



# PUMPING STATIONS

**PRODUCT RANGE, PG. 4**

**INSTALLATION, PG. 6**

**MAINTENANCE, PG. 10**



100% reusable PE material



Resistant to Nordic climate



Safe to maintain



Resistant to mechanical damage



The PE material's guaranteed lifetime is 50 years



## Dear customer!

Welcome to our pumping station catalogue!

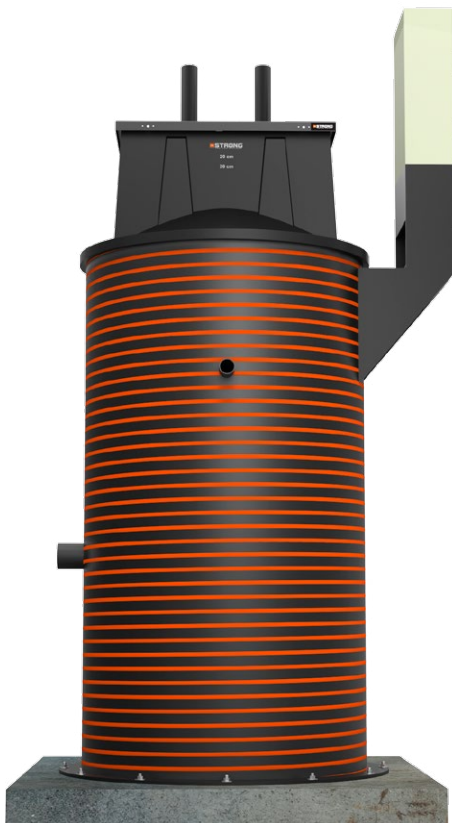
Here you will find information on what size pumping station to choose and how to install it, as well as tips on its maintenance.

Our pumping station development process focuses mainly on long-term durability, ease of installation and safety of use.

STRONG pumping stations are intended for pumping waste water, stormwater and drainage water in places where it is impossible or unfeasible to construct gravity-flow piping. Even the most hard-to-please water company will find a suitable pumping station, pumps and water automation from us.

In addition to STRONG pumping stations, our product selection includes tanks, septic tanks and e.t.c of the same brand.

Detailed information about all our products is available on our homepage [www.iwsgroup.ee](http://www.iwsgroup.ee).



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# PRODUCT SELECTION

STRONG pumping stations are intended for pumping waste water, stormwater and drainage water in places where it is impossible or unfeasible to construct gravity-flow piping.

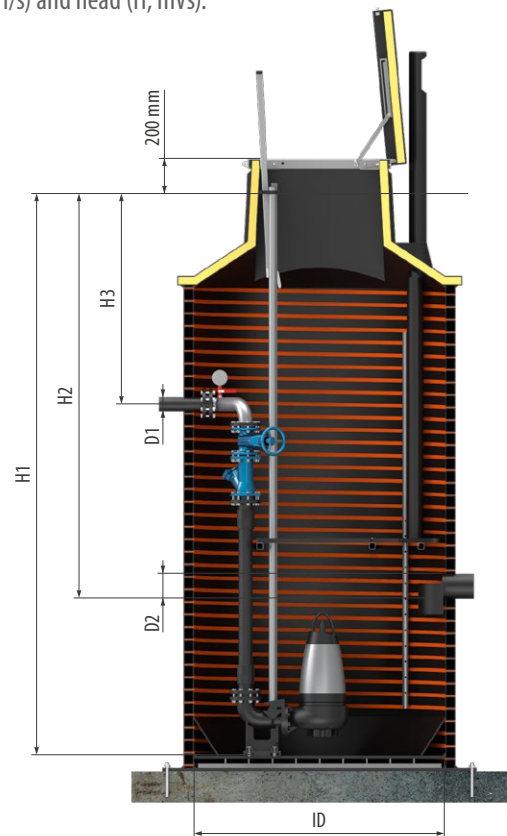
STRONG pumping stations are single-chamber pumping stations with submersible pumps. The pumping stations are compact and consist of a collection tank, pumps, their lifting elements, pressure pipes and complete control cabinet.

