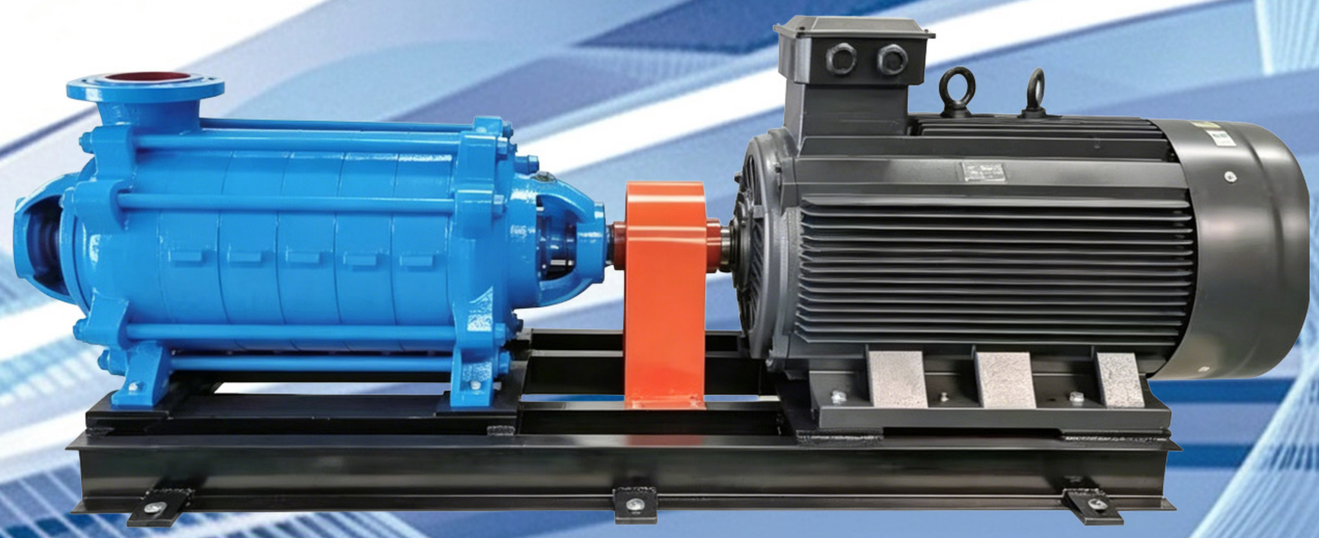
MD Series Multi-Stage Mining Pumps

User Manual



IVY-PUMP

Hebei Ivy Pump Industry Co., Ltd.

Safety Precautions

Dear Users:

For your safety, please be sure to carefully read these “Safety Precautions” and the “Product Installation and Operating Instructions” before installing or using the product.

1. The pump’s piping system—including the inlet and outlet pipes, as well as all fittings, seals, flanges, valves, etc.—must be properly matched to the pump’s operating pressure and the physical and chemical properties of the pumped medium, and must undergo a hydrostatic test at 1.5 times the operating pressure.

2. The pump discharge piping shall be equipped with an outlet control valve, a check valve, and monitoring and measuring instruments.

3. The pump unit must be installed on a separate concrete block foundation capable of supporting the unit’s weight and its dynamic loads. When the unit’s mass M ≥ 800 kg and the pump shaft power Pa ≥ 75 kW, the foundation must also be reinforced with 2 to 5 layers of horizontal and vertical rebar mesh.

4. The pump piping system shall have its own independent, sturdy support structure and stress-relieving, free-compensation devices. Elevated piping shall be installed at a sufficient safety height and shall include protective measures against impact and leakage, as well as clear and prominent safety markings.

5. Motor-driven pump units.For general applications, a Y-type motor should be used; for non-mining workfaces in mines, a YB2-type motor should be used; for mining workfaces in mines, a YBK2-type motor should be used. Cables, electrical starting and control equipment, as well as monitoring and measuring instruments, should be appropriately selected based on the motor’s rated power. Electrical circuits and equipment must maintain a safe distance from the pump’s inlet and outlet piping, and protective devices must be installed.

