

## **PSM SUBMERSIBLE MIXER – A REVOLUTION IN MIXING**

**TAILORED FOR BIOGAS PLANTS, WASTEWATER TREATMENT  
FACILITIES AND INDUSTRIAL APPLICATIONS**



**PRODUCT  
INNOVATION**

# BENEFITS AT A GLANCE

HIGH EFFICIENCY MOTOR WHILE MAINTAINING STRONG MIXER PERFORMANCE AND EQUIPMENT LONGEVITY

The PSM submersible mixer is the most innovative mixing technology currently available on the market. The powerful, gearless direct drive combined with the dynamic mixer controller delivers a mixing system that gets the most out of the energy it consumes. CO<sub>2</sub> and electrical savings of 50% or more can be realized depending on the initial situation.

With permanent synchronous magnet (PSM) motor a gearbox is completely avoided and high torque is available as soon as the mixer starts.

Not surprisingly, the PSM motor is also found in modern electric sports cars and delivers full torque right off the line. Therefore, floating layers and high solid digesters do not pose a problem for the PSM.

The 3D blade geometry has been designed using CFD modelling and has been improved and optimized to perfection with an ideal ratio of shear force and fluid flow. The result is consistently mixed digesters and bioreactors with maximum gas yield.

## EFFICIENT:

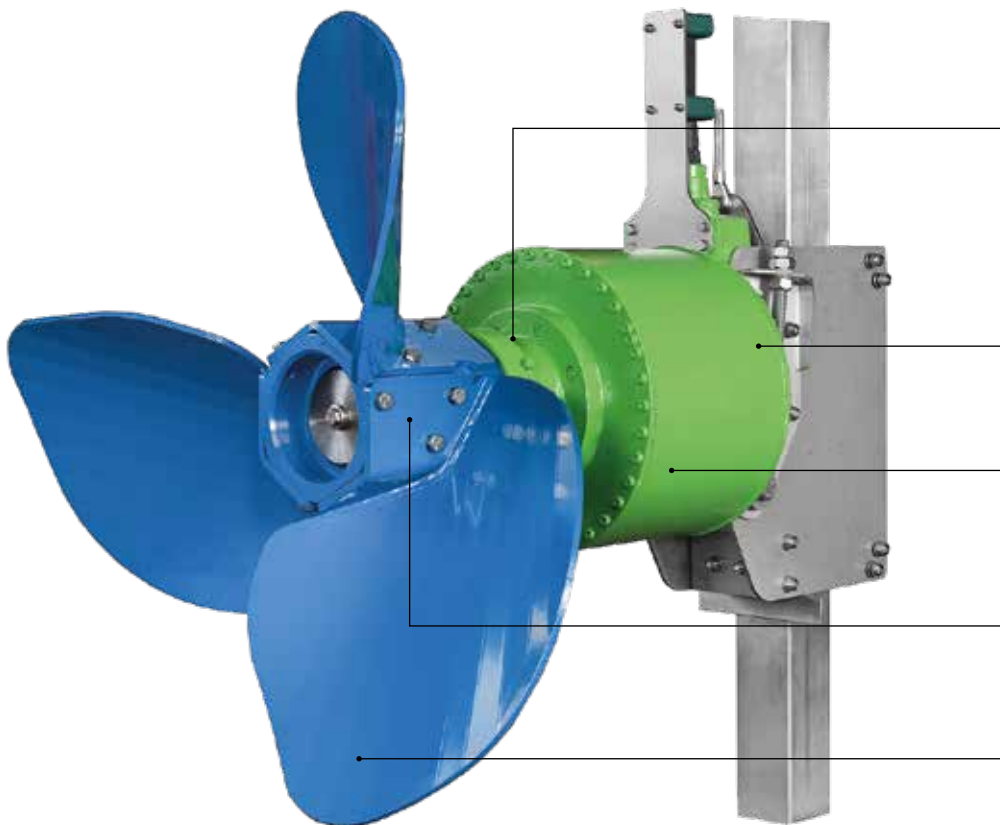
Average power input of 8kW - 12.5kW

## POWERFUL:

High torque motor with full power even at low speeds

Torque: up to 800Nm

Speed: between 80rpm and 150rpm



2 independent liquid seals prevent nuisance alarms and eliminate frequent maintenance. The first barrier is a pair of lip seals with flushless mechanical seal as a secondary protection

