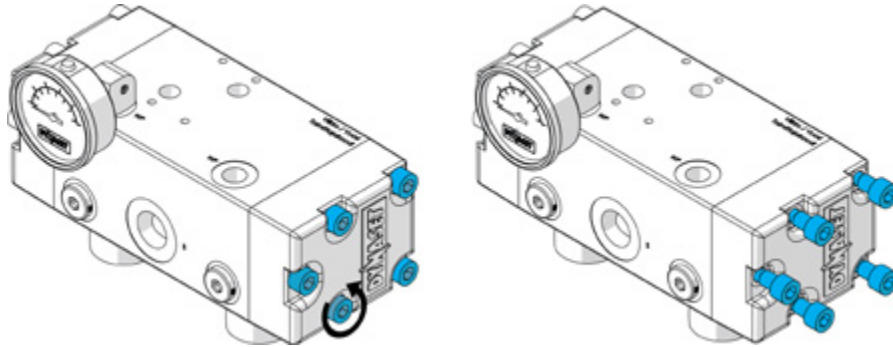
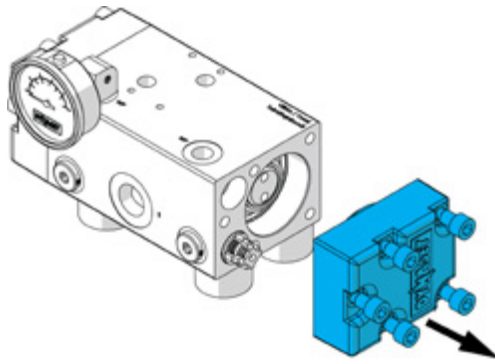


6.4. REPLACING WATER VALVES

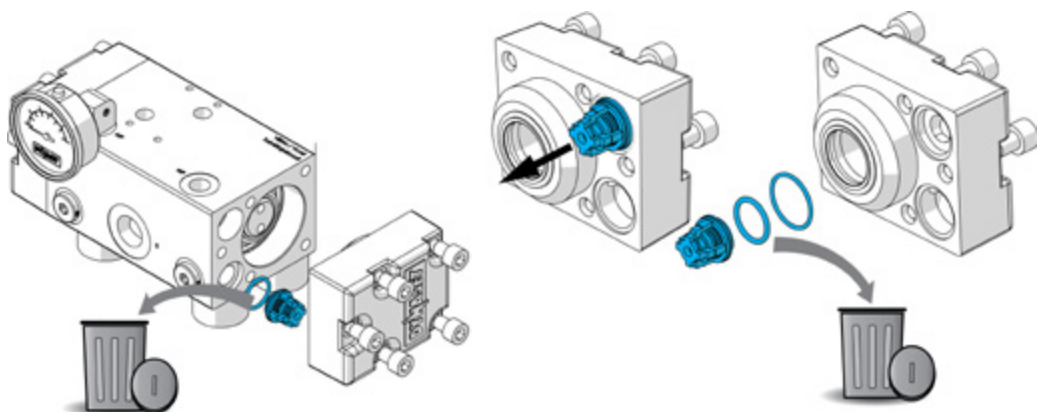
1. Remove screws from the head.



2. Pull out the head.

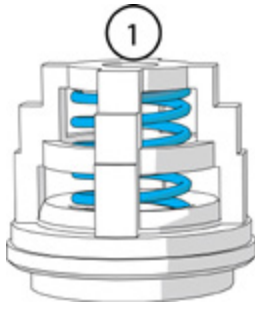


3. Remove water valves and O-rings.



⚠ ATTENTION!

The pressure valve's spring has less turns than the suction valve's spring.
Do not mix up the valves when re-assembling the pump!

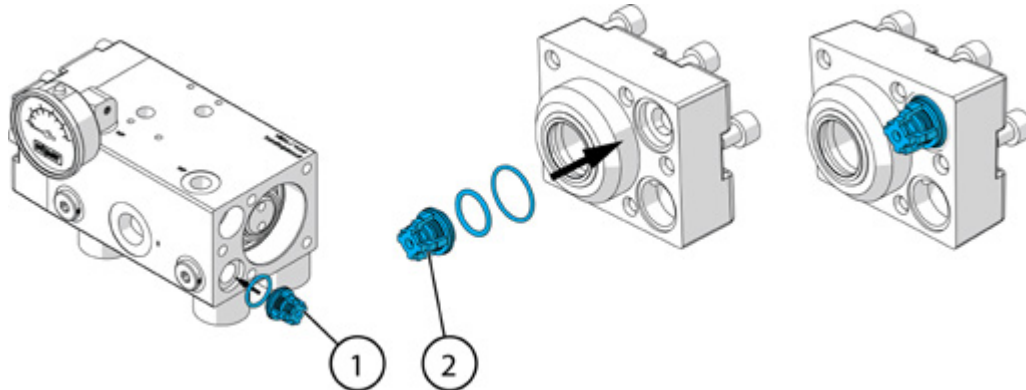


1. Suction valve

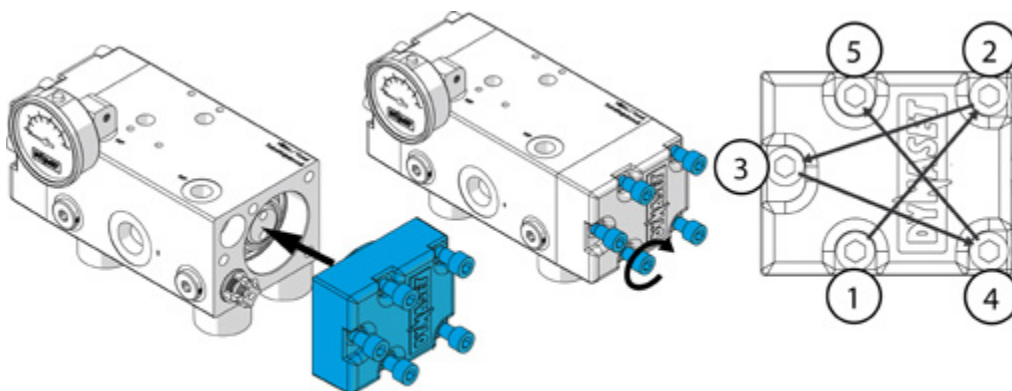


2. Pressure valve

4. Install new suction (1) and pressure (2) valves.



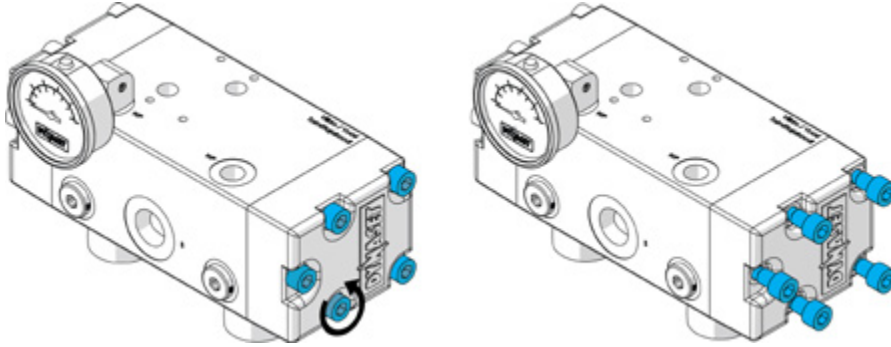
5. Install the head. Tighten heads bolts across, see chapter READ CHAPTER „6.6. Bolt tightening torques“



