



XCELLENCE IN WATER TREATMENT

*UREĐAJI
ZA FLOTACIJU*

*FLOTATION
PLANTS*





XELLENC IN WATER TREATMENT

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The values in the tables are only indicative.

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Model

X-FL**UREĐAJI ZA FLOTACIJU
FLOTATION UNIT**

Uređaj za flotaciju služi za fizičko-hemijski tretman vode.

Uređaj koristi rastvoreni vazduh da bi se razdvojila čvrsta i tečna faza vode koja se tretira.

Uvođenjem vazduha u vodu omogućava stvaranje mehurića vazduha koji u kontaktu sa suspendovanim česticama izaziva njihovo kretanje ka površini tako što se menja njihova gustina.

Da bi proces izdvajanja čestica bio efikasan potrebno je da se vazduh bude ravnomerno rastvoren u vodi.

Ako unutar flotacione jedinice ne bude ravnomernog rastvaranja vazduha neće doći do odvajanja svog flokulisanog mulja a otpadna voda može sadržati suspendovani materijal u većim količama.

Proces flotacije je automatizovan kontinuirani proces sa konstantnom brzinom protoka vode.

Rukovalac uređajem treba samo da proverava da ne dođe do kvarova ili da ne dođe do pojave bilo kog faktora koji može da utiče na proces razdvajanja plutajućeg mulja i prečišćene vode.

Obično se uređaji za flotaciju koriste za :

- Primarni tretman otpadnih kanalizacionih voda
- Odvajanje masti i ulja
- Primarno zgušnjavanje mulja
- Sekundarni tretman (odvajanje prečišćene vode od aktivnog mulja) kao alternativa ili kao podrška taložniku.

OPIS I PRINCIP RADA

Otpadna voda koja se tretira treba da bude skupljana i skladištena u nadzemne ili podzemne skladišne rezervoare.

Uređaj za flotaciju se mora napajati vodom sa konstantnim protokom.

Da bi se flotacioni uređaj zaštitio od čvrstih čestica veličina većih od 3mm koje bi prouzrokovale lom mehaničkih delova uređaja nepohodno je postaviti dinamičko ili statičko sito pre uređaja za flotaciju.

Postrojenje za uklanjanje otpadnih voda sa flotacionom jedinicom ima za cilj otklanjanje 80% masti i TSS kako bi se smanjio unos organskog opterećenja u postrojenje za biološko prečišćavanje ili ispuštanje tretirane vode u kanalizaciju.

Postrojenje je potpuno automatizovano za početak i kraj rada i za pripremu i doziranje hemikalija za koagulaciju i flokulaciju otpadnih voda koje se prečišćavaju.

Koagulacija / flokulacija se vrši direktno u dovodnom vodu flotacione jedinice gde se dozira koagulant (PAC, ClFe3) i polielektrolit koje je razblažen do upotrebne koncentracije (0,2-0,3%).

Polielektrolit se priprema u posebnoj automatskoj jedinici gde se koristi osnovni proizvod po zahtevu u emulziji ili prahu. Rezervoar flotacione jedinice u potpunosti je napravljen od nerđajućeg čelika AISI304 ili na zahtev od nerđajućeg čelika AISI316.

Flotacioni rezervoar je podeljen u tri odeljka koji čine jednu celinu :

- 1.Rezervor za saturaciju
- 2.Rezervoar oblika zarubljene piramide za skupljanje plutajućeg materijala
- 3.Rezervoar za skupljanje i ispuštanje bistre vode.

Unutar rezervoara za saturaciju usled vazduha raspršenog u sitne mehuriće, koagulirana i flokulirana otpadna voda brzo će se povući na površinu tečnosti gde će se za nekoliko minuta zgusnuti i može biti odstranjena nizom strugača koje vuku lanci gonjeni lančanicima po površini tečnosti i prebacuju u sabirni koš.



Saturacija tretirane vode sa komprimovanim vazduhom odvija se u vertikalnom cilindričnom rezervoaru za saturaciju koji se dimenzioniše prema protoku otpadne vode na ulazu u flotacioni uređaj.

Radni pritisak rezervoara za saturaciju je oko 3-4 bar i ovaj pritisak se reguliše specijalnim membranskim ventilom.

