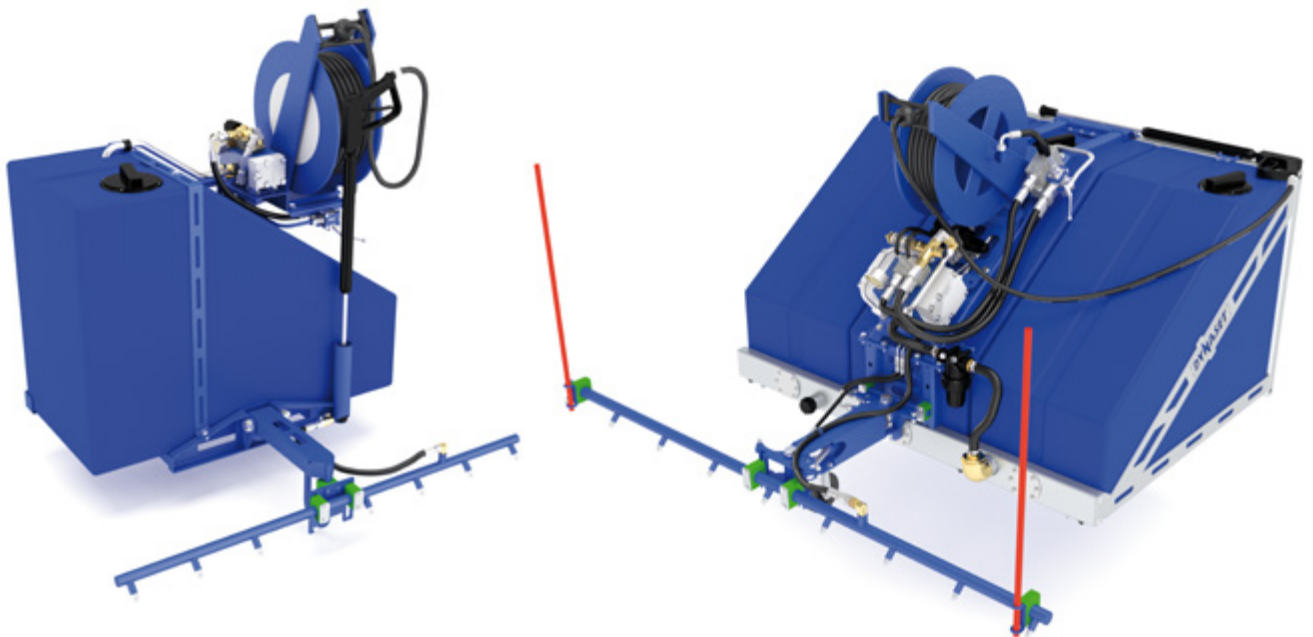




01/20
Rev 1.3

USER MANUAL

HIGH PRESSURE STREET WASHING UNITS



KPL

KPL - F

KPL - R

KPL - TRUCK





Congratulations!

You have just purchased DYNASET hydraulic equipment!

The equipment allows you to maximize the productivity and efficiency of your mobile machine. Read this User Manual before using your new equipment. It contains important information that will help you to take the full advance of the technical features available in your equipment.

Please contact us for any feedback you might have on our products. Your feedback is important to us for improving our products and customer service.

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1. GENERAL

This manual contains general information about assembly, installation, operation and maintenance of DYNASET KPL High Pressure Street Washing Unit.



ATTENTION!

Read and understand this user manual before installation, use or maintenance of the KPL unit to ensure proper handling, operation and maintenance right from the beginning. Pay attention to warnings and safety instructions. READ CHAPTER "2. SAFETY" for more information.

1.1. PRODUCT INFORMATION

DYNASET KPL High pressure street washing unit is a powerful accessory. It utilizes Dynaset HPW - Hydraulic High Pressure Water Pump, which transforms the hydraulic power of a working machine into high pressure water. The HPW pump is free of rotating parts, which makes it very durable and maintenance free.

Compact size, light weight and low water consumption make the KPL unit a cost-saving and work efficient solution. High pressure water digs dust and sand out from the pores in asphalt, concrete and similar surfaces. This way the surface will not emit dust after drying. Small water consumption makes it possible to wash large areas effectively even with a small vehicle, with less amount of water.

Street washing units raise the degree of working machine's versatility. With quick couplings the KPL units are easy to connect to different carriers. This guarantees optimal usability and best possible work results.

KPL Street Washing Units come in different models. The basic KPL Street washing Unit comes in four sizes S, M, L, XL. The basic model is a complete unit with street washing frame, pump unit and container.

The basic KPL units also include washing pistol and hose reel with 20 meter hose, which make cleaning of the apartment entrances, corners and other tight spaces effective and easy. Statues, park benches, road signs etc. can also be washed without prior arrangements with the handy washing pistol.

KPL-F is a modular unit, where you have the KPL washing frame unit as standard. The optional pump unit and the washing pistol with the hose reel can be installed separately to more suitable place according to the users needs. The KPL-F does not include the container, but can easily be connected to other water source or container, like a KPL-R.

KPL-R is also modular in sense that the container and the pump unit is combined and but does not include the street washing head. KPL-R can easily be combined with existing washing head or with KPL-F.

KPL TRUCK contains the washing head, pump unit and hose reel with washing pistol. It is designed for trucks and such vehicles.

The units and their combinations are presented in this chapter.

1.2. PRODUCT IDENTIFICATION KEY

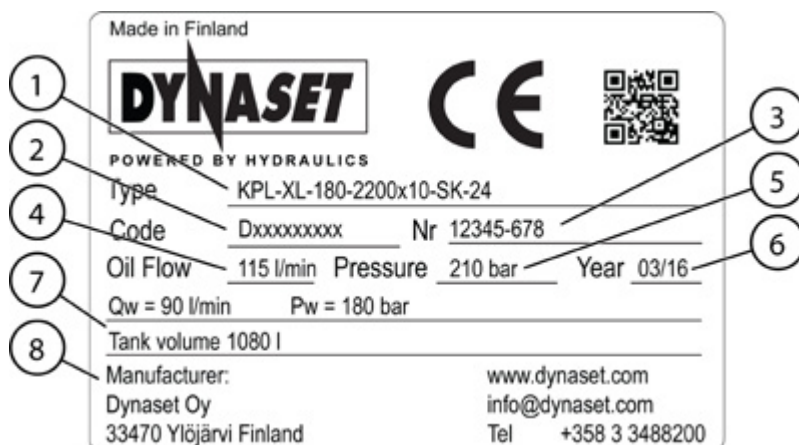
KPL - XL - 180 - 2200x10 - SK-24

(1) (2) (3) (4) (5)

Picture 1: Identification key for KPL units

1. Product group KPL Street Washing Unit.
2. Size (listed below)
 - S = 1 water tank, 270 liters.
 - M = 2 water tanks, 540 liters.
 - L = 3 water tanks, 810 liters.
 - XL = 4 water tanks, 1080 liters.
3. Maximum water pressure (bar) of HPW pump in KPL.
4. Washing pipe length (mm) and count of water nozzles.
5. Turning Device control (listed below)
 - M = Manual
 - HK = Hydraulic turning control.
 - SK = Electric turning control with 12V or 24V control voltage.

1.3. TYPE PLATE

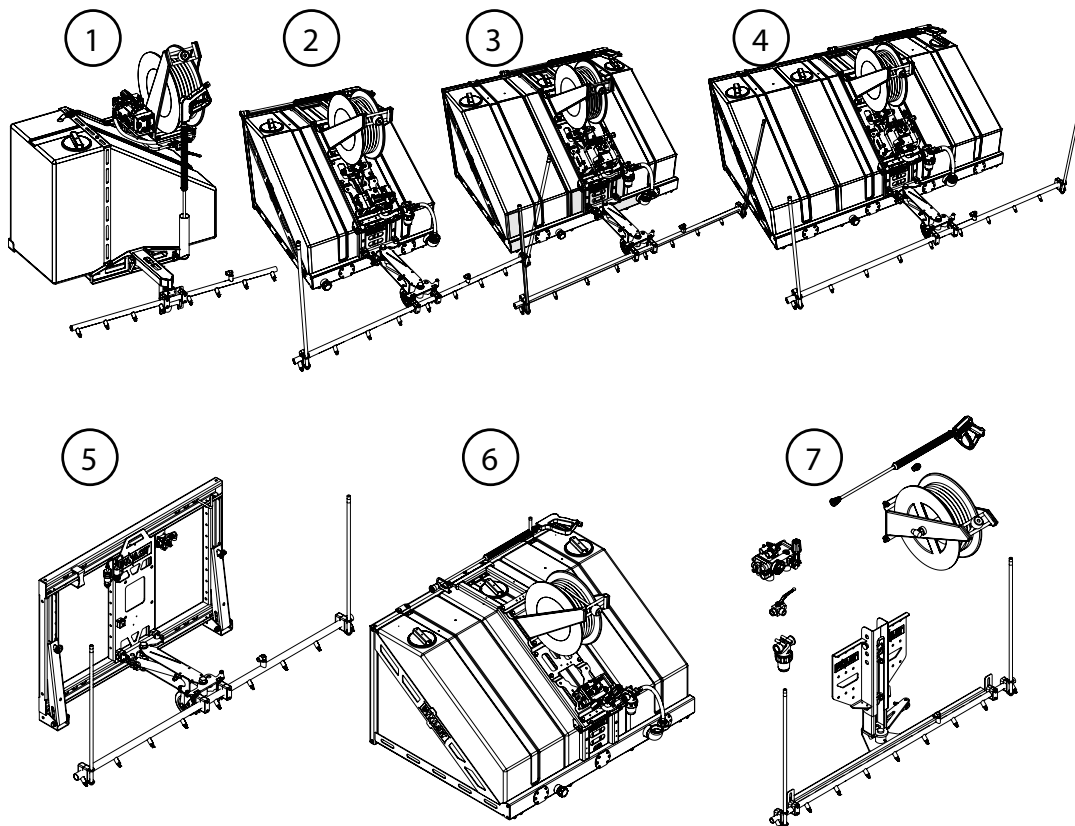


Picture 2: Type plate

The products type plate shows the following information.

- | | |
|-------------------------------|---|
| 1. Product identification key | 6. Production month / year |
| 2. Product code | 7. Output water flow rate and pressure. |
| 3. Serial number | 8. Manufacturer's contact information |
| 4. Maximum hydraulic flow | |
| 5. Maximum hydraulic pressure | |

