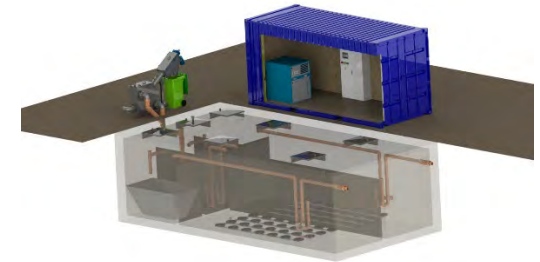




### SBR-technology

The sequencing batch reactor process (SBR process) is a variation of the conventional activated sludge process. The SBR consists of a reaction chamber that initially serves as a biological reactor and then as a sedimentation tank. In contrast to continuous-flow reactors, the SBR is filled and emptied discontinuously. The traditional spatial separation of the biological processes and sedimentation is replaced by a temporal one. The interval between the beginning of the filling process and the end of the extraction of clearwater and a possible rest period is called a cycle.



The SBR cycle is characterized by a sequence of successive process phases. The hydraulic decoupling of the SBR process makes it possible to design the duration, frequency and order of the cycle phases variably. The cycle starts with the filling phase in which the initial breakdown processes begin under anaerobic or anoxic conditions. In the actual decomposition or reaction phase the reactor is aerated. Depending on the purification goal, non-aerated phases can also be introduced. Then comes the sedimentation phase in which the activated sludge settles and a layer of clearwater forms. The clearwater is extracted in the sedimentation phase. The cycle then starts over again. The SBR process does not require a secondary purification phase.



### Description SBR Kits

ClearFox® SBR Kits operate according to the SBR-Process (Sequencing batch reactor) optional with integrated aerobic sludge stabilisation.

Plants larger than 500 PE should be equipped with a pre-screening to remove the inorganic components from the water.

After the screening, the wastewater enters a distributor/buffer shaft. From here, the reactors are fed alternately. In the bioreactor, the wastewater is biologically purified. The resulting secondary sludge is stored and thickened in a separate sludge storage tank. The clear water is discharged to the receiving water.

The system is designed dimensioned according to the guidelines of the DWA-A 131 and DWA-A 222 for domestic wastewater.

### Benefits for ClearFox® SBR Kits

- No odor
- Low running costs
- High performance with high quality, Made in Germany
- Easy installation and handling
- Sludge stabilization/sludge treatment
- Stable and very robust process technology



### Cleaning efficiency

The cleaning performance is split into classification "C" and "N"

- classification "C"

- o COD <150 mg/l
- o BOD <40 mg/l

- classification "N"

- o COD <90 mg/l
- o BOD <10 mg/l
- o NH4-N <10 mg/l

### Scope of delivery

Clearfox SBR Q1+Kits consist of an aeration system, airlift pumps, an air compressor, an air distribution manifold with electronic/magnetic valves and a control unit.

➤ **Maintenance free disc diffuser mounted on a PE manifold pipe, amount of diffusers and size of manifold according to plant design**

- o EPDM Membrane; A = 0,55m<sup>2</sup>; d=275 mm; chemical resistance
- o Mounting material

➤ **Maintenance free airlift for clearwater and backflushing**

- o Special pre-cleaning function for clearwater airlift to ensure that no solids get out of the system
- o Free ball passage from 50 up to 150 mm



➤ **Standard cabinet**

- Powder coated steel cabinet 600x600x300 mm
- Protection class IP 55
- Lockable, incl. key

➤ **CF Automation / control unit**

- Integrated air distributor (up to 4 stepper motors) for operation with diaphragm compressors
- Pressure sensor controlled microprocessor technology
- 5 x 230V outputs, individually fused via microfuses
- Convenient 6-key operation
- USB connection with auto-report function (electronic operation diary and faults) and plug-and-play software updates
- WLAN interface for readout via smartphone
- Console for indoor and outdoor installation IP 44, compressor socket on top of the housing
- Dimensions: 320 x 250 x 130 mm (l, w, h); 3 kg

➤ **Solenoid valve manifold separate for system**

- 2/2 way, G1 – G3
- EPDM Membrane -10 to + 140°C
- 230 VAC, 12 W, 100% ED

➤ **Maintenance free, two stage side channel air compressor**

- Capacity according to the dimensioning of the system size
- Associated silencer

