out of the high-pressure nozzle and check for eventual leakages in the hoses, pipes, pump or other machine connectors.

The machine should never run without water, as pump gaskets will be severely damaged. The maximum temperature of the supply water should not exceed 60^0 Celsius (140^0 F). Supply fresh water only.

6. Check that the main switch of the electrical switchboard (STOP/RESET button) is pressed and right-twisted at the STOP position. Connect the electric cable to an earthed power source. Ensure the same as the machine's rated voltage/frequency is used.
   Connect the electric plug of the machine via a 3phase circuit breaker 16Amps of your power mains supply.

During operation

1. Ensure the water supply is open. Unlock and press the trigger of the spray gun. Let water come out from the HP nozzle for 20 seconds.

2. Twist on the left the STOP button of the electrical switchboard to ON position. The motor starts. You are now ready to proceed with your cleaning task!

3. Ensure stable foothold, before pressing the trigger of the spray gun.

4. You may use the valve-handle at the double-lance to adjust the outlet pressure.

The machine will stop automatically if idle after approx. 20 seconds delay. The motor will re-start automatically if you operate the spray gun again.

Even when the machine is not operating, the pressure at the SPRAY GUN remains high. Never release the water remaining inside the hose and spray-gun to your-self, other people or delicate materials.

Always be aware of other people's presence in the working area to avoid injuries.

After using the machine

1. Press and twist on the right the STOP/RESET button of the electrical switchboard at the STOP position.
2. Unplug the electric supply power.
3. Close the water supply and disconnect the water inlet hose from the machine.
4. Press the trigger of the **SPRAY GUN** to release the remaining pressure and lock the **SAFETY LATCH** on the **SPRAY GUN**.

Storing & Freeze Protection

Always store the machine in a dry, free-frost place. In case the machine will be stored for extended periods or in temperatures around or below 0^0 C, drain completely and flush the pump with antifreeze liquid.

In case the machine is frozen, do not operate it, as severe damage will occur.

Antifreeze liquid should be collected for reuse or disposed according the regulations.

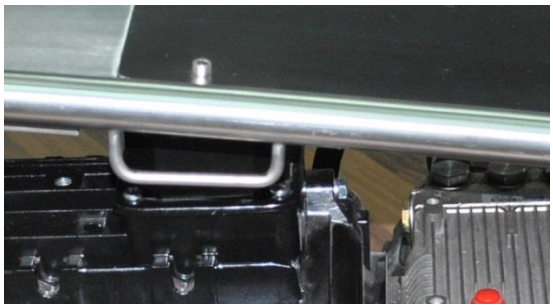
Transporting & lifting

The machine can easily move on its wheels. You should use belts to fix the machine if you transport it on a vehicle.

If you intend to lift the machine with the use of a crane, place and fix it on a pallet before lifting it.

In case of direct lifting, you should fix the belts at the 2 lifting eyebolts being at the chassis (illustrated below) to avoid damage of the machine and risk of injury.

When lifting, always ensure balanced load.



Maintenance

	Every time before operating the machine	Weekly or every 30 operating hours	Every 400 operating hours	After the first 50hrs, then every 500hrs or every 6 months
Water Filter cleaning		●		
Pump Oil Level inspection		●		
Pump Oil change				●
Visual inspection of machine: electrical components, piping, hoses, equipment	●			
Inspect the air intake at the rear side of the motor	●			
Unloader Valve			●	

Water Filter

Unscrew and remove the lower part of the water filter housing. Remove the micro-filter net and rinse with water. Replace if damaged. Install back the micro-filter and screw the housing.

Apart of the regular maintenance described above, Filter cleaning is necessary in case the mains water was not clean and dirty particles entered the inlet line.

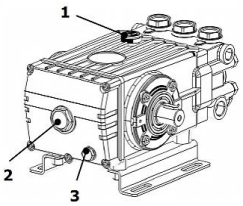
Pump

Pump Oil Level inspection

Check the oil level of the pump by the sight glass (2) or by the dipstick (1) and add oil if necessary.

Pump Oil Change

Remove drain plug (3) and collect the oil in appropriate tank for disposal as per regulations. Check drain plug gasket is in place and in good condition. Replace if necessary. Reinstall drain plug and fill in oil from the filling hole (1).

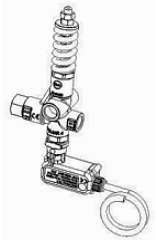


Attention!!

- ***If oil shows signs of contamination (milky/discoloured), change immediately, and replace packings.***
- ***If the pump shows signs of oil leaks between the crankcase/manifold, change piston rod oil seals immediately.***
- ***If oil leaks out of the side cover, change side-cover oil seals immediately.***
- ***If water leaks between crankcase/manifold, change packing assembly immediately.***
- ***If water leaks from valve caps, change valve cap o-rings.***

Unloader Valve with microswitch

The valve regulates the max pressure of the machine through a piston, which acts on a ball correctly positioned, that closes the bypass opening. A check valve cuts out the delivery section, the pressure of which controls the drive of the piston. Each regulation should be made when the system is operational and the nozzle open.