As a rule, a pumping station uses two submersible pumps, so the pumping station remains operational even during maintenance or breakdown of one pump. The pumps work alternately, in extreme situations also simultaneously. The pumps are controlled by automatics installed to the pumping station's control cabinet. Level sensor or float switches are used for setting the pumping station's water levels for starting and stopping the pumps. The pumping station's control cabinet board is designed according to the customer's needs.

The pumping station's internal pressure piping is chosen according to the pump's auto-coupling size. A closing device should be installed to the pumping station's inlet pipe, so as to close the inflow during maintenance works. This can be a knife gate valve inside the pumping station or an outside rubber gate valve.

**Pumping stations are made according to the initial data provided by the customer, stating the following main parameters for the pumping station:**

- type of water to be pumped (waste water, stormwater, etc.);
- pumping station's internal diameter (ID, mm);
- pumping station's height from the ground (H1, mm);
- outflow pressure pipe's height (H3, mm) and diameter (D1, mm);
- inflow pipe's height (H2, mm) and diameter (D2, mm);
- pump parameters – flow rate (Q, l/s) and head (H, mVs).



Diameter: ID1200  
Pressure pipes: DN40-65



ID1400  
DN50-80



ID1600  
DN50-100



ID2000  
DN50-160



ID2400  
DN50-200


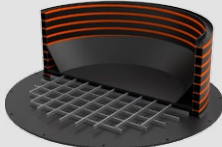



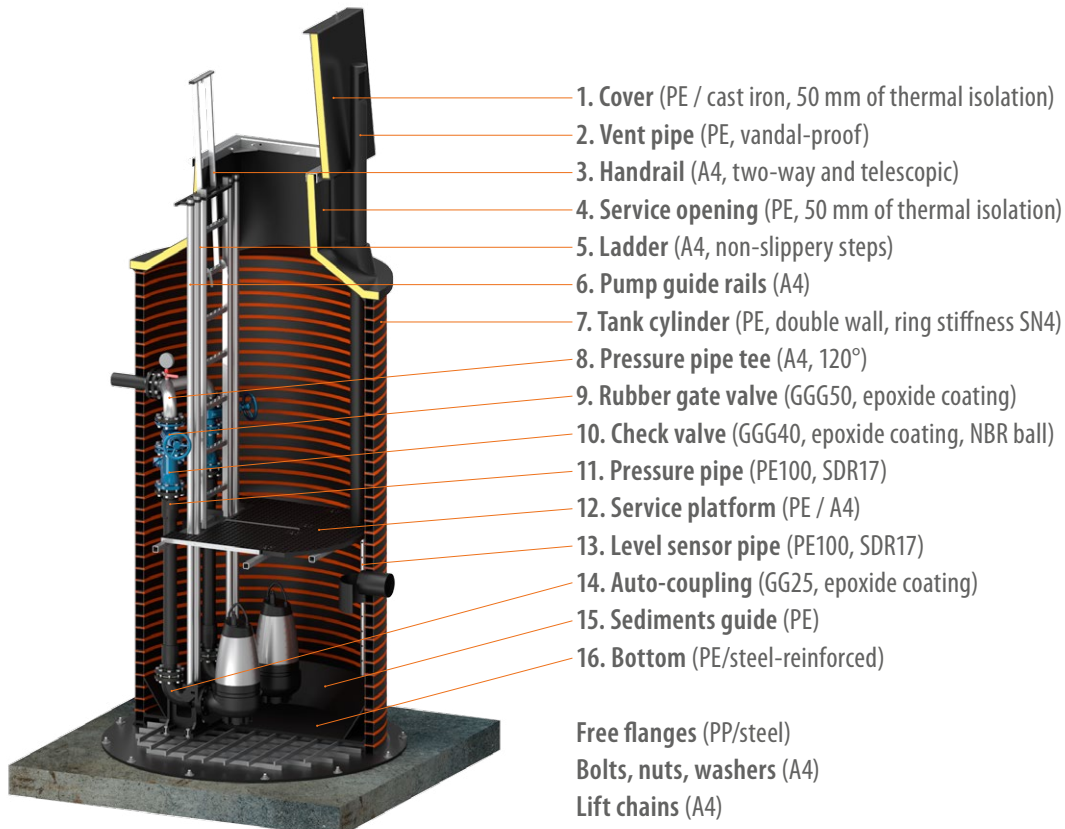
