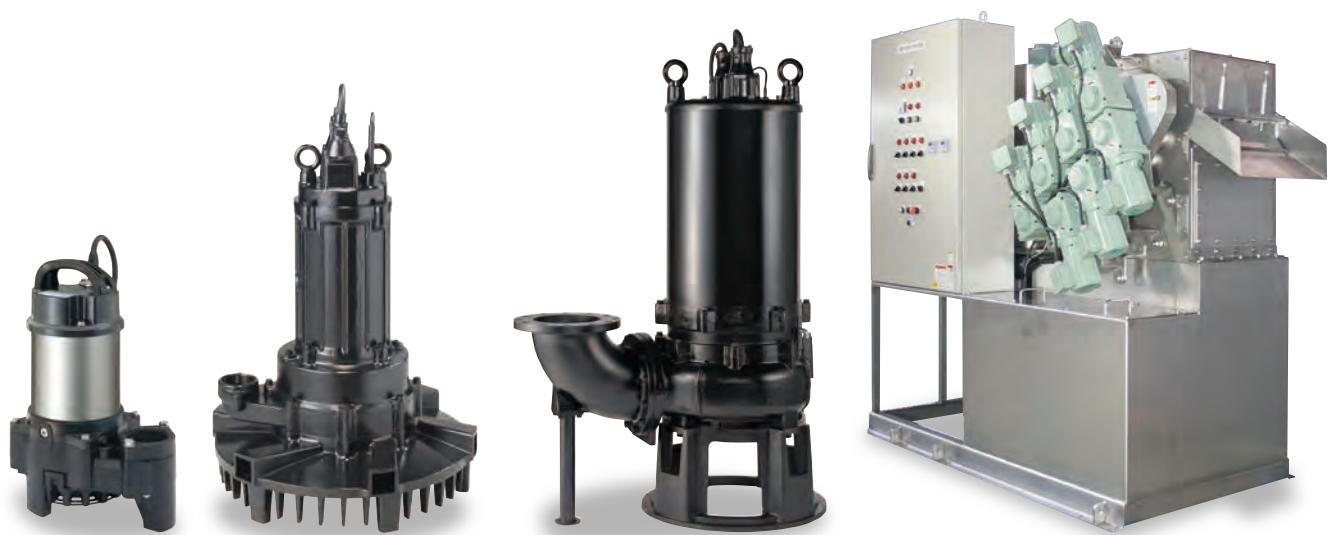


INDUSTRY  
&  
WASTEWATER TREATMENT

SUBMERSIBLE WASTEWATER PUMPS  
& WASTEWATER TREATMENT EQUIPMENT





## HEAVY-DUTY, EXCELLENT DURABILITY AND RELIABILITY – TSURUMI QUALITY

Tsurumi's submersible pumps are designed and developed along the user's line of sight, which is why they are known for their sound quality, durability, ease of maintenance and a high degree of reliability that enables continuous duty over long periods of use.

Tsurumi offers a variety of wastewater treatment equipment, which plays into corporate efforts to promote sustainable communities by protecting limited water resources and has led to a corporate philosophy of "being water- and people-friendly". In order to offer customers technologies for conserving and controlling water, Tsurumi has researched wastewater treatment for many years.

Tsurumi's line of submersible wastewater pumps covers small and midrange sizes for factories, waterfront environments and small wastewater treatment tanks, and large sizes for pump stations where employed for flood control measures. These pumps are made of various materials, such as cast iron, stainless steel, special resin and titanium, in order to meet the intended application and liquid content.

Furthermore, Tsurumi manufactures pumps of special specifications, such as "seawater-resistant", "high temperature liquid resistant", and "corrosion-resistant" pumps.

Available as wastewater treatment equipment are aerators, mixers, multi-disc dehydrators, rotary air blowers and bar screens, as well as unique products such as floating scum skimmers for collecting substances floating on water surfaces, and floating decanters for discharging supernatant liquids from tanks. With these products, Tsurumi can provide total equipment packages for handling the indispensable processes for wastewater treatment, such as aeration, agitation, scum collection, supernatant liquid discharge and sludge dehydration. Thus, Tsurumi's strengths lie in offering total packages that include submersible pumps for wastewater treatment plants and after-sales follow-up services that make use of the advantages of a pump manufacturer.

Designed in Japan, Tsurumi's leading submersible pumps and wastewater treatment units come loaded with original technologies tested and proven over the years such as anti-wicking cable, motor protector, dual inside mechanical seals with silicon carbide faces, Oil Lifter and more.

They are designed to enable continuous duty for a long period of time, which contributes to the stable operation of factories, waterfront environments, livestock farms, sewerage systems and wastewater treatment plants, and to reduce maintenance costs.



# Selection Table

## Submersible Pumps for Wastewater

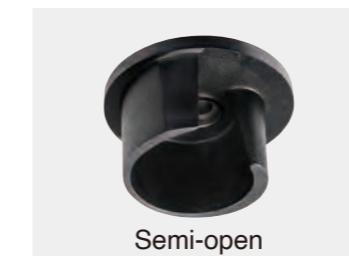
	Series	Discharge Bore mm	Motor Output kW	Feature	Impeller	Automatic Operation
Cast Iron	B	50 - 300	0.4 - 75	Basic sewage pumps	Channel	—
	BZ	80 - 350	1.5 - 75	Sewage pumps with wide passages of over 3 inches	Channel	—
	C	50 - 200	0.75 - 37	Sewage pumps with cutting mechanism	Cutter	—
	CZ	100	2.2 - 15	Smashing cutter pumps with crushing and shredding mechanism	Channel (Smashing Cutter)	—
	UT	40 - 50	0.25 - 0.75	Compact and economical type sewage pumps with semi-vortex design	Vortex	•
	U	50 - 80	1.5 - 3.7	Compact type sewage pumps with semi-vortex design	Vortex	—
	MG	32 - 50	1.0 - 3.7	High head sewage pumps with grinding mechanism	Vortex (Grinder)	—
	SF	50 - 80	0.75 - 11	High head wastewater pumps	Semi-open	—
Resin Made	PU	40 - 80	0.15 - 3.7	Corrosion-resistant portable sewage pumps	Vortex	•
	PN	40 - 80	0.25 - 3.7	Corrosion-resistant portable wastewater pumps	Vortex	•
	PSF	40 - 65	0.25 - 3.7	Corrosion-resistant portable high head wastewater pumps	Closed	•
	PLS	50	0.15 - 0.75	Corrosion-resistant portable horizontal wastewater pumps	Vortex	—
	OM	32	0.15	Corrosion-resistant portable economic type wastewater pumps	Vortex	•
Corrosion-Resistant	SQ2	40 - 50	0.25 - 0.75	Stainless steel portable pumps designed for handling corrosive liquids	Vortex	•
	SFQ	50 - 80	0.4 - 11	Stainless steel casting pumps for handling aggressive and corrosive liquids	Semi-open	—
	TM	40 - 80	0.25 - 3.7	Titanium and resin portable seawater pumps	Vortex	•

## Wastewater Treatment Equipment

	Series	Air-inlet/ Discharge Bore mm	Motor Output kW	Feature
Aeration	TRN	32 - 150	0.75 - 40	Submersible self-aspirating aerators
	BER	25 - 50	0.75 - 5.5	Submersible self-aspirating jet aerators
	PLS with Aeration Kit	25	0.15 - 0.75	Compact resin made submersible self-aspirating jet aerators
	TAR	65 - 250	1.5 - 30	Submersible air mixers for both aerobic and anaerobic agitation
	RSR-KS	50 - 350	—	Rotary air blowers equipped with 3-lobe spur rotor
Mixing	MR	—	0.25 - 7.5	Submersible mixers
	MRL	—	0.25 - 2.8	Low water level type submersible mixers
Dehydration	MDQ/MDC	—	0.6 - 3.15	Multi-disc screw press dehydrators
	JD	—	1.4 - 2.6	Multi-disc dehydrators
Others	FSP	50	0.4 - 0.75	Floating scum skimmers
	FHP	40 - 80	0.25 - 1.5	Floating decanters
	KE/KS/KW/KM	—	0.09 - 0.1	Front or rear screen type automatic bar screens

# Impellers

## Channel



Semi-open



Shrouded

The impeller is semi-open or shrouded type with single or two vanes. It has a wide channel extending from inlet to exit, which allows the pump to pass the solid matters from inflow to discharge with minimal blockage.

## Cutter



The impeller is a semi-open type with single or two vanes. A sintered tungsten carbide alloy edge is brazed on an impeller vane, and it rotates on a saw-tooth suction port of a suction cover. This mechanism allows to cut up the solid matters flowed into the impeller to discharge them.