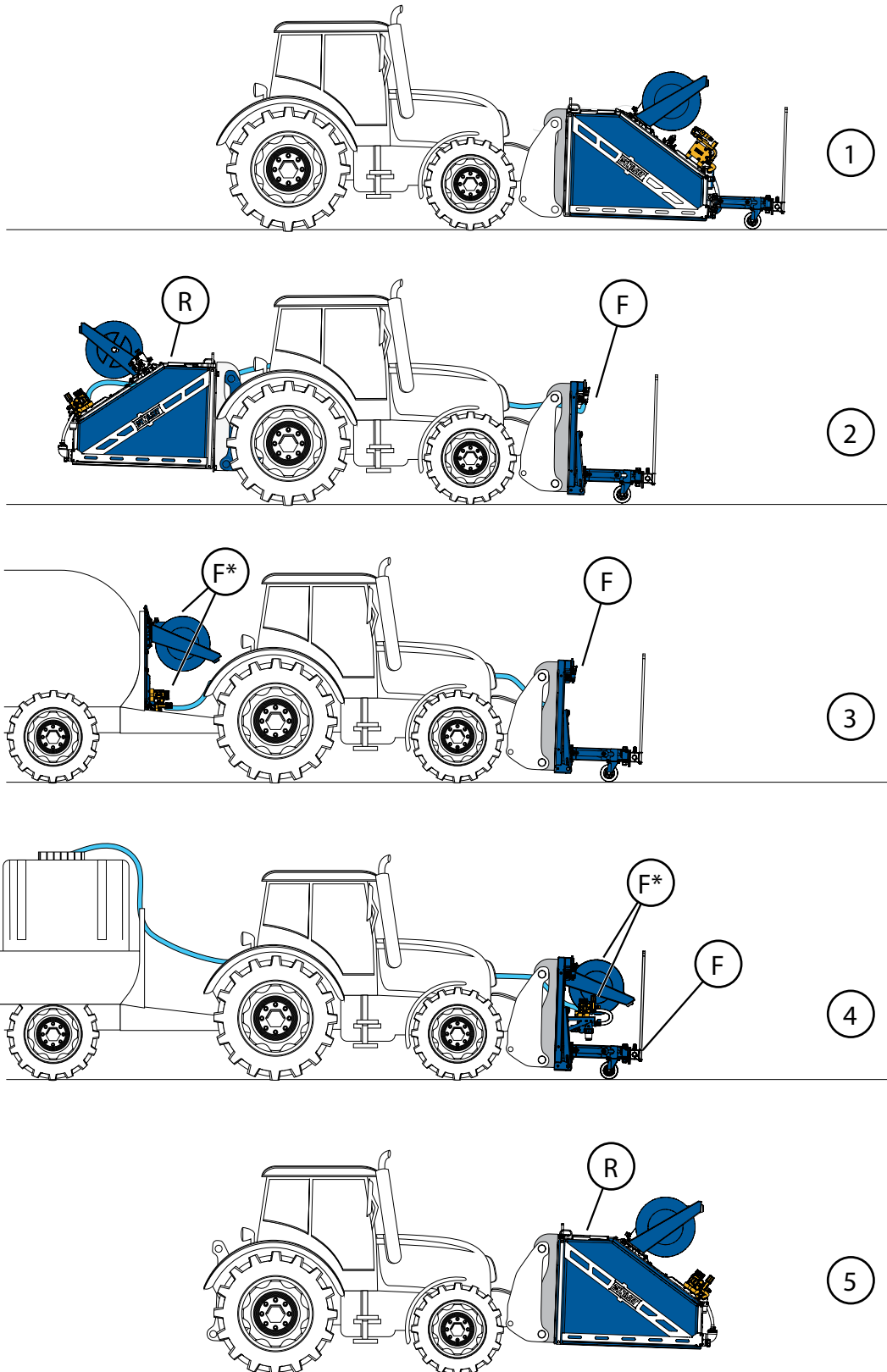
1.4. KPL UNIT LINE-UP



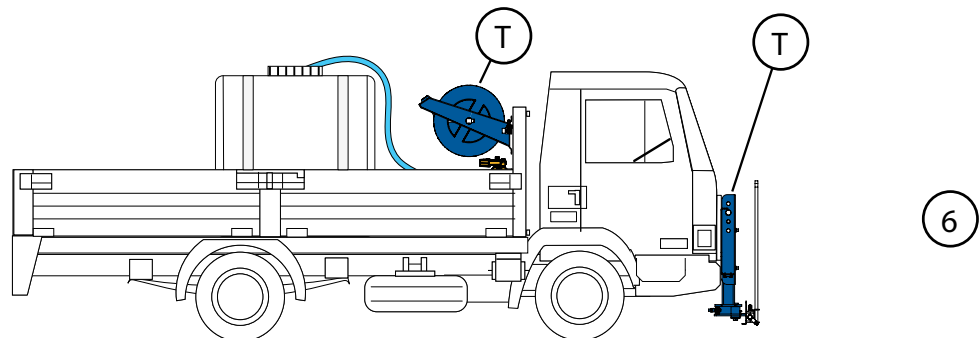
Picture 3: KPL unit line-up

KPL MODELS			
1.-4. BASIC	5. KPL-F	6. KPL-R	7. KPL-TRUCK
1. KPL S 250	KPL-F-1650x9x6501	KPL-R-M-250	KPL-TRUCK-250-1650x9
2. KPL M 250	KPL-F-2200x10x65015	KPL-R-L-250	KPL-TRUCK-220-2200x10
3. KPL L 250	KPL-F-1850x9x65015	KPL-R-L-220	KPL-TRUCK-90-2200x10
3. KPL L 220	KPL-F-2200x10x6503	KPL-R-XL-220	KPL-TRUCK-180-2200x10
4. KPL XL 220	-	KPL-R-XL-180	-
4. KPL XL 180	-	-	-

1.5. USE AND COMBINATIONS OF KPL UNITS



Picture 4: KPL Combinations

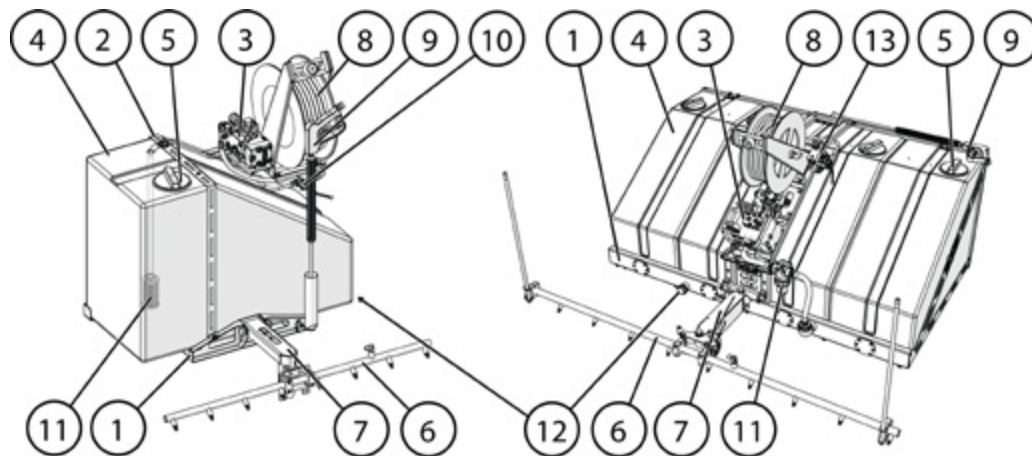


Picture 5: KPL Combinations

1. Basic KPL is a standalone unit for street and power washing. It comes in four standard sizes S, M, L, XL.
2. A tractor equipped with a KPL F in the front and the KPL-R on the rear. The KPL-F contains the washing pipe and the KPL-R has the container, pump unit and washing pistol with the hose reel.
3. Here is a combination of the standard KPL-F and optional KPL-F Pump unit and KPL-F Hose reel unit. Combination enables more modular placement of the washing setup on the working machine.
4. Another combination with the standard KPL-F, optional KPL-F Pump unit and KPL-Hose reel unit. This is perfect for those who already have a water container and want to have the washing pistol ready and available in the front of the machine.
5. The KPL-R has, as standard, container, pump unit, a washing pistol and hose reel so it can also be used as a standalone unit for power washing.
6. KPL Truck is designed to be installed on trucks, pick-ups and similar vehicles. It contains, as standard, washing pipe frame, pump unit and washing pistol with a hose reel.

MODEL	MAIN COMPONENTS						
	WASHING PIPE FRAME	PUMP UNIT	WATER FILTER	VALVES	CONTAINER	WASHING PISTOL	HOSE REEL
KPL Basic	x	x	x	x	x	x	x
KPL F	x						
KPL F* Pump unit		x	x	x			
KPL F* Washing Pistol unit						x	x
KPL R		x	x	x	x	x	x
KPL TRUCK	x	x	x	x		x	x

MAIN COMPONENTS OF KPL UNIT



Picture 6: Main components of KPL unit

- | | |
|------------------------|----------------------------------|
| 1. Frame | 8. Hose reel |
| 2. Support | 9. Washing pistol |
| 3. HPW pump | 10. 3-way water valve |
| 4. Water tank | 11. Water filter |
| 5. Water fill cap | 12. Drain plug |
| 6. Street washing pipe | 13. 3-way oil flow limiter valve |
| 7. Turning device | |

The KPL-F, KPL-R and KPL-TRUCK have different appearance but the components are the same.

2. SAFETY

2.1. SAFETY PRECAUTIONS



ATTENTION!

Operators and maintenance personnel must always comply with local safety regulations and precautions in order to close out the possibility of damages and accidents.

The pressure in both hydraulic oil and water circuits of KPL unit is considerably high. Keep the condition of your equipment and hydraulic system under constant observation.



WARNING

HIGH PRESSURE WATER AND OIL!

Can cause severe injuries.
Always wear appropriate clothing
and safety equipment.



Couplings, valves and hoses need to be kept tight and clean to avoid possible leakages. Leaks in the hydraulic system must be repaired immediately to avoid injuries caused by high pressure blowouts.

In order to avoid accidents, it is not allowed to clean or inspect KPL unit when hydraulic fluid circuit is pressurized. Prior to any cleaning, inspection and service, hydraulic system of your base machine must be stopped and all hydraulic fluid circuits must be depressurized.

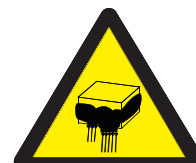
Prevent nozzles, water circuit and pipeline from freezing. Draining and air flushing of the water circuit have to be performed before ambient temperature reaches 0°C or lower.



CAUTION

PREVENT FROM FREEZING!

Frozen water inside the unit can permanently damage the unit. Always make sure the unit is properly drained and flushed after use in cold weather. In case this is not possible, mix environment friendly anti-freeze liquid to the water.



2.2. SAFETY EQUIPMENT

When operating close to the KPL unit, wear appropriate clothing and safety equipment such as safety goggles, safety shoes and ear protection.



2.3. OPERATING SAFETY

When operating the KPL unit, beware of the unit parts warmed by hot hydraulic oil.

**WARNING**

RISK OF BURNS!

The unit parts and hydraulic oil can be hotter than 80 °C!

Wear personal safety equipment!



Never aim high pressure water at a person.

**WARNING**

HIGH PRESSURE WATER!

Never aim high pressure water at a person.
This can cause severe injuries.



ATTENTION!

Do not exceed the maximum pressure, temperature or load.

ATTENTION!

Always detach KPL unit on to a firm and level surface for storage. Always storage in a way that the unit can't fall or cause damage.

 ATTENTION!

Always make sure that the KPL unit is properly coupled to the mobile machine. Dropping the KPL can damage the unit or cause injury.

 ATTENTION!

KPL unit can propel small rocks and objects to its surrounding. Make sure that no people is in close range when using the street washing head.

 ATTENTION!

When using the KPL units, do not leave fingers or anything else between the washing pipe, support legs and frame.

2.4. MAINTENANCE SAFETY

 ATTENTION

Installation and service of hydraulic equipment must be performed by qualified and experienced personnel only.

 NOTE!

When carrying out any maintenance to KPL unit keep the components of the system clean. This is to ensure safe, reliable and longlife operation of your equipment.

Hydraulic system of the base machine should be maintained according to the service program.

Always use eye protection when using high pressure air in maintenance. Do not aim compressed air at people or yourself, it can cause serious injury.

**WARNING**

HIGH PRESSURE AIR!
Never aim compressed air at a person or animal. Can cause severe injuries.



2.5. WARNING LABELS

Product recipient is obligated to place warning labels on the DYNASET product. Attach labels to visible and appropriate place onto or close to DYNASET product where it's easily seen. Clean surface with solvent detergent before attaching labels.



READ OPERATING
INSTRUCTIONS.



USE EAR PROTECTION
AND SAFETY
GOGGLES.



KEEP FROM
FREEZING.



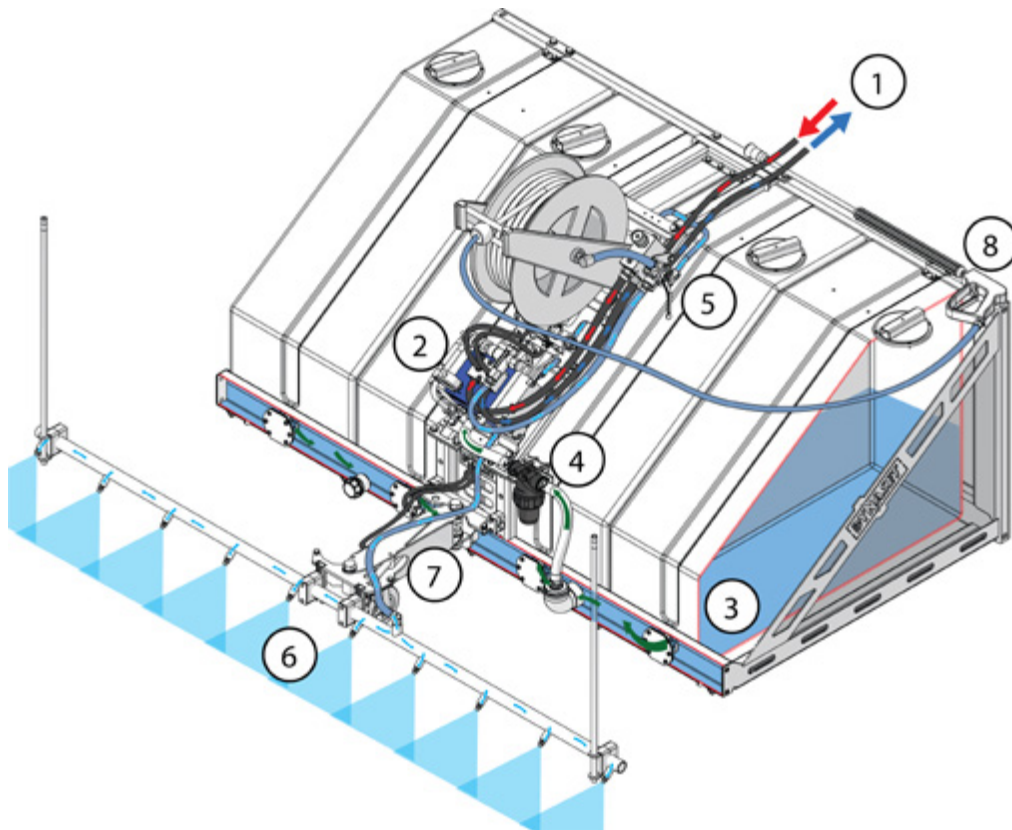
BEWARE OF HIGH
PRESSURE SPLATTERS.



BEWARE OF HOT
SURFACE.