Pri otvaranju ventila odmah se uspostavlja optimalni pritisak koji se više ne menja.

Količina vazduha unutar tanka za saturaciju dozira se pomoću specijalnog merača protoka vazduha.

Potrebna količina vazduha mora se proveriti na početku rada i ne sme se više menjati.

Pumpa za saturisanu vodu koja ima otvoreno radno kolo od nerđajućeg čelika sakuplja unutar rezervoara za saturaciju deo otpadne vode (čija je zapremina otprilike 3-4 puta veća od količine otpadne vode koja ulazi u uređaj) i pumpa je u rezervoar za saturaciju gde dolazi u kontakt sa vazduhom.

Zatim se saturisana voda vraća na ulaz otpadne vode čime se omogućava potiskivanje TSS prema gornjoj površini nivoa tečnosti.

Pročišćena tečnost će se odvoditi gravitacijom dok će se gust mulj prenositi pomoću pumpe za mulj u poseban rezervoar ili posudu za zgušnjavanje mulja a zatim se odlagati ili dalje dehidrirati.

AUTOMATIZOVAN RADNI CIKLUS

Postrojenje za flotaciju se automatski uključuje kada se pokrene pumpa za napajanje sistema otpadnom vodom kada se šalje signal na električni panel koji posle primanja signala pokreće rad :

- Pumpe za saturaciju
- Pneumatskog solenoidnog ventila
- Motora koji pokreće lančane zupčanike
- Pumpe za doiranje koagulanta
- Pumpe za doziranje flokulanta

Isključenje postrojenja za flotaciju je kalibrisano sa podesivim kašnjenjem u minutima kada se isključi pumpa za napajanje.

Tokom rada uređaja za flotaciju pumpa za saturaciju i pumpe za doziranje hemikalija rade konstantno dok pogonski motor sistema za izbacivanje flotiranih čestica radi pomoću vremenskog prekidača koji je podesiv na nekoliko minuta kako bi suspendovane čestice imale vremena da se podignu na površinu.

U slučaju da postoji vijčana pumpa za odstranjivanje flotiranih čestica ona će raditi sistemom pokreni – isključi.

Priprema razlaženog polielektrolita je automatska i može se praviti u posudama od nerđajućeg čelika ili od PVC-a tako da se u jednoj posudi priprema a u drugoj skladišti.

Linija cevovoda za vodu je ispresecana solenoidnim ventilima kojima upravljaju nivo – sonde koje pokazuju kada ventil treba biti otvoren (minimalni nivo) a kada treba biti zatvoren (kada je nivo maksimalan).

Tokom prolaska vode u struju vode biće injektovan polielektorlit u obliku emulzije ili praha pomoću pumpe ili dozatora praha u vremenskim intervalima tako da se dobije zadovoljavajuća koncentracija.

Pripremljeni polielektrolit se konstantno lagano meša pomoću mešalice i dozira klipom dozir pumpe koji je od nerđajućeg čelika za protoke do 500 l / h ili zapreminska pumpe sa glavom od nerđajućeg čelika za veće protoke.

UREĐAJI ZA FLOTACIJU

FLOTATION UNIT



KONSTRUKTIVNI MATERIJALI

- Flotacioni tank: AISI304 / AISI316
- Lanac za evakuaciju i povlačenje plutajućeg materijala: AISI304 / AISI316
- Vođica lanca: Polizene 1000
- Ploče za vuču i skupljanje flotiranog materijala: AISI304 / AISI316 – Guma (debljine 4mm)
- Osovinice lanca i klip: AISI304 / AISI316
- Ventil za pražnjenje rezervoara za saturaciju: Nerđajući čelik AISI316
- Ventili za saturisanu vodu: Liveno gvožđe GG25 sa NBR membranom
- Pumpa za saturisanu vodu: Centrifugalna pumpa sa otvorenim radnim kolom: Nerđajući čelik AISI316
- Merač protoka vazduha: Pleksiglas

REGULACIJA

Flotaciona jedinica je dimenzionisana prema ulaznom protoku tečnosti, količini TSS, vrsti otpadne vode npr. za primenu u fabrikama sušenog mesa i kremama postoji potreba za cevima većih preseka zbog značajne količine masti koja je prisutna u otpadnoj vodi.