# TECHNICAL CHARACTERISTICS

STRONG pumping stations are made of PE-HD (high-density polyethylene), which is an elastic and durable type of plastic. Nowadays, PE is a common material used for manufacturing pumping stations, tanks, wells and pressure pipes, because it is particularly durable in Nordic climate.

The tank cylinder of STRONG pumping stations (ID1200–2400 mm) are strong, made with ring stiffness of at least SN4 (4 kN/m<sup>2</sup>), so they resist mechanical damage that may occur when installing or using the system. This is important for preventing wastewater leakage into soil

or soil water penetration into the pumping station. Additionally, the pumping station's tank cylinder has double wall, making it absolutely leak-proof.

Cover: PE, 50 mm of thermal isolation	Service opening: PE, 50 mm of thermal isolation	Tank cylinder: PE double wall and ring stiffness SN4	Bottom: PE/steel reinforced and safety factor 2
			
Handrail: A4, telescopic	Ladder: A4, non-slippery	Platform: PE/A4, two-way opening	Base of control cabinet: PE, cable protection pipes
			



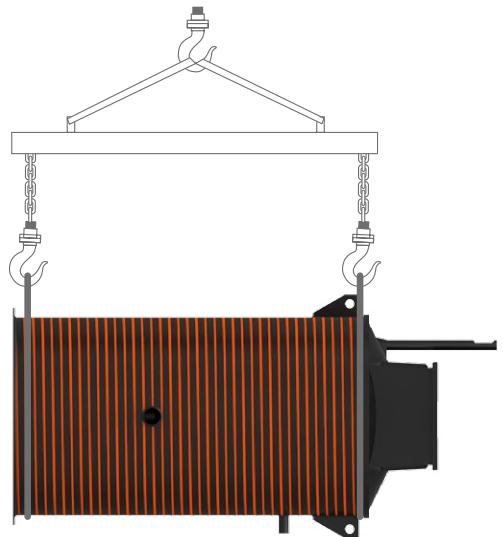
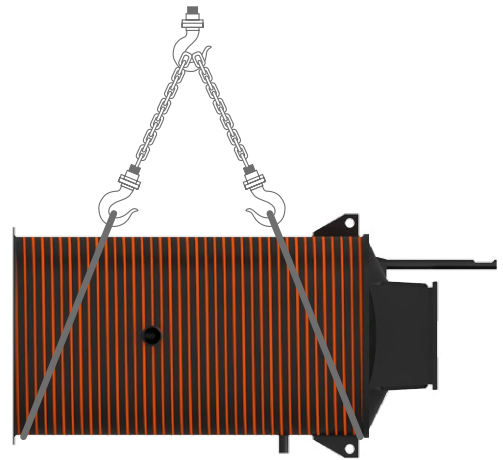
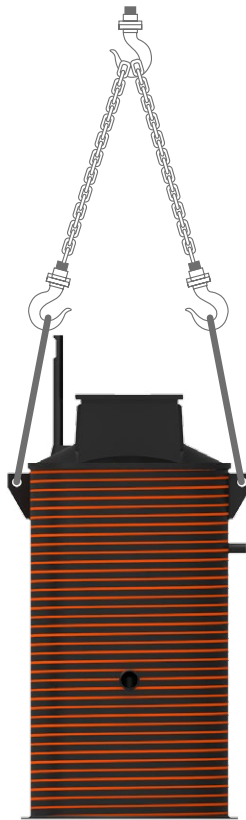
# INSTALLATION

## LIFTING OF PUMPING STATIONS

Use lift belts to lift a pumping station. If necessary, use a spreader bar. It is important to make sure that the lift belts do not damage any protruding parts. Do not put steel cables or chains around the pumping station. Use all available lift eyes and hanging lead ropes when lifting a pumping station to its base plate.