Every 400 working hours, check and lubricate the seals with water resistant grease.

Every 800 working hours, control the wear of the seals and internal parts and if necessary, replace with original parts taking care during installation to lubricate with water resistant grease.

Troubleshooting

MALFUNCTION	POSSIBLE CAUSE	REMEDY
Machine is not starting	No current	Check the electrical connection
While idle (auto-stop), motor starts without pressing the trigger	Water leakage at the high pressure line	Eliminate cause
Motor starts, then stops suddenly	Poor water supply	Eliminate cause
Motor buzzes without starting or trips	Supply voltage is low	Eliminate cause
	Pump blocked	Contact you dealer
	Phase missing	Eliminate cause
Pressure drop	Air in the piping	Check the suction hose and tighten the hose clips
	Pump sucks air	Check for leakages at the pump
	Insufficient water supply	Eliminate cause
	Clogged filter	Eliminate cause
Operating pressure is not achieved or fluctuates	Blocked, worn or wrong size nozzle	Clean or replace if necessary
	Air in the system	Eliminate cause
	Insufficient Water supply	Eliminate cause
	Dirt particles or worn parts in Unloader Valve	Dismantle Unloader Valve, remove dirt and repair if necessary
	Dirt particles in Pump valves	Dismantle pump head, remove dirt, check valves and repair if necessary
	Water leakage	Check for leakages at the system and repair if necessary

Specialized technicians only should carry out maintenance works as well as repairs!

Useful information

Environmental protection

Dispose as per regulations for used materials, such as oil, spare parts, electrical components as well as any other part of the machine should be disposed of properly. The machine is allowed to be connected to the drinking water supply mains, only when a backflow device has been installed, according to EN 1717.

Personal Protective Equipment

The use of personal protective equipment from the machine operator is highly recommended and should be in line with the regulations.

Hoses & Spray gun disconnection

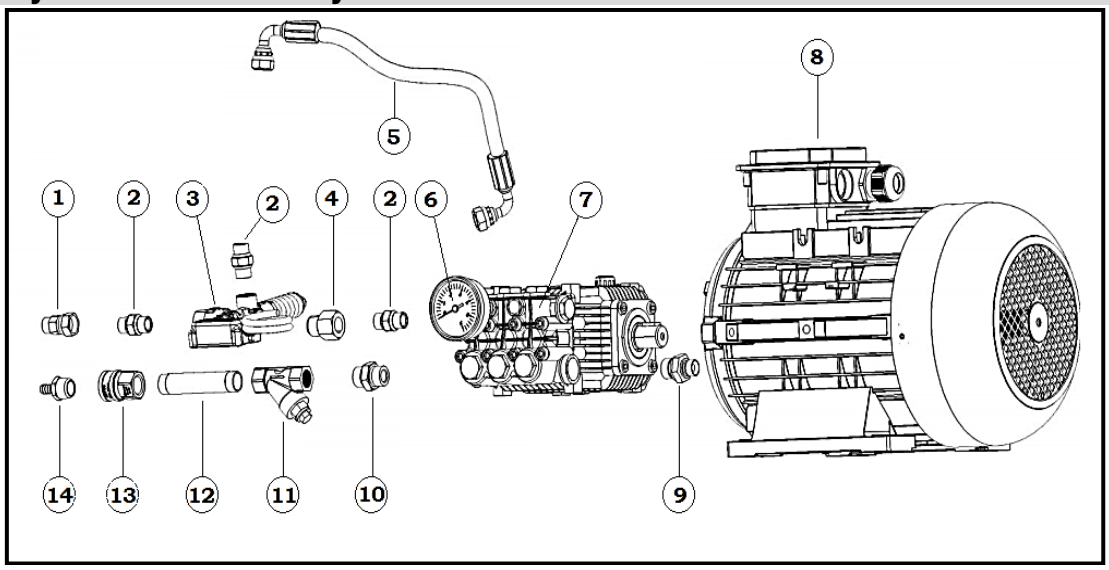
When machine is shut down, high pressure still remains in the system. Release pressure by operating the spray gun before you try disconnecting the hoses, the spray gun or any other part of the machine.

Repair Jobs & Spare parts

Only qualified personnel should attempt to repair the machine.. During maintenance or repair works, disconnect the machine from power source. Any modification to the machine or use of non-original spare parts may result in system damage and working safety is under risk. Only use manufacturer's original spare parts for the maintenance or repair of the machine. The machine is accompanied with its spare parts booklet. In case of loss, ask your dealer to provide you with a new one.

