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 **TSURUMI PUMP**
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SERIES
C

SUBMERSIBLE
SEWAGE PUMPS

CUTTER IMPELLER



Submersible Sewage Pumps with Cutter Impeller

Tsurumi C-series pumps are heavy-duty, submersible cutter pumps for sewage and wastewater, which are made of castings and equipped with cutting mechanism. Featuring a combination of impeller vane with brazed sintered tungsten carbide alloy edge and a suction cover of serrated shape, the C-series pumps enable smooth pumping, while cutting solid and fibrous matter during suction. These pumps have been used to drain sewage and wastewater from buildings and kitchens, and to transfer sewage and wastewater in water treatment facilities of factories and commercial complexes.

The C-series comes in a wide product lineup, covering discharge bore diameters of 50 to 200 mm and motor outputs of 0.75 to 37 kW. Among the C-series pumps, "CR" models are available as highly-durable cutter pumps, whose impeller and suction cover are made of high-chromium cast iron as a standard feature.

All models of the C-series can be used in combination with a guide rail fitting device that enables easy installation and maintenance. In addition, a new model of dry pit type is optionally available. The dry pit type pump can be installed indoors, and outside a tank. With Tsurumi's original specifications for dry pit, the dry pit pump delivers the performance of conventional submersible pumps in a variety of sites.

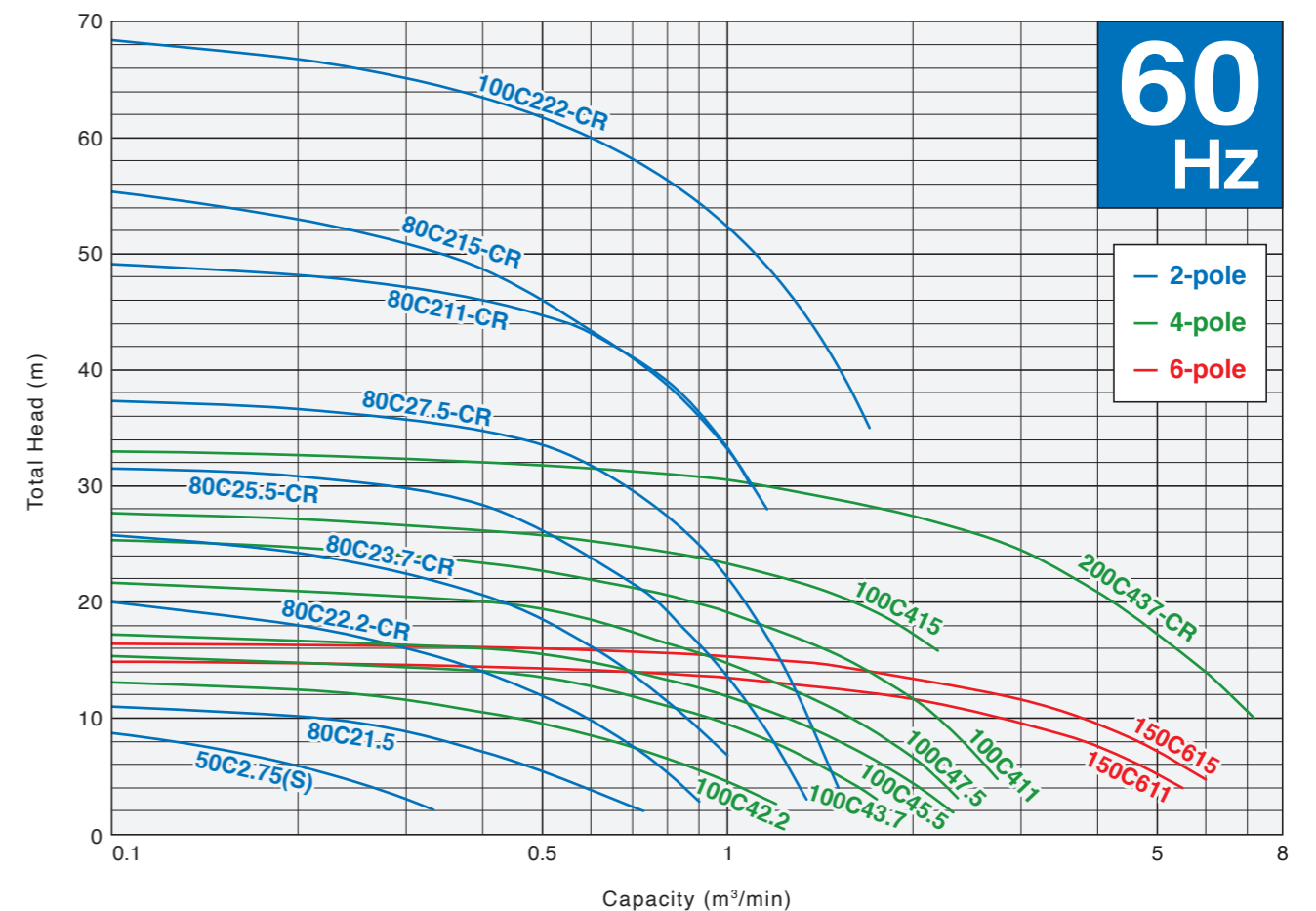
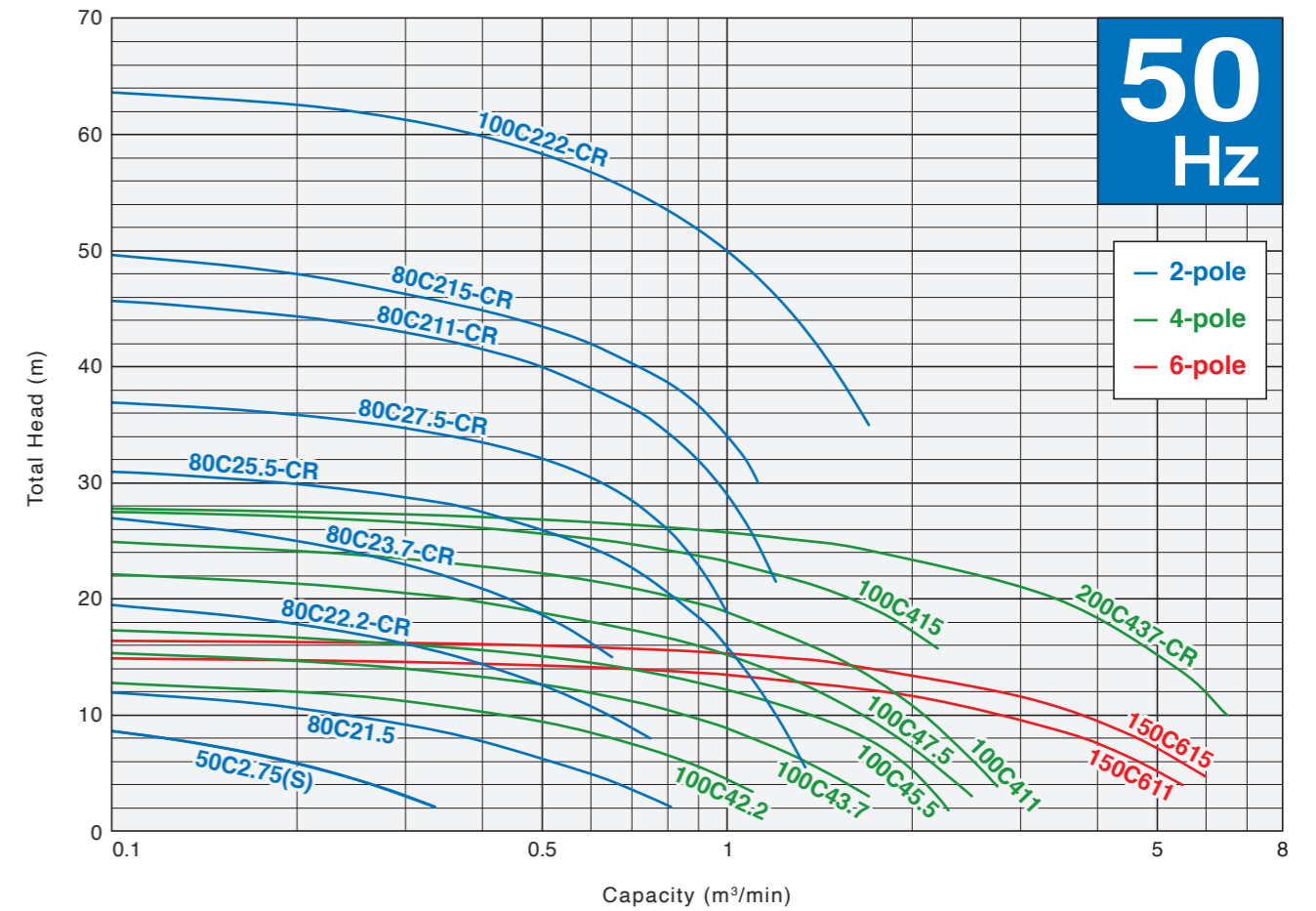
These pumps integrate original technologies that Tsurumi has researched and proven in the field over many years, such as anti-wicking cable, dual inside mechanical seals with silicon carbide face and Oil Lifter, etc.