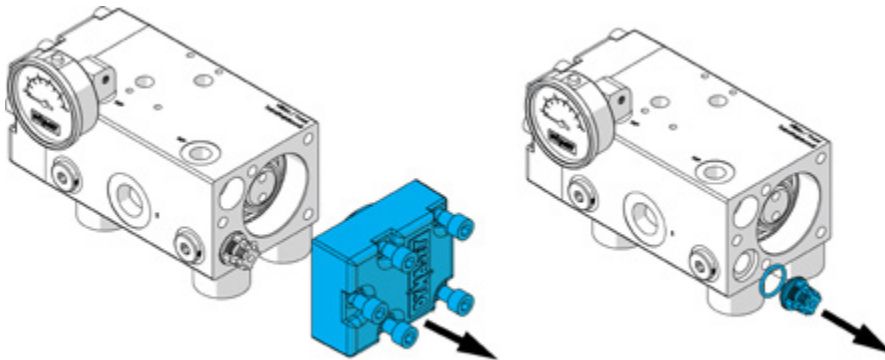
6. Repeat the operation to the other head.

6.5. REPLACING PUMP SEALS

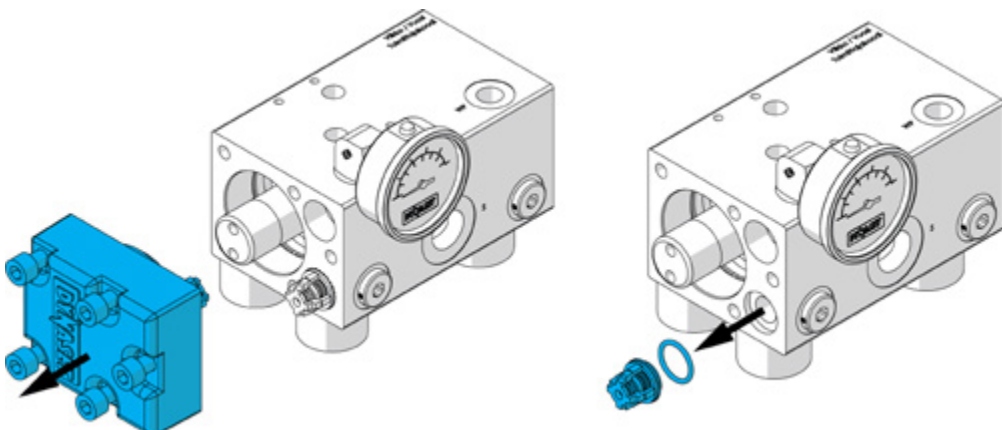
1. Remove screws from the head.



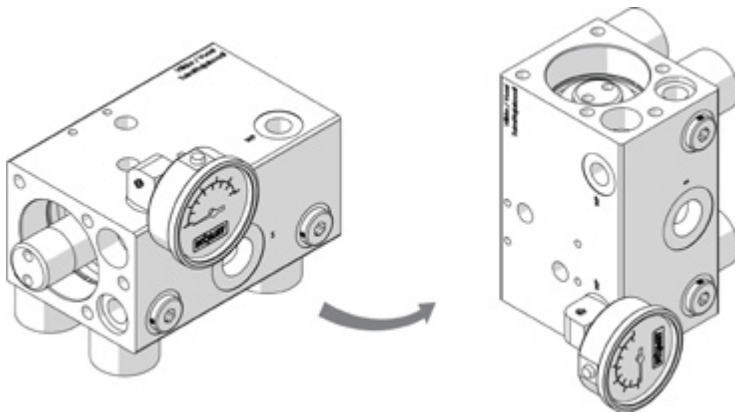
2. Pull out the head and remove water valves.



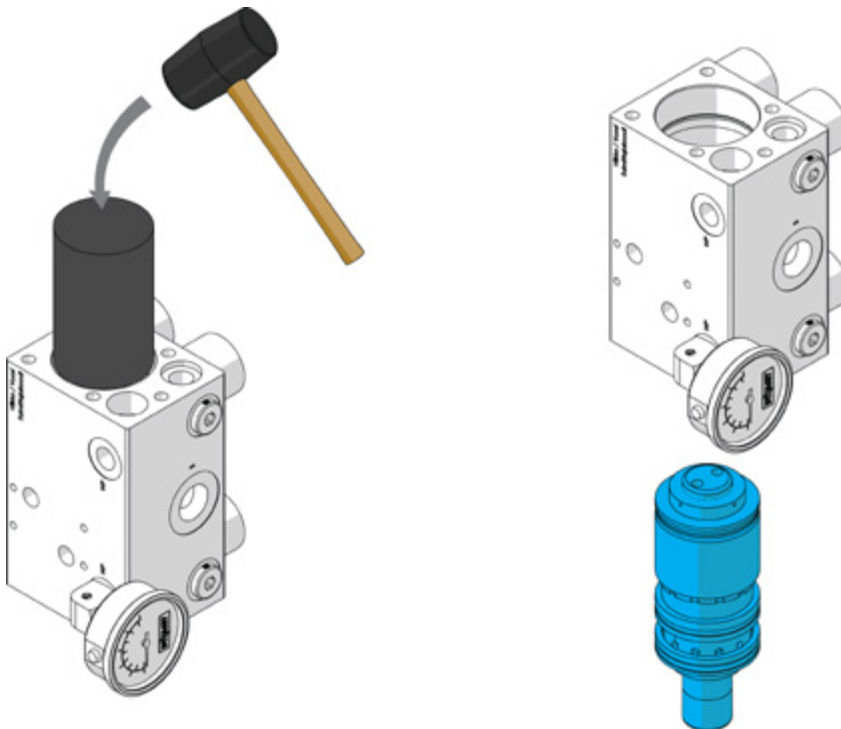
3. Remove the other head and water valves.