MAINTENANCE & SPARE PARTS

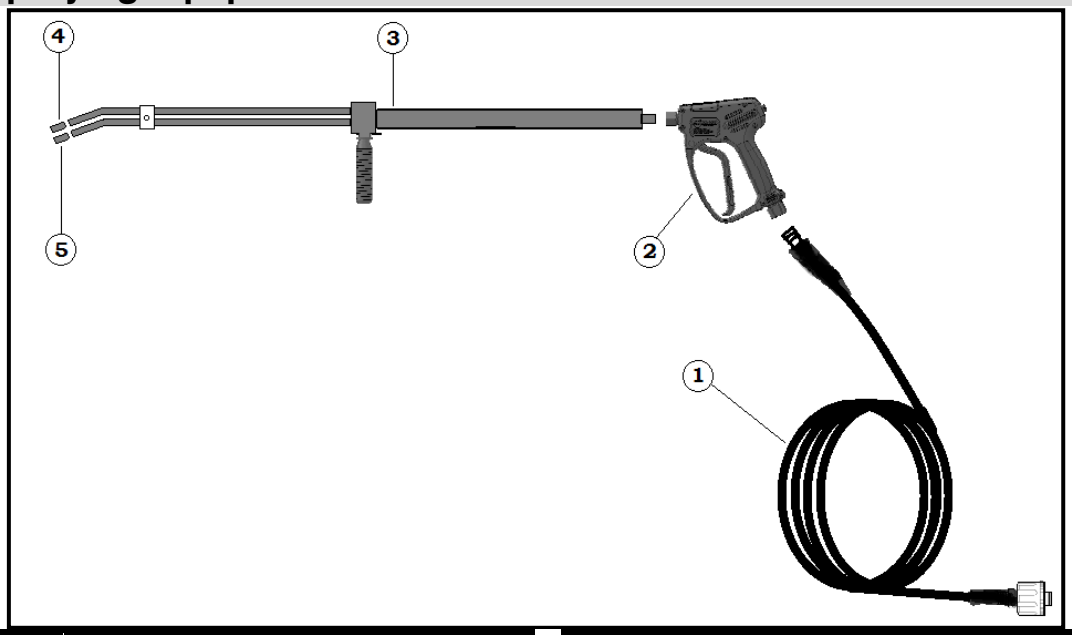
Hydraulic assembly



Pos.	Part No	Description	Qty
1	101007	Quick screw coupling	1
2	101112	Nipple	3
3	101130	Unloader valve w/microswitch	1
4	101198	Adaptor	1
5	101021	LP hose (by-pass)	1
6	101131	Gauge 0-400 bar	1
7	101414	HP Pump, 3x440V/60Hz	1
	101413	HP Pump, 3x400V/50Hz	

Pos.	Part No	Description	Qty
8	101508	Motor 3~ 7.5kW	1
9	101108	Reducing Nipple	1
10	101124	Nipple	1
11	101151	Water inlet filter Y-type	1
12	101020	Pipe ZP	1
13	101169	Quick coupling ball	1
14	101170	Hose barb	1

