

BIOLOGICAL WASTEWATER TREATMENT

PLANTS FOR 30 ÷ 300 PE

AS-VARIOcomp N, AS-VARIOcomp N/PUMP

AS-VARIOcomp N/ULTRA, AS-VARIOcomp N/BETON



In practice, the AS-VARIOcomp N biological wastewater treatment plants (further as the WWTPs) continue in the tradition of well-proven product family of WWTPs manufactured and operated by ASIO, spol. s r.o. since 1993. Due to this practical experience, we are able to offer highly professional approach in the terms of design and construction part of turnkey supplies of such WWTPs.

Application possibilities

This WWTP type is used for treatment of sewage produced in apartment houses, hotels, lodging-houses, or buildings offering similar services. Major advantages of the WWTP consist in its easy adaptability to local conditions and a simple equipment construction. Larger wastewater treatment plants can be designed by grouping of the basic type range members. In case of non-standard requirements, an individual process design can be prepared – such as removals of NH_4 , N_{total} , and P.



AS-VARIOcomp N

ALL PLANTS ARE MANUFACTURED UNDER THE INTERNATIONAL TRADE MARK



This is a type range of fitted wastewater treatment plants intended for treatment of sewage. These wastewater treatment plants can be used in sizes from 30 to 300 population equivalents (PE). The process design of these plants is based on stable and reliable operations at minimum energy consumption. The technology utilises aerobic biological processes that are verified in practice over long periods of service. For WWTs over 150 PE, an individual design preparation will be necessary.

Advantages of AS-VARIOcomp N



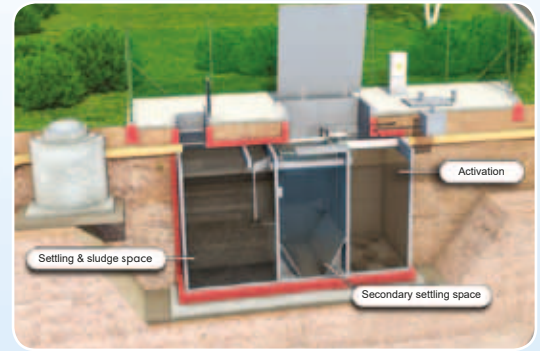
- Complete supply (all included in the price)
- Low operating costs and energy consumption
- Warm-padded and lockable cover (tilt-up on stainless-steel hinges)
- Easy maintenance and attendance of the plant
- High operating reliability
- Due to the draw-off of clean water provided with air-lift pumps, a sufficient space for newly incoming wastewater is created in the plant
- Easy operational settings of the plant
- Customer support and services throughout the whole Czech Republic



Process description

• AS-VARIOcomp N

Wastewater flows into the WWTP settling section, which is also used as an excessive sludge reservoir. Floating and sedimenting solids are collected here. In the activation tank space, the mechanically pre-treated water is then treated biologically. In the WWTP settling tank, sedimentation of formed sludge flocculi takes place and cleaned water is drawn off. The thickened sludge from the bottom of the secondary settling tank is pumped back to the activation section. A part of the activated sludge is removed from the activation space as excessive sludge to the sludge tank.



• AS-VARIOcomp N/P

In contrast to the AS VARIOcomp N type, this WWTP is extended with the coagulant dosing facility reducing the phosphorus content in the cleaned water. The coagulant dosing device can be placed into the plant space so that no additional modifications are necessary, except for power supply to the plant.

• AS-VARIOcomp N/PUMP

In contrast to the AS VARIOcomp N type, this plant is extended with a built-in pumping sump fitted with a sludge pump and negative screens. Wastewater can be pumped directly to the WWTP activation section.

• AS-VARIOcomp N/.....

We can design the plant for individual loading and discharge parameters, as required.

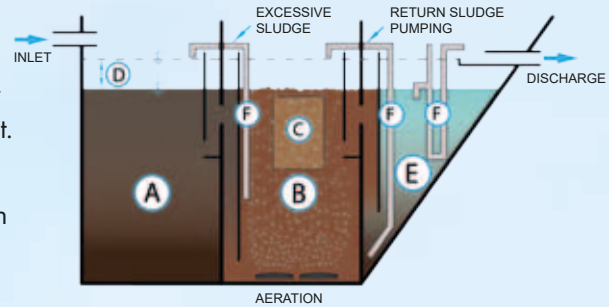


Diagram description:

- A - Settling & sludge space
- B - Activation
- C - Biomass carrier
- D - Accumulation space
- E - Secondary settling space
- F - Air-lift pumps