Od modela X-FL300 moguće je podešavanje nivoa tečnosti unutar rezervoara za saturaciju kao i podešavanje visine noževa za evakuaciju flotiranih čestica.

Modeli X-FL100 i X-FL200 imaju podešavanje nivoa tečnosti.

Standardni modeli sa karakteristikama su opisani u donjoj tabeli.

Moguće je prilagoditi uređaje za ulazne protoke koji su viši ili niži od navedenih.

DODATNA OPREMA NA ZAHTEV

- Lanac za regulaciju pH i koagulacije koji se sastoji od polietilenskog tanka sa vertikalnim mikserom, sonde za detekciju pH, pumpe za doziranje koagulant, pumpe za sodu
- Flokulacioni lanac – flokulacioni polietilenski lanac sa vertikalnim mikserom sa sporim okretanjem+ sonda za zamućenje kod doziranja polielektrolita
- Pumpa za evakuaciju plutajućeg materijala
- Kontrolna tabla sa PLC ekranom osjetljivim na dodir sa mogućnošću daljinskog upravljanja.

The flotation unit is a machine for the physical-chemical treatment of water. It uses dissolved air to obtain the solid / liquid separation. The introduction of air in the water allows the creation of air bubbles, that in contact with the suspended particles will cause the ascent to the surface, thereby modifying the density of the materials. The air dissolved in a uniform manner in the recycle stream is critical to its effective functioning. If within the flotation unit there will not be a good dissolution of air it will not be possible to separate all the flocculated sludge and the waste water may contain suspended material, in ever increasing quantities. The flotation operations provide for a continuous type process with automatic operation with a constant flow rate. The operator should therefore check only that there are no malfunctions or does not intervene any factor that may affect the functionality of separation "sludge" floated - sewage "clarified-purified".

Usually a flotation unit can be used:

- As a primary treatment (to pretreat sewage)
- Fats and oils separation
- As primary sludge thickening
- As secondary treatment (to separate the purified water from the activated sludge) as alternatives or in support to a sedimentation tank.

DESCRIPTION AND WORKING PRINCIPLE

The waters coming from the sites of collection, should be collected in a silo or in an underground tank, which will be used as storage.

The chemical-physical flotation plant must be fed at a constant flow rate.

In order to protect the flotation unit from solids with size greater than 3 mm, which would cause breakage to the mechanical parts, in particular to the sealing of the saturation electropump, is necessary to put a dynamic or static screen before the flotation unit.

The depuration plant with a flotation unit has the aim to remove 80% of fats and SST, in order to reduce the organic load input to the biological purification plant, or to the discharge into the sewer. The plant is completely AUTOMATIC to switch on and off, and for the preparation and dosing of chemicals for coagulation and flocculation of the wastewater to be purified.

The reaction of coagulation/flocculation will occur directly in the supply line of the flotation unit, where the coagulant is dosed (PAC, ClFe_3) and polyelectrolyte already diluted to the use concentration (0.2-0.3%). The polyelectrolyte will be prepared in a special automatic unit, using the mother product in emulsion or in powder, at request. The flotation unit tank is completely made in stainless steel AISI 304, or, at request, in stainless steel AISI 316.

The flotation tank is divided into three compartments, but in a single block.:

- 1) Saturation tank
- 2) Hopper, with a shape of a truncated pyramid, for the collection of the floated material
- 3) Tank for the accumulation and discharge of the clarified water

Inside the tank of saturation, due to the air dispersed in tiny bubbles, the coagulated and flocculated wastewater will be dragged quickly on the surface of the liquid where in a few minutes will thicken, and may be evacuated by a series of scrapers dragged by chains and sprockets in stainless steel and transferred to the collection hopper.

The saturation of the effluent with compressed air, takes place inside a tank of saturation, of vertical cylindrical shape, suitably dimensioned according to m^3/h entering the flotation unit.

Inside the tank of saturation, the pressure required is about 3-4 bar, this pressure is regulated by a special diaphragm valve, of type "started flow".

At the first start is established the optimal pressure and this will not have to be changed more.