Furthermore, durability and wear resistance have been thoroughly considered in their design, so these pumps enable continuous duty over long periods of time. Tsurumi products are designed to provide excellent durability and sound quality, thus contributing to the stable operation of facilities and enabling a considerable reduction in maintenance cost.

Cutting various solids matter with cutting mechanism



Performance Range



Selection Table

		C (2-pole)	C (4 · 6-pole)
Discharge Bore	mm	50 – 100	100 – 200
Motor Output	kW	0.75 – 22	2.2 – 37
Impeller		Cutter (Channel Impeller with Cutting Edge)	
Leakage Sensor		● (Float type, 15 · 22kW only)	● (Electrode type, 37kW only)
Seal Pressure Relief Ports		● (5.5 – 22kW only)	● (37kW only)
Guide Rail Fitting System		●	●
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Motor Output	0.75kW	1.5kW	2.2kW	3.7kW	5.5kW	7.5kW	11kW	15kW	22kW	37kW
2" 50mm										
3" 80mm			CR	CR	CR	CR	CR	CR		
4" 100mm									CR	
6" 150mm							CR	CR		
8" 200mm										CR

CR: Made of high-chromium cast iron impeller & suction cover

Advanced Model "CR"

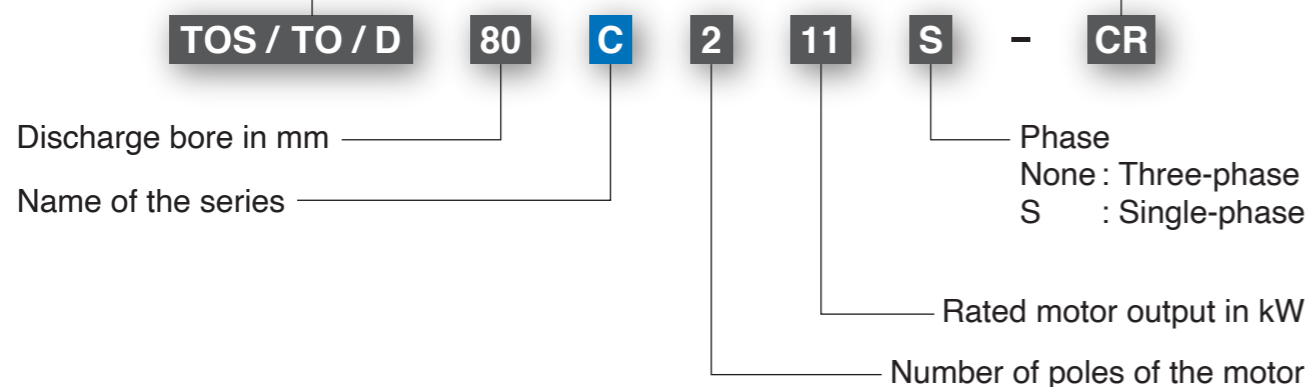
Among the C-series pumps, the "CR" models have been developed to transfer wastewater containing solids matter efficiently and smoothly, while maintaining high head and high volume. Since high-chromium cast iron is used for the impeller and the suction cover, the "CR" model pumps provide high durability, and enable continuous duty over long periods of time.

