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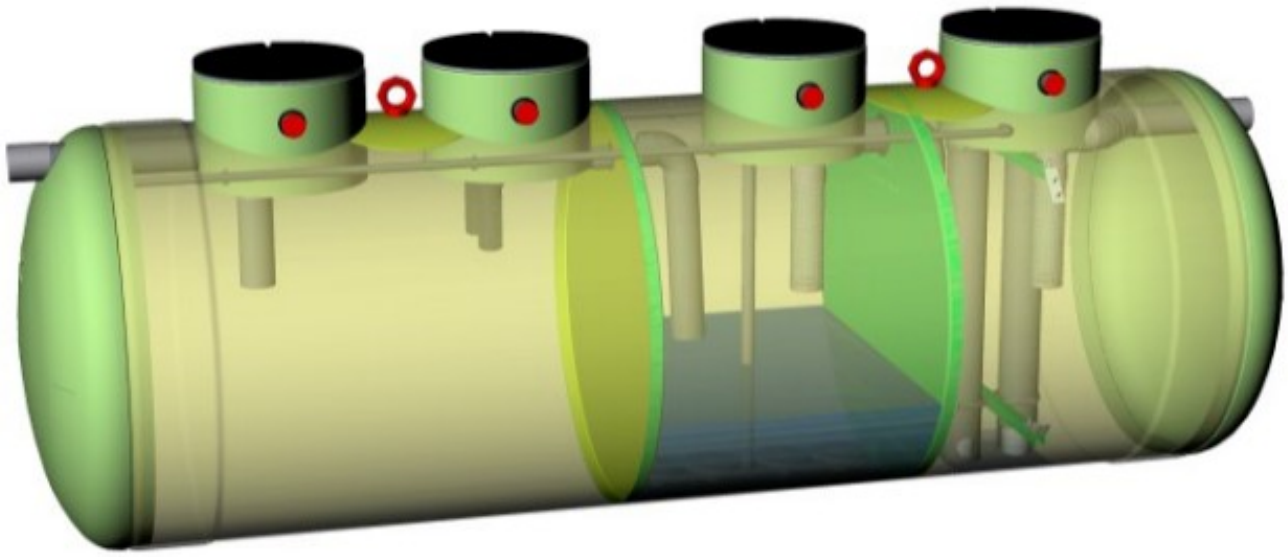
SIMOP MICRO-STATION OPERATING GUIDE



BIOXYMOP 6346
RANGE from 21 to 50
PE

We thank you for your confidence and hope that your SIMOP microstation gives you complete satisfaction.

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References of SIMOP microstations :

Number of PE	21	25	30	35	40	45	50
Reference	BIOXYMOP6346/ 21-19	BIOXYMOP6346/ 25-19	BIOXYMOP6346/ 30-19	BIOXYMOP6346/ 35-19	BIOXYMOP6346/ 40-19	BIOXYMOP6346/ 45-19	BIOXYMOP6346/ 50-19

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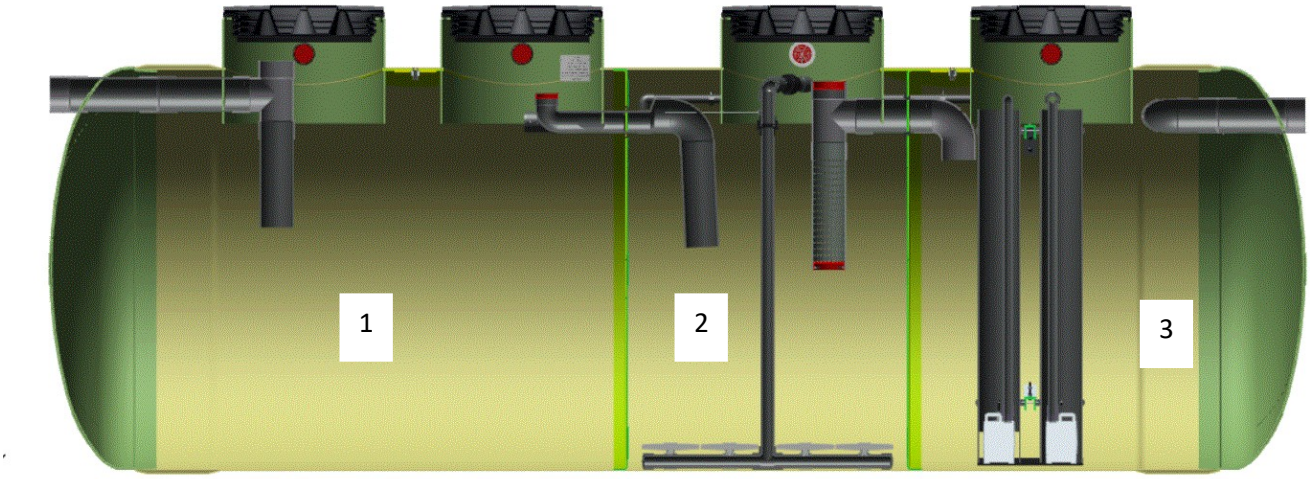
1 General information

1.1 Synthetic presentation of the purification concept:



Legend :
1 : primary clarifier 2 :
aeration basin
3 : clarifier

Simop's micro WWTP is designed using the Integrated Film Activated Sludge (IFAS) process. This process offers a high level of treatment and allows for large variations in organic and hydraulic loads, making it particularly suitable for domestic use.

The purpose of this process is to eliminate organic pollution through the action of bacteria. The micro-organisms use the organic pollution as a source of energy to ensure bacterial growth. This development results in the formation of organic sludge that is easily settled. The clarified water is then treated, the pollution having been captured by the sludge.

The domestic wastewater arrives in compartment n°1 to undergo decantation of solid particles and flotation of grease and light particles. The pre-treated effluent arrives in compartment n°2: the aeration tank. There, it undergoes forced aeration; air is diffused in the form of fine bubbles in the effluent by EPDM membrane diffusers under the action of an air compressor. The purifying bacteria develop freely in the effluent and a biofilm forms on the surface of the bacterial supports made up of HDPE cells with a large surface area for the growth of the bacteria.

After the aeration stage, the effluent passes through compartment n°3: the clarifier where it is decanted before being discharged to the outlet. The clarification compartment is equipped with 2 recirculation and extraction pumps which respectively maintain a constant sludge rate in the aeration tank and evacuate the excess sludge to the primary decanter where it will be stored.

1.2 Reference to standards used in construction for materials and equipment

The models of the " BIOXYMOP6346/XX-19 " range comply with the following elements

- ➢ Annex ZA of standard NF EN 12566-3+A1+A2, Domestic wastewater treatment plants ready for use and/or assembled on site.
- ➢ Order of July 21, 2015, on collective sanitation systems and non-collective sanitation facilities receiving a gross load of organic pollution load higher than 1.2 kg/day of BOD_5 (20 PE).
- ➢ Orders of 08/24/2017 and 07/31/2020 amending the order of 07/21/2015.
- ➢ NF DTU.64.1, for what concerns the ventilation system.
- ➢ NF C 15-100 for electrical installations.
- ➢ NF P 98-331 and NF P 98-332 for earthworks.

1.3 Basis for sizing

The models of microstations of the BIOXY3/6330 range take as a basis of dimensioning the following definition of the Equivalent-Capita:

- Hydraulic head: 150 l/d/PE
- Organic load: 60 g BOD5/d/EH.

The primary decanter is sized to meet :

- Volume, Vs = 300 l/EH
- Climbing speed, Va = 0,15 m/h

The aeration basin is sized to meet :

- Mass loading, Cm = 0.080 kg $BOD5_{/kg}$ MVS/d
- Volume loading, Cv = 0.28 kg BOD_5 / m^3

The clarifier is sized to meet :

- Climbing speed, Va = 0,4 m/h

1.4 Guaranteed performance

Simop guarantees the minimum performances imposed by the decree of 21/07/2015 after a start-up period of the microstation.

Parameters	Performance obtained *	Regulatory thresholds guaranteed by SIMOP
BOD5	Less than 35 mg/l	35 mg/l or 60 % in yield
TSS	Less than 35 mg/l	50% in yield
COD	Less than 125 mg/l	60% in yield

* These performances are obtained under normal conditions of use, care and maintenance in accordance with the prescriptions of this user's guide, and in the case of a biodegradable effluent with standard concentrations for a domestic effluent.

1.5 Composition of the treatment system

1.5.1 The lifting station (optional)

In case the water cannot enter the plant by gravity, Simop offers a complete range of lifting stations in PE and polyester, which can be equipped with one or more pumps controlled by a level switch, a screen basket and a valve chamber.

1.5.2 The bar screen (optional)

It protects the downstream works against the arrival of solid waste that could damage or clog the pipes and electromechanical equipment.
SIMOP has a range of automatic bar screens.
The automatic bar screens are of the inclined type with a 304L stainless steel frame ready to be installed in a channel. The effluent passes through a screen which retains the solids. The screenings are then automatically evacuated by a shovel and deposited in a container.
The manual bar screen is composed of a tank and a grid with a 15 mm air gap.

1.5.3 Storm overflow (optional)

Combined sewer systems with a peak flow in rainy weather that is too high compared to the hydraulic capacity of the plant are the source of WWTP malfunctions. In order to correct these problems, it is essential to bypass the excess flow at the maximum hydraulic capacity of the plant.
SIMOP offers a range of custom-made flow control equipment (DO, dry time measurement, etc.).

1.5.4 Storm water basin (optional)

The storm water basin is a buffer structure that allows the storage of excess flow during rainy periods and to send it back to the plant during dry periods or periods of low supply. It is a complementary structure to the overflow weirs. Simop has a wide range of tanks that can be used as a buffer basin.

1.5.5 Pre-treatment - Primary Decanter

The BIOXYMOP6346 range of plants is equipped with a primary settling tank. Primary settling consists of the separation of liquid and solid elements under the effect of gravity. It also allows the retention of light particles and grease. This type of pre-treatment allows the retention of approximately 50% of the TSS and 25% of the BOD5 and COD. The solids are deposited at the bottom of a structure called settling tank to form the primary sludge. The secondary sludge resulting from the biological treatment is also stored in this structure.

1.5.6 The Aeration Basin

The remaining pollution in the wastewater, mainly in the form of dissolved organic matter, is brought into contact with the biomass in the aeration tank. The degradation of the pollution is then carried out aerobically (in the presence of oxygen). The bacteria will use the organic matter as a source of carbon necessary for their development.

It is necessary to maintain a sufficient concentration of biomass in the reactor and to provide enough oxygen to maintain a good treatment quality.

The oxygen necessary for the metabolism is brought by fine bubble air diffusers fed by a membrane compressor, controlled by a programmable clock.

1.5.7 The clarifier

The clarifier is a structure that allows the physical separation of the sludge from the pore water. The clarified water is directly discharged to the outlet while the sludge settles in the bottom of the tank.

The clarifier includes two pumps. A recirculation pump which sends part of the sludge back to the aeration basin in order to maintain a constant concentration of biomass in the reactor and an extraction pump which allows the sludge produced in excess to be evacuated towards the primary settling tank.

1.5.8 The metering canal (optional)

In order to allow the measurement of the flow having transited in the station, the BIOXYMOP 6346 range can be equipped with a flow meter at the outlet. The flowmeter will be a venturi-type metering channel allowing the installation of a simple staff gauge or an ultrasonic probe for measuring the water level.