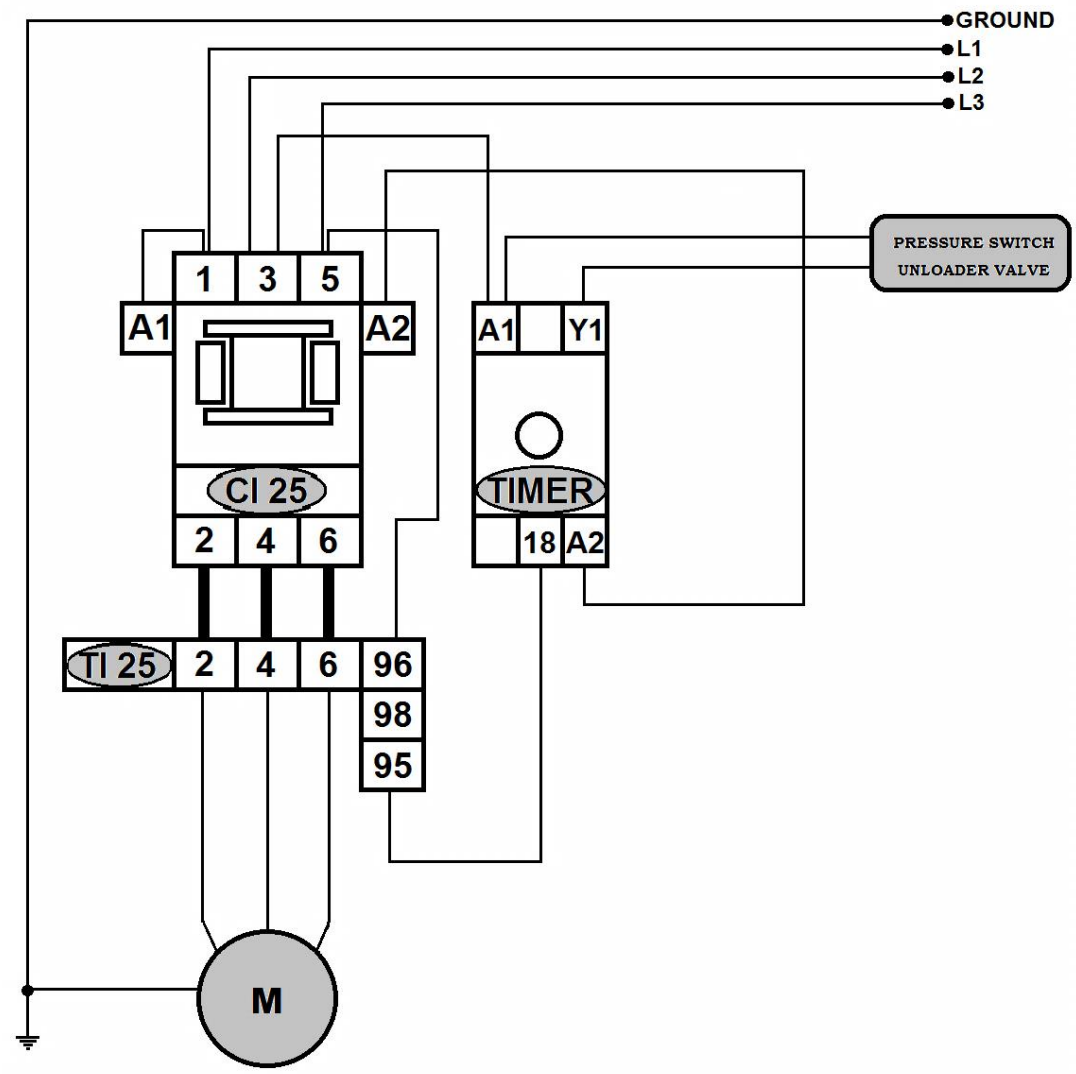
Spraying equipment

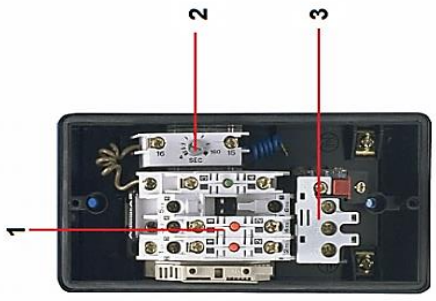


Pos.	Part No	Description	Qty
1	101002	HP hose, 10mtr	1
2	110703	Spray gun	1
3	110806	Double lance 1000mm w/valve aside	1

Pos.	Part No	Description	Qty
4	101180	HP nozzle flat fan	1
5	101148	LP nozzle (brass)	1

Motor starter 7.5Kw - electrical drawing [part no 101230]

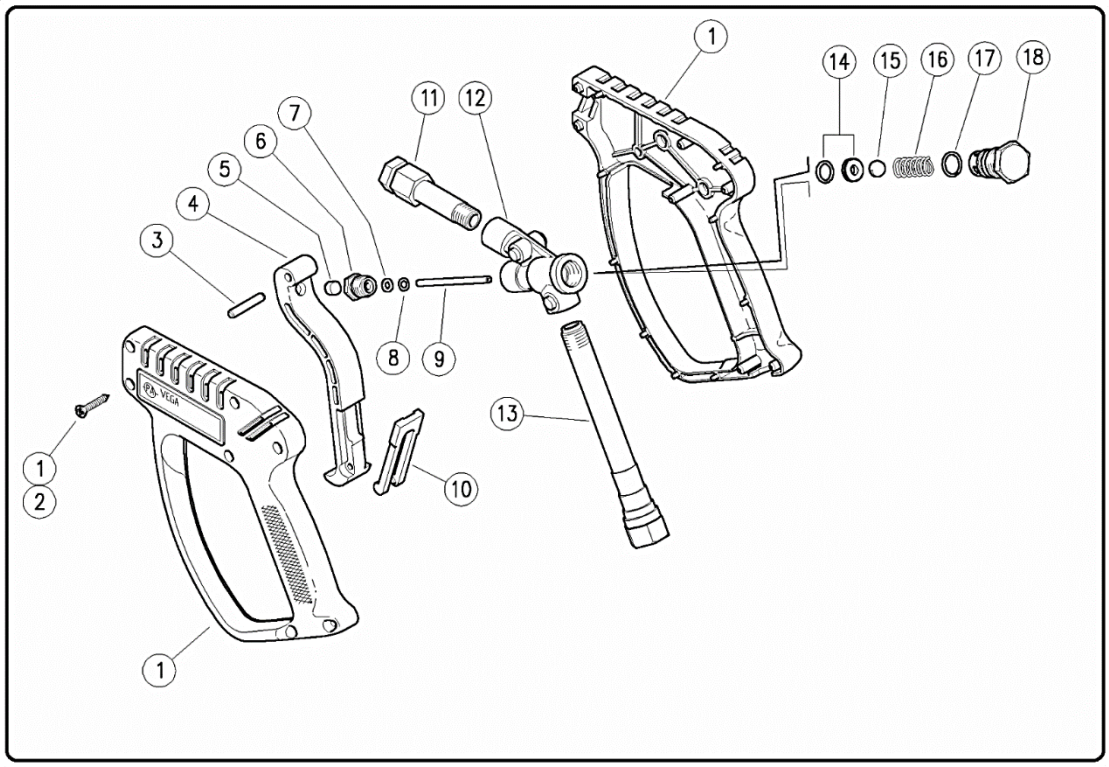




Pos.		Description	Qty
1	101228	Contactor	1
2	101222	Timer	1

Pos.		Description	Qty
3	101285	Thermal overload relay	1
	101230	**DOL STARTER 7.5kW COMPLETE**	

