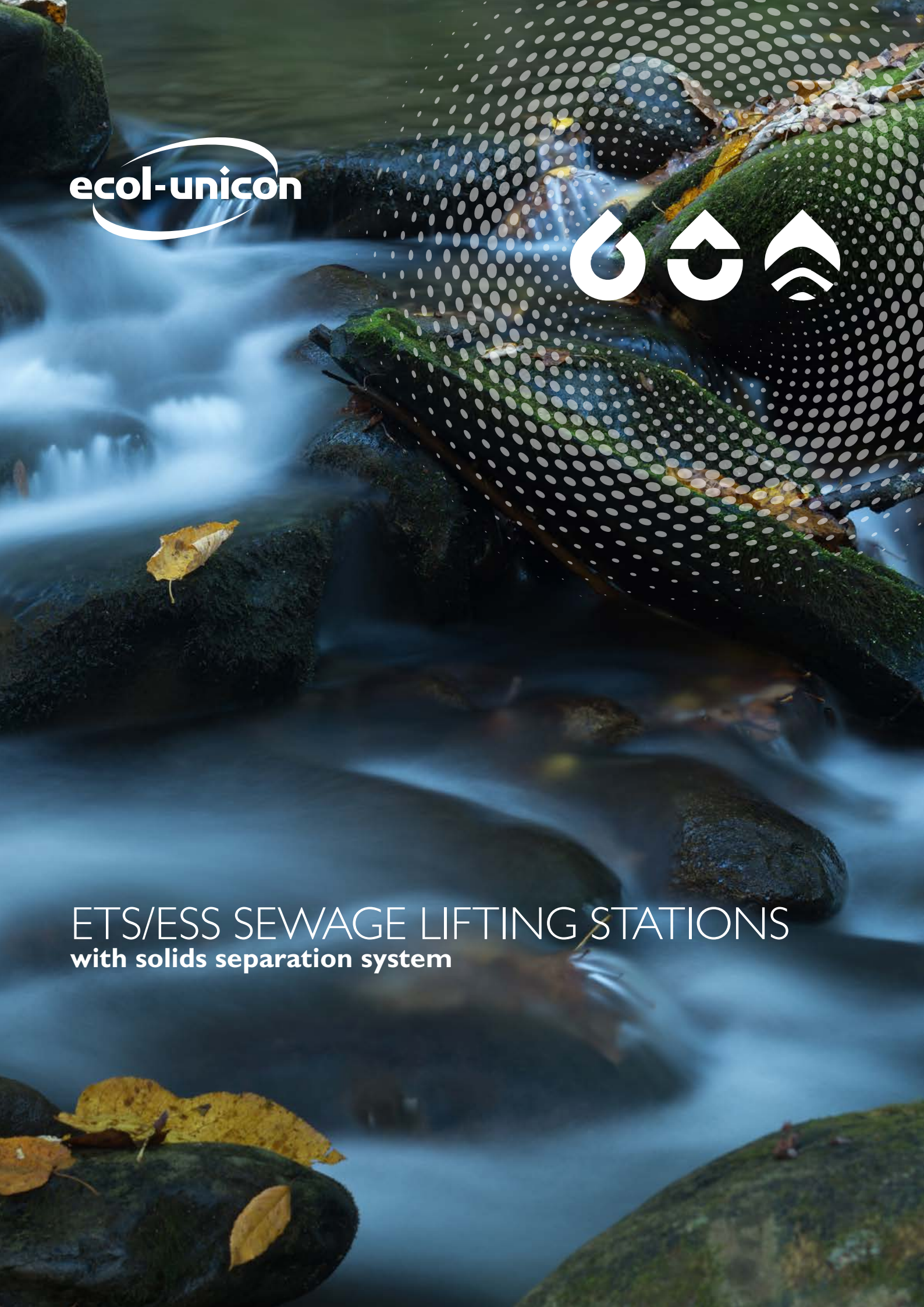


ecol-unicon

ETS/ESS SEWAGE LIFTING STATIONS

with solids separation system

The main task of DRY WELL PUMPING STATIONS is to pump a certain volume of wastewater to a specific height and distance, in a given unit of time. These devices, unlike wet well pumping stations, use a system of separating solids contained in sanitary sewage. This solution brings a number of benefits associated with the operation and maintenance of the facility.