6. The drive and speed-changing mechanisms of the pump unit, as well as its exposed rotating parts, may pose a safety hazard. Safety warning signs must be posted, and test runs or operation without protective covers are strictly prohibited.

7. To prevent shaft breakage or even motor burnout caused by the pump shaft coming into contact with the motor shaft after the pump starts running, the pump shaft must first be pulled outward as far as possible toward the pump coupling before adjusting the clearance between the two couplings of the pump and motor. The clearance adjustment should then be performed in accordance with the instructions in the manual.

8. Generally, centrifugal pumps with medium to low specific speeds should be started with the discharge control valve closed (start with valve closed), while those with high specific speeds should be started with the valve open. Failure to do so may result in motor overload, discharge pipe rupture, damage to the pump casing, media leakage, and other avoidable malfunctions.

9. Before and during maintenance (e.g., oiling, packing replacement) or repairs (shutdown, disassembly and inspection, major overhaul) of the pump unit, the power supply must be disconnected, and a warning sign such as “Under Maintenance” must be posted.

10. If, during operation, the pump exhibits increased vibration, flow interruption, increased noise, or other abnormal conditions, it must be shut down immediately and the power supply disconnected. Operation may resume only after inspection or repair has been completed and confirmed to be satisfactory.

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*Our company is committed to product research and innovation; individual dimensions are subject to change without prior notice.

I. Overview

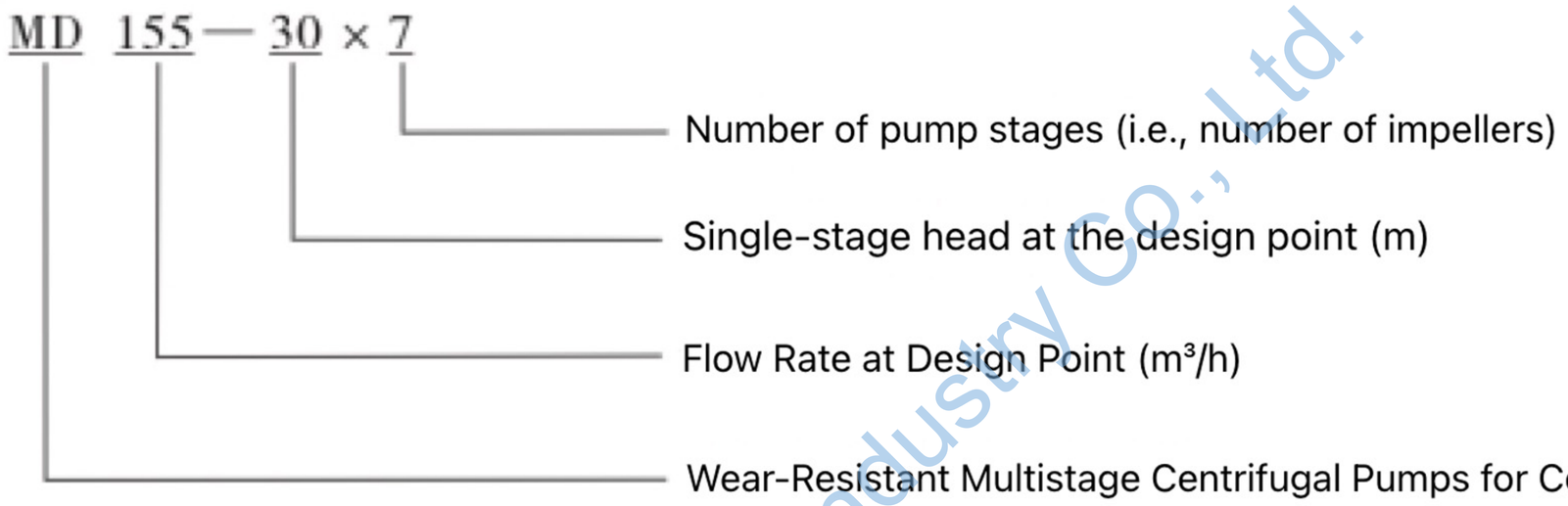
1.1 Standards for Instruction Manual Numbering: GB9969.1-1998 “General Rules for Instruction Manuals of Industrial Products”

