



Submersible Wastewater Pumps **Semi-open Impeller**

SF



Submersible cast-iron drainage pumps Ideal for high-head pumping plus defoaming at sewage treatment plants

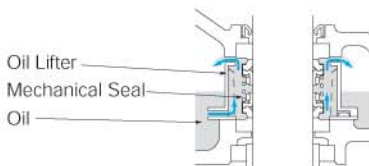
Motor protective device

All Tsurumi pumps have a built-in motor protection device. A circle thermal protector (CTP) is incorporated in Tsurumi pumps with a direct-on-line starting motor. The CTP is installed in the motor housing and it directly cuts the motor circuit if excessive heat builds up or an over-current is caused by an electrical or mechanical failure.

Pumps with a star-delta starting motor have three miniature thermal protectors (MTPs) imbedded in each winding of the 3-phase motor. These MTPs are connected in series, with their wires led out of the motor. Should the winding's temperature rise to the actuating level, the bimetal strip opens to cause the control panel to shut down the power supply.

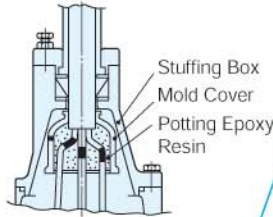
Oil Lifter (Pat. Pending)

The Oil Lifter is designed to stabilize the mechanical seal function. Utilizing the rotational energy of the shaft seal, the Oil Lifter continues to supply lubricant to the top seal faces even if the lubricant falls below the rated volume. This amazingly simple device not only turns wasted energy into added protection but also doubles the life expectancy of the mechanical seal and also the maintenance term.



Anti-wicking cable entry

Every cable has an anti-wicking block at the cable entry section of the pump. This mechanism is such that a part of each conductor is stripped back and the part is sealed by molded rubber or epoxy potting which has flowed in between each strand of the conductor. This unique feature prevents wicking under the strands of the conductor itself.



Motor

This induction motor is a dry, squirrel-cage type. Housed in a cast-iron watertight casing, the motor conforms to insulation class E and drives all standard pumps in ambient temperatures of up to 40°C.

Mechanical seal

All pumps are provided with a silicon-carbide dual inside mechanical seal that is located completely out of the drainage and is running in an oil-filled chamber. The seal has two major advantages: it eliminates spring failure caused by corrosion, abrasion and/or fouling which can prevent the seal faces from closing properly. Also, the seal prevents the loss of cooling energy to the bottom seal faces during run-dry conditions that causes the bottom seal to fail.

Seal-pressure relief system

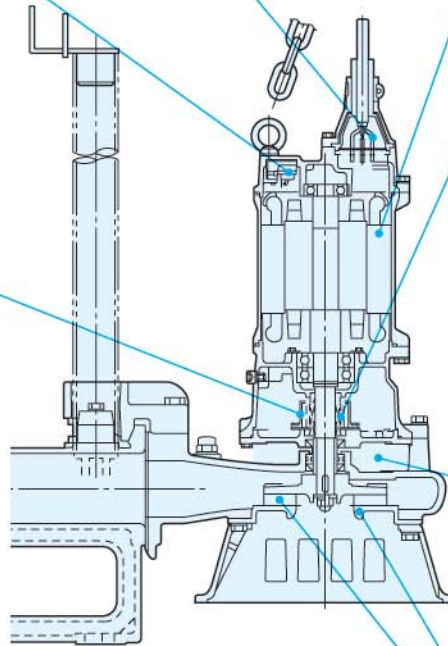
Tsurumi pumps with capacity of 5.5 kW or larger have a seal-pressure relief system. This system features an independent pump casing built separately from the oil casing which incorporates the mechanical seal. An intermediate chamber, opened to the outside, is installed between the pump casing and the oil casing. Thanks to this configuration, the mechanical seal is only exposed to static (submergence) pressure without the pumping pressure operating on it. This prevents the mechanical seal from premature wear under the high-head pumping condition.

Guide rail fittings (standard equipment)

Guide rail fittings readily connect/disconnect the pump to/from the piping system only by lifting up and down the pump. This simplifies regular maintenance and inspection, which will no longer require entry into the sump. The SF-series pumps with capacity of 1.5 kW to 11 kW, preceded by TOS in the model code, are available with guide rail fittings. For more information about model codes, please see the specifications table.