Also, with other models, the impeller and suction cover material can be changed to high-chromium cast iron, as an option.

Model Number Designation

TOS / TO : Guide rail fitting
D : Dry pit

Made of high-chromium
cast iron impeller & suction cover



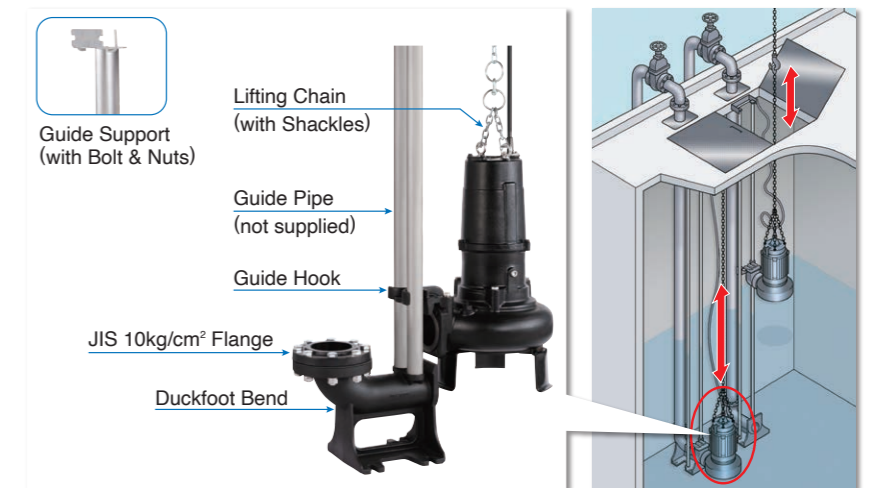
Guide Rail Fitting System

The guide rail fitting 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 TOS/TO is the guide rail fitting system made of cast iron and is compatible with cast iron pumps.

Accessories

- Duckfoot Bend
- Guide Support
- Guide Hook
- Lifting Chain 5m
- JIS 10kg/cm² Flange (excluding TO200C437-CR)



Float Switches

Tsurumi offers two types of float switches (liquid level sensors). A micro-switch is incorporated in both types.

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.