1.2 Product Standards: MT/T114-2005 “Multistage Centrifugal Pumps for Coal Mines”
GB/T5657-1995 “Technical Conditions for Centrifugal Pumps (Class III)”
JB/T1051-1993 “Types and Basic Parameters of Multistage Clean Water Centrifugal Pumps”

1.3 The MD-type wear-resistant multistage centrifugal pump for mining applications is based on the D-type pump, with flow components made of wear-resistant materials. It offers excellent cavitation resistance, wear resistance, energy efficiency, and a long service life. It is suitable for use in coal mines, other mines, factories, and similar environments to transport neutral mine water or other similar wastewater containing solid particles not exceeding 1.5% (particle size less than 0.5 mm) and with a temperature not exceeding 40°C.

1.4 Performance Range of the Company’s Current Products (at Specified Points)
Flow Rate: 15-500 m³/h
Head: 82-650 m

1.5 Model Designation



II. Structural Description

The MD series pumps are horizontal, single-suction, multistage, segmented centrifugal pumps. Their structure primarily consists of the working chamber, rotor assembly, bearing assembly, shaft seal assembly, balancing device, and drive mechanism. See Figure 1 on page 2.

2.1 Working Chamber
It is primarily composed of the suction section, intermediate sections, and discharge section, which are arranged in series and secured with tension bolts; they are sealed from one another with paper gaskets. Sealing rings are installed on the suction section and intermediate sections, while guide vanes are installed on the discharge section and intermediate sections, with guide vane sleeves behind the guide vanes. The pump's discharge port is located on the discharge section and faces vertically upward; the suction port is located on the suction section and faces horizontally.

2.2 Rotor Assembly
This assembly consists primarily of the shaft, with the impeller, shaft sleeve, retaining sleeve, balancing disc, bearing retainer, and roller bearings mounted in series on the shaft and secured with shaft sleeve nuts and round nuts. A pump coupler is mounted on the shaft's protruding end, and a water-sealing ring is installed on the bearing retainer. The entire rotor is supported by bearings at both ends of the shaft.

2.3 Bearing Assembly
This assembly primarily consists of bearing housings mounted on both sides of the pump casing, bearing covers, oil nipples, and roller bearings mounted on the shaft. These bearings are lubricated with lithium-based grease.