Replaceable wear parts

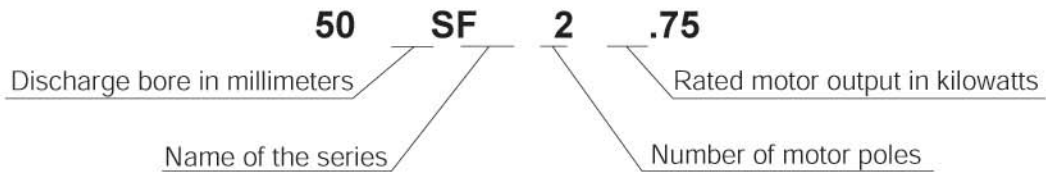
All these pumps are designed so that their wear parts, such as the impeller and the suction cover, can be replaced by new ones very easily.



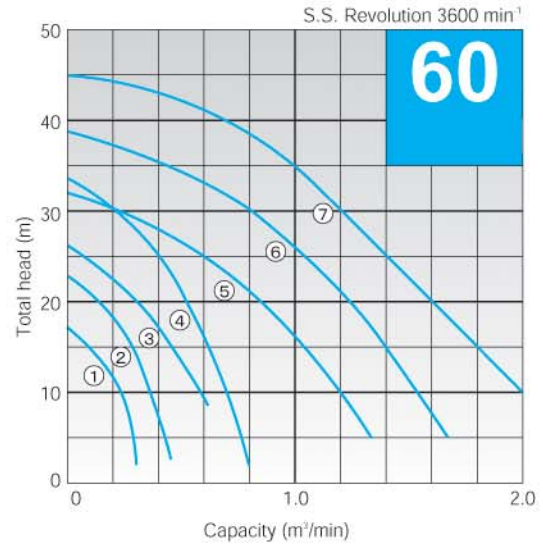
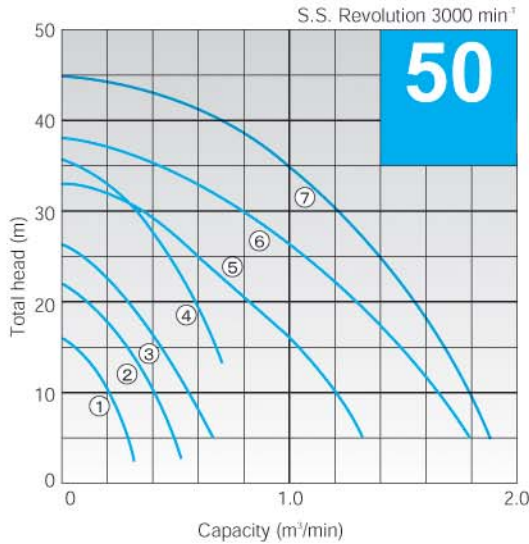
Applications:

- Defoaming spray and treated-water draining at sewage treatment plants;
- Dewatering and transferring industrial wastewater;
- Draining storm or surface water;
- Other high-head pumping jobs.

Composition of model code



Performance curves



Specifications

Curve No.	Discharge Bore mm	Free Standing	Guide Rail Fitting	Motor Output KW	Phase	Revolution 50 Hz/60 Hz min ⁻¹	Starting Method	Impeller Passage mm	Standard Cable Length m	Cable Code	Dimension L x H mm		Dry Weight kg	
											Free Standing	Guide Rail Fitting	Free Standing	Guide Rail Fitting
1	50	50SF2.75	(TOK)	0.75	Three	3000/3600	D.O.L.	11/10	6	A	253 × 375	—	20	—
2	50	50SF21.5	TOS50SF21.5	1.5	Three	3000/3600	D.O.L.	11/10	6	A	421 × 494	637 × 542	33	33
3	50	50SF22.2	TOS50SF22.2	2.2	Three	3000/3600	D.O.L.	7.5	6	C	466 × 534	648 × 582	49	49
4	50	50SF23.7	TOS50SF23.7	3.7	Three	3000/3600	D.O.L.	7.5	6	C	466 × 537	648 × 585	56	55
5	80	80SF25.5	TOS80SF25.5	5.5	Three	3000/3600	D.O.L.	15/19	8	H	635 × 824	808 × 855	125	122
6	80	80SF27.5	TOS80SF27.5	7.5	Three	3000/3600	D.O.L.	19/21	8	I	635 × 824	808 × 855	128	125
7	80	80SF211	TOS80SF211	11	Three	3000/3600	Star-Delta	22	8	R	635 × 872	808 × 903	147	144