After the concrete base plate has been installed, the pumping station must not be lifted by its lift hooks but only by the base plate or the base plate's hooks.



## REQUIREMENTS FOR THE FILLING MATERIAL

Sand, gravel, and crushed stone are suitable filler materials. The filler must be clean, freely flowing, and must not contain ice, snow, clay, organic substances, or too large or heavy objects that may damage pumping station when falling onto it. Minimum required bulk density is 1,500 kg/m<sup>3</sup>.

### Gravel

Gravel particle size must not be less than 3 mm or more than 20 mm.

### Crushed stone

Crushed stone particle size must not be less than 3 mm or more than 16 mm.

### Sand

The particle size must not exceed 3 mm.

### Sand/gravel mixtures

Sand and gravel mixtures can be used if the components comply with the above requirements for gravel, crushed stone, and sand. Sand and gravel mixtures must be compacted as instructed below.

# ANCHORING

## ANCHORING

### Lifting force of surface water

In order to neutralise the lifting force of surface water and to ensure that the pumping station remains securely in place, the pumping station must be anchored. The anchoring base plate weight plus the pumping station's weight and the weight of the soil on the base plate edges extending beyond the pumping station's edges must be at least equal to the lifting force. Friction between the pumping station's outer wall and the soil is usually not taken into account (it is left as a reserve). Calculated counterweight depends on maximum soil water level (the safest bet

is to consider soil water level up to the ground surface as the maximum level) and the weight of an empty pumping station. Then the lifting force equals to the pumping station's volume.

### Concrete anchoring base plate

If an anchoring base plate is needed, it must consist of at least 200 mm thick reinforced concrete containing a layer of lightweight, strengthened rebar (step 200 x 200, bar diameter 7 mm, 3.02 kg/m<sup>2</sup>, minimum strength 21 N/mm<sup>2</sup> (28 days later). The anchoring base plate must be installed on a 300 mm thick level sand base, mechanically compacted to at least 95% of standard density. Sulphate resisting concrete must be used if so required

by soil conditions. The width and length of the anchoring base plate must exceed the pumping station's outer diameter by at least 600 mm (300 mm from every edge of the pumping station); this is sufficient to anchor a pumping station with a diameter of up to 2,000 mm. To anchor a 2,400 mm diameter pumping station, use a rectangular anchoring base plate of 3.2 x 3.2 m. You can also use sufficiently large concrete well bottoms or well panels. For larger pumping station diameters, please consult individually. The anchoring base plates dimensions may be reduced according to the local situation, in consultation with the designer and the pumping station's manufacturer.

### Attaching the pumping station's bottom to the concrete slab using anchoring bolts

Anchoring with a concrete slab requires the use of corrosion-proof anchoring bolts fixed to the anchoring slab at equal intervals along the pumping station's diameter. The pumping station's bottom already has ready-made openings for M20 anchoring bolts.

The number of anchoring bolts per pumping station:

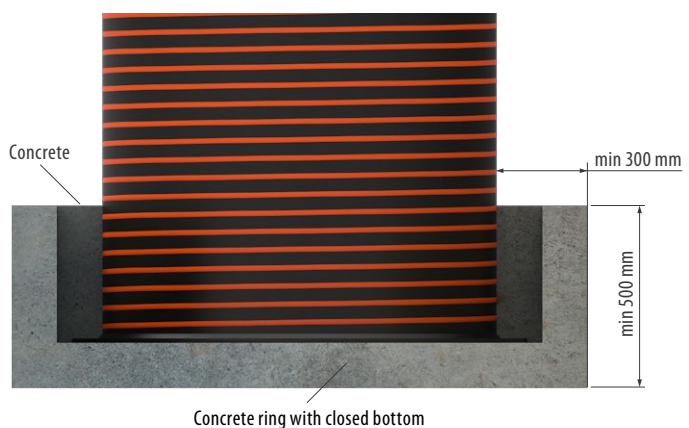
8 bolts for an ID1200 pumping station,  
12 bolts for an ID1400 pumping station,  
12 bolts for an ID1600 pumping station,  
12 bolts for an ID2000 pumping station,  
16 bolts for an ID2400 pumping station.

