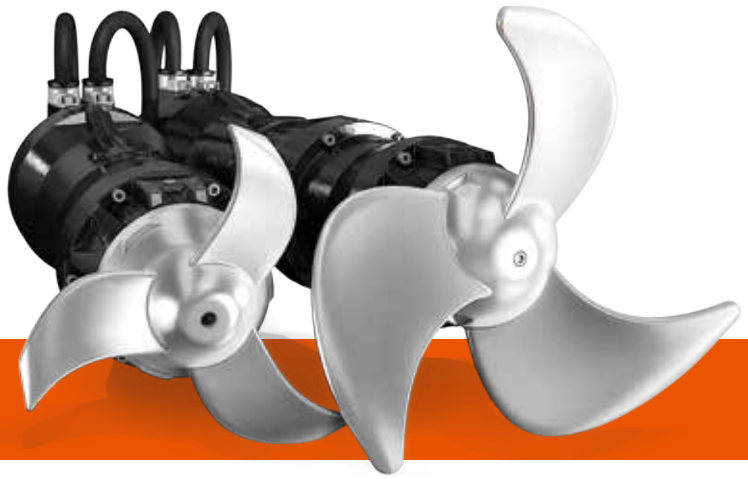
TSURUMI PUMP
For The **Earth**, For All The **People**

TSURUMI AVANT

SERIES MMR

SUBMERSIBLE MIXERS



IE3
PREMIUM EFFICIENCY MOTOR

TSURUMI AVANT

TSURUMI AVANT is a brand of submersible pumps and wastewater treatment equipment developed with an eye on the future by TSURUMI, a leading company in the field of submersible pumps for 100 years. TSURUMI created it to deliver the maximum in customer satisfaction, by pooling years of know-how garnered with submersible pumps and wastewater treatment equipment into a series of premium grade products. This includes completely revamping everything from the materials used for components to the product lineup itself. The premier brand is being released under the name of TSURUMI AVANT.

Cast iron type

Stainless steel type (Option)

MMR-series

Cast iron type — Motor in efficiency class IE3

DIRECT TRANSMISSION (200 - 300 - 400 series)
- 4 - 6 - 8 poles motor with DIRECT TRANSMISSION
- Motor power 0.75 - 4.5 kW
- Propeller Ø 200 - 300 - 400 mm

REDUCTION GEARS (650 series)
- 4 poles motor with REDUCTION GEARS
- Motor power 4 - 7.5 kW
- Propeller Ø 650 mm

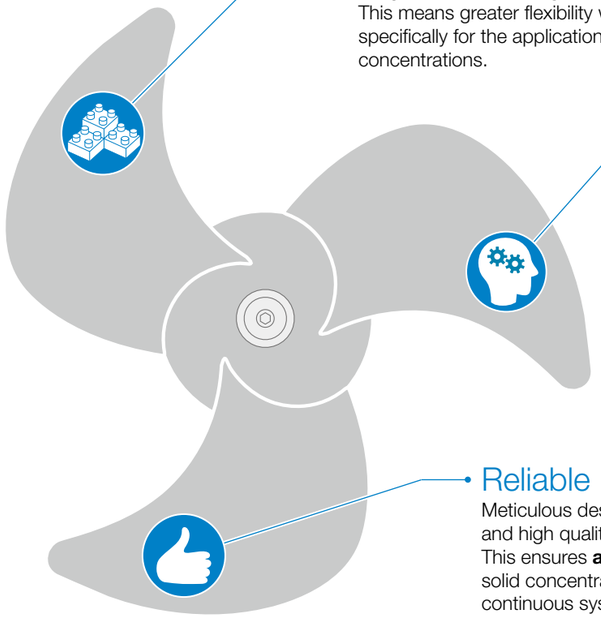
Stainless steel type available (Option)

The MMR-series of the TSURUMI AVANT brand features premium grade submersible mixers with a built-in IE3 premium efficiency motor. These durable compact mixers come in standard with EN-GJL-250 cast iron body, AISI 316 stainless steel propeller, AISI 431 stainless steel shaft and Tsurumi's typical dual inside mechanical seals with silicon carbide faces in the oil chamber. As an option, models are also available with a stainless steel body made of AISI 316. Either way, these high quality mixers guarantee users a high level of reliability and stability.
The MMR-series can be chosen from a wide lineup of propeller sizes (200 - 650 mm) and motor outputs (0.75 - 7.5 kW). Moreover, an array of accessories is available for installing the mixers anywhere inside a tank as a new installation or replacement of existing equipment.

