



**KUSTERS WATER**

a division of KUSTERS ZIMA



# DUALSTAR Aerator / Mixer

Efficient Aeration and Mixing or Mixing Only



Air



Water



Biosolids



**FUCHS**  
Clean Solutions

## General

The DUALSTAR Aerator/Mixer is a modification of the internationally successful FUCHS OXYSTAR Aerator. It combines two modes of operation for wastewater treatment applications.

In aeration mode it is used to introduce oxygen into activated sludge tanks, lagoons or equalization tanks. Together with fine-bubble deep aeration, it also provides circulation and thorough mixing of the wastewater.

In mixing mode air flow stops and it works as an efficient mixer only.

## Description

The DUALSTAR Aerator/Mixer incorporates two major components: a mixer and an additional blower.

The mixer essentially consists of an air-cooled electric motor, a fixed coupling, a shaft and a sophisticatedly designed three-blade propeller. The shaft rotates at motor speed inside a protective housing.

The blower essentially consists of a sidechannel blower, air filter, silencer, a non-return valve and an air pipe to the mixing zone.

The mixer generates a water jet angular to the bottom of the basin. While switched on, the blower pumps air to the mixing zone at the propeller.

Intense turbulence at the propeller breaks down the air to fine bubbles and the water jet carries the air bubbles deep into the basin.

## Design and Materials

DUALSTAR Aerators/Mixers are intelligently designed and very sturdy.

The mixer drives are AC motors supplied by well-established manufacturers in the European Community. They are highly efficient, adequately rated and equipped with permanently lubricated large grooved ball bearings. Motor housings are made of high-quality cast iron or aluminium with an additional coat of protective paint. The shaft is connected to the drive motor by means of a special conical (tapered) coupling which can easily be assembled and disassembled. This precision-machined component is produced on numerically-controlled machines. An extruded seamless steel tube with tight production tolerances is used for the shaft. Dynamical balancing of the whole assembly consisting of coupling, shaft and propeller in conjunction with the motor ensures smooth operation. The immersed parts do not contain any seals or bearings. Thus, DUALSTAR Aerators/Mixers are virtually maintenance-free. The blowers are supplied by high-quality manufacturers in the European Community.

All parts are made of non-corrosive materials. Standard material for the mixer shaft, the propeller, the air pipe and all small parts is stainless steel AISI 304. On request stainless steel AISI 316 Ti is available as well. The protective housing is made of glass fibre reinforced plastics or other non-corrosive materials.

DUALSTAR: blower with air filter, silencer and non return valve



DUALSTAR: anti vortex plate, air pipe and mixer propeller



## Wide-Ranging Applications

The DUALSTAR Aerator/Mixer is ideal for all applications which require aeration and mixing alternately. Typical examples are biological nitrogen removal (BNR) by intermittent aeration/denitrification or sequencing batch reactors (SBR).

While the blower is switched on, the DUALSTAR Aerator/Mixer effectively supplies oxygen for BOD removal and ammonia oxidation. In the anoxic cycle the blower is switched off to achieve anoxic complete-mix conditions for nitrate reduction.

## Installation

Every DUALSTAR Aerator/Mixer can be handled easily due to its low weight. There is no need of special buildings for blowers, compressed air pipes, covers and adjustable weirs. Interruption of operation or emptying of basins is not needed for upgrading or retrofitting of existing aeration systems.