2 Sizing

2.1 Basic data

2.1.1 Definition of population equivalent (PE)

The PE. is a unit of measurement for assessing the capacity of a wastewater treatment plant, based on the amount of pollution emitted per person per day.
The European directive of May 21, 1991 defines the population equivalent as the biodegradable organic load with a five-day biochemical oxygen demand (BOD5) of 60 grams of oxygen per day.
By extension the other parameters of wastewater pollution can be used to define it.
The BIOXYMOP 6346 range of wastewater treatment plants are sized according to an incoming pollution load expressed in PE. The table below defines the ratios used for each parameter:

Dotation journalière	l/EH/j	150

DBO5	g/EH/j	60
DCO		135
MES		70
NTK		15
Pt		3,0

2.1.2 General data

Données de base Eaux Brutes								
Modèle BIOXYMOP		BIOXY.21	BIOXY.25	BIOXY.30	BIOXY.35	BIOXY.40	BIOXY.45	BIOXY.50
Capacité nominale	EH	**21**	**25**	**30**	**35**	**40**	**45**	**50**
Charge Organique	Kg DBO_5/j	1,26	1,5	1,8	2,1	2,4	2,7	3
Charge Hydraulique	m^3 /j	**3,2**	**3,8**	**4,5**	**5,3**	**6,0**	**6,8**	**7,5**

2.1.3 Pollution flows and concentration of raw water

Modèle BIOXYMOP		BIOXY.21	BIOXY.25	BIOXY.30	BIOXY.35	BIOXY.40	BIOXY.45	BIOXY.50
Flux de pollution								
DBO5	Kg/j	1,26	1,50	1,80	2,10	2,40	2,70	3,00
DCO		2,84	3,38	4,05	4,73	5,40	6,08	6,75
MES		1,47	1,75	2,10	2,45	2,80	3,15	3,50
NTK		0,32	0,38	0,45	0,53	0,60	0,68	0,75
Pt		0,06	0,08	0,09	0,11	0,12	0,14	0,15
Concentration								
DBO5	mg/l	400,0	400,0	400,0	400,0	400,0	400,0	400,0
DCO		900,0	900,0	900,0	900,0	900,0	900,0	900,0
MES		466,7	466,7	466,7	466,7	466,7	466,7	466,7
NTK		100,0	100,0	100,0	100,0	100,0	100,0	100,0
Pt		20,0	20,0	20,0	20,0	20,0	20,0	20,0

2.1.4 *Raw water hydraulic data*

Model BIOXYMOP		BIOXY.21	BIOXY.25	BIOXY.30	BIOXY.35	BIOXY.40	BIOXY.45	BIOXY.50
Hydraulics								
Qmj	m3 /d	3,2	3,8	4,5	5,3	6,0	6,8	7,5
Qmh	m3 /h	0,13	0,16	0,19	0,22	0,25	0,28	0,31
Peak coefficient	-	4,0	4,0	4,0	4,0	4,0	4,0	4,0
Qph	m3 /h	0,5	0,6	0,8	0,9	1,0	1,1	1,3

2.1.5 *Target discharge levels (treated water)*

Niveau de rejet								
Concentration								
Modèle BIOXYMOP		BIOXY.21	BIOXY.25	BIOXY.30	BIOXY.35	BIOXY.40	BIOXY.45	BIOXY.50
DBO_5	mg/l	25,0	25,0	25,0	25,0	25,0	25,0	25,0
DCO		125,0	125,0	125,0	125,0	125,0	125,0	125,0
MES		30,0	30,0	30,0	30,0	30,0	30,0	30,0
NTK		10,0	10,0	10,0	10,0	10,0	10,0	10,0
NGL		30,0	30,0	30,0	30,0	30,0	30,0	30,0
Pt		-	-	-	-	-	-	-
Rendement Minimum								
DBO5	%	93,8	93,8	93,8	93,8	93,8	93,8	93,8
DCO		86,1	86,1	86,1	86,1	86,1	86,1	86,1
MES		93,6	93,6	93,6	93,6	93,6	93,6	93,6
NTK		90,0	90,0	90,0	90,0	90,0	90,0	90,0
NGL		70,0	70,0	70,0	70,0	70,0	70,0	70,0
Pt		-	-	-	-	-	-	-

2.2 Primary Decanter (PD)

2.2.1 *Basis for sizing*

In order to have storage volumes large enough to limit emptying and good settling of solids, the primary settling tank is sized to respect:

- Volume, Vs = 300 l/EH
- Climbing speed, Va = 0,15 m/h

Base de dimensionnement du DP								
Modèle BIOXYMOP		BIOXY.21	BIOXY.25	BIOXY.30	BIOXY.35	BIOXY.40	BIOXY.45	BIOXY.50
Diamètre de Virole	m	1,9	1,9	1,9	1,9	1,9	1,9	1,9
hauteur fil d'eau sortie	m	1,61	1,61	1,61	1,61	1,61	1,61	1,61
Longueur de Virole pour le D1	m	2,33	2,81	3,41	4,01	4,61	5,21	5,81
Volume D1	m^3	6,645	7,871	9,402	10,934	12,465	14,000	15,528
Surface au miroir	m^2	3,53	4,2	5,02	5,85	6,68	7,51	8,33
Vitesse ascensionnelle max Va	m/h	0,15	0,15	0,15	0,15	0,15	0,15	0,15
volume de stockage Vs	l/Eh	316	315	313	312	312	311	311

2.2.2 *Performance and discharge from the PD*

Modèle BIOXYMOP		BIOXY.21	BIOXY.25	BIOXY.30	BIOXY.35	BIOXY.40	BIOXY.45	BIOXY.50
Rendement								
DBO5	%	25,0	25,0	25,0	25,0	25,0	25,0	25,0
DCO		25,0	25,0	25,0	25,0	25,0	25,0	25,0
MES		50,0	50,0	50,0	50,0	50,0	50,0	50,0
NGL		-	-	-	-	-	-	-
Pt		-	-	-	-	-	-	-
Flux de pollution en Sortie de Décanteur								
DBO5	Kg/j	0,95	1,13	1,35	1,58	1,80	2,03	2,25
DCO		2,13	2,53	3,04	3,54	4,05	4,56	5,06
MES		0,74	0,88	1,05	1,23	1,40	1,58	1,75
NTK		0,32	0,38	0,45	0,53	0,60	0,68	0,75
Pt		0,0630	0,08	0,09	0,11	0,12	0,14	0,15
Concentration								
DBO5	mg/l	300	300	300	300	300	300	300
DCO		675	675	675	675	675	675	675
MES		233	233	233	233	233	233	233
NTK		100	100	100	100	100	100	100
Pt		20	20	20	20	20	20	20

2.3 Aeration basin (BA)

2.3.1 *Basis for sizing*

In order to optimally treat the organic load as well as the nitrogenous load, the plant has been sized to respect :

- Mass loading, Cm = 0.080 kgDBO5 /kg MVS/d
- Volume loading, Cv = 0.28 kg BOD_5 / m^3

Base de dimensionnement du BA								
Modèle BIOXYMOP		BIOXY.21	BIOXY.25	BIOXY.30	BIOXY.35	BIOXY.40	BIOXY.45	BIOXY.50
Charge Massique Cm	Kg DBO_5/Kg MVS/j	0,080	0,080	0,080	0,080	0,080	0,080	0,080
Charge Volumique Cv	Kg DBO_5/m^3	0,28	0,28	0,28	0,28	0,28	0,28	0,28
Concentration $[MS]_{BA}$	g/l	5	5	5	5	5	5	5
% $[MVS]_{BA}$	%	70	70	70	70	70	70	70
Age de boue	jour	18,9	18,9	18,8	18,9	18,8	18,9	18,9

Modèle BIOXYMOP		BIOXY.21	BIOXY.25	BIOXY.30	BIOXY.35	BIOXY.40	BIOXY.45	BIOXY.50
Diamètre de Virole	m	1,9	1,9	1,9	1,9	1,9	1,9	1,9
hauteur fil d'eau sortie	m	1,61	1,61	1,61	1,61	1,61	1,61	1,61
Longueur de Virole pour le BA	m	1,33	1,58	1,89	2,21	2,52	2,84	3,16
Volume utile BA	m^3	3,396	4,034	4,826	5,64	6,434	7,251	8,067
Temps de Séjour	h	25,9	25,8	25,7	25,8	25,7	25,8	25,8

2.3.2 *Nitrification*

It is the process of transformation of Kjeldahl nitrogen (organic nitrogen + ammoniacal nitrogen NH4+) into oxidized or mineral nitrogen (nitrate: NO3-)that takes place in the aeration tank in the presence of oxygen.

Nitrogen to nitrify = NTK_{input} - $N_{assimilated}$ - $NTK_{discharge}$

It is commonly accepted that the nitrogen assimilated by bacteria during the degradation of organic pollution is 5% of the incoming BOD5.

2.3.3 *Denitrification*

This is the process of converting nitrate to nitrogen gas that takes place in the aeration tank in the absence of oxygen. In the absence of free oxygen, denitrifying bacteria use the oxidized form of nitrogen as a source of oxygen leading to the reduction of nitrate to nitrogen.
The origin of nitrates in water comes from the nitrification reaction.

Nitrogen to denitrify = $NTK_{\text{to Nitrify}}$ -$N03_{\text{discharge}}$

Modèle BIOXYMOP		BIOXY.21	BIOXY.25	BIOXY.30	BIOXY.35	BIOXY.40	BIOXY.45	BIOXY.50
Dénitrification								
Azote global admis au rejet	Kg/j	0,0945	0,1125	0,135	0,1575	0,18	0,2025	0,225
Azote NTK admis au rejet	Kg/j	0,0315	0,0375	0,045	0,0525	0,06	0,0675	0,075
Azote NO3 admis au rejet	Kg/j	0,063	0,075	0,09	0,105	0,12	0,135	0,15
Azote à dénitrifier	Kg/j	0,17325	0,20625	0,2475	0,28875	0,33	0,37125	0,4125
Cinétique de dénitrification retenue	gN-NO_3/kg MVS/h	1,6	1,6	1,6	1,6	1,6	1,6	1,6
Quantité de MVS dans le BA	Kg	11,886	14,119	16,891	19,74	22,519	25,3785	28,2345
Quantité d'azote dénitrifiable	Kg/h	0,0190176	0,0225904	0,0270256	0,031584	0,0360304	0,0406056	0,0451752
Temps d'anoxie nécessaire pour dénitrifier	h	9,11	9,13	9,16	9,14	9,16	9,14	9,13

2.3.4 *Oxygen requirement*

The oxygen requirement is defined by the following formula:

$QO2_{/d}$ = a'Le + b'Sv + C' N - C'' c dN

Where

a' : Oxygen required to oxidize 1kgDBO5 The bOD5$_{\text{to be}}$ degraded (the yield is neglected)

b' oxygen required for endogenous metabolism of 1kg MVS

Sv mass of SVM in the biological reactor N nitrogen to Nitrify

C' rate of conversion of ammonia nitrogen to nitrogen nitric

C'' conversion rate of nitric nitrogen to gaseous nitrogen c o2 restitution efficiency during the denitrification

dN : Nitrogen to be denitrified

Besoin en oxygène Théorique								
QO_2/j = a'Le + b'Sv + C' N – C" c dN								
a'	$kgO_2/kgDBO_5$	0,66	0,66	0,66	0,66	0,66	0,66	0,66
Le	Kg DBO_5/j	0,945	1,125	1,35	1,575	1,8	2,025	2,25
b'	kgO_2/kg MVS/j	0,07	0,07	0,07	0,07	0,07	0,07	0,07
Sv	kg MVS	11,89	14,12	16,89	19,74	22,52	25,38	28,23
N	Kg N /j	0,236	0,281	0,338	0,394	0,450	0,506	0,563
C'	KgO_2/kg N-NH_4	4,53	4,53	4,53	4,53	4,53	4,53	4,53
c	-	0,5	0,5	0,5	0,5	0,5	0,5	0,5
DN	Kg	0,173	0,206	0,248	0,289	0,330	0,371	0,413
C"	KgO_2/kg N-NO_3	2,86	2,86	2,86	2,86	2,86	2,86	2,86
QO2/j	Kg O2 /j	2,278	2,710	3,248	3,792	4,331	4,875	5,420

In order to allow denitrification, aeration should be synced as follows: 14 hours of aeration and 10 hours of shutdown.

