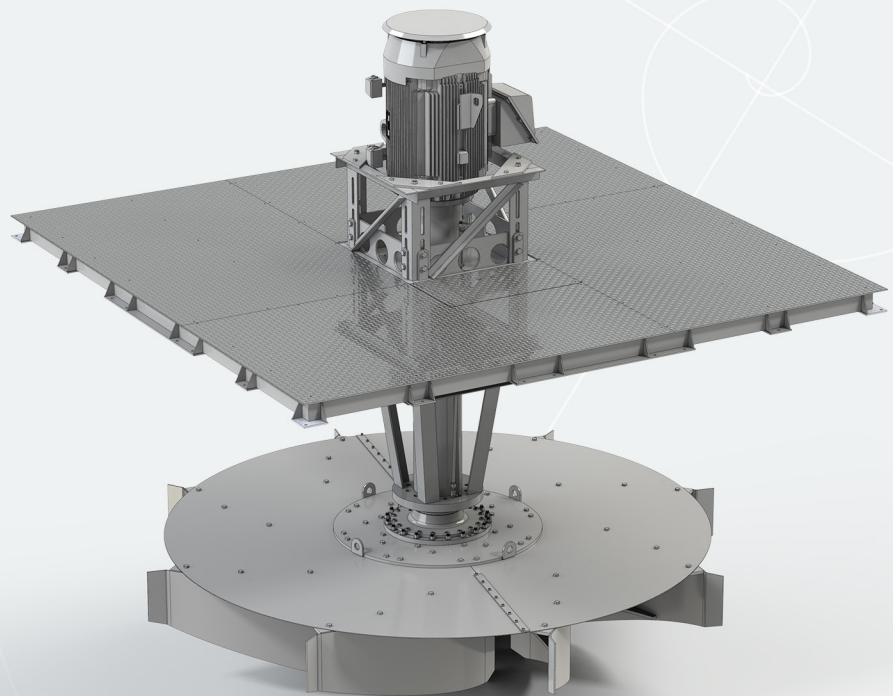


LOW SPEED AERATORS | **NSA SERIES**



ENGINEERED FIRSTS | **BUILT TO LAST**

OVERVIEW

With over 40 years of experience in designing and building aerators, DBS will provide you with the right solution for every application. Our NSA low-speed aerators are cost competitive with and at least 30% more efficient than high-speed aerators. In many cases, the energy cost savings will pay back the investment made in a DBS aerator.

SURFACE AERATORS

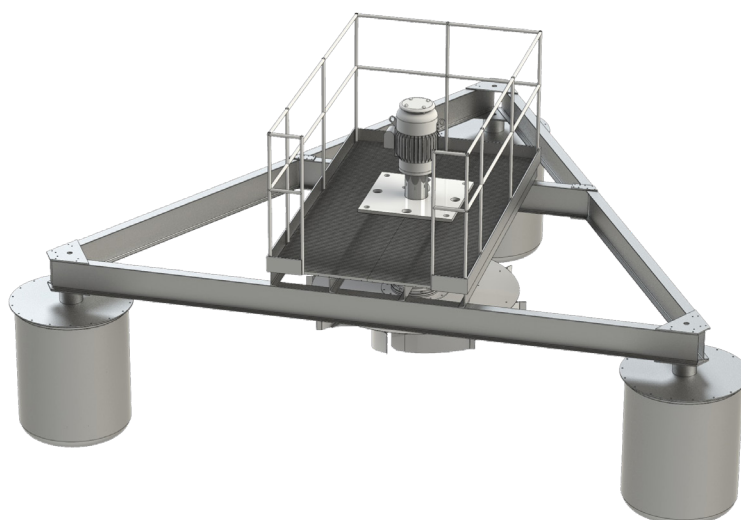
Surface mechanical aerators fall into two categories:

- **High-speed aerators** use an electric motor to directly drive an impeller that pumps water up and sprays it out horizontally. While this design is inexpensive, it has low oxygen transfer efficiency because the pump impeller wastes significant energy by moving water faster than needed.
- **Low-speed aerators** are more efficient because the rotor operates nearer the optimum aeration speed. But they are more expensive because they require a gearbox to reduce motor speed to turn a large diameter aeration rotor. This gearbox is

typically mounted a few feet above the rotor and requires a larger shaft with substantial support bearings.