## Smashing Cutter



Tsurumi's original heart-shaped suction cover is a unique design that improves the conventional Tsurumi cutter pumps by powerfully crushing and finely cutting solid and fibrous matters. Coupled with the new high efficiency two blade hydraulic impellers, CZ-series pump has greatly enhanced the pump performance while improving the cutting functions.

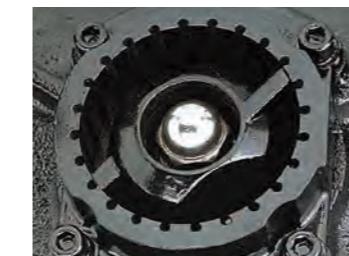
Furthermore, the extended rotating guide on the impeller prevents any waste material clogging in the central part of the impeller and facilitates smooth transfer of waste.

## Vortex



The impeller is a vortex type. The rotation of the impeller produces a whirling, centrifugal action between the impeller and pump casing. Being coupled with a wide pump casing, even large solids and fibrous matters can be pumped out without obstruction.

## Grinder



The grinder is made of high-chromium cast iron and is highly resistant to abrasion. The grinding mechanism is provided at the suction port of the pump. Flown in suspended solids are cut into small pieces and pumped out. This mechanism eliminates a fear of clogging in small diameter pipes.

# Submersible Pumps



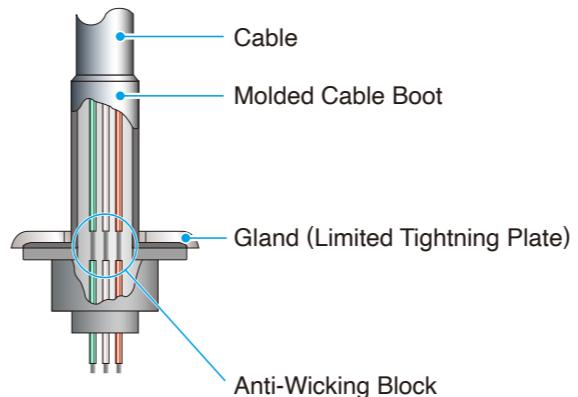
## Wastewater Treatment Equipment (for submersible)



## Structure

### Anti-Wicking Cable Entry

An anti-wicking block is provided at the cable entry section of the motor chamber. Even if the cable jacket becomes damaged or the tip of the cable is accidentally immersed in water, this device prevents water from traveling into the motor chamber through capillary action.



### Dual Inside Mechanical Seal

A dual inside mechanical seal, located in the oil chamber together with the Oil Lifter, has two sealing faces made of quality materials, including silicon carbide (SiC). The advantages of this seal are two-fold; it eliminates spring failure caused by corrosion, abrasion or fouling, which can prevent the seal faces from closing properly, and prevents loss of cooling to the lower seal faces during run-dry conditions, which causes the lower seal faces to fail.



### Automatic Motor Protection Device

A built-in thermal motor protection device reacts to the excessive heat caused by overcurrent or run-dry conditions. It not only cuts off the motor circuit automatically but also resets by itself.

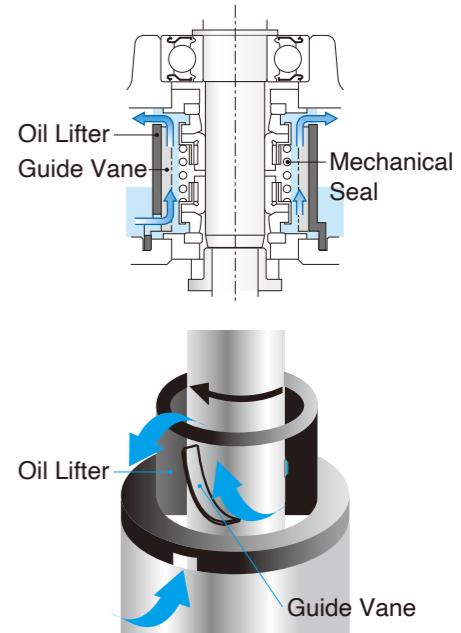


Miniature Thermal Protector

Circle Thermal Protector

### Oil Lifter

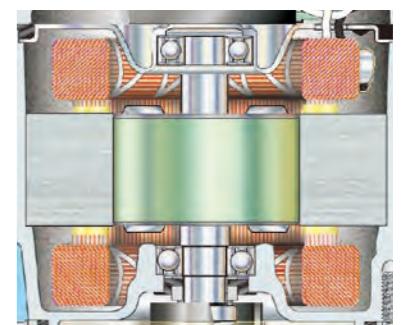
The Oil Lifter was developed as a lubricating device for the mechanical seal. Utilizing the centrifugal force of the shaft seal, the Oil Lifter forcibly supplies lubricating oil to the upper seal faces even if the lubricant falls below the specified volume. This amazingly simple device reliably lubricates and cools but also stabilizes the effect of the shaft seal and extends the length of the inspection period.



Oil Lifter Movie

### Bearings

High-grade bearings for high-temperature operation are used. Also, as deep-groove, double-shield ball bearings are used, and as the bearings are permanently lubricated by grease, there is no need for injection of lubricating oil.

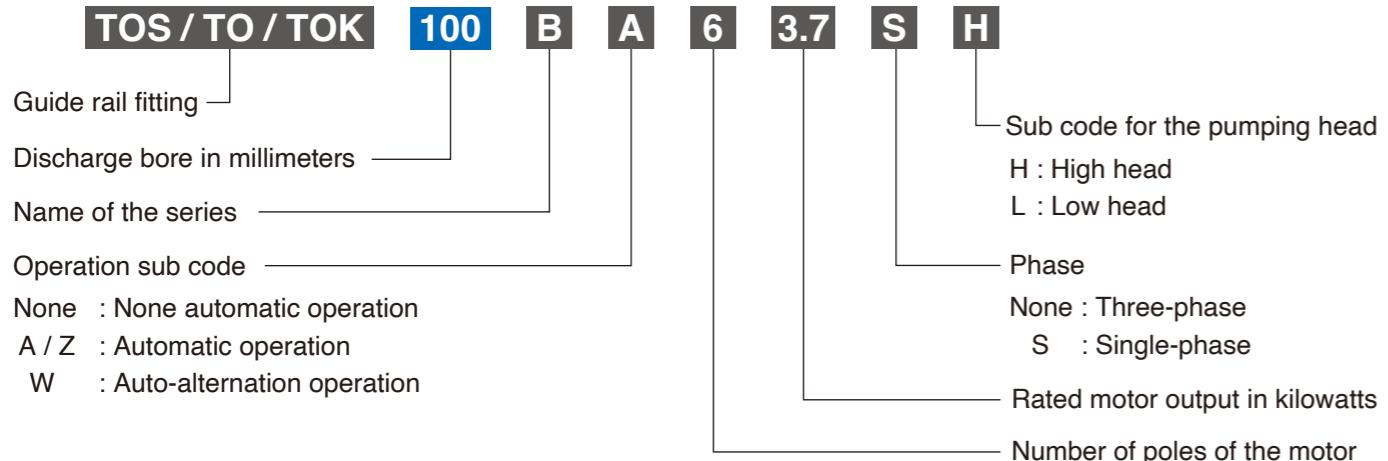


### High-Performance Motor

A motor having stable high performance that meets Tsurumi's high standards of quality is used.

# Feature

## Model Number Designation



## Guide Rail Fitting System

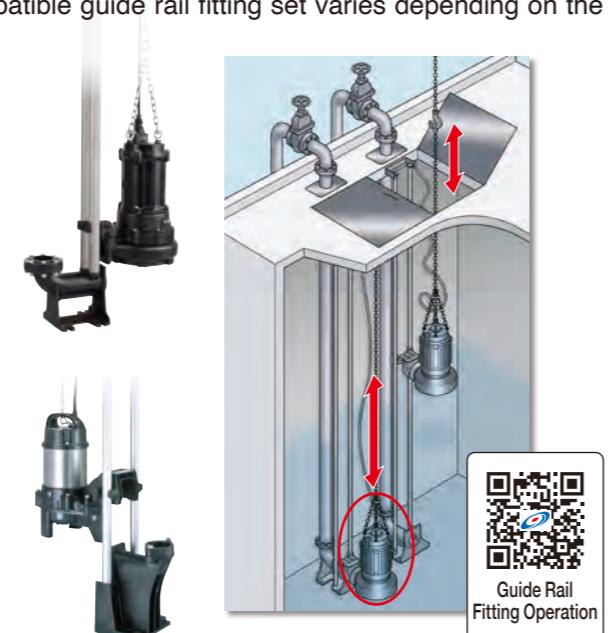
Tsurumi sewage/wastewater pump can be used in combination with a guide rail fitting system. The system connects the pump to and from the piping easily just by lowering and hoisting the pump, allowing easy maintenance and inspection without the need to enter the sump. The type of compatible guide rail fitting set varies depending on the pump model.