## State-of-the-art drive technology:

Powerful direct drive without gear unit

Robust housing with reinforced suspension

Dedicated high thrust bearings independent of motor roller bearings

Optimized 3D propeller

## PROTECTED:

ATEX and Cl. I, Div. 1  
Approved

## INTELLIGENT:

DMC control unit regulates  
everything automatically

## ROBUST:

Gearless drive, high-quality  
components

# THE MULTITASKER

PSM Submersible Mixer

## HOMOGENIZED SLURRIES

- » Effective mixing of slurries even with high total solids content
- » Enables wastewater treatment plant co-digestion or high solids digestion

## MIXING OF FLOATING SCUM LAYERS AND SETTLED GRIT

- » High thrust of up to 5.3kN prevents grit from settling and floating scum layers from forming even in high solids digesters
- » More operating reserves for biogas plants
- » High motor torque of up to 800Nm

## NO-RAG PROPELLER

- » Backwards sweeping propeller prevents rags or fibres from snagging on the propeller

## MAXIMIZE DIGESTER ACTIVE VOLUME

- » Maintain high active volume by eliminating dead zones
- » Uniform heat distribution and assimilation of influent sludge for maximum contact with microorganisms
- » Improved separation of digester gas from digester liquid

## SAFE AND FLEXIBLE USE

- » Efficient monitoring of the electric motor with the assistance of the DMC (temperature, power consumption, speed, torque)
- » Protection for both Class I, Division 1, Group D, T3C and ATEX II 2 G Ex e IIA T1 Gb

## LOW OPERATING AND MAINTENANCE COSTS

- » Power consumption drops at any speed thanks to the high efficiency permanent magnet motor
- » Each mixer is equipped with a Dynamic Mixer Controller (an intelligent VFD)
- » The mixer speed is continuously adjusted without operator intervention. Small reductions in speed and thrust result in large reductions in power. This leads to the lowest power costs of any mixing system.
- » Lower mixer speed also extends the life of the mixer and the interval between maintenance
- » Less wear = longer service life of the mixer



PSM-940



PSM-1500

# INTELLIGENT MIXING

FOR EVEN GREATER COMFORT

The **DMC** (Dynamic Mixer Controller) is our control unit developed exclusively for the PSM. It expands the possibility of the PSM and takes full advantage of output power and energy efficiency.

The DMC regulates the PSM according to the operator's needs or the requirements of the mixing application. For example, it is possible for the system to operate at constant speed or at constant torque. With a constant speed setting, the power input fluctuates depending on the torque.

If, by contrast, a torque value is specified, the speed of the mixer varies within a certain range and continuously

delivers high thrust mixing to the tank's slurry. In the process, the power input remains at a constant level. This all takes place fully automatically without intervention by the operator.

The DMC also outputs data and allows for insightful understanding of the mixing process. This allows the operator to quickly "see" the performance of the digester and how changes in substrate affects the process.

The DMC can be connected to the plant level PLC via an analogue signal, Profibus or Profinet connection. Fully integrated local control panels are also available complete with a touchscreen operator interface.

## INSTALLATION EXAMPLE FOR THE PSM MIXER:



Plant PLC



Mixer cable

PSM terminal box  
PSM maintenance switch

Leak probe (intrinsically safe cable)

PTC (intrinsically safe cable)

Disconnect switch control cable

DMC control signals

Power cable

# PSM - INSTALLATION EXAMPLE

FLEXIBLE MIXING FOR YOUR TOUGHEST APPLICATIONS

The PSM submersible mixer is suitable for installation in all common tanks. The bracket is designed for standard square guide posts with a 6inch (150mm) width but can also be installed with other square guide tube dimensions using bracket adapters. This makes it possible to integrate the mixer into a wide range of different biogas plants or wastewater treatment plant anaerobic digesters or anoxic tanks.

With the PSM, you bring mixing power, shear force and energy efficiency to your tank with a reliable, proven design.

Of course, in addition to the mixer, we also offer custom mixing equipment and installation solutions.

## **PSM + Service Box:**

Our Service Boxes Classic and Pro are equipped with an integrated mixer post pivoting bracket and a gas lock service opening. Therefore, the mixer can be adjusted in height and swivelled to the left and right in order to mix the contents of the entire tank.



## OUR ANAERGIA TECHNOLOGIES

We offer solutions for the following applications:

- » Pump Technology
- » Mixing Technology
- » Separation
- » Extrusion Technology
- » Screening & Sorting
- » Size Reduction
- » Organic Polishing
- » Conveyor Technology



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