



SSS 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 SSS (Solids Separation Systems) type pumping stations catalogue!

SSS STRONG pumping station is double-chamber, with dry installation pumps, and equipped with a solids separation system. The pumping station is intended for pumping waste water in places, where construction of gravity-flow piping is not possible or practical. Even the most demanding company will find a suitable pumping station, pumps and automatic control equipment from us.

Here you will find information about features of the pumping station, its installation, and maintenance tips. Our development of pumping stations focuses on their long-term durability, ease of installation and safety of use.

In addition to SSS STRONG pumping stations, our product range includes also pumping stations with submersible pumps, booster pumping stations, tanks, septics and other products of the same brand.

Detailed information about all our products is available at the address www.iwsgroup.ee/en.



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PRODUCT RANGE



AREA OF USE AND PRODUCT RANGE

The pumping station is intended for pumping waste water in places, where construction of gravity-flow piping is not possible or practical.

- Internal diameter of the pumping station: ID1600, 2000, 2400 mm
- Pressure pipes: DN50, 65, 80, 100 mm
- Inlet flow rate: up to 100 m³/h
- Operating volume of wet chamber: ID1600 300l, ID2000 950 l and ID2400 up to 2000 l
- Waste water temperature: up to 40°C

Pumping station, its pressure pipes and pumps are selected according to the waste water flow rate and required pumping head.

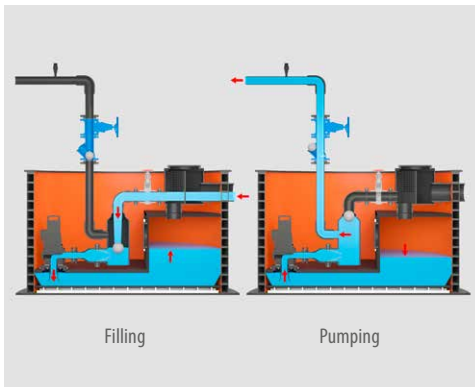


OPERATING PRINCIPLE

SSS pumping stations are double-chamber well-type pumping stations with dry installation pumps. Pumping station is equipped with a solids separation system (SSS).

Pumping stations include wet and dry chambers, pumps, solids separation system, pressure pipes and complete control cabinet.

Two dry installation pumps are used in the pumping station, in order to ensure operation of the pumping station also in case of maintenance or failure of one pump. Pumps operate alternately and are controlled by complete control cabinet installed in the control board of the pumping station. Level sensor is used for setting water levels in the pumping station, which regulate starting and stopping of pumps.



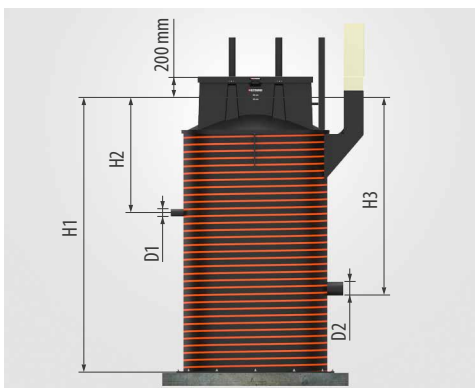
SOLIDS SEPARATION SYSTEM (SSS)

Wet chamber's filling stage

The inflowing waste water is cleaned of solids and only the pre-treated waste water is directed through the pump into the wet chamber; solid particles are collected in a separator.

Pumping stage

When the wet chamber is full, the pre-treated waste water is pumped back through the solids separator, so the pre-treated waste water takes along the solid particles that have collected in the separator.



