



# BIOGAS AGITATORS

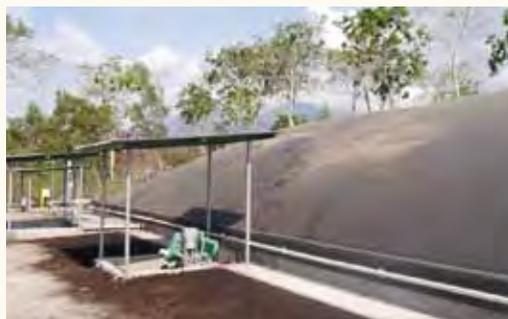
Our product range  
for increased biogas production



## Giantmix FR Propeller Agitators



**For closed concrete digester  
For mounting through wall or roof**



The Giantmix FR has been specially designed to optimize the biological process in digester and afterfermenters with almost constant substrate levels. The Giantmix FR:

- Prevents the formation of floating and sediment layers
- Ensures that an equal temperature is maintained throughout the substrate
- Distributes nutrients homogeneously for the biological process
- Enables more efficient gas flow out of the substrate

An advantage of the design of the Giantmix is that almost all maintenance can be done without opening the digester or dismantling the unit.

The drive side with the electric motor and transmission is accessible from the outside; only the shaft tube and propeller are inside the fermenter and in an optimal position for thorough mixing.

### TECHNICAL DATA

#### FR I - 6 (240 / 315 / 330 / 480 rpm)

- Ex-motors of rated output 10/15/20/25 and 30 hp at 240 - 480 rpm (3-phase 60 cycles)
- 18 hp for hazardous zone 1 (ATEX)
- Low noise spur gear
- Bearing housing with mechanical seal of SiC/SiC
- Agitator shaft tube Ø 4" ss304 or ss316 stainless steel,
- Wall thickness 0.16" or 0.2"
- Tube lengths 8,2' / 9,8' / 13'
- Sealing plates in ss304 or ss316 and 3 sizes
- Sealing membrane EPDM 60 or rubber compression seal in EPDM 70
- Oil expansion vessel for lubrication and monitoring of the seal
- For immersion depths to 26' beneath substrate level (FR SP and FR stationary) or up to 5' beneath substrate level (FR 30°)
- Propeller Ø from 21" to 31" in ss304 or hardened steel
- Inclination adjustment by upper control arm or optional through pinion rack with winch or hydraulic cylinder
- Stainless steel rain covers optional
- Optional tractor-driven configuration through PTO connection
- Giantmix FR HY only with PTO drive and without motor possible

## Giantmix FR Propeller Agitators



**For closed steel digester  
For mounting through digester wall**



For technical reasons due to loads, the Giantmix FR cannot be directly mounted to the wall of a steel digester.

A scaffold to support the weight and absorb the thrusting forces is a possible solution to compensate for this limitation. This could double as a service platform.

In addition, a favoured application is fixed mounting through the lower part of the digester wall. It is intended mainly to prevent sediment layers from forming yet achieving thorough mixing.

### TECHNICAL DATA

#### FR I - 6 (240 / 315 / 330 / 480 rpm)

- Motors of rated output 10/15/20/25 and 30 hp at 240 - 480 rpm (3-phase 60 cycles)
- 18 hp for hazardous zone 1 (ATEX)
- Low noise spur gear
- Bearing housing with mechanical seal of SiC/SiC, independent on rotation
- Agitator shaft tube  $\varnothing$  4" ss304 or ss316 stainless steel
- Wall thickness 0.16" or optional 0.2"
- Tube lengths 8,2' / 9,8' / 13'
- Sealing plates in ss304 or ss316 and 3 sizes
- Sealing membrane EPDM 60 or compression rubber seal in EPDM 70
- Oil expansion vessel for lubrication and monitoring of the seal
- For immersion depths up to 26' beneath substrate level (FR stationary) or 10' beneath substrate level (FR 30°)
- Propeller diameters from 21" to 31" in ss304 stainless or hardened steel
- Stainless steel rain covers optional
- Optional tractor-driven configuration through PTO connection
- Giantmix FR HY only with PTO drive and without motor possible

## Giantmix FT Propeller Agitators



**For closed concrete digester  
For mounting through wall or roof**



The Giantmix FT is the development of the Giantmix FR.