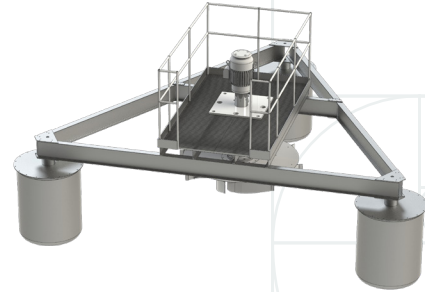
DBS NSA AERATORS

Before DBS introduced the NSA, a user had to weigh the long-term power savings of the low-speed, high-efficiency aerator against the initial capital savings of the high-speed, low-efficiency aerator. Now the DBS NSA low-speed aerator provides high efficiency at a lower cost. The power savings can be significant, up to 20% to 30% or more.



NSA TECHNICAL FEATURES

NSA Aerators are designed to provide the efficiency of low-speed aerators with the cost savings of high-speed aerators.



GEARBOX

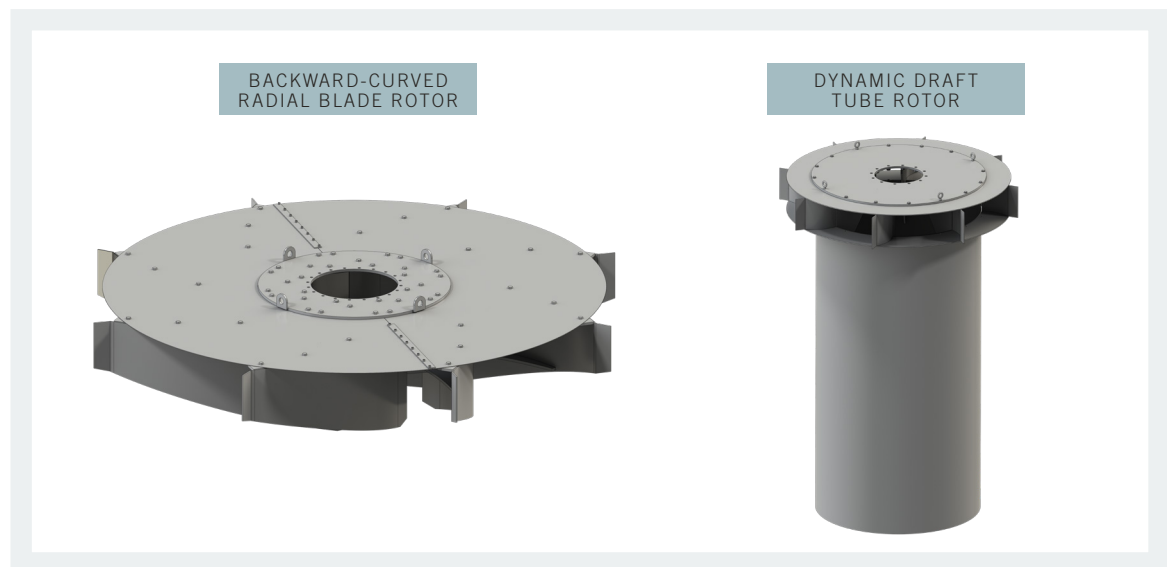
The NSA aerator uses a planetary gearbox to drive the aerator rotor. This mass-produced gearbox offers an excellent power/cost ratio. The gearbox is uniquely mounted directly in the aerator rotor, which provides a number of benefits:

- The gearbox operates partially submerged. Water flowing through the impeller cools the gearbox to near ambient temperature, allowing longer oil life.
- The gearbox directly drives the rotor preventing inherent driveshaft vibration problems common in traditional low-speed aerators.

- The gearbox and rotor assembly is attached to the electric motor by a “torque tube,” which flexes laterally to dampen shocks caused by wave impact on the rotor.