	50/60Hz Motor			Propeller Ø [mm]
DIRECT TRANSMISSION	P2 [kW] 0.75 - 4.5	4 - 6 - 8 poles	+	200 - 300 - 400
REDUCTION GEARS	P2 [kW] 4 - 7.5	4 poles	+	650

Characteristics of submersible mixers with IE3 motor

- Innovative cable gland system with cable holder. The universal thread ring-nut can be removed to fix a rigid or flexible duct to the cable gland to protect the cable from physical and mechanical stresses.
- Premium IE3 class cold-running motor for high efficiency and minimal energy use. Insulation class H (180°C).
- Double silicon carbide (SiC) mechanical seals protected inside a large, inspectable oil chamber. MMR 650-series equipped with 3 mechanical seals.
- Cast AISI 316 stainless steel propeller, designed with specially shaped blades to ensure high hydraulic efficiency and prevent fouling with filaments and solids. Extra thick for ruggedness and reliability even in heavy-duty conditions.
- Water sensor detecting seepage into the mechanical seal oil chamber. The temperature sensor prevents possible damage due to overheating of the motor. Bearing temperature sensors are available on request. (other monitoring options are available for the MMR 650-series on request)
- Wide range of rugged stainless steel accessories for optimal installation in relation to the system layout and when replacing existing devices.



Modular

Tsurumi MMR-series mixers is built on a **modular criterion** that combines **IE3 premium efficiency motors** with propellers of different shapes, sizes and materials. This means greater flexibility when selecting the product, which can be configured specifically for the application, and for liquids with different densities and concentrations.

Innovative

Tsurumi mixers are built with innovative materials and include **state-of-the-art engineering solutions** developed in a modern department which also conducts performance and endurance tests on the parts most subject to wear.
This guarantees lower energy consumption and exceptional versatility, making them suitable for any type of installation.

Reliable

Meticulous design, machining on latest-generation machining centres and high quality components make Tsurumi mixers highly reliable. This ensures **a long working life** even with liquids containing high solid concentrations, and low maintenance, guaranteeing trouble-free, continuous system operation.

Features

Submersible mixers are the most practical and efficient solution for mixing, agitating, homogenizing and equalizing wastewater at treatment facilities. They are used in aerobic as well as anaerobic and anoxic stages of wastewater treatment processes to prevent sedimentation and maintain constant concentration levels in the tanks. Propellers for mixers are sized, shaped and driven at speeds designed to match the site requirements.

MOTOR

Premium IE3 class cold-running motor for high efficiency and minimal energy use. Insulation class H (180°C).
50Hz and 60Hz versions.