### TOS & TO

The TOS or TO set is the standard guide rail fitting system made of cast iron and is suitable for use with a cast iron pump. The TOS has a vertical seal face, and the TO has an inclined seal face. Pumps having a discharge bore from 50 to 150 mm are available for the TOS, and from 200 mm and above are available for the TO (excluding some models).

### TOK

Made of high-quality resin, the TOK set is a resin made guide rail fitting system suitable for use with a small cast iron or a resin made pump. Since it is originally developed for lightweight pumps, it is specially devised to cope with a water leakage that may occur through the seal face.



## Automatic & Auto-alteration Model

The automatic operation system is controlled by the float switch. When the water level rises and raises the float switch to a preset level, the switch turns on, and the pump starts. When the water level lowers to the preset level, pump operation stops. The float switch incorporates a micro switch, and it directly connects or disconnects the electricity at every ON-OFF cycle.

### Automatic Model



Single Float Type (UT)



Float Type (PU, PN, PSF, SQ2, TM)



Cylindrical Float Type (OM)

### Auto-alteration Model



(PU, PN, PSF)

## How the Auto-alteration Model Works

Tsurumi offers an automatic alternation system by a duplex pump comprising an automatic model "A" unit and auto-alteration model "W" unit. The "A" unit is a stand-alone automatic pump and the "W" unit is a pump that has an alternating circuitry. They operate automatically in response to the change in water levels.



"A" Unit (Automatic)

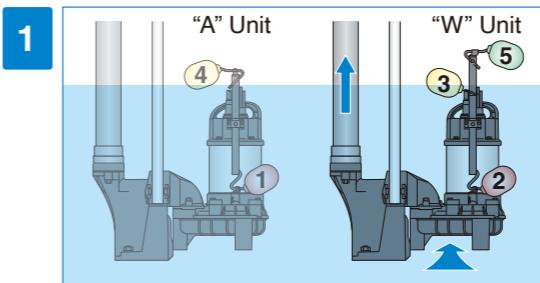


"W" Unit (Auto-alteration)

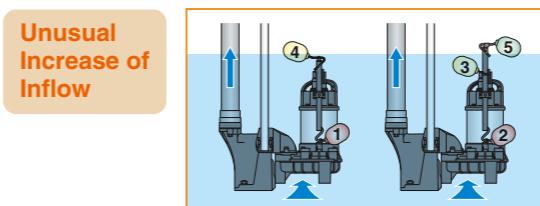


Automatic & Auto-alteration Operation

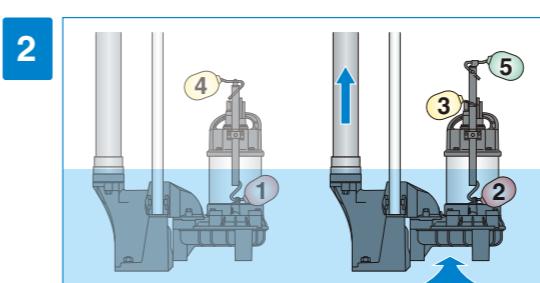
### Primary Operation



Water level rises and turns the Float #2 up. The Float #2 is activated but the pump does not start. When water level rises to Float #3 and the float is activated, the "W" unit starts.

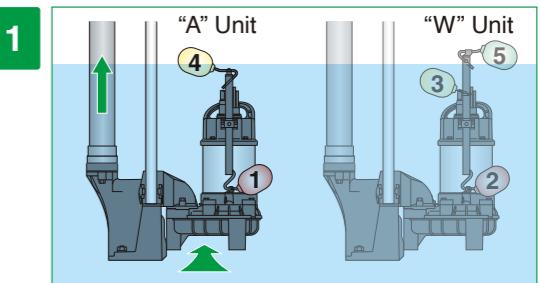


If inflow exceeds the capacity of "W" unit and the water level rises to Float #4, "A" unit starts.

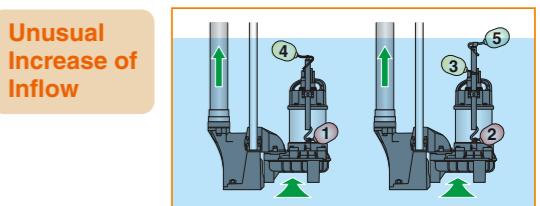


The "W" unit is discharging water (Water level falls).

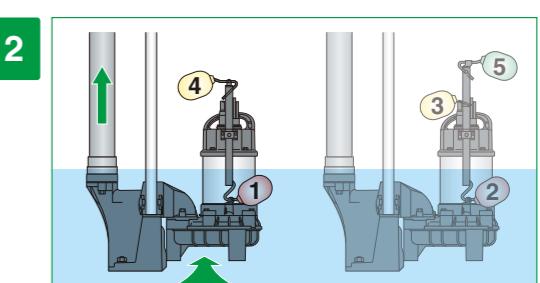
### Secondary Operation



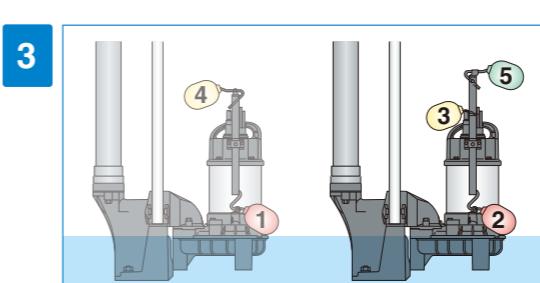
The next time the water level rises, Float #1 on the "A" unit is activated but the unit does not start until Float #4 is activated.



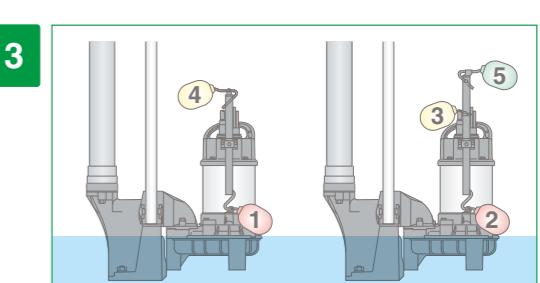
If inflow exceeds the capacity of "A" unit and the water level rises to Float #5, "W" unit starts.



The "A" unit is discharging water (Water level falls).



When water level falls to Float #2, the float is activated, and the "W" unit stops. The alternating circuitry deactivates the "W" unit for the next level rise.



When water level falls and Float #1 is activated, the "A" unit stops. At the same time, "W" unit becomes ready for operation for the next level rise.

Channel Impeller

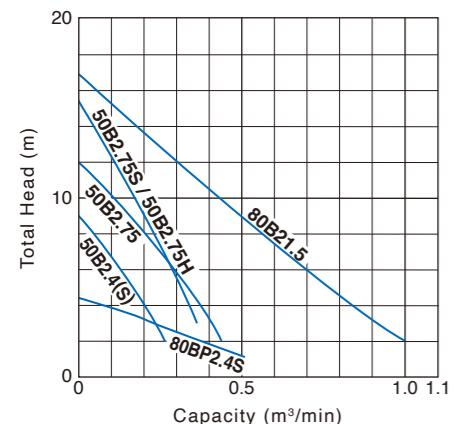
**B**

- Tsurumi basic sewage and wastewater pumps, wide range lineup
- Minimize trouble due to clogged solids and fibrous matter in pumped fluids
- Available in guide rail fitting system

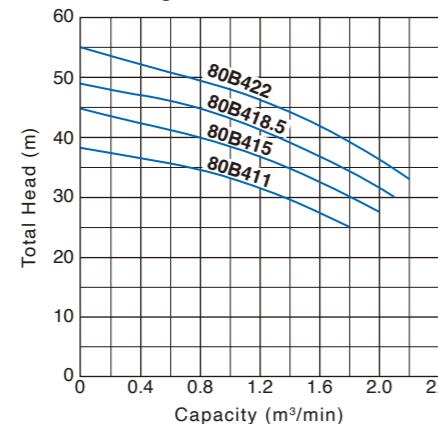
Discharge Bore: 50 - 300 mm  
Motor Output: 0.4 - 75 kW