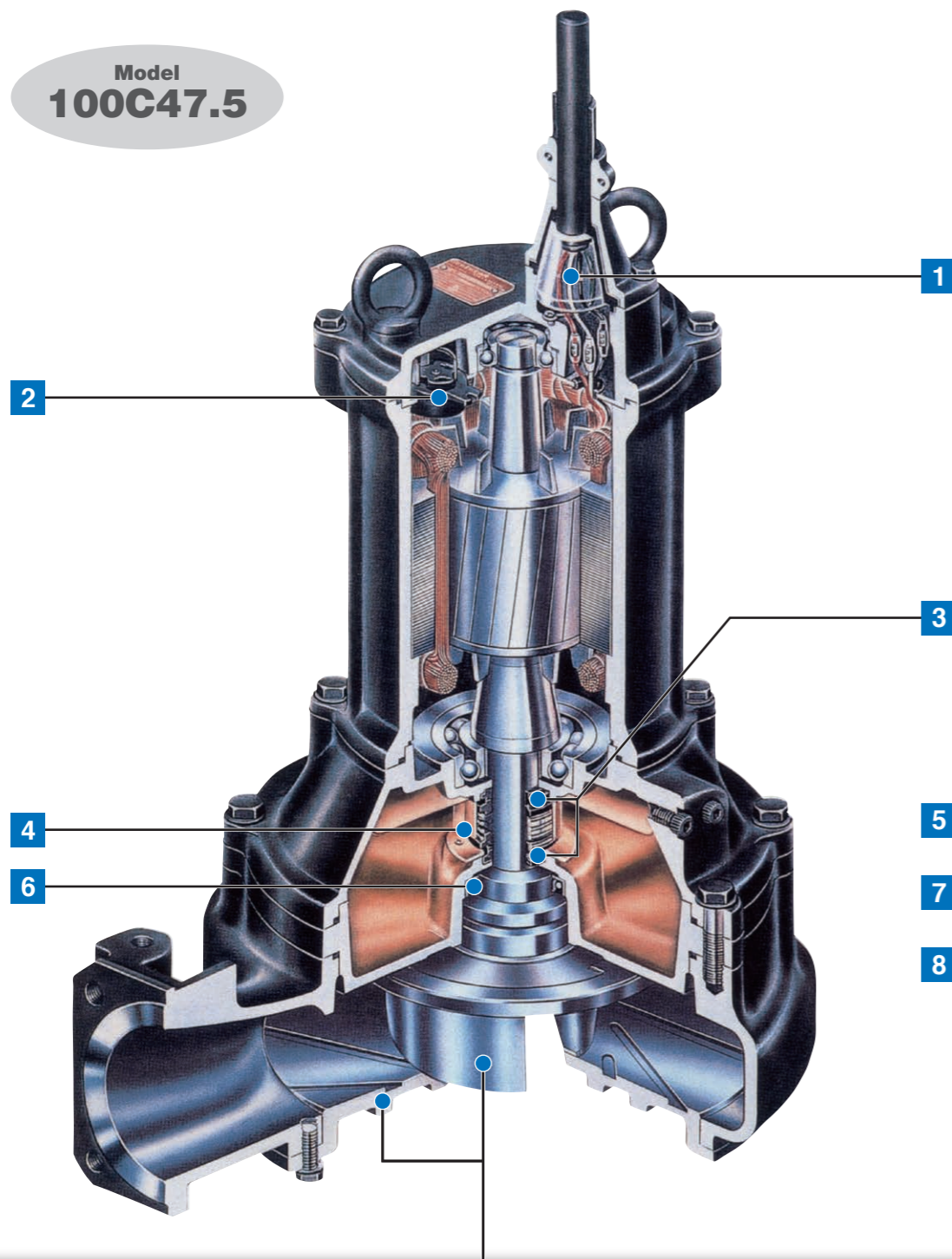


Model RF-5 is an economy type float which can detect upper/lower limit water levels with single float. The snap on-off action ensures stable operation in clean or waste water containing suspended solids or oil and fat.

Options

- Seawater-resistant version;** Galvanic anode & special Impeller
- High temperature liquids version;** Max. 80°C
- Special material version;** Made of high-chromium cast iron impeller & suction cover
- Dry pit version;** Available upon request

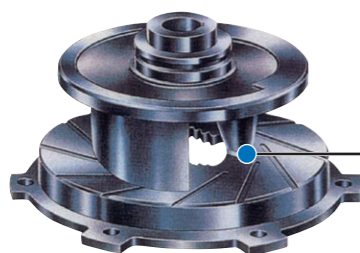
Model
100C47.5



Impeller & Suction Cover

CUTTING MECHANISM

The cutter pump mechanism comprises a combination of impeller vanes with single or two brazed sintered tungsten carbide alloy edge and a suction cover of serrated shape. The front surface of the suction cover has numerous grooves that catch fibrous matter, which is then shredded by the tungsten carbide alloy edges of the impeller vanes and the saw teeth of the suction cover. This mechanism prevents the pump from being clogged with fibrous matter that can easily clog any pump.



Sintered Tungsten Carbide Alloy Edge

1 Anti-wicking Cable Entry

Prevents water incursion due to capillary action should the cable sheath be damaged or the end of cable submerged. Also prevents moist air from infiltrating the motor housing and condensation from forming inside the housing due to temperature differences between the housing and outside air.

2 Motor Protector

Circle Thermal Protector (7.5kW and below)

Directly cuts the motor circuit if excessive heat builds up or overcurrent occurs in the motor.

Miniature Thermal Protectors (11kW and above)

React to excessive heat caused by dry-running. The bimetal strip opens to cause the control panel to shut the power supply.

3 Dual Inside Mechanical Seals with Silicon Carbide Faces

Isolated in the oil chamber where a clean, non-corrosive and abrasion-free lubricating environment is maintained. Compared with the water-cooled outside mechanical seal, it reduces the risk of failure caused by dry-heating and adhering matter. The silicon carbide provides 5 times higher corrosion, wear and heat resistance than the tungsten carbide. Rubber parts of the upper and lower fixing rings are made of NBR or FPM (FKM), which provides higher resistance to heat and chemicals.

4 Oil Lifter

Provides lubrication and cooling of the seal faces down to 1/3 of normal oil level, thus maintaining a stable shaft sealing effect and prolonging seal life longer. The Oil Lifter is Tsurumi original design.

5 Leakage Sensor

Float Type (80C215-CR and 100C222-CR)

Electrode Type (200C437-CR)

Detects flooding into the incursion water storage chamber and oil chamber that may occur in a worst case scenario. When flooding is detected, signals are sent to operate the indicator lamps through the external control panel.

6 Oil Seal

Used as a "Dust Seal," it protects the mechanical seal from abrasive particles.

7 Seal Pressure Relief Port (5.5kW and above of 2-pole, and 200C437-CR)

Protects the mechanical seal from pump pressure. It also protects the seal face by discharging wear particles.

8 Air Release Valve *excluding some models

Fitted on the pump casing to prevent the air lock. When air flows through the valve, the ball stays at the bottom, but when the pumped water starts to flow, the ball closes the outlet because of its buoyancy.

Options

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.

Special Option: Dry Pit Version

Developed with Tsurumi-original specifications, aiming for stable operation and reduction in maintenance labor.

As a special option of the Tsurumi C-series cutter pumps, dry pit specifications are available. The dry pit pumps have been designed to drain wastewater from buildings, in which a mixture of all kinds of sewage and wastewater is expected.

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. Of course, the dry pit pumps inherit the anti-wicking cable, dual inside mechanical seals with silicon carbide faces on the sides that are not in contact with wastewater, and Oil Lifter from Tsurumi's submersible pumps. In addition, they are designed with the maximum consideration for high-temperature resistance, with bearing grease for high temperature use, class H insulation, a leakage sensor, mechanical seals made of FPM (FKM), and high-grade lubricating oil as standard specifications. Pump models of 7.5 kW or lower motor output come without a water jacket, while the models of 11 kW or higher motor output are equipped with a water jacket as a standard feature.

As the most advanced feature of the 11 kW or higher output models, a wear ring is provided to prevent waste from clogging in the water jacket. Thus, solids can enter the water jacket only through the minute clearance between the impeller and the wear ring. This structure is a Tsurumi-original design.

As described above, Tsurumi's dry pit pumps feature a high quality, highly-reliable design that ensures excellent durability and high wear resistance. They can be installed in a variety of sites and will help keep facilities operating stably and will remarkably reduce maintenance costs.

