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TSURUMI PUMP

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SERIES LH

SUBMERSIBLE HIGH HEAD DRAINAGE PUMPS

Submersible High Head Drainage Pumps

Tsurumi LH/LH-W series pumps are submersible heavy-duty pumps specialized for high head. These pumps are available in a wide lineup, offering 3 to 110 kW motor output and 18 to 230 m maximum head. The LH/LH-W series has played an active role in various fields, from small/medium-scale civil engineering and construction work that requires high reliability, to large-scale projects for constructing tunnels, bridges and dams. And, because of their slim body, these pumps have proven to be particularly useful for deep well dewatering and mine pit drainage where required to work in limited space.

In addition, the LH-D-series pumps, which are equipped with a 2-pole 110 kW/185 kW motor and double suction impeller, have been newly added to the product lineup to provide high volume, high head performance.
With a max. capacity of 14 m^3/min and max. head of 92 m, the LH-D-series meets the needs of open-pit/underground mining, heap leaching and large-scale tunneling work.

So that they can stand up to harsh environment, these pumps have the impeller and mouth ring made of high-chromium cast iron that provides high wear resistance. The pump is equipped with seal pressure relief ports* that release pump pressure applied to the mechanical seal. Furthermore, to endure even extended operation at low water level, these pumps feature flow-thru design that forcibly cools down the motor.
* excluding 3 kW and LH-D-series

Tsurumi submersible pumps integrate original technologies that Tsurumi has researched and proven in the field over many years, such as anti-wicking cable, motor protector, dual inside mechanical seals with silicon carbide faces and Oil Lifter, etc. With these features, Tsurumi pumps provide excellent reliability and durability that enables continuous duty for long periods of time.

Available as optional specifications are an original “seawater-resistant pump” developed over many years by Tsurumi to enable seawater intake/drainage for long periods of time, and an “all stainless steel pump” using 316 stainless steel for mining markets.

LH

Submersible High Head Drainage Pumps

Major Applications

Extreme circumstances reveal true value.

With over 95 years of history, the Tsurumi Pump Brand continues to receive worldwide support with its superior quality, exceptional durability and solid reliability.

LH: Lineup of pumps with high head in consideration of discharge volume.

LH-W: Comprised of dual impellers for extra high head.

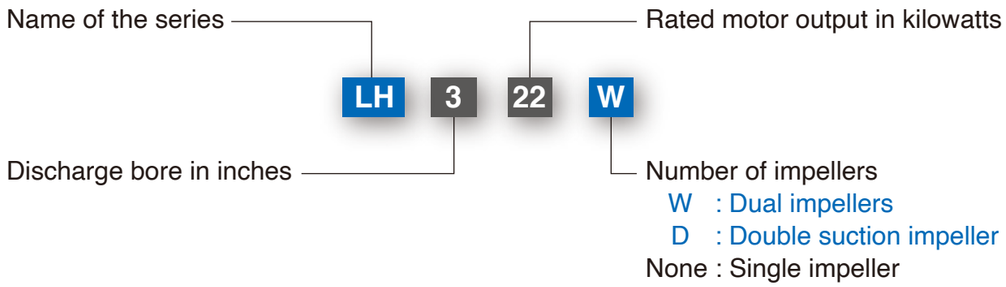
LH-D : High volume, high head performance by double suction impeller

Selection Table

Motor Output (kW)		3	5.5	11	15	19	22	30	37	45	55	75	90	110	185
LH (Single Impeller)	3” 80mm	★													
	4” 100mm						■	■	■						
	6” 150mm				■	■	■		■			■	■	■	
	8” 200mm								■	■	■	■	■	■	
LH-W (Dual Impellers)	2” 50mm	★	★												
	3” 80mm			★			★								
	4” 100mm							★						■	
LH-D (Double Suction Impeller)	10” 250mm													■	
	12” 300mm														■

★: Tandem operation model: Same model pumps are connected in series, to deliver higher head.

Model Number Designation



Options

- ☑ Seawater-resistant version; Galvanic anode & Special impeller
- ☑ High temperature liquids version; Max. 80°C
- ☑ High voltage version; Max. 1000V
- ☑ All stainless steel version; 316 S.S.

☑ Seawater-Resistant Version

Tsurumi’s pumps can be combined with a seawater-resistant kit (optional) that adds a “galvanic anode” and “seawater-resistant special cast iron impeller,” and enables about two years of service. (The service period depends on operating conditions.) For details, refer to the Seawater-Resistant Pumps catalog [IB115].

Conversion to Seawater-Resistant Pump

☑ High Temperature Liquids Version

Tsurumi's 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.

☑ High Voltage Version

Tsurumi's pumps can be manufactured to between 380 - 1000 V ratings that are often required for mining applications. The pumps meet mining safety standards as they come with screened cables and motors with built-in diodes for ground-fault checks.