3. OPERATING PRINCIPLES

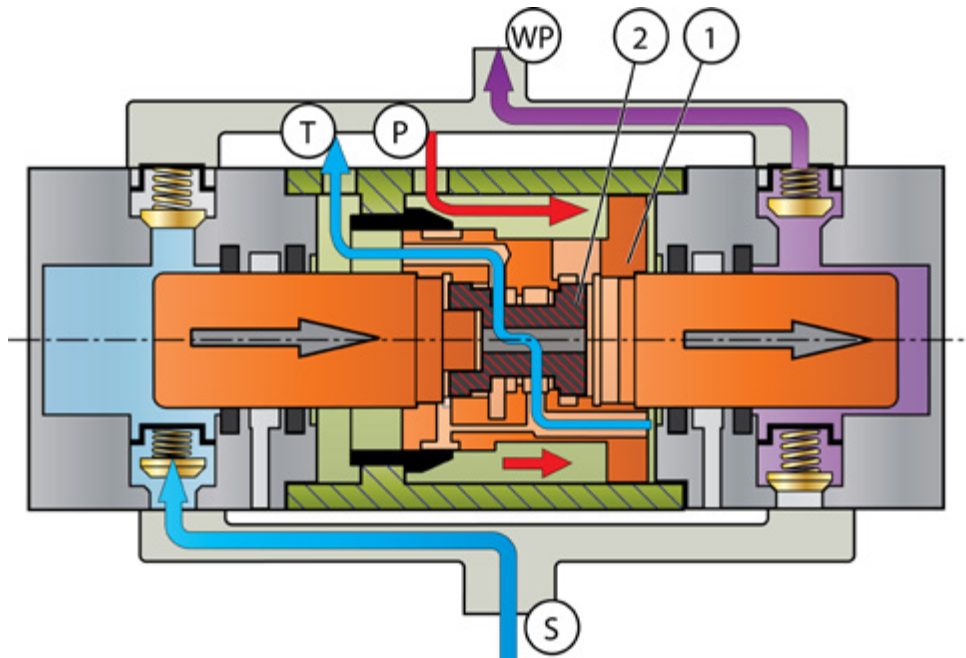
3.1. OPERATING DESCRIPTION



Picture 7: Operating description of KPL unit

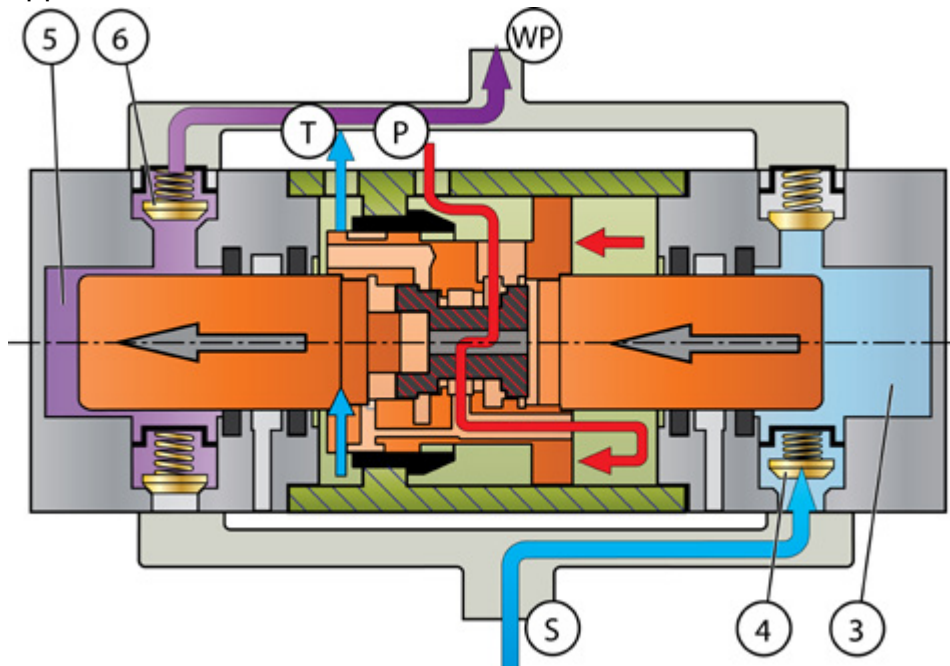
HPW pump (2) of the KPL unit is driven by hydraulic oil flow (1) from the base machine. The HPW pump self-primers water from a water tanks (3) and water is filtered with a water filter (4). High pressurized water flows from the HPW pump to 3-way valve (5), where the water can be directed to street washing pipe (6) or to washing pistol (8). The steering angle and the position of the street washing pipe can be adjusted with turning device (7) in KPL M, L and XL models. In KPL S model steering angle can be adjusted manually.

The patented HPW-pump utilizes the reciprocal motion of the hydraulic piston.



Picture 8: Operating description of HPW pump 1

HPW-pump is driven by hydraulic flow through the hydraulic ports (P) and (T). Hydraulic flow moves the piston assembly (1) into its extreme position. After extreme position reached, reversal valve (2) inside the piston assembly changes the direction of hydraulic flow and the piston assembly starts to move into the opposite direction.



Picture 9: Operating description of HPW pump 2

Move of the piston assembly creates pressure and suction. Pump self-priming from water supply line (S) and generates pressure into pressure line (WP). When piston assembly moves away from head it creates underpressure (3) and water (or other pumping fluid) is sucked through intake valve (4) into head. When water piston moves towards the head, it creates pressure (5) and water is pushed through pressure valve (6) into pumping fluid outlet (WP).

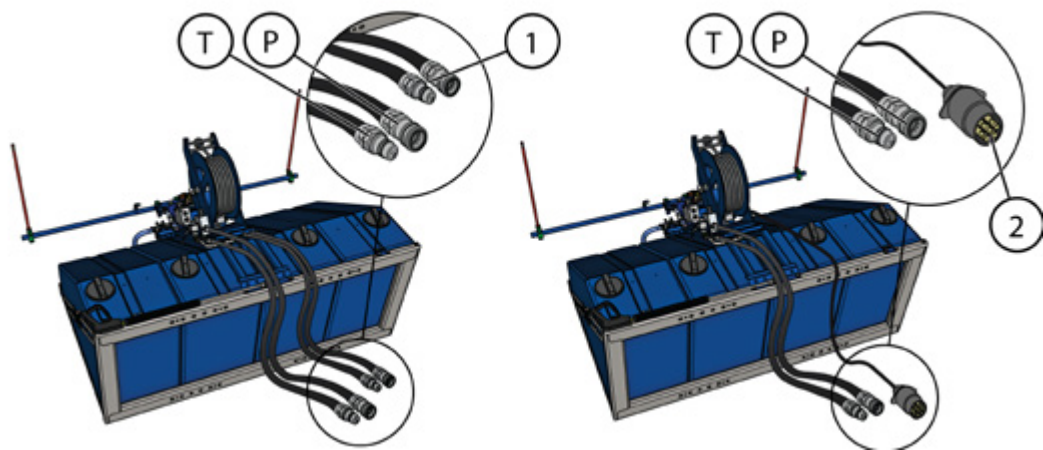
4. INSTALLATION OF THE KPL UNIT

4.1. INSTALLATION TO A HYDRAULIC TOOL LINE

The KPL unit is recommended to be installed into the base machine's existing hydraulic tool line. Usually other installations are not required and the KPL unit can be operated from the existing controls.

Install the hydraulic tool lines **pressure (P)** and **return (T)** ports to their corresponding ports in the KPL unit.

KPL unit is equipped either with hydraulic, electric, or manual turning device control. Hydraulic connection of turning device is connected to other hydraulic tool line connection ports.



Picture 10: Connections of KPL unit

1. Hydraulic connection of turning device control

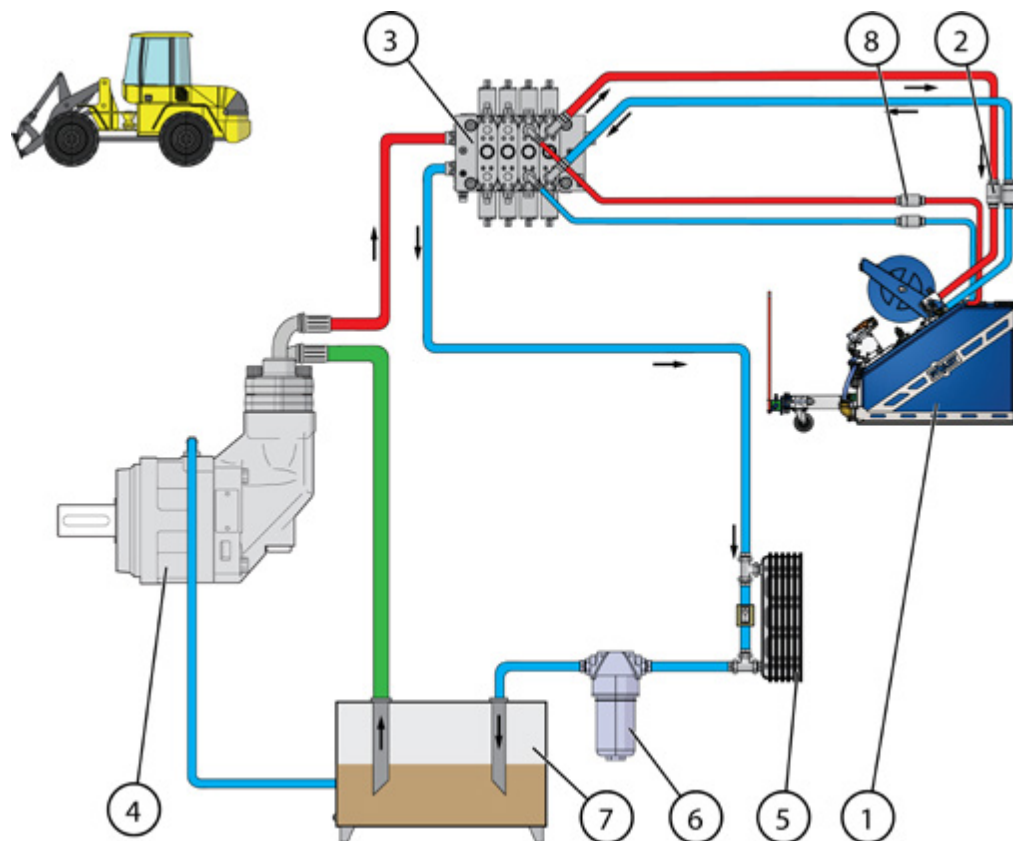
2. Electric connection of turning device control

Ensure that the hydraulic flow of the base machine is sufficient to run the unit. At least the nominal hydraulic flow must be available to get the maximum washing power. Lower hydraulic flow reduces washing power.

ATTENTION!

Ensure that the filtering degree and cooling capacity of the hydraulic system are sufficient. Read chapter "10. TECHNICAL SPECIFICATIONS" for more information..

In the picture 9 is an example of installing the KPL unit with hydraulic turning control into a existing tool line.



Picture 11: Exaple of existing tool line installation

- | | |
|--|--|
| 1. DYNASET KPL unit | 5. Oil cooler |
| 2. Quick couplers for hydraulic connection | 6. Oil filter |
| 3. Open centre directional control valves | 7. Oil tank |
| 4. Base machines displacement pump | 8. Quick couplers for turning device (HK-models) |

4.2. HYDRAULIC FLUIDS

To use proper hydraulic fluid Read chapter "6.2. Hydraulic fluids" for more information..

4.3. QUICK ATTACHMENTS

DYNASET KPL can be connected to the base machine with quick attachments.

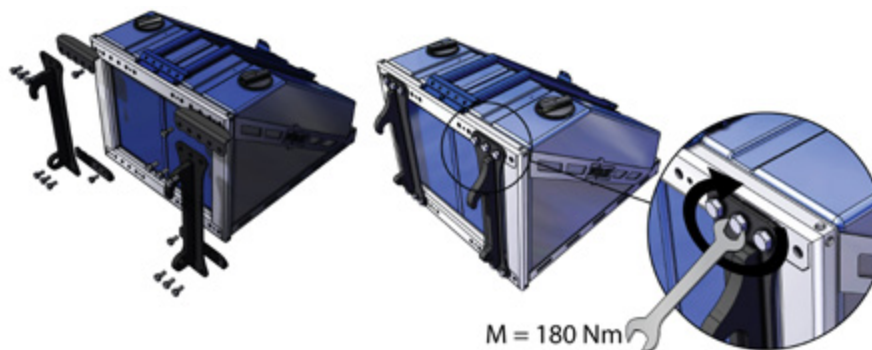


Picture 12: Quick couplings

Check available quick attachments from chapter "10. TECHNICAL SPECIFICATIONS"

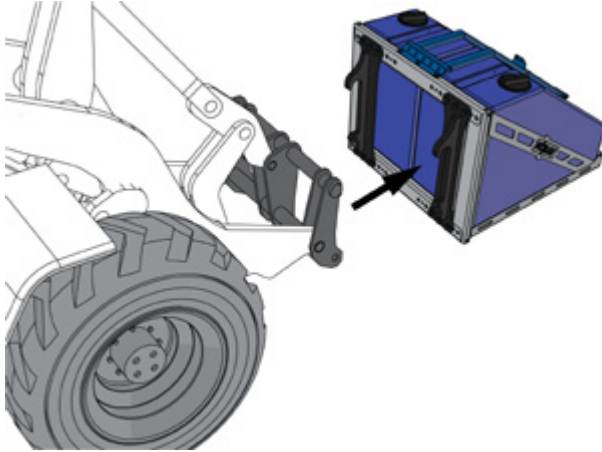
4.4. INSTALLATION TO THE BASE MACHINE

To install KPL unit to your base machine, install suitable quick coupling in to your KPL unit. If installing quick couplings to a KPL M unit, you may need adapters.



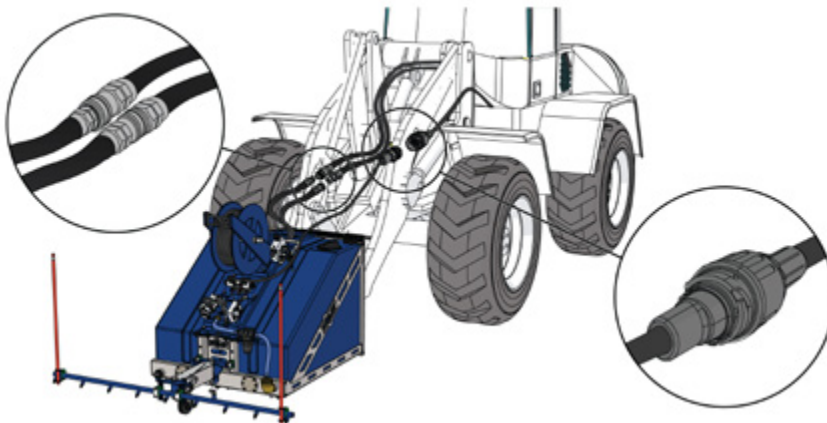
Picture 13: Quick couplings with adapter

Attach KPL unit into your base machines mounting plate.



