

TSURUMI UNIVERSE

SERIES
NH 50Hz

SUBMERSIBLE
SEWAGE PUMPS



TSURUMI UNIVERSE

“TSURUMI UNIVERSE” is a new brand of products from TSURUMI, a leading company in the field of submersible pumps for over 95 years. It has been developed to further spread TSURUMI products to markets around the world. Based on years of research and achievements, the brand was developed with the aim of enhancing competitiveness, while providing qualities equivalent to conventional models and TSURUMI’s original features and functions. Now, after thorough preparation, we are releasing our NH-series pumps under the new brand name of “TSURUMI UNIVERSE.”



Submersible Sewage Pumps

The NH-series pumps of the “TSURUMI UNIVERSE” brand are heavy-duty submersible sewage pumps made of cast iron. In addition to the wide range of specifications featuring 50 to 300 mm discharge bore diameters and 0.75 to 75 kW motor output capacities, the NH-series offers a variety of product lineups with three types of impellers: Channel, Cutter and Vortex types. The guide rail fitting device is applicable to all models, enabling easy installation and maintenance.

Equipped with a channel impeller, the NHB and NH series are TSURUMI’s basic type of pumps and provide excellent foreign object passage. The NHC-series features cutter pumps built with a combination of a channel impeller and a specially structured suction cover, in which a tungsten carbide alloy cutting edge is brazed to the impeller vane, thus enabling foreign objects to be shredded at the suction port while pumping. The NHU-series provides a semi-vortex structure equipped with a vortex impeller, whereby minimizing potential troubles caused by clogging of fibrous foreign objects.

The NH-series pumps are applicable to a wide spectrum of fields, such as raw water transfer in purifying tanks (Johkasou/septic tanks), wastewater treatment facilities, pumping stations and flood prevention equipment, and reservoirs of recreational facilities, as well as drainage of sewage and wastewater. These pumps integrate original technologies TSURUMI has perfected via years of research and achievements, to note our anti-wicking cable, dual inside mechanical seals with silicon carbide face, and Oil Lifter. In addition, with a design that thoroughly considers pump durability and wear resistance, these pumps enable continuous duty for a long period of time. TSURUMI products feature a highly reliable design that ensures excellent durability and stable quality, contributes to stable operations of facilities, and results in remarkably reduced maintenance costs.



Selection Table

		Sewage Pumps			
		NHB	NHC	NHU	NH
Discharge Bore	mm	100 – 300	50 • 80	50 • 80	50 – 150
Motor Output	kW	5.5 – 75	0.75 – 11	0.75 – 3.7	1.5 – 7.5
Pole		4	2	2	2
Impeller		Channel	Cutter (Channel Impeller with Cutting Edges)	Vortex	Channel
Flange Standard		DIN	JIS	JIS	JIS
Water Jacket		● (55 • 75kW only)			
Leakage Sensor		● (11 – 75kW only)			
Seal Pressure Relief Ports		● (22 – 75kW only)	● (5.5 – 11kW only)		● (5.5 • 7.5kW only)
Back Pull-out Design				● (2.2 • 3.7kW only)	
Guide Rail Fitting System		●	●	●	●
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IMPELLERS

Channel



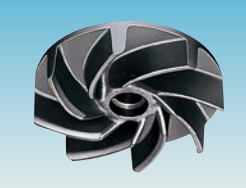
The impeller is shrouded type with one or two vanes. It has a wide channel extending from inlet to exit, which allows the pump to pass the solid matters from inflow to discharge with minimal blockage.

Cutter



The impeller is a semi-open type with two vanes. Two sintered tungsten carbide alloy edges are brazed on two impeller vanes, and they rotate on a saw-tooth suction port of a suction cover. This mechanism allows to cut up the foreign matters flowed into the impeller to discharge them.

Vortex



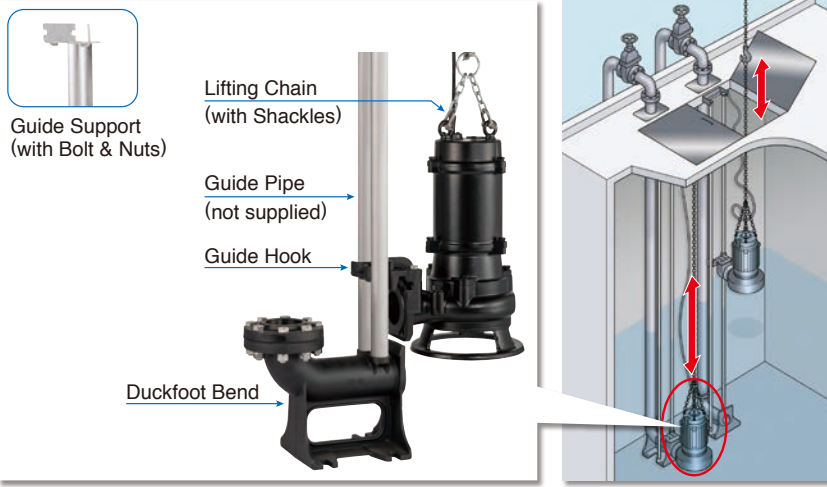
The impeller is a vortex type. The rotation of the impeller produces a whirling, centrifugal action between the impeller and pump casing. Being coupled with a wide pump casing, even large solids and fibrous matters can be pumped out without obstruction.