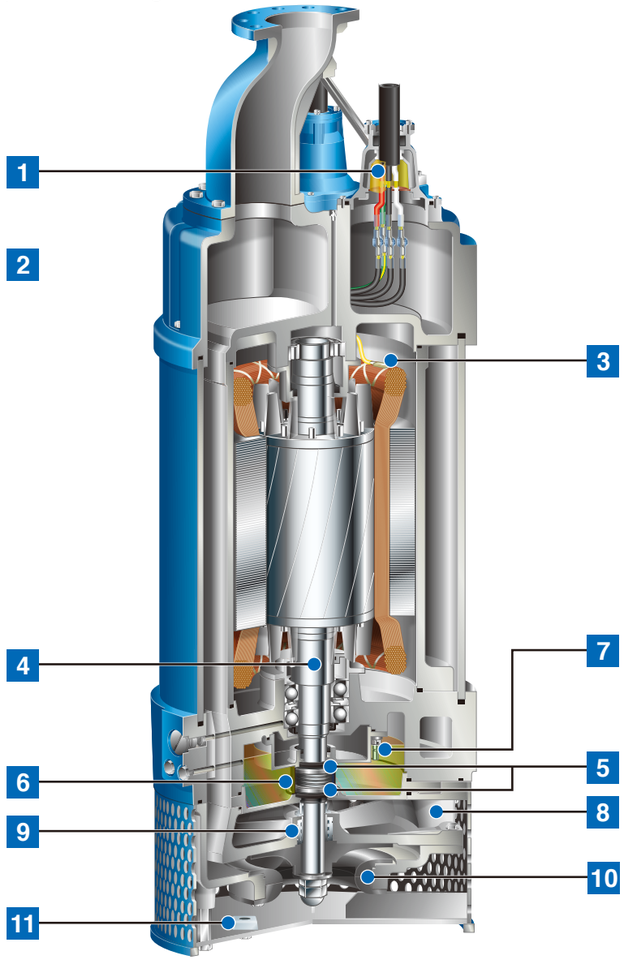
☑ All Stainless Steel Version

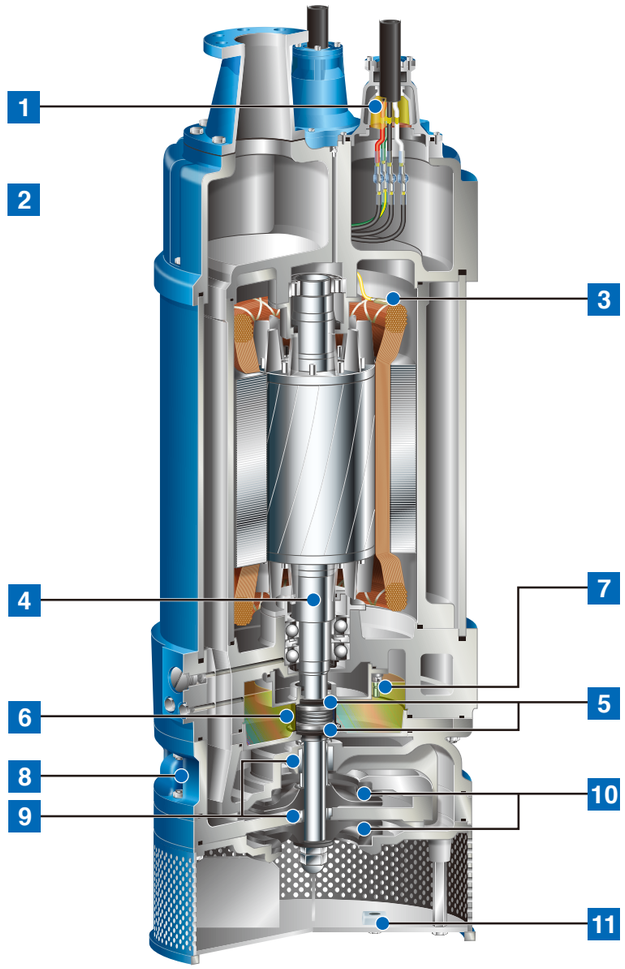
All of the parts of Tsurumi’s pumps that contact fluid, including the impeller, pump casing, motor frame, outer cover, strainer stand, and flange, can be made in 316 stainless steel. Tsurumi’s all stainless steel pump can handle corrosive fluids generated in mines or quarries, and fluids of low pH value. For details, refer to the Corrosion-Resistant Pumps catalog [IB116].

Top Discharge, Flow-thru Design

This design provides maximum motor cooling efficiency allowing continuous operation at low water levels and extended dry-run capability, and also allows the shape of the pump to be cylindrical and slim for installation in a well casing for deep well dewatering.

Model
LH8110
(Single Impeller)





Model
LH4110W
(Dual Impellers)

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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 **Cable Clip**
Prevents unexpected water incursion that can occur if the cable is damaged, by protecting the cable against the tugging and rough handling found at construction sites.

3 **Motor Protector**
Circle Thermal Protector (22 kW and below)
Directly cuts the motor circuit if excessive heat builds up or overcurrent occurs in the motor.
Miniature Thermal Protectors (30 kW and above)
React to excessive heat caused by dry-running. The bimetal strip opens to cause the control panel to shut the power supply.

4 **Shaft**
Quenching treatment is applied to parts that contact particles in pumped fluids and whose mechanical seal may wear out, to enhance surface hardness and extend shaft service life.

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 desigh.

7 **Leakage Sensor** (55 kW 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 **Seal Pressure Relief Ports** (excluding 3 kW & LH-D)
Protect the mechanical seal from pump pressure. They also protect the seal face by discharging wear particles.

9 **Labyrinth Ring** (LH 15 kW and above & LH-W)
Equipped to provide a better countermeasure against wear caused by high pressure generated in the casing and improve the maintainability.

10 **High-chromium Cast Iron Impeller & Mouth Ring / Suction Mouth**
Resists wear caused by abrasive particles and enables the pump to maintain its original performance for an extended period of time.
LH: Single impeller LH-W: Dual impellers LH-D: Double suction impeller

11 **Galvanic Anodes** (excluding 3 kW)
Protect the pump against corrosive potential generated during the drainage of wastewater.

