LOW SPEED AERATOR AIRMAX®

Specification for TENDER BOOK

General

Surface aerators will be mechanical aerators of **clog free** design suitable for installation on reinforced concrete supporting structures within the aeration tanks.

Each assembly will be completed weather proof and satisfactory for operation conditions duty and environment specified.

The impeller that can be in contact with sewage water will be obligatory in **carbon steel protected by epoxy coating.**

Each unit shall be individually driven by an electric motor through a reduction gearbox.

The aerators are low-speed, open type use for oxidation ditches, tanks or lagoons.

Vertical aerators will have rigid coupling between gearbox and aerator shaft.

The aerator installation will generally consist of the following parts:

- Impeller
- Intermediate shaft
- Foundation plate
- Rigid coupling between shaft and gearbox
- Heavy duty gearbox
- Flexible coupling between gearbox and E motor
- E-motor

Construction

In order to reach a no clogging impeller, the impeller has to be a flat base plate with anti clogging blades. The number of blades is **minimum 12** and each blade is oriented with an angle of 30° in order to reach a good spread of splashing water in the space around the aerator.
The impellers have to be provided with three lifting lugs for easy installation.
The shaft is connected to the drive unit by means of a rigid coupling. All parts are connected with strength fastenings hot galvanized bolts. The foundation plate is provided with hot galvanized bolts to enable the horizontal adjustment during erection. Those bolts will be embedded in concrete deck that ensures a robust and vibration free mounting construction.

The coating of the aerator is epoxy suitable for sewage water. The minimum protection requirement is after SA2½ blast cleaned two layers of minimum 150 microns epoxy coating.

Impeller in polyester is not allowed

Design

The diameter of the aerator must be designed as following:

$$D = 0{,}15 \times (SOTR)^{1/2} + 0.8(*)$$

where: D= diameter in m

SOTR = Standard Oxygen Transfer Rate in kg O_2/h in drinking water
According EN 12-255-15
Those diameters can be higher to achieve a much better mixing.
(*) For Carrousel system, replace 0.8 by 1.

The peripheral speed of the aerator is **not exceeding 5.5 m/sec** so that the possibility of sludge break-up is kept to a minimum.

The complete units will be capable of being started with aerator at the operating depth of submergence.

The up-trust of the aerator assembly will be equal or lower than the total weight of the impeller assembly in order to guarantee the longest life time of the gearbox.

The mains characteristics are:

- Low axial and radial forces (no up-trust above impeller weight)
- Optimum efficiency
- Propulsion capacity and mixing capacity in oxidation ditches
- No-clogging of the aerator
- Hardly any maintenance

Accuracy of performance is according ATV M 209 or EN 12-255-15.

Gearboxes

The gearbox unit will have a design life of not less than **100.000 hours according to AGMA** and be selected in accordance with recommendations for power transmission calculation.

For the selection of the gearboxes, the service factor is minimum 1.75 between nominal AGMA power of gearboxes and shaft power for oxidation ditches, and 1.5 for complete mixed tank.

Those factors are respectively 2 and 1.75 in case of oxidation ditches.

Gearboxes will be designed for continuous 24 hours/day operations and be classified for medium shock loading.

The efficiency of the gearbox is not less than 99% per stage.

The lantern on the gearbox is an obligation

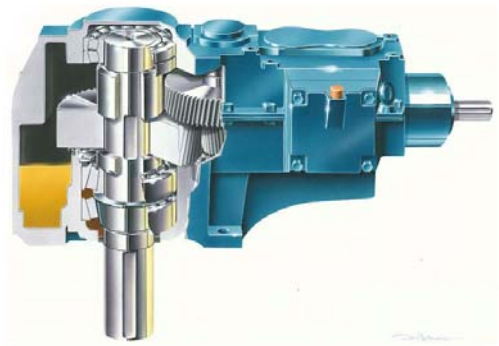
It is possible to disassembly the gearbox on site.

The gears and pinion shafts are manufactured from alloy steel, precision grinded to ensure high efficiency, maximum tooth strength low noise and vibration level.

For gearboxes with higher torque than 5000kN:

-mechanical oil pump is an obligation to ensure a perfect lubrication of each bearing inside the gearbox
-Integrated and inverted dry well is required in order to avoid oil leakage

DRY WELL →



Recommended options: The gearboxes are fitted with lifting lugs and will be supplied complete with oil level indicator and connection for removing oil.

Internal surfaces will be protected with adequate protection film to long term storage if required.

Electric motors

The motors are with cast iron frames and flanges , type B5 vertically mounted, and further according to IEC standard. Type eff1. (high efficiency) IP 55, V1 class F rise B
Aluminium casing is not allowed.
Rain or sun canopy will be supplied.
The starting procedure of the motor will be DOL or soft starter or with frequency converter.

Aeration test : (suivant EN 12-255-15) (if required)

Aeration test can be made to determine the SOTR (kgO2/h) in drinking water and the efficiency (kgO2/kwh) on the motor wire.
The test is done by a third party in the application field of the European standard EN 12-255-15.