Application

Dry well pumping stations are complete, fully automated devices, adapted to be integrated into the gravity-pressure sewage network. They are suitable for uneven or low sewage inflow rates. Their compact design allows to reduce installation space to a minimum, while providing convenient access to serviced components. Dry well pumping stations, due to the complete lack of any odour nuisance, can be located near residential buildings and public facilities.

ADVANTAGES

- possibility of servicing one of the inflow and discharge circuits while the other one remains operational
- quick and easy service access to all system components
- Complete elimination of odour nuisance
- comfortable and clean operation and servicing
- wide range of pump selection - based on design specifications and according to customer requirements
- separation of solids prior to the pumps:
  - Reduction of potential pump failures
  - lower costs (more energy efficient pumps)
- low maintenance costs
- made of materials guaranteeing corrosion resistance

MORE AT:
https://en.ecol-unicon.com/products/pumping-products/dry-well-pumping-stations/

Comparison of devices for pumping of sanitary sewage

Comparison feature	Pumping device	
	Wet well	Dry well
Separation of solids	none	separators with flexible flaps
Odour elimination	partial	complete
Servicing comfort	lower	high
Investment costs	lower	higher
Energy consumption	higher	lower – solids do not come into contact with the hydraulic components of the pump
Servicing costs	higher	lower

ETS/ESS SEWAGE LIFTING STATIONS TYPE SERIES

No.	Max. inflow		Module	Sump diameter (SN8 HDPE)	Min. discharge height**	Min. Hc	Max. Hc ***	Hdop ****	Net retention volume	Piping diameter	Inlet diameter	Transport size (HxW)
	m^3/h	l/s		mm	mm	mm	mm	mm	dm^3	DN	mm	m
1	15	4	ETS PE 80/2/1.6/300	1600	2020	2820	7000	1250	300	80	250	2.19 x 2.2
2	30	8	ESS PE 100/2/2.0/500	2000	2360	3200	7000	1500	500	100	250	2.71 x 2.45
3	40	11	ESS PE 100/2/2.0/700	2000	2560	3400	7000	1700	700	100	250	2.71 x 2.45
4	50	14	ESS PE 100/2/2.0/900	2000	2760	3600	7000	1900	900	100	250	2.71 x 2.45
5	75	21	ESS PE 150/2/2.6/1400	2600	3750	3800	7000	1900	1400	150	315	3.35 x 3.36
6	100	28	ESS PE 150/2/2.6/1700	2600	2950	4000	7000	2100	1700	150	315	3.35 x 3.36
7	150	42	ESS PE 200/2/3.0/2500*	3000	on request	on request	on request	2100	2600	200	400	on request
8	200	56	ESS PE 200/2/3.0/3400*	3000	on request	on request	on request	2500	3400	200	400	on request

* - available from 3Q23
** - height from the bottom of the chamber to the axis of discharge pipe
*** - depending on water table
**** - height from the bottom of the module/chamber to the bottom of the inflow pipe

ETS PE / ESS PE pumping station declaration of performance and CE marking confirms compliance with the PN-EN 12050-1:2002 standard, in addition national declaration of performance and a construction mark confirms compliance with the National Technical Assessment for devices with pumping systems.



ETS 80 PE



ETS 150 PE

Sewage lifting modules with a dual channel solids separation system for installation inside of a building (e.g. basement) or in a sump chamber for an underground installation.
ETS / ESS sewage lifting modules can be integrated into new or existing concrete chambers, as well as tanks made of HDPE, GRP or any other material suitable for installation underground.