LH –Single Impeller–

The LH-series is a submersible three-phase cast iron high head drainage pump. Being the pump cylindrical and slim, it can be installed in a well casing for deep well dewatering. The center flange construction assures a stable installation even if it is fixed by the discharge pipe. The top discharge, flow-thru design provides maximum motor cooling efficiency allowing continuous operation at low water levels and extended dry-run capability. The pump incorporates seal pressure relief ports that prevent the pumping pressure from applying to the shaft seal.*

* excluding LH33.0

LH33.0

LH637

LH6110

Discharge Bore mm	Model	Motor Output kW	Phase	Starting Method	Solids Passage mm	Dimensions L x H mm	Dry Weight*2 kg	Cable Length m
80	**LH33.0**	3	Three	D.O.L.	6	185 x 645	42	20
100	**LH422**	22		D.O.L.*1	6	420 x 1352	350	10
100	**LH430**	30		Star-Delta	6	420 x 1352	355	10
150	**LH615**	15		D.O.L.*1	8.5	330 x 1014	213	10
150	**LH619**	19		D.O.L.*1	12	420 x 1423	350	10
150	**LH622**	22		D.O.L.*1	12	420 x 1423	360	10
150	**LH637**	37		Star-Delta	6	530 x 1448	495	10
150	**LH645**	45		Star-Delta	6	530 x 1448	510	10
150	**LH675**	75		Star-Delta	8	563 x 1676	865	10
150	**LH690**	90		Star-Delta	10	592 x 1787	1100	20
150	**LH6110**	110		Star-Delta	10	616 x 1887	1210	20
200	**LH837**	37		Star-Delta	20	530 x 1488	495	10
200	**LH845**	45		Star-Delta	20	530 x 1488	510	10
200	**LH855**	55		Star-Delta	20	563 x 1716	820	10
200	**LH875**	75		Star-Delta	20	563 x 1716	865	10
200	**LH890**	90		Star-Delta	20	592 x 1787	1150	20
200	**LH8110**	110		Star-Delta	20	616 x 1887	1210	20

*1 Star-Delta available upon request

*2 Weights excluding cable

Performance Curves

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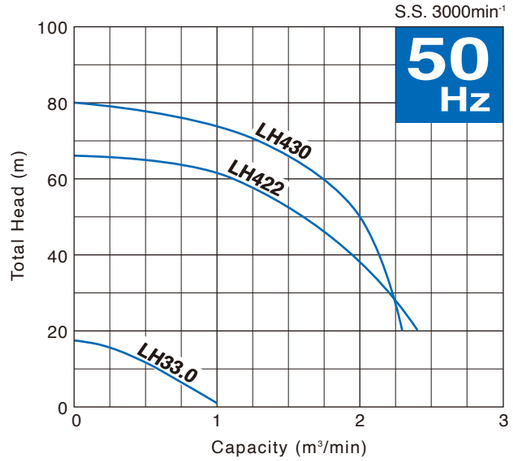

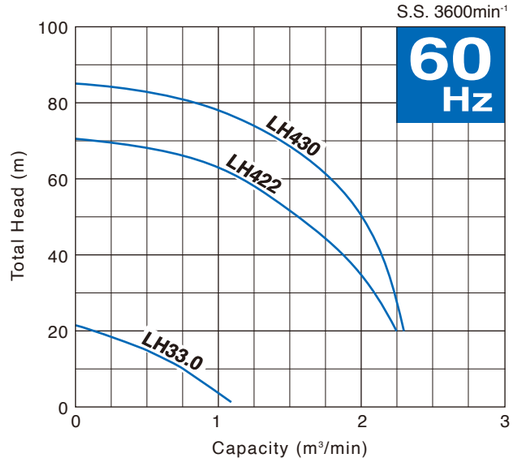

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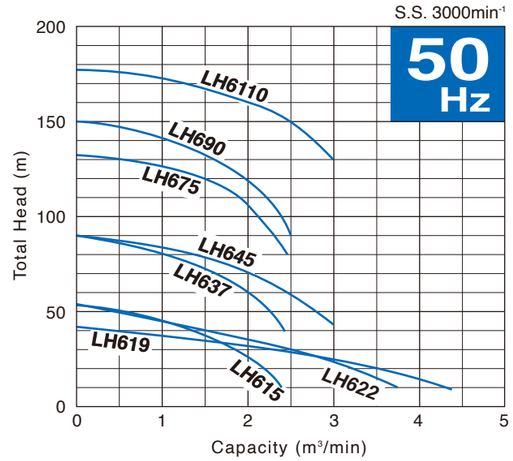

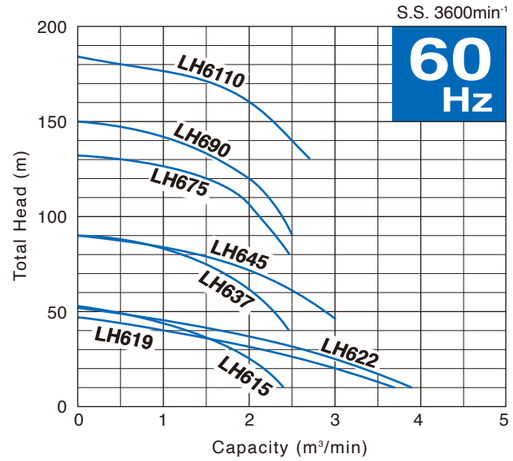

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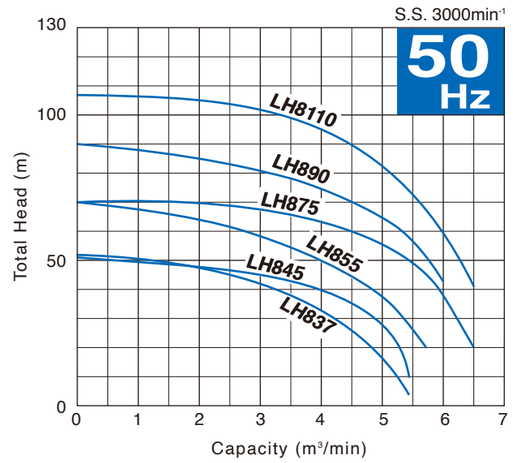
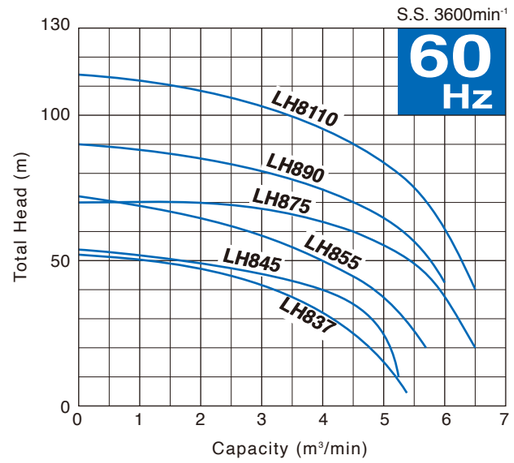