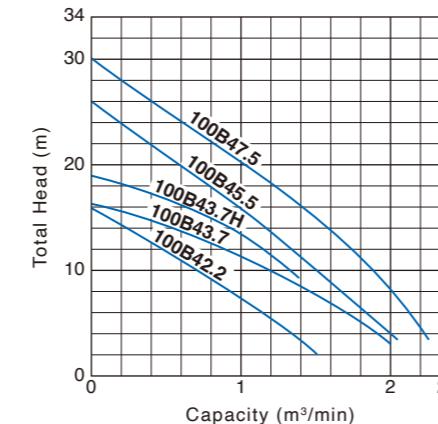
&lt; 50 · 80mm &gt;



&lt; 80mm -High Head- &gt;



&lt; 100mm &gt;



Channel Impeller

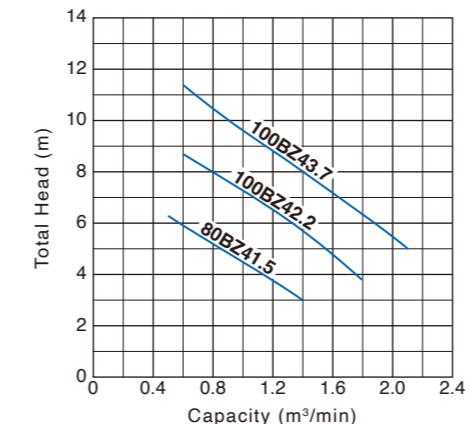
**BZ**

- Sewage and wastewater pumps with a larger diameter
- Wide solids passage of over 3 inches (76.2 mm) in diameter
- Available in guide rail fitting system

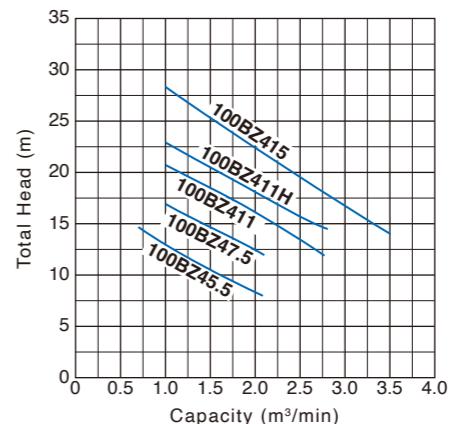


Discharge Bore: 80 - 350 mm  
Motor Output: 1.5 - 75 kW

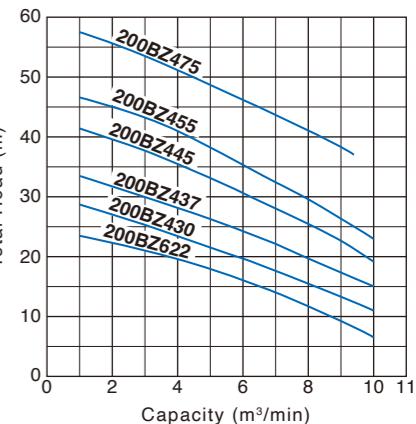
&lt; 80 · 100mm (3.7kW and below) &gt;



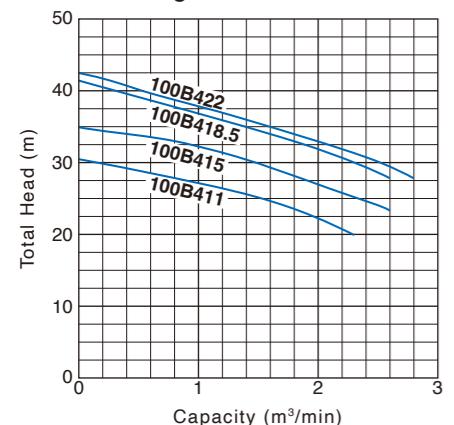
&lt; 100mm (5.5–15kW) &gt;



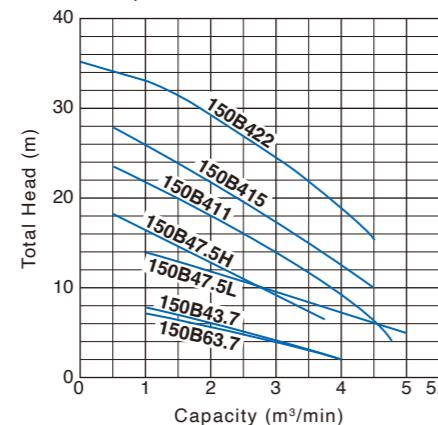
&lt; 200mm &gt;



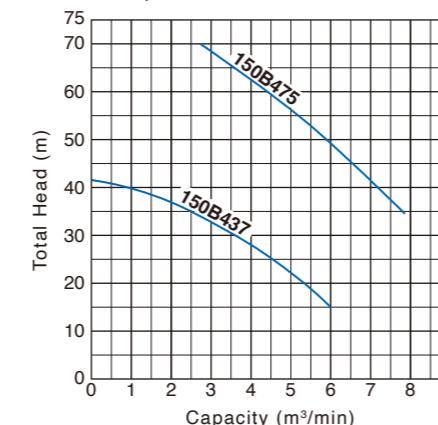
&lt; 100mm -High Head- &gt;



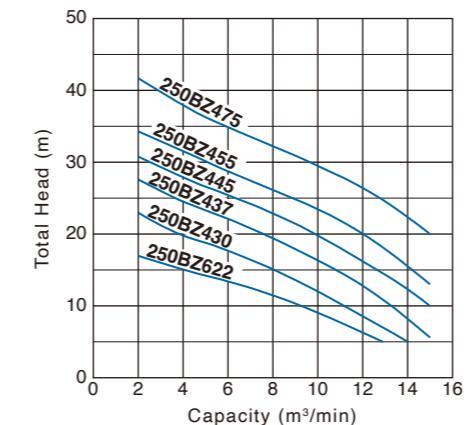
&lt; 150mm, 3.7 – 22kW &gt;



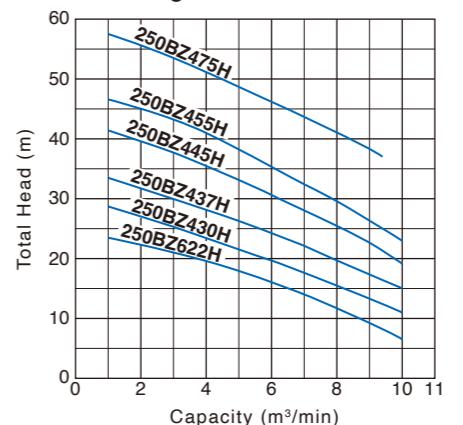
&lt; 150mm, 37 · 75kW &gt;



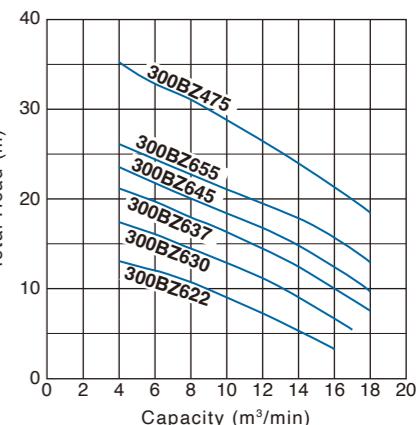
&lt; 250mm &gt;



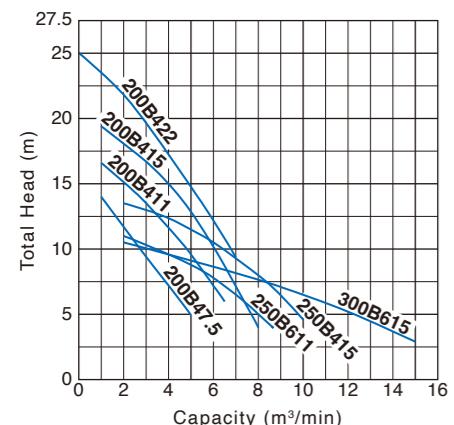
&lt; 250mm -High Head- &gt;



&lt; 300mm &gt;

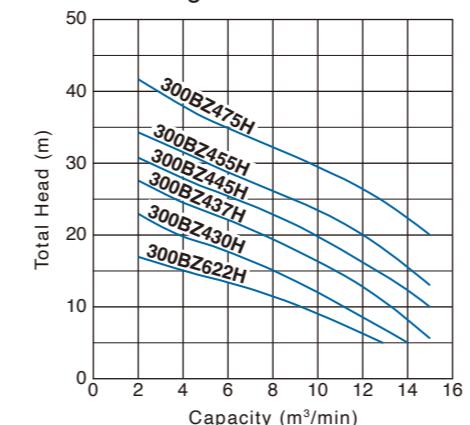


&lt; 200 · 250 · 300mm &gt;

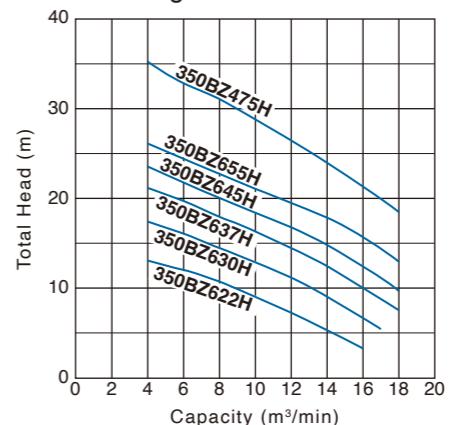
**Extra-large discharge bores of 350 mm or greater****B-series (350 – 800 mm)**

As an option, the B-series pumps can be specially configured with discharge bores of 350 mm and greater, or adapted for dry pit, seawater, high temperature liquids and other special applications. Let Tsurumi know what you need.