※ weights of pump only

Notes:

When an SF pump is ordered with guide-rail fitting*, the following accessories will come with the pump as standard equipment (*Please attach TOS to its model code.):

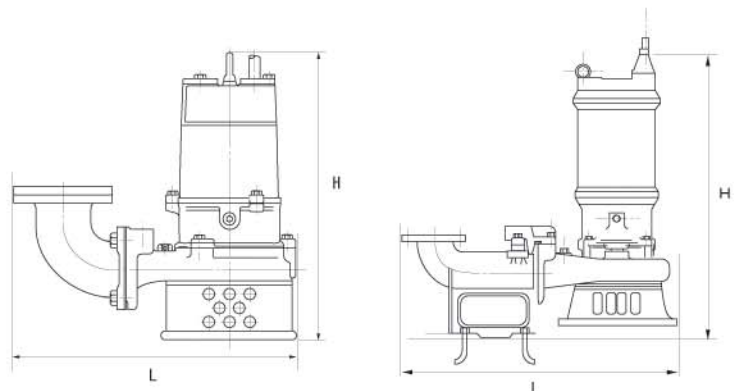
- 1 × Duckfoot Bend
 - 1 × Guide Support
 - 1 × Guide Hook
 - 1 × Lifting chain (5 m long) with shackle
- (Foundation bolts are available as an optional accessory.)

Cable Cable

Code	Pcs/unit	Core × mm ²	Dia. mm	Material
A	1	4 × 1.25	11.1	PVC Sheath
C	1	4 × 2	11.8	
H	1	4 × 3.5	14.1	Chloroprene Sheath
I	1	4 × 5.5	16.8	
R	3	4 × 3.5	14.1	
		3 × 3.5	12.9	
		2 × 2	10.6	

Note:

A thicker cable may be supplied depending on the power supply voltage.



Tsurumi float switch

Model MC-2 is a heavy-duty float switch with a shock absorber. Equipped with a high-grade micro-switch, the float assures trouble-free pump operation in the sewage or liquid containing suspended solids and floating scum. The MC-2 has both normally open and normally close contacts as standard. You can select either of the two contacts as required.

Model RF-5 is an economy float switch which can detect upper/lower limit water levels with a single float. The snap on-off action ensures stable pump operation in the clean or waste water containing suspended solids or oil and fat.



TOK guide rail fittings (option)

Tsurumi provides TOK-type guide rail fittings, as an option, for Model 50SF2.75. The fittings connect/separate the pump to/from piping only by lifting up and down the pump; no need to enter the sump for maintenance.



The TOK is supplied with the following contents:

- 1 × Duckfoot Bend
- 1 × Upper Guide Support
- 1 × Guide Hook
- 1 × Lifting Chain, 4m long
- 1 × Rubber Bellows

(The foundation bolts, two numbers are required, are not

Special Versions

Sacrificial anode

The sacrificial anode makes use of a battery phenomenon generated by the difference in the electric potentials of two different materials when they are dipped in an electrolytic liquid. Metal, which has a higher electric potential, dissolves first thus protecting the pump body from corrosion.

High temperature liquid

Standard pumps are designed for continuous running at a maximum ambient temperature of 40 °C. In addition to these, Tsurumi can provide pumps for operation at higher liquid temperature upon request. Refitting for operation at higher temperature involves modification of not only the insulation of motor windings but also several components. Two high - temperature operation models are available - the Rank 60 for operation in liquid up to 60 °C and the Rank 90 for operation in liquid up to 90 °C. Consult your dealer for more details. (These special versions are not available for some pump models.)

Non-standard materials

Tsurumi also offers pumps with essential components, such as the impeller, pump casing and suction cover, made of non-standard materials. Select from stainless steel, chromium iron and bronze to suit specific requirements. Please consult your dealer for more information.