LH-W –Dual Impellers–

The LH-W-series is a submersible three-phase cast iron extra high head drainage pump having dual impellers. Being the pump cylindrical and slim, it can be installed in a well casing for deep well dewatering. The center flange construction assures a stable installation even if it is fixed by the discharge pipe.*1 The top discharge, flow-thru design provides maximum motor cooling efficiency allowing continuous operation at low water levels and extended dry-run capability. The pump incorporates seal pressure relief ports that prevent the pumping pressure from applying to the shaft seal.*2

*1 excluding LH4110W
*2 excluding LH23.0W

LH23.0W

LH311W

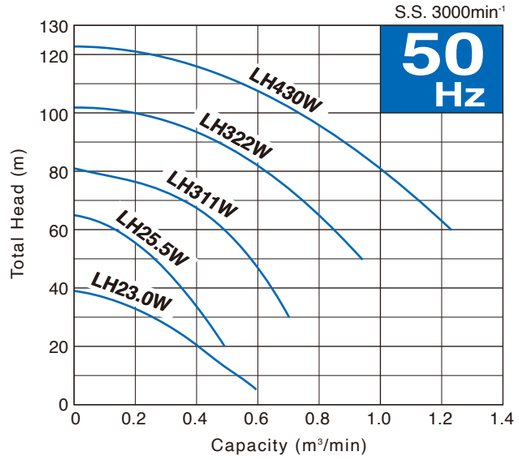
LH4110W

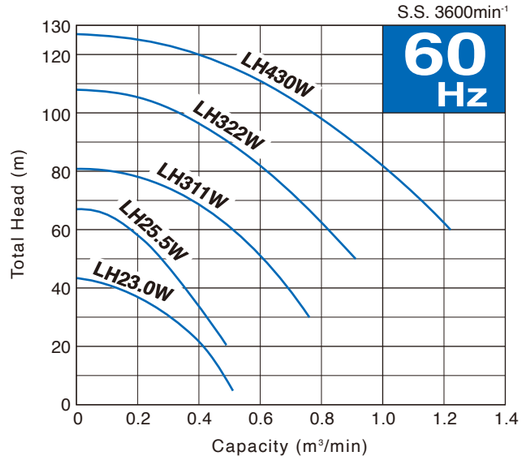
Discharge Bore mm	Model	Motor Output kW	Phase	Starting Method	Solids Passage mm	Dimensions L x H mm	Dry Weight*2 kg	Cable Length m
50	**LH23.0W**	3	Three	D.O.L.	6	185 x 630	46	20
50	**LH25.5W**	5.5		D.O.L.*1	6	254 x 750	80	20
80	**LH311W**	11		D.O.L.*1	8.5	270 x 1024	130	20
80	**LH322W**	22		D.O.L.*1	8.5	330 x 1235	304	20
100	**LH430W**	30		Star-Delta	8.5	365 x 1375	324	20
100	**LH4110W**	110		Star-Delta	8	616 x 1825	1270	20

*1 Star-Delta available upon request
*2 Weights excluding cable

Performance Curves

< 3-30kW >





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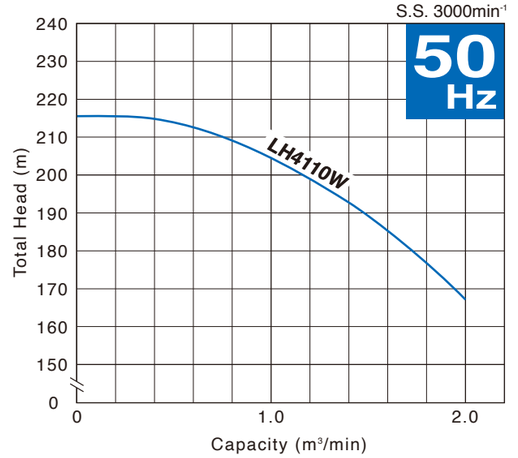
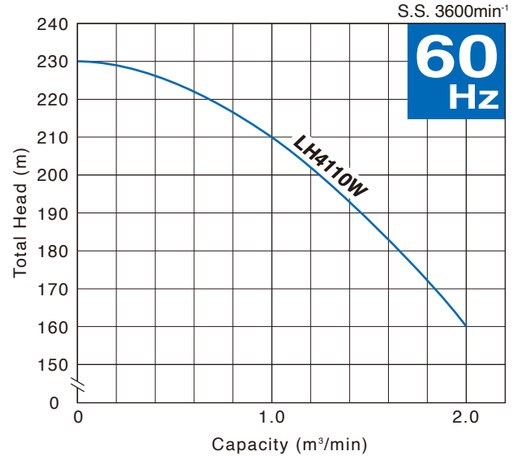




LH-D –Double Suction Impeller–

The LH-D-series are submersible pumps with 2-pole 110/185 kW motors, on which a double suction impeller is mounted to deliver assured performance in high volume, high head applications. These pumps were developed based on Tsurumi's LH-series that has built a long-standing name and reputation as a quality line of submersible high head drainage pumps in the mining and construction fields. With a max. capacity of 14 m³/min and max. head of 92 m, the LH10110D and LH12185D meet the needs of open-pit/underground mining, heap leaching and large-scale tunneling work.