Pump models of 7.5kW and below without Water Jacket



Pump models of 11kW and above with Water Jacket



Model D100C415

- Standard Specifications
- Special Specifications for Dry Pit Version

Anti-wicking Cable Entry

Bearing

Bearing grease for high temperature use

Motor Protector

Water Jacket (11kW and above)

The motor is cooled by a water jacket assuring efficient motor cooling even when the pump operates with its motor exposed to air.

Leakage Sensor

- Electrode Type (7.5kW and below)
- Float Type (11kW and above)

Motor

Class H insulation

Dual Inside Mechanical Seals with Silicon Carbide Faces

Rubber parts are made of FPM (FKM) which provides high resistance to heat and chemicals.

Oil Lifter

Lubricating Oil

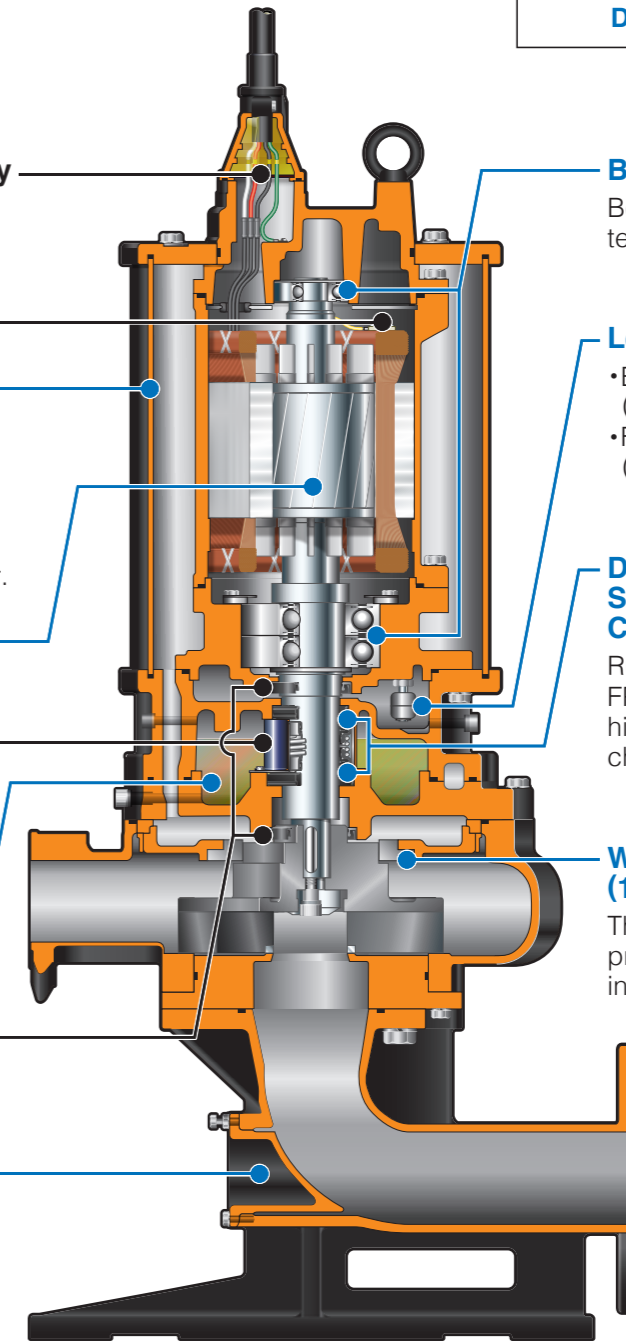
Turbine oil (ISO VG56), high-grade lubricating oil

Wear Ring (11kW and above)

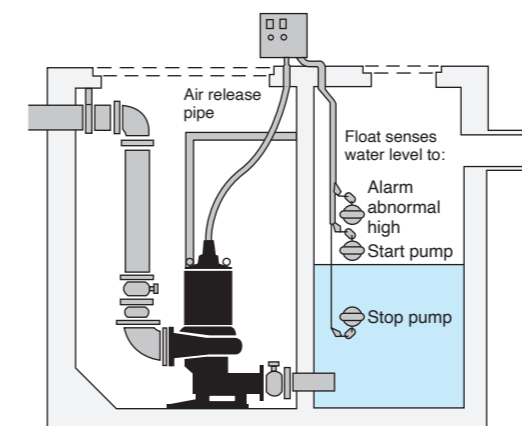
The wear ring is provided to prevent waste from clogging in the water jacket.

Oil Seal

Cleaning Cover



Example of Installation



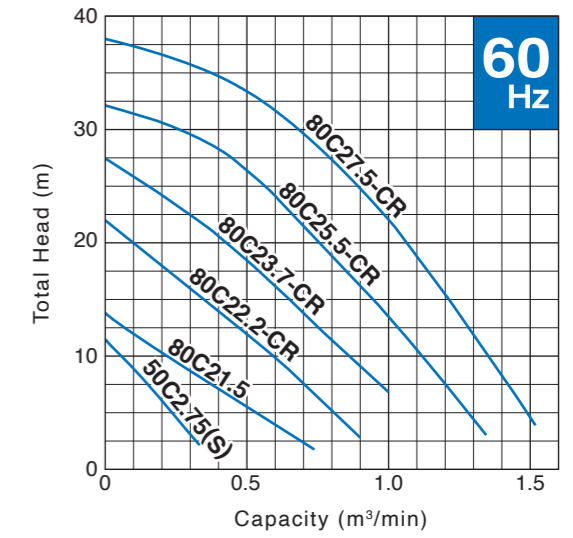
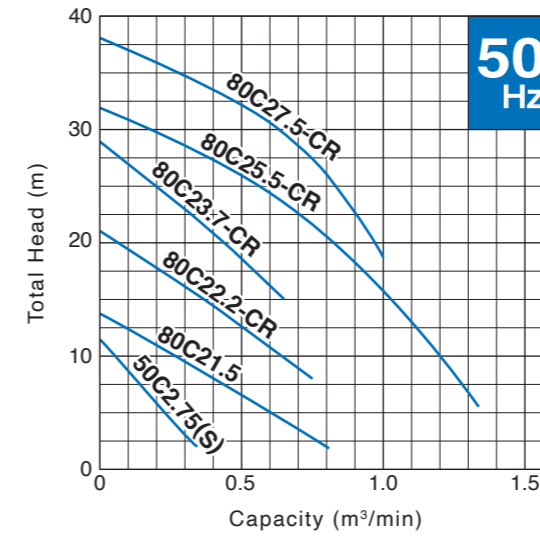
C (2-pole) –Cutter Impeller–