INITIAL DATA FOR MANUFACTURING A PUMPING STATION




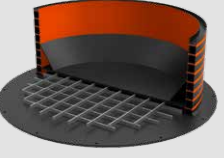




- type of water to be pumped (waste water, grey water, etc.);
- pumping station's internal diameter (ID, mm);
- pumping station's height from the ground (H1, mm);
- outflow pressure pipe's height (H2, mm) and diameter (D1, mm);
- inflow pipe's height (H3, mm) and diameter (D2, mm);
- pump parameters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

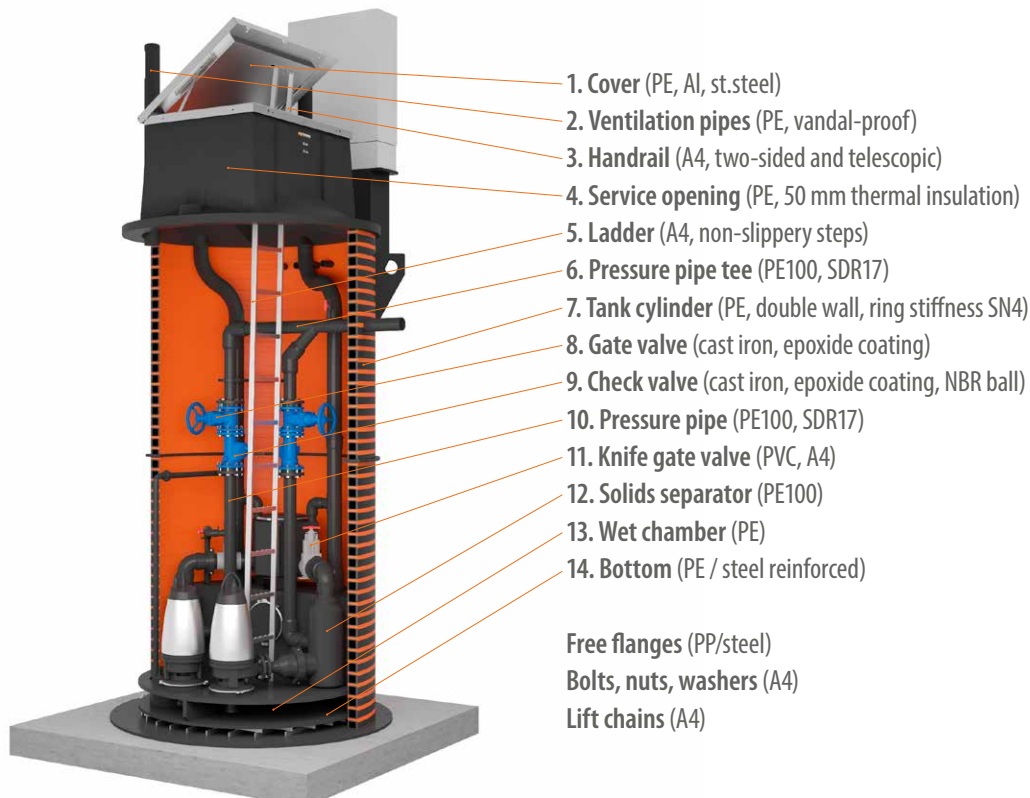
TECHNICAL CHARACTERISTICS

STRONG pumping stations are made of PE-HD (high-density polyethylene). Nowadays, PE is the main material used for manufacturing pumping stations, tanks, wells and pressure pipes. PE is a very hard-wearing and elastic material. PE is chemically inert in normal use,

meaning that a pumping station will not rot, rust or corrode due to chemical or electrical reactions and nothing will emit or dissolve from it into the environment. Tank cylinders of STRONG pumping stations are always made with a ring stiffness of at least SN4 (4 kN/m²), so they

resist mechanical damage that may occur when installing or using the system. This is important for preventing waste water 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 insulation	Service opening: PE, 50 mm of thermal insulation	Tank cylinder: PE double wall and ring stiffness SN4	Bottom: PE/steel reinforced and safety factor 2
			
Handrail: A4, telescopic	Ladder: A4, non-slippery	Solids separator: PE	Base of control cabinet: PE, cable protection pipes
			



SSS PUMPING STATION'S ADVANTAGES

ENERGY SAVINGS

Thanks to the separation of solid particles, the pumps are protected against clogging and this allows using pumps with a smaller free opening. Such pumps have higher efficiency and use less power.

RELIABILITY

The solids separation system protects the pumps against clogging, thus ensuring their long-term problem-free operation.

INCREASING PUMP HEAD

Pumps with a smaller free opening allow increased pump head. This means that a single pumping station is able to pump waste water further away.