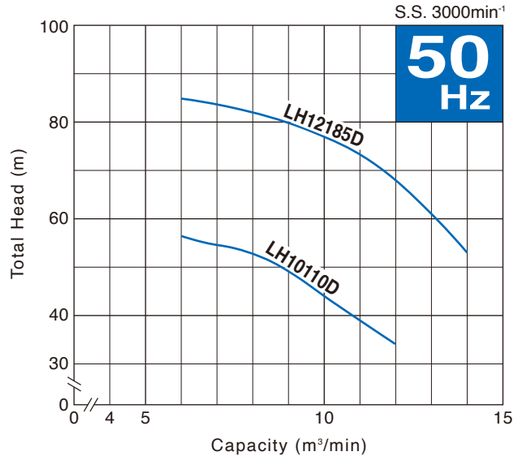
LH12185D

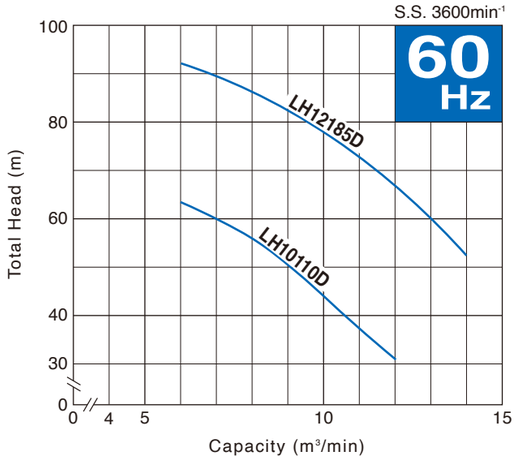
Discharge Bore mm	Model	Motor Output kW	Phase	Starting Method	Solids Passage mm	Dimensions L x H mm	Dry Weight* kg	Cable Length m
250	**LH10110D**	110	Three	Star-Delta	20	699 x 1853	1450	20
300	**LH12185D**	185		Star-Delta	20	773 x 2008	1950	20

* Weights excluding cable

Performance Curves

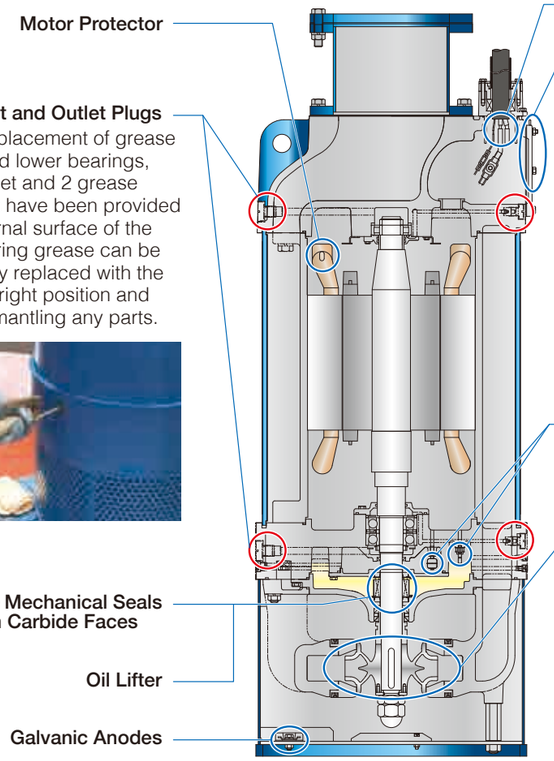
< 110 • 185kW >





Features

The biggest feature of LH-D-series is that they powerfully draw large volume of water from both upper and lower sides of the double suction impeller. This reduces thrust load, which extends the service-life of bearings and increases the stability of pumping operations. Moreover, in order to stand up to harsh conditions of use, the impeller and suction mouth are made of wear-resistant high-chromium cast iron.



Grease Inlet and Outlet Plugs

For easy replacement of grease in upper and lower bearings, 2 grease inlet and 2 grease outlet plugs have been provided on the external surface of the pump. Bearing grease can be conveniently replaced with the pump in upright position and without dismantling any parts.

Inspection Window

Equipped with an inspection window at the bottom of the stuffing box that facilitates cable maintenance.

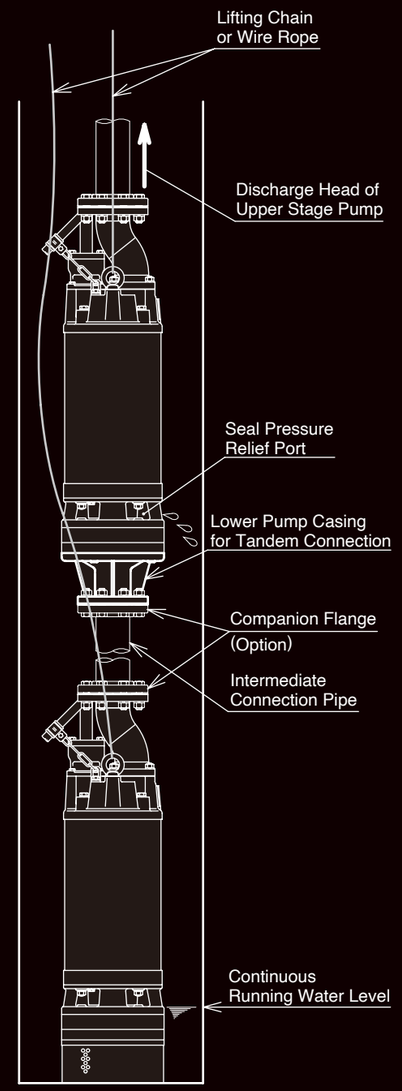
Leakage Sensors (Electrode and Float Type)

Double Suction Impeller

With its high efficiency suction mechanism, the double suction impeller enables higher volume performance. It also reduces the thrust load, which extends the service-life of bearings and increases the stability of pumping operations.

