Passavant

Reliable Performance.
Sustainable Results.

A brand of
Aqseptence Group

Passavant®
Surface Brush Aerator Mammutrotor®

Field of Application

The Mammutrotor® is a horizontal shaft aerator used for oxygen transfer in the biological wastewater treatment process. For the two standard diameters the following lengths are available:

- Ø 0.7 m (~2.30 ft) up to 6.0 m (~19.68 ft) length
- Ø 1.0 m (~3.28 ft) up to 9.0 m (~29.53 ft) length

Suitable for plants with high and low load, but especially for low loaded plants when fitted with appropriate drives (optional with frequency converters) the Mammutrotor® produces adequate flow velocities, at low energy consumption and with a low oxygen input (necessary for simultaneous denitrification). The Mammutrotor® can be used in either longitudinal circulation flow tanks, carrousel or annular tanks with horizontal flow; if required a combination with submersible flow boosters is also possible. Maximum water depth without guide baffle and mixer should not exceed:

- Ø 0.7 m (~2.30 ft) in circular tanks approximately 2.2 m (~7.22 ft) and other types of tanks approximately 2.6 m (~8.53 ft)
- Ø 1.0 m (~3.28 ft) in circular tanks approximately 3.0 m (~9.84 ft) and in other types of tanks approximately 4.0 m (~13.12 ft) (max. up to 8.0 m (~26.25 ft) if operating with guide baffle and mixer).

Function

By rotation, the oxygen from the air will be transferred into the mixed liquor At the same flow will be genarate for a settlement free operation. The required number of Mammutrotor®s and their lengths are determined by the required oxygenation capacity and the tank volume.

Accessories

- Aerosol protection for up- / downstream side
- Frost protection covers; alternatively heatable frost protection hoods for coupling and bearing for Ø 0.7 m (~2.30 ft)
- Noise protection hood covering gear reducer
- Safety bars for accident prevention – upstream of rotors
- Damping plates for suppression of surging
- Overflow weirs to control immersion depth (0_2-input) with manual or electrical drive
- Dissolved oxygen metre a. control systems

Construction

The Mammutrotor® mainly consists of the following components:

Drive

The drive unit the Ø 1.0 m (~3.28 ft) rotor consists of a two-stage bevel / spur gear reducer (manufactured by Passavant®) as well as a flange mounted 3-phase motor (vertical arrangement) with a flexible coupling between the motor and gear reducer. For a rotor of Ø 0.7 m (~2.30 ft), a two stage spur gear reducer (by Passavant®) including a V-belt drive and a 3-phase motor (design B3) mounted on a pivoting base plate, is used. Special seals are provided to effectively prevent spray water penetrating into gearbox.

Rotor

The rotor consists of a tubular shaft with flanges, the aeration blades and two end discs (as spray protection). The aeration blades (Ø 0,7 m steel galvanized, Ø 1,0 m GRP or steel galvanized) are mounted onto the pipe shaft in an off-set screw pattern, ensuring a non-pulsating torque on the drive unit.

Coupling

The flexible coupling is shrunk onto the gear reducer output shaft and bolted to the rotor shaft flange. It absorbs the start-up shock and operational vibrations and compensates for possible misalignments.

End bearing

The end bearing has been designed as a loose bearing housed in a solid support with an elastic supporting pad. That enables compensating linear expansion and minor rotor misalignments. Special seals are provided to effectively prevent spray water penetrating into end bearing.

Concrete bridge

Generally, the Mammutrotor® is installed below a wide concrete bridge with the up and downstream side beams 10 cm (3.94 in) above water level, therefore the aerosol development and escape are largely impeded and the noise level reduced. Gearbox and end bearings are mounted on the concrete foundations by anchor bolts; alternatively they can be fixed by means of special dowels or threaded spindles and nuts. The installation opening in the bridge should be covered with removable concrete slabs. Alternatively covers made of GRP segments can also be used. It is, however, suggested to have light and easy to remove covers for maintenance work in areas of couplings and end bearings.