2.3.5 *Fine bubble aeration*

The air flow rate for fine bubble insufflations is given by the following formula:

Q air = AH/ (Rdt = CTG=mass O2=He=0.001)

where

AH: oxygen flow rate per hour

Rdt: the clear water yield per meter of immersion water of fine bubble diffusers.

CGT : the global coefficient of oxygen transfer in fine bubbles He

: the water height above the diffusers

O2 mass: mass of oxygen present in the air under normal conditions.

Calcul du débit d'air théorique								
Q_{air} =AH/(Rdt * CTG * Masse O2 * He * 0,001)								
Modèle BIOXYMOP		BIOXY.21	BIOXY.25	BIOXY.30	BIOXY.35	BIOXY.40	BIOXY.45	BIOXY.50
Rdt	%	5	5	5	5	5	5	5
CGT	-	0,55	0,55	0,55	0,55	0,55	0,55	0,55
Masse O2 / Nm3 air	g O2/m³	300	300	300	300	300	300	300
He	m	1,50	1,50	1,50	1,50	1,50	1,50	1,50
Q_{air}	**Nm³/h**	**11,1**	**13,3**	**15,9**	**18,6**	**21,2**	**23,9**	**26,5**

2.3.6 *Compressor selection*

The choice of compressors was made on the basis of a nominal theoretical air flow, **after 5 years of operation of the microstation**.

Model BIOXYMOP6346		BIOXY 21	BIOXY 25	BIOXY 30	BIOXY 35	BIOXY 40	BIOXY 45	BIOXY 50
Compressor brand		SECOH	SECOH	SECOH	SECOH	SECOH	SECOH	SECOH
Model		JDK-S-200	JDK-S-250	JDK-S-300	JDK-S-400	JDK-S-400	JDK-S-500	JDK-S-500
Reference SIMOP		PP501-9	PP501-10	PP501-15	PP501-16	PP501-16	PP501-17	PP501-17
Power	W	180	225	230	360	360	450	450
Number		1	1	1	1	1	1	1
Daily electricity consumption	kW/d	2,52	3,15	3,22	5,04	5,04	6,3	6,3
Total pressure loss	mbar	261	261	261	261	261	261	261
Unit air flow rate	m3/h	10,1	12,9	15,0	20,3	20,3	27,0	27,0
Total Qair	Nm3/h	11,9	15,1	17,6	23,8	23,8	31,6	31,6

2.3.6 Choice of fine bubble diffusers

The chosen diffusers will be EPDM diffuser discs with a diameter of 27 cm and an operating range of 2 to 6 $^{m3/h}$.

Air diffuser								
Model BIOXYMOP 6346		BIOXY 21	BIOXY 25	BIOXY 30	BIOXY 35	BIOXY 40	BIOXY 45	BIOXY 50
Diffuser brand		Jaëger	Jaëger	Jaëger	Jaëger	Jaëger	Jaëger	Jaëger
Disc model		HD270	HD270	HD270	HD270	HD270	HD270	HD270
Number		4	4	4	6	6	6	9
Flow rate per diffuser	m3/h	2,5	3,2	3,8	3,4	3,4	4,5	3,0

2.4 Clarifier

2.4.1 Basis for sizing

The clarifier is sized to meet :

- Climbing speed, Va = 0.4 m/h calculated on the peak flow

Basis for clarifier sizing								
Model BIOXYMOP 6346		BIOXY 21	BIOXY 25	BIOXY 30	BIOXY 35	BIOXY 40	BIOXY 45	BIOXY 50
Shell diameter	m	1,9	1,9	1,9	1,9	1,9	1,9	1,9
Height of the water line	m	1,61	1,61	1,61	1,61	1,61	1,61	1,61
Ferrule length for the clarifier	m	1,476	1,476	1,476	1,476	1,596	1,826	2,046
Useful volume of clarifier	M3	4,5	4,5	4,5	4,5	4,8	5,4	5,9
Mirror surface	M2	2,38	2,38	2,38	2,38	2,51	2,83	3,14
Transit time at peak flow	h	8,57	7,20	6,00	5,14	4,77	4,76	4,74
Max. climb speed (Va)	m/h	0,22	0,26	0,32	0,37	0,40	0,40	0,40
Ratio l/EH	l/EH	214	180	150	128	120	120	118

2.5 Biological sludge

2.5.1 Sludge production (PB)

There are several predictive models for determining the production of biological sludge. The model chosen is the CIRSEE AGHTM model. The production of biological sludge is given by the formula :

Sludge production = Smin + Sdur + (0.83 + 0.2 log Cm) * BOD5 elim + k'N - Seff

Where:

Smin = Mineral part of TSS, 30 % of TSS

Sdur = Non-biodegradable part of the SVD, 30% of the SVD (70% of the TSS)

Cm = mass load

BOD5elim = amount of BOD removed that can be assimilated to the incoming BOD.

K' = nitrifying bacteria production coefficient per kg of nitrified nitrogen

seff = TSS leakage at the outlet

There is a simplified formula that establishes that PB = 0.8*Le (Le, being the BOD5 load in input)

Modèle Modèle simplifé								
Production de boues = 0,8 * DBO5 elim								
Flux DBO5 entr	Kg MS /j	0,945	1,125	1,35	1,575	1,8	2,025	2,25
Production de boues	Kg MS /j	0,756	0,900	1,080	1,260	1,440	1,620	1,800
Ratio de production de boue	Kg MS/EH	36	36	36	36	36	36	36

2.5.2 Sludge recirculation (R)

The recirculation of sludge keeps the sludge rate in the aeration tank constant. The recirculation rate is defined as R = Sa *100 / (Sr-Sa)
where

Sa = TSS concentration in the aeration tank Sr =

TSS concentration of the recirculated sludge

Recirculation des Boues								
Modèle BIOXYMOP		BIOXY.21	BIOXY.25	BIOXY.30	BIOXY.35	BIOXY.40	BIOXY.45	BIOXY.50
taux de recirculation	%	150	150	150	150	150	150	150
Concentration de boue $[MS]_{RA}$	g/l	5	5	5	5	5	5	5
Concentration de boue $[MS]_{Cla}$	g/l	8,33	8,33	8,33	8,33	8,33	8,33	8,33
Q débit recirculé	m3/j	4,725	5,625	6,75	7,875	9	10,125	11,25

Pompe de recirculation								
Modèle BIOXYMOP		BIOXY.21	BIOXY.25	BIOXY.30	BIOXY.35	BIOXY.40	BIOXY.45	BIOXY.50
Marque de la pompe		EBARA	EBARA	EBARA	EBARA	EBARA	EBARA	EBARA
Modèle		Optima M	Optima M	Optima M	Optima M	Optima M	Optima M	Optima M
Puissance	W	250	250	250	250	250	250	250
Débit	m^3/h	8,25	8,2	8,18	8,16	8,1	8	7,95
temps de fonctionnement	min	35	42	50	58	67	76	85
Consommation mensuel	kW/mois	4,38	5,25	6,25	7,25	8,38	9,50	10,63

2.5.3 Sludge extraction

It is necessary to extract the biological sludge produced in excess.

Extraction des Boues								
Modèle BIOXYMOP		BIOXY.21	BIOXY.25	BIOXY.30	BIOXY.35	BIOXY.40	BIOXY.45	BIOXY.50
Masse de boue à extraire	Kg MS/j	0,897	1,068	1,282	1,496	1,709	1,923	2,136
Concentration de boue $[MS]_{Cla}$	g/l	8,3	8,3	8,3	8,3	8,3	8,3	8,3
Volume de boue à extraire	l/j	107,64	128,17	153,85	179,47	205,14	230,74	256,35
	m3/semaine	0,754	0,897	1,077	1,256	1,436	1,615	1,794
	l/3j	322,9	384,5	461,6	538,4	615,4	692,2	769,1

Pompe d'extraction								
Modèle BIOXYMOP		BIOXY.21	BIOXY.25	BIOXY.30	BIOXY.35	BIOXY.40	BIOXY.45	BIOXY.50
Marque de la pompe		EBARA	EBARA	EBARA	EBARA	EBARA	EBARA	EBARA
Modèle		Optima M	Optima M	Optima M	Optima M	Optima M	Optima M	Optima M
Puissance	W	250	250	250	250	250	250	250
Débit	m^3/h	8,1	8	7,8	7,65	7,55	7,5	7,24
temps de fonctionnement	min/j	0,80	0,96	1,18	1,41	1,63	1,85	2,12
	min/semaine	5,58	6,73	8,28	9,85	11,41	12,92	14,87
	min / 3 jours	2,39	2,88	3,55	4,22	4,89	5,54	6,37
	sec/j	48	58	71	84	98	111	127
Consommation mensuel	kW/mois	0,0997	0,1202	0,1479	0,1759	0,2038	0,2307	0,2656

3 Implementation and installation

3.1 Choice of the place of installation of the microstation

The place of installation of the microstation must respect the following points:

- The land must not be in a flood zone
- More than 3 m from any founded structure / dwelling
- More than 3 m from any neighbourhood boundary
- More than 2 m from any tree or plant with a significant root system
- More than 35 m from any declared water catchment used for human consumption
- Do not install the tank in the immediate vicinity of a traffic lane or parking area.
  Any static or rolling load is forbidden in the immediate vicinity of the device (minimum distance to be respected), except for specific structural dimensioning provisions verified by a design office.

  It is imperative to follow the installation instructions described in the following paragraphs, otherwise the Simop warranty will be void, as well as the PHPRV-NC installation instructions.

3.2 Transport methods on the plot

During unloading and installation, the tanks must be handled with chain slings to be hooked on the lifting rings located on the top of the shell and with a lifting machine (except forklift with forks) adapted to the volume of the tank.

- Chain slings must be provided by the installing company.

- Provide for the accessibility of the means of transport to the site (possible accessibility of semi-trailer trucks or exceptional convoy).

Nota For tanks longer than 6 meters, it is imperative to use a lifting beam (not supplied) adapted to the lifting of the tank according to its weight.

3.3 Installation instructions

The studies of the plot of land must be carried out in accordance with the regulations in force in order to evaluate the constraints related to the nature of the ground, and according to our instructions for installation PHPRV-NC.

3.3.1 Earthworks

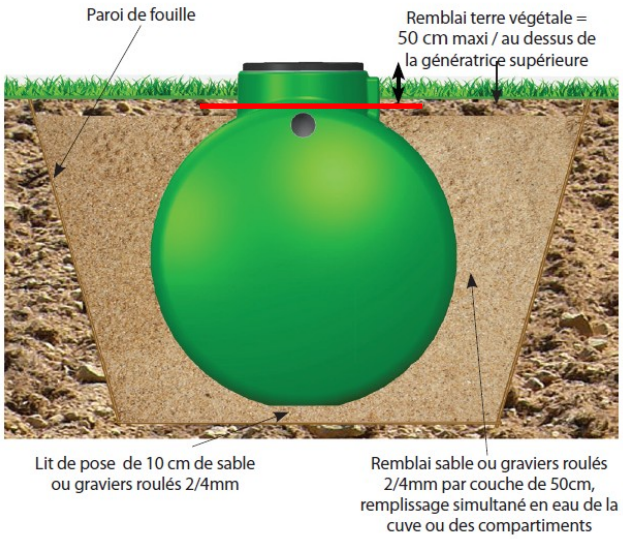
The walls of the excavation should be about 50 cm all around the tank.
The bottom of the slope constituting an earthen berm must be at least 4 m around the tank. **Attention, in the case of installation in the groundwater: The** altimetric implantation of the tank must be calculated in such a way that the height of the groundwater table does not exceed the level of the outlet water line.
Draw down the groundwater table until backfilling of the unit is complete.