The agitator is the only agitator known which can be inclined horizontally and vertically by  $\pm 30^\circ$ . Therefore a high quality hydraulic unit and hand spindle are provided as standard.

Because of the unique sealing system, the installation at immersion depths to 8 m below maximum substrate level and full swivelling range is possible.

The tube's flexible lead through is sealed by 2 EPDM sealing membranes (inside and outside) and with a ball between the two membranes.

The Giantmix FT can alternatively be tractor-driven by using an optional PTO fixture. All agitators of the type Giantmix FT are available with only a PTO connection and without motor or reducer.

### TECHNICAL DATA

#### FT I - 6 (240 / 315 / 330 / 480 rpm)

- Motors of rated output 10/15/20/25 and 30 hp at 240 - 480 rpm (3-phase 60 cycles) for hazardous zone 2 (ATEX)
- Low noise spur gear
- Bearing housing with two tapered roller bearings and mechanical seal of SiC/SiC
- Agitator shaft tube  $\varnothing$  6" ss304 or ss316
- Wall thickness 0.2"
- Tube lengths 13' / 16,5' / 18'
- Sealing plates in 2 sizes in ss304 or ss316 stainless steel
- Sealing membrane EPDM 60
- Oil expansion vessel for lubrication and monitoring of the seal
- For immersion depths to 26' below maximum substrate level
- Horizontal and vertical inclination adjustment of  $\pm 30^\circ$
- Propeller  $\varnothing$  from 21" to 31" ss304 stainless or hardened steel
- Hydraulic inclination (optional: cylinder wall support upwards)
- Stainless steel rain covers optional
- Optional tractor-driven configuration available
- Giantmix FT HY only with PTO drive and without motor possible

## Giantmix AMT Propeller Agitators



**For closed concrete digester  
For mounting through wall or roof**



The Giantmix AMT is used for larger fermenter, post digester and gas-tight end storage tanks.

The Giantmix AMT comes with a robust ss316-tube and with a big vertically hydraulic inclination of  $\pm 30^\circ$ .

For higher dry substrate levels the Giantmix AMT 3 and 5 are perfect. This is especially true because of the SUMA developed damping system, strengthened sealing plate and larger and reinforced propellers are used.

### TECHNICAL DATA

#### AMT 6 - 7 (325 rpm)

- Geared motors of 30 and 38 hp at 325 rpm (3-phase 60 cycles) for hazardous zone 2 (ATEX)
- Low noise spur gear
- Bearing housing with mechanical seal of SiC/SiC
- Agitator shaft tube  $\varnothing 9'' \times 0.3''$  ss316 stainless steel
- Tube lengths from 16.5' to 21'
- Sealing plates in ss304 or ss316 stainless steel
- Sealing membrane EPDM 60
- Oil expansion vessel for lubrication and monitoring of the seal
- For immersion depths to 19.5' below maximum substrate level
- Vertical inclination adjustment of  $\pm 30^\circ$  and horizontal adjustment  $\pm 25^\circ$
- Propeller  $\varnothing 31'' - 34''$  in ss304, ss316 or hardened steel
- Hydraulic inclination adjustment (optional: cylinder wall support upwards)

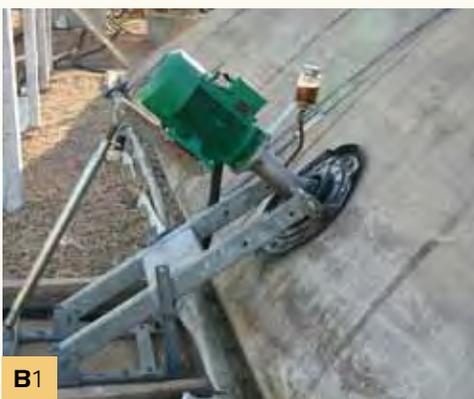
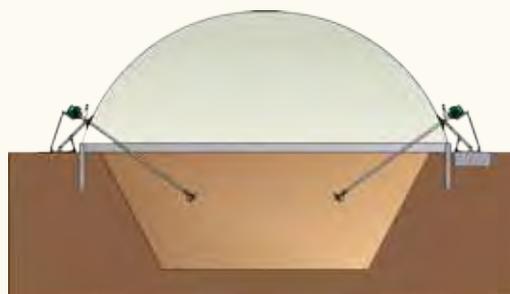
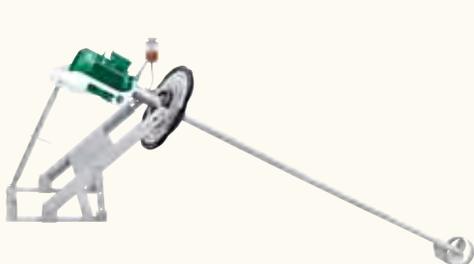
#### AMT 3 / 5 (165 rpm)