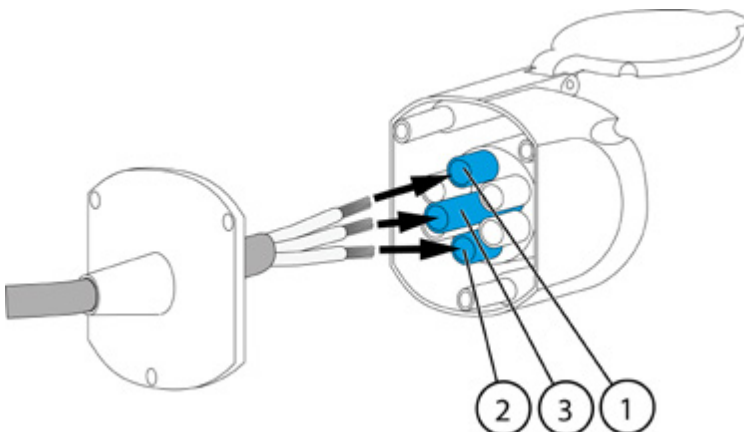
Picture 14: Attach KPL into your base machine

Connect hydraulic hoses and electric cable if washing pipe turning is electrically controlled.



Picture 15: Connect hydraulic connections and turning device connections

4.5. ELECTRIC TURNING DEVICE CONTROL SOCKET CONNECTION



Picture 16: Electric turning device control socket connection

1. **1/L** Cylinder extend
2. **4/R** Cylinder retract
3. **58L** Ground

**NOTE!**

READ CHAPTER 11. APPENDIX for electric schematic

4.6. SETTING KPL-F UP FOR OPERATION / STORAGE

**ATTENTION!**

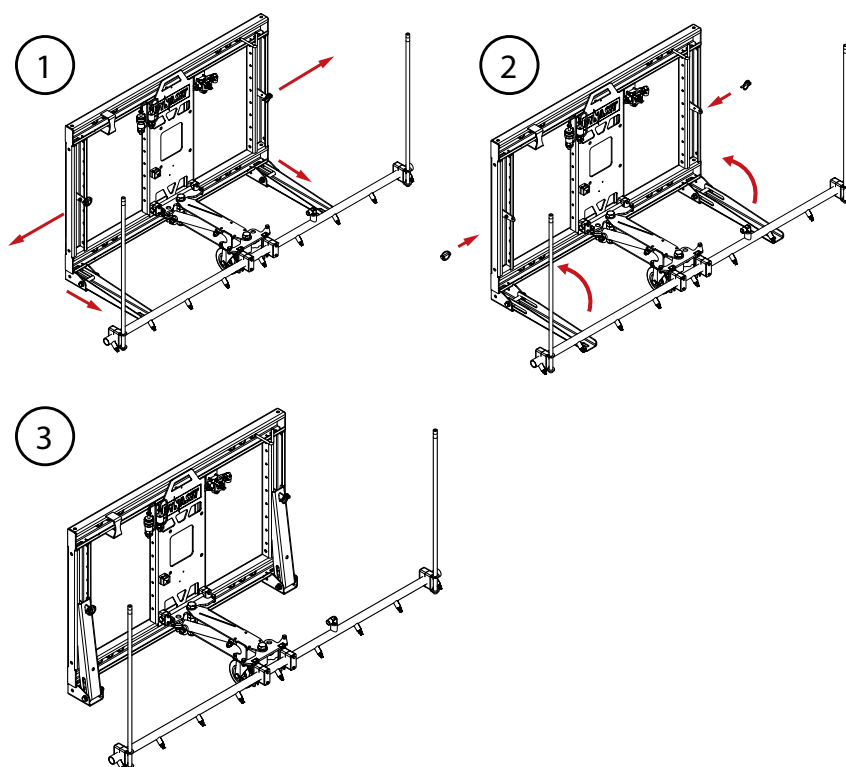
Always attach the KPL-F unit on to the working machine before setting it up to operation by lifting the support legs.

**CAUTION****PREVENT FROM FREEZING!**

Frozen water inside the unit can permanently damage the unit. Always make sure the unit is properly drained and flushed after use in cold weather. In case this is not possible, mix environment friendly anti-freeze liquid to the water.



Prevent nozzles, water circuit and pipeline from freezing. Draining and air flushing of the water circuit have to be performed before ambient temperature reaches 0°C or lower.



Picture 17: Setting the KPL-F in operation and for storage

Set the KPL-F for operation by lifting the support legs up:

- 1.Remove the tap and pull the support legs outward
- 2.Push the support legs up
- 3.Plug the tap to secure the leg in upright position

To put the KPL-F back into the storage configuration, just reverse the procedure.

⚠ ATTENTION!

When using the KPL units, do not leave fingers or anything else between the washing pipe, support legs and frame.

⚠ ATTENTION!

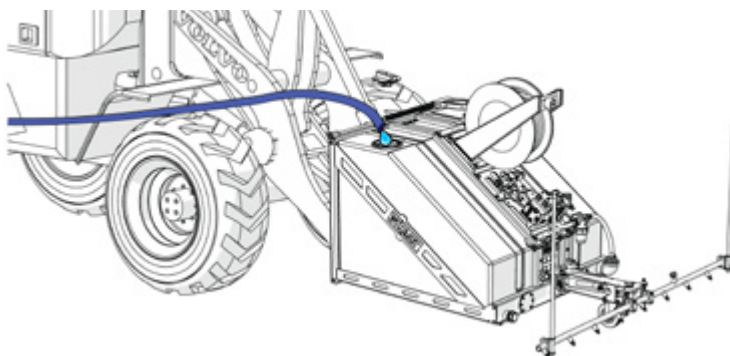
Always detach KPL unit on to a hard, level surface for storage. Always storage in a way that the unit cant fall or cause damage.

5. OPERATION

After having ensured the proper mechanical and hydraulic installation of the KPL unit it is ready for use.

5.1. BEFORE OPERATING THE KPL UNIT

1. Fill the water tank with clean water.

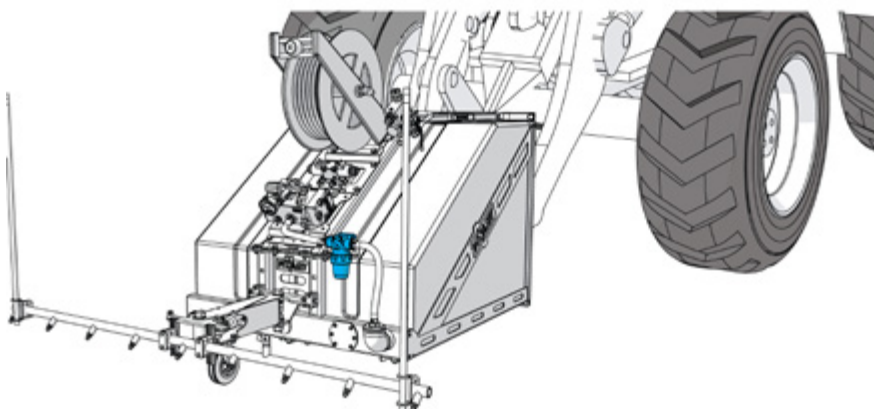


Picture 18: Fill the water tank

! NOTE!

**Maximum water temperature is 45 °C.
Do not exceed the maximum temperature.**

2. Ensure that the water filter is clean and in place.



Picture 19: Location of water filter

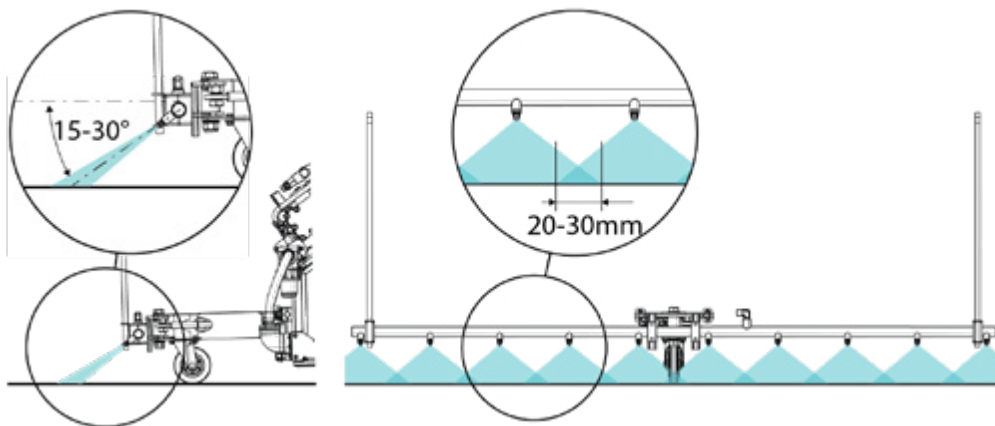
3. Adjust the washing angle of the washing pipe as instructed in CHAPTER „5.3. Adjusting washing angle“

5.2. STARTING AND STOPPING THE KPL UNIT

To start and stop the KPL unit turn on/off the hydraulic flow in to the hydraulic line where KPL unit is installed, for example hydraulic tool line.

5.3. ADJUSTING WASHING ANGLE

Washing angle should be 15-30 degree and the height of washing pipe should be positioned so that the water jets cross each other 20-30 mm before hitting ground.



Picture 20: Washing angle

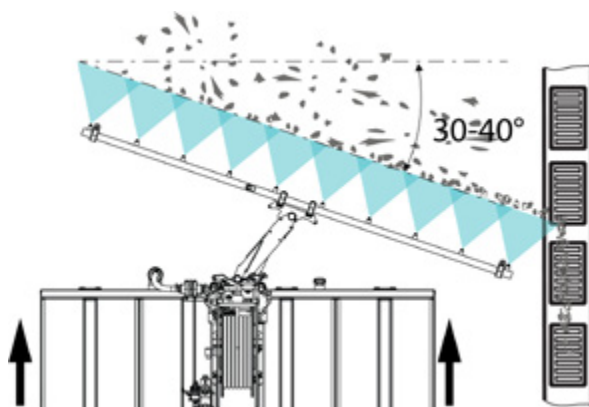


ATTENTION!

Wrong positioning of the washing pipe can cause washing power loss up to 50 %.

5.4. ADJUSTING STEERING ANGLE

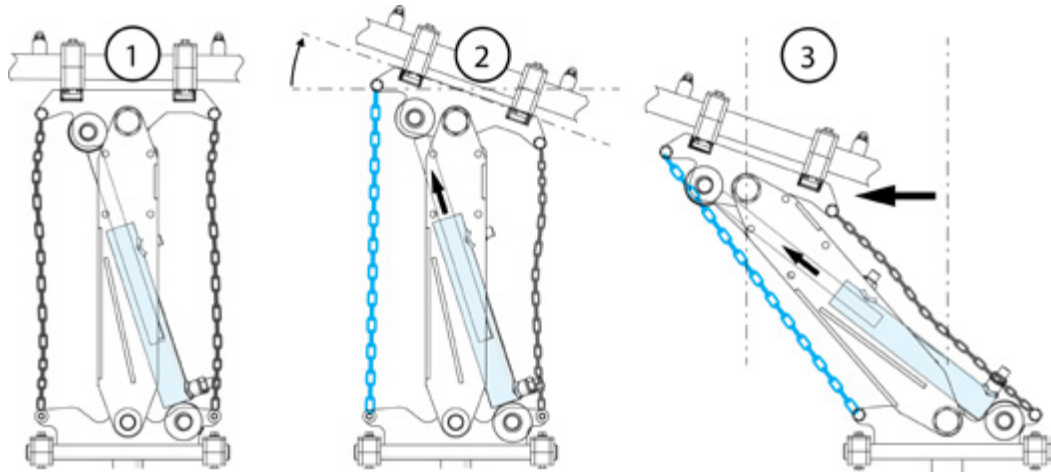
The steering angle of the washing pipe determines the direction where the dirt is moved to. The steering angle of 30 - 40° is most effective. High pressure water jets work as dozer blade, moving dirt along the washing pipe to its other end and further aside.



Picture 21: Steering angle

In KPL M, L , XL and KPL-F models steering angle can be adjusted with turning device and in KPL S turning angle can be adjusted manually.

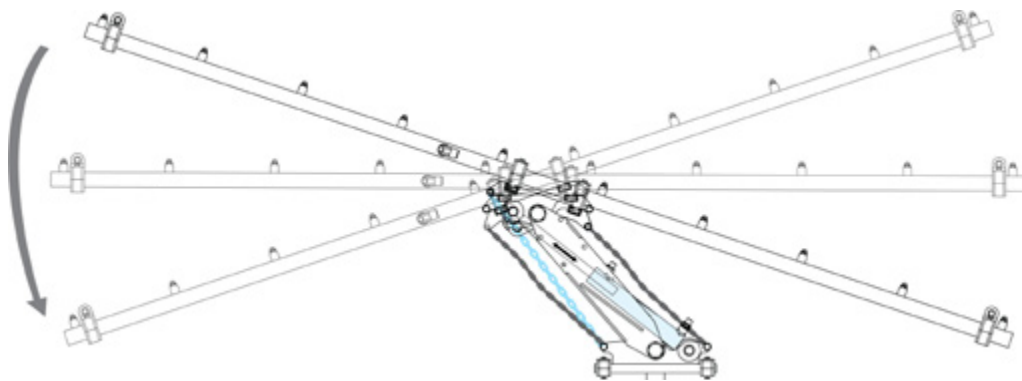
To adjust steering angle in KPL M, L , XL and KPL-F models extend (or subtract depending desired direction) the cylinder of the turning device. In KPL-TRUCK the turning method is similar but the structure of the device is different. In KPL-TRUCK there is no horizontal movement on the washing pipe.