The C-series is a submersible cutter pump for sewage and wastewater, which is made of casting and equipped with cutting mechanism. Featuring a combination of impeller vane with brazed sintered tungsten carbide alloy edge and a suction cover of serrated shape, the C-series pumps enable smooth pumping, while cutting solid and fibrous matter during suction. The impeller and suction cover of the “CR” type are made of high-chromium cast iron, ensuring excellent durability and enabling the pump to maintain high performance for an extended period.

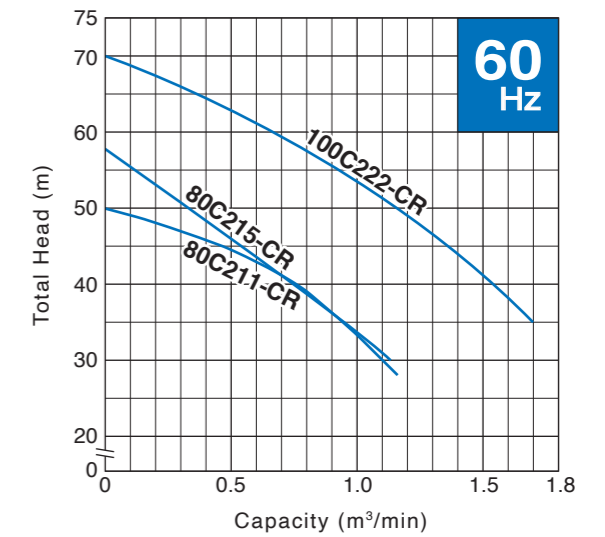
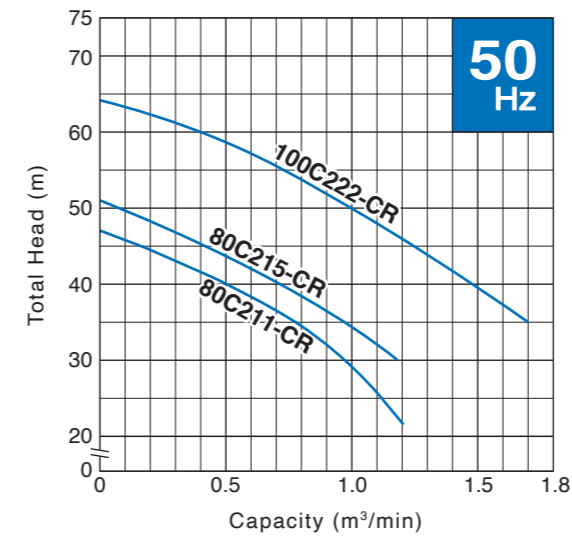


Performance Curves

< 0.75 - 7.5kW >



< 11 - 22kW >

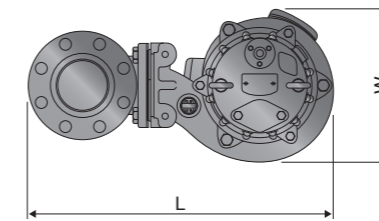


Discharge Bore mm	Model		Motor Output kW	Phase	Starting Method	Dimensions L x W x H mm		Dry Weight*2 kg		Cable Length m
	Free Standing	Guide Rail Fitting				Free Standing	Guide Rail Fitting	Free Standing	Guide Rail Fitting	
50	50C2.75S	TOS50C2.75S	0.75	Single	Capacitor Start	405 x 250 x 523	621 x 250 x 566	32	30	5
50	50C2.75	TOS50C2.75	0.75	Three	D.O.L.	405 x 250 x 415	621 x 250 x 458	24	23	6
80	80C21.5	TOS80C21.5	1.5	Three	D.O.L.	446 x 250 x 536	668 x 250 x 586	36	34	6
80	80C22.2-CR	TOS80C22.2-CR	2.2	Three	D.O.L.	519 x 260 x 611	693 x 260 x 640	70	64	10
80	80C23.7-CR	TOS80C23.7-CR	3.7	Three	D.O.L.	519 x 260 x 613	693 x 260 x 640	70	64	10
80	80C25.5-CR	TOS80C25.5-CR	5.5	Three	D.O.L.*1	615 x 345 x 879	788 x 320 x 877	120	106	8
80	80C27.5-CR	TOS80C27.5-CR	7.5	Three	D.O.L.*1	615 x 345 x 879	788 x 320 x 877	125	111	8
80	80C211-CR	TOS80C211-CR	11	Three	Star-Delta	615 x 345 x 927	788 x 320 x 925	147	133	8
80	80C215-CR	TOS80C215-CR	15	Three	Star-Delta	730 x 430 x 1086	937 x 430 x 1086	260	235	10
100	100C222-CR	TOS100C222-CR	22	Three	Star-Delta	837 x 510 x 1184	1025 x 510 x 1184	420	380	10