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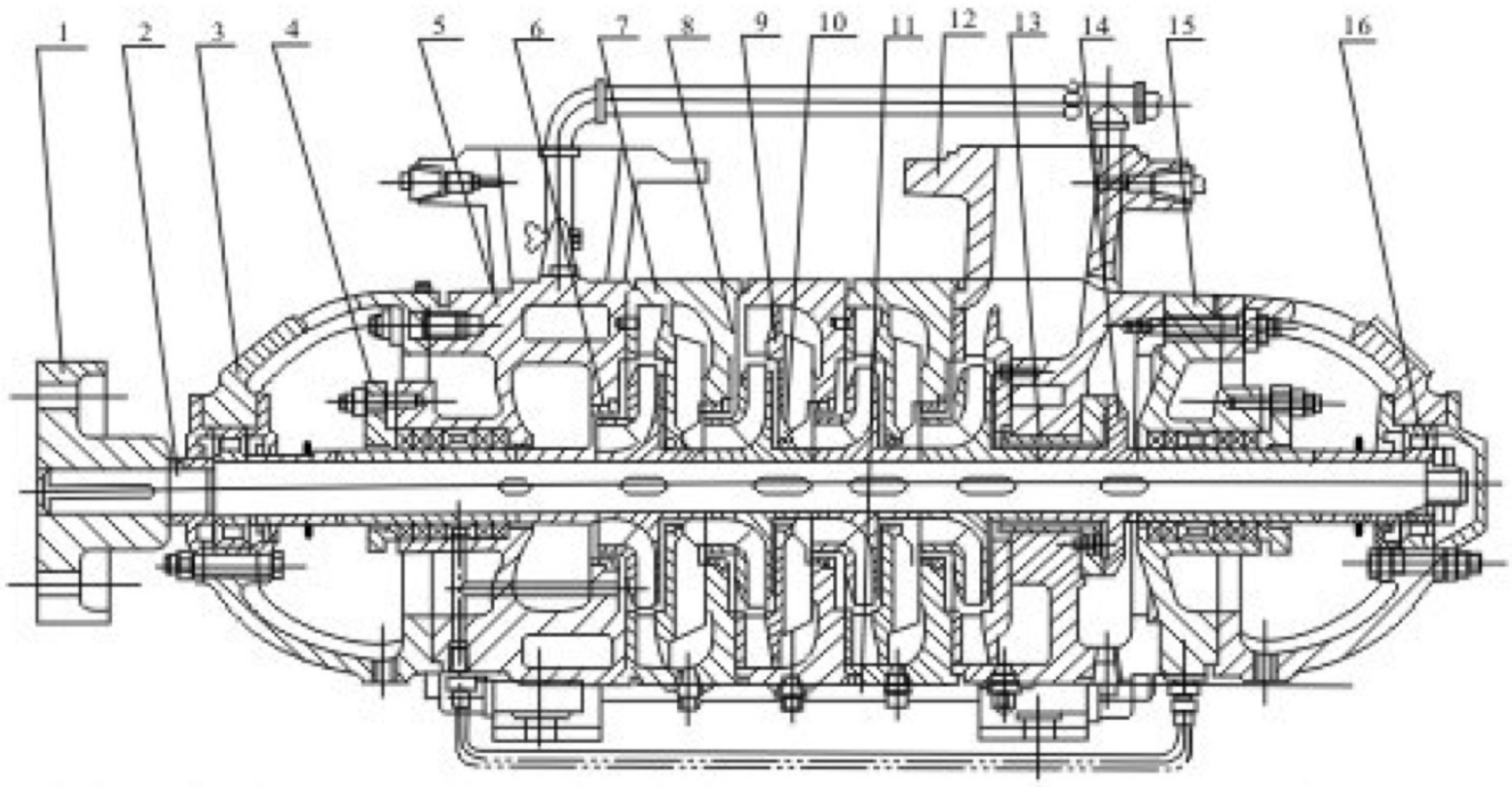

1. Pin - type coupling 2. Shaft 3. Rolling bearing assembly 4. Packing gland 5. Suction section 6. Sealing ring 7. Intermediate section 8. Impeller 9. Guide vane 10. Guide vane sleeve 11. Tensioning bolt 12. Discharge section 13. Balancing sleeve (ring) 14. Balancing disc 15. Packing gland body 16. Bearing

Figure 1: Structural Diagram of the MD Series Multi-Stage Wear-Resistant Mining Pump

2.4 Shaft Seal Assembly

Shaft seal assemblies are installed on both sides of the pump casing and primarily consist of the stuffing box, packing rings (also known as water seal rings), packing, packing gland, and water seal pipe.

2.5 Balancing Assembly

This assembly consists of a stator balancing ring fixed to the rear wall of the discharge section, a rotor balancing disc mounted on the shaft, and a balancing pipe connecting the balancing chamber to the suction chamber. To ensure effective balancing of axial forces, the balancing pipe must remain unobstructed at all times.

2.6 Drive Mechanism

It consists of the pump coupling, the motor coupling, and a pin assembly with elastic rings.

The pump rotates clockwise when viewed from the drive end.