&lt; 300mm -High Head- &gt;



&lt; 350mm -High Head- &gt;



## Cutter Impeller

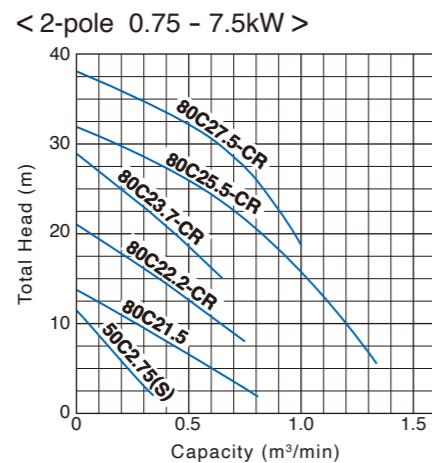
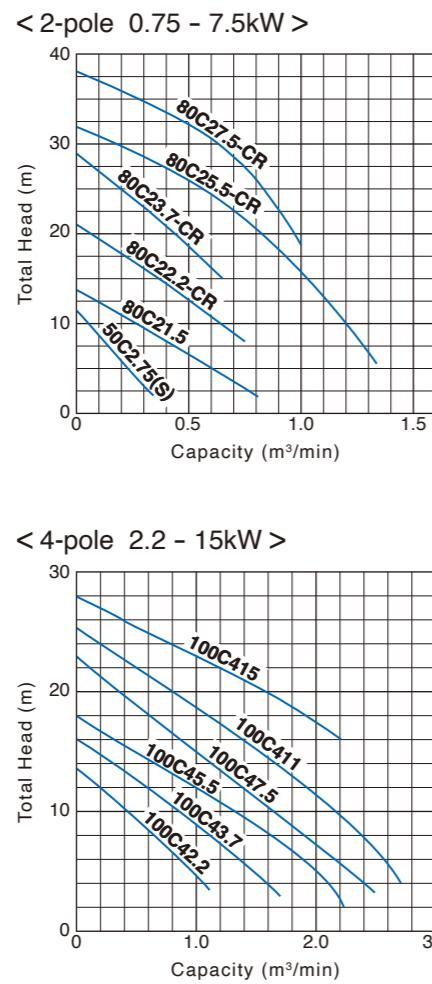
**C**

- Incorporated cutting mechanism
- Impeller & suction cover of the "CR" type made of high-chromium cast iron
- Available in guide rail fitting system

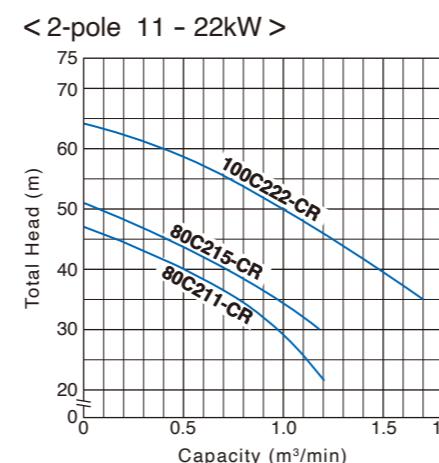
Discharge Bore: 50 - 200 mm  
Motor Output: 0.75 - 37 kW



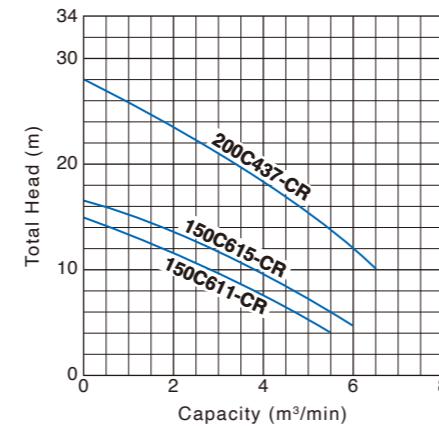
**< 4-pole 2.2 - 15kW >**



**< 2-pole 0.75 - 7.5kW >**



**< 4-pole 37kW, 6-pole 11 · 15kW >**

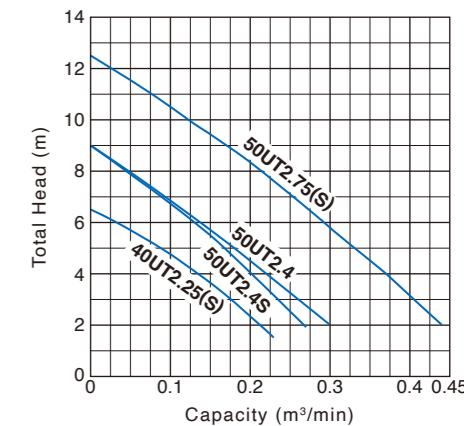


## Vortex Impeller

**UT**

- Compact type sewage and wastewater pumps with 35 mm diameter of large solids passage
- Available in automatic model and guide rail fitting system

Discharge Bore: 40 · 50 mm  
Motor Output: 0.25 - 0.75 kW

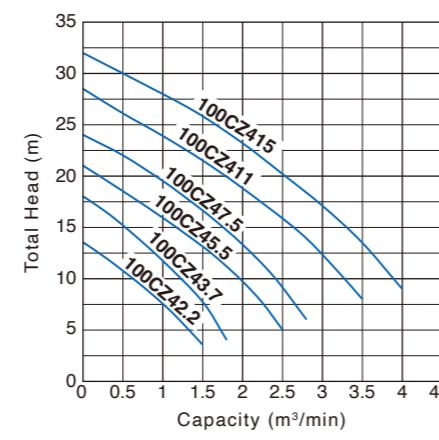


## Channel Impeller (Crushing and Shredding Mechanism)

**CZ**

- Smashing cutter pumps incorporated crushing and shredding mechanism
- Innovative scissor-like mechanism combining original heart-shaped suction cover and unique impeller
- Prevents clogging of the pump by crushing and shredding solids more finely
- Available in guide rail fitting system

Discharge Bore: 100 mm  
Motor Output: 2.2 - 15 kW



## Comparision of SMASHING CUTTER and TSURUMI CUTTER PUMP

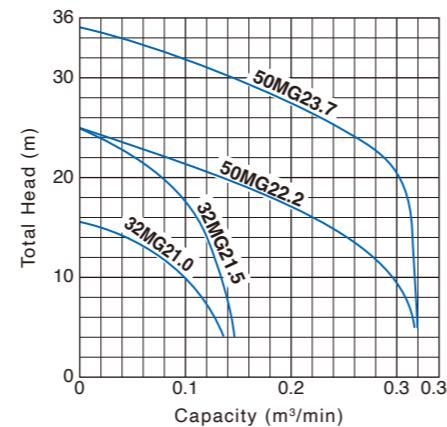
## THE NEW CRUSHING MECHANISM CRUSHES and SHREDS SOLID MATTERS INTO EVEN FINER PIECES!