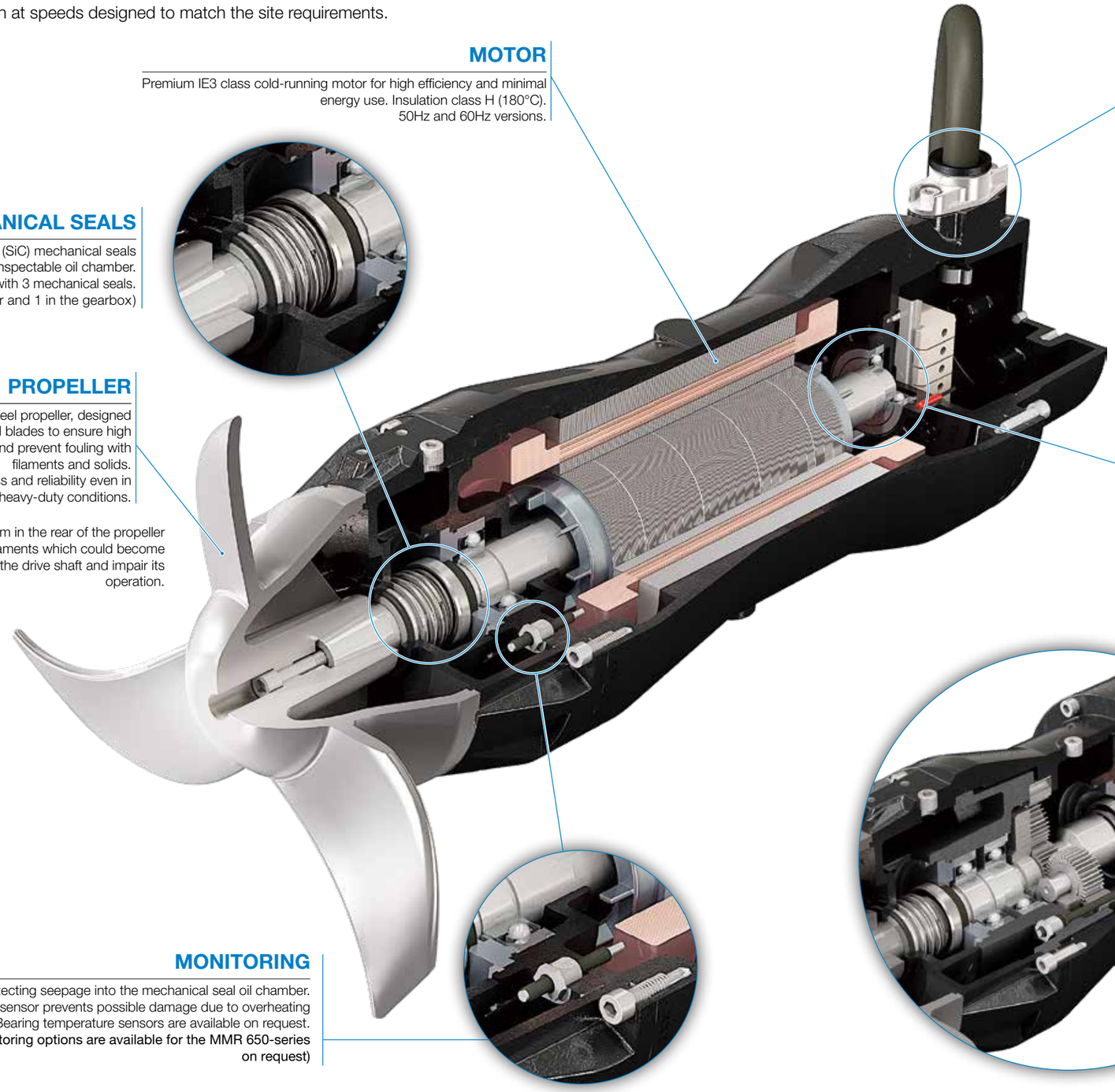
MECHANICAL SEALS

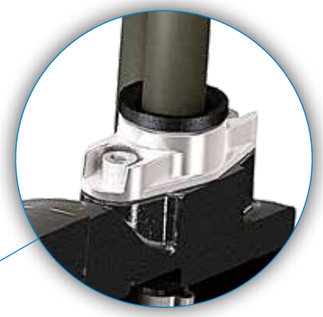
Double silicon carbide (SiC) mechanical seals in large, inspectable oil chamber.
MMR 650-series equipped with 3 mechanical seals. (2 in the oil chamber and 1 in the gearbox)

PROPELLER

Cast AISI 316 stainless steel propeller, designed with specially shaped blades to ensure high hydraulic efficiency and prevent fouling with filaments and solids.
Extra thick for ruggedness and reliability even in heavy-duty conditions.

A special chopper system in the rear of the propeller prevents the entry of filaments which could become entangled around the drive shaft and impair its operation.





CABLE GLAND

Innovative cable gland system with cable holder.
The universal thread ring-nut can be removed to fix a rigid or flexible duct to the cable gland to protect the cable from physical and mechanical stresses.

INSTALLATION

Wide range of rugged stainless steel accessories for optimal installation in relation to the system layout and when replacing existing devices.

BEARINGS

Ball bearings with lifetime lubrication designed to guarantee 100,000 working hours.
Temperature sensor on request.

REDUCTION GEARBOX [MMR 650-series]

Rugged planetary reduction gearbox which provides high reduction ratios and torque transfer and withstands heavy radial loads, with compact size and light weight.

MONITORING

Water sensor detecting seepage into the mechanical seal oil chamber. The temperature sensor prevents possible damage due to overheating of the motor. Bearing temperature sensors are available on request.
(other monitoring options are available for the MMR 650-series on request)

Range characteristics

50Hz

Series		Motor			Propeller		
		P_2 [kW]	Poles	Rotation speed [rpm]	Propeller Ø [mm]	Thrust [N]	Rotation speed [rpm]
MMR 200	DIRECT TRANSMISSION	0.75 - 1.5	4	1450	200	165 - 230	1450
MMR 300		1.5 - 3.2	6	960	300	350 - 820	960
MMR 400		3.0 - 4.5	8	750	400	685 - 1060	750

Series		Motor			Propeller		
		P_2 [kW]	Poles	Rotation speed [rpm]	Propeller Ø [mm]	Thrust [N]	Rotation speed [rpm]
MMR 650	REDUCTION GEARS	4.0 - 7.5	4	1450	650	1025 - 2100	202 - 300

60Hz

Series		Motor			Propeller		
		P_2 [kW]	Poles	Rotation speed [rpm]	Propeller Ø [mm]	Thrust [N]	Rotation speed [rpm]
MMR 200	DIRECT TRANSMISSION	1.1 - 1.5	4	1750	200	225 - 230	1750
MMR 300		1.5 - 3.2	6	1150	300	420 - 730	1150
MMR 400		4.5	8	875	400	970	875

Series		Motor			Propeller		
		P_2 [kW]	Poles	Rotation speed [rpm]	Propeller Ø [mm]	Thrust [N]	Rotation speed [rpm]
MMR 650	REDUCTION GEARS	4.0 - 7.5	4	1750	650	1365 - 2125	245 - 307

For detailed specifications of each models, refer to the data booklet.