Tandem Operation

"Tandem operation" is an operation method that connects two pumps of the same model in series. This provides double pump head at the same flow rate in comparison with that of a single pump. The principle of tandem operation is the same as that with multistage pumps.



Precautions for Selection and Use

For model selection, piping and installation procedure, be sure to consult Tsurumi distributors in advance.

1. If the required total head exceeds the maximum head of the pump without the intermediate connection pipe shown in the selection table, insert a intermediate connection pipe of a length corresponding to the excess amount or more, to reduce the pressure applied to the pump in the upper stage.
2. Check the approximate weight of one pump and the allowable load for two eyebolts (per pump) shown in the selection table, and determine the piping weight, installation method and lifting procedure so that the allowable load is not exceeded.
3. The pump in the lower stage should be installed at the bottom of the vertical hole, unless special measures are taken. Do not suspend the pump in midair. Do not allow the weight of the upper pump and piping to be applied to the lower pump.
4. Since a certain amount of water spouts from the seal pressure relief port,* both the upper- and lower-stage pumps should be installed in the vertical hole. Do not use the pumps as booster pumps in the middle of a horizontal line lying on the ground.
   * excluding LH33.0 and LH23.0W
5. Do not connect pumps of different models in series. Do not use either of two connected pumps singly. Failure to observe these instructions may change the operating point improper, resulting in trouble.

Tandem Operation –LH / LH-W–

"Tandem operation" is an operation method that connects two pumps of the same model in series. This provides double pump head at the same flow rate in comparison with that of a single pump. The principle of tandem operation is the same as that with multistage pumps. The LH and LH-W series pumps adopt the center flange construction to align the discharge pipe with the cylindrical pump center axis*. Connecting the pumps in series with the tandem connector can provide higher pump head without affecting the advantage of the slim design. At construction sites, there are many cases where a higher pump head is required as construction work progresses. In such cases, the addition of a tandem pump may meet the required pump head, instead of using a new pump.

* Available as an option for separately purchased LH33.0 and LH23.0W.

LH23.0W
for Tandem Operation

LH430W
for Tandem Operation

Discharge Bore mm	Model	Motor Output kW	Starting Method	Max. Head in Tandem m	Max. Head w/o Intermediate Connection Pipe m	Dimensions L x H mm	Dry Weight *2 kg	Allowable Load on Eyebolts kg	Cable Length m
80	**LH33.0**	3	D.O.L.	36 / 44	33	185 x 731	54	150	20
50	**LH23.0W**	3	D.O.L.	78 / 86	50	185 x 759	59	150	20
50	**LH25.5W**	5.5	D.O.L.*1	130	97.5	254 x 808	96	220	20
80	**LH311W**	11	D.O.L.*1	162	121.5	270 x 1043	125	450	20
80	**LH322W**	22	D.O.L.*1	204 / 216	162	330 x 1255	365	950	20
100	**LH430W**	30	Star-Delta	246 / 254	190.5	365 x 1400	389	950	20

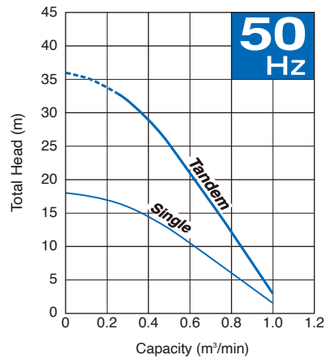
*1 Star-Delta available upon request

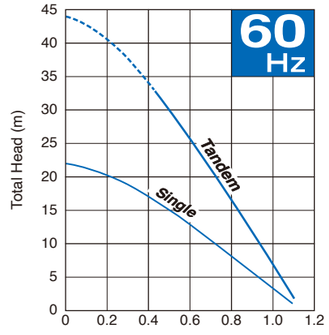
*2 Weights excluding cable

Performance Curves

The intermediate connection pipe is not required in the range indicated as a bold line on curves.
If the required total head exceeds the maximum head of the pump without an intermediate connection pipe (indicated as dashed line), an intermediate connection pipe of a length corresponding to the excess amount or more is required.

< LH33.0 >





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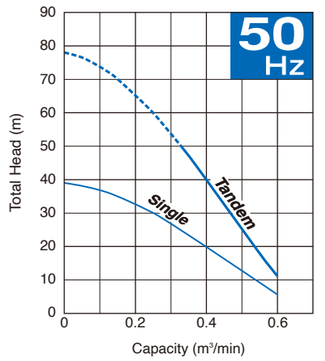

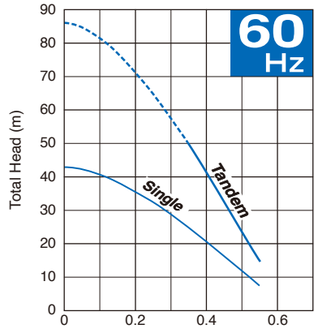

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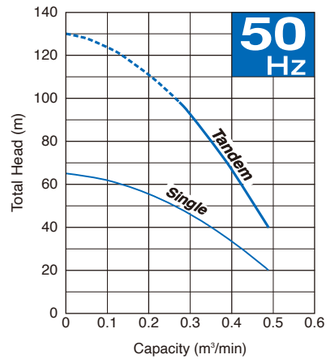

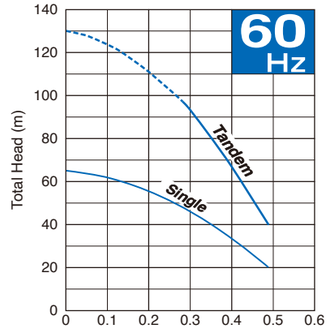

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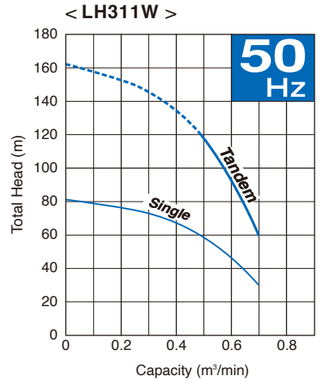