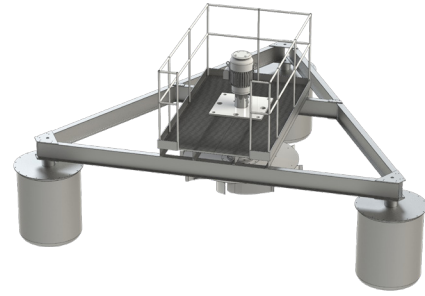
ROTOR

The NSA features a traditional high-efficiency backward-curved radial blade rotor or a DBS dynamic draft tube (DDT) rotor.

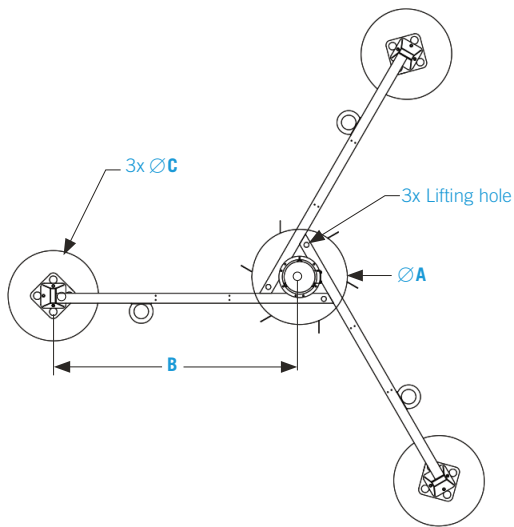


FLOATING NSA AERATOR

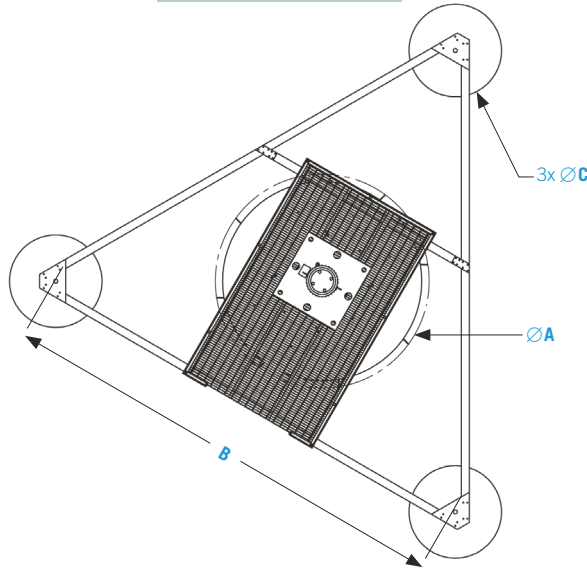
DBS offers floating aerators from 7.5 HP to 200 HP to match any aeration requirement.