Construction materials

	Standard	Optional
Motor complex	Cast iron EN-GJL-250	AISI 316 stainless steel (MMR21, MMR22 models of 50Hz only)
Propeller	AISI 316 stainless steel	Duplex / With Vulkollan coating
Shaft	AISI 431 stainless steel	-
Mechanical seals	Double silicon carbide (SiC) in oil chamber	-
Nuts and bolts	A2-70 Stainless Steel	A4 stainless steel
Gaskets	NBR	FPM (FKM)
Hook	AISI 304 stainless steel	AISI 316 stainless steel
Motor bracket	AISI 304 stainless steel	AISI 316 stainless steel
Paintwork	Bicomponent epoxy paint 200 µm	Bicomponent epoxy paint 400 µm

Operating limits

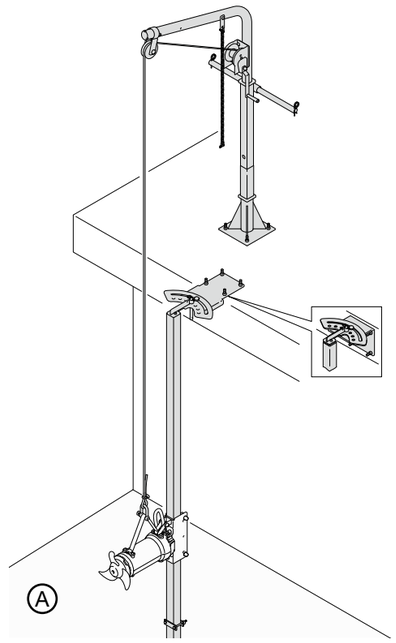
Max. ambient temperature	40°C*
Max. immersion depth	20 m
pH of treated liquid	6 - 12
Max. starts/hour	15 (evenly distributed)
Max. acoustic pressure	70 dB
Duty	S1 – continuous operation
Density of treated liquid	1060 kg/m³
Max. dynamic viscosity	500 mPas

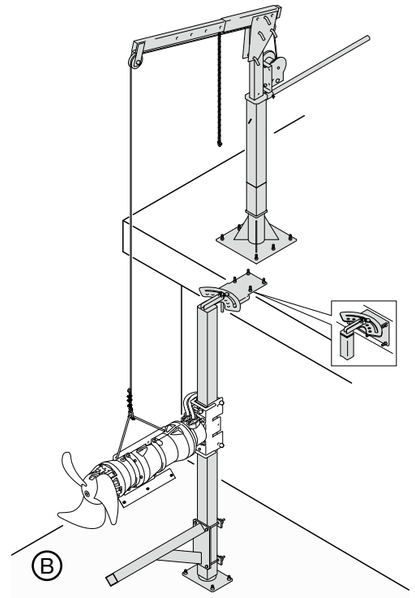
*A mixer with an IE3 motor efficiency rating can be used up to max. ambient temperature of 60°C.

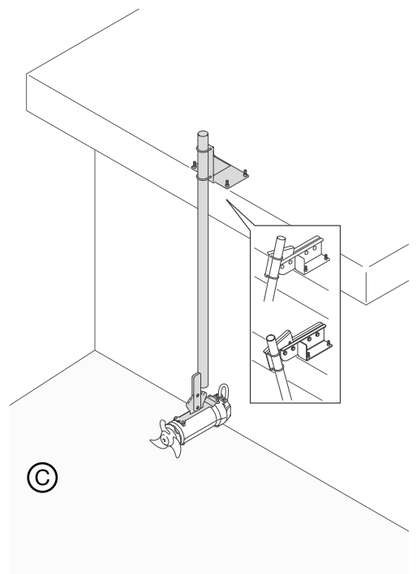
Installation and accessories

To guarantee top mixer performance, Tsurumi has developed a wide range of accessories for adjusting devices' positions in the tank and lifting and removing them without having to drain the system.
Designed for easy installation and generously sized to guarantee durability, accessories are available in galvanised or stainless steel.

The recommended installation modes are:







Mast installation (fig. A and B)
The most widely used installation mode, suitable for mixers of any shape and size.
The mixer, fitted with a runner which is also compatible with existing installations, slides along a square post and can be removed with no need to drain the tank, thanks to rugged lifting jib cranes.
The mixer can be horizontally adjusted for the best possible position.

Pendular installation (fig. C)
Mobile installation in which the mixer can be both installed and removed with the tank full.
The mixer is suspended from a suspension pipe and fixed to a mounting bracket; it can be adjusted both horizontally and vertically.

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