- Geared motors of 15 or 20 hp at 165 rpm (3-phase 60 cycles) for hazardous zone 2 (ATEX)
- Propeller diameter 40" and 47" in ss304, ss316 or hardened steel
- Vertical adjustment  $\pm 30^\circ$  and horizontal adjustment  $\pm 20^\circ$
- SUMA-damping systems on the barrel mounting wall support and in the swivel arm
- Strengthened sealing plate

## REKORDMIX B1 and Giantmix BG2



For earth basins / lagoons



B1



BG2

The Rekordmix B1 has been specially developed for biogas plants built around a large covered lagoon. Retro-fitting is also possible.

The Rekordmix serves to optimize the biological process by:

- preventing floating layers and sediment
- ensuring that the substrate maintains an equal temperature throughout
- distributing nutrients homogeneously for the biological process
- enabling more efficient gas flow out of the substrate mass

Specification:

Shaft unit with electric motor, shaft tube with bearing and sealing unit of low-maintenance modular construction.

All important components are manufactured in stainless steel. To protect the gas storage membrane inside the bay, the propeller is fitted with a protective ring. An oil reservoir serves the lubrication and the maintenance indicator.

A mounting bracket for securing the unit to the foundation is included within the scope of delivery. Height of the unit is set at the frame. A rubber sealing membrane, secured by a metal ring fastened to the membrane ensures a gas-tight installation. Through the rubber seal, the agitator unit is mechanically separated from the gas membrane to prevent ripping and tearing of the membrane.

### TECHNICAL DATA

#### REKORDMIX B1 (1150 rpm)

- Motor rated at 6.2 hp (1150 rpm)
- Tube Ø 2.75 x 0.12", in ss304
- Tube length 12' or 14'
- Propeller Ø 13, in ss304 or hardened steel
- Stainless steel protective ring (ss304)
- Bearing housing with a mechanical seal of SiC/SiC
- Clamping unit with sealing membrane in EPDM 60
- Agitator frame with inclination adjustment
- Oil expansion vessel for lubrication and monitoring of the seals
- The unit does not come with power cables and control unit
- Foundation is required for mounting the unit

#### GIANTMIX BG2 (460 rpm)

- Ex-motor with 13 hp (460 rpm)
- Tube diameter 4" ss304 or ss316
- Tube length 14.5'
- Propeller Ø 19"
- Wall thickness 0.16 / 0.2"
- Spur gear
- Protective bar and support bracket
- Like Rekordmix B1

## OPTIMIX 2G Propeller Agitators with Submersible Motors



**For closed concrete digester  
For mounting through fermenter wall**



**2G 150-460**



**2G 150-325**



**2G 40-1150**



**2G 90-90**

The flow optimized submersible motor Optimix 2G is available with 4 / 5.5 / 12 and 20 hp motors and different rotational speeds of the propeller.

Because of the unique SUMA modular design different motor performances, gears, propeller and mast sizes can be combined for the most appropriate agitator for the customer.

The SUMA-guide mast support with 4 rollers and POM-slide rollers guarantee perfect sliding on the mast and galvanical isolation between the mast and the agitator. The 3 separate oil chambers for motor, gear and bearing housing ensure proper stirring. Longlife oil with an extended oil changing interval is used for the gear and the bearing housings. The sealing is made with the mechanical seal SiC/SiC within the bearing housing. There are delta-star-operating-switches for a manually operation or time-controlled SUMA-soft start controls available. All agitators can be operated on an external frequency converter.