Steel bridge

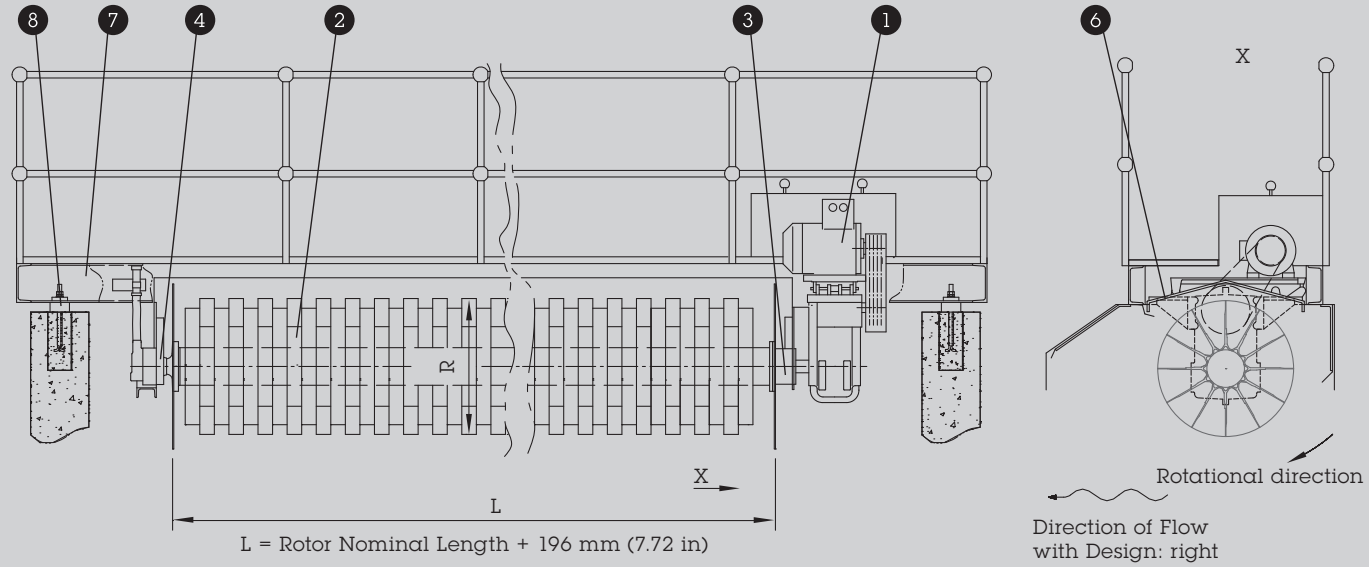
Rotors with Ø 0.7 m (~2.30 ft) and with Ø 1.0 m (~3.28 ft) can be delivered with a steel bridge. The bridge is made of sectional steel with hot dip galvanized grating covers and railing which span the channel width of the activated tank and is fixed on the walls of the tank by means of anchor bolts. The complete Mammutrotor® is mounted in the bridge assembly. Gear reducer and end bearings are mounted on steel brackets within the bridge construction. Spray protection covers (made from stainless steel) protect the bridge as well as the drive unit and end bearings against the spray water.

Passavant® Surface Brush Aerator Mammutrotor®

Ø 700 mm (~2.30 ft) – Steel Bridge

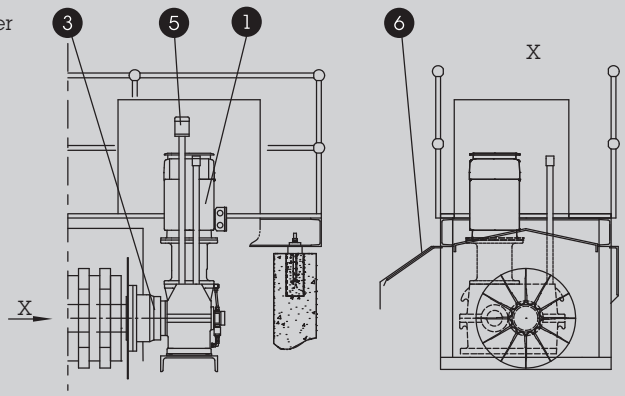
1. Drive unit
2. Rotor
3. Flexible coupling
4. End bearing
5. Humidity filter
6. Spray protection hood
7. Sectional steel frame
8. Packing Plates (optional)