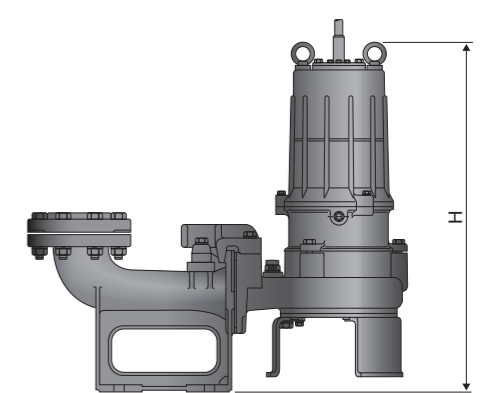
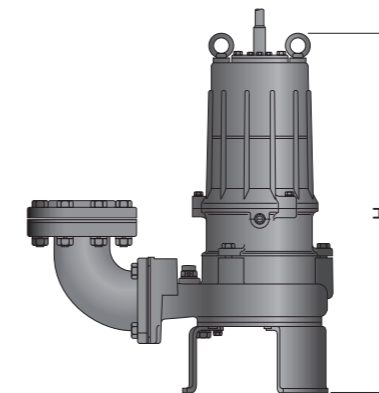
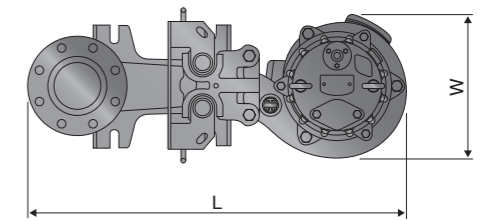
*1 Star-Delta available upon request
 *2 All weights excluding cable
 Weights of guide rail fitting excluding duckfoot bend

Dimensions

Free Standing



Guide Rail Fitting



C (4·6-pole) –Cutter Impeller–

The C-series is a submersible cutter pump for sewage and wastewater, which is made of casting and equipped with cutting mechanism. Featuring a combination of impeller vane with brazed sintered tungsten carbide alloy edge and a suction cover of serrated shape, the C-series pumps enable smooth pumping, while cutting solid and fibrous matter during suction. The impeller and suction cover of the “CR” type are made of high-chromium cast iron, ensuring excellent durability and enabling the pump to maintain high performance for an extended period.



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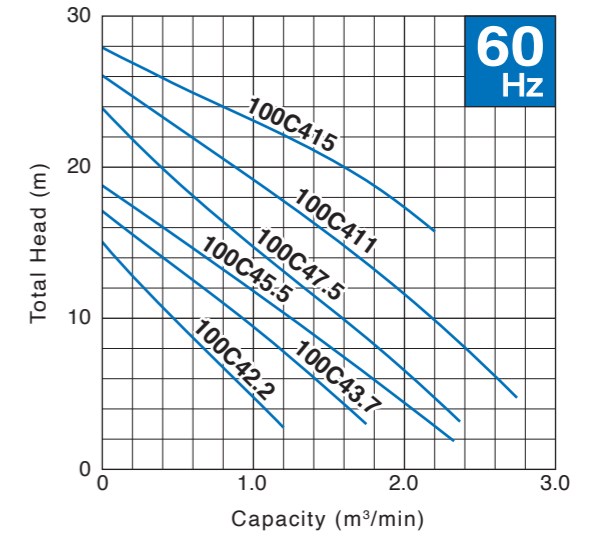
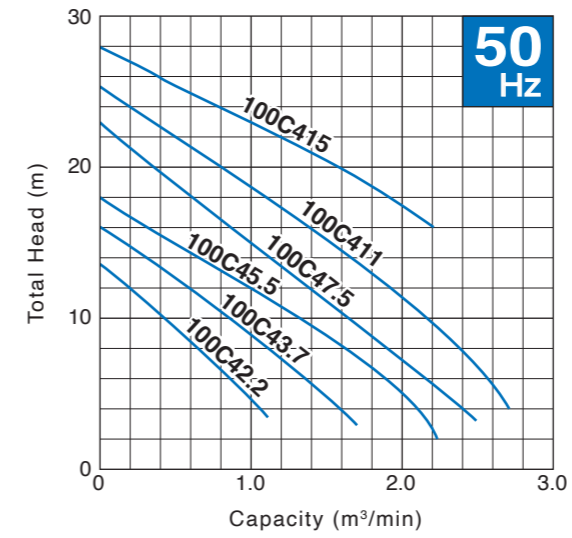
100C415



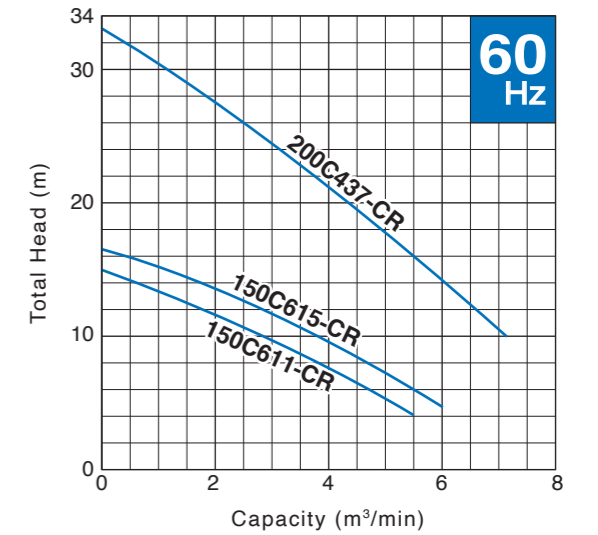
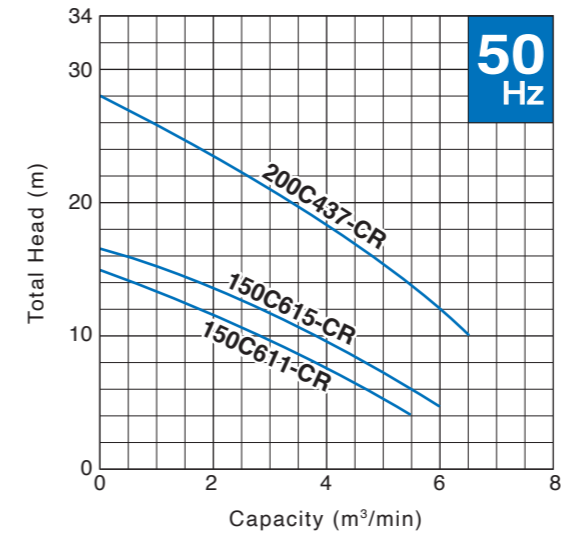
TOS100C47.5