III. Unpacking and Inspection of the Pump

Upon delivery of the pump to the user, the completeness, integrity, and condition of the entire unit and technical documentation should be checked against the “Product Packing List.” If any missing or damaged items are discovered, the transportation department or the pump manufacturer should be notified immediately to ensure a timely and proper resolution.

IV. Pump Lifting and Handling

The pump must be lifted evenly and steadily to prevent swaying and collisions; particular care must be taken to avoid damaging the machined mating surfaces of the pump coupling shaft. When lifting pumps with narrow, elongated bases, additional lanyards or other effective measures should be used to prevent deformation or breakage. Foreign objects must not be allowed to enter the pump or motor during handling.

V. Pump Installation

Refer to the installation diagram and installation dimension table.

5.1 Pump Foundation

The pump foundation must be a concrete base of sufficient strength and dimensions. The mass of the foundation should be approximately 3 to 5 times the mass of the unit. The foundation should extend 50 to 70 mm beyond the pump base, and anchor bolt holes (with a diameter 3 to 4 times that of the anchor bolts) must be provided.

5.2 Leveling the Base

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Place steel shims and wedges under the base, typically at the locations of the anchor bolts. If the base is long, one or more shims may be added between two anchor bolts.

Place a straightedge or level on the machined surface where the pump and motor feet are to be installed. Use shims or adjustment pads to ensure the base is level in all directions; it is recommended that the unevenness be less than 0.25 mm per 100 mm of length.

5.3 Base Grouting

Grouting may only be performed after the base has been leveled and the foundation is stable. During grouting, ensure that all air is completely expelled from each cavity. Once the grout has cured, tighten the nuts on the anchor bolts to prevent loosening during operation or the generation of unnecessary vibration and noise.

5.4 Unit Alignment

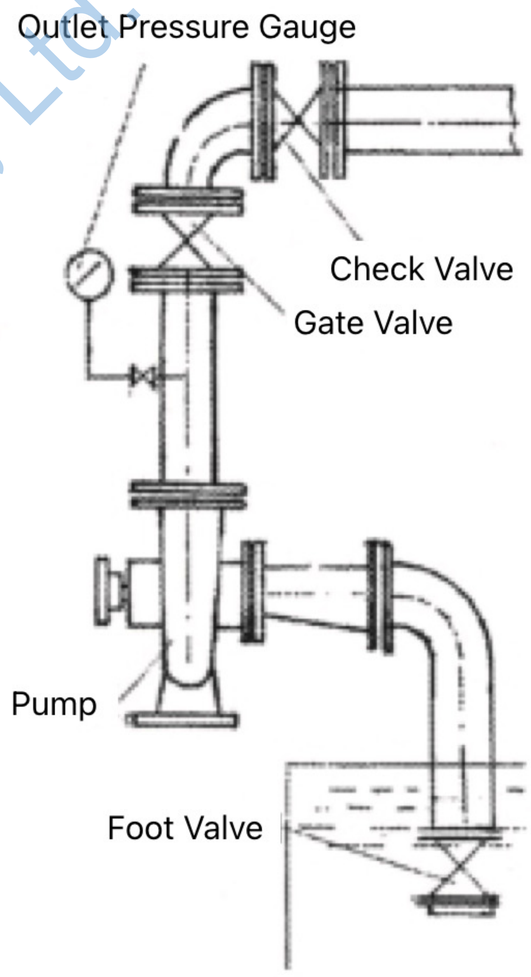
5.4.1 For direct drive between the pump and motor, the pump shaft and motor shaft must be coaxial. The motor coupling and pump coupling must be aligned horizontally and vertically, with misalignment at corresponding positions not exceeding 0.08 mm.There should be a clearance of 3–5 mm between the two when the pump shaft is pulled toward the motor in the axial direction, and this clearance should be uniform around the circumference, with the difference between the widest and narrowest points not exceeding 0.06 mm.