Design 7.5 kW (10.05 hp)
Gear reducer



L = Rotor Nominal Length + 196 mm (7.72 in)

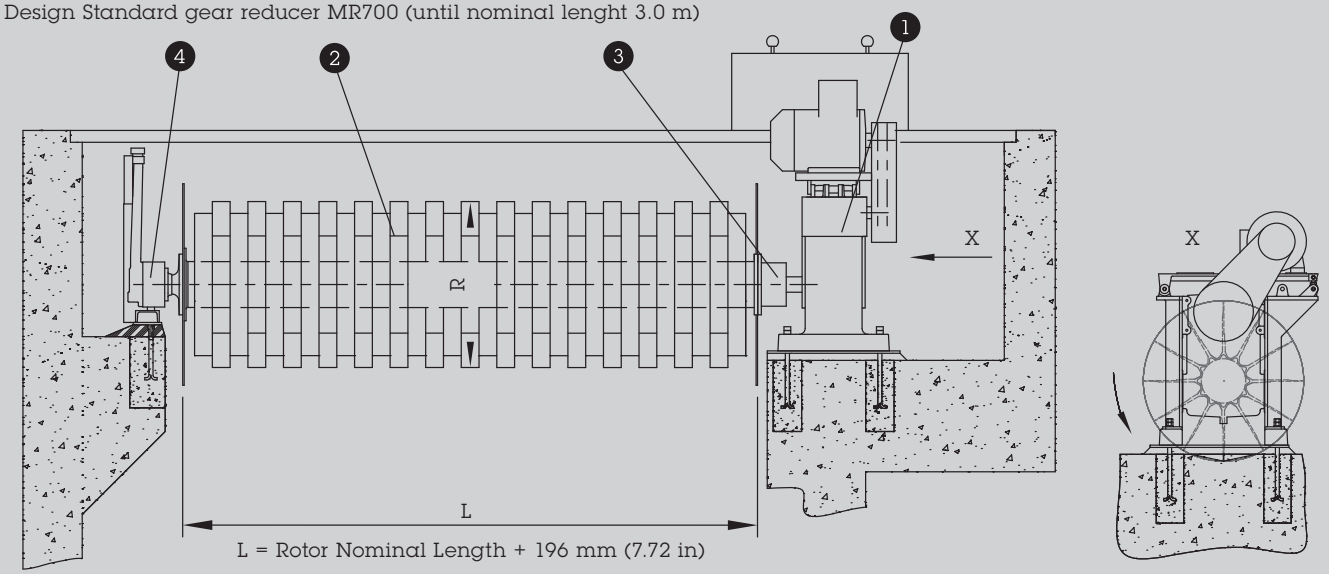
Design 15 kW (20.11 hp) Gear reducer



Ø 700 mm (~2.30 ft) – Concrete Bridge

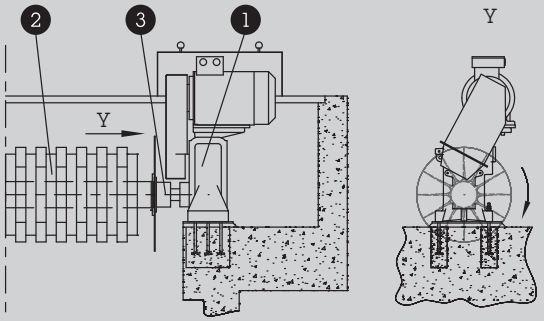
1. Drive unit
2. Rotor
3. Flexible coupling
4. End bearing
5. Humidity filter