	Original	Smashing Cutter	Cutter
Aluminium Can			
Plastic Bottle			
Hand Towel			
Wet Wipes			
Face Mask			

Vortex Impeller (Grinding Mechanism)

**MG**

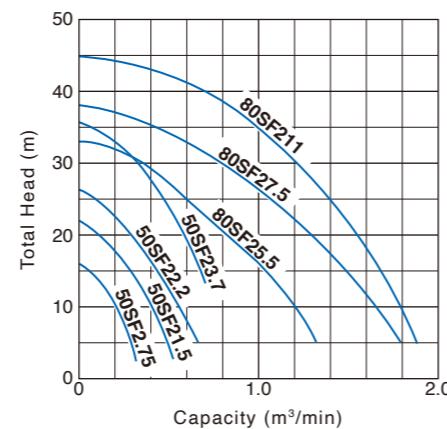
- Incorporated grinding mechanism
- Grinder mechanism crushes waste, vinyl, cloth, and other solids in sewage into small pieces
- Available in guide rail fitting system

Discharge Bore: 32 · 50 mm  
Motor Output: 1.0 - 3.7 kW

Semi-open Impeller

**SF**

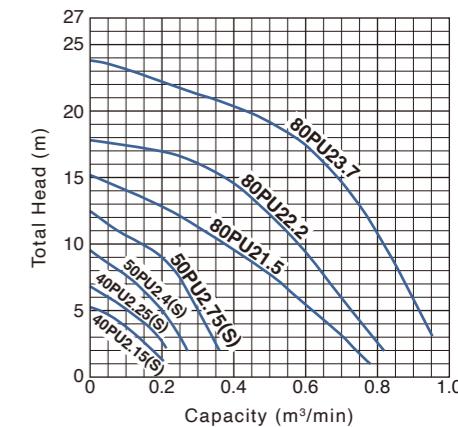
- High head specifications enable pumping from deep underground
- For defoaming in wastewater treatment processes
- Available in guide rail fitting system

Discharge Bore: 50 · 80 mm  
Motor Output: 0.75 - 11 kW

Sewage, Vortex Impeller

**PU**

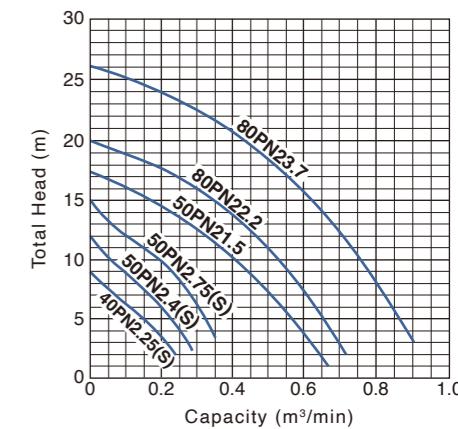
- "VANCS"; corrosion-resistant portable pumps made of special resin and 304 stainless steel
- Designed for handling raw sewage, wastewater, and liquid carrying solid matters
- Fish friendly lubricating oil suitable for waterfalls, fishponds, aquaculture
- Available in automatic & auto-alternation model and guide rail fitting system

Discharge Bore: 40 - 80 mm  
Motor Output: 0.15 - 3.7 kW

Wastewater, Vortex Impeller

**PN**

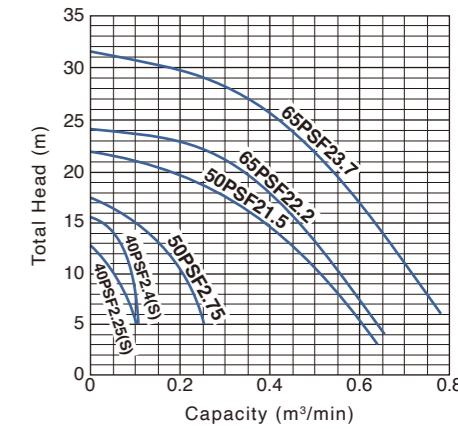
- "VANCS"; corrosion-resistant portable pumps made of special resin and 304 stainless steel
- Designed for handling wastewater and liquid carrying small solid matters
- Fish friendly lubricating oil suitable for waterfalls, fishponds, aquaculture
- Available in automatic & auto-alternation model and guide rail fitting system

Discharge Bore: 40 - 80 mm  
Motor Output: 0.25 - 3.7 kW

High Head, Closed Impeller

**PSF**

- "VANCS"; corrosion-resistant portable pumps made of special resin and 304 stainless steel
- High head specifications enable pumping wastewater and liquid carrying few solid matters from deep underground
- Fish friendly lubricating oil suitable for waterfalls, fishponds, aquaculture
- Available in automatic & auto-alternation model and guide rail fitting system

Discharge Bore: 40 - 65 mm  
Motor Output: 0.25 - 3.7 kW

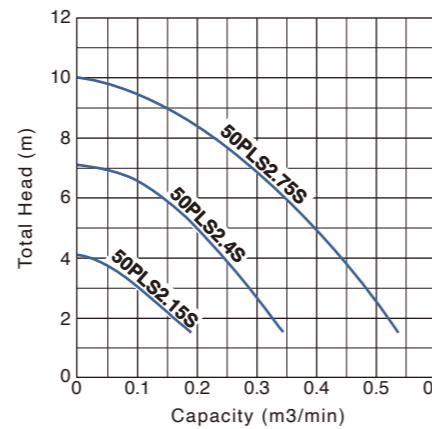
**Resin Made**

Horizontal, Vortex Impeller

**PLS**

- "VANCS"; corrosion-resistant portable pumps made of special resin and 304 stainless steel
- Horizontal semi-vortex pump designed for handling wastewater and liquid carrying small solid matters in a shallow or narrow sump
- Fish friendly lubricating oil suitable for waterfalls, fishponds, aquaculture

Discharge Bore: 50 mm  
Motor Output: 0.15 - 0.75 kW

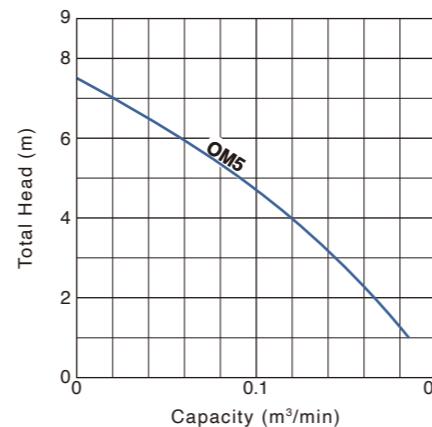
**VANCS**

Economic, Vortex Impeller

**OM**

- "VANCS"; corrosion-resistant portable pumps made of special resin and 304 stainless steel
- Designed for handling household wastewater and liquid carrying small solid matters
- Fish friendly lubricating oil suitable for waterfalls, fishponds, aquaculture
- Available in automatic model

Discharge Bore: 32 mm  
Motor Output: 0.15 kW

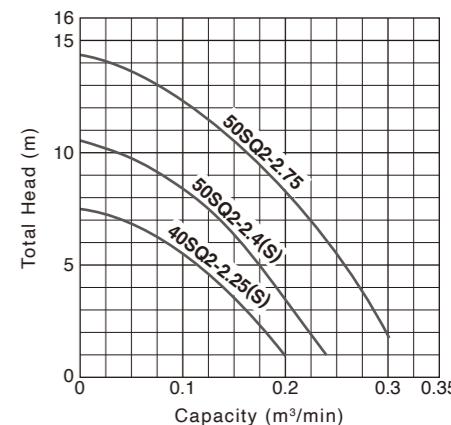
**VANCS****Corrosion-Resistant**

Stainless Steel, Vortex Impeller

**SQ2**

- Corrosion-resistant pumps made of 304/316 stainless steel
- Food grade lubricating oil suitable for food-processing factory
- Available in automatic model

Discharge Bore: 40 • 50 mm  
Motor Output: 0.25 - 0.75 kW

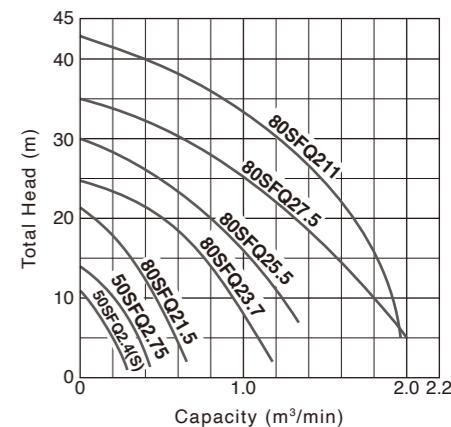


Stainless Steel Casting, Semi-open Impeller

**SFQ**

- High head corrosion-resistant pumps made of 316 stainless steel casting
- Designed for handling aggressive and corrosive liquids in industrial factory, hospital
- Available in guide rail fitting system

Discharge Bore: 50 • 80 mm  
Motor Output: 0.4 - 11 kW



Titanium, Vortex Impeller

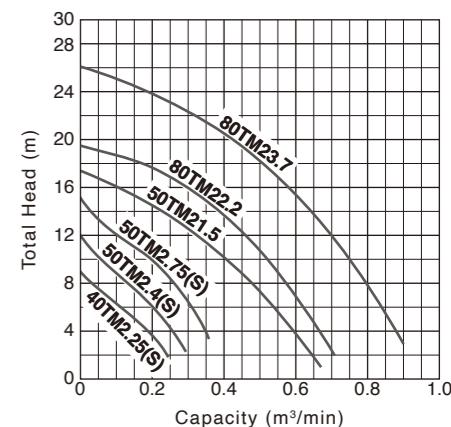
**TM**

- "VANCS"; seawater pumps made of titanium and special resin
- Fish friendly lubricating oil suitable for saltwater aquaculture, fish farm
- Available in automatic model

Discharge Bore: 40 - 80 mm  
Motor Output: 0.25 - 3.7 kW

**VANCS****Corrosion Tests (in Seawater / 6 months)**

Titanium has a much stronger oxide film on its surface than stainless steel and is therefore highly corrosion resistant, even under conditions of high chloride ion concentration, such as seawater.