Guide Rail Fitting System

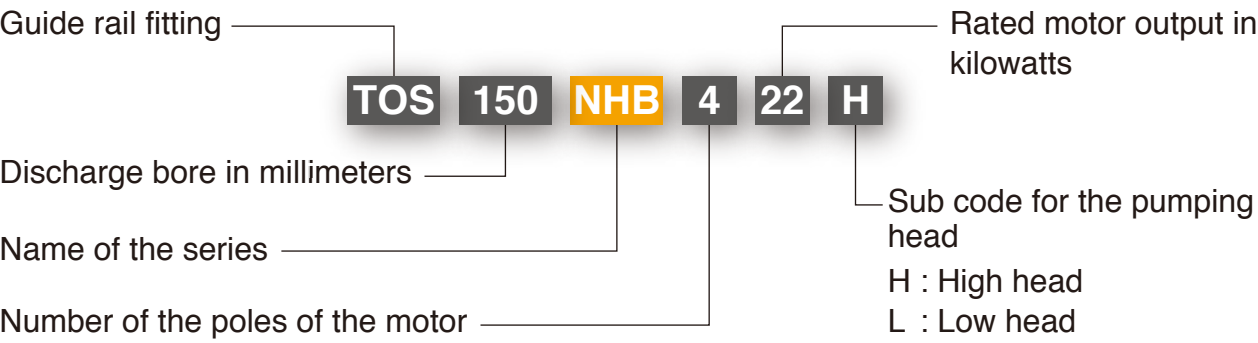
The guide rail fitting system connects the pump to and from the piping easily just by lowering and hoisting the pump, allowing easy maintenance and inspection without the need to enter the sump. The TOS/TO is the guide rail fitting system made of cast iron and is compatible with cast iron pumps.

Accessories

- Duckfoot Bend
- Guide Support
- Guide Hook
- Lifting Chain 5m (with Shackles)
- JIS 10kg/cm² Flange or DIN PN6 Flange



Model Number Designation



Float Switches

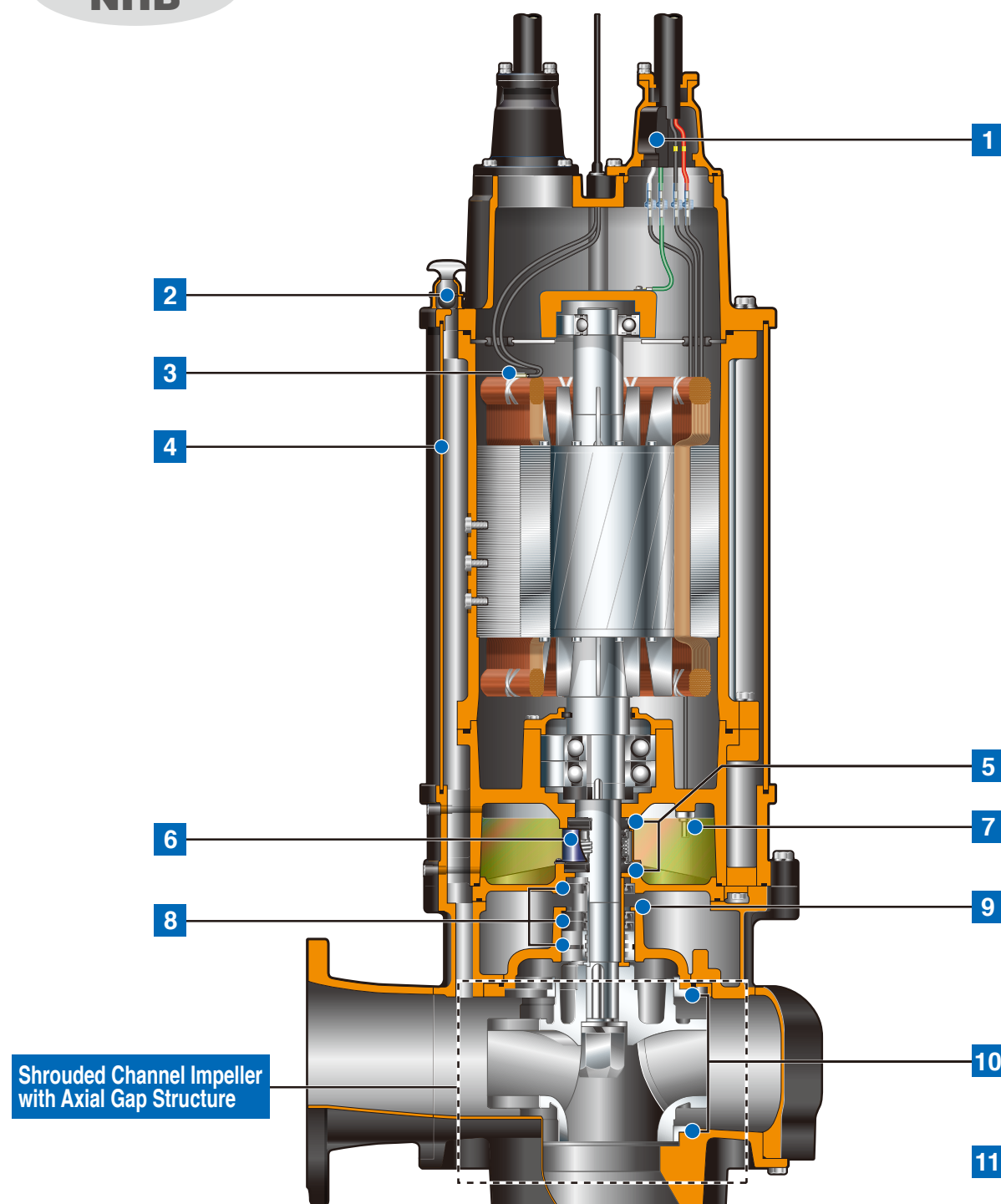
Tsurumi offers two types of float switches (liquid level sensors). A micro-switch is incorporated in both types.