### Anchoring the pumping station by casting its lower part into concrete

In difficult installation conditions (great installation depth, difficult soil conditions, etc.), we recommend casting the pumping station's lower part into concrete. To do so, compact and level the pit's bottom, then place a concrete ring with closed bottom on it and lower the pumping station into the ring. The concrete ring with closed bottom must be at least 500 mm high and with a suitable dimension so that it extends 300 mm from the pumping station's outer wall in all directions. Fill the space between the pumping station and the concrete ring with concrete.



A pumping station's sideways deviation from the vertical must not be corrected with wedges between the anchoring base plate and the pumping station's bottom. The anchoring base plate must be smooth and flat.



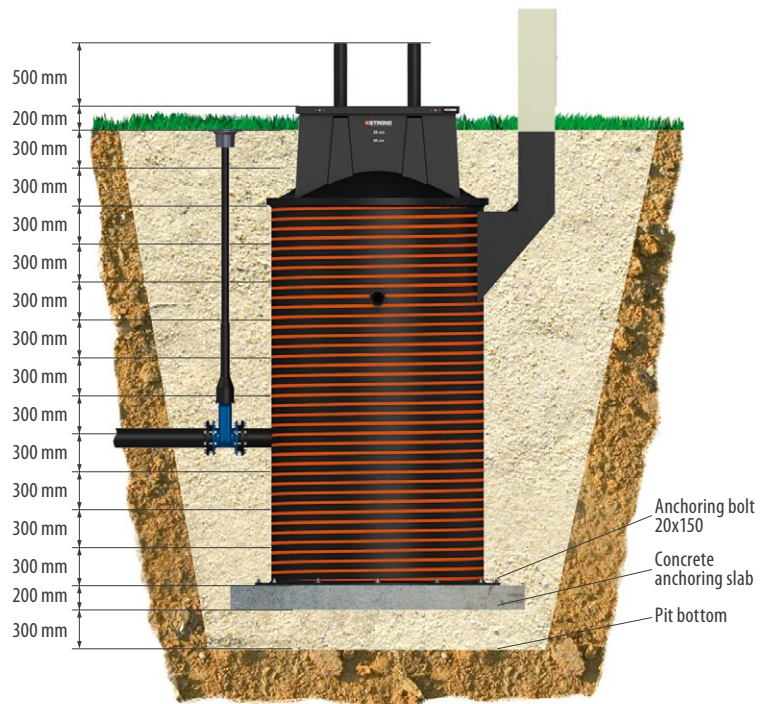
# INSTALLATION

## BACKFILLING

The pumping station trench is filled on all sides in 300 mm thick layers of gravel, crushed stone or sand, compacting each layer to 95% of the soil's natural density.

In case of high soil water level or otherwise wet and heavy soil (e.g. clay soil), use only gravel or crushed stone as backfill material. During backfill works, keep the pumping station filled with water to the level of the current backfill layer. Take special care when compacting near the pumping station's pipe connections to avoid any empty spaces remaining there.

When installing the pumping station to a green area, make sure the cover reaches at least 100 mm above the ground, preferably even 200 mm, in order to prevent stormwater from entering the pumping station.