NSA1 TOP VIEW



NSA2/3/4 TOP VIEW



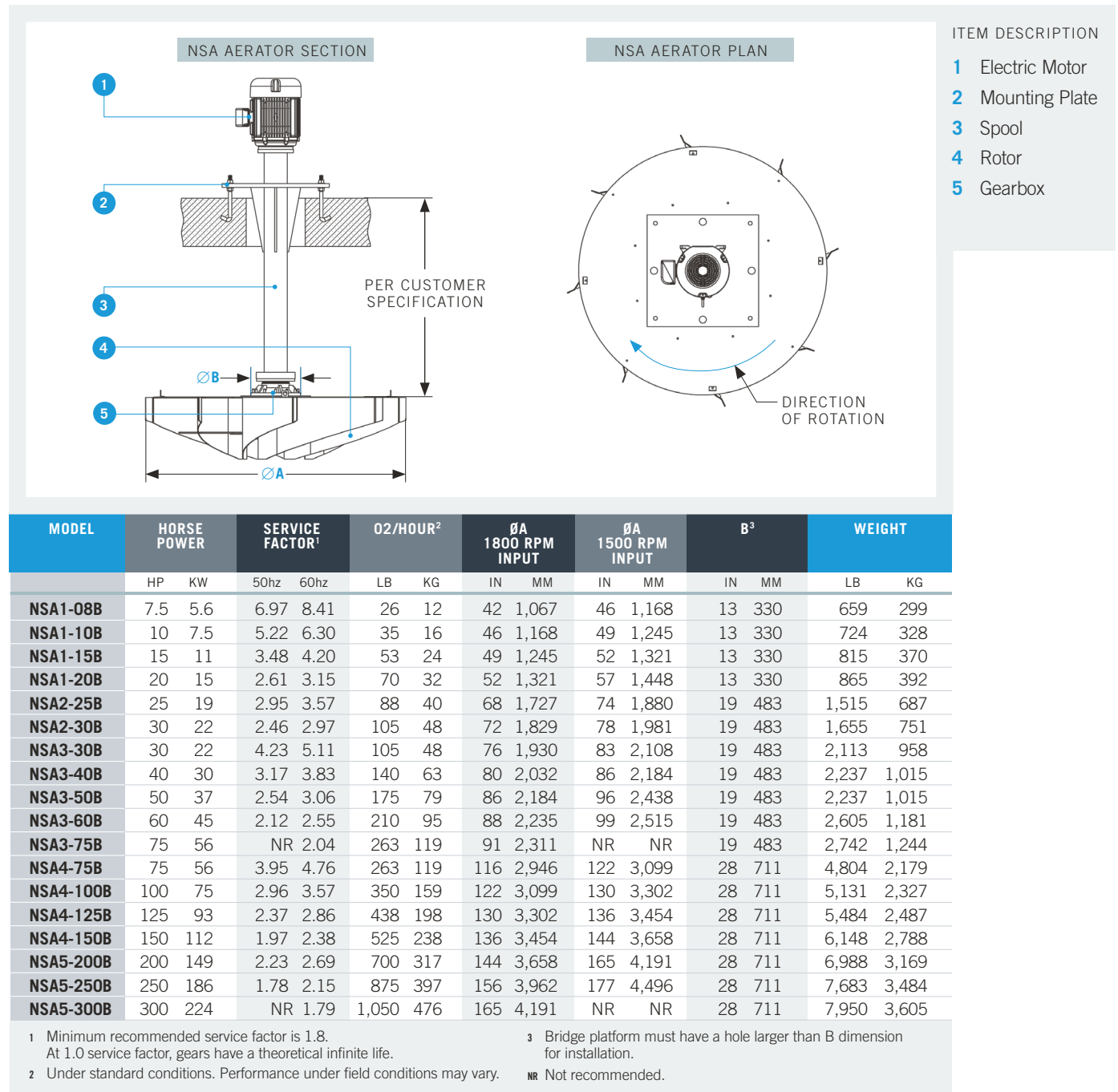
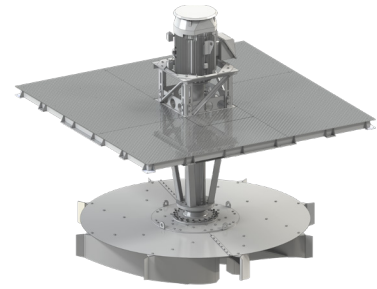
MODEL	HORSE POWER		SERVICE FACTOR ¹		O ₂ /HOUR ²		ØA 1800 RPM INPUT		ØA 1500 RPM INPUT		B		ØC		WEIGHT	
	HP	KW	50hz	60hz	LB	KG	IN	MM	IN	MM	IN	MM	IN	MM	LB	KG
NSA1-08	7.5	5.6	6.97	8.41	26	12	42	1,067	46	1,168	98	2,489	38	965	1,047	475
NSA1-10	10	7.5	5.22	6.3	35	16	46	1,168	49	1,245	98	2,489	38	965	1,112	504
NSA1-15	15	11	3.48	4.20	53	24	49	1,245	52	1,321	98	2,489	38	965	1,203	546
NSA1-20	20	15	2.61	3.15	70	32	52	1,321	57	1,448	98	2,489	38	965	1,253	568
NSA2-25	25	19	2.95	3.57	88	40	68	1,727	74	1,880	240	6,096	40	1,016	1,960	889
NSA2-30	30	22	2.46	2.97	105	48	72	1,829	78	1,981	240	6,096	40	1,016	2,100	952
NSA3-30	30	22	4.23	5.11	105	48	76	1,930	83	2,108	240	6,096	46	1,168	2,558	1,160
NSA3-40	40	30	3.17	3.83	140	63	80	2,032	86	2,184	240	6,096	46	1,168	2,682	1,216
NSA3-50	50	37	2.54	3.06	175	79	86	2,184	96	2,438	240	6,096	46	1,168	3,046	1,381
NSA3-60	60	45	2.12	2.55	210	95	88	2,235	99	2,515	240	6,096	46	1,168	3,264	1,480
NSA3-75	75	56	NR	2.04	263	119	91	2,311	NR	NR	240	6,096	46	1,168	3,500	1,587
NSA4-75	75	56	3.95	4.76	263	119	116	2,946	122	3,099	300	7,620	60	1,524	6,520	2,957
NSA4-100	100	75	3.59	2.97	350	159	122	3,099	130	3,302	300	7,620	60	1,524	6,847	3,105
NSA4-125	125	93	2.37	2.86	438	198	130	3,302	136	3,454	300	7,620	60	1,524	7,200	3,265
NSA4-150	150	112	1.97	2.38	525	238	136	3,454	144	3,658	300	7,620	60	1,524	7,700	3,492
NSA5-200	200	149	2.23	2.69	700	317	144	3,658	165	4,191	300	7,620	60	1,524	8,400	3,810