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.





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 Air Release Valve *excluding some models

Fitted on/into the water jacket and/or 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.

3 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.

Shrouded Channel Impeller with Axial Gap Structure (NHB)

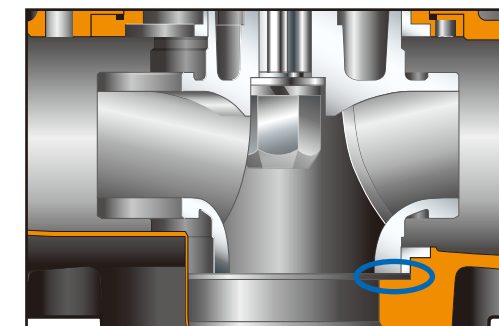
* Some models consist of radial gap structure.

Tsurumi's sewage pumps have been developed on the following two design concepts.

- **Stable pump performance over long periods of time**
- **Improved maintainability and durability**

This axial gap structure is intended to prevent troubles caused by performance drop, cavitation and clogging due to ingested foreign objects, which may incur with pumps over extended operation.

The structure itself is formed by a closed type impeller and suction cover, and is adopted for many models of Tsurumi pumps to fulfill this purpose.



Feature

With the axial gap structure, the gap between the impeller and suction cover is perpendicular to the shaft. On the other hand, with a radial gap structure, the gap is parallel to the shaft.

In other words, assuming the same increase in gap width due to wear, pump performance drop of the axial gap structure is considerably smaller than that of the radial gap structure. With the axial gap structure, pump performance and efficiency can be maintained, even under impeller wear, by adjusting the gap between the impeller and suction cover with packing, etc. This reduces maintenance costs and ensures stable performance over long periods of time.

Furthermore, Tsurumi's own technical investigations and many years of research have shown the axial gap structure to be more advantageous against "clogging by fibrous materials," a problem that afflicts sewage pumps in general.

4 Water Jacket (NHB 55kW and above)

The pump is equipped with a water jacket, around the motor frame. A portion of the pumped liquid is allowed to flow into the water jacket to cool the motor. This design feature permits the unit to operate at low water levels for extended periods of time.

5 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.

6 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.

7 Leakage Sensor (11kW and above)

Detects flooding into the 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.

8 Single/Triple Oil Seals + Labyrinth Ring (NHB 55kW and above)

Used as a "Dust Seal", single or triple oil seals protect the mechanical seal from abrasive particles. The labyrinth ring is equipped to provide a better countermeasure against wear caused by high pressure generated in the casing and improve the maintainability for pumps of 55kW and above.

9 Seal Pressure Relief Ports (NHB 22kW and above, and NH, NHC 5.5kW and above)

Protect the mechanical seal from pump pressure. They also protect the seal face by discharging wear particles.

10 Mouth Ring & Wear Ring (NHB 30kW and above)

Prevent wear in the pump casing and suction cover, resulting in reduced maintenance costs.

11 Back Pull-out Design (NHU 2.2 & 3.7kW only)

Enables the motor to be separated from the pump unit with the impeller attached, by removing the bolts between the oil casing and the pump casing. This design facilitates maintenance and inspection of the principal parts of the pump.

NHB –Channel Impeller, 4-pole–

The NHB-series is a submersible channel impeller pump designed for handling raw sewage, wastewater and heavy-duty industrial applications, where the pump is subject to complete submersion and requires maximum reliability. A shrouded channel impeller practically prevents internal clogging and enables the pump to efficiently transfer sewage and wastewater containing solid matters. It is available as an extended line-up from 100 to 300mm discharge bores, 5.5 to 75kW.