Spray gun [part no. 110703]

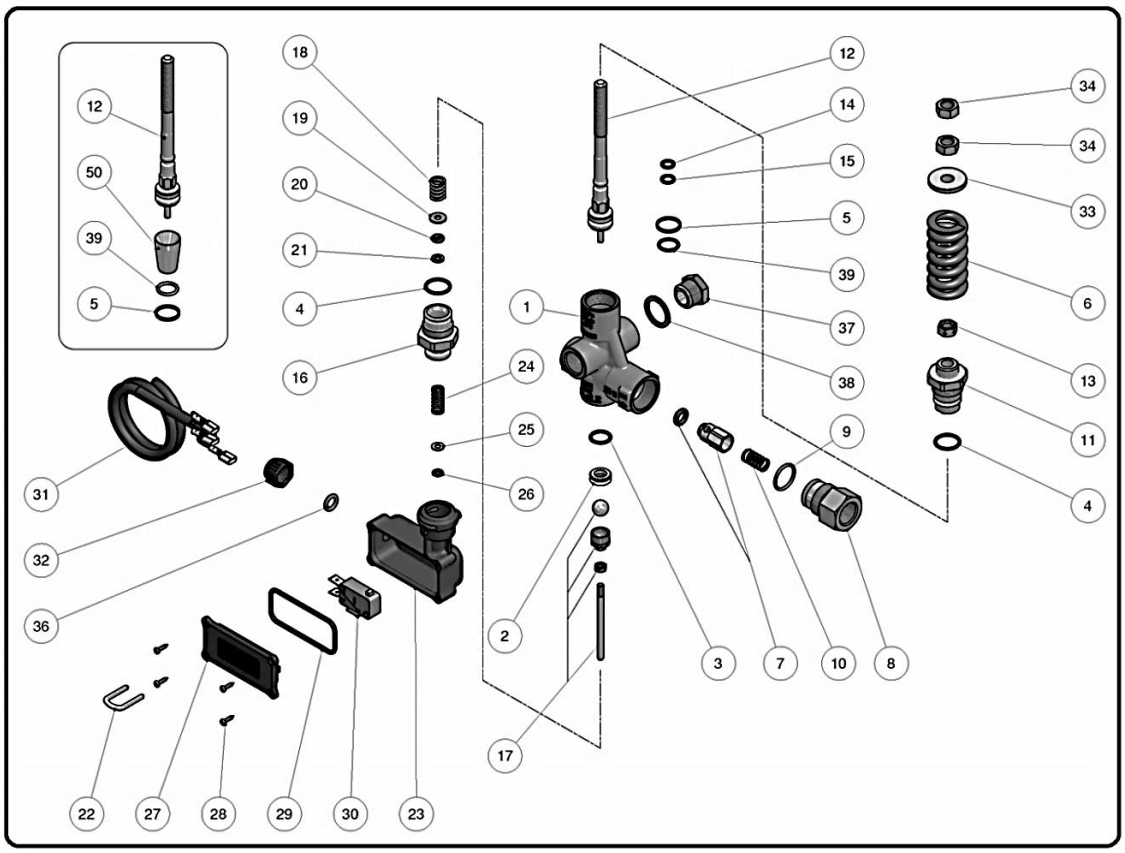


Spare parts list

Pos	Part No	Description	Qty	KIT
1		Casing KIT w/screws	1	
2		S/tapping screw	7	
3		Parallel pin	1	
4		Trigger	1	
5		Stop pin	1	
6		Front plug brass	1	
7		Back-up ring	1	■
8		O-ring	1	■
9		Piston	1	■
10		Safety latch	1	
11		Front tube	1	
12		Housing	1	
13		Back tube	1	
14		Seat Sst + O-ring	1	■
15		Ball	1	■
16		Spring	1	
17		O-ring	1	■
18		Spring holder	1	