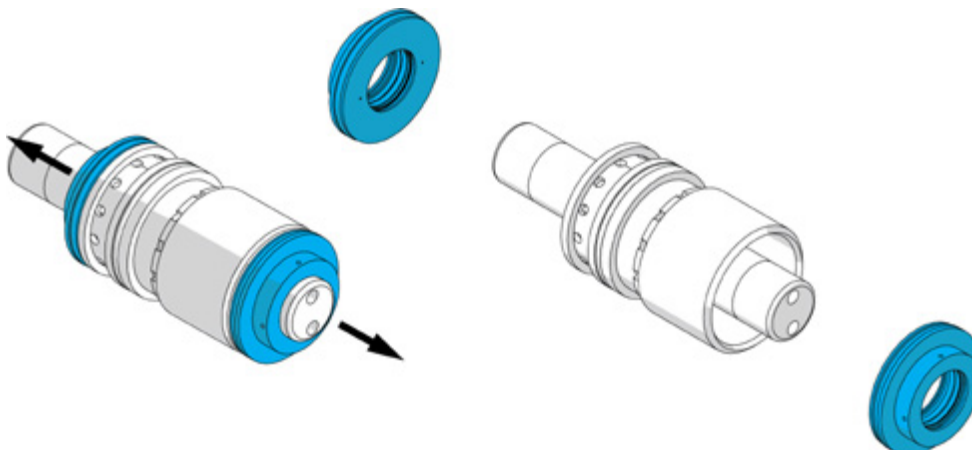
4. Turn the pump frame into a vertical position.



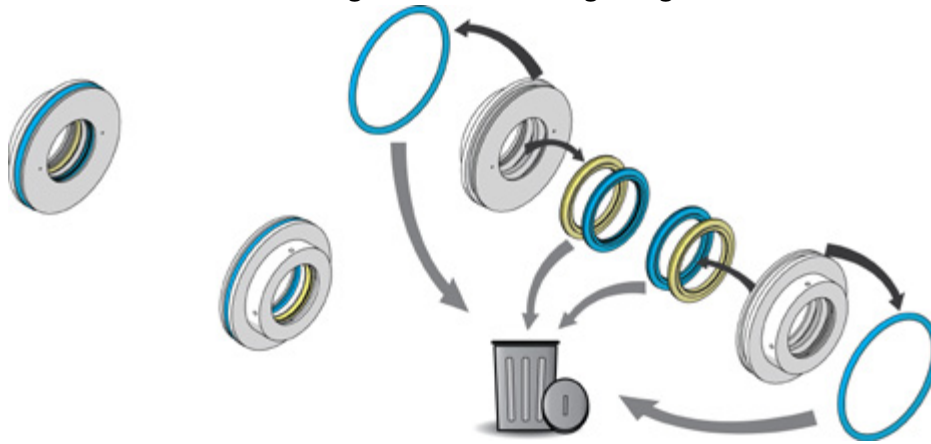
5. Use rubber hammer and special tool to remove piston assembly with cylinder and sealing flanges from the pump.



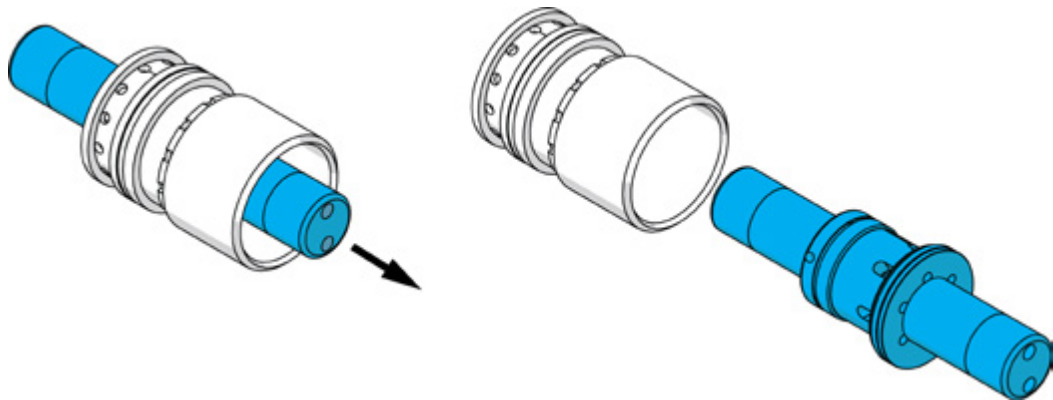
6. Remove the sealing flanges from the piston assembly.



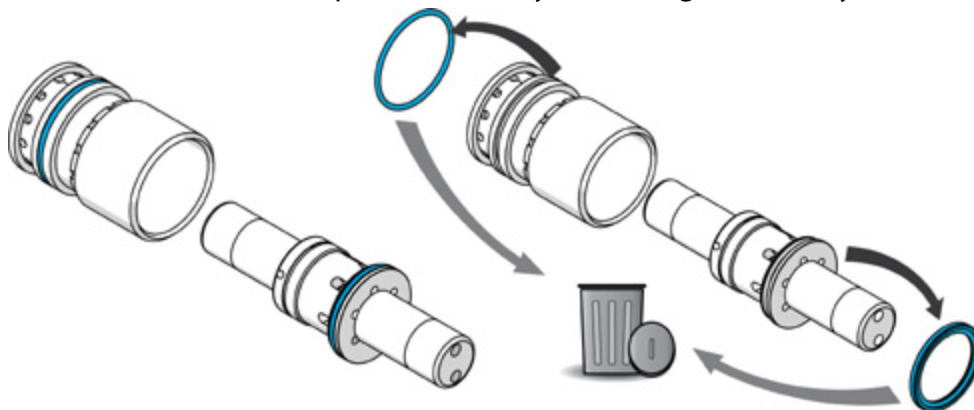
7. Remove seals and o-rings from the sealing flanges.



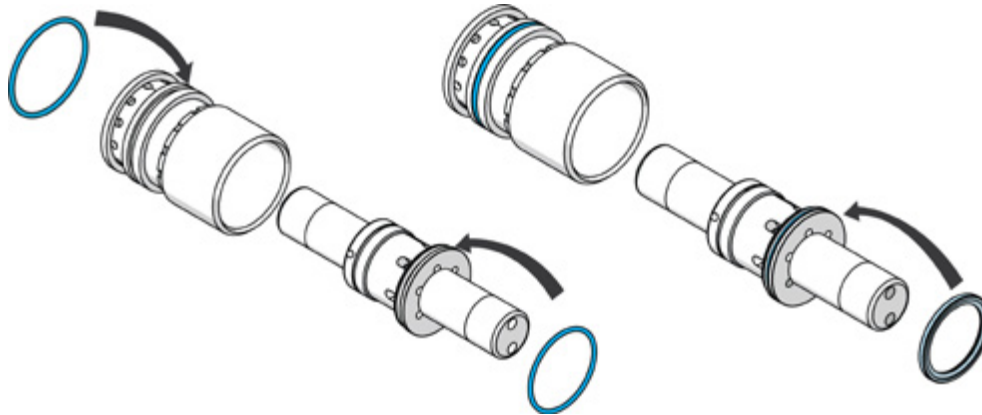
8. Remove the piston assembly from the cylinder.