Picture 22: Adjusting steering angle

To position the washing pipe left or right, extend or subtract the cylinder of the turning device until the other chain is tight. Keep extending the cylinder and the turning device rotates to the direction of the tight chain. After desired position of the washing pipe is achieved stop extending the cylinder of the turning device.

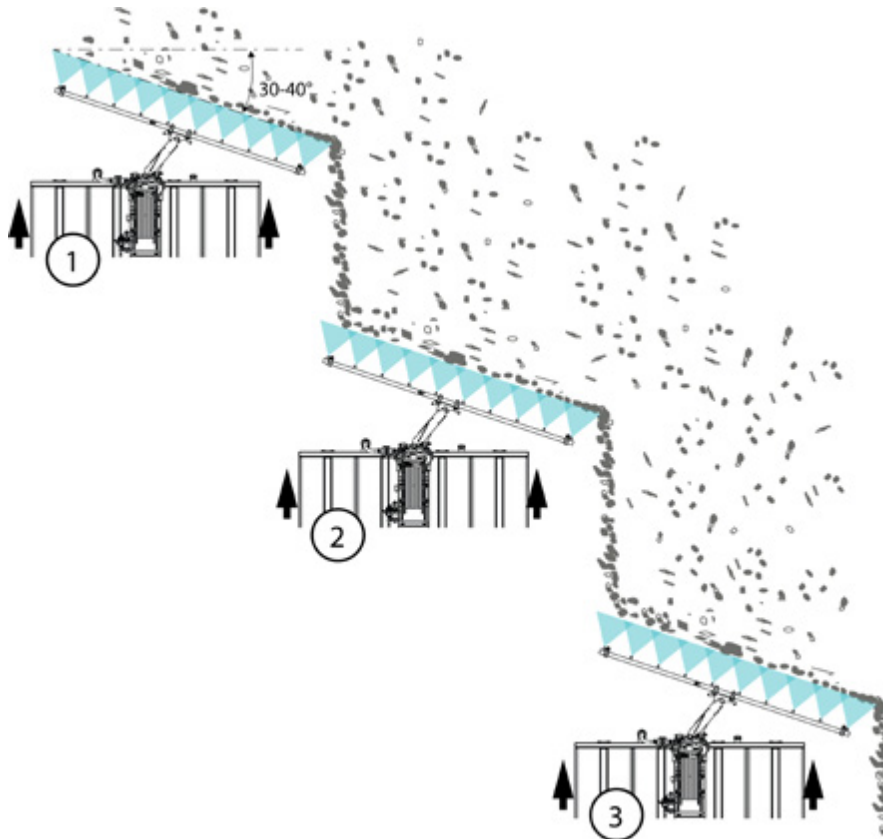
The steering angle of washing pipe can be adjusted after positioning of the washing pipe.



Picture 23: Steering angle in far left position of turning device

5.5. WASHING

When washing large area, it is recommended to start job from the highest point of the area to be washed. When washing the first lane the dirt runs with the washing water and is moved side to next lane. Wash the area one lane at the time until the whole area is clean.



Picture 24: Washing large area

5.6. WORKING IN COLD TEMPERATURES

To prevent pipes and KPL unit from freezing in cold season the pump, water lines and water tank should be dewatered after a working shift. Open the drain plug of the water tank and drain out the water. After tank is empty run the pump dry for a while until all water is removed from water circuit.



ATTENTION!

Prevent the KPL unit from freezing.

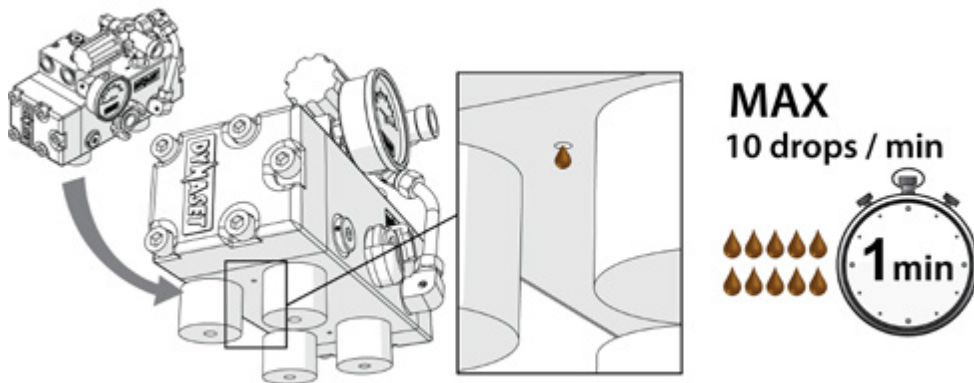
6. MAINTENANCE

6.1. MAINTENANCE INTERVAL

All maintenance must be complied with as they are scheduled in this manual. The following table provides maintenance schedule for DYNASET KPL units.

CHECK POINTS	Daily	After daily use	Every 1500 hours or if necessary
Observe HPW pumps leakage detectors	x		
Clean KPL unit		x	
Clean water intake filter	x	x	
Change water intake filter			x
Change filter of nozzles			x
Change HPW pump sealings			x

Check constantly whether the fluid dropping from pump's leakage detectors is growing. Replace sealing in proper time to exclude intermixing of hydraulic oil and pumping fluid. Sealings replace instructions can be found in HPW User Manual.



Picture 25: Location of leakage detectors in HPW

6.2. HYDRAULIC FLUIDS

Wide range of standard hydraulic fluids can be used with DYNASET hydraulic equipment. Depending on the operating temperature, following mineral hydraulic oils are recommended:

Mineral hydraulic oil	Operation temperature up to
ISO VG 32S	60 °C
ISO VG 46S	70 °C
ISO VG 68S	80 °C

! NOTE!

Recommended oil viscosity is between 10 to 35 cSt when operating at normal operating temperature.

Synthetic and bio-oils can also be used if their viscosity characteristics and lubricating efficiency are similar to the mineral oils.

Automatic transmission fluids and even engine oils can be used, provided that they are allowed to be used in hydraulic system of your base machine.

For the hydraulic fluid change interval follow the base machine's maintenance instructions.

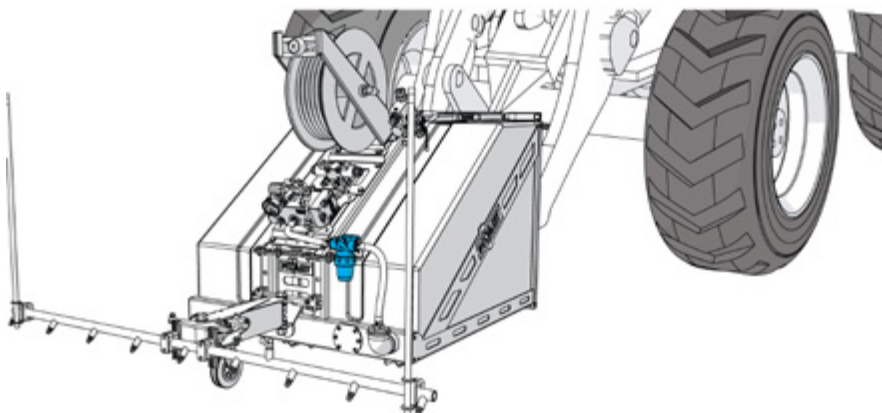
To use special hydraulic fluids with DYNASET equipment, please contact the nearest DYNASET representative for more information.

6.3. CLEAN THE KPL UNIT**! ATTENTION!**

Keep the KPL unit clean to enable its safe and longlife operation. Check and clean your KPL unit after every work shift.

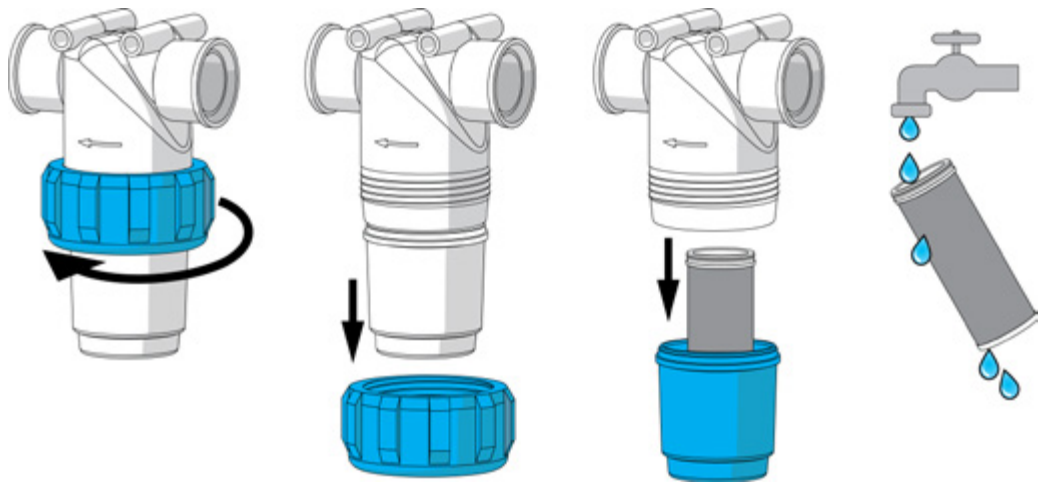
6.4. CLEAN WATER FILTER

Water filter is located in front of the water tank.



Picture 26: Location of water filter in KPL M, L and XL

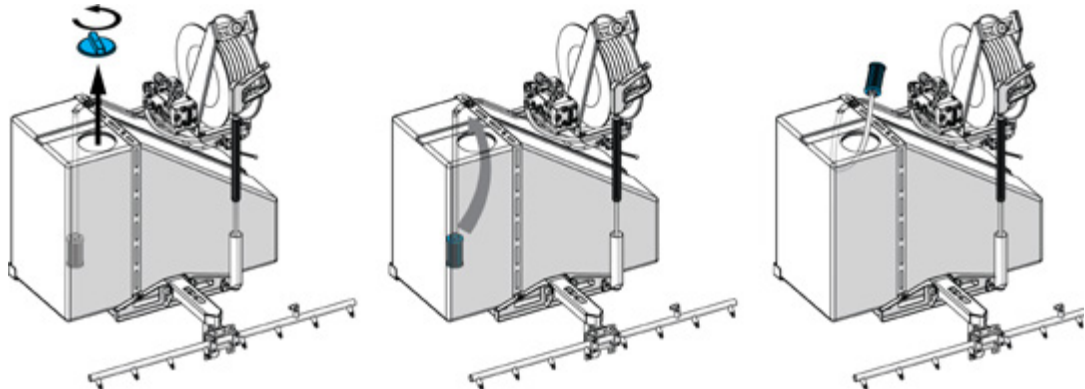
Check and clean water filter every 3 months in KPL M, L and XL models, replace if necessary. Check and replace water filter every 3 months in KPL S.



Picture 27: Clean water filter in KPL M, L and XL

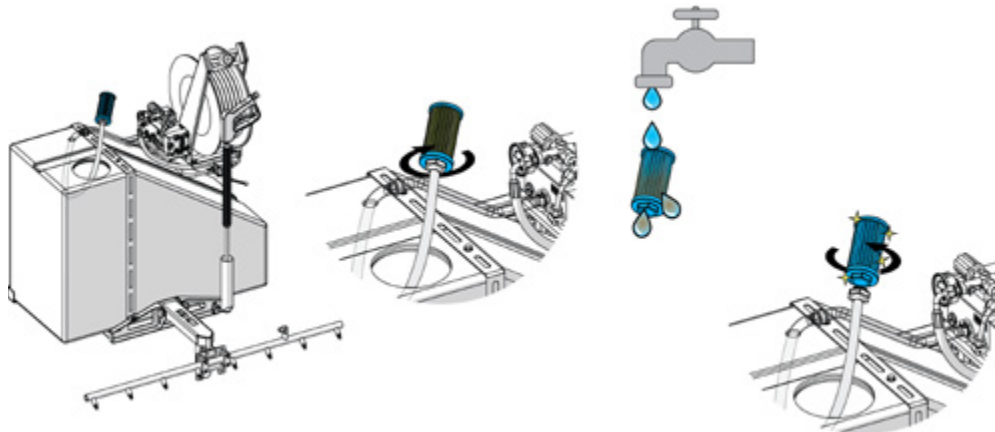
Remove the water filter in KPL M, L and XL models. Wash the water filter under clean water to remove all soil and dirt from the filter. Install clean filter back to the KPL unit.

In KPL S model water filter is located inside the water tank.



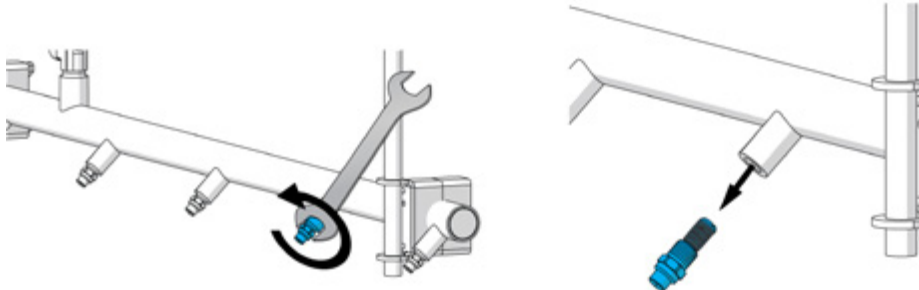
Picture 28: Location of water filter in KPL S

To clean or replace the water filter, open water tank cover and pull out the water filter.