3.3.2 *Installation of the tank in ground without water table*

Make a compacted sand bed 10 to 20 cm high, levelled in all directions, then level the tank and connect the inlet and outlet pipes.
If the topography of the ground allows it, carry out a drainage at the bottom of the excavation with gravity evacuation towards an outlet (type ditch, brook?);

Realization of the lateral embankment :

1st phase Placement of a 50 cm layer of sand (or 2/4 mm gravel) all around the tank.
2nd phase Fill the tank with water to a height of 50 cm.
As the tank has several compartments, the compartments can be filled simultaneously or successively **taking care not to exceed a height difference of 50 cm.**
3rd phase Repeat phases 1 and 2 up to the level of the manholes (hydraulic compaction by water saturation of the sand fill is recommended; in case of risk of migration of fines from the fill to the environment, it is necessary to place an anti-contaminant geotextile in interface).

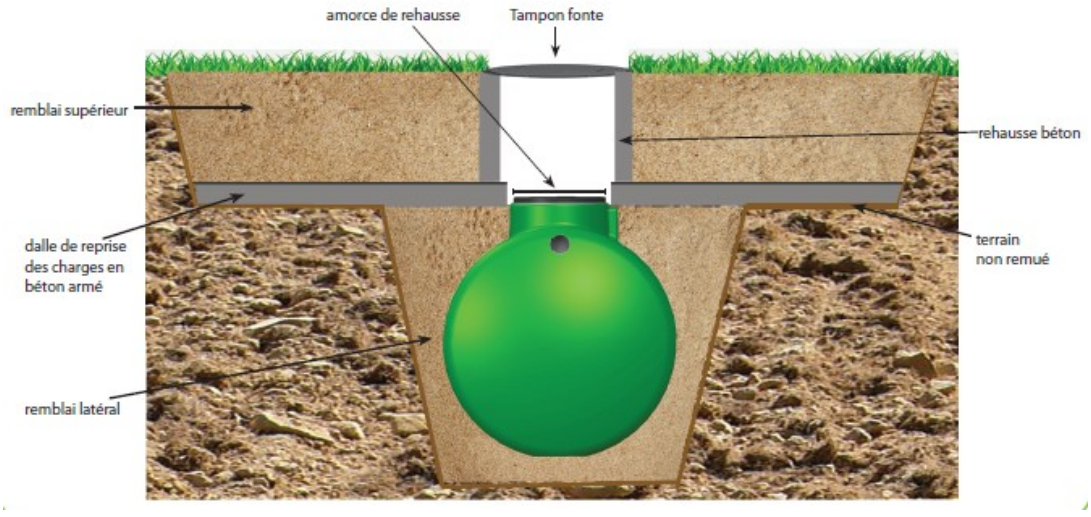


Creation of the upper fill :

Possibility of backfilling with topsoil to a maximum height of 50 cm (without load distribution slab) above the upper generatrix of the tank (use RH602 extensions - screw-on extension, height 250 mm - to place the tank covers at the level of the finished floor).

Special precautions:

After the tank is completely filled, make a self-supporting reinforced concrete slab just above the upper generatrix of the tank, resting **on the stabilized and undisturbed ground** **all around the excavation** in the following cases:
1) In case of backfill of more than 50 cm above the upper generatrix of the tank.
2) In case of punctual overload due to the passage of vehicles at less than 4m from the edge of the excavation.
3) When using concrete sockets.
4) In case of overloads due to extreme climatic conditions (e.g. snow).



3.3.3 Installation of the tank in clay soil and/or presence of groundwater

Create a reinforced concrete invert with a lateral installation of Tor irons forming a loop that will be used to hang the anchoring belts.
On the concrete slab, lay a bed of sand stabilized with 200kg/m3 cement 20 cm high, levelled in all directions.
Then place the level tank and connect the inlet and outlet pipes.
Installation of the piezometer Ø 315 mm minimum, which will be closed at its lower end by a geotextile sock (Allows to control the water level around the tank during the draining).

Realization of the lateral embankment :

1st phase Installation of a 50 cm layer of sand stabilized with cement 200kg/m^3 all around the tank.
2nd phase Fill the tank with water to a height of 50 cm.
As the tank has several compartments, the compartments can be filled simultaneously or successively, **taking care not to exceed a height difference of 50 cm**.
3rd phase Repeat phases 1 and 2 up to the level of the manholes (hydraulic compaction by water saturation of the sand fill is recommended; in case of risk of migration of fines from the fill to the environment, it is necessary to place an anti-contaminant geotextile in interface).

Derogation for lateral backfill: in the case of implantation in a non clayey ground, stabilized and without strong slope, it is possible to replace the stabilized sand with cement 200kg/m3 by sand (no backfill with the ground or the all coming).

Creation of the upper fill :

Possibility of backfilling with topsoil to a maximum height of 50 cm (without load distribution slab) above the upper generatrix of the tank (use polyethylene or polyester risers to place the tank covers at the level of the finished floor).

Special precautions:

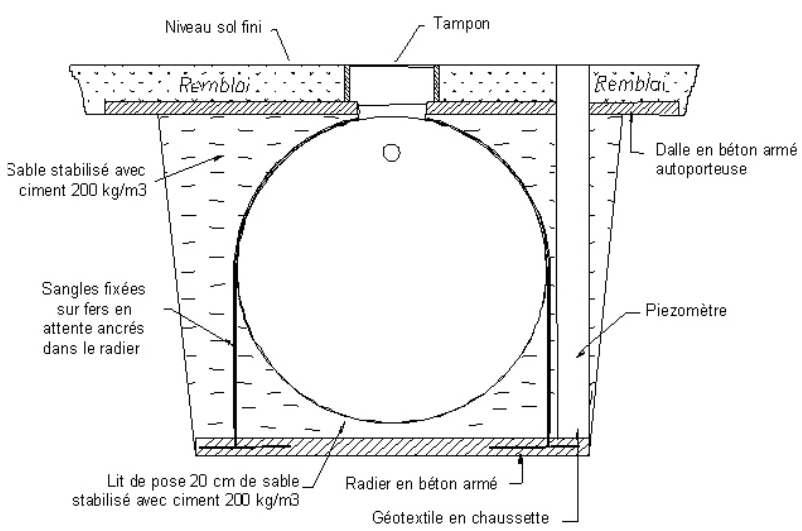
After the tank has been completely filled, a self-supporting reinforced concrete slab should be made just above the upper generatrix of the tank, resting on the stabilized and undisturbed ground all around the excavation in the following cases

1) In case of backfill of more than 50 cm above the upper generatrix of the tank.

2) In case of punctual overload due to the passage of vehicles at less than 4m from the edge of the excavation.

3) In case of use of concrete extensions.

4) In case of overloads due to extreme climatic conditions (e.g. snow).



3.4 Electrical connections

The electromechanical elements of the microstations (2 pumps + 1 compressor) are controlled and protected by a 230 V control panel.
The electrical connection (extension cable between the microstation and the control cabinet) must be made by a professional certified to the NF C 15-100 standard by his employer.
Before any work is carried out on the electrical equipment, the installation must be de-energized.

During the earthwork :

- Install a 110 mm sleeve between the microstation and the control cabinet for the passage of the electrical cables supplying the two pumps.
- Install a 110 mm sleeve between the compressor and the BA manhole for the connection of the air ramps to the compressor.
- Provide a power supply for the cabinet's 300mA main circuit breaker.

The following items are not part of the SIMOP supplies:

- extension cords for pumps and compressors (provide 3G2.5 mm cable²)
- the inlet/outlet pipes of the network
- ventilation pipes

Items provided:

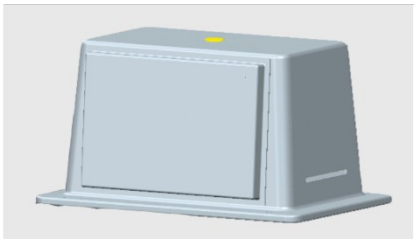
- Polyurethane air inlet duct (25mm inside /33 mm outside), 10 m supplied per compressor

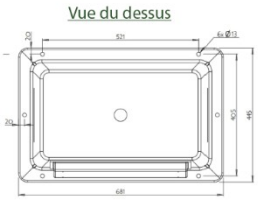
The power supply must be connected to the general terminal block. A 300mA main switch allows to cut the power supply of the cabinet.

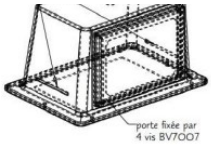
Two types of waterproof outdoor cabinets are available:

a) Waterproof wall cabinet AE300-ME2
Important: the compressor must be installed in a technical room or, outside, under a plastic box REL4/6025, on a concrete slab.
Dimensions H432 x W340 X D161 mm - Weight : 6 kg

Wall cabinet AE300-ME2







Box REL4/6025 to house the compressor

b) Polyester control cabinet AE300-C2 including the control cabinet as well as the support plate to receive the compressor.
Dimensions: h762 x W560 x D250 mm.
Weight: 25 kg

Outdoor cabinet on base: AE300-C2

It is not recommended to install the compressors more than 10 m from the station (consult us if necessary). In addition, it is imperative that the compressor be located at a higher altitude than the air diffusers.

3.5 Methods of making hydraulic connections

The microstation is delivered ready to be connected with DN160 PVC pipe. These connections are made by the company responsible for installing the microstation, following the SIMOP installation instructions described in this guide.
The effluent inlet and outlet pipes must have a slope of 2% to 4% (note: take into account the settlement of the land).