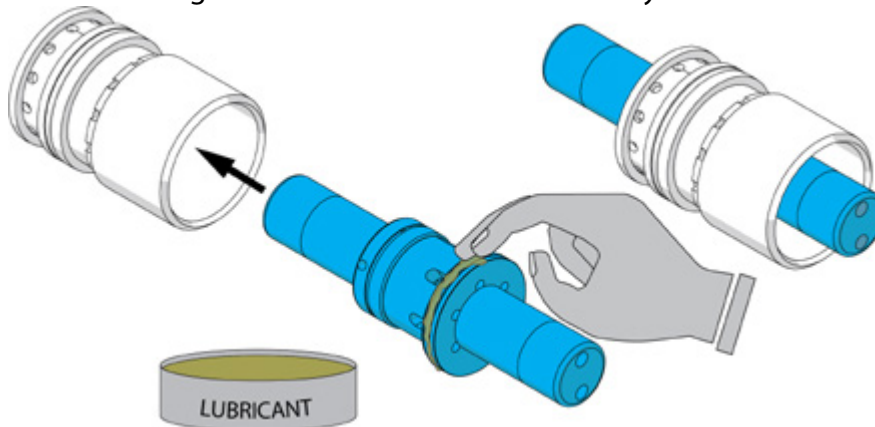
9. Remove seal from the piston assembly and o-ring from the cylinder.



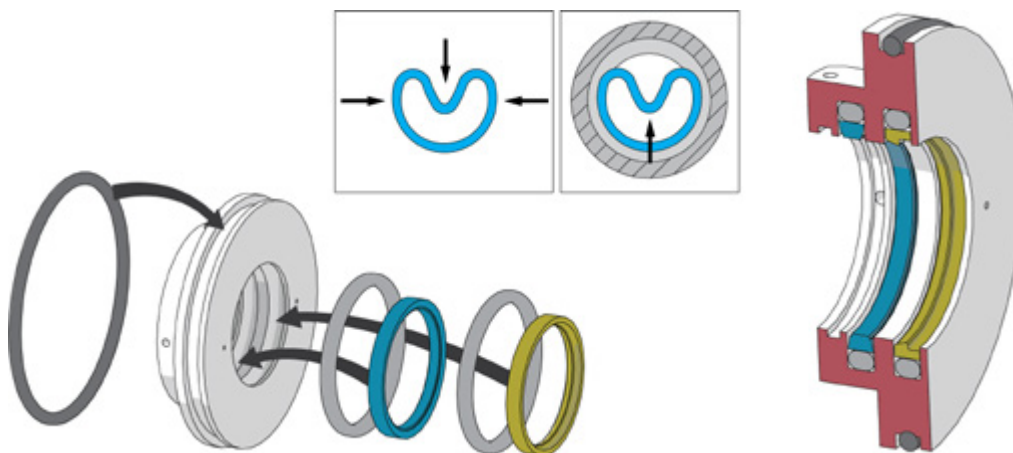
10. Install new o-ring to the cylinder, new o-ring and seal to the piston assembly.



11. Install the piston assembly to the cylinder. Use vaseline or mineral oil on the seal and mating surfaces to make installation easy.



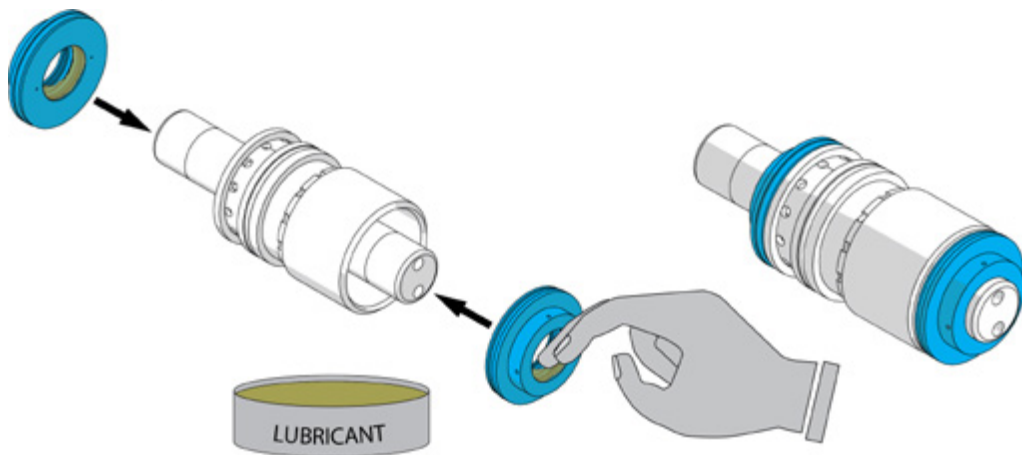
12. Install new o-rings and seals to the sealing flanges. First install o-rings and then the seals. Compress the seal into a kidney shape, place it into groove and push it back to normal shape. Avoid making sharp bends on the seal.



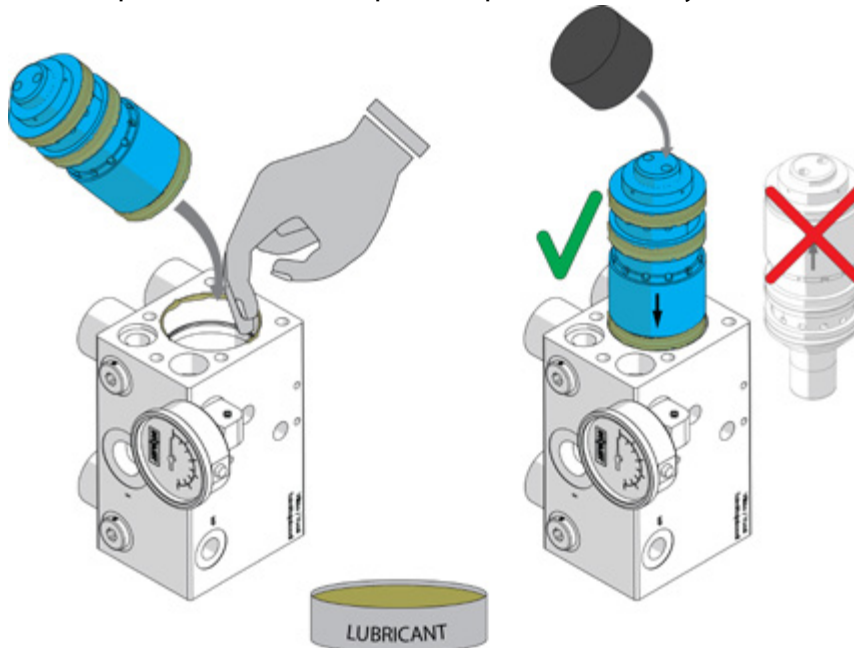
⚠ ATTENTION!