Performance Curves

< 4-pole 2.2 - 15kW >



< 4-pole 37kW, 6-pole 11·15kW >



Discharge Bore mm	Model		Motor Output kW	Phase	Starting Method	Dimensions L x W x H*2 mm		Dry Weight*3 kg		Cable Length m
	Free Standing	Guide Rail Fitting				Free Standing	Guide Rail Fitting	Free Standing	Guide Rail Fitting	
100	100C42.2	TOS100C42.2	2.2	Three	D.O.L.	596 x 324 x 641	754 x 324 x 656	68	64	6
100	100C43.7	TOS100C43.7	3.7		D.O.L.	601 x 333 x 715	759 x 333 x 725	84	80	6
100	100C45.5	TOS100C45.5	5.5		D.O.L.*1	686 x 410 x 908	905 x 384 x 906	133	126	8
100	100C47.5	TOS100C47.5	7.5		D.O.L.*1	686 x 410 x 929	905 x 384 x 927	144	137	8
100	100C411	TOS100C411	11		Star-Delta	709 x 436 x 1000	928 x 431 x 998	179	172	8
100	100C415	TOS100C415	15		Star-Delta	707 x 436 x 1080	926 x 424 x 1078	221	201	8
150	150C611-CR	TOS150C611-CR	11		Star-Delta	1043 x 602 x 1211	1237 x 559 x 1126	430	390	8
150	150C615-CR	TOS150C615-CR	15		Star-Delta	1043 x 602 x 1261	1228 x 559 x 1176	500	410	8
200	200C437-CR	TOS200C437-CR	37		Star-Delta	1190 x 724 x 1588	1428 x 608 x 1408	660	555	10

*1 Star-Delta available upon request

*2 Refer to page 10 for dimension symbol positions.

*3 All weights excluding cable

Weights of guide rail fitting excluding duckfoot bend



Specifications

		C (2-pole)									C (4 · 6-pole)												
		50C2.75S	50C2.75	80C21.5	80C22.2-CR	80C23.7-CR	80C25.5-CR	80C27.5-CR	80C211-CR	80C215-CR	100C222-CR	100C42.2	100C43.7	100C45.5	100C47.5	100C411	100C415	150C611-CR	150C615-CR	200C437-CR			
PUMP	Discharge Bore mm	50			80						100			100						150			200
	Discharge Connection	Threaded Oval Flange			Threaded JIS 10kg/cm ² Flange						Threaded JIS 10kg/cm ² Flange						JIS 10kg/cm ² Flange						
	Impeller	Cutter (Semi-open Single-channel Impeller with Cutting Edge)			Cutter (Semi-open Two-channel Impeller with Cutting Edges)						Cutter (Semi-open Single-channel Impeller with Cutting Edge)						Cutter (Semi-open Two-channel Impeller with Cutting Edges)						
		Gray Cast Iron with Tungsten Carbide Alloy			High-chromium Cast Iron with Tungsten Carbide Alloy						Gray Cast Iron with Tungsten Carbide Alloy						High-chromium Cast Iron with Tungsten Carbide Alloy						
	Suction Cover	Ductile Cast Iron			High-chromium Cast Iron						Ductile Cast Iron						High-chromium Cast Iron						
	Oil Seal	Nitrile Butadiene Rubber									Nitrile Butadiene Rubber						—			Nitrile Butadiene Rubber			
	Casing	Gray Cast Iron									Gray Cast Iron												
	Shaft Seal	Dual Inside Mechanical Seals (with Oil Lifter)									Dual Inside Mechanical Seals (with Oil Lifter)												
Silicon Carbide									Silicon Carbide														
MOTOR	Type	Continuous-duty Rated, Dry-type Induction Motor									Continuous-duty Rated, Dry-type Induction Motor												
	Output kW	0.75	1.5		2.2	3.7	5.5	7.5	11	15	22	2.2		3.7	5.5	7.5	11	15	11	15	37		
	Phase	Single	Three									Three											
	Pole	2									4						6		4				
	Speed (S.S.) 50/60Hz min ⁻¹	3000/3600									1500/1800						1000/1200		1500/1800				
	Insulation	E			F						F						B		F				
	Starting Method	Capacitor Start	D.O.L.			D.O.L.*2			Star-Delta			D.O.L.			D.O.L.*2			Star-Delta					
	Motor Protector (built-in)	CTP						MTP			CTP						MTP						
	Leakage Sensor (built-in)	—						Float			—						Electrode						
	Lubricant ml	590	440	900	1890		2090			3300	3400	1350			4200	4800	6500	5500	6000		9500		
		Turbine Oil (ISO VG32)									Turbine Oil (ISO VG32)												
	Frame	Gray Cast Iron									Gray Cast Iron												
	Shaft	420 Stainless Steel									420 Stainless Steel												
Power Cable m	5	6		10		8		10		6			8						10				
	PVC				Chloroprene Rubber					PVC			Chloroprene Rubber										
Dry Weight **	Free Standing kg	32	24	36	70	120	125	147	260	420	68	84	133	144	179	221	430	500	660				
	Guide Rail Fitting kg	30	23	34	64	106	111	133	235	380	64	80	126	137	172	201	390	410	555				

**1 All weights excluding cable
Weights of guide rail fitting excluding duckfoot bend
**2 Star-Delta available upon request

CELEBRATING

50

YEARS OF EXPERIENCE

**EXPERIENCE INNOVATIVE
THINKERS AND PRODUCTS**



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