Design Standard gear reducer MR700 (until nominal lenght 3.0 m)

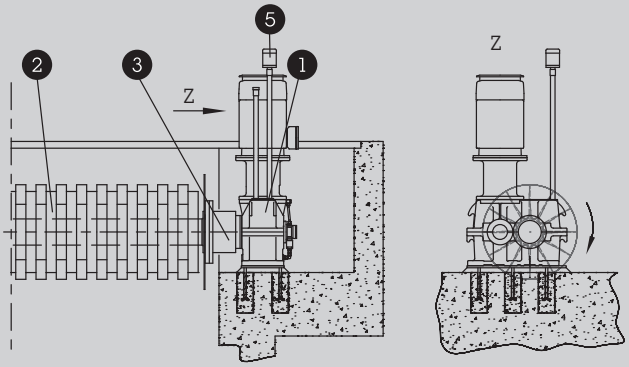


L = Rotor Nominal Length + 196 mm (7.72 in)

Design Standard gear reducer MR700
(until nominal length 3.0 m)



Standard gear reducer MR1000
(nominal length more than 3.0 m)

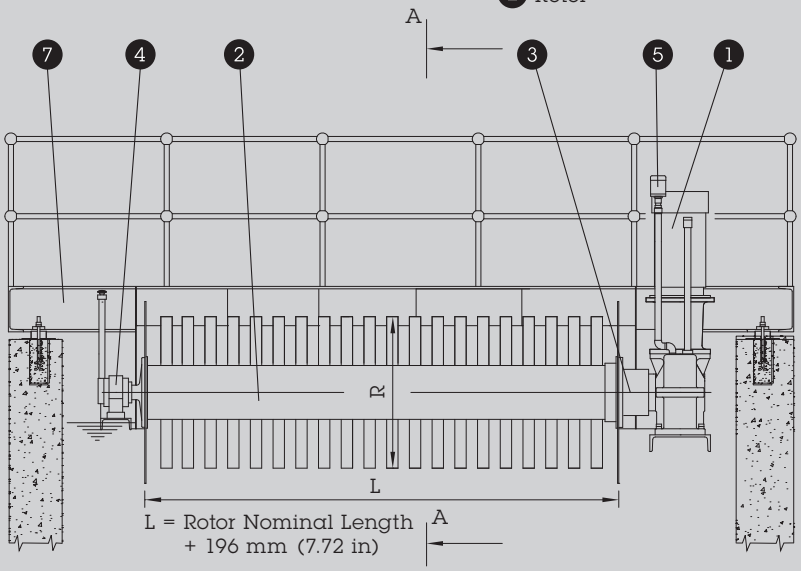


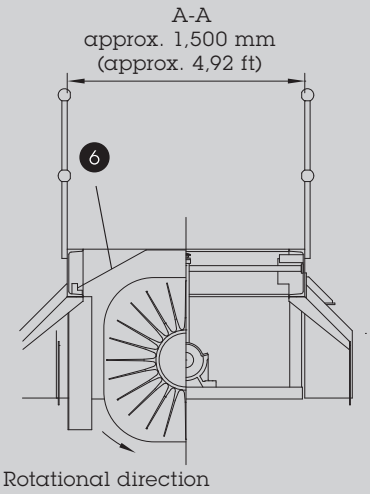
Rotor Diameter (R) mm (ft)	Nom. Rotor Length (L) mm (ft)	Rotor Speed* min^{-1}	Motor Capacity** kW (hp)	Motor speed min^{-1}	Max. Immersion Depth mm (in)
700 (2.30)	1,000 (3.28)	85	2.2 (2.95)	1,500	240 (9.45)
700 (2.30)	1,500 (4.92)	85	3.0 (4.02)	1,500	240 (9.45)
700 (2.30)	2,000 (6.56)	85	4.0 (5.36)	1,500	240 (9.45)
700 (2.30)	2,500 (8.20)	85	5.5 (7.37)	1,500	240 (9.45)
700 (2.30)	3,000 (9.84)	85	7.5 (10.05)	1,500	240 (9.45)
700 (2.30)	4,000 (13.12)	85	11 (14.75)	1,500	240 (9.45)
700 (2.30)	6,000 (19.69)	85	15 (20.11)	1,500	240 (9.45)