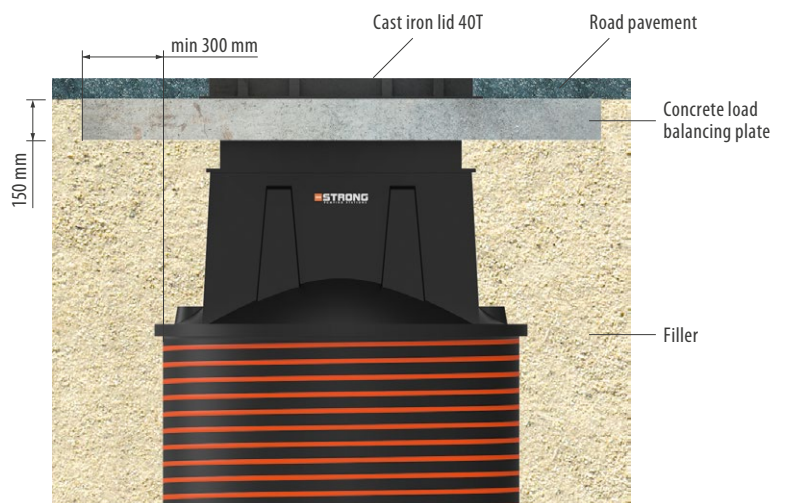


**!** A pumping station installed without full backfilled topsoil layer may shift due to the impact of soil water. For this reason, the pumping station must be filled with water if backfilling works are interrupted!

## INSTALLATION UNDER TRAFFIC AREA

To avoid traffic load on a pumping station installed under traffic area, the pumping station must be covered by a load balancing plate. The thickness of filler layer on top of the pumping station must be at least 500 mm. A 150 mm thick reinforced concrete load balancing plate must be installed onto the filler layer. The plate must extend at least 300 mm beyond the pumping station in all directions.

All pumping stations under a traffic area must have a cast iron cover supported by the concrete load balancing plate. This prevents traffic load on the pumping station's service opening.





# OPERATION

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The pumping station is intended for collecting and pumping waste water or stormwater. As a rule, the pumping stations have two pumps, rarely one or three pumps. The pumps are controlled by automatics installed to the pumping station's control cabinet. Level sensor or float switches are used for setting the pumping station's water levels for starting and stopping the pumps. Read more about the controlling and monitoring of pumps in the automation instructions.

## INSTALLATION AND DISMOUNTING OF PUMPS

### Opening and closing the pumping station's cover

Plastic or aluminium cover are opened by first turning their fastening bolts counter-clockwise. Use the key delivered with the pumping station. The cover can be fixed to open position at 90° or to fully open position (by opening the T-nuts of

fasteners) at 190°. To close the cover, set it back to its initial position and turn the locking bolts clockwise, using the same key.

Cast iron cover are opened by using a metal rod, inserting it into the cover's hole and lifting the cover up.

### Opening the service platform

The platform's opening part has stainless steel lift chains. The platform must be opened by using the lift chains before installing or dismantling the pumps.

### Installing the pumps

The guide shoe attached to the pump must be placed onto the guide rails and then the pump must be lowered along the rails onto its auto-coupling foot. To lift the pumps, use the prescribed stainless steel lift chains. The pump's correct positioning on its auto-coupling foot can be verified by starting the pump in manual mode and looking for leaks between

the pump and its auto-coupling foot. If there is no leak, the pump is in its correct work position. If there is a leak, the pump must be moved, using its lift chain, until it is in its correct work position.



**It is prohibited to lift the pump by its power cable.**

**If the pumping station is not used in winter then the pumping station and its internal piping must be drained of water to prevent it from freezing. To drain the internal piping, open the cover of check valves and let the pressure pipe drain.**

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## STARTING THE PUMPS

1. Before starting the pumps, make sure the valves on pipes located in the pumping station and in outlet are open.
2. When setting the pumping station's trigger levels, make sure that the pump switches off at the water level required by its manufacturer. The minimum water levels are stated in the pumps' instructions. The water level must never drop below the chamber level of the impeller.
3. For pumps with a 3-phaser motor, check the rotor's rotation direction before starting the pump! As a rule, the rotation direction is marked on the pump's casing. If the pump rotates in wrong direction, the order of connecting the phases is wrong. To change that, order the phase wires around. Please be careful to avoid injury when checking the rotation.