¹ Minimum recommended service factor is 1.8.
At 1.0 service factor, gears have a theoretical infinite life.

² Under standard conditions. Performance under field conditions may vary.
NR Not recommended.

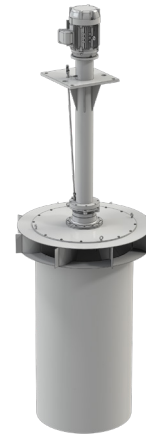
BRIDGE-MOUNTED NSA AERATOR

DBS offers bridge mounted aerators from 7.5 HP to 300 HP to match any aeration requirement.



DBS DYNAMIC DRAFT TUBE AERATOR ROTOR

The Dynamic Draft Tube (DDT) Aerator combines two proven aeration devices: the low speed surface aerator and the draft tube, into one unique, efficient device.



DESCRIPTION

For decades, low speed surface aeration rotors have pumped water from beneath the rotor and sprayed it on the surface to mix with air. However, the suction effect of surface aerators is usually limited to 15 feet (4.5 M). To increase the effective working depth, draft tubes below the surface aerator concentrate the aerator's suction deeper into the tank or basin.

BENEFITS

By combining the aeration rotor and draft tube, the DDT draws 100% of its water from the bottom of the ditch or tank eliminating any possibility of short circuiting. No matter how deep the ditch or tank, the DDT will ensure a continuous flow from top to bottom, and the rotating draft tube will efficiently mix water down to the depth of the draft tube.



Standard DBS AERATOR ROTOR

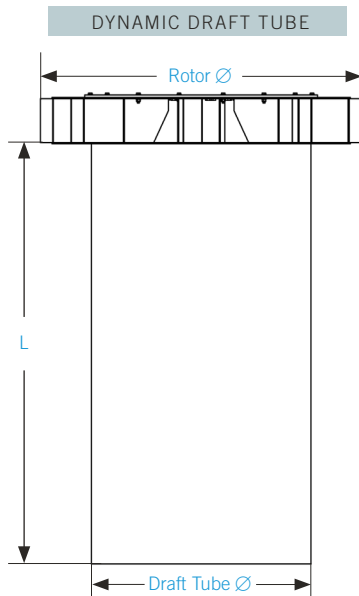
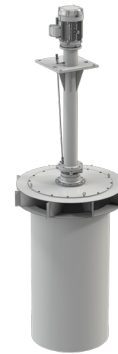


DDT DBS AERATOR ROTOR

The DDT Aerator Rotor consumes 30+% less power than the standard aerator rotor while providing equal dissolved oxygen levels. Even with less power consumption, the wave (outward flow) action of the DDT rotor is stronger, as evident by the foam pushed further out.

DBS DYNAMIC DRAFT TUBE AERATOR ROTOR

The DDT design offers high-aeration efficiency and uniform flow of water for deep oxidation ditches 20 feet (6 M) or more in depth. The DDT rotors can operate in aeration basins at the same depth as fine bubble diffusers 25-30 feet (6-9 M).