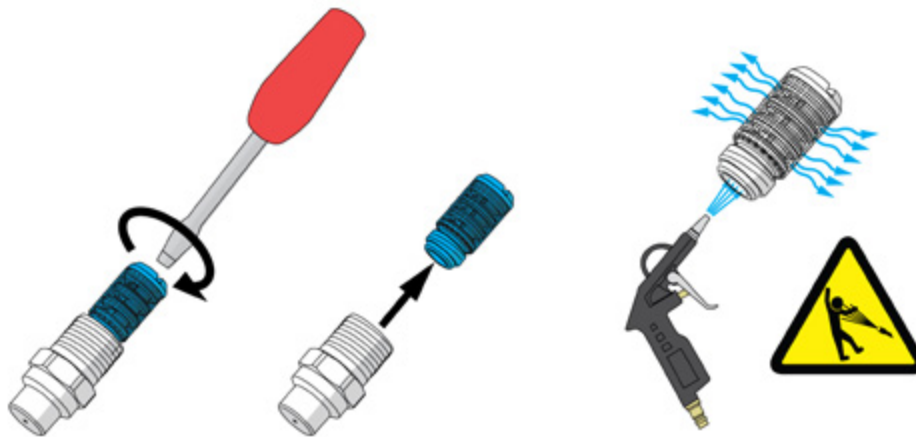


Picture 29: Clean water filter in KPL S

Remove the water filter from the suction hose and clean the filter or install new water filter if necessary.

6.5. CLEAN NOZZLE FILTER

Picture 30: Remove nozzle from street washing pipe



Picture 31: Remove and clean nozzle filter

Remove nozzle filter from the nozzle. Use air blow gun to clean clogged nozzle filter. Re-install clean nozzle filter to nozzle and to street washing pipe.

Always use eye protection when using high pressure air. Do not aim compressed air at people or yourself, it can cause serious injury.

 WARNING	
HIGH PRESSURE AIR! Never aim compressed air at a person or animal. Can cause severe injuries.	

6.6. 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
KPL unit 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.

FAILURE	REASON	CORRECTIVE ACTION
KPL unit does not deliver water	No water in tanks.	Check and fill the water tank.
	Intake hose detached or hose breathes.	Check and fix the hose and connectors.
	Water supply line clogged.	Check water filter and clean thoroughly.
	Nozzle is clogged	Check and clean nozzle filter.

Troubleshooting for HPW pump can be found in HPW User Manual.



HIGH PRESSURE STREET WASHING UNITS MAINTENANCE

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 STREET WASHING UNITS 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

RoHS directive 2015/863

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: KPL High pressure street washing units

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



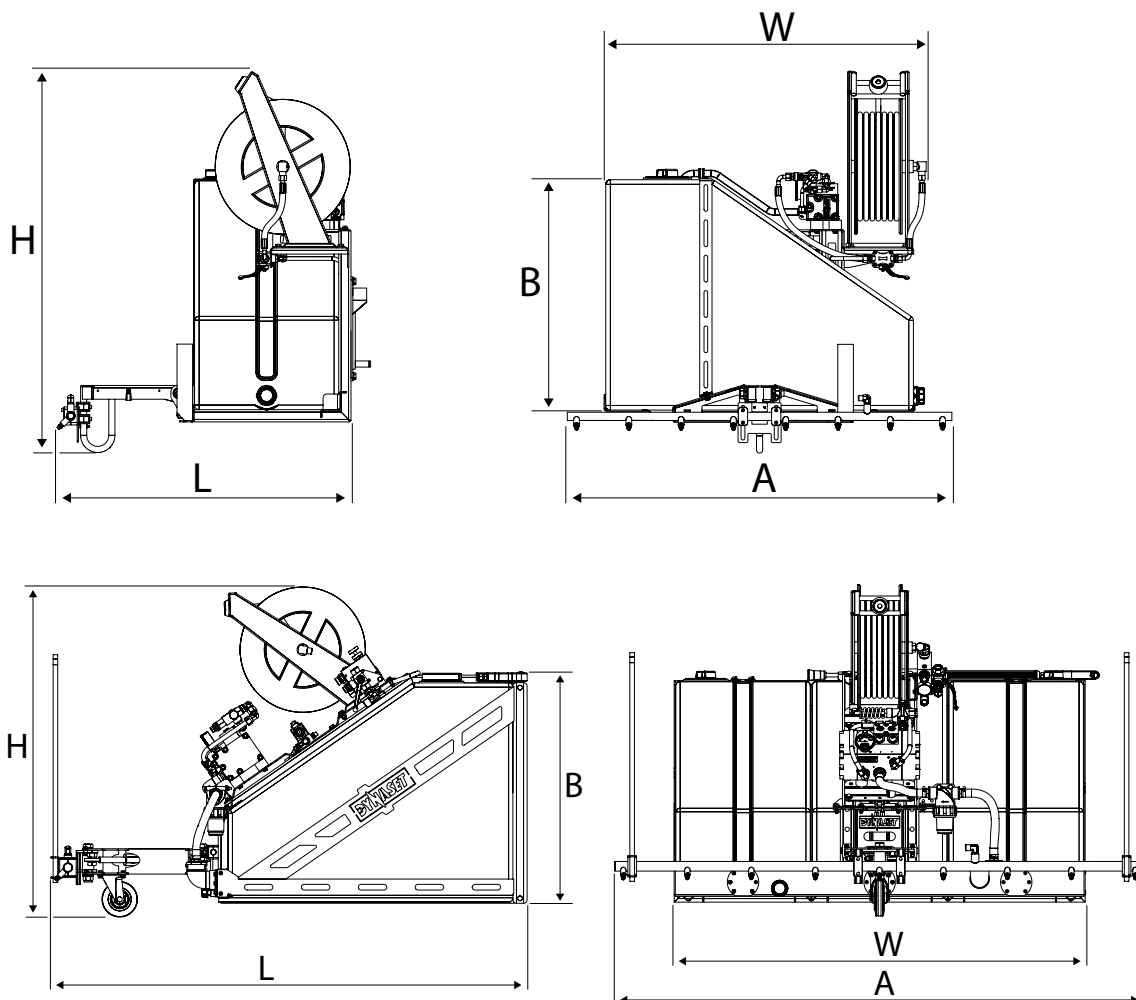
Timo Nieminen
R&D Manager
Ylöjärvi, Finland 01.07.2019



HIGH PRESSURE STREET WASHING UNITS DECLARATION OF CONFORMITY

10. TECHNICAL SPECIFICATIONS

10.1. DIMENSIONS KPL

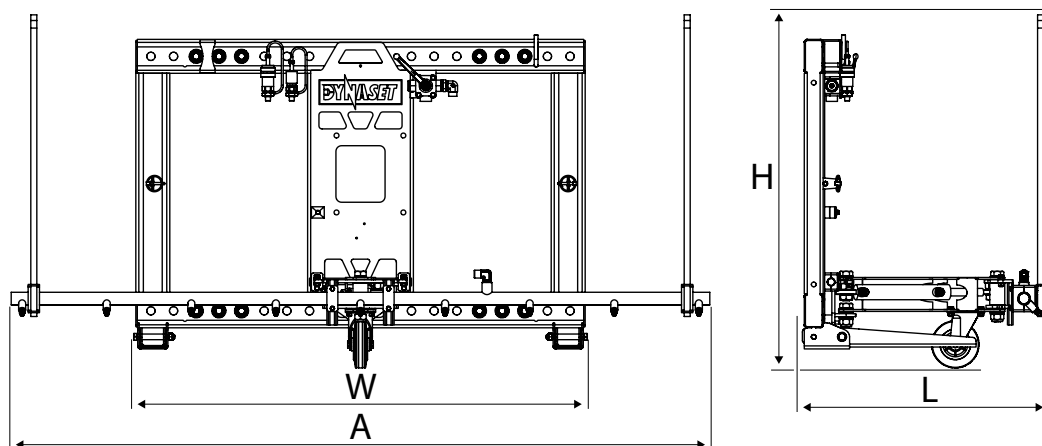


MODEL	DIMENSIONS, mm (in)					WEIGHT*
	L	W	H	A	B	kg (lbs)
KPL S 250	960 (37.8)	1042 (41.0)	1143 (45.0)	1250 (49.2)	880 (34.7)	80 (176)
KPL M 250	1655 (65.2)	960 (37.8)	1100 (43.3)	1650 (65.0)	945 (37.2)	212 (467)
KPL L 250	1655 (65.2)	1438 (56.6)	1100 (43.3)	1650 (65.0)	945 (37.2)	215 (473)
KPL L 220	1655 (65.2)	1438 (56.6)	1100 (43.3)	1850 (72.8)	945 (37.2)	225 (496)
KPL XL 220	1655 (65.2)	1916 (75.4)	1100 (43.3)	2200 (86.6)	945 (37.2)	302 (666)
KPL XL 180	1655 (65.2)	1916 (75.4)	1100 (43.3)	2200 (86.6)	945 (37.2)	312 (688)

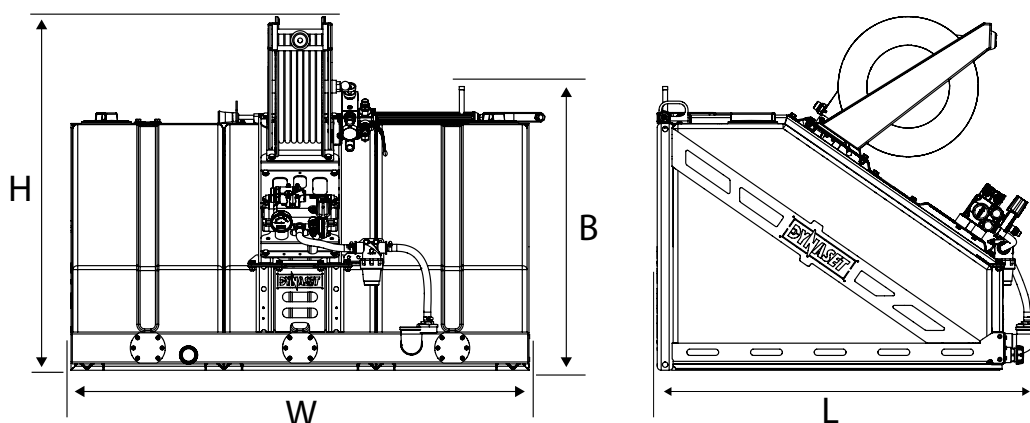
* Weights are without quick attachments

10.2. DIMENSIONS KPL-F/R

F



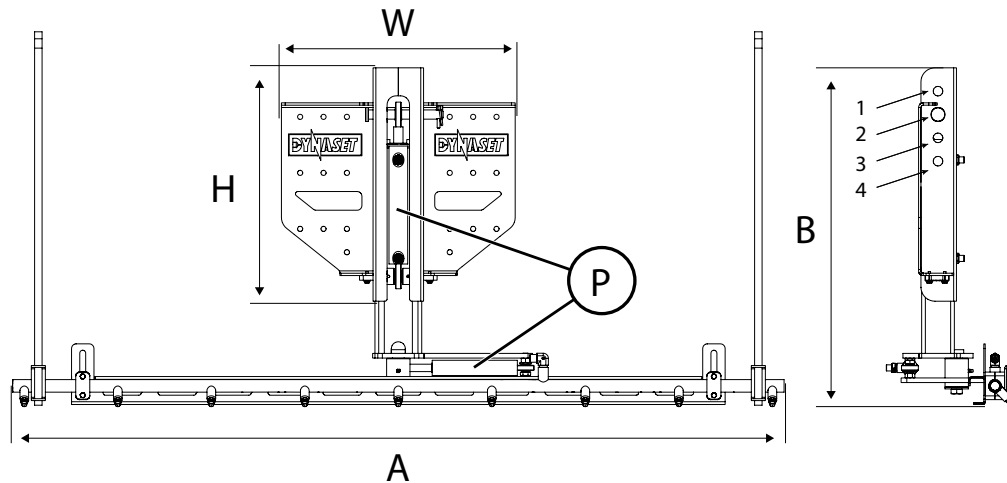
R



MODEL	DIMENSIONS, mm (in)					WEIGHT*
	L	W	H	A	B	kg (lbs)
KPL F 1650x9x6501	624 (24.56)	1201 (47.28)	870 (34.25)	1650 (64.96)	-	80 (176)
KPL F 2200x10x65015	641 (25.23)	1201 (47.28)	870 (34.25)	2200 (86.61)	-	85 (187)
KPL F 1850x9x65015	641 (25.23)	1201 (47.28)	870 (34.25)	1850 (72.83)	-	82 (1180)
KPL F 2200x10x6503	641 (25.23)	1201 (47.28)	870 (34.25)	2200 (86.61)	-	85 (187)
KPL R M 250	1199 (47.20)	960 (37.79)	1111(43.74)	960 (37.8)	885 (34.84)	212 (467)
KPL R L 250	1199 (47.20)	1438 (56.61)	1111(43.74)	1438 (56.6)	891 (35.07)	215 (473)
KPL R XL 250	1199 (47.20)	1916 (75.43)	1111(43.74)	1916 (75.4)	891 (35.07)	292 (643)
KPL R L 220	1199 (47.20)	1438 (56.61)	1111(43.74)	1438 (56.6)	891 (35.07)	225 (496)
KPL R XL 220	1199 (47.20)	1916 (75.43)	1111(43.74)	1916 (75.4)	891 (35.07)	302 (666)
KPL R XL 180	1199 (47.20)	1916 (75.43)	1111(43.74)	1916 (75.4)	891 (35.07)	312 (688)