Discharge Bore mm	Model		Motor Output kW	Starting Method	Dimensions L 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	
100	100NHB45.5	TOS100NHB45.5	5.5	D.O.L.*1	689 x 908	905 x 906	145	132	6
100	100NHB47.5	TOS100NHB47.5	7.5	D.O.L.*1	689 x 929	905 x 927	158	145	6
150	150NHB47.5L	TOS150NHB47.5L	7.5	D.O.L.*1	858 x 1085	1065 x 1030	221	192	6
150	150NHB411	TOS150NHB411	11	Star-Delta	882 x 1097	1089 x 1052	243	213	8
150	150NHB415	TOS150NHB415	15	Star-Delta	882 x 1167	1089 x 1122	259	234	8
150	150NHB422H	TOS150NHB422H	22	Star-Delta	884 x 1281	1092 x 1241	347	317	8
150	150NHB422	TOS150NHB422	22	Star-Delta	884 x 1282	1092 x 1241	347	317	8
150	150NHB437	TO150NHB437	37	Star-Delta	1072 x 1567	1305 x 1399	547	486	8
150	150NHB455	TO150NHB455	55	Star-Delta	1120 x 1663	1391 x 1557	877	838	8
200	200NHB411	TO200NHB411	11	Star-Delta	947 x 1113	1257 x 1078	262	257	8
200	200NHB415	TO200NHB415	15	Star-Delta	925 x 1184	1235 x 1144	287	282	8
200	200NHB437	TO200NHB437	37	Star-Delta	1191 x 1590	1432 x 1477	562	503	8
200	200NHB455	TO200NHB455	55	Star-Delta	1189 x 1663	1470 x 1577	912	875	8
200	200NHB475	TO200NHB475	75	Star-Delta	1189 x 1663	1470 x 1577	992	955	8
250	250NHB430	TO250NHB430	30	Star-Delta	1296 x 1517	1567 x 1450	551	473	8
250	250NHB437	TO250NHB437	37	Star-Delta	1296 x 1594	1567 x 1527	611	533	8
250	250NHB445	TO250NHB445	45	Star-Delta	1314 x 1556	1581 x 1497	711	620	8
250	250NHB475	TO250NHB475	75	Star-Delta	1384 x 1663	1702 x 1606	1050	995	8
300	300NHB445	TO300NHB445	45	Star-Delta	1349 x 1605	1672 x 1536	775	695	8

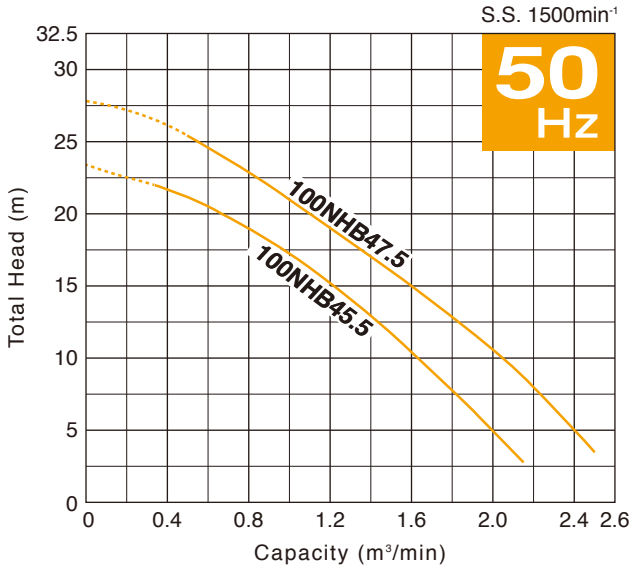
*1 Star-Delta available upon request

*2 All weights excluding cable
Weights of guide rail fitting excluding duckfoot bend