AS-VARIOcomp N

WWTP size	Number of PE	Nominal daily flow rate (m ³ /day)	Nominal loading with substances - BOD ₅ (kg/day)	Length × width × height L × W × H (mm)	Inlet / discharge height Hv (mm) / Ho (mm)	Weight (kg)
30	25 - 33	3,75 - 4,95	1,5 - 1,98	2000 × 2160 × 2980	2200 / 2050	1250
40	34 - 44	5,1 - 6,6	2,04 - 2,64	3000 × 2160 × 2980	2200 / 2050	1400
50	45 - 55	6,75 - 8,25	2,7 - 3,3	4000 × 2160 × 2980	2200 / 2050	1750
60	56 - 70	8,4 - 10,5	3,36 - 4,2	4000 × 2160 × 2980	2700 / 2550	1900
80	71 - 90	10,65 - 13,5	4,26 - 5,4	5000 × 2160 × 2980	2700 / 2550	2200
100	91 - 110	13,65 - 16,5	5,46 - 6,6	6000 × 2160 × 2980	2700 / 2550	2450
125	111 - 135	16,65 - 20,25	6,66 - 8,1	7000 × 2160 × 2980	2700 / 2550	2700
150	136 - 155	20,4 - 23,25	8,16 - 9,3	8000 × 2160 × 2980	2700 / 2550	2950

AS-VARIOcomp N/PUMP

WWTP size	Number of PE	Nominal daily flow rate (m ³ /day)	Nominal loading with substances - BOD ₅ (kg/day)	Length × width × height L × W × H (mm)	Inlet / discharge height Hv (mm) / Ho (mm)	Weight (kg)
30	25 - 33	3,75 - 4,95	1,5 - 1,98	3000 × 2160 × 2980	min. 1300 / 2050	1700
40	34 - 44	5,1 - 6,6	2,04 - 2,64	4000 × 2160 × 2980	min. 1300 / 2050	1850
50	45 - 55	6,75 - 8,25	2,7 - 3,3	5000 × 2160 × 2980	min. 1300 / 2050	2200
60	56 - 70	8,4 - 10,5	3,36 - 4,2	5000 × 2160 × 2980	min. 1300 / 2550	2350
80	71 - 90	10,65 - 13,5	4,26 - 5,4	6000 × 2160 × 2980	min. 1300 / 2550	2650
100	91 - 110	13,65 - 16,5	5,46 - 6,6	7000 × 2160 × 2980	min. 1300 / 2550	2900
125	111 - 135	16,65 - 20,25	6,66 - 8,1	8000 × 2160 × 2980	min. 1300 / 2550	3150
150	136 - 155	20,4 - 23,25	8,16 - 9,3	9000 × 2160 × 2980	min. 1300 / 2550	3400

Table of guaranteed values – according to BAT

The guaranteed values at the discharged from WWTP AS-VARIOcomp N will be met, if the design parameters and, installation/operating conditions are respected (according to the supplied Operating instructions). In addition, for the AS-VARIOcomp N/P and/or AS-VARIOcomp N/PUMP/P WWTP types it is possible to guarantee the phosphorus concentration in the discharge:
 $P_{total} = 2 \text{ mg/l}$.

Parameter	Values „p“	Values „m“
BOD ₅ (mg/l)	25	60
CHSK (mg/l)	90	150
NL (mg/l)	30	60
P _{total} (mg/l)	-*	-*

* ... if extended with the dosing device, the phosphorus content reduction: 2 / 4

FOR MORE DETAILS, PLEASE ASK FOR DESIGN AND INSTALLATION SUPPORTING DOCUMENTS!

AS-VARIOcomp N ULTRA

This type range is intended for the capacity from 30 to 150 population equivalent units. The fitted wastewater treatment plants are designed for treatment of sewage from permanently occupied buildings (i.e. from 30 to 150 population equivalents). The wastewater treatment plant is provided with the membrane technology, which liquidate a major part of viruses and bacteria in the treated water.

Advantages of AS-VARIOcomp N/ULTRA

- In terms of hygiene, the water is (partially) safe from bacteria
- It can be used for irrigation, cleaning, car washing and toilet flushing
- The water is qualitatively comparable with rainwater, it can be soaked away
- An environmentally friendly solution
- Intensification of existing wastewater treatment plants
- The plant can be operated at a half of its nominal capacity (load)

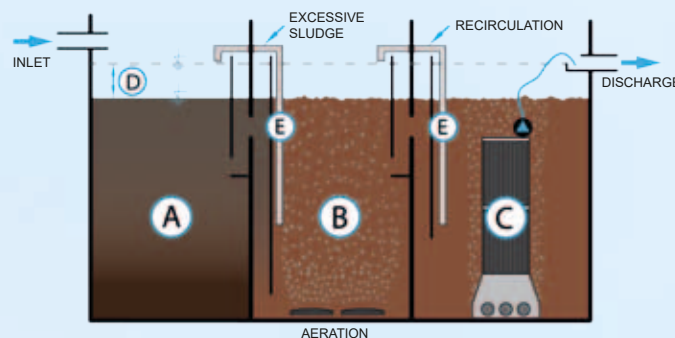


Diagram description:

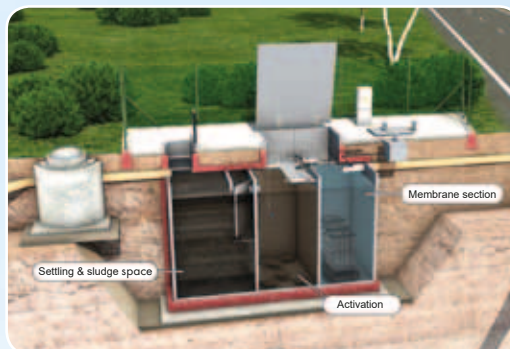
- A - Settling & sludge space
- B - Activation
- C - Membrane section with module and pump
- D - Accumulation space
- E - Air-lift pumps

Process description

The plant consists of an all-plastic tank divided with internal partitions to individual process areas.