The amount of air inside the tank saturation is dosed by a specific flow meter for air. The amount of air required must be checked at the first start, and must not be changed. The pump saturation, open impeller type, backward with shaft and impeller made of stainless steel, collects inside the tank of saturation a portion of the wastewater of about 3-4 times greater than the amount of wastewater in entry, and sends it to the tank of saturation, where it will occur the contact with the air. Following, is returned at the entrance of the wastewater, air-saturated, so as to allow the pushed upwards of TSS in the wastewater. The clarified liquid will be discharged by gravity, while the thick mud will be transferred by means of progressing cavity pump, into a special tank or thickening tank and then disposed of by self-venting or further dehydrated.

OPERATING CYCLE IN AUTOMATIC

The whole plant is automatically switched in parallel at the start of the feed pump, and then the electrical panel will receive from the external pump, a signal (clean contact) of the operation of the pump and then of the arrival of the wastewater:

- Saturation electropump
- Compressed air solenoid valve
- Chain gear motor
- Coagulant dosing pump
- Flocculant dosing pump

The switching off of the plant is calibrated, with an adjustable delay in minutes, at the de-energizing of the electrical feeding pump.



Modello / Model

X-FL**UREĐAJI ZA FLOTACIJU
FLOTATION UNIT**

During operation, the saturation electropump and the electric pumps for the chemicals dosing, will function in a constant way, while the gearmotor of the catenary for the evacuation of the floated, with timer function "pause-work", adjustable in minutes, to have the necessary time for the lift of the suspended solids. In case is present the single screw pump for evacuation of the floated, the pump will run and then turn off, in parallel to the motor of the catenary. The preparation of the diluted polyelectrolyte is automatic and can be made of stainless steel (monobloc tank) or in two tanks in PVC, one for the preparation and one for the storage of the polyelectrolyte.

The water line network is intercepted by a solenoid valve that is controlled by level probes resistive, (three-pointed probe) which indicate when the solenoid valve should be opened (at the minimum level) and when it shall close (to reaching the maximum level). During the passage of water for the filling, in the same current will be injecting the polyelectrolyte, in emulsion or in powder form, dosed from the progressive cavity pump or from the powder doser, timed so as to obtain the concentration of use.

The polyelectrolyte prepared will be constantly mixed by a slow agitator, and dosed with a dosing pump piston with stainless steel head, for flow rates up to 500 l/h, or positive displacement pump with the head in stainless steel for higher flow rates.

CONSTRUCTION MATERIALS

- Flotation tank: Stainless Steel AISI 304/316
- Floated material evacuation and dragging chain: Stainless Steel AISI 304/316
- Guide chain: Polizene 1000
- Plates for the dragging/collection of the floated material: Stainless Steel AISI 304/316 - Rubber (thickness 10mm)
- Chain shafts and pignon: Stainless Steel AISI 304/316
- Saturation tank discharge valve: Stainless Steel AISI 316
- Saturation valve (started flow type): Spheroidal Cast iron GG25 with NBR membrane
- Saturation electropump: Centrifugal pump with open impeller and backward in Stainless Steel AISI 316
- Air flow meter: Plexiglass

REGULATION

The flotation unit is dimensioned according to the input flow rate, the amount of TSS and the type of waste, for example for the application in cured meats factories and creameies, there is the need of pipes with larger sections, due to the significant amount of fats present in the wastewater. From the model X-FL 300, is allowed both the adjustment of the liquid level inside the tank of saturation, both the height adjustment of the catenary and the scraping blades.

This is to optimize the consistency in percentage of dry product floated.

