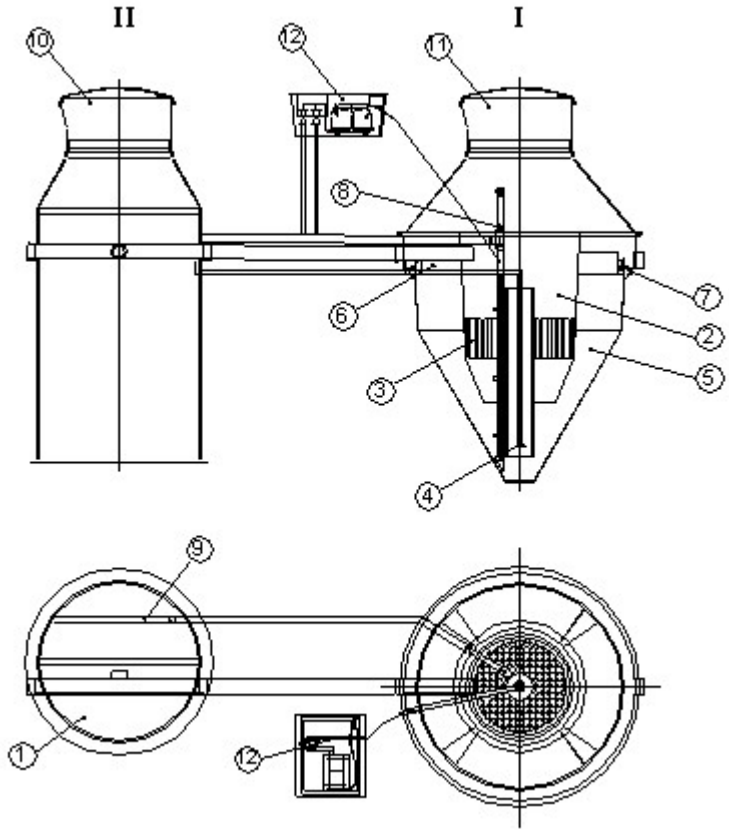
NV- t type biological wastewater treatment plant

Domestic wastewater treatment system consists of two separate tanks – the NV type biological treatment plant and the sludge thickening device (Figure 1).

NV 1÷4t type wastewater treatment plant of domestic wastewater consists of two chambers present in one tank (Figure 1; I). At first, wastewater, flowing into the plant, enters into the aeration chamber (Figure 1; 1, 2 positions), where it is mixed with the activated sludge with the help of air. Compressed air is necessary for supporting life of activated sludge and internal recirculation of treated wastewater. Air is provided with the help of the compressor (airblower) (Figure 1; 12 position). Wastewater is mixed with the activated sludge by the air, lifting through the aerator (Figure 1; I, 4 position) from the bottom to the top. Biological wastewater treatment is performed with the help of microorganism's that decompose organic substances.

Purpose of the process is to bind soluble, colloidal and biogenic substances from wastewater into the activated sludge and separate activated sludge. Flake forming microorganisms multiply and form groups that cause adherence of protozoots and other bacteria. Microorganisms metabolyse ("eat up" and decompose) and destroy organic substances. Decomposition of organic materials and formation of activated sludge performs in the aeration section. Mixture of the activated sludge from the aeration chamber enters the external chamber (the secondary settling vessel) (Figure 1; I, 5 position), where, due to gravity forces, the activated sludge separates and falls down into the bottom part of the plant, from which, with the help of aeration system, once again rises into the aeration section - aerotank. Clarified wastewater enters into the collection duct, installed in the perimeter of the whole secondary settling vessel, and by passing through the flow regulator (Figure 1; I, 7 position), is removed through the outflow pipe.

If the mass of microorganisms increases, the amount of the activated sludge also increases. With the help of the airlift, excess sludge is periodically removed to the sludge thickening device (Figure 1, II). Sludge thickening device consists of two chambers – chambers of excess sludge and collection of clarified water. Particles of sludge settle at the bottom of the tank and the clarified water enters into the chamber of collection of clarified water through the overflow duct. Water is returned to the treatment plant from the collection chamber through a T-joint fitted on the inflow pipe. Excess sludge that dewatered is periodically removed from the thickening device by pumping-off.