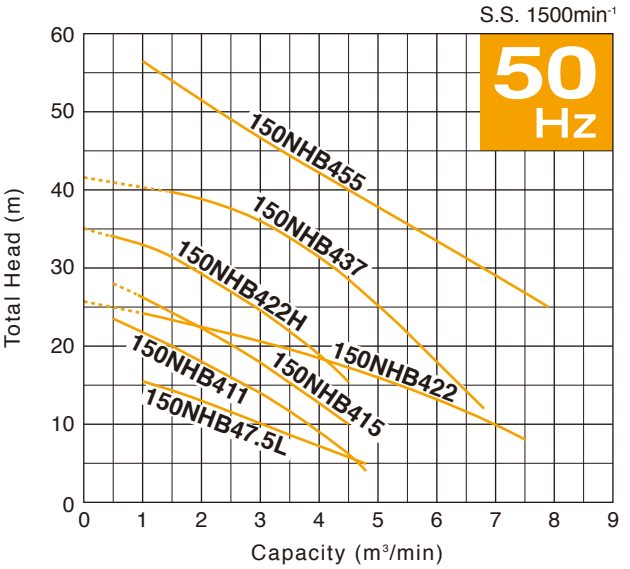
Performance Curves

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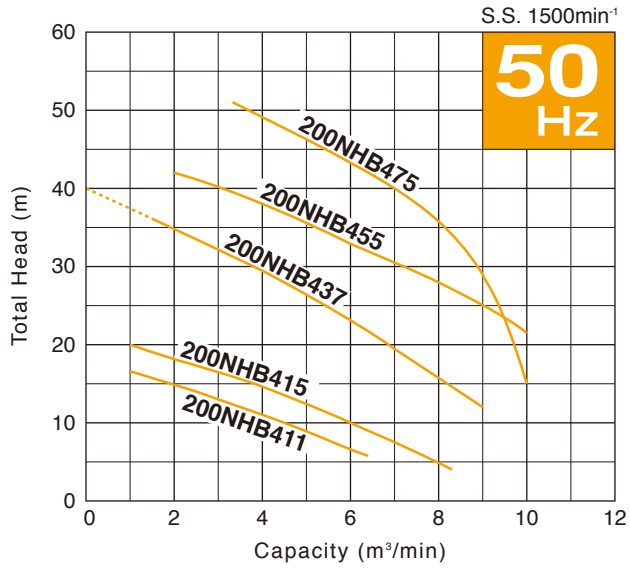
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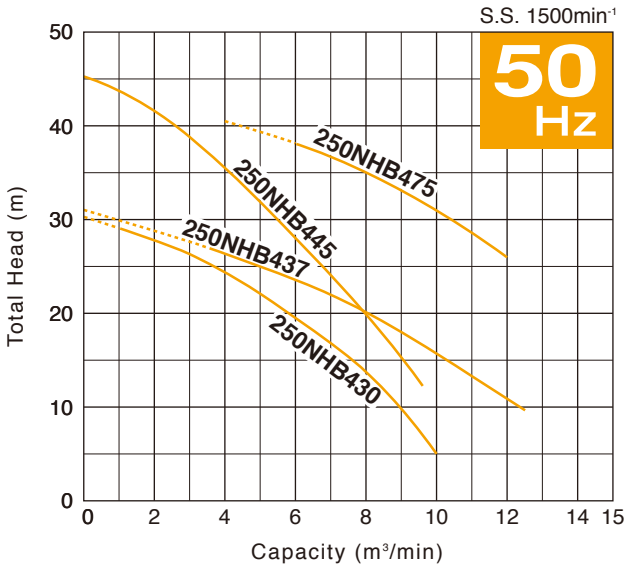
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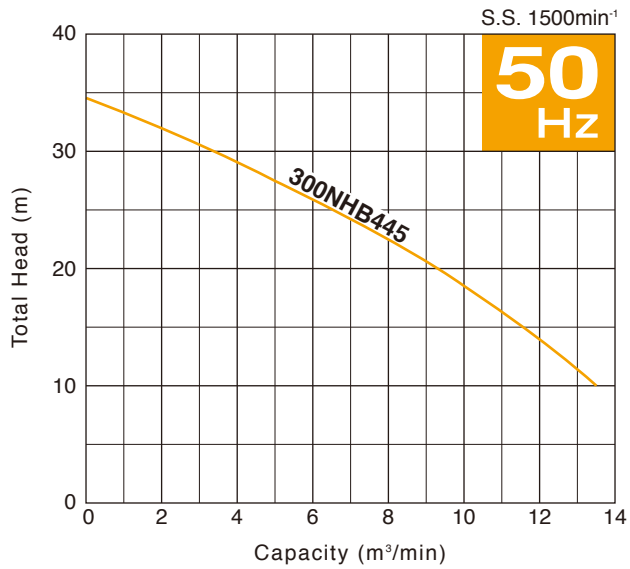
< 200mm >



< 250mm >



< 300mm >



NHC –Cutter Impeller, 2-pole–

The NHC-series is a submersible cutter pump designed for handling raw sewage, wastewater, and heavy-duty industrial applications, where the pump is subject to clogging from oversize material. Two tungsten carbide alloy edges blazed on the impeller vane on the serrated suction cover. This mechanism cuts incoming fibrous material into pieces, permitting smooth passage of fibrous material.