* optional use with frequency converters or 2-speed motor
** guiding values depending on tank design and operating conditions (e.g. use with or without guide baffle)

Ø 1,000 mm (~3.28 ft) – Steel Bridge

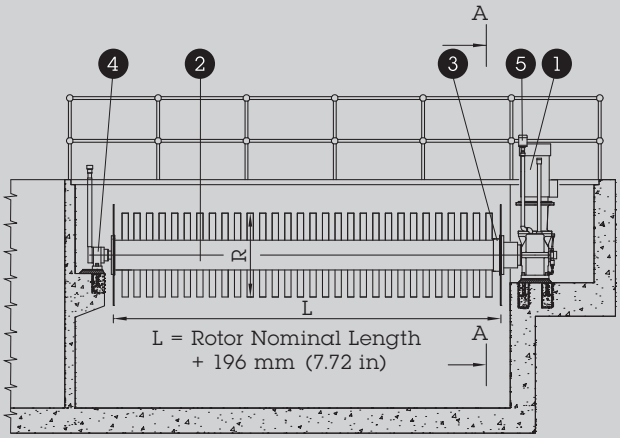
1 Drive unit
2 Rotor
3 Flexible coupling
4 End bearing
5 Humidity filter
6 Spray protection hood
7 Sectional steel frame

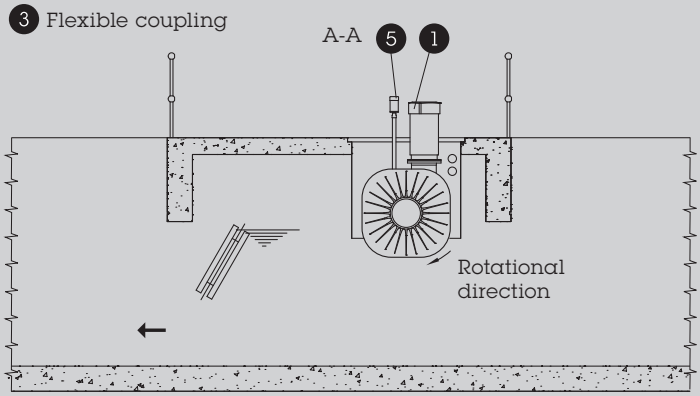




Ø 1,000 mm (~3.28 ft) – Concrete Bridge

1 Drive unit
2 Rotor shaft
3 Flexible coupling
4 End bearing
5 Humidity filter





Rotor-Ø (R) mm	Nom. Rotor Length (L) mm (ft)	Rotor Speed* min^{-1}	Motor Capacity kW (hp)	Motor speed min^{-1}	Max. Immersion Depth mm (in)
1,000 (3.28)	3,000 (9.84)	72	15 (20.11)	1,500	300 (11.81)
1,000 (3.28)	4,500 (14.76)	72	22 (29.50)	1,500	300 (11.81)
1,000 (3.28)	6,000 (19.69)	72	30 (40.21)	1,500	300 (11.81)
1,000 (3.28)	7,500 (24.61)	72	37 (49.60)	1,500	300 (11.81)
1,000 (3.28)	9,000 (29.53)	72	45 (60.32)	1,500	300 (11.81)

*optional use with frequency converters or 2-speed motors

Aqseptence Group GmbH
Water Treatment Systems

Passavant-Geiger-Straße 1
65326 Aarbergen · Deutschland
Phone +49 6120 28-0
Fax +49 6120 28-2182
passavant@aqseptence.com

www.aqseptence.com

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