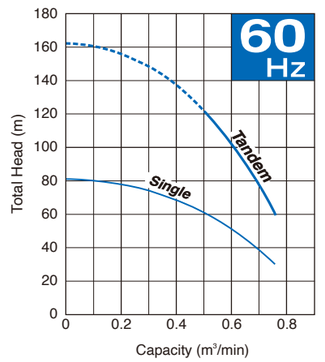

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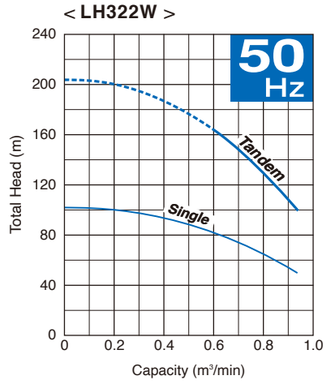

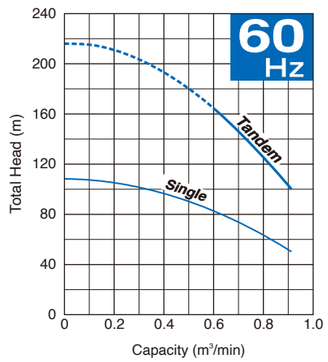

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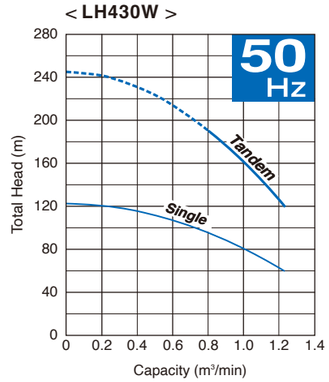
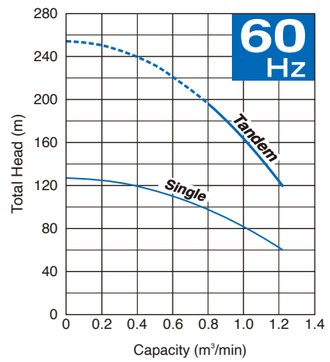




Specifications

		LH												LH			LH-W						LH-D	
		LH33.0	LH422	LH430	LH615	LH619	LH622	LH637	LH645	LH675	LH690	LH6110		LH837 LH845	LH855 LH875	LH890 LH8110	LH23.0W	LH25.5W	LH311W	LH322W	LH430W	LH4110W	LH10110D	LH12185D
PUMP	Discharge Bore mm	80	100		150									200			50		80		100		250	300
	Discharge Connection	Threaded Hose Connector	JIS 10kg/cm² Flange							JIS 20kg/cm² Flange				JIS 10kg/cm² Flange			Threaded Hose Connector	JIS 10kg/cm² Flange		JIS 20kg/cm² Flange			JIS 10kg/cm² Flange	
	Solids Passage mm	6			8.5	12		6		8	10			20			6		8.5			8	20	
	Impeller	Semi-open	Closed											Closed			Semi-open (Dual)	Closed (Dual)				Closed (Dual Back-to-back)	Double Suction	
		High-chromium Cast Iron												High-chromium Cast Iron										
	Mouth Ring / Suction Mouth	—	High-chromium Cast Iron											High-chromium Cast Iron			—	High-chromium Cast Iron						
	Labyrinth Ring	—	304 Stainless Steel								403 Stainless Steel			304 Stainless Steel	403 Stainless Steel		304 Stainless Steel					630 Stainless Steel	—	
	Casing	Gray Cast Iron / Ductile Cast Iron												Gray Cast Iron / Ductile Cast Iron										
	Shaft Seal	Dual Inside Mechanical Seals (with Oil Lifter)												Dual Inside Mechanical Seals (with Oil Lifter)										
		Silicon Carbide												Silicon Carbide										
	Shaft Sleeve	403 Stainless Steel												403 Stainless Steel								630 Stainless Steel	403 Stainless Steel	
	Galvanic Anode	—	Aluminium Alloy											Aluminium Alloy			—	Zinc		Aluminium Alloy				
MOTOR	Type	Continuous-duty Rated, Dry-type Induction Motor												Continuous-duty Rated, Dry-type Induction Motor										
	Output kW	3	22	30	15	19	22	37	45	75	90	110		37 45	55 75	90 110	3	5.5	11	22	30	110	185	
	Phase	Three												Three										
	Pole	2												2										
	Insulation	F	B	F	B			F						F			B				F			
	Starting Method	D.O.L.	D.O.L.*2	Star-Delta	D.O.L.*2			Star-Delta						Star-Delta			D.O.L.	D.O.L.*2			Star-Delta			
	Motor Protector (built-in)	CTP		MTP	CTP			MTP						MTP			CTP				MTP			
	Leakage Sensor (built-in)	—								Electrode				—	Electrode		—					Electrode	Electrode + Float	
	Lubricant ml	380	6900		3740	6900		4800		6100	8000			4800	6100	8000	380	720	800	2350		7800	6000	8000
		Turbine Oil (ISO VG32)												Turbine Oil (ISO VG32)										
	Frame	Gray Cast Iron												Gray Cast Iron										
	Outor Cover	Rolled Steel												Rolled Steel										
	Shaft	420 Stainless Steel												420 Stainless Steel										
	Power Cable m	20	10								20			10	20									
		Chloroprene Rubber												Chloroprene Rubber										
Dry Weight*1 kg		42	350	355	213	350	360	495	510	865	1100	1200		495 510	810 865	1150 1250	46	80	130	304	324	1270	1450	1950