MODEL	HORSEPOWER		O ₂ /HOUR ¹		ROTOR DIAMETER		DRAFT TUBE DIAMETER	
	HP	KW	LB	KG	IN	MM	IN	MM
NSD1-10	10	7.5	42	19	42	1,067	24	610
NSD1-15	15	11	63	29	48	1,219	30	762
NSD1-20	20	15	84	38	48	1,219	30	762
NSD2-25	25	19	105	48	64	1,626	40	1,016
NSD2-30	30	22	126	57	64	1,626	40	1,016
NSD3-40	40	20	168	76	74	1,880	50	1,270
NSD3-50	50	37	210	95	74	1,880	50	1,270
NSD3-60	60	45	252	114	88	2,235	60	1,524
NSD3-75	75	56	315	143	88	2,235	60	1,524
NSD4-100	100	75	420	190	116	2,946	80	2,032
NSD4-125	125	93	525	238	116	2,946	80	2,032
NSD4-150	150	112	630	285	130	3,302	90	2,286
NSD5-200	200	149	840	381	144	3,658	104	2,642
NSD5-250	250	186	1,050	457	156	3,962	112	2,844
NSD5-300	300	225	1,260	571	160	4,064	120	3,048

¹ Under standard conditions. Performance under field conditions may vary.

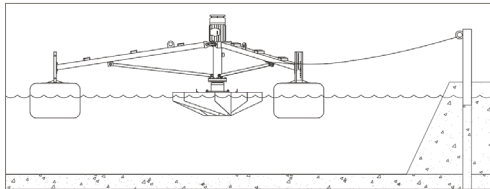
FLOATING NSA AERATOR MOORING OPTIONS

The key to mooring success is careful planning and engineering based on water level fluctuation, mooring distance, weather conditions and aeration basin design.

The mooring accessories listed below are the minimum requirements for normal applications. You should also adhere to applicable local, state and federal guidelines. Avoid any possibility of tangling the mooring cable in the rotor or rubbing and wearing damage to the cable. Make sure

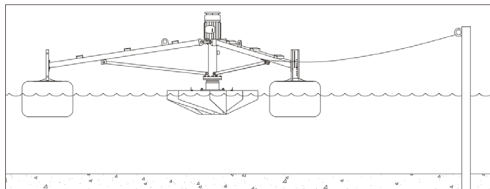
the entire length of the mooring cable is visible. Use floats when the mooring cable is long. Three-cable mooring is preferred if the water level is stable. Two-cable mooring can better compensate for water level fluctuation, but the aerator tends to drift sideways when the mooring cables are long.

MOORING OPTIONS



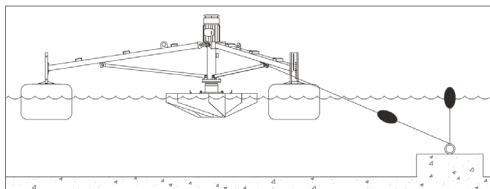
Shore Mooring

A two-cable mooring system can be used when the aerator is close to shore. The minimum cable length is 10 feet (3 meters) plus the amount of water fluctuation squared.



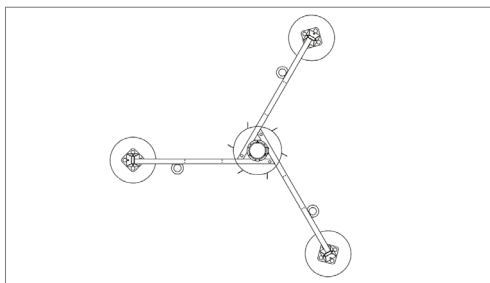
Post Mooring

In large lagoons where distances prohibit mooring to shore, posts can be used for anchoring. The cable length can be calculated the same as for shore moorings.



Bottom Mooring

If the mooring point is at the bottom of the basin, the mooring point and the trace of the mooring line must be flagged with floats. The minimum cable length is four times the basin depth plus the water fluctuation squared.