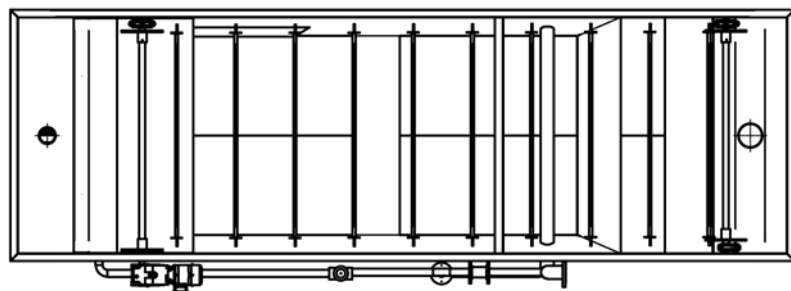
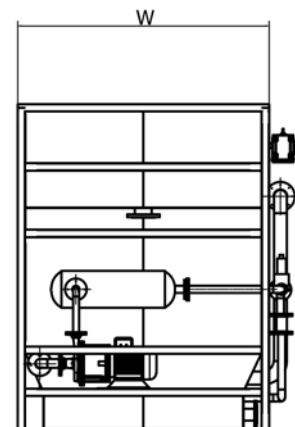
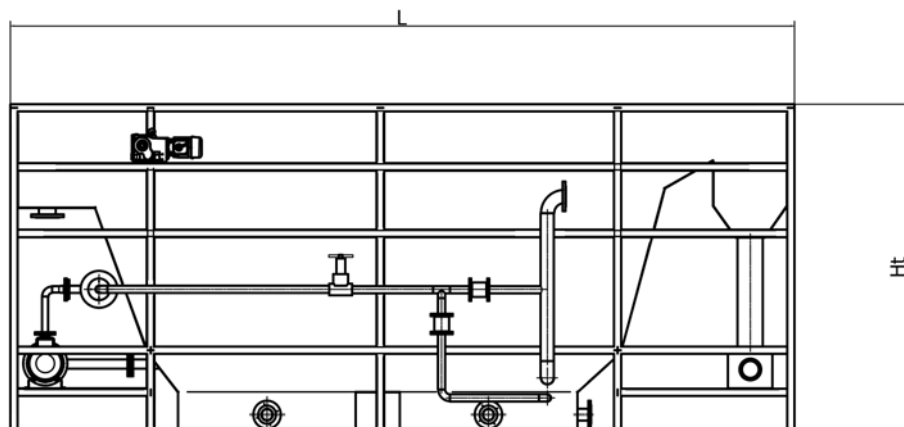
The X-FL 100 and X-FL 200 have the only adjustment of the liquid level.

The standard models and their characteristics are described in the following table. It is possible to customize the machines to flow rates lower or higher than those described.

EXTRA ACCESSORIES ON REQUEST:

- ph and coagulation regulation chain composed of:
Polyethylene reaction tank with vertical mixer, ph detection probe with proportional signal, Acid / Basic coagulant dosing pump, Soda pump.
- Flocculation chain:
Flocculation polyethylene tank with vertical mixer with slow turns + turbidity probe for proportional polyelectrolyte dosing + diluted poly pump
- Floating material evacuation pump
- Control panel with PLC touch screen with the possibility of remote control





MODEL MODEL	PROTOK FLOWRATE (m ³ /h)	SNAGA POWER (kW)	DIMENZIJE TANKA TANK DIMENSIONS LxWxHt (mm)	TEŽINA PRAZAN EMPTY WEIGHT (Kg)	TEŽINA PUN FULL WEIGHT (Kg)
X-FL 100	3	3	1800x1100x1250	300	900
X-FL 200	5	4	2500x1100x1250	400	1400
X-FL 300	10	5,5	3500x1300x1900	680	3900
X-FL 400	15	5,5	4000x1300x1900	800	4800
X-FL 600	25	7,5	5200x1600x2200	1600	8000
X-FL 800	30	11	5500x2100x2300	1700	11000
X-FL 1000	40	11	6800x2100x2300	1800	15000
X-FL 1200	50	15	7000x2100x2300	2000	21000
X-FL 1400	60	15	7500x2500x2300	2500	23000
X-FL 1800	70	26	9000x2500x2300	3000	25000
X-FL 2000	80/90	26	10000x2500x2300	3500	27000
X-FL 2500	100/120	30	9600x3200x2300	4000	31000

A richiesta X-FL può essere fornito anche in versione con vasca circolare.
 Na zahtev X-FL može biti opremljen kružnim tankom

Model

X-POLI**PRIPREMA POLIEKTROLITA I DOZIRNA STANICA****OPIS I PRINCIP RADA**

Stanica za pripremu i doziranje polielektrolita dizajnirana je za proizvodnju emulzije ili praškastog polielektrolita.

Ova rešenja se mogu primeniti u svim slučajevima kada želimo da odvojimo vodu od kanalizacione tečnosti kao što je biološki mulj ili hemijsko-fizički postupak.