■	**301040**	**REPAIR KIT (6x1pcs)**	**1**

Unloader Valve with micro-switch



Spare parts list

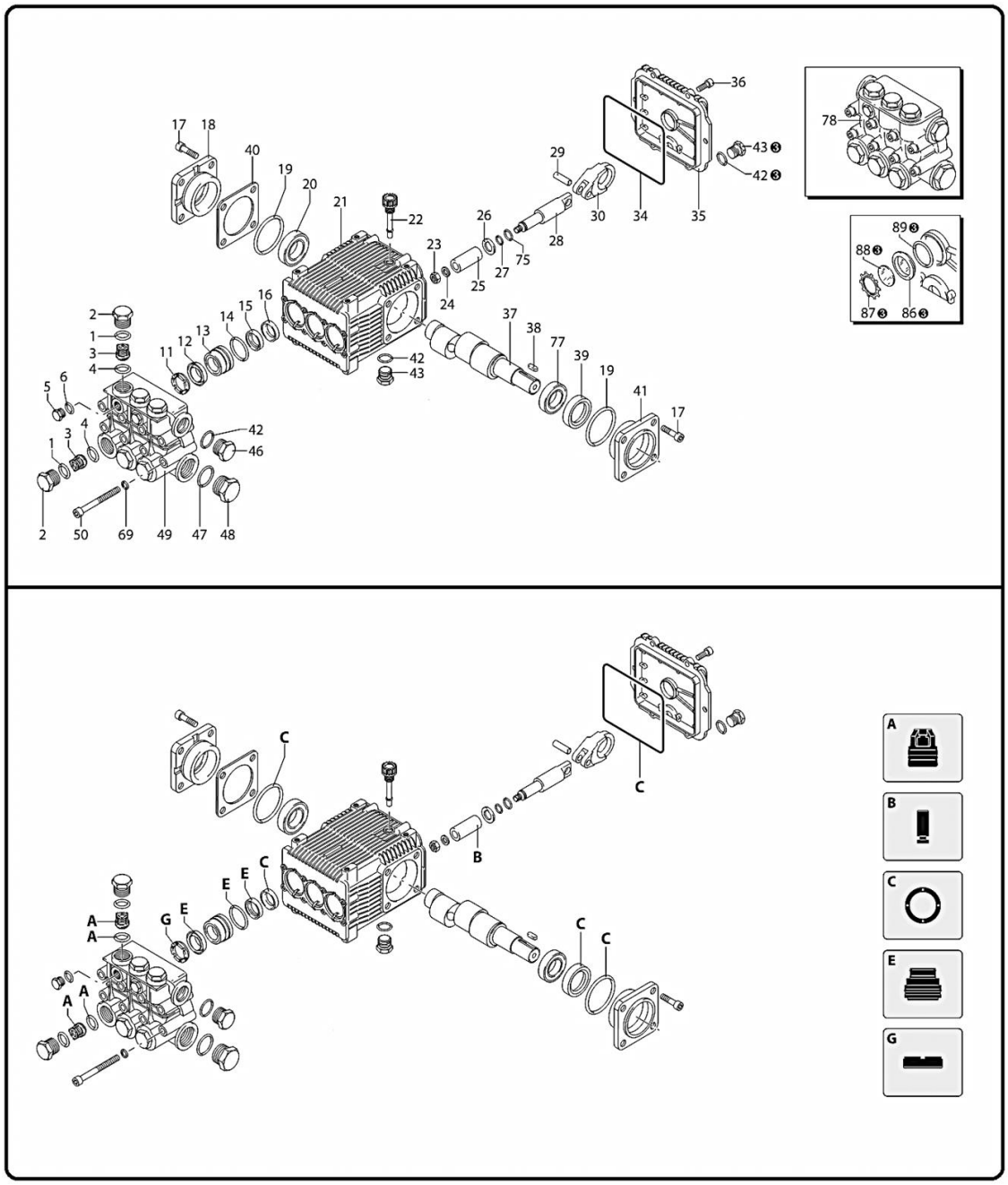
Pos.	Part No	Description	Qty	KIT
1		Housing	1	
2		Seat + O-ring	1	■
3		O-ring	1	
4		O-ring	2	■
5		Back-up ring	1	■
6		Spring,	1	
7		Shutter pin, O-ring	1	
8		Shutter coupl.	1	
9		O-ring	1	■
10		Spring	1	
11		Piston holder	1	
12		Piston Sst	1	
13		Hex nut	1	
14		Back-up ring	1	■
15		O-ring	1	■
16		Microswitch coupl.	1	
17		Piston + shutter + PR16	1	■
18		Spring	1	
19		Washer	1	
20		O-ring	1	■

Pos	Part No	Description	Qty	KIT
21		Back-up ring	1	■
22		U-bolt Sst	1	
23		Casing PR	1	
24		Spring	1	
25		Washer	1	
26		O-ring	1	■
27		Lid, PR	1	
28		S/tap. Screw	4	
29		O-ring	1	■
30		Microswitch	1	
31		Cable 3x1	1	
32		Locknut, cable gland	1	
33		Spring holder ring	1	
34		Hex nut	2	
35		O-ring	1	■
36		O-ring	1	■
37		Plug	1	
38		Washer	1	
39		O-ring	1	■
50		Seal frame	1	

Pos.	Part No	Description
■ KIT	301041	Repair KIT [14X1 pcs]

MARINE CARE

Pump – exploded view



MARINE CARE

Pump – Spare parts list

Pos	Part No	Description	Qty	KIT
1		O-Ring	6	
2		Plug inox	6	
3		Complete valve	6	KIT 2864
4		O-Ring	6	KIT 2864
5		Plug	2	■ 15 Nm
6		O-Ring	2	
11		Support ring	3	KIT 1829
12		Gasket	3	
13		Piston guide	3	
14		O-Ring	3	
15		Gasket	3	
16		Seal	3	KIT 1855
17		Screw	8	■24.5 Nm
18		Closed bearing sup.	1	
19		O-Ring	2	1855
20		Bearing	1	
21		Pump housing	1	
22		Oil cap	1	
23		Nut	3	■ 20 Nm
24		Washer	3	
25		Ceramic piston	3	KIT 2757
26		Spacer	3	
27		O-Ring	3	
28		Guiding piston	3	
29		Piston pin	3	