EASY TO MAINTAIN

All important components are in the dry chamber and can be removed, so the pump station can be maintained and repaired while in operation.

SAFE TO MAINTAIN

The pumps and the pipes are located in the dry chamber. The dry chamber is separated from the wet chamber with a watertight and airtight barrier; this allows maintenance of the pumping station in a clean and safe environment.

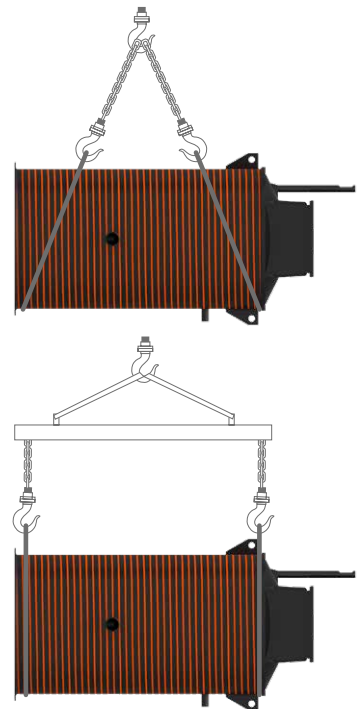
INSTALLATION

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. Minimum required bulk density is 1500 kg/m³.

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.

INSTALLATION

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's weight plus the pumping station's weight and the weight of the soil on the base plate's 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/m²), minimum strength 21 N/mm² (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 2000 mm. To anchor a 2400 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 plate's 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 base plate using anchoring bolts

Anchoring with a concrete base plate requires the use of corrosion-proof anchoring bolts fixed to the anchoring base plate 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:

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

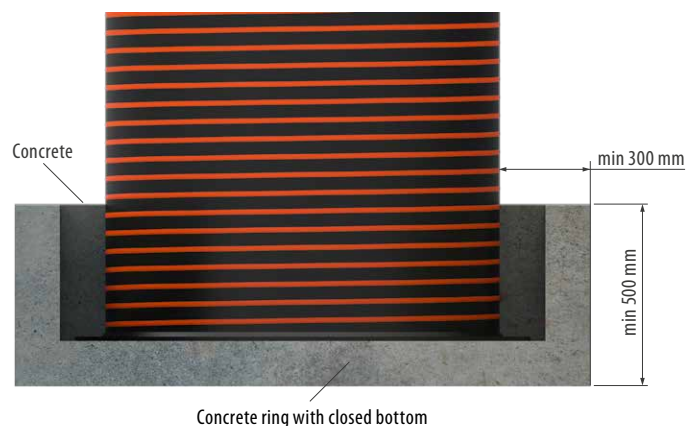
Anchoring the pumping station by casting its lower part into concrete

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 trench 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.



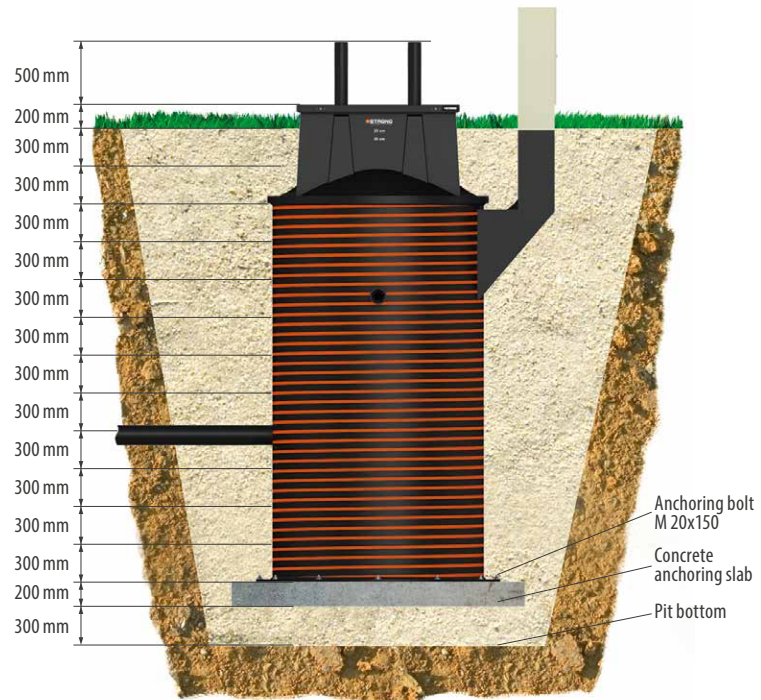
INSTALLATION

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 cavities remaining there.