**Pumps must never run dry. If that happens, stop their automation immediately!**

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# MAINTENANCE

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If there are no faults, we recommend performing visual and functional inspections at the following intervals:

- **pumping stations for industrial and public buildings – after every 3 months**
- **pumping stations in residential areas – after every 6 months**
- **pumping stations for one-family home – once per year**

**The following maintenance procedure is recommended at least once per year:**

1. Lift the pumps up along their guide rails, using their lift chains; then wash the pumps with a pressure jet and assess their condition.
2. Inspect the functioning of the valves inside the pumping station. Close and open the valves once.
3. Clean the inside of check valves from the collected debris and sediments. To do so, close the dampers and open the backflow valve's cover.
4. Clean the pumping station's inner walls and bottom from sediments, using a pressure jet.

Depending on the sediments collecting in the pumping station, the cleaning interval may be shorter or longer.

5. After completing the maintenance works above, lower the pumps along their guide rails to their auto-coupling feet again and check their functioning in operation conditions. Use the prescribed stainless steel lift chains for lifting and lowering the pumps.
6. Clean the float switches and the level sensor from sediments; visually inspect the condition of the pumps' power cables and equipotential connections of the pumping station's metal structures (ladder, etc.).

7. Repair or replace faulty elements!

As a rule, the pumping station's tank cylinder and internal structures do not need any further maintenance.

Pump maintenance must follow the manufacturer's instructions (technical passport). If the pumps are working below their stated productivity or emit noises that were not heard when the pumps were new, we recommend taking steps to eliminate the faults in order to prevent the pumps from possibly becoming unusable in the future. Contact a company providing pump maintenance services.

# SAFETY

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1. The employer of the pumping station's maintenance personnel must instruct the maintenance employees about electrical hazards and toxic exhaust gases and must provide them with necessary protective equipment.
2. Before starting maintenance of the pumping station, switch off the pumps at the control cabinet!
3. Before entering the pumping station, the pumping station must be ventilated for at least 5 minutes!
4. Only one person at a time may stand on the pumping stations service ladder and a single person must not

carry along any items that are not lightweight and easy to use.

5. Do not use an ordinary pump for pumping oil, gasoline or other liquid presenting an explosion risk. An explosion-safe pump may be used in an explosive environment, but only with a temperature sensor.
6. It is strictly prohibited to perform any works inside the pumping station alone!
7. Close all inflows into the pumping station for the duration of maintenance works!
8. Before commissioning the pumping

station, properly qualified personnel must verify that all applicable safety regulations are fulfilled. The earthing device, the neutral line and the equipotential connections must comply with regulations for electrical installations and must be inspected by qualified personnel.

9. If the pump has a plug connection, its earthed power outlet must be installed above the water level. The power cable of no-plug pumps must be connected by a qualified specialist.
10. If safety requirements are ignored, no damage claims will be accepted.

# WARRANTY

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Innovative Water Systems undertakes the responsibility for the equipment's properties and for elimination of shortcomings becoming apparent during the equipment's use. The warranty terms stem from the legislation of the Republic of Estonia, and the warranty is first and foremost based on the manufacturers' warranties as long as they do not conflict with the laws of the Republic of Estonia. The warranty includes shortcomings of the equipment's or its individual elements' manufacture, materials or design.

## 1. General terms of warranty

1.1. The warranty is valid for 2 years i.e. 24 months in case of the product's purposeful use.

1.2. The warranty period starts from the product's handover date.

## 2. Warranty's validity terms

2.1. The prerequisite is the regulations in force and the installation and operation manuals required to be followed upon installation, use and maintenance of the equipment. The warranty will be valid if the equipment has been maintained

regularly and used according to the manufacturer's instructions.

2.2. If the fault's identification requires that the equipment be dug out, this must be done in the presence of the manufacturer's representative.

2.3 The warranty does not include damage caused to third parties because of a faulty product; it also does not include loss of revenue or any other similar loss.

2.4. In case of a fault becoming apparent, the equipment shall be repaired, not replaced as a whole.

## 3. The warranty does not include:

3.1. training for installation, maintenance and use of the equipment;

3.2. repairs of transport damage and other mechanical damage (caused by vandalism, lightning, fire, etc.).

The warranty does not cover shortcomings caused by insufficient maintenance, incorrect installation and repairs, or normal wear. The warranty is also void if the equipment has been reconstructed.



**INNOVATIVE WATER SYSTEMS**

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