MODULES:

No.	Max. inflow		Module	Min. sump diameter	Min. discharge height**	Hdop***	No. pump starts	Net retention volume	Piping diameter	Inlet diameter	Weight****
	m³/h	l/s		mm	mm	mm	1/h	dm³	DN	mm	kg
1	15	4	ETS PE 80/2/1.6/300 M	1600	2090	1250	15	300	80	250	520
2	30	8	ESS PE 100/2/2.0/500 M	2000	2450	1500	15	500	100	250	730
3	40	11	ESS PE 100/2/2.0/700 M	2000	2650	1700	15	700	100	250	750
4	50	14	ESS PE 100/2/2.0/900 M	2000	2850	1900	15	900	100	250	770
5	75	21	ESS PE 150/2/2.6/1400 M	2600	2800	1900	15	1400	150	315	1360
6	100	28	ESS PE 150/2/2.6/1700 M	2600	3000	2100	15	1700	150	315	1400
7	150	42	ESS PE 200/2/3.0/2500 M*	3000	on request	2100	15	2600	200	400	on request
8	200	56	ESS PE 200/2/3.0/3400 M*	3000	on request	2500	15	3400	200	400	on request

* - available from 3Q23
** - height from the bottom of the chamber to the discharge stub
*** - height from the bottom of the module/chamber to the bottom of the inflow pipe
**** - without pumps

ETS PE / ESS PE pumping station declaration of performance and CE marking confirms compliance with the PN-EN 12050-1:2002 standard, in addition national declaration of performance and a construction mark confirms compliance with the National Technical Assessment for devices with pumping systems.



ESS 80 PE



ESS 150 PE

CONSTRUCTION

Basic elements of a sewage lifting station include:

- body
- retention module
- solids separators
- pumps
- hydraulic-mechanical equipment - piping and fittings
- shut-off and non-return valves
- ventilation with odour neutralisation system
- power and control system
- accessories

BODY

The body of the unit is a sealed tank made of concrete, polymer concrete or PEHD, taking into account project requirements and the soil / water conditions. The cover of the pumping station is fitted with a manhole complete with a stainless steel, PEHD or cast iron manhole cover (depending on the intended use of the terrain at the site of the pumping station).
Dimensions of the manholes are adapted to the dimensions of the pumps for installation and removal and for operation and maintenance purposes. Passages through the body walls are made airtight to the extent that both groundwater infiltration and sewage exfiltration are prevented.

RETENTION MODULE

Retention module of the sewage lifting station is a sealed container designed to collect wastewater flowing into the unit. It is made entirely of stainless steel or HDPE. The used materials eliminate the need for additional corrosion protection coatings and ensure a long service life. Dimensions and retention volume are determined at the design stage with regard to the volume of wastewater inflow. Inspection openings are located in the upper part of the module, and allow to perform service checks without stopping the operation or conduct full servicing and cleaning of the interior when inflow is stopped.

SOLIDS SEPARATION SYSTEM

Solids separators are made of stainless steel. Each separator is fitted with flexible straining flaps. Depending on the type of liftin station, two types of separators are used: single-channel for ETS or dual-channel for ESS. In both cases, separators are located at pump discharge connections. Each type of separator is characterised by a reliable design that ensures full free passage during pumping, without any components remaining permanently in the pumped liquid stream that could block the flow of wastewater. Design of the separators ensure self-cleaning during operation.

PUMPS

Pumps in the lifting stations are mounted vertically, outside the retention module. Pumps are not directly submerged in wastewater, as in traditional pumping stations. IP68 protection rating submersible pumps suitable for dry operation are used as standard. Pumps are fitted with either a channel or vortex impeller and are designed for alternating operation in a 1+1 arrangement, with each pump operating in alternating cycles with a capacity equal to the total capacity of the pumping station at the assumed head. The pumps function as a backup for each other.

HYDRAULIC EQUIPMENT

FITTINGS

The Ecol-Unicon pumping stations use check valves and shut -off valves from the renowned and widely available manufacturers. These are located outside of the retention module, guaranteeing ease of service and quick access to spare parts. They allow for operation/maintenance activities during continuous operation of the device.

RETURN VALVES

- Ball elbow check valves - located on both gravitational inflow pipes, behind the preliminary separator, in front of the solids separator. The elbow valve system is fully automatic.
- Vertical ball return valves – located in each of the discharge pipes.

SHUT-OFF VALVES

Knife gate valves - used to cut off the flow of wastewater. These are located in strategic locations, so that their shut-off enables the service of individual elements of the device (fittings, pumps).