Inside the tank, microfiltration modules are placed; they consist of an air distribution system, aeration elements, membranes, and pumps. The tank is covered with a warm-padded hinged cover. Wastewater flows into the settling space of the plant inlet section, where mechanical, floating, and settleable solids are removed. These solids are further subjected to anaerobic decomposition (hydrolysis). From the settling space, mechanically pre-treated wastewater flows (over the overflow) to the activation space containing the membrane section with microfiltration modules.

The activation space is used for wastewater biological treatment and microfiltration over the membranes. In its bottom part, it is fitted with a fine bubbling system for aeration of the tank and cleaning of the membranes; the air stream is supplied by a blower. This is advantageous because the plant operates in the range from its minimum to maximum operating levels, which provides the accumulation space within the entire plant space, and therefore it is useful for the wastewater accumulation as well as for balancing the discharge from the plant. The activated mixture from the activation space is filtered under pressure over the membranes (pore diameter: 0.03 μm), from where it continues to the discharge.



Discharged water quality

Assuming that the wastewater incoming stream corresponds, by its character and composition, to the municipal (sewage) wastewater as specified in ČSN 75 6402 "Sewage Treatment Plants up to 500 of Population Equivalents", the AS-VARIOcomp ULTRA plants are capable of achieving the values shown in the table.

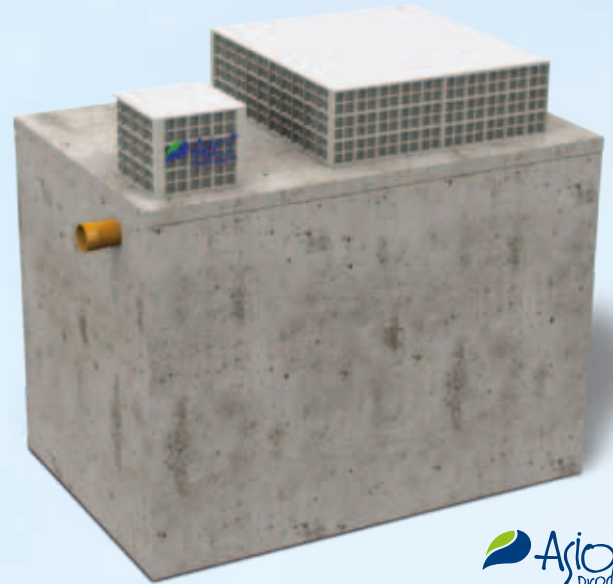
AS-VARIOcomp N/BETON

This is a wastewater treatment plant, the fitting of which is made into a concrete tank. The concrete tank is formed by pre-fab walls, bottom, and bleeders – all of them are fitted together on the site.

The concrete tanks are produced in sizes from 30 to 150 population equivalents.

Advantages of AS-VARIOcomp N/BETON

- Retaining of the AS-VARIOcomp N process, i.e. all utilisation advantages and possibilities; the process is well proven in practice
- Self-supporting tanks (no concrete encasement necessary)
- Reduced construction costs (i.e. in the builder's work)
- Tank settings in places with underground water level occurrence
- Package wastewater treatment plant (i.e. it is delivered to the site completed, incl. plant equipment fitting out)
- Quick installation



Utilisation possibilities of AS-VARIOcomp N/BETON

- Standardised wastewater treatment plants, 50 to 150 PE, single-line arrangement
- Larger standardised wastewater treatment plants (double-line arrangement) 200, 250, and 300 PE
- Plants with integrated pumping stations
- Individual solution design (modified to the requirements for cleaned water quality, removal of organic and inorganic contaminants, incl. nutrients)

AS-VARIOcomp N/BETON

WWTP size	DN Inlet / discharge	Length x width x height* L x W x H (mm)	Inlet / discharge height Hv (mm) / Ho (mm)	Weight (kg)
30	150	2680 x 2180 x 2920	2265 / 2115	13200
40	150	3080 x 2680 x 2920	2265 / 2115	16700
50	150	3580 x 2680 x 2920	2265 / 2115	18250
60	200	4080 x 2680 x 3110	2625 / 2475	23300
80	200	4580 x 2680 x 3110	2625 / 2475	25600
100	200	5580 x 2680 x 3110	2625 / 2475	30100
125	200	6380 x 2680 x 3110	2625 / 2475	33700
150	200	3580 + 4080 x 2680 x 3110	2625 / 2475	19300 + 21200

*The tank height is ex bleeders and covers



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FOR FURTHER INFORMATION SEE WWW.ASIO.CZ

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