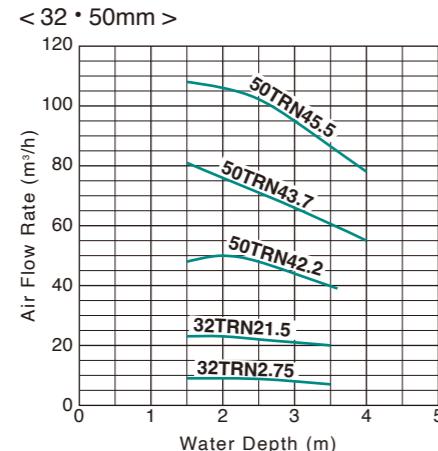
# Wastewater Treatment Equipment

Submersible Aerator

## TRN

- Suitable for aeration, pre-aeration and mixing at wastewater treatment plant
- Self-aspirating aerators designed for aeration and mixing of wastewater
- High efficiency dissolution of oxygen by special impeller design, and multi directionally eject mixture of air and water from outlets
- Capable of deep-water aeration in combination with a general-purpose blower

Air-inlet Bore: 32 - 150 mm  
Motor Output: 0.75 - 40 kW  
Max. Water Depth: 3.5 - 6 m



Submersible Jet Aerator

## BER

- Suitable for pre-aeration and mixing at wastewater treatment plant
- Self-aspirating aerators designed for aeration and mixing of wastewater
- Powerfully ejects a mixed flow of air and water in one direction
- Available in guide rail fitting system

Air-inlet Bore: 25 - 50 mm  
Motor Output: 0.75 - 5.5 kW  
Max. Water Depth: 3.5 - 6 m

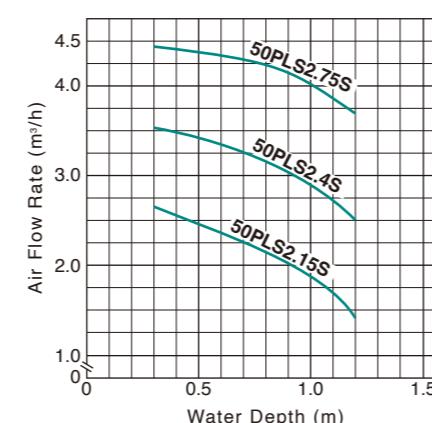
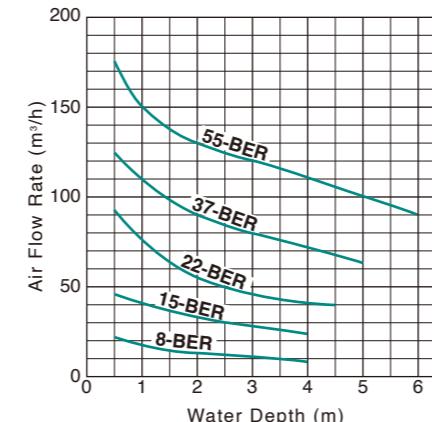
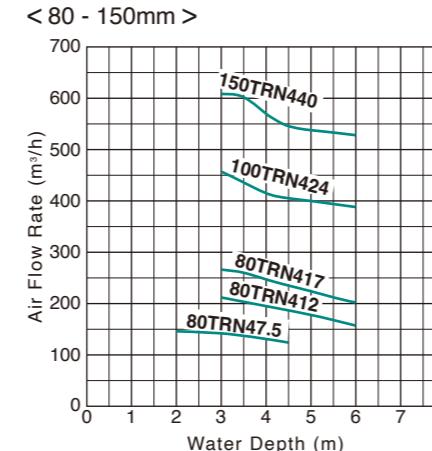


Submersible Jet Aerator

## PLS with Aeration Kit

- Suitable for pre-aeration and mixing at septic tank/Johkasou
- Self-aspirating aerators designed for aeration and mixing of wastewater
- Powerfully ejects a mixed flow of air and water in one direction
- Made of special resin and 304 stainless steel, thus tough against corrosion, lightweight and compact
- Can be used in water as shallow as 310 mm

Air-inlet Bore: 25 mm  
Motor Output: 0.15 - 0.75 kW  
Max. Water Depth: 1.2 m



Submersible Air Mixer

## TAR

- Suitable for aeration, pre-aeration and mixing at public and industrial wastewater treatment plants
- Aerobic and anaerobic processing can be used separately by simply switching the blower on and off
- Downward 4-directional discharge design spreads that mixed flow outward along the bottom of the tank
- Available in guide rail fitting system

Air-inlet Bore: 65 - 250 mm  
Motor Output: 1.5 - 30 kW



Rotary Air Blower

## RSR-KS

- 3-lobe spur rotor designed for corrosion resistance, heat resistance and durability
- Low noise, low vibration, ease of maintenance and high efficiency
- Available in air-cooled type or water-cooled type, optional helical rotor

Discharge Bore: 50 - 350 mm  
Air Volume: 0.72 - 246.8 m³/min



# Wastewater Treatment Equipment

Submersible Mixers

## MR

- Generate powerful jet of water using a propeller
- Available in wide variations, cast iron or stainless steel casting construction
- Wide lineup available in two types; without guide ring type and with guide ring type
- Available in lifting device as an option

Flow Rate: 1.4 - 42 m<sup>3</sup>/min  
Motor Output: 0.25 – 7.5 kW



Submersible Mixers

## MRL

- Generate powerful jet of water using a propeller
- Low water level type designed to operate in water as shallow as 500 mm
- Available in wide variations, including cast iron or stainless steel casting construction
- Available in lifting device as an option

Flow Rate: 1.32 - 11.3 m<sup>3</sup>/min  
Motor Output: 0.25 – 2.8 kW

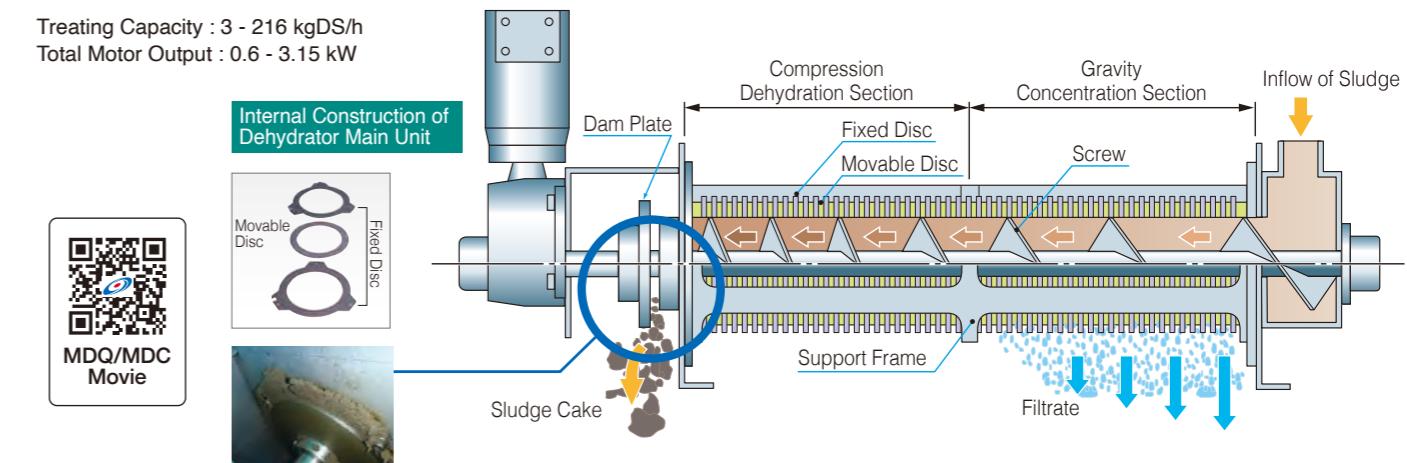


Multi-disc Screw Press Dehydrator

## MDQ / MDC

- Wide product lineup; treating capacity in a range of 3 to 216 kgDS/h
- Utilize both gravity filtration and screw displacement compression systems
- Continuous operation is possible due to the self-cleaning mechanism that seldom clogs
- Optimum solution for treating oily sludge such as DAF froth (mixing with excess sludge) at food processing plant
- Capable of treating low concentration sludge from 0.5 to 2.0%
- Small amount of flush water and low maintenance
- Major parts made of stainless steel