PIPING

Made of corrosion-resistant materials - stainless steel or HDPE. Piping diameter is adjusted to the capacity of the pumping station, taking into account optimal flow rate of wastewater in the discharge pipelines.

It is possible to include additional elements, such as e.g. platform, flow meter, aeration and venting valve.

STANDARD AUXILIARY EQUIPMENT

- ladder with CE marking
- handrails
- drainage system
- lighting
- rinsing system

VENTILATION

The mechanical-gravitational ventilation of the chamber guarantees a continuous exchange of air. The retention module is equipped with gravitational ventilation, terminating with an odour neutraliser. The neutralization process is carried out with the use of activated carbon, an anti-odour insert inside of a pipe filter.

POWER SUPPLY AND CONTROL SYSTEM

Power and control switchboard is a standard equipment of each pumping station. The switchboard conforms with a declaration of performance and CE marking, confirming compliance with Directive 2014/35/EU, 2014/30/EU.

The main task of the switchboard is to automatically start the pumps, depending on the level of wastewater in the pumping station. The level is measured by means of a hydrostatic probe. The pumping station is also equipped with 2 alarm sensors, which are an additional protection of the system in case of emergency situations and enable automatic operation of the pumping station in case of a possible failure of the hydrostatic probe or controller.

It is possible to monitor and control the parameters of the pumping station by incorporating it into the BUMERANG monitoring system - data transfer is wireless, using the GPRS standard.

INSTALLATION

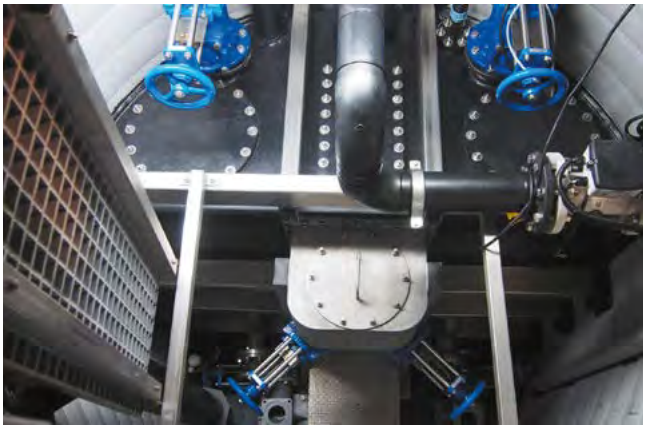
Pumping station chambers are delivered to the construction site as a monolithic tank or in prefabricated elements. The assembly of the chamber should be done according to the supplied instructions and drawings. When placing the chamber in the excavation, pay special attention to the correct direction of the inflow and discharge in relation to the direction of the external pipelines (the collector feeding the sewage to the pumping station and the discharge pipeline) and in relation to the sump, located in the bottom of the chamber (as per the drawing supplied by Ecol-Unicon). The next stage is the assembly of internal equipment: retention module, pumps, piping, fittings and accessories.

The ESS-PE pumping stations are designed as plug&play devices, i.e. they are delivered to the construction site as a complete, ready-to-install unit with a pre-installed module, hydraulic and mechanical equipment and accessories. This reduces installation work only to the connection of inflow and discharge pipes, pumps and power supply.

The last step is to connect the power system and to install and connect the power and control switchboard.



ETS pumping station in the HDPE chamber
Białystok



ESS-PE pumping station
Greece

OPERATION

Sewage pumping station is an automatic device which, apart from the necessity to intervene in case of failure or periodic inspections, does not require permanent service and frequent maintenance. During normal operation, the unit should undergo a detailed technical inspection once a year, however, due to the diverse composition of wastewater, the frequency of inspections should be determined individually. Flexible components of the separator should be replaced once a year or according to their condition and wear. A detailed service schedule is provided with the unit. All operation/maintenance, periodic inspections and warranty activities need to be recorded in the Pumping Station Operation Book.



ETS pumping station
Mieroszyno

OPERATION FRIENDLY

Operation and service should only be performed by personnel trained by the Manufacturer or by the authorized Ecol-Service representative.

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