### TECHNICAL DATA

#### OPTIMIX

- 2G 30-870: 4 hp 870 rpm (without gear)
  - 2G 40-220: 5 hp 220 rpm
  - 2G 40-305: 5 hp 305 rpm
  - 2G 40-1150: 5 hp 1150 rpm (without gear)
  - 2G 90-90: 12 hp 90 rpm
  - 2G 90-330: 12 hp 330 rpm
  - 2G 90-460: 12 hp 460 rpm
  - 2G 90-1750: 12 hp 1750 rpm (without gear)
  - 2G 150-325: 20 hp 325 rpm
  - 2G 150-460: 20 hp 460 rpm
- Galvanised propeller, optional in hardened steel, ss304 or ss316
  - Bearing housing with mechanical seal of SiC/SiC
  - 3 separate oil chambers for motor, gear and bearing housings
  - Longlife-oil within the gear and bearing housings
  - Guide mast support with 4 rollers for 3" x 3" / 4" x 4" / 5" x 5" / 6" x 6" masts
  - Galvanically isolated to the mast through ss316-rope
  - The cable is resistant against biomass

## OPTIMIX 2A / 3G Propeller Agitators with Submersible Motors



### For open biogas residue storage / lagoons



3G



2A



We offer the OPTIMIX 3G with 34 hp for higher performance requirements.

For substrates with low pH-values and operations in aggressive media the OPTIMIX 2A is available completely assembled in stainless steel.

Because of the unique SUMA modular design, different motor performances, gears, propeller and mast sizes can be combined for the most appropriate agitator for the customer.

The SUMA-guide mast support with 4 rollers and POM-slide rails guarantee a perfect sliding on the mast and galvanical isolation between the mast and the agitator. The 3 separate oil chambers for motor, gear and bearing housing ensure proper stirring. Longlife oil with a extended oil changing intervals is used for the gear and the bearing housings. The sealing is made with the mechanical seal SiC/SiC within the bearing housing. There are delta-star-operating-switches for a manually operation or time-controlled SUMA-soft start controls available. All agitators can be operated on an external frequency converter.

### TECHNICAL DATA

#### OPTIMIX 3G and 2A

- 3G 250-325: 34 hp 325 rpm
- 2A 135-330: 18 hp 330 rpm (completely in ss304 optional ss316, hazardous zone 1) (ATEX)
- 2A 135-460: 18 hp 460 rpm (completely in ss304 optional ss316, hazardous zone 1) (ATEX)
- Galvanized propeller, optional in hardened steel, ss304 or ss316
- Bearing housing with mechanical seal SiC/SiC
- 3 separate oil chambers for motor, gear and bearing housings
- Longlife-oil within the gear and bearing housings
- Guide mast support with 4 rollers for 4" x 4" / 5" x 5" / 6" x 6" mast
- Galvanically isolated to the mast through ss316-ropes
- The cable is resistant against biomass

## Gas tight mast (MGD)



### Gas tight mast (MGD)

For mounting through fermenter wall



The guide mast with base frame is suitable for tanks with a depths of 39' and includes wall support inside and outside the tank, gastight cable- and rope lead throughs, external rope winch with a  $\varnothing$  0.3" ss316 rope and a handwheel for the vertical adjustment of the agitator.

The vertical adjustment is made through the external handwheel. The cable guide is behind the mast on a  $\varnothing$  1.2" ss316 guide tube through cable clips.

The robust device is delivered with a spacing of 1.9' to the mast (steel tank) or 3.9' to the mast (concrete tank).

A height indicator for the exact display of the agitator-height and an angle display for the exact determination of the angle of the agitator within the tank can be delivered optional.

