



WASTEWATER ACCEPTANCE UNIT – SEWALUX

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Relevance. Most of the city's wastewater treatment stations are technically capable of receiving, processing and cleaning larger quantities of wastewater and organic pollutants when compared to the quantities that are presently collected via the general wastewater network system. It should be noted that a certain part of the water users, i.e. potential wastewater suppliers, have not yet connected to the centralised wastewater network system. This group could include manufacturing ventures, as well as households. To control and protect the natural environment from accidental spills and pollution, it is essential to collect this wastewater, to make a proper accounting of it and to evaluate the pollution level thereof. In certain cases, a wastewater treatment plant operator might find it financially useful to collect additional wastewater and organic pollutants; furthermore, this might also be beneficial for the purpose of maintaining an optimal wastewater treatment process, i.e. ensuring the correct proportion of organic pollutants and nutrients or optimising the processes of nitrogen discharge and biogas production. It should be noted that the wastewater acceptance unit SewaLux functionally meets all the following objectives – it collects wastewater,

accounts for its flow, identifies the carrier, shreds the solids, and, most importantly, it can instantly determine wastewater parameters or collect wastewater samples for analysis (for detailed wastewater pollution assessment, protection of the wastewater treatment plant against toxic shocks and proper pricing of the customers).

Description. A wastewater acceptance unit **SewaLux** is a fully automated set of equipment that is designed to accept wastewater, identify the carrier, account for the flow, collect samples for a quality analysis and online control of the wastewater in accordance with the pH, electrical conductivity, Redox potential, or temperature parameters. To ensure free flow and avoid pipes networks, pumps damages and blockages the device include a stone catcher and grinder. Additional sensors for the instant analysis of specific materials can be installed at the customer's request. The wastewater acceptance unit is designed to receive and discharge the wastewater delivered by septic tank vehicles to the wastewater networks. This equipment can be used for the acceptance of several wastewater types: various manufacturer's wastewater from the food industry, catering or other industries; as well as wastewater from private houses, enterprises or industrial centres. Wastewater units can be installed next to the wastewater treatment stations, or further away in order that the wastewater can be evenly distributed within the total wastewater flow, and in such way that the instant pollution of the treatment facilities can be reduced.



Picture 1. Wastewater acceptance unit SewaLux 2140L



Table 1. Dimensions, configuration and performance of the wastewater acceptance unit

Model	Length, mm	Width, mm	Height, mm	Door position*	Throughput
2140R	4000	2100	2500	Right	Up to 100 m ³ /h, pressure up to 1 bar
2140L	4000	2100	2500	Left	

*Door position in the right or left side, looking at the direction of sewage flow in the wastewater acceptance unit.

Equipment. The wastewater acceptance units **SewaLux** are produced in one size but can have two configurations depending on the flow direction (Table 1). The set of equipment included in the wastewater acceptance unit **SewaLux** depends on the customer's needs, the type of received wastewater and the operating conditions. It should be noted that we are ready to adapt to the requests and needs of the customer and can design modified wastewater acceptance units composed of various sets of equipment. Wastewater acceptance equipment also can be adapted and installed in an existing building. The key wastewater acceptance unit components and variations of the possible equipment are listed in Table 2.

Operating principles. A description of the operating principles. It should be noted that the device management is easily adjustable to the customer's needs.

- A carrier operator delivers the wastewater to the acceptance unit and connects a wastewater discharge hose to the acceptance pipe.
- The carrier operator touches a digital card reader with his user card to perform a user identification process.
- Carrier operator can type address where sewage was collected from via outside control panel.
- The wastewater acceptance unit turns on – a valve opens, and the wastewater starts flowing into the acceptance unit and to the sewage network.
- Heavy material such as rocks or metals are collected in the stone catcher. The grinder then crushes the rest debris and protects the pipelines and other devices against blockages and mechanical damage.

- The flow meter for commercial use records the amount of the intake.

- The sensors of the instant wastewater parameters (pH, temperature, electrical conductivity, Redox, etc.) transfer data to the control panel. If the acceptable limits of the instant wastewater quality parameters are exceeded, the intake can be terminated (the valve will be closed).

- Pressure control in the sewage receiving pipeline. The user determines the maximum pressure that can be reached in the pipeline – this protects the equipment installed in SewaLux. When the pressure is exceeded, the valve closes and the acceptance process is stopped.

- The automatic sampler turns on when at least one of the criteria set by the operator of the control panel is reached, i.e. a certain amount of wastewater has flowed through, a certain period of time has passed from the moment of the start of the intake, or certain limits of the wastewater parameters are exceeded. The automatic sampler takes a sample of the discharged wastewater.

- The sample taken by the automatic sampler can be directed to the laboratory for the identification of the pollution parameters of the wastewater. Depending on the wastewater pollution results, it is possible to apply a different fee for the handling of the intake or, in the case of severe pollution.

- Once the flow meter has identified that the wastewater has not been flowing for a while, the intake process is terminated – the valve closes and the automatic washing begins.

- The data ticket is printed on an information acceptance with indications of the time, the amount of the intake, etc.



Picture 2. Equipment in wastewater acceptance unit Sewalux



Table 2. The set of devices and technical characteristics of the wastewater acceptance unit SewaLux.