Seals of the sealing flange differs from each other, make sure that correct seal is installed into correct place.

13. Install sealing flanges into the piston assembly. Use lubricant to make the installation easy.



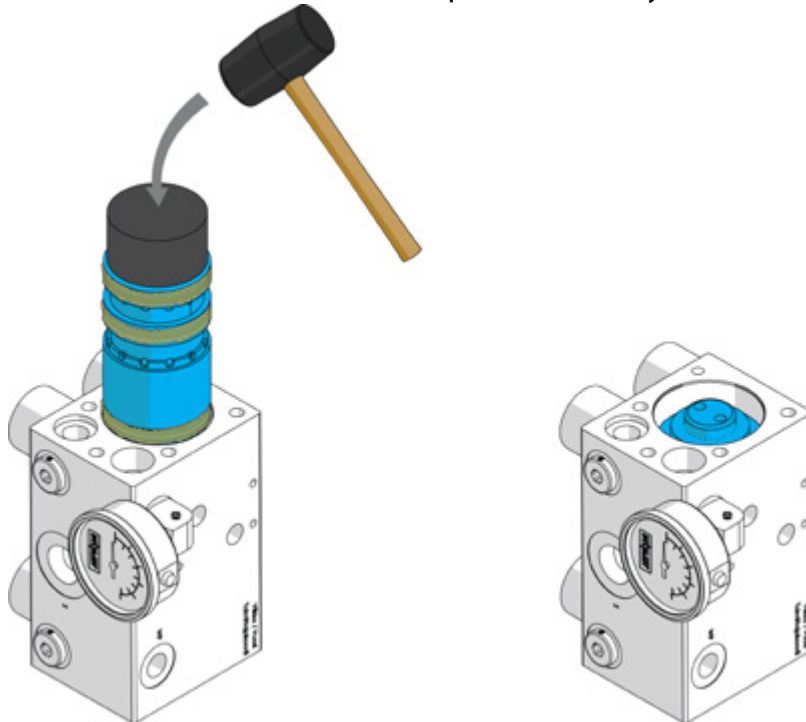
14. Lubricate mating surfaces of the piston assembly and insert it to the body. Place the special tool in the top of the piston assembly.



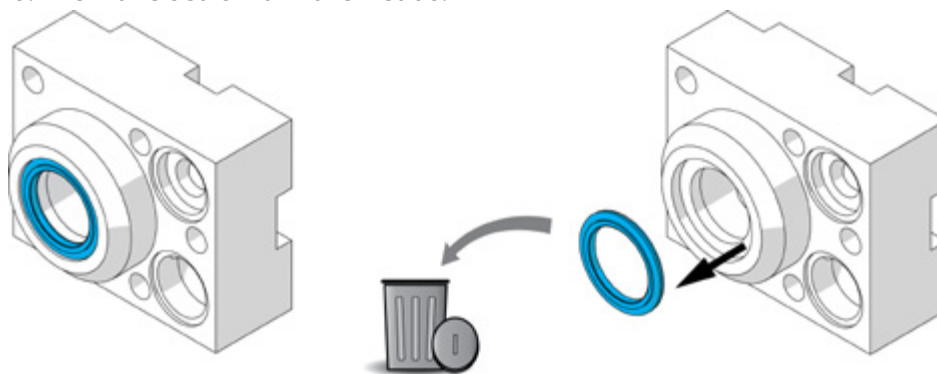
! NOTE!

Make sure that the piston assembly is installed correctly.

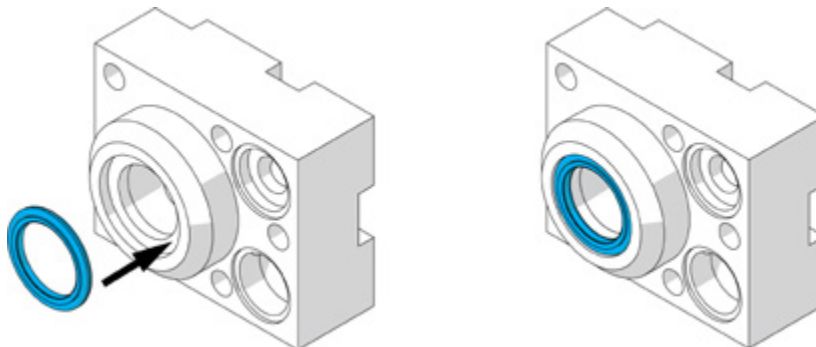
15. Use rubber hammer to install piston assembly into the body.



16. Remove seals from the heads.



17. Install new seals into the heads.

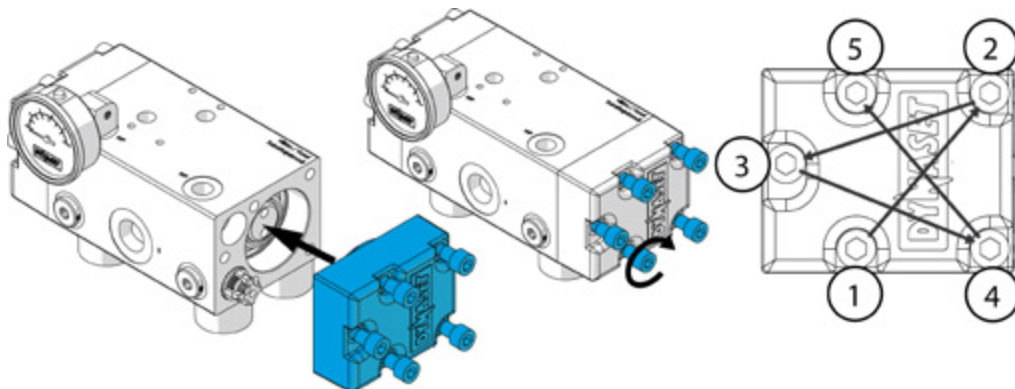


18. Install water valves. READ CHAPTER „6.4. Replacing water valves“.

! NOTE!

DYNASET recommends replacing the water valves at the same time as the pump seals.