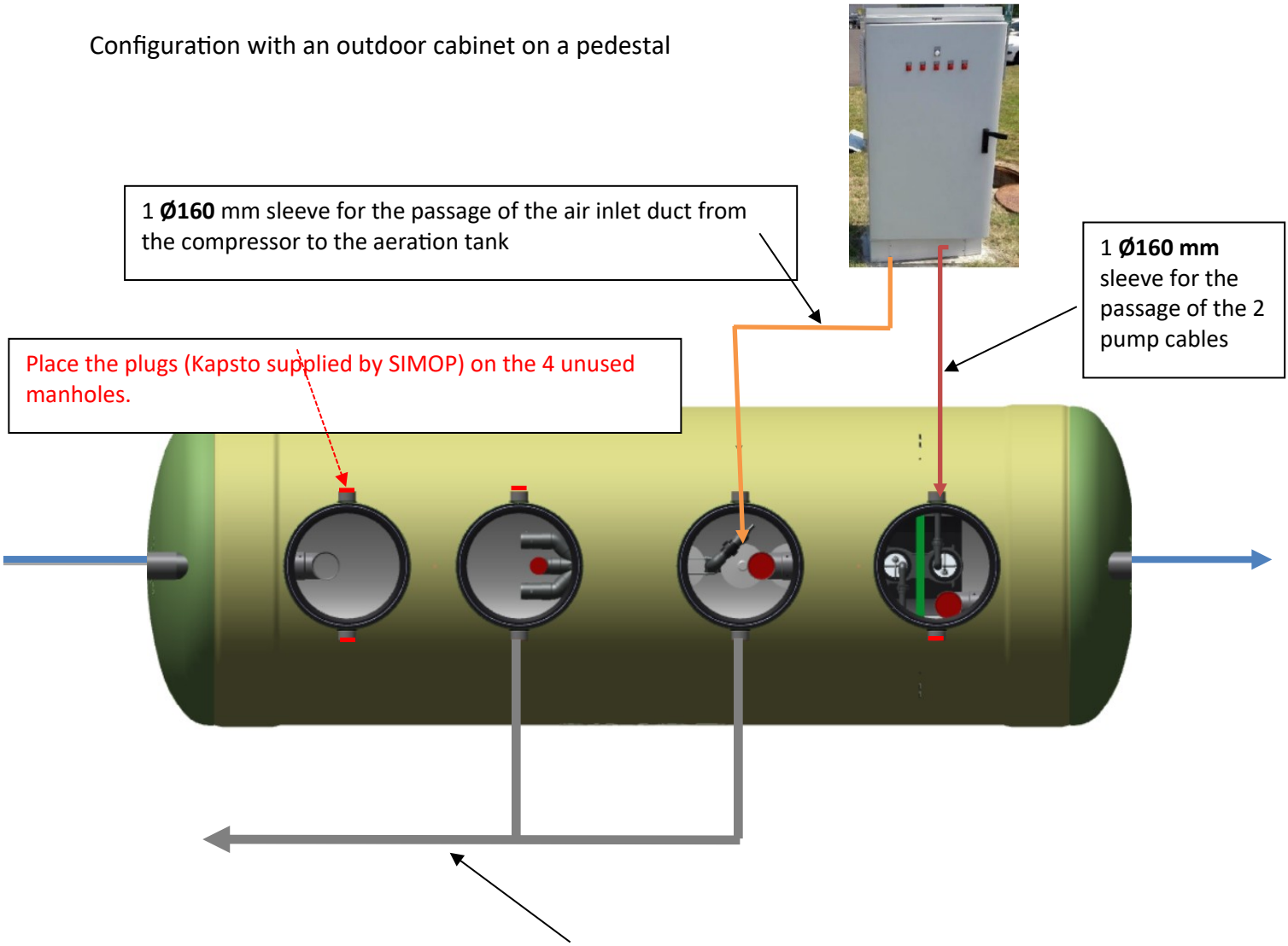
3.6 Ventilation and/or gas or odor exhaust connection

Naturally, wastewater produces unpleasant odors. However, the micro WWTP should not produce strong odors. The presence of strong odors in the vicinity is a sign of malfunction. In this case, a technician should be called in.
The microstation mainly releases a gas called $_{H2S}$.

The air intake and extraction of fermentation gases must comply with NF DTU 64.1
The fermentation gases must be evacuated by a ventilation system equipped with a static or wind extractor located at 0.40 m above the ridge and at least 1 m from any opening and any other ventilation. Provide this connection on the ventilation sleeve of the primary decanter compartment.

3.7 Installation diagram

Configuration with an outdoor cabinet on a pedestal



Ventilation (not supplied by SIMOP) in **PVC Ø 100** (tube, elbows, tees not supplied by SIMOP).
The outlets are to be connected to a single or multiple secondary ventilation ducts equipped with a static or wind driven extractor located 0.40 m above the ridge and at least 1 from any opening and any other ventilation.
In the absence of a dwelling, the discharge point must be above 2 m to avoid any olfactory nuisance

4 Commissioning

A company approved by Simop will have to ensure the commissioning of the treatment plant. This service, invoiced in addition to the treatment process, will include

- Verification of elements electromechanical (pumps, compressors and of electrical cabinet
- Adjustment of the different running times and verification of the correct operation of the equipment
- Verification of compliance with installation conditions
- Control of the good flow of water between upstream and downstream

4.1 List of the equipment of the installation

The unit is composed of the following elements:

Model BIOXYMOP6346		BIOXY 21	BIOXY 25	BIOXY 30	BIOXY 35	BIOXY 40	BIOXY 45	BIOXY 50
Compressor brand		SECOH	SECOH	SECOH	SECOH	SECOH	SECOH	SECOH
Model		JDK-S-200W	JDK-S-250W	JDK-S-300	JDK-S-400	JDK-S-400	JDK-S-500	JDK-S-500
EBARA optima M pump		2	2	2	2	2	2	2
Number of HD270 disks		4	4	4	6	6	6	9
Media (HDPE cell)	M3	1	1,2	1,4	1,7	1,9	2,1	2,4

4.2 Installation of electromechanical equipment

The different equipments (2 pumps, 1 compressor, 1 electrical cabinet) are delivered on a separate pallet from the station and can be delivered to a different address from the station on request (make sure to put the material at the disposal of the company carrying out the commissioning).

4.2.1 The compressor

The compressor must be installed in the cabinet, in a technical room provided for this purpose or under the REL4/6025 cabinet.
It is not recommended to install the compressor more than 10 m away from the station (consult us if necessary) and it is imperative that the compressor is located at a higher altitude than the air diffusers.

4.2.2 The pumps

The recirculation and extraction pumps are identical and must be installed in the clarifier. The connection is made by a 1''1/4 threaded nipple.
Please note that the electrical cables of each pump must be identified.

- The recirculation pump discharges the sludge to the aeration tank (central compartment) and must be connected to the pump terminal block N°1 (recirculation).
- The extraction pump discharges to the primary clarifier (^{1st} compartment) and must be connected to the terminal block of pump N°2 (extraction).

4.2.3 *The electrical cabinet*

The electrical cabinet can be installed outside, either fixed to the wall or on a suitable base, depending on the model chosen.

The power supply must be connected to the general terminal block. A 300mA main switch allows to cut the power supply of the cabinet.

4.2.4 *Setting the time delays*

Ventilation:

The compressors are controlled by a single programmable time switch (15 minute setting).
All the stations have been dimensioned for 14 hours of operation, so the time delay is identical on all models.

Make the settings as follows:

Sequence 1	05h30	3h30
	09h00	
Sequence 2	11h30	2h30
	14h00	
Sequence 3	16h30	7h30
	00h00	
Sequence 4	02h30	0h30
	03h00	

Recirculation and extraction :

The recirculation and extraction pumps are controlled by a cyclic dosing unit which allows to alternate the running and stopping times in a cyclic way.
The ON and OFF times can be different and chosen in a different time base.

Make the settings as follows:

Recirculation delay :

Modèle BIOXYMOP		BIOXY.21	BIOXY.25	BIOXY.30	BIOXY.35	BIOXY.40	BIOXY.45	BIOXY.50
Débit pompe	m^3/h	8,25	8,2	8,18	8,16	8,1	8	7,95
temps de fonctionnement	min/j	35	42	50	58	67	76	85
Base Temps ON		1-10 min	1-10 min	1-10 min	1-10 min	1-10 min	1-10 min	1-10 min
Temps ON		1	1	1	1	2	2	3
Base Temps OFF		6-60 min	6-60 min	6-60 min	6-60 min	6-60 min	6-60 min	6-60 min
Temps OFF		7	6	5	4	7	6	8

Extraction delay :

Modèle BIOXYMOP		BIOXY.21	BIOXY.25	BIOXY.30	BIOXY.35	BIOXY.40	BIOXY.45	BIOXY.50
Débit pompe	m^3/h	8,1	8	7,8	7,65	7,55	7,5	7,24
temps de fonctionnement	min/j	0,80	0,96	1,18	1,41	1,63	1,85	2,12
	min/3 jours	2,39	2,88	3,55	4,22	4,89	5,54	6,37
Base Temps ON		1-10 min	6-60 sec	1-10 min	1-10 min	1-10 min	1-10 min	1-10 min
Temps ON		1	8	1	2	2	3	3
Base Temps OFF		10-100 h	10-100 h	10-100 h	10-100 h	10-100 h	10-100 h	10-100 h
Temps OFF		3	2	2	3	3	4	3

4.3 Safety recommendations

Electrical safety:

All electrical work on the micro plant must be carried out by a qualified professional in accordance with the regulations in force and in particular the NF C 15-100 standard.
Before working on the electrical components of the microstation, it is imperative to cut off the power supply.

Safety of the installation :

Without a load distribution slab, the access buffers withstand a pedestrian load of 2.5kN/m².
This resistance was validated during the CE marking tests.

Life safety:

During the execution of the excavation, the protection of the operators must be done in accordance with the national regulations, in particular the wearing of PPE (individual protection equipment) must be respected in order to avoid any contact with the wastewater.

5 Maintenance and Operation

5.1 Conditions from operation for the sustainability performance

Wastewater treatment plants are designed to treat urban wastewater continuously. They are not suitable for occasional treatment. Moreover, it is strictly forbidden to convey rainwater to the plant. In the case of a combined sewer system, it is mandatory to protect the plant with a regulation structure allowing to bypass the peak flows during rainy periods.
Like most domestic wastewater treatment systems, our micro plant biologically degrades organic pollution.

It is therefore forbidden to discard the following products (non-exhaustive list):

- Mineral oils
- Petroleum products
- Chlorinated products
- Pure bleach
- Any bactericidal product
- Condensation water (air conditioner, boiler)
- Water softener brine drain
- Pesticide
- Resins
- Non-biodegradable materials
- Periodic protection, condoms, wipes, diapers
- Construction waste (paint, rubble, plaster, cement, etc.…)

The materials used in the microstation are insensitive to corrosion:

Elements	Materials
Curved shell and bottom	Glass reinforced polyester (GRP)
Stamps	Polyethylene (PE)
Aeration discs of the biological reactor	Membrane made of ethylene propylene diene monomer (EPDM) Polypropylene (PP) backing,
Compressor	Polymer, IP45
Free media	Polypropylene (PP)
Sludge recirculation pump	Stainless steel class 304, IP68
Piping	Polyvinyl chloride (PVC)
Joint	Elastomer
Bolts and nuts	Stainless steel class 304

5.2 Noise level

The air compressors and pumps chosen emit a noise of about 45 to 55 dB(A) depending on the model. The station is buried and does not generate any significant noise.
For comparison, the table below shows the noise level emitted by household equipment:

Household equipment	Noise level (db)
Dishwasher	40 à 50
Washing machine	50 à 60
Dryer	60 à 70
Vacuum cleaner	70 à 80
Lawn mower	80 à 90
Chainsaw	90 à 100

5.3 Power consumption

Operating time of electrical equipment:

Model BIOXYMOP6346		BIOXY 21	BIOXY 25	BIOXY 30	BIOXY 35	BIOXY 40	BIOXY 45	BIOXY 50
Compressor	h/d	14	14	14	14	14	14	14
Recirculation	Min/d	35	42	50	58	67	76	85
Extraction	Min/d	0,80	0,96	1,18	1,41	1,63	1,85	2,12
Power consumption	kW/d	2,67	3,33	3,43	5,29	5,33	6,62	6,66
Annual consumption	**kW/ year**	**974**	**1215**	**1253**	**1930**	**1944**	**2418**	**2432**

5.4 Wear parts list

Recirculation pump :
We recommend replacing the pump at the first sign of weakness, the replacement is estimated at about every 5 years.
Air compressor :
We recommend replacing the MEMBRANE KIT after **2 years of operation** and replacing the compressor **after 8 years of operation**.
Air diffusers :
We recommend replacing the diffusers after 10 years of operation.
The supply of spare parts is carried out by the manufacturer, the installer or the company in charge of the maintenance of the micro plant; and this during the warranty period or not.

Contact SIMOP after sales service (manufacturer) :

SIMOP
10, rue Richedoux
50480 Sainte-Mère-Eglise
Tel : 02 33 95 88 00 Fax : 02 33 21 50 75

In order to maintain reliable performance of the unit, it is important that components be replaced by a qualified person before the end of their service life, as indicated above.