Components	Technical characteristics	Equipment	
		Standard equipment	Optional equipment
Device (body and walls)	The frame, inner and outer walls are made of galvanised sheet metal and profiles. Insulated with 8 cm insulation layer. $U=0,27 \text{ W/m}^2\text{K}$	√	
Identification system of the users (carriers)	Stationary industrial reader. Reliable and effective scanning of RFID tags.	√	
Printer	Print-out of the information acceptances of the intake.	√	
Control panel	Top quality, universal, industrial composite components manufactured by a well-known global vendor. Includes a touch-screen.	√	
Data transmission module	Data transfer via a USB drive.	√	
	Remote data transfers.	√	
Stone Catcher	Helps to contain solid parts and stones.	√	
Grinder	Two-shaft grinder DN 100	√	
Electromagnetic flow meter	DN100, commercial metering.	√	
Wastewater parameter meters	Measurements of the pH, electrical conductivity, temperature, Redox and other pollutants (COD, oil)	√	
Stainless steel pipeline	DN100, including a washer and a fast connector DN100	√	
Pneumatic valves	Steel, stainless steel valve (DN 100)	√	
Air compressor	Pneumatic device management.	√	
Automatic hose reel for washing	Lot cleaning.	√	
Automatic electric heater	For heating the wastewater acceptance unit and ensuring a positive temperature of the device.	√	
Keyboard	Mounted on external control panel. Stainless steel, for the outdoor use.	√	
Automatic sampling scoop	Wastewater sample acceptance.		√
Video recorder	WEB video camera for image transfers, with a hard disk external 1TB drive for recording possibility.		√
Alarm system	With audible siren, light indicator, remote control, text message notification in case of break-in.		√
Precipitation barriers (at the control panel)	Made of transparent, UV-resistant plastic		√



- Information data (indicating the user, the intake amount and the instant quality parameters) are saved on the control panel and remotely are transmitted to the operator's PC.

- The data and error signals can be identified in real-time on a locally installed control screen or transferred to the wastewater treatment station's control panel or the operator's PC. Video surveillance is optional.

Benefits and features. SewaLux wastewater acceptance units typically have the following advantages and features:

- It is adapted to cold climate conditions – has thermal insulation of 8 cm.

- The container is produced, and the device is fully assembled by UAB Ekotakas, with consideration of the needs and requirements of every client.

- Data recording, processing and remote transfer to the operator's PC.

- Database of all Lithuanian, Latvian and Estonian addresses is included.

- Efficient identification system of the users (carriers).

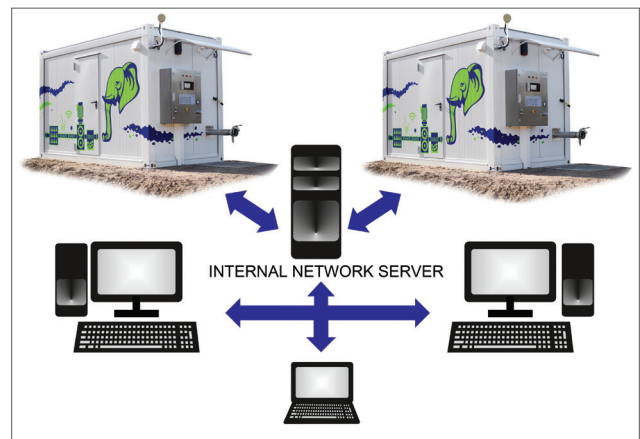
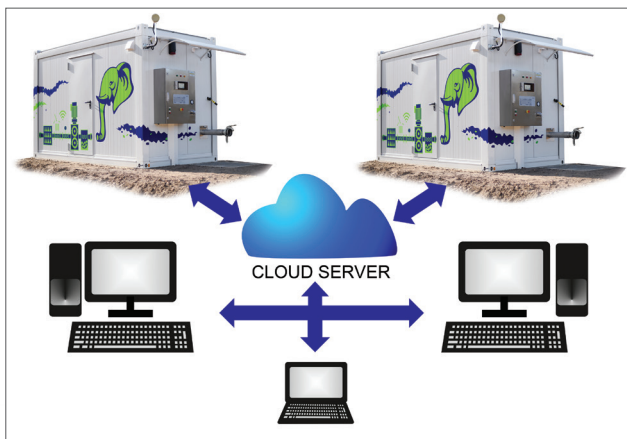
- Instant identification of the intake quality (pH, temperature, Redox, electrical conductivity, etc.).

- Termination of the intake if the limits of the instant wastewater quality parameters are exceeded.

- Automatic sampling of the intake for a laboratory analysis, i.e. identification of the pollution level.

SewaSoft software is installed together with SewaLux wastewater acceptance unit. SewaSoft is a software for processing and managing data received from SewaLux. SewaLux collects data in a special file when receiving sewage. SewaSoft receives data from SewaLux and forms database containing information about sewage carrier, the date and time of discharging, the amount of wastewater, pollution, etc. SewaSoft program forms and manages this database using a cloud computing. The client can connect to the SewaSoft program using a personal computer with Windows operating system. The data on the computer is synchronized with the database in the cloud. You can perform ordinary actions: data processing and handling (filtering, selecting data fields, exporting, etc.) using database on the computer. Also, it is possible to send commands to SewaLux acceptance unit and to control it via SewaSoft software using computer. SewaSoft program allows you to collect and merge information from several separate wastewater acceptance units. SewaSoft program can be used by different levels of users: administrator, operators, accountants, and end-users. Administrator of SewaSoft can give various access rights to the data and system management for the rest of the users.

Communication of SEWALUX and SEWASOFT



Picture 3. SewaSoft can serve a group of wastewater acceptance units and can be used on computers running the Windows operating system.