19. Install both heads into the body. Tighten heads bolts across, see chapter READ CHAPTER „6.6. Bolt tightening torques“



20. Test run the pump and make sure that there are no leakages.

6.6. BOLT TIGHTENING TORQUES

BOLT		TIGHTENING TORQUE
M6	8.8, SS	9 Nm (6.5 lb ft)
M8	8.8, SS	22 Nm (16.0 lb ft)
M10	8.8, SS	45 Nm (33.0 lb ft)
M10	12.9	75 Nm (55.0 lb ft)
M12	8.8, SS	75 Nm (55.0 lb ft)
M12	12.9	135 Nm (99.5 lb ft)
M16	8.8, SS	180 Nm (133.0 lb ft)
M16	12.9	300 Nm (221.0 lb ft)

*SS = Stainless Steel

6.7. TROUBLESHOOTING

Performing the maintenance tasks requires a qualified hydraulic mechanic. Please, contact DYNASET authorized workshop or dealer for more maintenance information.

FAILURE	REASON	CORRECTIVE ACTION
HPW pump does not work.	Hydraulic flow not sufficient or no hydraulic flow at all.	Enable or adjust the hydraulic flow.
	Hydraulic pressure too low.	Adjust the hydraulic pressure.
	Hydraulic flow reversed.	Check and reconnect hydraulic hoses. Pressure hose should be connected to P-port and return hose to T-port.
	Hydraulic piston damaged mechanically.	Replace damaged part.
FAILURE	REASON	CORRECTIVE ACTION
HPW pump works, but does not deliver water flow.	Water intake and pressure valves are open (jammed with debris) or damaged.	Check water valves and clean them thoroughly or replace when damaged.
	Regulator's unloader valve opens from intake to pressure (models with water pressure unloader valve).	Check the valve and repair failure.
FAILURE	REASON	CORRECTIVE ACTION
HPW pump does not receive pumping fluid	Intake hose detached or hose breathes.	Check and fix the hose and connectors.
	Water supply line clogged.	Check strainer or water filter and clean thoroughly.
	Suction head too high.	Check the performance with pressurized water supply when possible.
FAILURE	REASON	CORRECTIVE ACTION
Water pressure line blocked.	Nozzle clogged.	Check the nozzle and clean thoroughly.
	Regulator's check valve damaged, pressure line blocked (models with water pressure unloader valve).	Check the valve and repair failure.

FAILURE	REASON	CORRECTIVE ACTION
Water flow rate too small	Insufficient hydraulic flow or pressure.	Adjust the hydraulic flow to the demanded level at required pressure.
	Nozzle of your pressure tool undersized.	Verify the nozzle sizing and replace with proper one.
	Pressure loss in delivery hose.	Verify the hose sizing and replace with proper one.
FAILURE	REASON	CORRECTIVE ACTION
Water pressure too low	Insufficient hydraulic flow or pressure.	Adjust the hydraulic pressure to the demanded level at required hydraulic oil flow. Pressure loss should be minimized - Do not use hoses of too small diameter or/and of an excessive length.
	Nozzle of pressure tool oversized.	Verify the nozzle sizing and replace with proper one.
	Wear-out of nozzle.	Replace the nozzle.
	Insufficient water supply.	Check and fix the problem. Use pressurised water supply if available.
	Water pressure unloader valve set too low (models with water pressure unloader valve).	Check and re-adjust to specification.
FAILURE	REASON	CORRECTIVE ACTION
Intence pulsating of water pressure.	Some of water intake and pressure valves are open or damaged.	Check water valves, clean thoroughly or repair.
	Water intake line breathes causing pump cavitation.	Check water intake line and fix the problem.
	Water intake line's diameter to small, resulting in pump cavitation.	Verify the hose sizing and replace with proper one.
	Excessive hydraulic flow, when HPW-pump runs too fast.	Adjust the hydraulic flow to the demanded level.
	Filter clogged or too small.	Clean filter or replace filter of correct size.

FAILURE	REASON	CORRECTIVE ACTION
<p>Closing the water pressure line does not drop pressure to free circulation mode.</p> <p>Hydraulic system starts to run through the pressure relief valve, emitting excessive heat.</p>	<p>Insufficient hydraulic pressure in relation to pumping fluid pressure, adjusted with water pressure unloader valve.</p>	<p>Adjust the hydraulic pressure up as much as necessary to enable proper operation of water pressure unloader valve. Note that the maximum hydraulic pressure should not be overrun!</p> <p>If boosting the hydraulic pressure is not possible, the water unloader pressure setting should be dropped.</p>
	<p>Defective water pressure unloader valve (models with water pressure unloader valve).</p>	<p>Repair or replace water pressure unloader valve.</p>
FAILURE	REASON	CORRECTIVE ACTION
<p>Sealings and water pistons wear off repeatedly.</p>	<p>Broken filter.</p>	<p>Check and replace filter.</p>
	<p>Filter missing totally.</p>	<p>Install filter. Always must use filter, even with clear tap water.</p>
<p>Leakages.</p>	<p>Hydraulic oil leakages.</p>	<p>Check the tightness of component mating, tighten screws.</p>
		<p>Replace sealings of pumps mated surfaces if necessary.</p>
		<p>Check and tighten couplings. Replace if necessary.</p>
	<p>Pumping fluid leakages.</p>	<p>Check the tightness of component mating, tighten screws.</p>
		<p>Replace sealings of pumps mated surfaces if necessary.</p>
	<p>Check and tighten couplings. Replace if necessary.</p>	
<p>Hydraulic oil-pumping fluid leakage.</p>	<p>If the draining from leakage detectors exceeds rate of 10 drops per minute, pump's sealings should be replaced.</p> <p>The rule applies to dropping of hydraulic fluid, pumping fluid and their commixture.</p>	

7. MANUFACTURER'S LIMITED WARRANTY

1. Warranty coverage

All hydraulic accessories manufactured by DYNASET OY are subject to the terms and conditions of this limited warranty. Products are warranted to the original purchaser to be free from defects in materials or workmanship. Exclusions from warranty are explained in item Exclusions from warranty.

2. Beginning of warranty period

Warranty period begins from the delivery date of the product. Delivery is considered to be done on the date when installation has been accomplished or purchaser has taken the product in use. Product is considered as taken in use at the date when DYNASET OY has delivered the product to purchaser, unless separately agreed otherwise by written agreement.

3. Warranty period

Warranty period is twenty four (24) months based on maximum of 2000 hours usage during this time period. In cases where the system is provided complete with certain special components (e.g. drive unit), those components are considered as a subject to their manufacturer's warranty.