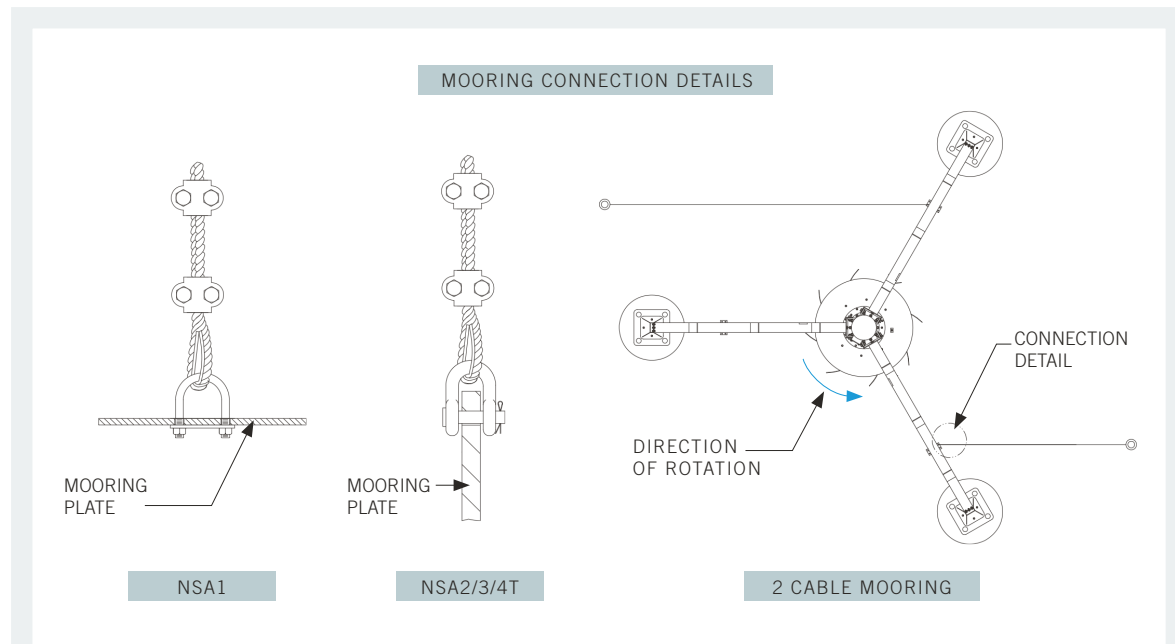
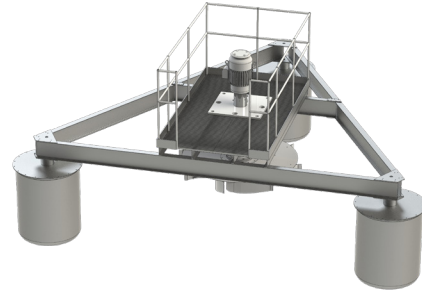





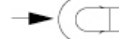
Direct Post Mooring

The arms of a floating aerator can be directly tied to the mooring posts, as long as a sliding mechanism is placed to compensate for water level changes.

FLOATING NSA AERATOR MOORING OPTIONS

DBS Floating NSA Aerators have several mooring options depending on the type of anchoring required, such as shore, post or bottom mooring.

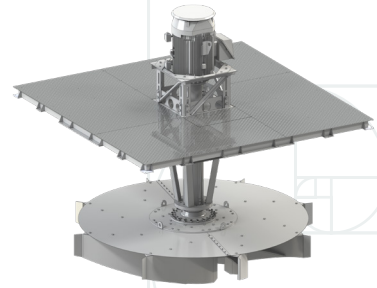


COMPONENTS		MOORING CABLE		THIMBLE/CABLE CLIP	SHACKLE		ANCHORING POINT					
Specification		HIGH FLEX 304 STAINLESS STEEL, 7 X 19 CABLE		STAINLESS STEEL	STAINLESS STEEL							
Picture												
Key Variables		D		BREAKING STRENGTH	S		WORKLOAD LIMIT	TEST	FORCE			
		IN	MM		LBS	N	IN	MM	LBS	N	LBS	N
Minimum Recommendations	NSA1	0.19	5	3,700	16,444	For proper cable size	0.38	10	2,000	8,889	1,300	5,778
	NSA2	0.25	7	6,400	28,444		0.38	10	2,000	8,889	4,000	17,778
	NSA3	0.25	7	6,400	28,444		0.50	13	4,000	17,778	4,500	20,000
	NSA4:75-125	0.31	8	9,000	40,000		0.63	16	6,000	26,667	10,000	44,444
	NSA4:150 & up	0.38	10	12,000	53,333		0.75	20	8,500	37,778	14,000	62,222

¹ Under standard conditions. Performance under field conditions may vary.