Operater podešava hidraulički sistem za doziranje praha u dozir pumpu za emulziju prema podatku o koncentraciji rastvora i podešava protok vode.

Voda se meša sa koncentrovanim polielektrolitom u rezervoaru sa vertikalnim mikserom koji se okreće sa malim brojem obrtaja.

Uređaj je dizajniran tako da ima mogućnost rada u režimu kada treba predvideti minimalno vreme sazrevanja razblaženog polielektrolita (20-30min) u zavisnosti od rada dozir pumpe.

Standardna verzija se sastoji od :

- Rezervoara za mešanje (AISI304L) koji je podeljen u jedan ili više odeljaka.
- Loptasti ventil za pražnjenje AISI304
- Preliv
- Vertikalna mešalica sa malim brojem obrtaja sa osovinom i lopaticama od nerđajućeg čelika
- Indikator nivoa tečnosti
- Solenoidni ventil na liniji ulazne vode
- Regulacioni ventil pritiska sa filterom
- Merač protoka ulazne vode
- Vijčana / Dozir pumpa za koncentrovan polielektrolit
- Vijčana / Dozir pumpa za razblaženi polielektrolit.

TEHNIČKI PODACI / TECHNICAL DATA

MODEL	X-POLI 300	X-POLI 500	X-POLI 800	X-POLI 1000	X-POLI 1250	X-POLI 1500	X-POLI 2000	X-POLI 3000	X-POLI 4000	X-POLI 5000
Zapremina (Lt)	300	500	800	1000	1250	1500	2000	3000	4000	5000
Dužina (mm)	700	850	950	1250	1250	1300	1450	1900	2050	2250
Širina (mm)	650	750	850	950	1100	1150	1250	1300	1450	1550
Visina (mm)	1150	1150	1150	1150	1150	1250	1350	1350	1550	1650

POLIELECTROLYTE PREPARATION AND DOSING STATION

DESCRIPTION AND WORKING PRINCIPLE

The polyelectrolyte preparation and dosing station is designed for the production of emulsion or powder polyelectrolyte.

These solutions can be used in all the cases where we want to separate water from sewage liquid such as biological sludge or chemical-physical process.

The operator by means of concentration solution data, set the hydraulic powder dosing system in emulsion dosing pump, and set capacity of network water based on his needs.

The water get mixed with concentrate polyelectrolyte inside a tank with a vertical low rpm mixer.

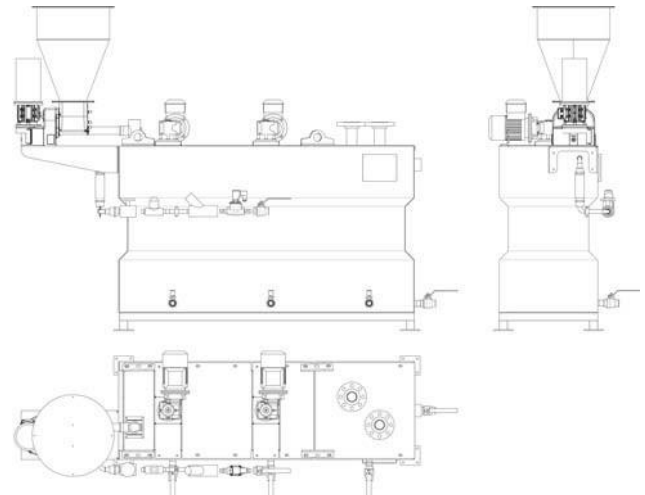
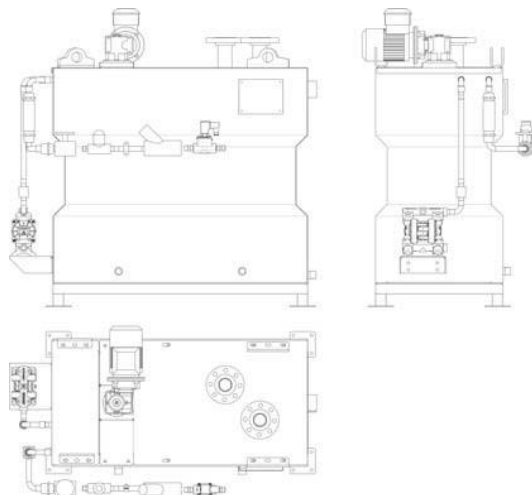
The machine is designed in order to respect a specific retention time (20-30 min) based on the diluted dosing pump.