PE	hydraulic Loading m³/day	organic Loading KG BOD/day	Sludge storage 3 month Vs [m³]	buffer VB [m³]	classification °C	max. water depth m	Compressor size KW	dimension airlift pumps Mm	power consumption KWh/day	Calculated Sludgeproduction		Cleaningcycles		diameter connecting tube mm
					COD = 150 mg/l BOD = 40 mg/l					Kg/month	m³/day	No./day	max.m³/cycle	
					V <sub>Bio</sub> [m³]									
500	75,00	30,00	59,00	33,00	75,00	3	4	150	42,00	615,00	2,10	3	25	40
600	90,00	36,00	71,00	39,00	90,00	3	5,5	150	57,80	738,00	2,52	3	30	40
700	105,00	42,00	83,00	46,00	105,00	3	5,5	150	57,80	861,00	2,94	3	35	40
800	120,00	48,00	95,00	53,00	120,00	3	7,5	150	78,80	984,00	3,36	3	40	40
900	135,00	54,00	107,00	59,00	135,00	3	7,5	150	78,80	1107,00	3,78	3	45	40
1000	150,00	60,00	119,00	66,00	150,00	3	7,5	150	78,80	1230,00	4,20	3	50	50
1250	187,50	75,00	149,00	82,00	187,50	4	9,2	150	96,60	1537,50	5,25	3	62,5	50
1500	225,00	90,00	178,00	98,00	225,00	4	11	200	115,50	1845,00	6,30	3	75	50
1750	262,50	105,00	208,00	115,00	262,50	4	11	200	115,50	2152,50	7,35	3	87,5	50
2000	300,00	120,00	238,00	131,00	300,00	4	15	200	157,50	2460,00	8,40	3	100	80
2500	375,00	150,00	297,00	164,00	375,00	4	15	200	157,50	3075,00	10,50	3	125	80
3000	450,00	180,00	356,00	197,00	450,00	4	18,5	200	194,30	3690,00	12,60	3	150	80
3500	525,00	210,00	416,00	230,00	525,00	4	18,5	200	194,30	4305,00	14,70	3	175	80
4000	600,00	240,00	475,00	263,00	600,00	5	30	200	315,00	4920,00	16,80	3	200	80
4500	675,00	270,00	535,00	295,00	675,00	5	33	200	346,50	5535,00	18,90	3	225	80
5000	750,00	300,00	594,00	328,00	750,00	5	33	200	346,50	6150,00	21,00	3	250	80

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PE	hydraulic Loading	organic Loading	Sludge storage	buffer	classification "N"	max. water depth	Compressor size	dimension airliftpumps	power consumption	Calculated Sludgeproduction		Cleaningcycles		diameter connecting tube
					COD = 90 mg/l BOD = 10 mg/l NH4-N = 10 mg/l					Kg/month	m³/day	No./day	max.m³/cycle	
	3 month	V <sub>s</sub> [m³]	VB [m³]	V <sub>Bio</sub> [m³]	m	KW	Mm	KWh/day						
500	75,00	30,00	44,00	33,00	87,50	3,00	7,50	150	78,80	615,00	2,10	3	25,00	40
600	90,00	36,00	53,00	39,00	105,00	3,00	7,50	150	78,80	738,00	2,52	3	30,00	40
700	105,00	42,00	62,00	46,00	122,50	3,00	11,00	150	115,50	861,00	2,94	3	35,00	40
800	120,00	48,00	71,00	53,00	140,00	3,00	11,00	150	115,50	984,00	3,36	3	40,00	40
900	135,00	54,00	80,00	59,00	157,50	3,00	15,00	150	157,50	1107,00	3,78	3	45,00	40
1000	150,00	60,00	88,00	66,00	175,00	3,00	18,00	150	189,00	1230,00	4,20	3	50,00	50
1250	187,50	75,00	111,00	82,00	218,80	4,00	18,00	150	189,00	1537,50	5,25	3	62,50	50
1500	225,00	90,00	133,00	98,00	262,50	4,00	22,00	200	231,00	1845,00	6,30	3	75,00	50
1750	262,50	105,00	155,00	115,00	306,30	4,00	22,00	200	231,00	2152,50	7,35	3	87,50	50
2000	300,00	120,00	177,00	131,00	350,00	4,00	30,00	200	315,00	2460,00	8,40	3	100,00	80
2500	375,00	150,00	221,00	164,00	437,50	4,00	36,00	200	378,00	3075,00	10,50	3	125,00	80
3000	450,00	180,00	265,00	197,00	525,00	4,00	36,00	200	378,00	3690,00	12,60	3	150,00	80
3500	525,00	210,00	310,00	230,00	612,50	4,00	44,00	200	462,00	4305,00	14,70	3	175,00	80
4000	600,00	240,00	354,00	263,00	700,00	5,00	44,00	200	462,00	4920,00	16,80	3	200,00	80
4500	675,00	270,00	398,00	295,00	787,50	5,00	45,00	200	472,50	5535,00	18,90	3	225,00	80
5000	750,00	300,00	442,00	328,00	875,00	5,00	45,00	200	472,50	6150,00	21,00	3	250,00	80

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### Additional equipment

The **Clearfox SBR** system can be upgraded to any required effluent standard. No matter if it is a phosphorous elimination, disinfection or even persistent/trace substances that must be eliminated.