Pos	Part No	Description	Qty	KIT
30		Bronze con-rod	3	
34		O-ring	1	KIT 1855
35		Complete cover	1	
36		Screw	6	■ 10 Nm
37		Crankshaft	1	440V/60Hz 400V/50Hz
38		Key	1	
39		Seal	1	1855
40		0.10mm shim 0.20mm shim 0.30mm shim	1 1 1	
41		Open bearing sup.	1	●
42		O-ring	3	●
43		Plug	2	■20 Nm ●
46		Plug	1	■ 25 Nm
47		O-ring	1	
48		Plug	1	■ 40 Nm
49		Pump head	1	
50		Screw	8	■ 24.5 Nm
69		Washer	8	
75		Ring	3	
77		Bearing	1	
78		Pump head assembly	1	
86		Oil indicator	1	●
87		Snap ring	1	●
88		Disc	1	●
89		O-ring	1	●

SYMBOLS

■ Torque wrench (Allowance +0/-10% Nm)

● Part of part Pos. 35

PART KITS

Part No 301018 A = KIT 2864 VALVES		Part No 301019 B = KIT 2757 PISTONS		Part No 301020 C = KIT 1855 OIL SEALS		Part No 301021 E = KIT 1857 WATER SEALS		Part No 301022 G = KIT 1829 SUPPORT RINGS	
Pos.	Qty	Pos.	Qty	Pos.	Qty	Pos.	Qty	Pos.	Qty
3	6	25	3	16	3	12	3	11	3
4	6			19	2	14	3		
				34	1	15	3		
				39	1				

Servicing the pump

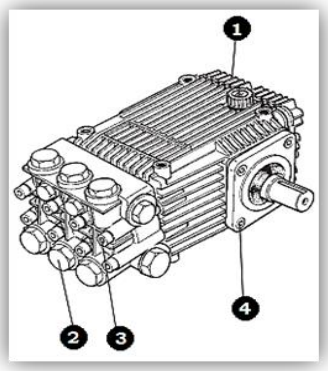

Before carrying out any maintenance, check that no part of the machinery is live!

❶ **REAR COVER**

❷ **VALVE CAPS**

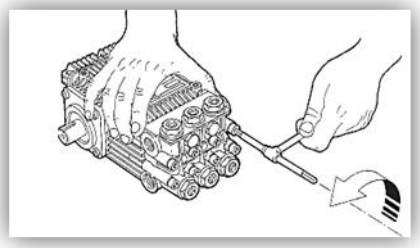
❸ **PUMP HEAD**

❹ **SIDE COVER**

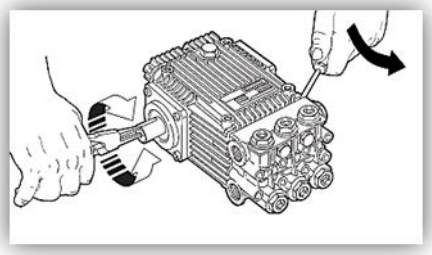


1. ASSEMBLY–DISASSEMBLY OF THE PUMP HEAD

1.1 Unscrew head bolts. For torque ratings see relevant figures on the pump **SPARE PARTS LIST** page.



1.2 Remove the head by rotating the shaft and levering between head and body.

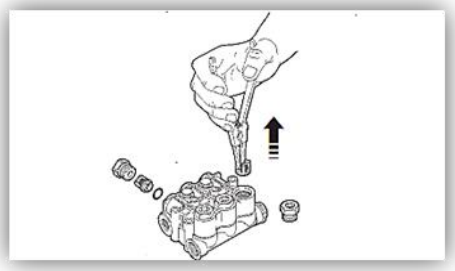


1.3 For re-assembly, invert above instructions and keep torque rates shown in the **pump SPARE PARTS LIST** page.

2. INSPECTING INLET/OUTLET VALVES

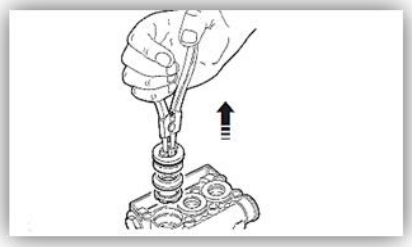
2.1 Remove valve caps, slide out inlet/outlet valves, check the condition of the various components of the valve as well as the O-ring and replace if necessary.

2.2 For re-assembly, invert previous operation. Keep the torque ratings as shown on the pump **SPARE PARTS LIST** page.

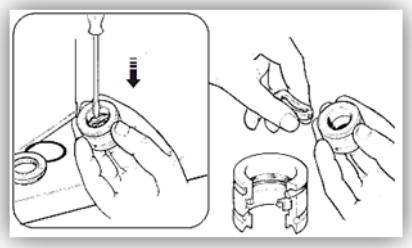


3. REPLACING PACKING AND RECOVERY SEALS

3.1 Remove the head (see p.1.), then slide out piston guides, being careful not to deform them, using the special extractor pliers.