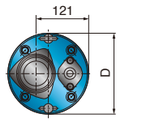
*1 Weights excluding cable *2 Star-Delta available upon request

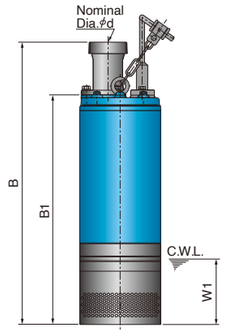
Dimensions

C.W.L.: Continuous Running Water Level

LH

< 80mm >





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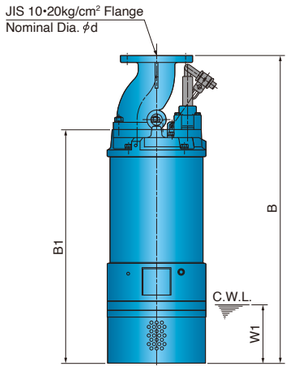

LH-W

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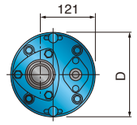

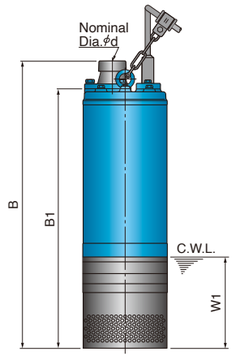

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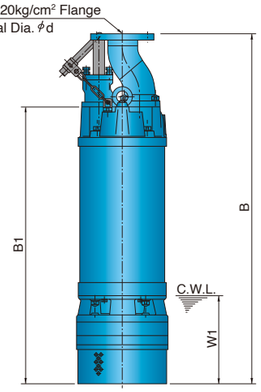
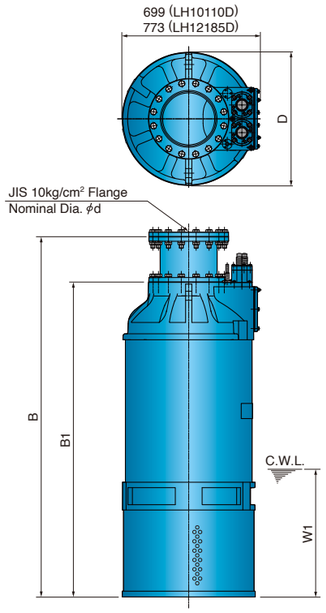


LH-D



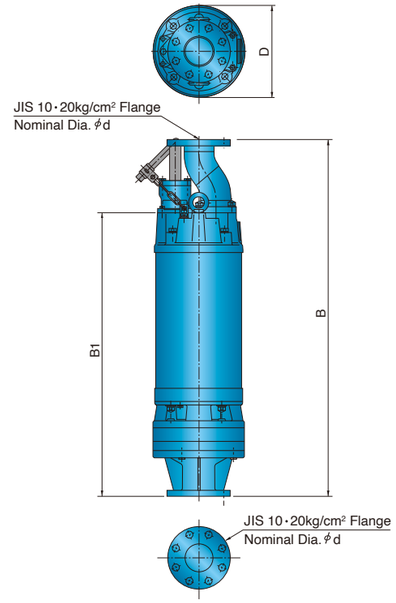
Unit: mm

Model		d	B	B1	D	W1
LH	**LH33.0**	80	645	524	185	150
	LH422	100	1352	1051	420	250
	LH430	100	1352	1051	420	250
	LH615	150	1014	777	330	185
	LH619	150	1423	1072	420	270
	LH622	150	1423	1072	420	270
	LH637	150	1448	1027	530	180
	LH645	150	1448	1027	530	180
	LH675	150	1676	1300	563	200
	LH690	150	1787	1385	592	200
	LH6110	150	1887	1485	616	200
	LH837	200	1488	1027	530	180
	LH845	200	1488	1027	530	180
	LH855	200	1716	1300	563	200
	LH875	200	1716	1300	563	200
	LH890	200	1787	1385	592	200
	LH8110	200	1887	1485	616	200
LH-W	**LH23.0W**	50	630	569	185	200
	LH25.5W	50	750	574	254	170
	LH311W	80	1024	809	270	200
	LH322W	80	1235	978	330	300
	LH430W	100	1375	1018	365	300
	LH4110W	100	1825	1626	616	380
LH-D	**LH10110D**	250	1853	1600	694	600
	LH12185D	300	2008	1755	743	700

Tandem Operation

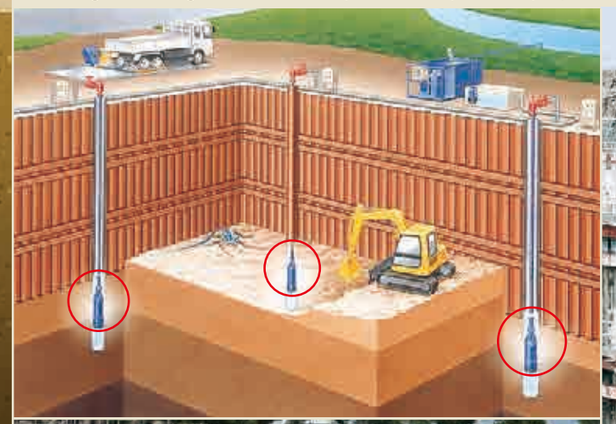
Unit: mm

Model	d	B	B1	D
LH33.0	80	731	510	185
LH23.0W	50	759	558	185
LH25.5W	50	808	632	254
LH311W	80	1043	828	270
LH322W	80	1255	998	330
LH430W	100	1400	1043	365



An excellent choice for deep well dewatering!

Tsurumi LH/LH-W series of submersible pumps are an excellent choice for worksites where deep well dewatering is used to deal with groundwater issues. Their slim body, high head performance and pressure-resistant construction meet the seepage and drainage challengesof excavated pits that require deeper, narrower wells.



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