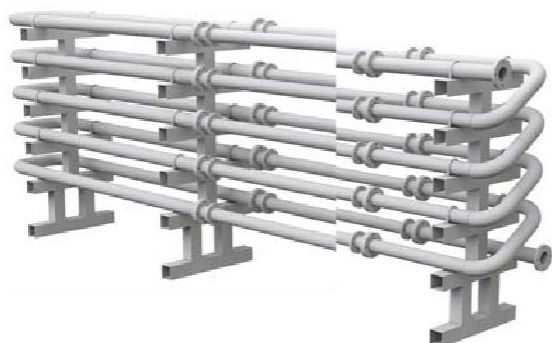
CONSTRUCTION CHARACTERISTICS

Polypreparator system in standard version is composed as follow:

- mixing tank in stainless steel AISI 304 divided into one or more sections
- discharge ball valve AISI 304
- Overflow sleeve
- vertical low rpm mixer with stainless steel shaft and blades
- bars sensor level
- solenoid valve for network water
- regulation pressure valve + Y filter
- flowmeter for monitoring mechanical-analog input network water
- screw/piston dosing pump for concentrate poli
- screw/piston dosing pump for diluted poli



X-SFP

STATIČKI FLOKULATOR
STATIC FLOCCULATOR

Flokulacija mulja može se izvršiti i pomoću statičke flokulacione cevi napravljene od PVC-a dovoljne dužine da bi vreme za koje tečnost prođe kroz cev bilo dovoljno da se izvrši proces flokulacije.

Pored ulazne priрубnice nalazi se statički mešać od nerđajućeg čelika AISI304 sa držačem za ulaz polielektrolita.

Statički mikser ima funkciju mešanja mulja i polielektrolita pre transportne zone cevi.

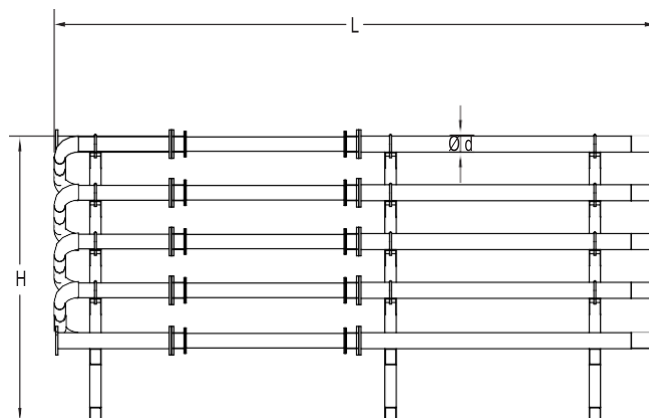
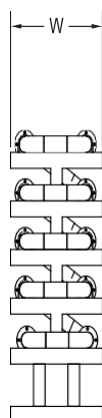
Prednosti ovog rešenja su nulta potrošnja električne energije i održavanje mulja pod pritiskom dok ne dođe u prijemni uređaj

The sludge flocculation can be done also by means of static flocculation pipe made by PVC-u and with a sufficient length in order to have the request retention time.

After the inlet flange is positioned a static mixer made by AISI 304 and plastic bracket with the inlet of polyelectrolyte.

The static mixer has the function of mixing sludge and poli before the transport zone.

The advantages of this solution are none electric consumption, and the maintenance of pressure sludge till the reception machine.



TEHNIČKI PODACI / TECHNICAL DATA

MODEL	X-SFP 50	X-SFP 80	X-SFP 100	X-SFP 150
Prečnik cevi (d)	DN50	DN80	DN100	DN150
Ukupna dužina (L)	3400 mm	3400 mm	3400 mm	3400 mm
Ukupna dužina cevi	35 mt	35 mt	35 mt	35 mt
Ukupna širina (W)	600 mm	600 mm	800 mm	800 mm
Ukupna visina (H)	1350 mm	1350 mm	1650 mm	1650 mm

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