5.5 Drainage

Emptying must be carried out by an approved emptying contractor in accordance with the terms of the amended Order of September 7, 2009. No other person or company is legally authorized.

The emptying of the microstation must take place **when the height of sludge in the primary settling compartments reaches 50% of the useful volume**. When emptying the primary settling tank, provide for the removal of sludge and the cleaning of the clarifier.
Floating matter and grease must be emptied at least once a year. after each emptying, the station must be put back in water.

In the case of an emptying with presence of groundwater, it is strongly advised to lower the groundwater with a vacuum pump at the level of the bottom of the piezometer in order to limit the risks of deformations of the tank. The pumping of the groundwater must be carried out before the emptying and be maintained during all the operation of emptying until the level of the compartments is restored.

The emptying vehicle must park at least 5 meters from the microstation.

* Skimming of the surface of the clarifier and the primary clarifier, 30 cm on the surface of both compartments, every year.
** Emptying of the primary clarifier: 50% of the volume of the primary clarifier, every 3 years.

5.6 Annual maintenance cost and annual consumption

REFERENCE BIOXYMOP	Maintenance contract € (1 visit per year)	Emptying: skimming and extraction of sludge €	Change of parts ?	Energy consumption (based on 0.174€ per KWH)	TOTAL EXCL. TAX EURO
BIOXYMOP6346/21-19	335	252	258	170	1015
BIOXYMOP6346/25-19	335	262	293	211	1101
BIOXYMOP6346/30-19	335	271	341	218	1165
BIOXYMOP/6346/35-19	335	279	391	336	1341
BIOXYMOP/6346/40-19	335	287	391	338	1351
BIOXYMOP/6346/45-19	335	299	452	421	1507
BIOXYMOP/6346/50-19	335	310	458	423	1526

Note: these prices are given as an indication and are of course subject to the evolution of inflation.

As a reminder:
- Surface skimming of the clarifier and primary clarifier should be done every year on the first 30 cm.
- The emptying of 50% of the decanter volume should take place approximately every 3 years.

Change wear parts according to section 5.5.

5.7 Procedure to follow in case of malfunction

Recordable events	Actions	Frequency
Abnormal air compressor noise	Contact the installer or service company. Check that the air compressor is not in contact with any wall. Repair or replace the compressor	The life span of a membrane is 2 years. They are checked once a year during the maintenance visit
Abnormal noise of the recirculation pump	Contact the installer or service company. Check that the discharge pipe is firmly attached to the tank. Replace the pump	Can happen very occasionally in case of a locked wheel. It is checked once a year during the maintenance visit
Very strong odor	Contact the installer or service company. Check and adjust settings	This can happen in case of compressor failure (life span 8 years) or membrane rupture (life span 2 years), or under aeration in case of overloading of the plant. The proper functioning of the micro plant is checked once a year during the maintenance visit. An unconnected or poorly dimensioned ventilation system can also be the cause of this type of nuisance.
No bubbling in the aeration tank	Contact the installer or service company. Check the air line from the pump to the diffuser	It can happen in case of compressor failure (life span 6-7 years) or in case of membrane rupture (life span 2 years) or in case of total pinching of the air hose, or in case of total clogging of the diffusers (life span 10 years). The proper functioning of the aeration of the micro plant is checked once a year during the maintenance visit
Sludge height higher than the maximum dimensions	Order an oil change from a licensed oiler. Contact your installer to find a licensed oil drainer near you.	The height of the sludge must be checked regularly
Fault light on	Contact the installer or service company.	

6 Guarantees

6.1 Guarantees on the devices and the electromechanical equipment

The vat room is guaranteed for 10 years from the date of delivery, provided that the installation instructions have been followed.
The electromechanical elements are guaranteed for 1 year.

MATERIALS	**DURATION OF THE WARRANTY**
TANK	10 YEARS
COMPRESSOR	1 YEAR
PUMP	1 YEAR
CONTROL BOX	1 YEAR
CONTROL BOX COMPONENT	1 YEAR

6.2 Description of the traceability process for devices and components of the facility.

The factory production control is in accordance with the requirements of NF EN 12566-3+A2:2013. SIMOP's quality management system is certified ISO 9001: 2008
Each microstation has a traceability number, to which
a set of information is attached:
- Date of manufacture
- Production order number
- Material batch number
- Identity of the editor
- Quality control sheet
- Batch material, its certificate of analysis
- Component lot (internal equipment)

Qualitative and quantitative controls on production are carried out to ensure the conformity of the products at the beginning.

7 Quality certificate

7.1 ISO 9001:2008 certificate:

CAPCERT

ANNEXE AU CERTIFICAT n° **CAP143** – LISTE DES SITES COMPRIS DANS LE PERIMETRE DE CERTIFICATION **ISO 9001** DE L'ENTITE **F2F**

*ANNEX TO THE CERTIFICATE n° **CAP0143** – LIST OF SITES INCLUDED IN THE SCOPE OF ISO 9001 CERTIFICATION OF **F2F***

Site n°1 : **LE HAM** 3 Rue Saint Pierre, 50310 Le Ham	Site n°2 : **MONTDIDIER** ZI de la Roseraie, 80500 Montdidier

Site n°3 : **BUJARALOZ**

P.I Lastra, Monegros Parc B1, 50177 Bujaraloz, Espagne

Fait à Argenteuil – Le 09/09/2021

Luc MOUNEY – Le représentant de CAPCERT

CAPCERT
2 Square Aquitaine, 95100 Argenteuil

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7.2 CE conformity certification:

CE 11	**Déclaration de performance N° :** *BIOXY6346-21-A*
	Classe : 3
	organisme notifié **Certipro N° 1476** et **PIA N°1739**

SIMOP EQUIPEMENTS POUR L'ENVIRONNEMENT
50480 Sainte-Mère Église
www.simop.fr

EN 12566-3+A1+A2 :
Petites stations de traitements des eaux usées :
Stations d'épuration des eaux usées domestiques

Modèle BIOXYMOP6346/21-19

Pour le traitement des eaux usées domestiques jusqu'à 50 habitants

Matériau :	Polyester renforcé de verre
Capacité du traitement : Charge organique journalière Débit hydraulique journalier	1,26 kg/j 3,15 m³/j
Efficacité du traitement :	DCO 88,1 % DBO 96,2 % MES 94,4 % Pt PND KN 60,7 %
Étanchéité à l'eau (essai à l'eau) :	Conforme
Résistance à l'écrasement (pit-test) :	Remblai : 0,5 m Humide : 1,61 m
Durabilité :	Conforme
Réaction au feu :	F
Émission de substance dangereuse :	PND

CE 11	**Déclaration de performance N° :** *BIOXY6346-25-A*
	Classe : 3
	organisme notifié **Certipro N° 1476** et **PIA N°1739**

SIMOP EQUIPEMENTS POUR L'ENVIRONNEMENT
50480 Sainte-Mère Église
www.simop.fr

EN 12566-3+A1+A2 :
Petites stations de traitements des eaux usées :
Stations d'épuration des eaux usées domestiques

Modèle BIOXYMOP6346/25-19

Pour le traitement des eaux usées domestiques jusqu'à 50 habitants

Matériau :	Polyester renforcé de verre
Capacité du traitement : Charge organique journalière Débit hydraulique journalier	1,5 kg/j 3,75 m³/j
Efficacité du traitement :	DCO 88,1 % DBO 96,2 % MES 94,4 % Pt PND KN 60,7 %
Étanchéité à l'eau (essai à l'eau) :	Conforme
Résistance à l'écrasement (pit-test) :	Remblai : 0,5 m Humide : 1,61 m
Durabilité :	Conforme
Réaction au feu :	F
Émission de substance dangereuse :	PND

CE 11	**Déclaration de performance N° :** *BIOXY6346-30-A*
	Classe : 3
	organisme notifié **Certipro N° 1476** et **PIA N°1739**

SIMOP EQUIPEMENTS POUR L'ENVIRONNEMENT
50480 Sainte-Mère Église
www.simop.fr

EN 12566-3+A1+A2 :
Petites stations de traitements des eaux usées :
Stations d'épuration des eaux usées domestiques

Modèle BIOXYMOP6346/30-19

Pour le traitement des eaux usées domestiques jusqu'à 50 habitants

Matériau :	Polyester renforcé de verre
Capacité du traitement : Charge organique journalière Débit hydraulique journalier	1,8 kg/j 4,5 m³/j
Efficacité du traitement :	DCO 88,1 % DBO 96,2 % MES 94,4 % Pt PND KN 60,7 %
Étanchéité à l'eau (essai à l'eau) :	Conforme
Résistance à l'écrasement (pit-test) :	Remblai : 0,5 m Humide : 1,61 m
Durabilité :	Conforme
Réaction au feu :	F
Émission de substance dangereuse :	PND

CE 11	**Déclaration de performance N° :** *BIOXY6346-35-A*
	Classe : 3
	organisme notifié **Certipro N° 1476** et **PIA N°1739**

SIMOP EQUIPEMENTS POUR L'ENVIRONNEMENT
50480 Sainte-Mère Église
www.simop.fr

EN 12566-3+A1+A2 :
Petites stations de traitements des eaux usées :
Stations d'épuration des eaux usées domestiques

Modèle BIOXYMOP6346/35-19

Pour le traitement des eaux usées domestiques jusqu'à 50 habitants

Matériau :	Polyester renforcé de verre
Capacité du traitement : Charge organique journalière Débit hydraulique journalier	2,1 kg/j 5,25 m³/j
Efficacité du traitement :	DCO 88,1 % DBO 96,2 % MES 94,4 % Pt PND KN 60,7 %
Étanchéité à l'eau (essai à l'eau) :	Conforme
Résistance à l'écrasement (pit-test) :	Remblai : 0,5 m Humide : 1,61 m
Durabilité :	Conforme
Réaction au feu :	F
Émission de substance dangereuse :	PND

CE 11	**Déclaration de performance N° :** *BIOXY6346-40-A*
	Classe : 3
	organisme notifié **Certipro N° 1476** et **PIA N°1739**

SIMOP EQUIPEMENTS POUR L'ENVIRONNEMENT
50480 Sainte-Mère Église
www.simop.fr

EN 12566-3+A1+A2 :
Petites stations de traitements des eaux usées :
Stations d'épuration des eaux usées domestiques

Modèle BIOXYMOP6346/40-19

Pour le traitement des eaux usées domestiques jusqu'à 50 habitants

Matériau :	Polyester renforcé de verre
Capacité du traitement : Charge organique journalière Débit hydraulique journalier	 2,4 kg/j 6 m³/j
Efficacité du traitement :	DCO 88,1 % DBO 96,2 % MES 94,4 % Pt PND KN 60,7 %
Étanchéité à l'eau (essai à l'eau) :	Conforme
Résistance à l'écrasement (pit-test) :	Remblai : 0,5 m Humide : 1,61 m
Durabilité :	Conforme
Réaction au feu :	F
Émission de substance dangereuse :	PND

CE 11	**Déclaration de performance N° :** *BIOXY6346-45-A*
	Classe : 3
	organisme notifié **Certipro N° 1476** et **PIA N°1739**

SIMOP EQUIPEMENTS POUR L'ENVIRONNEMENT
50480 Sainte-Mère Église
www.simop.fr

EN 12566-3+A1+A2 :
Petites stations de traitements des eaux usées :
Stations d'épuration des eaux usées domestiques

Modèle BIOXYMOP6346/45-19

Pour le traitement des eaux usées domestiques jusqu'à 50 habitants

Matériau :	Polyester renforcé de verre
Capacité du traitement : Charge organique journalière Débit hydraulique journalier	 2,7 kg/j 6,75 m³/j
Efficacité du traitement :	DCO 88,1 % DBO 96,2 % MES 94,4 % Pt PND KN 60,7 %
Étanchéité à l'eau (essai à l'eau) :	Conforme
Résistance à l'écrasement (pit-test) :	Remblai : 0,5 m Humide : 1,61 m
Durabilité :	Conforme
Réaction au feu :	F
Émission de substance dangereuse :	PND

CE 11	**Déclaration de performance N° :** *BIOXY6346-50-A*
	Classe : 3
	organisme notifié **Certipro N° 1476** et **PIA N°1739**

SIMOP EQUIPEMENTS POUR L'ENVIRONNEMENT
50480 Sainte-Mère Église
www.simop.fr

EN 12566-3+A1+A2 :
Petites stations de traitements des eaux usées :
Stations d'épuration des eaux usées domestiques

Modèle BIOXYMOP6346/50-19

Pour le traitement des eaux usées domestiques jusqu'à 50 habitants

Matériau :	Polyester renforcé de verre
Capacité du traitement : Charge organique journalière Débit hydraulique journalier	 3,0 kg/j 7,5 m³/j
Efficacité du traitement :	DCO 88,1 % DBO 96,2 % MES 94,4 % Pt PND KN 60,7 %
Étanchéité à l'eau (essai à l'eau) :	Conforme
Résistance à l'écrasement (pit-test) :	Remblai : 0,5 m Humide : 1,61 m
Durabilité :	Conforme
Réaction au feu :	F
Émission de substance dangereuse :	PND

8 Lexicon

-EPDM: a polymer with "elastic" properties, obtained after cross-linking. It supports very large deformations before breaking. The term rubber is a common synonym for elastomer.