Main structural parts:

I. Biological treatment plant
II. Sludge thickening device

1. Chamber of collection of clarified water
2. Aeration chamber
3. Bioload
4. Aerator
5. Secondary settling vessel
6. Outflow pipe
7. Outflowing water flow regulator
8. Airlift
9. Sludge chamber
10. Lid
11. Lid
12. Airblower

Figure 1. System of NV 1÷4t type treatment plants of domestic wastewater with a separate sludge thickening device

Technological parameters of NV 1÷4t type plants

Identification (according to capacity)	Capacity			Arbitrary number of population	Removed pollutants (indexes)	Initial pollution of wastewater		After treatment		Removal of occurring waste (slime, sludge, sand, etc.) change of filters (in every element)			
	m³/d	m³/h	l/s			kg/d	mg/l	mg/l	%	Waste (from filter) designation	Removal (dewatering) frequency, in times per year according to the fact	kg SS / removal	m³/ removal
NV-1t	0,8	0,3	-	4	BOD_7	0,28	350	<29	94,3%	Excess sludge	1-2	0,171	0,017
					SS	0,28	350	<35	95,1%				
					ChDS	0,48	600	<125	88,9%				
NV-2t	1,44	0,4	-	8	BOD_7	0,56	390	<29	94,3%	Excess sludge	1-2	0,24	0,024
					SS	0,56	390	<35	95,1%				
					ChDS	0,96	670	<125	88,9%				
NV-3t	2,52	0,8	-	14	BOD_7	0,98	390	<29	94,3%	Excess sludge	1-2	0,42	0,042
					SS	0,98	390	<35	95,1%				
					ChDS	1,68	670	<125	88,9%				
NV-4t	3,42	1,0	-	19	BOD_7	1,33	390	<29	94,3%	Excess sludge	1- 2	0,56	0,056
					SS	1,33	390	<35	95,1%				
					ChDS	2,28	670	<125	88,9%				

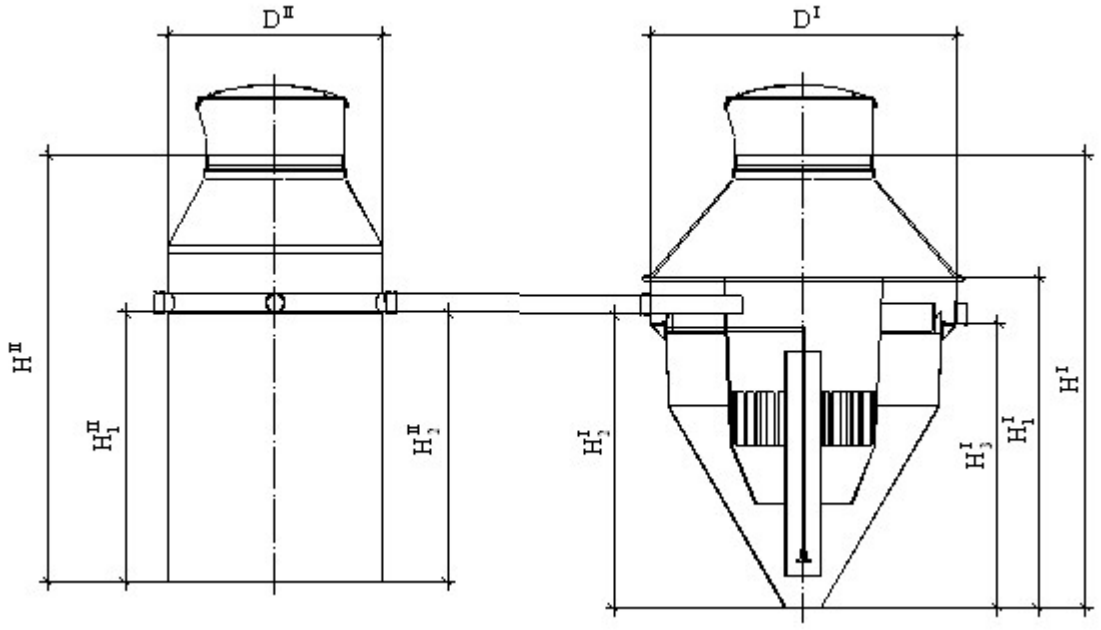


Figure 2. The main overhaul data of the NV 1÷4t type plant and sludge thickening device

Technical data of the plants

Model	Data of the biological wastewater treatment plant						Data of sludge thickening device			
	H^I, m*	H_1^I, m	H_2^I, m	H_3^I, m	D^I, m	Weight (netto), kg	H^{II}, m *	H_1^{II}, m	H_2^{II}, m	D^{II}, m
NV-1t	2,53	1,84	1,65	1,59	1,71	188	2,4	1,2	1,145	1,2
NV-2t	3,035	2,345	2,25	2,195	2,15	289	3,0	1,8	1,745	1,2
NV-3t	3,725	3,1	2,95	2,895	2,73	578	3,1	1,9	1,845	1,5
NV-4t	3,99	3,3	3,15	3,095	3,0	1000	3,2	2,0	1,945	1,5

** When the plant is installed in the depth of 1.2m.*
The manufacturer reserves the right to change parameters of the product, retaining treatment efficiency.

www.traidenis.com

info@traidenis.lt