5. *5* Piping Connections

5.5.1 The pump piping system must have its own independent, sturdy support structure and stress-relieving, free-compensation devices; the weight and stress of the piping system must not act directly on the pump's inlet or outlet.

5.5.2 The flange surfaces of the piping connected to the pump's inlet and outlet shall align with the pump's inlet and outlet surfaces. If misalignment occurs between the two surfaces, adjust the piping or piping flanges; do not force the two surfaces to align by tightening flange bolts or using a pry bar, as this may cause flange fracture, misalignment, uneven rotor wear, or pump damage.

5.5.3 Please refer to the piping installation diagram when installing the pump's piping.



VI. Pump Operation

6.1 The following principles must be observed when operating the pump:

6.1.1 Pumps shall be used for their specified purposes and within their applicable ranges. Clean water pumps must not be used to transport abrasive or corrosive liquids, and the medium temperature shall not exceed the specified limit;

6.1.2 Pumps should be operated within their permissible operating range or specified high-efficiency zone; operation under conditions of excessive flow, pressure, speed, or load is not permitted;

6.1.3 Pumps should operate without cavitation; they must not be used under conditions of cavitation, flow interruption, insufficient water supply, or continuous release of large amounts of gas from the liquid;

6.1.4 The pump shall operate safely, smoothly, with normal temperature rise, and at high efficiency and economy; it must not be operated under abnormal conditions such as increased noise, severe vibration, excessive temperature rise, severe friction, overload, or a sharp decline in performance.

6.2 Pre-Startup Inspection and Preparation

6.2.1 Disconnect the drive mechanism between the pump and the motor. Start the motor separately to check its rotation direction and no-load characteristics. Once the rotation direction and no-load characteristics are confirmed to meet requirements, reconnect the drive mechanism;

6.2.2 Check the axial play and operational condition of the pump shaft. Once it is confirmed that the pump shaft has 2–5 mm of axial play and that both the play and operation are smooth and uniform, push the axial play of the pump shaft toward the discharge side of the pump to disengage the balance disc from the balance ring. This reduces the pump's starting load and prevents dry grinding between the balance disc and the balance ring before high-pressure water enters the balance chamber.

6.2.3 Check the bearing operation and lubrication condition, and fill with No. 2 or No. 3 stator oil up to the level indicated on the oil sight glass;

6.2.4 Whether using back-filling or vacuum suction, water must be injected into the pump, and the pump body and entire inlet piping system must be completely filled with water and all air must be purged;

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and check the pump body and piping system for any leaks or air ingress.

6.3 Pump Startup

6.3.1 Close the discharge valve; if a backflow prevention device is installed, fully open both the inlet and discharge valves. Note: The pump must not be started with the discharge valve fully open and the pump under full load; nor should it be started or operated with the inlet valve closed or with the inlet flow restricted;

6.3.2 Start the motor, turn on the pump inlet vacuum gauge and outlet pressure gauge, and activate the electrical monitoring and control instruments and gauges. Closely observe the pump's vacuum level and discharge pressure, as well as the motor's starting, running, and load conditions. Once it is confirmed that the motor and pump have reached normal speed, gradually open the pump's discharge valve until the pump delivers water normally and the motor is not overloaded.Note: The above process must be completed within a very short period of time. Failure to do so will cause the rotor and stator inside the pump to overheat, resulting in grinding and shaft seizure;

6.3.3 Open the pressure gauges and flow meters in the piping system, and closely monitor the system's operating condition. The entire startup process is complete only when it is confirmed that the pump, motor, and associated system are operating safely, smoothly, with normal temperature rise, and at high efficiency and economy.