- **Aluminum Outdoor cabinet RAL 7035**
  - 1200x600x500
  - Protection class IP 55
  - Single-door lockable, incl. key
  - Material Aluminum Sheet powder-coated
  
- **Aluminum Outdoor cabinet RAL 7035**
  - 1200x800x500
  - Protection class IP 55
  - Single-door lockable, incl. key
  - Material Aluminum Sheet powder-coated
  
- **Aluminum Outdoor cabinet RAL 7035**
  - 1200x1200x500
  - Protection class IP 55
  - Double-door lockable, incl. key
  - Material Aluminum Sheet powder-coated



- **Technical Room**
  - 2150x2100x1140
  - Galvanized sheet steel
  - Electrical Installation
  - Damp-proof luminaire
  - socket
  - Single-door lockable, incl. key
  
- **Technical Container C 20 ft**
  - 20 ft HC sea container, standard insulated
  - Tara weight of the Container: 3,0 tons
  - Container dimensions: 6,1 x 2,5 x 2,9 m (l, w, h)
  - Light grey RAL7035
  
- **Red alarm light**
  - Complete set with red lamp housing 230 V
  
- **Modem for CF Automation / control unit**
  - Remote maintenance and remote management possible for customer, maintenance company and manufacturer
  - Integrated modem for network connection
  - Automatic forwarding of faults by e-mail
  - Web portal for access to the control system (display and download of fault messages and operating hours, change of control system parameters depending on authorization, different access levels, system updates)

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### ➤ Phosphorous elimination

At the end of the cleaning process a precipitant is added to the reactor.

This takes the phosphate out and store it in the activated sludge.

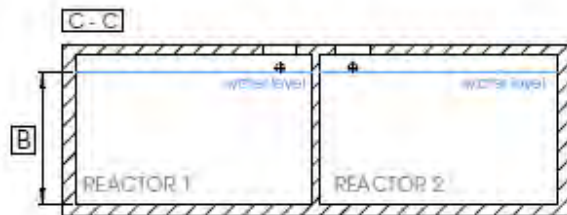
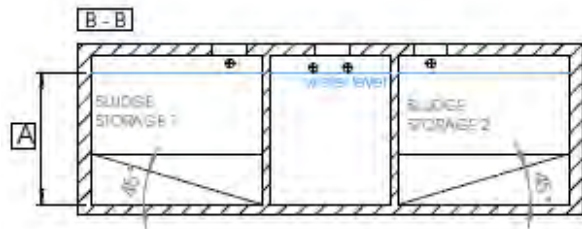
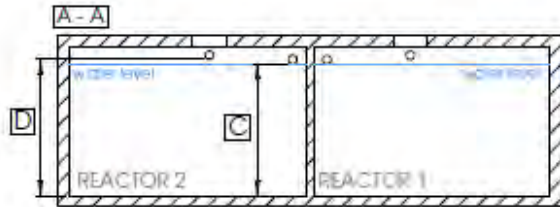
- Peristaltic dosing pump 0,2 – 4,5 l/h
- 230 V +/- 10%, 50/60 Hz; 5 VA
- IP65
- Capacity adjustable via potentiometer
- Suction lance with level control

### ➤ Chlorine disinfection

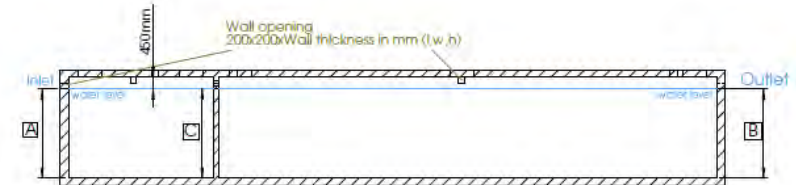
The chlorine disinfection also will be handled with a dosing pump.

The cleaned water will be pumped by the airlift system to a retention tank. During the filling is also the dosing of the chlorine to this tank.