-HDPE : High Density Polyethylene

-PE : Polyethylene

-BOD5: Biochemical oxygen demand (BOD) is the amount of oxygen needed to oxidize organic matter (biodegradable) by biological means (oxidation of biodegradable organic matter by bacteria). It allows us to evaluate the biodegradable fraction of the carbonaceous pollutant load in wastewater.

-COD: The chemical oxygen demand (COD) is the consumption of oxygen by strong chemical oxidants to oxidize organic and mineral substances in the water. It is used to evaluate the pollution load of wastewater.

-TSS: Suspended Solids, fine particles suspended in water that are either of natural origin, in connection with precipitation, or produced by urban and industrial discharges.

-NTK: This parameter quantifies the reduced fraction of nitrogen pollution: it is the sum of organic nitrogen (proteins for example) and ammoniacal nitrogen.

-Pt: Total Phosphorus

-Qmd: Average daily flow rate

-Qmh : Average flow per hour

-Qph : Hourly peak flow

-Concentration $[MS]_{BA}$ dry Matter concentration in the aeration tank

-% $[M\ VS]_{BA}$: percentage of Volatile Suspended Matter in the aeration tank

-NO3 : Nitrate

9 Appendices

9.1 Definition and characteristics of polyester

Our tanks are made of glass fiber reinforced polyester and are molded by filament winding.

The filament winding process simply consists in winding a wire, previously impregnated with resin, on a die in order to produce a ferrule or any other part of revolution.
The result is an ultra-resistant wall composed of successive layers of wound wire, where each layer of wire is optimally oriented to respond effectively to the various mechanical stresses. The mechanical resistance is even more effective thanks to a very high glass fiber content in mass, in the order of 60% to 70%. In addition to these interesting mechanical characteristics, this laminate has the particularity of offering excellent durability over time.
Our tanks have a perfectly controlled thickness, which can vary from 7 to 12mm depending on the diameter.

The polyester resin used for our fiberglass-reinforced tanks is a pre-accelerated thixotropic resin with low styrene emission. The viscosity and rheology of this resin have been specially studied and adapted to filament winding molding, while allowing optimal impregnation of the fiber.

Characteristics of the resin in its liquid state	
Density at 25°C	1,12
Brookfield viscosity at 25°C	4.5-5 Dpa.s
Acid number	27-30 mg KOH/g
Volatile content	40 à 44 %

Characteristics of the resin in the cured state	
Density at 20°C	1,2
Barcol Hardness	45
Moisture recovery (24h at 23°C)	20 mg KOH/g
Strain temperature under load (1.8MPa)	70 °C
Elongation at break	2 %
Resistance to bending	65 MPa
Modulus of elasticity	3100 MPa

The glass yarn used is a type E yarn covered with a silane-based sizing that facilitates its association with the polyester resin. It is specially adapted to pultrusion or filament winding and offers very good mechanical characteristics.

Wire characteristics	
Linear density (±5%)	2400 Tex
Filament diameter	24 µm
Type of glass	E6
Ensimage	Silane
Sizing rate (±0.1%)	0,65 %
Tensile strength	2732 MPa
Modulus of elasticity	80132 MPa

9.2 Data sheet of the fine bubble diffuser disc

Disques diffuseurs HD

HD 270 / HD 340

Caractéristiques produit

- Coût d'installation faible
- Grande fiabilité
- Excellentes performances
- Maintenance faible
- Conception rentable

Conditions de fonctionnement

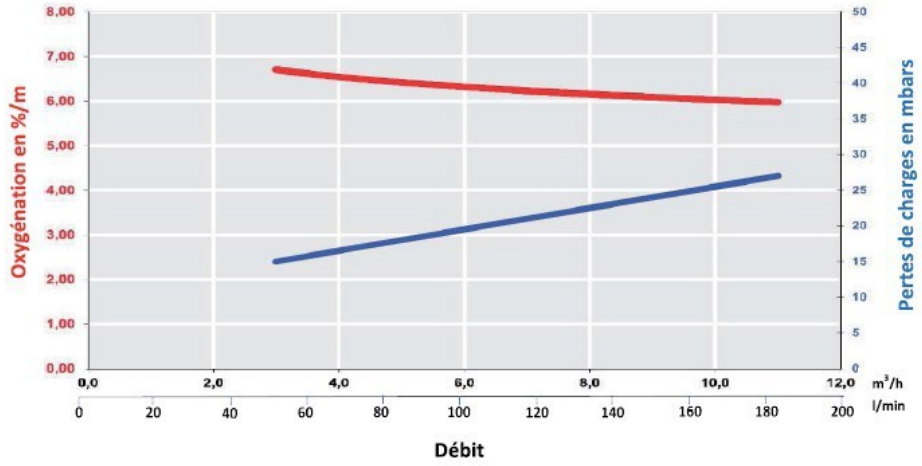
En continu ou par intermittence

Type	Débit mini		Débit optimal		Débit maxi		Débit surcharge / maintenance	
	l/min	m³/h	l/min	m³/h	l/min	m³/h	l/min	m³/h
HD 270	33	2	66	4	100	6	166	10
HD 340	83	5	140	8.5	200	12	250	15

Oxygénation et pertes de charges

Pertes de charges dues au diffuseur environ 30 à 40 mbars.

Disque diffuseur HD 340 en EPDM standard



BIBUS Tous les designs, dimensions et spécifications sont sujets à modifications sans préavis (oct. 2012).
www.bibusfrance.fr

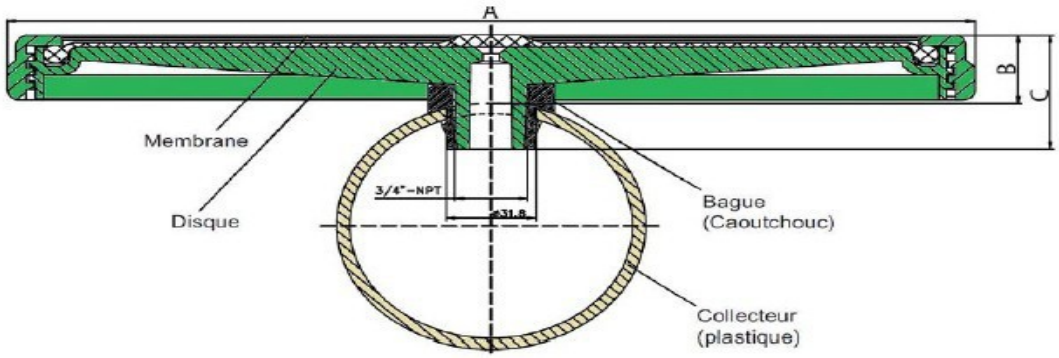
Matières de membranes

Matière	Couleur	Température de fonctionnement	Utilisation
EPDM Standard F053	noir	0 à 80 °C	Eaux usées
EPDM Plastifié F057	noir	0 à 80 °C	Eaux usées avec rejets industriels
Silicone	translucide	0 à 100 °C	Eaux usées industrielles à forte teneur en graisses, huiles et hydrocarbures

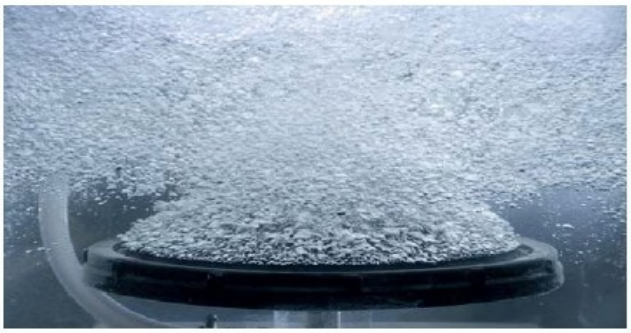
Dimensions

Type	Hauteur (C) mm	Diamètre total (A) mm	Diamètre effectif mm	Hauteur totale (B) mm	Surface perforée m²	Matière disque	Poids total kg
HD 270	60	268	218	30	0.037	PP GF 30	0.60
HD 340	76	340	310	46	0.060	PP GF 30	0.85

Tous les diffuseurs sont équipés d'une connexion mâle filetée ¾".
Autres filetages disponibles sur demande en fonction de la quantité.



Exemple de montage



Tous les designs, dimensions et spécifications sont sujets à modifications sans préavis (oct. 2012).
www.bibusfrance.fr

9.3 Technical data sheet for pumps (recirculation and extraction)

EBARA

OPTIMA

ÉLECTROPOMPES SUBMERSIBLES

en AISI 304

Electropompes submersibles pour eaux claires avec hydrauliques en acier inoxydable AISI 304.