Treating Capacity : 3 - 216 kgDS/h  
Total Motor Output : 0.6 - 3.15 kW

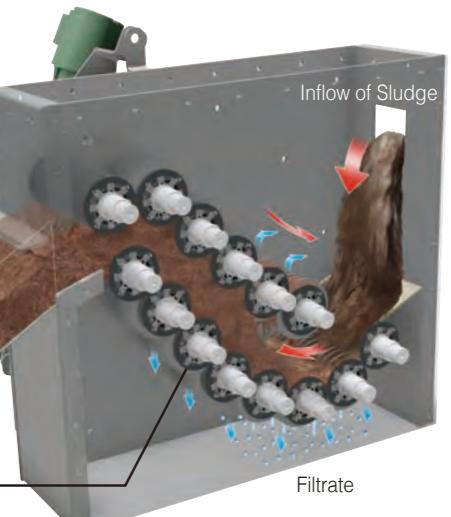
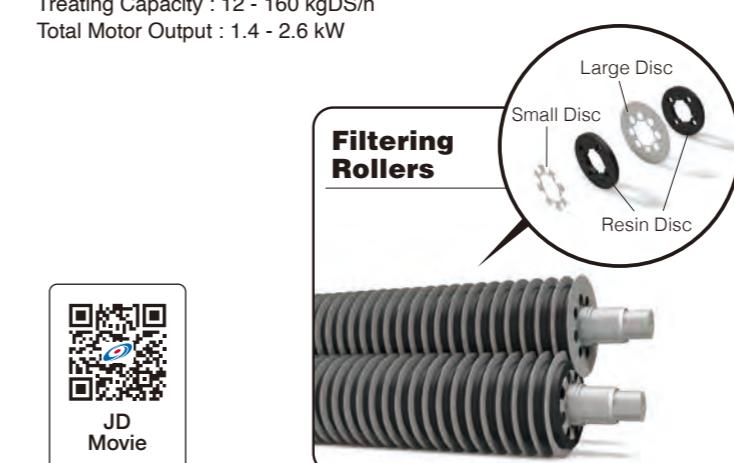


Multi-disc Dehydrator

## JD

- Treating capacity in a range of 12 to 160 kgDS/h
- Utilize both gravity filtration and compression dehydration systems
- Continuous operation is possible due to the self-cleaning mechanism that never clogs
- Optimum solution for treating oily sludge such as DAF froth at food processing plant
- Capable of treating low to high concentration sludge ranging from 0.5 to 5.0%
- Small amount of flush water and low maintenance
- Major parts made of stainless steel

Treating Capacity : 12 - 160 kgDS/h  
Total Motor Output : 1.4 - 2.6 kW



# Wastewater Treatment Equipment

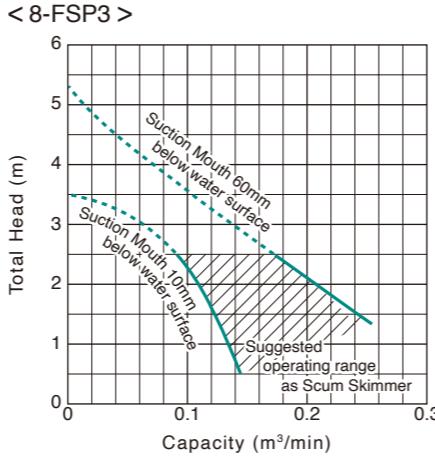
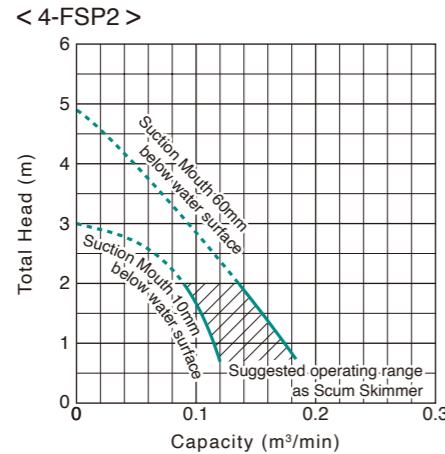
Floating Scum Skimmer

## FSP

- Collection of floating scum in the wastewater treatment
- Water, air and scum are drawn simultaneously by jet-injector mechanism
- Keep suction mouth relative position with the water surface

Discharge Bore: 50 mm

Motor Output: 0.4 · 0.75 kW



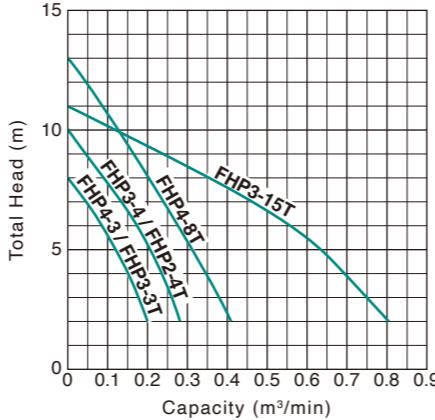
Floating Decanter

## FHP

- Discharge supernatant liquid in SBR
- Consists of submersible pump, sludge sensor, and float
- Sludge sensor prevents inflow of sludge or sediment and helps discharge supernatant liquid

Discharge Bore: 40 - 80 mm

Motor Output: 0.25 - 1.5 kW



Automatic Bar Screen

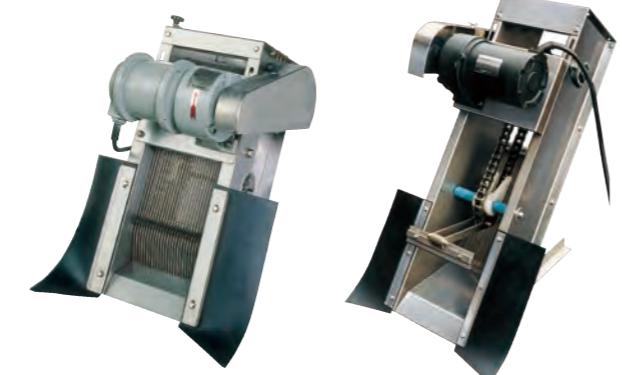
## KE / KS / KW / KM

- Screening wastewater
- Available in front screen type or rear screen type
- Major parts made of stainless steel

Bar Spacing: 1 - 50 mm

Motor Output: 0.09 · 0.1 kW

Max. Capacity: 223 m<sup>3</sup>/h



## Options

### Float Switches

Tsurumi offers different types of float switches (liquid level sensors). A micro-switch is incorporated in all types. For details, refer to the float switches catalog [ID105].



**Model MT-1** is an economy-type float switch. A teardrop body design with an integrated counterweight, MT-1 float switch is an ideal water level sensor for highly dense scum-filled wastewater. Moreover, equipped with the SPDT switch, it can be used as a water level sensor for filling as well as emptying operations.



**Model MC-2** is a heavy-duty type float switch with a shock absorber. Having equipped with a high grade micro switch, the MC-2 assures trouble-free operation in the liquid containing much suspended solids and floating scum. Either of the two contacts, normally-open or normally-close, can be selected as required.



### Seawater-Resistant Version

In seawater, a material's resistance to corrosion can be seen clearly. When metals with different potentials are brought into contact in seawater, only the metal of lower potential corrodes. As the difference in potential increases, the metal of lower potential corrodes faster. As an option, Tsurumi can supply pumps with parts made of higher electric potential metal as the sacrificial anode.



### High Temperature Liquids Version

Tsurumi's submersible pumps are applicable to high temperature liquids of up to 80°C. Pumps of the standard specification can discharge liquids of up to 40°C. However, there are many fields that need to discharge higher temperature liquids, e.g., discharging industrial water from a power plant or ironworks, or discharging hot spring water from a mine in a volcanic zone.



### Special Material Version

Tsurumi can also provide you with pumps with essential components such as the impeller, pump casing and the suction cover made of non-standard materials. Select from stainless steel, high-chromium cast iron and bronze to suit your specific requirements.



### Dry Pit Version

The dry pit pumps can be installed indoors and outside of tanks, and still deliver the performance of conventional submersible pumps. Daily inspection and maintenance are easy, because the pump body is installed outside of tanks. These pumps have been developed with Tsurumi-original specifications, aiming for stable operation and reduction in maintenance labor.



**TSURUMI PUMP**

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We reserve the right to change the specifications and designs without prior notice. The OO series and model OO are indicated with our series/model codes in this catalog.

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