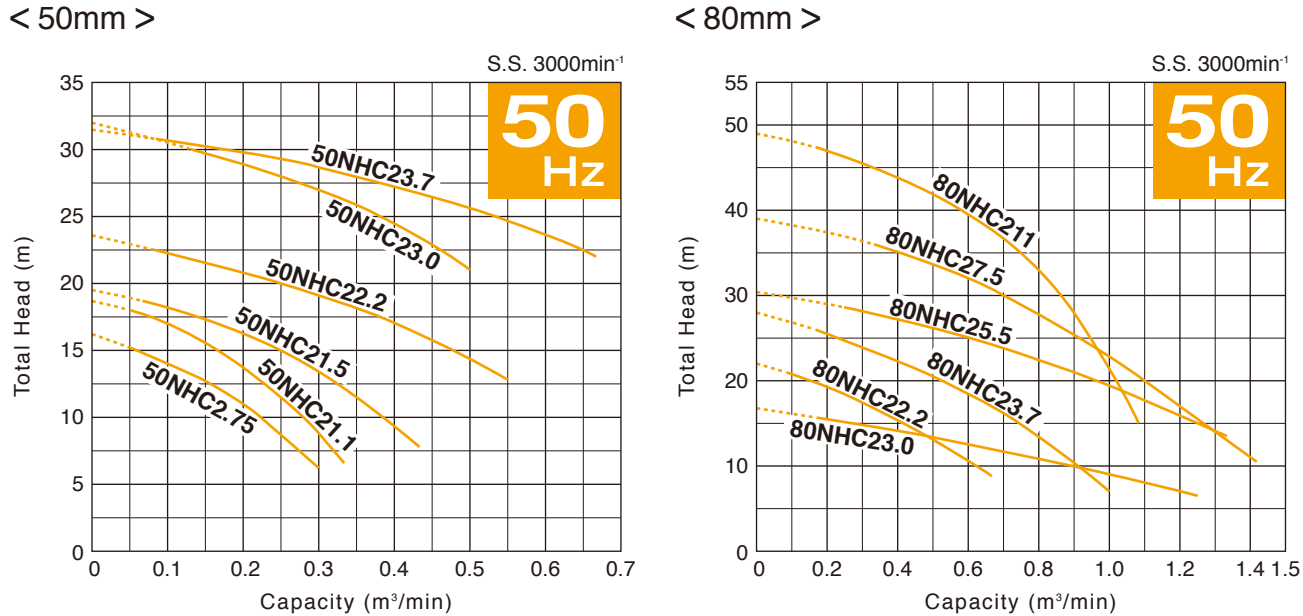


Discharge Bore mm	Model		Motor Output kW	Starting Method	Dimensions L x H mm		Dry Weight* kg		Cable Length m
	Free Standing	Guide Rail Fitting			Free Standing	Guide Rail Fitting	Free Standing	Guide Rail Fitting	
50	50NHC2.75	TOS50NHC2.75	0.75	D.O.L.	380 x 414	596 x 486	26	23	6
50	50NHC21.1	TOS50NHC21.1	1.1	D.O.L.	380 x 414	596 x 486	26	23	6
50	50NHC21.5	TOS50NHC21.5	1.5	D.O.L.	451 x 468	633 x 534	41	37	6
50	50NHC22.2	TOS50NHC22.2	2.2	D.O.L.	451 x 510	633 x 569	44	39	6
50	50NHC23.0	TOS50NHC23.0	3.0	D.O.L.	470 x 540	652 x 597	51	47	6
50	50NHC23.7	TOS50NHC23.7	3.7	D.O.L.	513 x 557	695 x 611	56	52	6
80	80NHC22.2	TOS80NHC22.2	2.2	D.O.L.	517 x 577	691 x 604	55	48	6
80	80NHC23.0	TOS80NHC23.0	3.0	D.O.L.	515 x 585	688 x 627	55	48	6
80	80NHC23.7	TOS80NHC23.7	3.7	D.O.L.	517 x 610	691 x 637	67	60	6
80	80NHC25.5	TOS80NHC25.5	5.5	D.O.L.	615 x 879	788 x 877	115	102	6
80	80NHC27.5	TOS80NHC27.5	7.5	D.O.L.	615 x 879	788 x 877	128	115	6
80	80NHC211	TOS80NHC211	11	Star-Delta	615 x 927	788 x 925	154	141	8

* All weights excluding cable
Weights of guide rail fitting excluding duckfoot bend

Performance Curves

It is not recommended to operate the unit continuously along the dashed curve.



Cutting Mechanism: Impeller & Suction Cover

Two sintered tungsten carbide alloy edges are brazed onto the impeller vane, and they rotate on the serrated part of the suction cover. Incoming fibrous materials are cut up by this mechanism, and this prevents clogging in the pump discharge pipes or valves.



NHU –Vortex Impeller, 2-pole–

The NHU-series is a heavy-duty submersible pump equipped with a vortex impeller for pumping sewage and wastewater. The semi-vortex design provides a solids passage that is 70% or more* of the discharge bore, thus reducing troubles caused by the clogging of fibrous solids to a minimum. Rotation of the impeller produces vortex flow in the pump casing, which allows those foreign matters to be pumped out with minimum contact to the impeller.

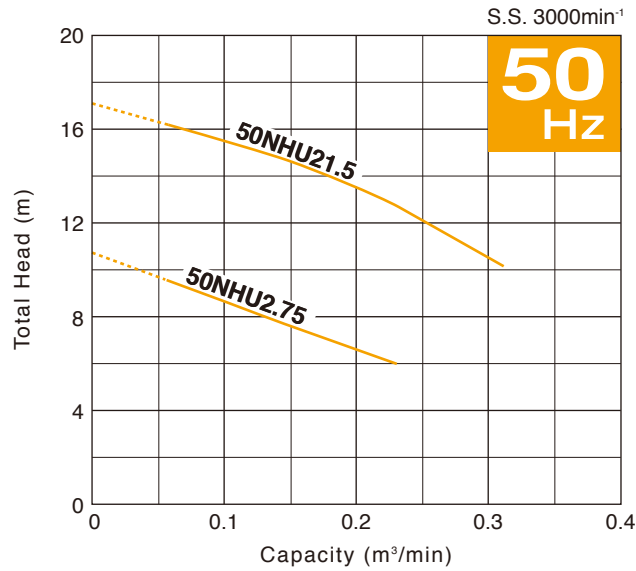
* excluding model 80NHU21.5



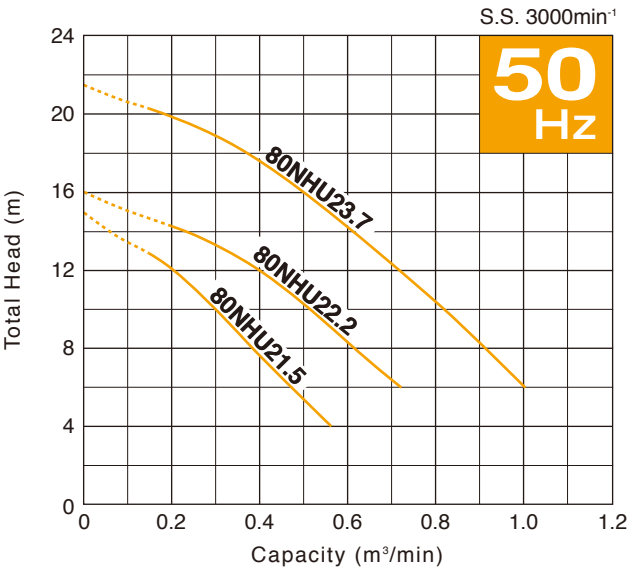
Performance Curves

It is not recommended to operate the unit continuously along the dashed curve.