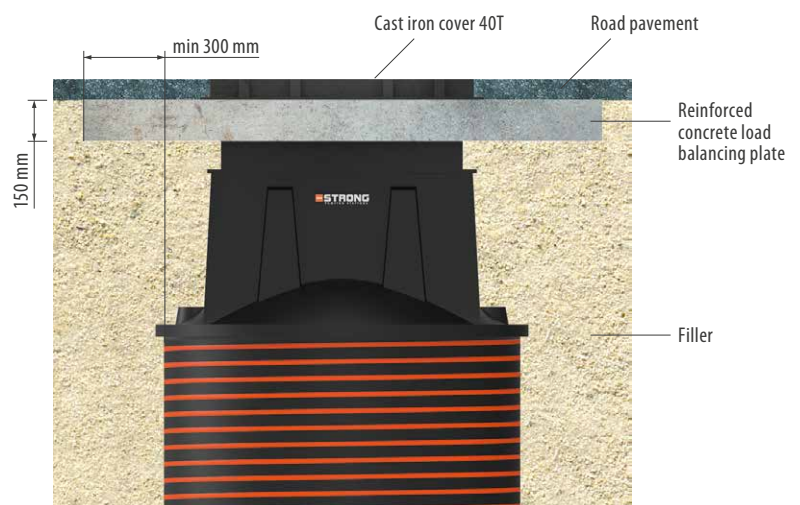
When installing the pumping station to a green area, make sure the cover reaches at least 100 mm above the ground, preferably even 200 mm, in order to prevent storm water from entering the pumping station.



! A pumping station installed without full backfilled topsoil layer may shift due to the impact of soil water. For this reason, the installation trench must be protected against soil water entering it 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 made of reinforced concrete. 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

The SSS STRONG pumping station is intended for pumping waste water.

The pumping stations are double-chamber well-type pumping stations with dry-installation pumps.

The pumping stations are compact in design and consist of a wet chamber and a dry chamber, pumps, solids separation system, pressure pipes and complete control cabinet.

The pumping stations use two dry-installation pumps, so the pumping station remains operational even during maintenance or breakdown of one pump.

The pumps work alternately and are controlled by complete control cabinet installed to the pumping station's control board.

A level sensor is 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 - www.iwsgroup.ee/en/products/autom

Opening and closing the pumping station's cover

Plastic, st. steel or Al (aluminium) covers 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°. To close the cover, set it back to its initial position and turn the locking bolts clockwise, using the same key.

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

Opening the safety platform

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



If the pumping station is not used in winter then the pumping station and it's 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.



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

STARTING THE PUMPS

1. Before starting the pumps, make sure the valves on pressure pipes located in the pumping station and exiting the pump are open.
2. When setting the pumping station's switching levels, make sure that the pump switches off before the water level reaches the pump's suction opening and the pumps run dry.
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 by moving rotor when checking the rotation.

MAINTENANCE

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.**

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

1. Inspect the functioning of the valves inside the pumping station. Close and open the valves once.
2. Clean the inside of check valves from the collected debris and sediments. To do so, close the valves and open the backflow valve's cover.
3. Clean the inlet distribution chamber. To do this, first close the inlet knife valve and open the cleaning door of distribution chamber.
4. Clean the solids separators.
 - Close inlet and outlet gate valves.
 - Disconnect the connection pipe

between separator and pump, and remove strainer.

- Clean the solids separator.
- Reinstall screen and connection pipe.

5. Pressure wash the walls of wet chamber of the pumping station and remove sediments from the bottom. To do this, open the cleaning door of wet chamber.
6. Clean the level sensors 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 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

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 liquids 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

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
www.iwsgroup.ee