* Weights are without quick attachments

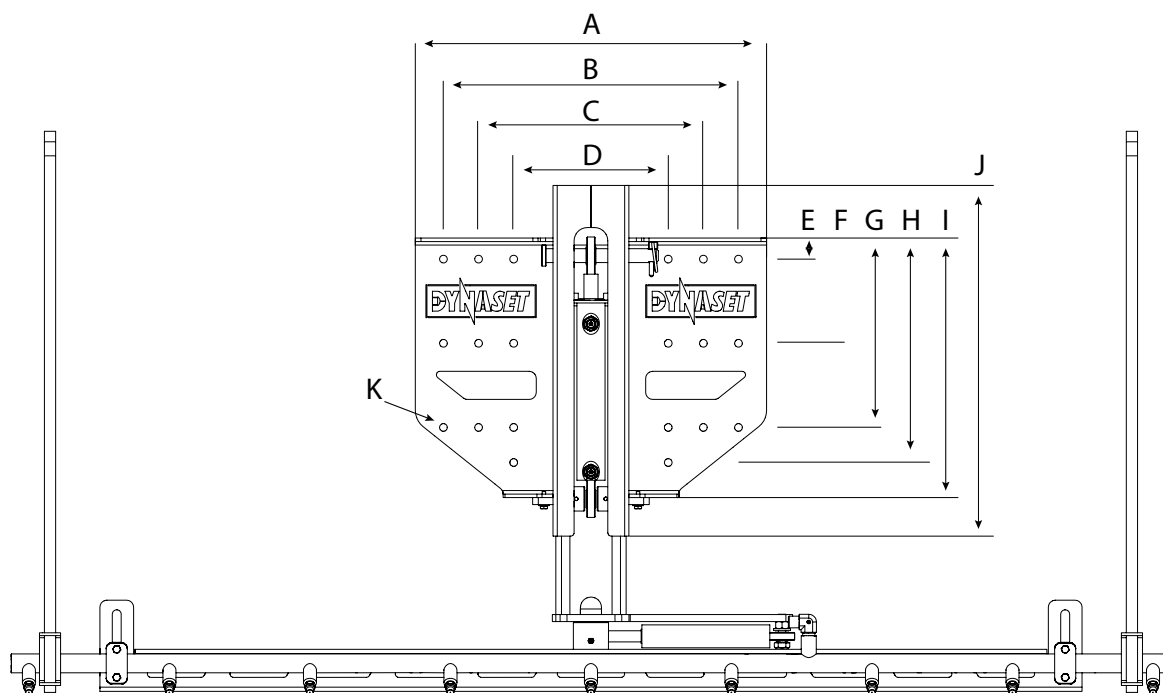
10.3. DIMENSIONS KPL-TRUCK



MODEL	DIMENSIONS, mm (in)			WEIGHT
	W	H	A	kg (lbs)
KPL-TRUCK-250-1650x9	500 (19.68)	500 (19.68)	1650 (64.96)	80 (176)
KPL-TRUCK-220-2200x10	500 (19.68)	500 (19.68)	2200 (86.61)	85 (187)
KPL-TRUCK-90-2200x10	500 (19.68)	500 (19.68)	2200 (86.61)	85 (187)
KPL-TRUCK-180-2200x10	500 (19.68)	500 (19.68)	2200 (86.61)	85 (187)

MODEL	B = WORKING POSITION, MIN-MAX, MM (IN)			
	1	2	3	4
KPL TRUCK	567-737 (22.32-29.01)	617-787 (24.29-30.98)	667-837 (26.25-32.95)	717-887 (28.22-34.92)

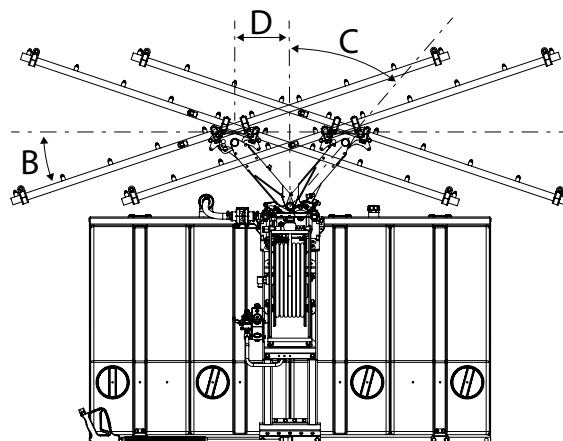
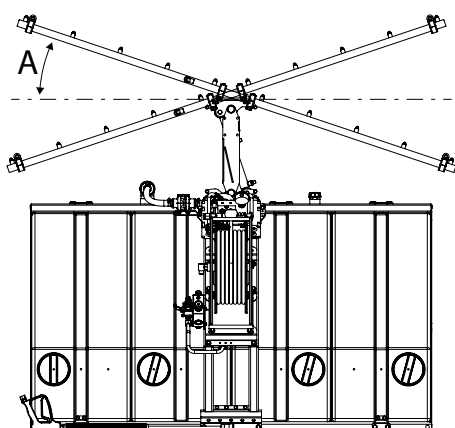
MODEL	HYDRAULIC PORTS
KPL TRUCK	G 1/4" 60° Male



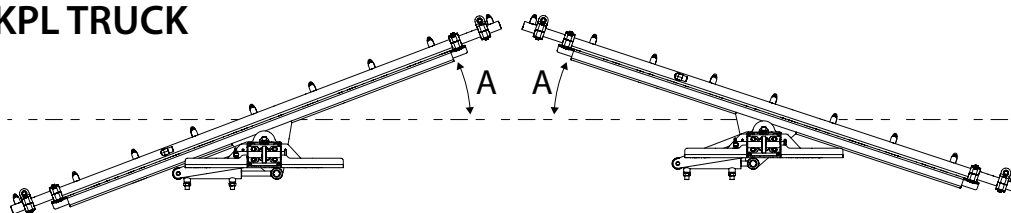
MODEL	DIMENSIONS, mm (in)										
	A	B	C	D	E	F	G	H	I	J	K
KPL TRUCK	500 (19.68)	420 (16.53)	320 (12.59)	220 (8.66)	30 (1.18)	150 (5.90)	270 (10.62)	320 (12.59)	370 (14.56)	500 (19.68)	11 (0.43)

10.4. TURNING DIMENSIONS

KPL / KPL - F / KPL - R

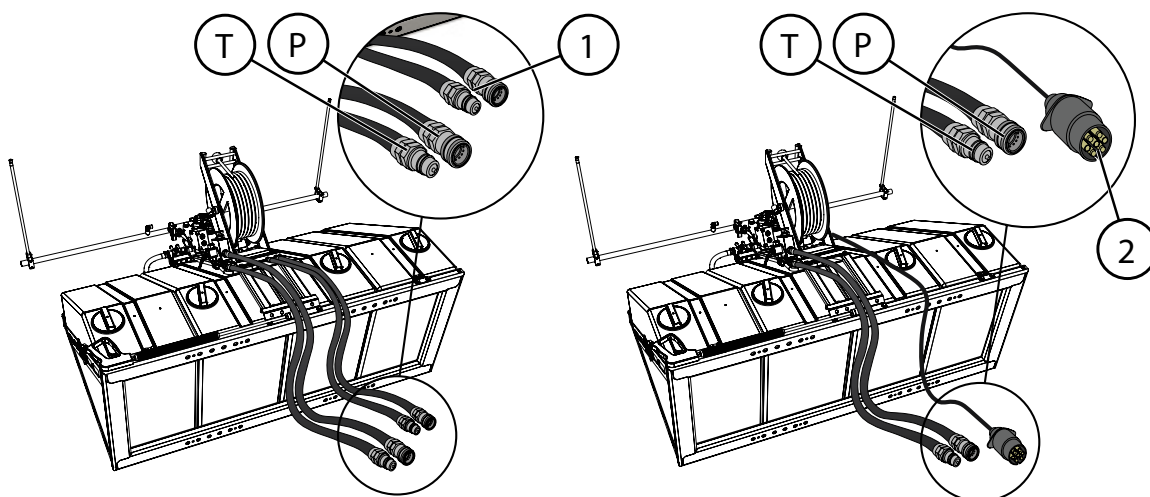


KPL TRUCK



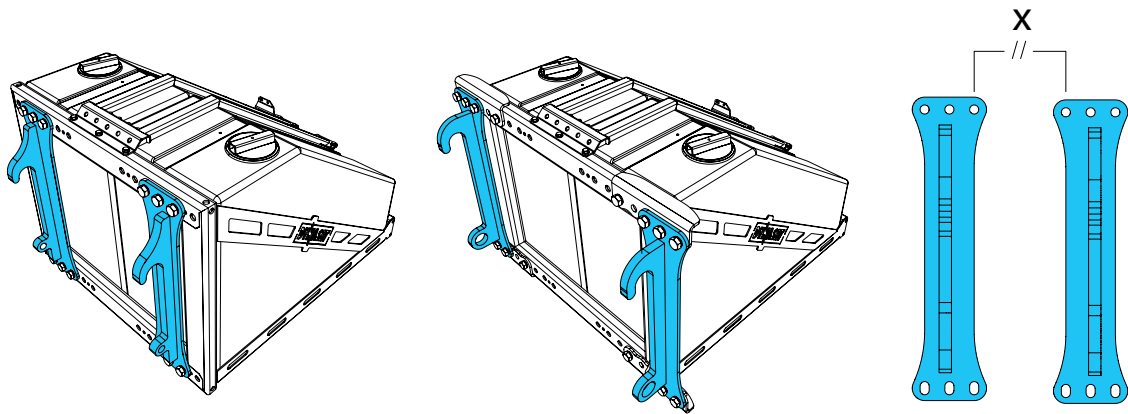
MODEL	DIMENSIONS, mm (in)			
	A	B	C	D
KPL S 250	38 °	-	-	-
KPL M 250	20 °	20 °	41 °	261 (10.3)
KPL L 250	20 °	20 °	41 °	261 (10.3)
KPL L 220	20 °	20 °	41 °	261 (10.3)
KPL XL 220	20 °	20 °	41 °	261 (10.3)
KPL XL 180	20 °	20 °	41 °	261 (10.3)
KPL F 1650x9x6501	20 °	20 °	41 °	261 (10.3)
KPL F 2200x10x65015	20 °	20 °	41 °	261 (10.3)
KPL F 1850x9x65015	20 °	20 °	41 °	261 (10.3)
KPL F 2200x10x6503	20 °	20 °	41 °	261 (10.3)

10.5. HOSE CONNECTIONS



MODEL	PRESSURE LINE	RETURN LINE	TURNING DEVICE CONTROL	
	P	T	HYDRAULIC (1)	ELECTRIC (2)
KPL S 250	1/2" ISO - A	1/2" ISO - A	-	-
KPL M 250	1/2" ISO - A	1/2" ISO - A	1/2" ISO - A	ISO 1724
KPL L 250	1/2" ISO - A	1/2" ISO - A	1/2" ISO - A	ISO 1724
KPL L 220	3/4" TEMA 7500	3/4" TEMA 7500	1/2" ISO - A	ISO 1724
KPL XL 220	3/4" TEMA 7500	3/4" TEMA 7500	1/2" ISO - A	ISO 1724
KPL XL 180	3/4" TEMA 7500	3/4" TEMA 7500	1/2" ISO - A	ISO 1724
KPL F 1650x9x6501	-	-	1/2" ISO - A	-
KPL F 2200x10x65015	-	-	1/2" ISO - A	-
KPL F 1850x9x65015	-	-	1/2" ISO - A	-
KPL F 2200x10x6503	-	-	1/2" ISO - A	-
KPL F HPW250	1/2" ISO - A	1/2" ISO - A	-	-
KPL F HPW220	3/4" TEMA 7500	3/4" TEMA 7500	-	-
KPL F HPW90	3/4" TEMA 7500	3/4" TEMA 7500	-	-
KPL F HPW180	3/4" TEMA 7500	3/4" TEMA 7500	-	-
KPL R M 250	1/2" ISO - A	1/2" ISO - A	-	-
KPL R L 250	1/2" ISO - A	1/2" ISO - A	-	-
KPL R XL 250	1/2" ISO - A	1/2" ISO - A	-	-
KPL R L 220	3/4" TEMA 7500	3/4" TEMA 7500	-	-
KPL R XL 220	3/4" TEMA 7500	3/4" TEMA 7500	-	-
KPL R XL 180	3/4" TEMA 7500	3/4" TEMA 7500	-	-