< 50mm >



< 80mm >



Discharge Bore mm	Model		Motor Output kW	Starting Method	Solids Passage mm	Dimensions L x H mm		Dry Weight* kg		Cable Length m
	Free Standing	Guide Rail Fitting				Free Standing	Guide Rail Fitting	Free Standing	Guide Rail Fitting	
50	50NHU2.75	TOS50NHU2.75	0.75	D.O.L.	35	364 x 430	580 x 518	23	21	6
50	50NHU21.5	TOS50NHU21.5	1.5	D.O.L.	35	406 x 466	622 x 549	31	30	6
80	80NHU21.5	TOS80NHU21.5	1.5	D.O.L.	46	420 x 489	607 x 577	36	33	6
80	80NHU22.2	TOS80NHU22.2	2.2	D.O.L.	56	502 x 539	641 x 624	50	42	6
80	80NHU23.7	TOS80NHU23.7	3.7	D.O.L.	56	502 x 572	641 x 657	58	50	6

* All weights excluding cable
Weights of guide rail fitting excluding duckfoot bend



NH –Channel Impeller, 2-pole–

The NH-series is a cast iron made, submersible sewage pump utilizing 2-pole motor. This impeller is a shrouded two-channel impeller. Each channel is designed to have a larger area and it enables the pump to be suitable for pumping wastewater containing a certain size of solids. The pumps are available in six motor sizes ranging from 1.5 to 7.5kW and available in either High Head or High Volume Type.



50NH21.5



100NH25.5

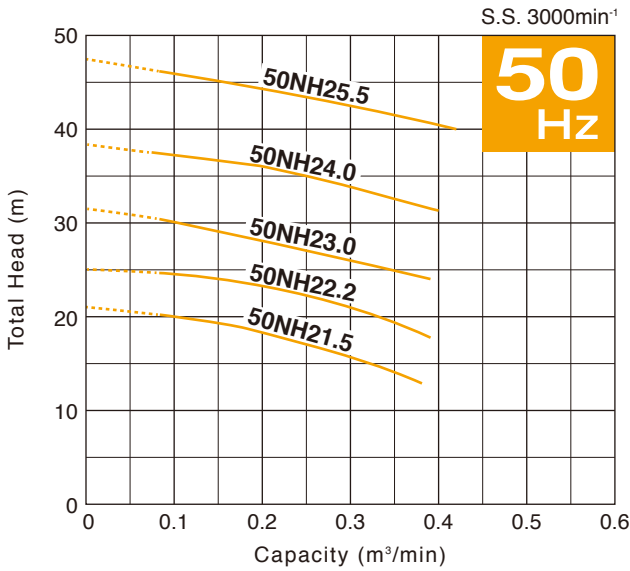


TOS80NH24.0

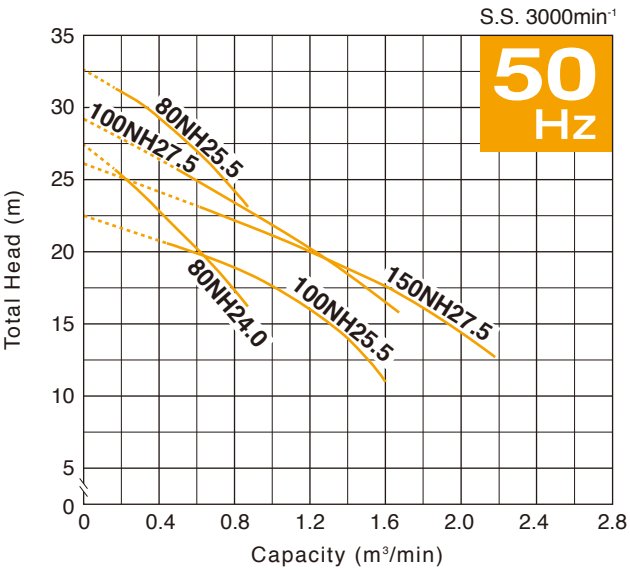
Performance Curves

It is not recommended to operate the unit continuously along the dashed curve.

< High Head Type >



< High Volume Type >



Discharge Bore mm	Model		Motor Output kW	Starting Method	Dimensions L x H mm		Dry Weight* kg		Cable Length m
	Free Standing	Guide Rail Fitting			Free Standing	Guide Rail Fitting	Free Standing	Guide Rail Fitting	
50	50NH21.5	TOS50NH21.5	1.5	D.O.L.	452 x 475	634 x 534	40	36	6
50	50NH22.2	TOS50NH22.2	2.2	D.O.L.	454 x 510	637 x 568	44	40	6
50	50NH23.0	TOS50NH23.0	3.0	D.O.L.	474 x 540	657 x 597	51	47	6
50	50NH24.0	TOS50NH24.0	4.0	D.O.L.	515 x 557	698 x 611	57	52	6
50	50NH25.5	TOS50NH25.5	5.5	D.O.L.	540 x 798	723 x 841	93	88	6
80	80NH24.0	TOS80NH24.0	4.0	D.O.L.	538 x 563	712 x 631	63	55	6
80	80NH25.5	TOS80NH25.5	5.5	D.O.L.	544 x 804	718 x 857	99	91	6
100	100NH25.5	TOS100NH25.5	5.5	D.O.L.	585 x 835	804 x 910	107	97	6
100	100NH27.5	TOS100NH27.5	7.5	D.O.L.	622 x 832	841 x 905	117	107	6
150	150NH27.5	TOS150NH27.5	7.5	D.O.L.	727 x 850	921 x 972	146	120	6