### TECHNICAL DATA

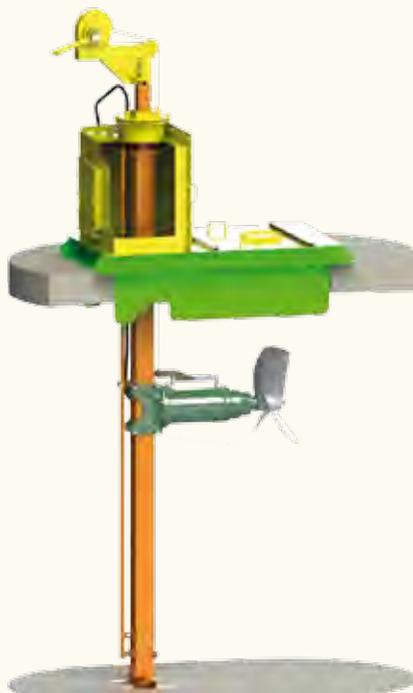
#### Gas tight mast (MGD)

- Guide mast: 4" x 4" / 5" x 5" / 6" x 6" in ss316
- For depths to 3.9'
- For concrete tanks (3.9' distance to the wall)
- For steel tanks (1.9' distance to the wall)
- Innovative gastight rope lead through
- Unique cable guide behind the mast with cable clips and strain relief
- Base frame with dowels
- External lateral adjustment of the Optimix via handwheel over slewing ring possible up to 270°
- Height adjustment through rope winch and ss316 rope  $\varnothing$  0.3"
- Optional height indicator for the exact display of the height of the agitator within the tank
- Optional angle display to determine the exact horizontal angle of the agitator within the tank

## Gas tight ceiling lead through (GDD)



### Gas tight ceiling lead through (GDD) For mounting through fermenter roof



The gas tight ceiling lead through is a developed product by SUMA with guaranteed serviceability and optimized for biogas tanks with concrete top, big lagoons with concrete bridge or membrane covered tanks with balconies..

The service box of the GDD simplifies the maintenance of the propeller of the submersible motors without shutting down the digester. The easy adjustment of the lateral direction and the gas tightness of the service box are unique advantages of the GDD. For a gas tightness of nearly 100 %, a new seal bushing for the rope lead through was developed which is lubricated with special grease at the installation point.

A special highlight is the optional available access cover which closes automatically when sliding the agitator to the top. This mechanism reduces the loss of gas while maintenance is in progress and simplifies the installation work. The maintenance unit can be adapted accordingly to the tank ceiling opening.

In addition to the mounted sight glass a height indicator for the exact display of the height of the agitator will be delivered.

The GDD is manufactured completely in ss316 and is suitable for guide masts from 4" to 6".

#### TECHNICAL DATA

##### Gas tight ceiling lead through (GDD)

- For biogas tanks up to 39' height with concrete ceiling
- Innovative gas tight rope lead through
- Unique cable guidance behind the mast with cable clips and strain relief
- Lateral adjustment 360°
- Servicebox:
  - Sealing plate 74" x 42" x 0.1" in ss316
  - Guide mast: 4" x 4" / 5" x 5" / 6" x 6"
- Maintenance unit (optional):
  - Base frame 80" x 48" x 0.1" in ss316
  - Maintenance cover to close the tank during service and maintenance work
- Height indication: for indication of the exact agitator height in the tank

## Long-axis Agitator Giantmix Z5 and Z6



### For open biogas residue storage / lagoons



Z5



Z6

The Giantmix Z5 and Z6 are the agitators for lagoons and pits, especially for digester residue storage, in which difficult operating conditions demand high-performance tractor power.

The Giantmix Z6 has been developed to tractors of 215 HP and above and the Z5 for 118 HP and above. The both are designed to satisfy the demands for durability over long periods.

The design concept of the shaft unit bearings, proven over decades, has naturally been adopted and incorporated into a practical modular construction. The compatible frame design has been designed for a universal 3-point connection.

For optimal alignment of the agitator, the inclination can also be adjusted by hydraulic cylinders.

### TECHNICAL DATA

#### Giantmix Z5 and Z6

- Galvanized steel shaft tube  $\varnothing$  6.3" x 0.25" (Z5) or 8" x 0.25" (Z6)
- Tube lengths 23' / 26' (Z5) or / 19.5' / 24.5' / 29.5' (Z6)
- Propeller  $\varnothing$  from 23" to 28" (Z5) / 28" to 34" (Z6)
- Suitable for tractor power from > 118 hp (Z5) / > 215 hp (Z6)
- Bearing housing with mechanical seal SiC/SiC
- Thrust and radial forces from the propeller absorbed by two tapered roller bearings
- Power take-off connection is solely 1-3/4"
- The drive shaft within the agitator tube is a  $\varnothing$  2.8" splined hollow tube with multiple bearings



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