4. Warranty procedures

Immediately upon identifying a problem which purchaser believes to be a failure subject to the product's limited warranty, purchaser must contact primary to the seller of the product. Contact must be made as soon as possible, latest thirty (30) days after the problem was identified. Seller and/or manufacturer technical staff determines the nature of the problem primarily by phone or e-mail. Purchaser commits to give necessary information and to perform routine diagnostic procedures in order to determine the nature of the problem and necessary procedures.

5. Warranty repairs

If the product is found to be defective during the warranty period, DYNASET OY will, at its option, either repair the product, author it to be repaired at its authorized workshop or exchange the defective product. If the product must be repaired elsewhere than premises of DYNASET OY or authorized workshop, all costs excluded from this warranty (traveling and waiting hours, daily allowance, traveling expenses and uninstallation/reinstallation costs) will be charged from the purchaser. If the problem is not covered by this limited warranty, DYNASET OY has the right to charge purchaser of troubleshooting and repairing.

6. Delivery terms of warranty repair

If the product is found possible to be defective under this limited warranty and it needs to be repaired, DYNASET OY gives Warranty Return Number (WRN). Items being returned must be shipped, at the purchaser's cost, adequately packed for shipment, to the DYNASET OY or to other location authored by DYNASET OY.

Shipment documents must contain:

- Purchaser's name and contact information
- Receipt of original purchase
- WRN code
- Problem description

7. Warranty of repaired product

Warranty period of the product repaired under this limited warranty continues to the end of original warranty period.

8. Exclusions from warranty

This warranty shall not apply to:

- Failures due to normal wear and tear, improper installation, misuse, abuse, negligence, purchaser selection of improper product to intended use, accident, improper filtration of hydraulic oil or intake water or lack of maintenance.
- Cost of maintenance, adjustments, installation or startup.
- Coating, hydraulic oil, quick couplings and interconnection hoses (internal or external to system assemblies).
- Products altered or modified in a manner not authorized by DYNASET OY in writing.
- Products which have been repaired during warranty period by others than DYNASET OY or its authorized workshop.
- Costs of any other damage or loss, whether direct, indirect, incidental, special or consequential, arising out of the use of, or the inability to use, the product.
- Telephone or other communications expense.
- Product that is used in exceptional conditions, considered to cause excessive wear and tear.
- Faults caused by nature phenomenon's like flood, thunder, etc.

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8. PRODUCT DISPOSAL

Dispose and recycle all DYNASET products and their packaging environmentally responsible way.

Do not dispose used oils, electrical components, batteries or any other hazardous waste with normal waste. They are harmful for the environment and can be recycled for re-use.

Contact your local waste recycling facility for more information about recycling hazardous waste.

! NOTE!

Always act according to the waste legislation, regulations and recommendations in waste disposal and waste recycling issued by your local authorities.



**HIGH PRESSURE WATER PUMP
PRODUCT DISPOSAL**

9. DECLARATION OF CONFORMITY

We hereby declare that the design and manufacture of the product stated below are in conformity with the provisions of the European Parliament and Councils on the harmonization of the laws of Member States on the safety of machines.

Machine directive 2006/42/EC

LVD directive 2014/35/EU

EMC directive 2014/30/EU

Applied conformity standards:

CEN EN ISO 4413: EN ISO 4413:2010 Hydraulic fluid power - General rules and safety requirements for systems and their components.

EN60204-1 Safety of machinery – Electrical equipment of machines.

Manufacturer: **DYNASET Oy**
Menotie 3, FI-33470 Ylöjärvi, Finland

Product group: HIGH PRESSURE WATER PUMPS

Product: HPW High pressure water pumps

If the device has been modified by someone other than the manufacturer or without the manufacturer's permission, this declaration is not valid.



Timo Nieminen
R&D Manager
Ylöjärvi, Finland 20.04.2016



**HIGH PRESSURE WATER PUMPS
DECLARATION OF CONFORMITY**

10. TECHNICAL SPECIFICATIONS

		HPW 200 /30-45	HPW 420 /20-50	HPW 220 /50-70	HPW 90 /150-85	HPW 520 /30-85	HPW 180 /90-115	HPW 460 /50-115	HPW 130 /180-140
DISCHARGE CHARACTERISTICS									
Pumping fluid flow max.	l/min (gpm)	30 (7.9)	20 (5.3)	50 (13.2)	150 (39.6)	30 (7.9)	90 (23.8)	50 (13.2)	180 (47.6)
Pressure max.	bar (psi)	200 (2900)	420 (6100)	220 (3200)	90 (1300)	520 (7500)	180 (2600)	460 (6700)	130 (1900)
Power	kW	10	14	18,5	22,5	26	27	38	39
Water/hydraulic pressure ratio		1,18	2,12	1,26	0,52	2,62	1,12	2,03	0,68
HYDRAULIC CONNECTIONS									
Pressure line	P	BSP 1/2"	BSP 1/2"	BSP 3/4"	BSP 3/4"	BSP 3/4"	BSP 3/4"	BSP 3/4"	BSP 3/4"
Return line	T	BSP 1/2"	BSP 1/2"	BSP 3/4"	BSP 3/4"	BSP 3/4"	BSP 3/4"	BSP 3/4"	BSP 3/4"
Service line	CMP	-	-	-	BSP1/8"	BSP1/8"	BSP1/8"	BSP1/8"	BSP1/8"
Outlet line	WP	BSP 3/8"	BSP 3/8"	BSP 1/2"	BSP 1"	BSP 3/8"	BSP 3/4"	BSP 1/2"	BSP 1"
Intake line	S	BSP 3/4"	BSP 3/4"	BSP 1"	BSP 2"	BSP 3/4"	BSP 1 1/4"	BSP 1"	BSP 2"
HYDRAULIC POWER REQUIREMENTS									
Oil flow max.	l/min (gpm)	40 (10.6)	50 (13.2)	70 (18.5)	85 (22.5)	85 (22.5)	115 (30.4)	115 (30.4)	140 (37.0)
Operating pressure	Δp . bar (psi)	210 (3000)	210 (3000)	210 (3000)	210 (3000)	210 (3000)	210 (3000)	240 (3500)	240 (3500)
Pressure max.	bar (psi)	210 (3000)	220 (3200)	210 (3000)	210 (3000)	250 (3600)	210 (3000)	250 (3600)	250 (3600)
HYDRAULIC FLUID REQUIREMENTS									
Viscosity	cSt	10-200 / optimum 25-35							
Temperature *	° C (° F)	max. 70 (158)							
Filter ratio	μm	25 or better							
Cooling capacity requirement	kW	2	2	3	4	4	6	5	6
PUMPING FLUID INTAKE REQUIREMENTS									
Suction head max	m (ft)	3 (9.8)							
Feed pressure	bar (psi)	-0,3...16 (-43.5...232)							
Water filter	mesh	80 or better							
OVERALL DIMENSIONS									
Length	mm (in)	160 (6.3)	160 (6.3)	170 (6.7)	175 (6.9)	140 (5.5)	240 (9.4)	195 (7.7)	175 (6.9)
Width	mm (in)	245 (9.6)	245 (9.6)	280 11.0)	345 (13.6)	290 (11.4)	330 (13.0)	314 (12.2)	400 (15.7)
Height	mm (in)	165 (6.5)	155 (6.1)	185 (7.2)	250 (9.8)	175 (6.9)	175 (6.9)	197 (7.8)	270 (10.6)
Weight	kg (lbs)	8 (17.6)	16 (35.2)	18 (39.6)	31 (68.3)	22 (48.5)	28 (61.7)	26 (57.3)	35 (77.2)