3.2 Disassemble the components of the piston guide, check the condition and replace if necessary.



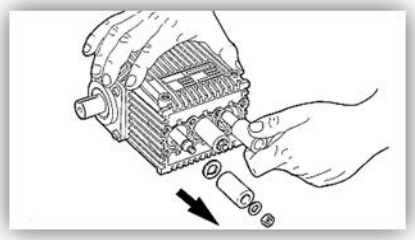
3.3 For re-assembly invert operation.

4. REPLACING THE PISTONS

4.1 Remove the head, and then unscrew the piston retainers.

4.2 Slide off the ceramic pistons, check their condition and replace if necessary

4.3 For re-assembly invert above operations. Keep the torque ratings as shown on the pump **SPARE PARTS LIST page**.



5. DISCHARGING OIL

5.1 Remove oil dipstick, unscrew oil discharge plug and empty the pump.

Oil pollutes the environment!
Do not pour down drain!

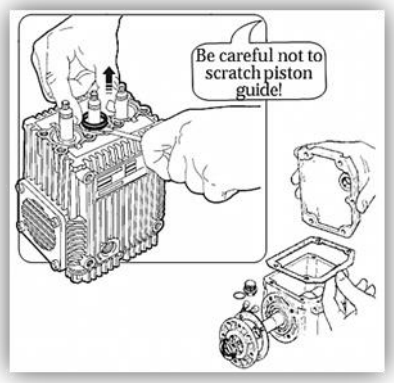
6. REPLACING OIL SEALS

6.1 Remove the head, remove the pistons, and discharge oil.

6.2 Remove the oil seals and the O-rings, checking the seats and the piston guides.

6.3 Remove the rear cover gasket.

6.4 For re-assembly invert above operations. Keep the torque ratings as shown on the **SPARE PARTS LIST** page.



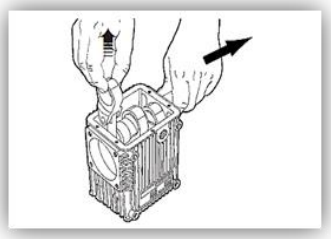
7. CRANK MECHANISM MAINTENANCE

7.1 Remove the head, remove the ceramic pistons and discharge oil.

7.2 Remove the rear cover.

7.3 Remove the con-rod sliding the one piece-rod whilst removing the shaft.

7.4 For re-assembly invert operations. Keep the torque ratings as shown on the **SPARE PARTS LIST** page.



8. LUBRICATION

8.1 Before starting the pump, check the oil level in the pump.

8.2 **0.43kg** of **SAE 15W40** oil is to be used.

8.3 Change the oil after the first 50 working hours and then after every 500 hours.

TROUBLE SHOOTING

PROBLEM	CAUSE	REMEDY
The pump is noisy	**Pump sucking air**	**Check suction malfunction**
Pressure gauge fluctuates	**Valves blocked by foreign bodies or worn** **Packing worn** **High temperature of pumped liquid**	**Clean or replace valves** **Replace packing** **Reduce temperature of pumped liquid**
Water leaks from the bottom of the pump	**Piston packing worn**	**Replace piston packing**
Water leaks from head	**Head O-ring worn**	**Replace O-ring**
Oil leaks from the bottom of the pump	**Oil seals worn**	**Replace seals**

Declaration of conformity

Distributor	**Marine Care BV**
Address	Oude Maasweg 35, 3197 KJ Rotterdam - Botlek, The Netherlands Tel : +31(0)10 2950342 E-mail: operations@marinecare.nl

Declares that the product

Product name	**HIGH PRESSURE CLEANING MACHINE(ELECTRIC OPERATED, COLD WATER)**
Model type	**CARETECH HPC 280, 3X400V/50Hz & 3X440V/60Hz**

conforms to the essential requirements of the directives 2006/42/EC based on the following specifications:

STANDARDS	EN ISO 13857:2008 Safety distances to prevent hazard zones being reached by upper and lower limbs EN ISO 12100-2:2003 Safety of machinery. General principles for design. Risk assessment and risk reduction EN 349/93 + A1:2008 Safety of machinery. Minimum gaps to avoid crushing of parts to the human body

July 2016

Optional accessories

Part No	Description	
101005	High pressure extension hose 20mtr	
101007	Nipple for connecting extension hoses (spare)	
201104	Electric extension cable with connectors IP67, 50mtr	
200020	Turbonozzle complete package	
110977	Turbonozzle	
110978	Repair kit for turbonozzle	
101904	Sandblasting Package 280bar	
200017	Adjustable chemical injector, complete with filter	
201113	Sewer/pipe cleaning pack, w/hose 20mtr and micronozzle	

110983	Slop/Drainage system w/5mtr hose 2”	
110984	Rotating Brush	
110985	Surface cleaner Ø450mm	
101079	Wall cleaner Ø320mm	
	Caretech HPC extension lance – extending reach over 7 meters – aluminum anodized, complete with support belt and nozzles.	

More accessories & personal protective equipment are available upon request

Notes

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