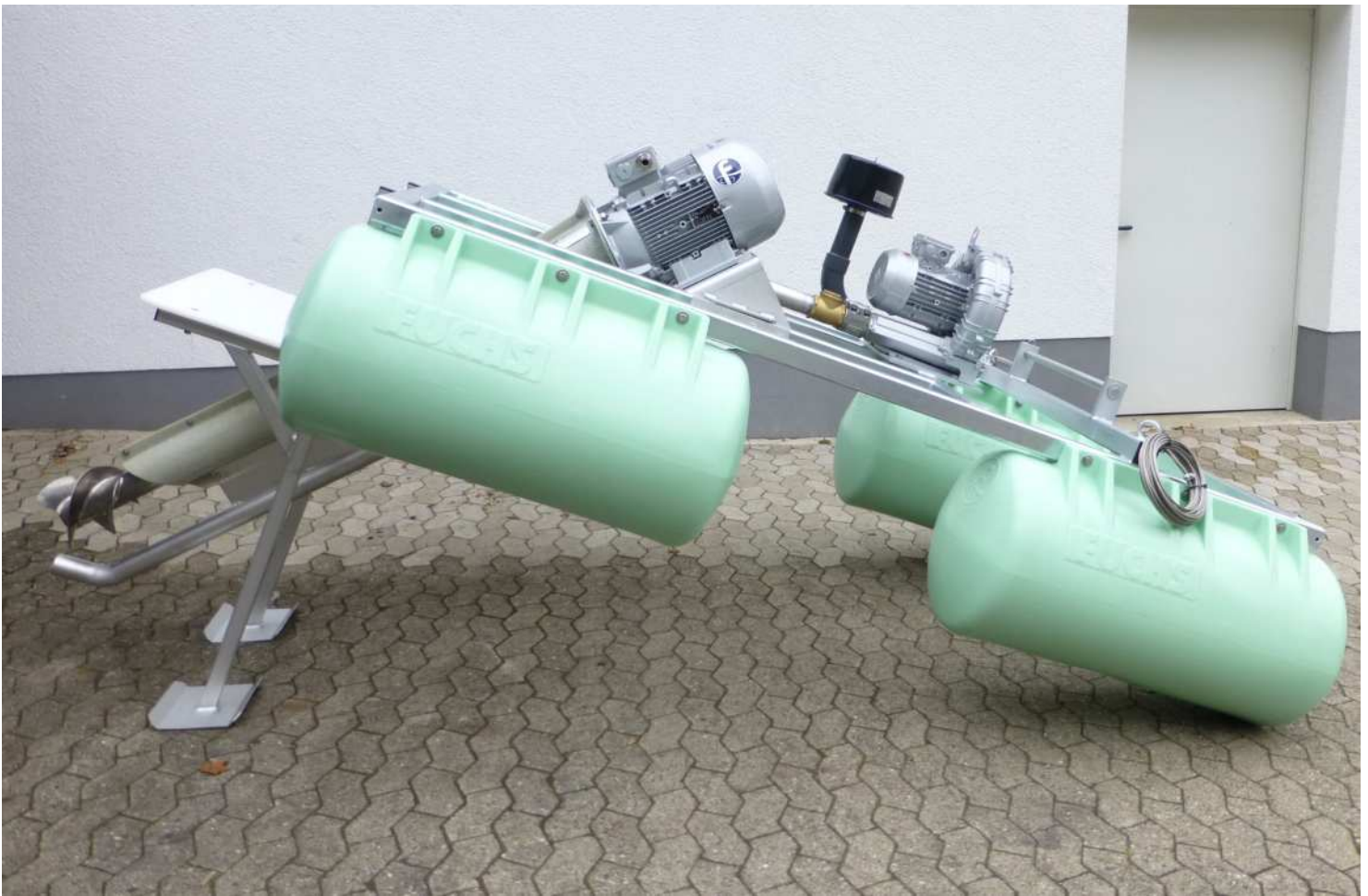
In basins with varying water level the DUALSTAR Aerator/Mixer is preferably installed on sturdy float assemblies with a fixing bar and mooring cables.

The float assembly for a DUALSTAR Aerator/Mixer essentially consists of a framework made of hot-dip galvanized steel and pontoons made of LDPE.

In activated sludge basins with non-varying water level the DUALSTAR Aerator/Mixer may be fixed with mounting brackets to bridges or to a side wall.

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High-quality materials and durable design





Aerated Wastewater Lagoon System in Spain (700 PE)



Research project to adapt German design criteria to hot and cold climates

## The DUALSTAR Aerator/Mixer: Advantages

- Efficient oxygen transfer
- High-efficiency mixing and circulation
- Aeration with mixing and alternatingly pure mixing mode
- No spray water, calm water surface
- Easy handling and mounting
- Low maintenance
- Long life time

## Technical Data

The DUALSTAR Aerator/ Mixer DS is available in all IEC motor sizes from 2.2 kW to 18.5 kW. Standard motors are 230/400 V resp. 400/690 V, 50 Hz, 3-phase.

Other voltages and 60 Hz are available.

Motor speed: ≤ 1,500 r.p.m. at 50 Hz

≤ 1,800 r.p.m. at 60 Hz

| DUALSTAR Type | Nominal Power (Mixer) kW | Nominal Current (Mixer) A | Length m | Weight kg | Immersion Depth m |
|---------------|--------------------------|---------------------------|----------|-----------|-------------------|
| DS 2.2        | 2.2                      | 4.6                       | 1.5      | 48        | 0.5               |
| DS 3.0        | 3.0                      | 6.3                       | 1.6      | 51        | 0.5               |
| DS 4.0        | 4.0                      | 9.6                       | 1.6      | 61        | 0.5               |
| DS 5.5        | 5.5                      | 10.5                      | 1.8      | 80        | 0.6               |
| DS 7.5        | 7.5                      | 14.3                      | 1.8      | 82        | 0.6               |
| DS 11.0       | 11.0                     | 20.5                      | 2.2      | 117       | 0.8               |
| DS 15.0       | 15.0                     | 28.5                      | 2.2      | 136       | 0.8               |
| DS 18.5       | 18.5                     | 35.0                      | 2.3      | 171       | 0.8               |

Data for DS mixer unit and standard motors 400 V, 50 Hz. Other voltages, 60Hz as well as larger units on request. The data are subject to technical change.



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