Gallons are U.S. liquid gallons

* READ CHAPTER "10. TECHNICAL SPECIFICATIONS"



HIGH PRESSURE WATER PUMPS TECHNICAL SPECIFICATIONS

		HPW 320 /75-125	HPW 800 /30-140	HPW 1600 /15-140	HPW 1000 /30-140	HPW 360 /220-360	HPW 300 /300-350	HPW 1200 /100-440
DISCHARGE CHARACTERISTICS								
Pumping fluid flow max.	l/min (gpm)	75 (19.8)	30 (7.9)	15 (4.0)	30 (7.9)	220 (58.0)	300 (79.2)	100 (26.4)
Pressure max.	bar (psi)	3200 (4600)	800 (11600)	1600 (23200)	1000 (14500)	360 (5200)	300 (4300)	1200 (17400)
Power	kW	40	40	40	50	132	150	200
Water/hydraulic pressure ratio		1,5	4	7,87	4	1,5	1,06	4
HYDRAULIC CONNECTIONS								
Pressure line	P	BSP 3/4"	BSP 3/4"	BSP 3/4"	BSP 3/4"	SAE 6000 1 1/4"	SAE 6000 1 1/4"	SAE 6000 1 1/4"
Return line	T	BSP 3/4"	BSP 3/4"	BSP 3/4"	BSP 3/4"	SAE 6000 1 1/4"	SAE 6000 1 1/4"	SAE 6000 1 1/4"
Service line	CMP	-	BSP 1/8"	BSP 1/8"	BSP 1/8"	BSP 1/8"	BSP 1/8"	BSP 1/8"
Outlet line	WP	BSP 1/2"	BSP 3/8"	HP 1/4"	MP 9/16"	SAE 6000 1" (BSP 3/4")	SAE 6000 1" (BSP 3/4")	MP 3/4"
Intake line	S	BSP 1 1/4"	BSP 3/4"	BSP 1/2"	BSP 3/4"	SAE 3000 2"	SAE 3000 2"	SAE 3000 2"
HYDRAULIC POWER REQUIREMENTS								
Oil flow max.	l/min (gpm)	125 (33.0)	140 (37.0)	140 (37.0)	140 (37.0)	360 (95.0)	350 (92.5)	440 (116.0)
Operating pressure	Δp. bar (psi)	240 (3500)	210 (3000)	230 (3300)	260 (3800)	250 (3600)	350 (5100)	300 (4300)
Pressure max.	bar (psi)	250 (3600)	210 (3000)	230 (3300)	280 (4100)	250 (3600)	350 (5100)	350 (5100)
PUMPING FLUID REQUIREMENTS								
Suction head max	m (ft)	3 (9.8)	2 (6.5)	-	-	3 (9.8)		-
Feed pressure	bar (psi)	-0,3...16 (-43.5...232)	-0,2...16 (-29...232)	1...16 (14.5...232)	5...20 (72.5...290)	-0,3...16 (-43.5...232)		1...16 (14.5...232)
Water filter	mesh	80 or better		625 or better		80 or better		625 or better
HYDRAULIC FLUID REQUIREMENTS								
Viscosity	cSt	10-200 / optimum 25-35						
Temperature *	° C (° F)	max. 70 (158)						
Filter ratio	µm	25 or better						
Cooling capacity requirement	kW	6	6	6	8	25	30	35
OVERALL DIMENSIONS								
Length	mm (in)	250 (9.8)	195 (7.6)	195 (7.6)	168 (6.6)	270 (10,6)	270 (10,6)	265 (10.4)
Width	mm (in)	344 (13.5)	340 (13.3)	405 (15.9)	379 (15.6)	745 (29,3)	745 (29,3)	915 (36)
Height	mm (in)	282 (11.1)	195 (7.6)	160 (6.3)	194 (7.6)	360 (14,2)	360 (14,2)	350 (13.8)
Weight	kg (lbs)	32 (70.4)	39 (85.9)	36 (79.3)	39 (85.9)	170 (374,7)	170 (374,7)	177 (390.2)

Gallons are U.S. liquid gallons

* READ CHAPTER "10. TECHNICAL SPECIFICATIONS"



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ELECTRICITY

HG Hydraulic Generator
HGV POWER BOX Variable Hydraulic Generator System
HGV Variable Hydraulic Generator System
HWG Hydraulic Welding Generator
HGG Hydraulic Ground Power Generator



HIGH PRESSURE WATER

HPW Hydraulic High Pressure Water Pump
HPW Hydraulic Power Washer
KPL High Pressure Street Washing Unit
HPW-DUST High Pressure Dust Suppression System
PPL High Pressure Pipe Cleaning Unit
HPW-FIRE High Pressure Firefighting System
FP Fire Fighting Piercing Kit
HDF Hydraulic Drilling Fluid Pump
JPL High Pressure Bin Washing System
HSP Hydraulic Submersible Pump



COMPRESSED AIR

HK Hydraulic Piston Compressor
HKL Hydraulic Rotary Vane Compressor
HKR Hydraulic Screw Compressor



MAGNET POWER

HMG PRO Hydraulic Magnet Generator
MAG Lift Magnet
HMAG PRO Hydraulic Magnet



VIBRATION

HVB Hydraulic Vibration Pump
HVD Hydraulic Directional Vibra
HVC Hydraulic Vibration Compactor
HRC Hydraulic Reversal Cylinder



POWER BOOSTING

HPI Hydraulic Pressure Intensifier
HPI-C Hydraulic Pressure Intensifier for Cylinder



KNOW-HOW

Hydraulic Power Take-off (PTO)
Hydraulic Power Unit Technology
HEU Hydraulic Expansion Unit
HRU Hydraulic Rescue Units
De-Icing Technology
Installation Valves
HHK Hydraulic Grinder
HV/HVY Hydraulic Winch / Winch Unit

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