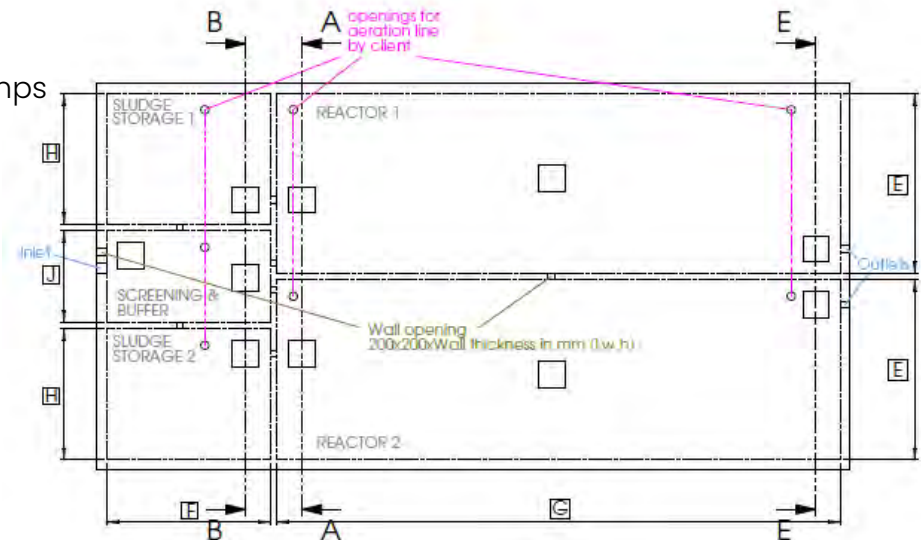
- Peristaltic dosing pump 0,2 – 4,5 l/h
- 230 V +/- 10%, 50/60 Hz; 5 VA
- IP65
- Capacity adjustable via potentiometer
- Suction lance with level control
- Size of the retention tank (customer side)  
50% of the daily amount of wastewater



- Connection tube 1 ½ "
  - 50 m roll
  - Pressure hose
  - Size 1 ½ " (38mm) 38x4,8mm
  - Stainless steel hose clamps



- Connection tube 2"
  - 50 m roll
  - Pressure hose
  - Size 2" (38mm) 50x5mm
  - Stainless steel hose clamps



\*The drawings are for illustration purposes only and may differ from the actual project.

➤ Classification "C"

PE	A	B	C	D	E	F	G	H	J
	[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]
500	3,25	3,15	3,00	3,20	3,50	4,70	3,60	2,10	2,60
600	3,25	3,15	3,00	3,20	3,50	5,50	4,30	2,10	2,60
700	3,25	3,15	3,00	3,20	4,00	5,60	4,40	2,40	3,00
800	3,25	3,15	3,00	3,20	4,00	6,50	5,00	2,40	3,00
900	3,25	3,15	3,00	3,20	5,00	6,00	4,50	3,10	3,60
1000	3,25	3,15	3,00	3,20	5,00	6,70	5,00	3,10	3,60
1250	4,25	4,15	4,00	4,20	5,00	6,30	4,70	3,10	3,60
1500	4,25	4,15	4,00	4,20	5,00	7,50	5,60	3,10	3,60
1750	4,25	4,15	4,00	4,20	6,00	7,50	5,50	3,80	4,20
2000	4,25	4,15	4,00	4,20	6,00	8,60	6,30	3,80	4,20
2500	4,25	4,15	4,00	4,20	6,00	10,70	7,80	3,80	4,20
3000	4,25	4,15	4,00	4,20	6,00	12,90	9,40	3,80	4,20
3500	4,25	4,15	4,00	4,20	6,50	13,80	10,10	4,10	4,60
4000	5,25	5,15	5,00	5,20	6,50	12,60	9,20	4,10	4,60
4500	5,25	5,15	5,00	5,20	7,00	13,00	9,60	4,40	5,00
5000	5,25	5,15	5,00	5,20	7,00	14,40	10,70	4,40	5,00

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➤ **Classification "N"**

PE	A	B	C	D	E	F	G	H	J
	[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]
500	3,25	3,15	3,00	3,20	3,50	4,70	4,20	2,10	2,60
600	3,25	3,15	3,00	3,20	3,50	5,50	5,00	2,10	2,60
700	3,25	3,15	3,00	3,20	4,00	5,60	5,10	2,40	3,00
800	3,25	3,15	3,00	3,20	4,00	6,50	5,80	2,40	3,00
900	3,25	3,15	3,00	3,20	5,00	6,00	5,30	3,10	3,60
1000	3,25	3,15	3,00	3,20	5,00	6,70	5,80	3,10	3,60
1250	4,25	4,15	4,00	4,20	5,00	6,30	5,50	3,10	3,60
1500	4,25	4,15	4,00	4,20	5,00	7,50	6,60	3,10	3,60
1750	4,25	4,15	4,00	4,20	6,00	7,50	6,40	3,80	4,20
2000	4,25	4,15	4,00	4,20	6,00	8,60	7,30	3,80	4,20
2500	4,25	4,15	4,00	4,20	6,00	10,70	9,10	3,80	4,20
3000	4,25	4,15	4,00	4,20	6,00	12,90	10,90	3,80	4,20
3500	4,25	4,15	4,00	4,20	6,50	13,80	11,80	4,10	4,60
4000	5,25	5,15	5,00	5,20	6,50	12,60	10,80	4,10	4,60
4500	5,25	5,15	5,00	5,20	7,00	13,00	11,30	4,40	5,00
5000	5,25	5,15	5,00	5,20	7,00	14,40	12,50	4,40	5,00

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