APPLICATIONS

- Vidange de puits, garages, caves ou locaux sujets à inondation
- Irrigation de jardins et potagers
- Relevage des eaux d'infiltration ou vidange d'eaux claires

PARTICULARITÉS TECHNIQUES

- Dotées de garniture mécanique de série
- Fiables et résistantes à la corrosion
- Hautement versatiles
- Elles peuvent être utilisées dans des installations fixes ou mobiles
- Équipées d'un câble d'alimentation de 5 m type H05 RN-F pour usage intérieur (10 m pour usage extérieur), avec ou sans flotteur

DONNÉES TECHNIQUES

- Immersion maximale: 5 m
- Température maximale du liquide: 50°C
- Passage maximum de solides: 10 mm
- Moteur asynchrone, 2 pôles
- Classe d'isolation F
- Degré de protection IP68
- Tension monophasée 230V ±10%, 50 Hz
- Raccord refoulement G1¼

MATÉRIAUX

- Corps pompe, grille aspiration, disque support garniture et caisse moteur en AISI 304
- Roue, diffuseur et couvercle moteur en technopolymère renforcé par fibres de verre
- Arbre en AISI 303
- Garniture mécanique de série (Carbone/Céramique/NBR)

VERSIONS SPÉCIALES

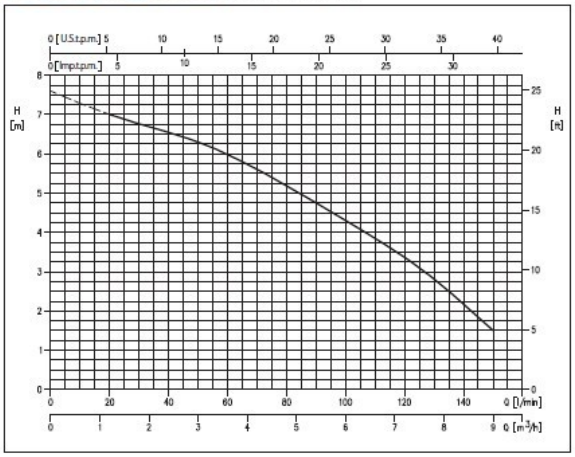
- Version MS avec flotteur magnétique vertical MS (Magnetic Switch) compacte pour eaux propres
- Version MA avec flotteur

ACCESSOIRES (sur demande)

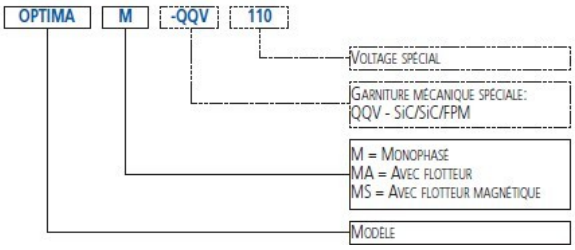
- Embout de 1¼ et serre-tube correspondant
- Dispositif d'aspiration minimale jusqu'à 3 mm

Pour d'autres accessoires et coffrets, voir à partir de la page 66

COURBE DE PRESTATION (selon ISO 9906 Annexe A)



SIGLE D'IDENTIFICATION



EBARA

OPTIMA

ÉLECTROPOMPES SUBMERSIBLES

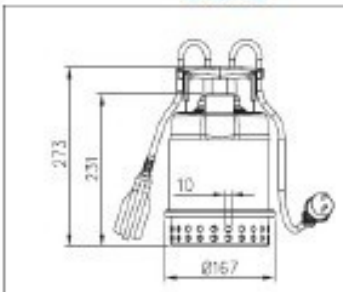
en AISI 304

TABLEAU DES PERFORMANCES

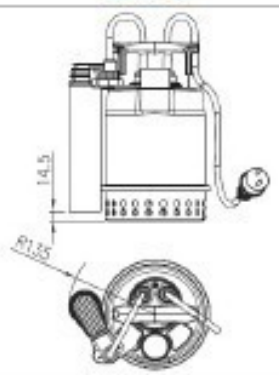
Modèle	P1		Condensateur		Cour. Ab.	Q=DEBIT						Poids
	[HP]	[kW]	µF	Vc	[A]	Vmin	30	50	75	100	125	150	[kg]
						m³/h	1,2	3	4,5	6	7,5	9	
						Hauteur [m]							
OPTIMA M	0,33	0,25	8	450	1,9	7,0		6,2	5,6	4,9	4,1	1,5	4,2
OPTIMA MA	0,33	0,25	8	450	1,9	7,0		6,2	5,6	4,9	4,1	1,5	4,4
OPTIMA MS	0,33	0,25	8	450	1,9	7,0		6,2	5,4	4,9	4,1	1,5	4,6

DIMENSIONS

OPTIMA MA



OPTIMA MS



VUE EN SECTION

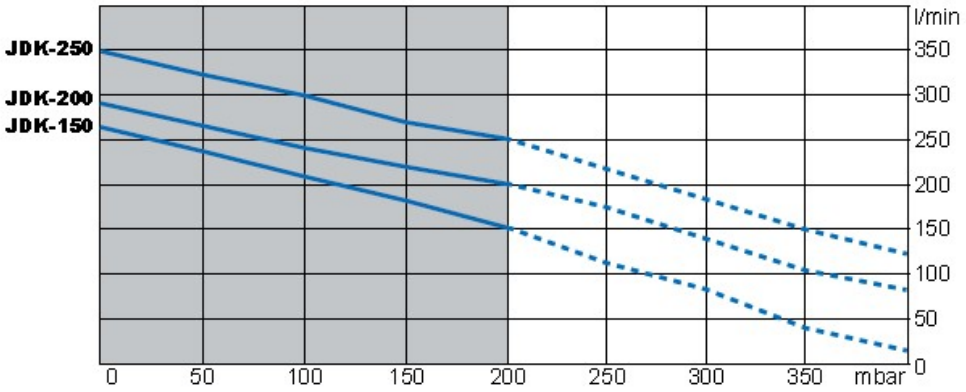
9.4 Technical data sheet for compressors

SÉRIE JDK(*) : JDK-150 / JDK-200 / JDK-250

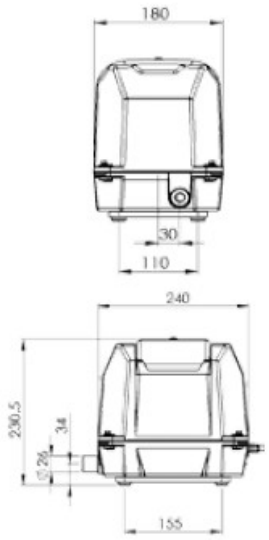
Caractéristiques produit

Maintenance simple
Cycle longue durée
Nuisance sonore limitée
Protection de surcharge
Tube de connexion inclus
Carter métal en option
(*) Version "S" : Voyant de défaut sur capot
(*) Version "C" : Voyant de défaut déporté (option)

Performances



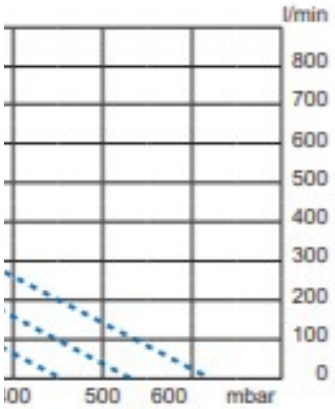
Dimensions



Modèle		Pression	JDK-150	JDK-200	JDK-250
Débit[1]	l/min	0 mbar	270	290	350
		50 mbar	240	270	325
		100 mbar	210	245	300
		150 mbar	180	220	270
		200 mbar	150	200	250
Tension[2]	V / VAC			230	
Consommation	W	200 mbar	115	180	225
Niveau sonore	dB(A)		44	46	52
Dimensions	mm	L x l x H		240 x 180 x 230,5	
Connexion	mm	Ø extérieur		26	
Poids net	kg			10	

[1] Les performances des produits peuvent varier de +/- 10 % par rapport aux courbes de performances.
[2] Valeurs à 50 Hz

(*) Version "S" : Voyant de défaut sur capot
(*) Version "C" : Voyant de défaut déporté (option)



Modèle		Pression	JDK-300	JDK-400	JDK-500
Débit[1]	l/min	0 mbar	525	600	700
		50 mbar	480	560	655
		100 mbar	430	510	600
		150 mbar	375	460	545
		200 mbar	300	400	500
Tension[2]	V / VAC			230	
Consommation	W	200 mbar	230	360	450
Niveau sonore	dB(A)		52	54	58
Dimensions	mm	L x l x H		335 x 240 x 238.5	
Connexion	mm	Ø extérieur		27	
Poids net	kg			18	

[1] Les performances des produits peuvent varier de +/- 10 % par rapport aux courbes de performances.
[2] Valeurs à 50 Hz

ACCESSOIRES

Kit de réparation

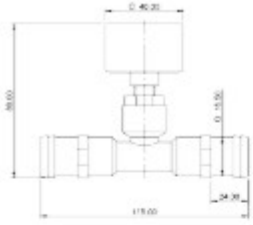
Avec nos kits de réparation (pièces sous vide et protégées de la lumière), vous échangez rapidement et à peu de frais les pièces d'usure d'une pompe SECOH. La pompe n'est immobilisée qu'un court instant. Pas besoin de réinvestir dans un nouveau système.

MEMBRANE ET KIT DE RÉPARATION

KIT AIMANT

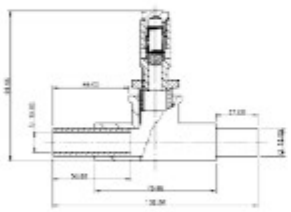
PIÈCES DÉTACHÉES

Accessoires



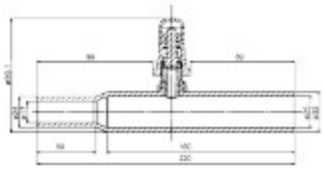
MANOMÈTRE (BP1)

Plage de pression	0 - 0,6 bar
Dimensions (L x W x H)	115 x 40 x 80 mm
Connexion	19 Ø mm
Poids net	0,25 kg



VALVE DE SÉCURITÉ JDK-50 / 120 (SE11)

Point de fonctionnement	0,20 bar
Dimensions (L x W x H)	132 x 40 x 80 mm
Connexion	19 Ø mm
Poids net	0,5 kg



VALVE DE SÉCURITÉ JDK-150 / 400 (SE45)

Point de fonctionnement	0,25 bar
Dimensions (L x W x H)	220 x 32 x 90,1 mm
Connexion	19 Ø / 26 Ø mm
Poids net	0,1 kg

9.5 Description of the AE300-ME2 wall cabinet

- **Description:**

Supply of a waterproof modular box including the equipment.

H432 x W340 X D161 mm - Weight : 6 kg

Provision of a wiring diagram.

Equipment in the box of :

Part Power :

- 1 general differential switch 2x25A 300mA
- 2 pump outlets by 2 circuit breakers 2x4A with fault indication block
- 1 compressor start by 1 circuit breaker 2x4A with fault indication block
- 2 control switches "Auto / 0 / Forced"
- 1 terminal block for power cables

Ordering Party :

- 1 daily programmable analogue time switch vertical dial minimum programming 15 minutes. 100H power reserve for ventilation (setting according to our chronograms)
- 2 cyclic dosing units adjustable in minutes or hours (separate but repetitive ON and OFF times) for extraction and recirculation
- 3 fault indicators (2 pumps and 1 compressor) on the front panel

9.6 Description of the AE300-C2 cabinet

- **Description** :

Supply of an IP54 closed polyester box of dimension H800xW600xD300 including the apparatus and the compressor with 2 ventilation grids, closing with double bar insert handle.

Provision of a wiring diagram.

Equipment in the box of :

Part Power :

- 1 general input switch 2x20A with external side control (230V mono power supply)
- 1 general differential switch 2x25A 300mA
- 2 pump outlets by 2 circuit breakers 2x4A with fault indication block
- 1 compressor start by 1 circuit breaker 2x4A with fault indication block
- 2 control switches "Auto / 0 / Forced"
- 1 terminal block for power cables

Ordering Party :

- 1 daily programmable analogue time switch vertical dial minimum programming 15 minutes. 100H power reserve for ventilation (setting according to our chronograms)
- 2 cyclic dosing units adjustable in minutes or hours (separate but repetitive ON and OFF times) for extraction and recirculation
- 3 fault indicators (2 pumps and 1 compressor) on the front panel

Compressors in the lower part: the compressor is integrated into the cabinet by Assisteaux and fixed to the support during commissioning and connected to the electrical power terminal block.

9.7 Electrical cabinet options

Reference	Description
AE300-OPT1	Addition of 2 Auto/Stop/Manual switches for the control of the 2 pumps and 1 Auto/Stop/Manual switch for the control of the compressor
AE300-OPT2	Added value for compatibility with the IT neutral system Replacement of the 5 iDT40 type circuit breakers by iC60 type bipolar circuit breakers and of the iID type differential switch by an iC60 RCBO type differential switch
AE300-OPT3	Hour meter on inner door for the 2 pumps and 2 compressors. Modular totalizing hour meter with digital display - 230 V AC - 50 Hz - 2 modules
AE300-OPT4	230V mono socket inside the box