* All weights excluding cable
Weights of guide rail fitting excluding duckfoot bend



Specifications 50Hz

			NHB									NHB											
			100NHB45.5	100NHB47.5	150NHB47.5L	150NHB411	150NHB415	150NHB422H	150NHB422	150NHB437		150NHB455		200NHB411	200NHB415	200NHB437	200NHB455	200NHB475	250NHB430	250NHB437	250NHB445	250NHB475	300NHB445
PUMP	Discharge Bore	mm	100		150							200					250					300	
	Discharge Connection		DIN PN6 Flange (come with Threaded Companion Flange)									DIN PN6 Flange											
	Impeller		Shrouded One-channel		Shrouded Two-channel	Shrouded One-channel			Shrouded Two-channel				Shrouded Two-channel										
			Radial Gap		Axial Gap					Radial Gap			Axial Gap			Radial Gap		Axial Gap			Radial Gap		Axial Gap
			Gray Cast Iron									Gray Cast Iron											
	Suction Cover		Gray Cast Iron									Gray Cast Iron											
	Wear Ring		—					Gray Cast Iron				—		Gray Cast Iron									
	Mouth Ring		—					Gray Cast Iron				—		Gray Cast Iron									
	Oil Seal	Q'ty	Single						Triple			Single			Triple		Single			Triple		Single	
			Nitrile Butadiene Rubber									Nitrile Butadiene Rubber											
	Labyrinth Ring		—					304 Stainless Steel			—			304 Stainless Steel		—			304 Stainless Steel		—		
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	5.5	7.5		11	15	22		37	55		11	15	37	55	75	30	37	45	75	45	
	Phase		Three									Three											
	Pole		4									4											
	Speed (S.S.)	min ⁻¹	1500									1500											
	Insulation		F									F											
	Starting Method		D.O.L.* ²			Star-Delta						Star-Delta											
	Motor Protector (built-in)		CTP			MTP						MTP											
	Leakage Sensor (built-in)		—			Electrode						Electrode											
	Lubricant	ml	4200	4600		5200	5100	4600		9100	9600		5200	5100	9100	9600		8600	9100		9600	9100	
			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	6			8						8												
		Chloroprene Rubber									Chloroprene Rubber												
Dry Weight* ¹	Free Standing	kg	145	158	221	243	259	347		547	877		262	287	562	912	992	551	611	711	1050	775	
	Guide Rail Fitting	kg	132	145	192	213	234	317		486	838		257	282	503	875	955	473	533	620	995	695	

*¹ All weights excluding cable

*² Star-Delta available upon request

Weights of guide rail fitting excluding duckfoot bend

Specifications 50Hz

			NHC												NHU					NH										
			50NHC2.75	50NHC21.1	50NHC21.5	50NHC22.2	50NHC23.0	50NHC23.7	80NHC22.2	80NHC23.0	80NHC23.7	80NHC25.5	80NHC27.5	80NHC211		50NHU2.75	50NHU21.5	80NHU21.5	80NHU22.2	80NHU23.7	50NH21.5	50NH22.2	50NH23.0	50NH24.0	50NH25.5	80NH24.0	80NH25.5	100NH25.5	100NH27.5	150NH27.5
PUMP	Discharge Bore	mm	50					80								50		80			50					80		100		150
	Discharge Connection		Threaded Oval Flange		Threaded JIS 10kg/cm² Flange											Threaded Oval Flange			Threaded JIS 10kg/cm² Flange											
	Impeller		(Semi-open Two-channel Impeller with Two Cutting Edges)												Vortex					Shrouded Two-channel										
			Gray Cast Iron with Tungsten Carbide Alloy												Gray Cast Iron															
	Suction Cover		Ductile Cast Iron												Gray Cast Iron			—		Gray Cast Iron										
	Oil Seal	Q'ty	Single												Single															
			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	1.1	1.5	2.2	3.0	3.7	2.2	3.0	3.7	5.5	7.5	11		0.75	1.5		2.2	3.7	1.5	2.2	3.0	4.0	5.5	4.0	5.5		7.5	
	Phase		Three												Three															
	Pole		2												2															
	Speed (S.S.)	min ⁻¹	3000												3000															
	Insulation		F												F															
	Starting Method		D.O.L.										Star-Delta			D.O.L.														
	Motor Protector (built-in)		CTP										MTP			CTP														
	Leakage Sensor (built-in)		—										Electrode			—														
	Lubricant	ml	500		940	1160	1100	1300	1160	1100	1300	2140	2000			500	940		1160	1300	940	1160	1100	1300	2140	1300	2140		2000	
			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	6										8			6														
			Chloroprene Rubber												Chloroprene Rubber															
Dry Weight*	Free Standing	kg	26		41	44	51	56	55		67	115	128	154		23	31	36	50	58	40	44	51	57	93	63	99	107	117	146
	Guide Rail Fitting	kg	23		37	39	47	52	48		60	102	115	141		21	30	33	42	50	36	40	47	52	88	55	91	97	107	120

* All weights excluding cable
Weights of guide rail fitting excluding duckfoot bend



Product images and specifications may differ from actual products due to improvements. The OO series and model OO are indicated with our series/model codes in this catalog.

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