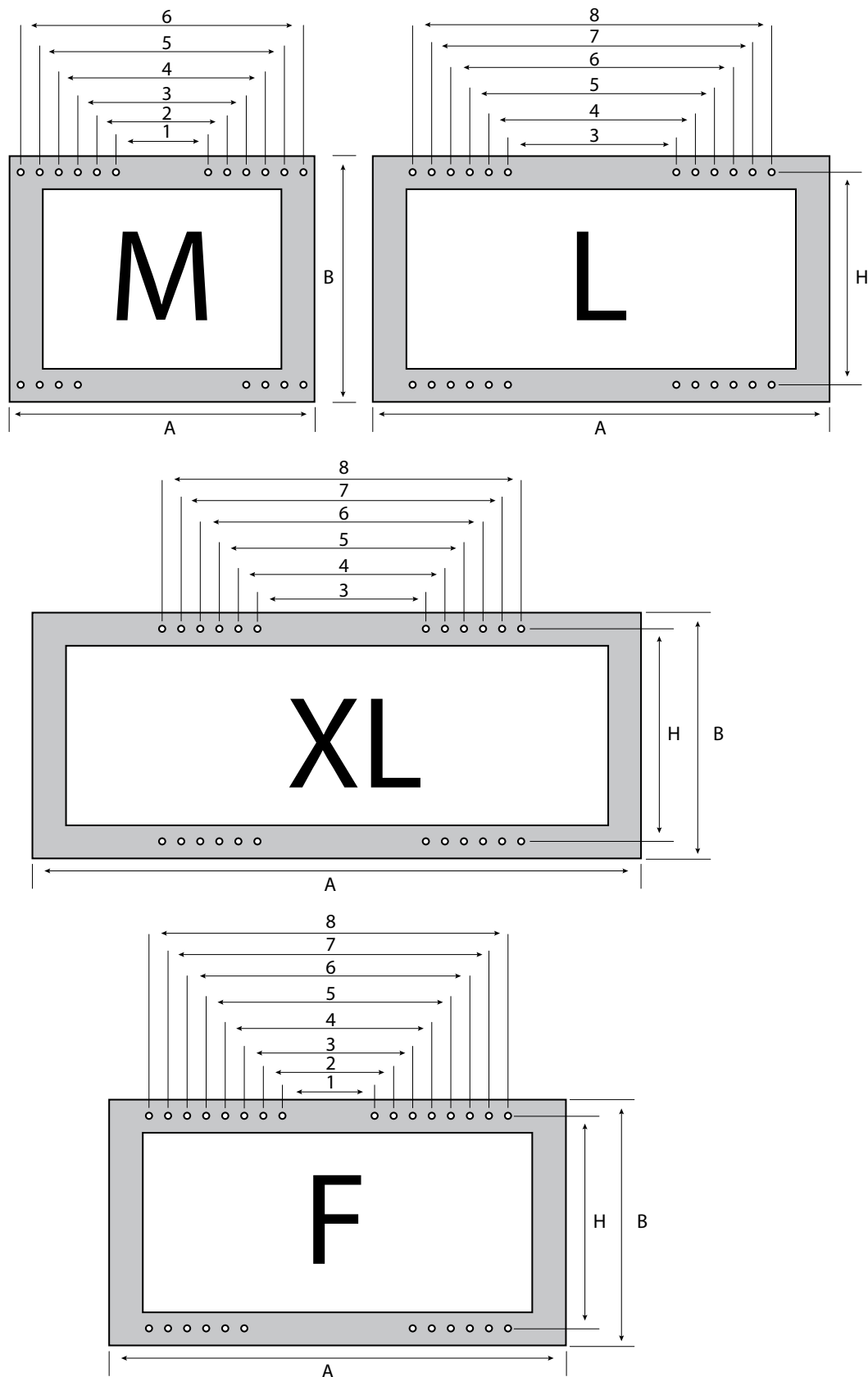
10.6. QUICK ATTACHMENT



ATTACHMENT TYPE						BOLT DISTANCE, mm (in)
KPL MODEL	KPL	KPL / KPL-R			KPL-F	
KPL FRAME SIZE	S	M	L	XL	-	X
3-Point Hitch - Cat. 1	X	X	X	X	X	510 (20.1)
3-Point Hitch - Cat. 2	X	X	X	X	X	510 (20.1)
Atlas AR 40-80	-	A	X	X	X	870 (34.3)
Avant / Agromatic	X	X	X	X	X	510 (20.1)
Bobcat	X	X	X	X	X	630 (24.8)
EURO	X	A	X	X	X	750 (29.5)
Forklift Adapter	-	X	X	X	X	630 (24.8)
Giant	-	X	X	X	X	510 (20.1)
Isme	-	X	X	X	X	510 (20.1)
JCB 406-409 - Zettlemeyer	-	A	X	X	X	750 (29.5)
Kramer 180-350	-	X	-	-	X	270 (10.6)
Kramer 380-580	-	A	X	X	X	750 (29.5)
Kunta 500	-	A	X	X	X	870 (34.3)
Manitou	-	X	X	X	X	630 (24.8)
Merlo ZM1-2	-	X	X	X	X	630 (24.8)
MP-Lift / Trima	-	X	X	X	X	510 (20.1)
Valtra	-	A	X	X	X	870 (34.3)
Volvo BM	-	A	X	X	X	870 (34.3)
Volvo L20-L25	-	X	X	X	X	510 (20.1)
Volvo TPZ	-	A	X	X	X	870 (34.3)
Wiedemann	X	X	X	X	X	510 (20.1)
Wiedemann 4070	-	X	X	X	X	750 (29.5)

A = with adapter

10.7. QUICK ATTACHMENT FASTENING POINTS



BOLT DISTANCE, mm (in)								
1	2	3	4	5	6	7	8	H
270 (10.6)	390 (15.3)	510 (20.1)	630 (24.8)	750 (29.5)	870 (34.2)	990 (39.0)	1110 (43.7)	675 (26.6)

OVERALL DIMENSIONS, mm (in)				
MODEL	M	L	XL	F
A	960 (37.8)	1438 (56.6)	1916 (75.4)	1190 (46.9)
B	775 (30.5)	775 (30.5)	775 (30.5)	765 (30.1)

10.8. TECHNICAL SPECIFICATIONS

BASIC KPL MODELS

		KPL S 250	KPL M 250	KPL L 250	KPL L 220	KPL XL 220	KPL XL 180
WATER POWER							
Water output max.	l/min (gpm)	30 (7.92)	30 (7.92)	30 (7.92)	50 (13.20)	50 (13.20)	90 (23.78)
Pressure max.	bar (psi)	250 (3600)	250 (3600)	250 (3600)	220 (3191)	220 (3191)	180 (2611)
Working width	cm (in)	150 (59.1)	180 (70.9)	180 (70.9)	200 (78.7)	250 (98.4)	250 (98.4)
Water tank	l (gal)	270 (71.32)	540 (142.65)	810 (213.98)	810 (213.98)	1080 (285.30)	1080 (285.30)
Water filter size		R3/4"	R3/4"	R3/4"	R1"	R1"	R1 1/4"
Water filter mesh		80 or better					
WASHING PIPE							
Turning device control (M) Manual / (H) Hydraulic / (E) Electric *		M	H / E	H / E	H / E	H / E	H / E
Washing pipe width	mm (in)	1250 (49.2)	1650 (65.0)	1650 (65.0)	1850 (72.8)	2200 (86.6)	2200 (86.6)
Washing nozzles		8	9	9	9	10	10
WATER PISTOL							
Water pistol hose diameter		3/8"					
Water pistol hose length	m (feet)	20m (65.6)					
Water pistol		ST2300-SW-800-2508					
HYDRAULIC POWER REQUIREMENTS							
Oil flow max.	l/min (gpm)	40 (10.56)	40 (10.56)	40 (10.56)	70 (18.49)	70 (18.49)	115 (30.38)
Pressure max.	bar (psi)	210 (3046)					
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	2	3	3	6

Gallons are U.S. liquid gallons

* Electric turning device control available in 12VDC and 24VDC

** Depending on hydraulic fluid.

KPL-F

	KPL-F- 1650x9x 6501	KPL-F- 2200x10x 65015	KPL-F- 1850x9x 65015	KPL-F- 2200x10x 6503
WATER POWER				
Suitable KPL-F pump units*	HPW250	HPW220	HPW180	HPW90
WASHING PIPE				
Turning device control	Hydraulic	Hydraulic	Hydraulic	Hydraulic
Washing pipe width mm (in)	1650 (65.0)	2200 (86.6)	1850 (72.8)	2200 (86.6)
Washing nozzles	9	10	9	10
WATER PISTOL				
Water pistol hose diameter	3/8"			
Water pistol hose length m (feet)	20m (65.6)			
Water pistol	ST2300-SW-800-2508			

KPL-F OPTIONAL PUMP UNITS

		KPL F HPW250	KPL F HPW220	KPL F HPW90	KPL F HPW180
WATER POWER					
Water output max.	l/min (gpm)	30 (7.92)	50 (13.20)	150 (39.6)	90 (23.78)
Pressure max.	bar (psi)	250 (3600)	220 (3191)	90 (1300)	180 (2611)
Water filter size		R3/4"	R1"	R1 1/2"	R1 1/4"
Water filter mesh		80 or better			
WATER PISTOL					
Water pistol hose diameter		3/8"			
Water pistol hose length	m (feet)	20m (65.6)			
Water pistol		ST2300-SW-800-2508			
HYDRAULIC POWER REQUIREMENTS					
Oil flow max.	l/min (gpm)	40 (10.56)	70 (18.49)	85 (22.5)	115 (30.38)
Pressure max.	bar (psi)	210 (3046)			
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	4	6

Gallons are U.S. liquid gallons

* Check the KPL-F Pump setup choices on next table.

** Depending on hydraulic fluid.

KPL-R

		KPL-R-M-250	KPL-R-L-250	KPL-R-XL-250	KPL-R-L-220	KPL-R-XL-220	KPL-R-XL-90	KPL-R-XL-180
WATER POWER								
Water output max.	l/min (gpm)	30 (7.92)	30 (7.92)	30 (7.92)	50 (13.20)	50 (13.20)	150 (39.6)	90 (23.78)
Pressure max.	bar (psi)	200 (2900)	200 (2900)	200 (2900)	220 (3191)	220 (3191)	90 (1300)	180 (2611)
Water tank	l (gal)	270 (71.32)	540 (142.65)	810 (213.98)	810 (213.98)	1080 (285.30)	1080 (285.30)	1080 (285.30)
Water filter size		R3/4"	R3/4"	R3/4"	R1"	R1"	R1 1/2"	R1 1/4"
Water filter mesh		80 or better						
WATER PISTOL								
Water pistol hose diameter		3/8"						
Water pistol hose length	m (feet)	20m (65.6)						
Water pistol		ST2300-SW-800-2508						
HYDRAULIC POWER REQUIREMENTS								
Oil flow max.	l/min (gpm)	40 (10.56)	40 (10.56)	40 (10.56)	70 (18.49)	70 (18.49)	85 (22.5)	115 (30.38)
Pressure max.	bar (psi)	210 (3046)						
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	2	3	3	4	6

Gallons are U.S. liquid gallons

* Depending on hydraulic fluid.

KPL-TRUCK

		KPL-TRUCK 250 - 1650x9	KPL-TRUCK 220 - 2200x10	KPL-TRUCK 90- 2200x10	KPL-TRUCK 180 - 2200x10
WATER POWER					
Water output max.	l/min (gpm)	30 (7.92)	50 (13.20)	150 (39.6)	90 (23.78)
Pressure max.	bar (psi)	250 (3600)	220 (3191)	90 (1300)	180 (2611)
Working width	cm (in)	180 (70.9)	250 (98.4)	250 (98.4)	250 (98.4)
Water filter size		R3/4"	R1"	R1 1/2"	R1 1/4"
Water filter mesh		80 or better			
WASHING PIPE					
Turning device control		Hydraulic	Hydraulic	Hydraulic	Hydraulic
Washing pipe width	mm (in)	1650 (64.96)	2200 (86.61)	2200 (86.61)	2200 (86.61)
Washing nozzles		9	10	10	10
WATER PISTOL					
Water pistol hose diameter		3/8"			
Water pistol hose length	m (feet)	20m (65.6)			
Water pistol		ST2300-SW-800-2508			
HYDRAULIC POWER REQUIREMENTS					
Oil flow max.	l/min (gpm)	40 (10.56)	40 (10.56)	70 (18.49)	40 (10.56)
Pressure max.	bar (psi)	210 (3046)			
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	3	4	6

Gallons are U.S. liquid gallons

* Depending on hydraulic fluid.



HIGH PRESSURE STREET WASHING UNITS

TECHNICAL SPECIFICATIONS

11. APPENDIX

APPENDIX 1: ELECTRIC SCHEMATIC FOR ELECTRIC CONTROLLED TURNING DEVICE

A muutos			D muutos			11
B muutos			E muutos			12
C muutos			F muutos			13
						14
						15
						16
						17
						18
						19
						20
						21
						22
						23
						24
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						28
						29
						30
						31
						32
						33
						34
						35
						36
						37

A muutos			D muutos			11
B muutos			E muutos			12
C muutos			F muutos			13
						14
						15
						16
						17
						18
						19
						20
						21
						22
						23
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						29
						30
						31
						32
						33
						34
						35
						36
						37

Peel cable approx. 50mm and add insulated wire end ferrules

1/L -X2.1 / -W1.1
4/R -X3.1 / -W1.2
58L -X2.GND & -X3.GND / -W1.3

W1 / LFFYY11Y 4x0.75 3000mm

Ensure proper tightening to ISO 1724 plug

Moulded two way valve plug connector with indicating LED
Mark as Connector 1 with permanent marker to label area

-X1.1/L / -W1.1 1
-X1.58L / -W1.3.GND 2 X2
GND

120mm

-X1.4/R / -W1.2 1
-X1.58L / -W1.3.GND 2 X3
GND

Moulded two way valve plug connector with indicating LED
Mark as Connector 2 with permanent marker to label area

Valve plug 1
Solenoid A

Valve plug 2
Solenoid B

View from contact side

ISO 1724 plug

View from contact side

Valve plugs (DIN 43650-A) are connected in under described order:
Valve plug 1 is connected to solenoid A, cylinder (+) move
Valve plug 2 is connected to solenoid B, cylinder (-) move

DYNASET

POWERED BY HYDRAULICS

KPL – ELECTRIC CONTROLLED
TURNING DEVICE
WIRING HARNESS

ELECTRIC SCHEMATIC
IN Production

Suunn.	Kokonaissuus	Sähköposito	Yönnúmero
THN /200616			
Piirt. THN 200616	Lehti 1/1	Piirustusnumero	
Tark. THN 220616			

05002386



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info@DYNASET.com



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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