DBS “RACETRACK” OXIDATION DITCH

Oxidation ditches have proven to be efficient, economical wastewater treatment systems for decades. DBS Manufacturing Inc., has improved upon this technology by incorporating their new DBS Aerator.



DESCRIPTION

DBS Racetrack Oxidation Ditches are powered by the patented NSA low-speed aerator that provides high efficiency and long life at a substantially lower cost than competitive aerators. Plus, maintenance parts are available worldwide.

Equipped with DBS stainless steel high-efficiency backward curved aeration rotors, DBS Racetrack

Oxidation Ditch aerators maximize pumping rate for superior mixing and aeration.

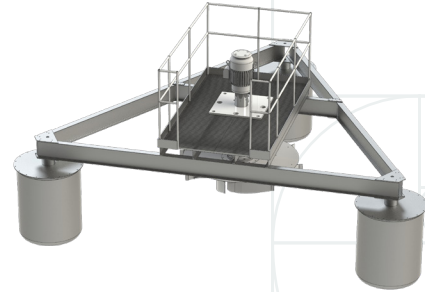
The DBS Racetrack Oxidation Ditch not only offers guaranteed performance for the mechanical equipment, but also for the biological process and ditch velocity.



DBS Racetrack OXIDATION DITCH

LOW SPEED AERATORS AEROBIC DIGESTORS – LAGOON AERATION

DBS Floating Aerators are ideal for lagoon and aerobic digester applications because their compact design makes these units easy to assemble and install.



DESCRIPTION

All wetted parts such as the aeration rotor, float arm lower link, and float hardware are made from corrosion resistant stainless steel for long life and reliability. The flexibility of the DBS stainless steel mooring winch

may significantly benefit lagoon applications. Two winches make easy work of moving the DBS aerator across the lagoon to maximize mixing efficiency.



Post Mounted AERATOR

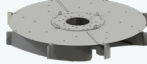




Floating Aerator WITH WINCH

ORDERING INFORMATION

DBS offers several options for our NSA Low Speed Aerators. Contact DBS or a DBS representative for assistance in deciding your equipment requirements.

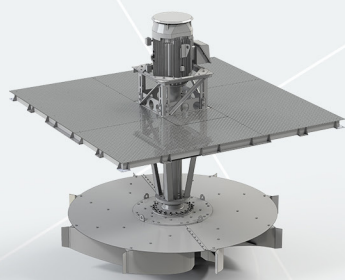


NSA LOW SPEED AERATOR MODEL OPTIONS									
NSA Aerator	ROTORS		GEARBOX			HORSEPOWER		MOUNTING	
									
	CODE		CODE	RATIO	MAX HP	CODE	HP	CODE	MOUNTING
Standard backwards curved rotor	A	D	1	21.1:1	20	08	7.5	B	Bridge
			2	24.9:1	30	10	10	Omit	Floating
			3	29:1	75	15	15		
			4	38.9:1	150	20	20		
			5	41.26:1	300	25	25		
						30	30		
						40	40		
						50	50		
						60	60		
						75	75		
						100	100		
						125	125		
						150	150		
						200	200		
						250	250		
						300	300		

EXAMPLE: MODEL **NSA5-300B** is for an Aerator with a standard backward-curved rotor, size 5 gearbox, 300 HP electric motor, bridge mounting.

OPTIONS

- Stainless steel construction
- Special coating
- Maintenance platform
- Low oil level switch



LOW SPEED | AERATORS
NSA SERIES
MODEL NSA5-300B

- CLARIFIER & THICKENER DRIVES
- RETROFITS
- LOW-SPEED SURFACE AERATORS
- ROTARY DISTRIBUTOR CENTER MECHANISMS

DBS MANUFACTURING

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