VII. Pump Maintenance and Care

7.1 Pump Operation and Maintenance

7.1.1 The pump shall be operated and used under conditions that comply with Section 6.1;

7.1.2 The lubrication, oil seals, temperature rise, and operating condition of the bearings should be checked at all times. For pumps in initial use, the lubricating oil should be replaced after 100 hours of operation, and thereafter every 2,000 hours of operation. Care should be taken to replenish the lubricating oil regularly;

7.1.3 The sealing, lubrication, temperature rise, and flow rate and pressure of the water seal should be checked at all times. Replace the packing with new packing periodically. The packing gland should not be tightened too much nor left too loose. The shaft seal leakage rate should comply with the provisions in Table 1:

Table 1 Shaft Seal Leakage Rate

Pump Flow Rate m^3/h	≤50	>50–100	>100–300	>300–1000
Shaft seal leakage rate m1/min	≤15	≤20	≤30	≤40

7.1.4 Frequently observe and test the pressure, flow rate, head, current, voltage, speed, and power of the pump, motor, and their associated systems, and maintain detailed operating logs. Always ensure the efficient and economical operation of the pump, motor, and their associated systems. When wear, cavitation, corrosion, or damage to the flow components of the pump and its piping system causes a deviation from normal operating conditions or prevents normal operation, adjustments, repairs, or replacements should be performed promptly.

7.2 Pump Shutdown and Maintenance

7.2.1 To shut down a pump, close the discharge valve, disconnect the vacuum gauge, turn off the power supply, and close the pressure gauge in that order. For backflow prevention devices, the inlet valve should be closed last, after the pump has come to a complete stop. Note: The pump must not be shut down with the inlet valve already closed or controlled.

7.2.2 After the pump is shut down, if the ambient temperature is below 0°C, all water inside the pump must be completely drained.

7.2.3 If the pump is to be taken out of service for an extended period, it should be completely disassembled in accordance with the procedures and methods outlined in Sections 7.1 and 7.2, wiped clean, coated with rust-preventive oil, and properly stored.

7.2.4 For pumps in storage or on-site as spares, rotate the shaft 1/4 turn weekly to prevent static bending of the pump shaft.

7.2.5 For pumps that have been idle for an extended period without being disassembled and stored, they must be disassembled and reassembled before being put back into service.

VIII. Pump Troubleshooting

If a pump malfunctions or fails to operate normally, it must be thoroughly inspected, carefully analyzed, and properly addressed. Refer to the table below for troubleshooting procedures:

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Fault	Cause	Solution
1. Pump fails to deliver water; pressure gauge and vacuum gauge vibrate violently.	Insufficient water filled into the pump; air not completely purged; air leakage in suction pipeline, pump shaft seal and suction chamber; insufficient submergence depth of foot valve and too small wall-clearance, resulting in vortex at water inlet.	Seal air-leaking points; fill with water completely; purge air; increase submergence depth; enlarge wall-clearance to eliminate vortex.
2. Pump fails to deliver water; vacuum gauge indicates high vacuum.	Foot valve not opened or blocked; suction pipeline blocked or excessive resistance loss; excessive installation height; system NPSH less than pump required NPSHr.	Open foot valve; clear blockage; reduce pipeline loss; lower installation height or raise water level; increase system NPSH.
3. Pump delivers water, but no water discharges at pipeline outlet.	Excessive resistance of piping system; wrong rotation direction or low rotating speed; partial blockage of impeller flow passages; mismatch between system characteristics and pump characteristics; system head higher than pump head.	Reduce pipeline resistance loss; adjust rotation direction or increase rotating speed; clear blockage; adjust system head to match pump head properly.
4. Insufficient pump flow rate and head.	Excessive resistance of piping system; air leakage in suction pipeline, pump shaft seal and suction chamber; partial blockage of piping system or impeller flow passages; low rotating speed; insufficient submergence depth and too small wall-clearance causing inlet vortex; severe wear of flow-passing parts; system head higher than pump head.	Reduce pipeline resistance loss; eliminate air leakage and clear blockages; increase rotating speed; increase submergence depth; enlarge wall-clearance; eliminate vortex; replace worn parts; adjust system head to match pump head.
5. Excessive pump flow rate.	Mismatch between system characteristics and pump characteristics; pump head higher than system head; excessively high rotating speed.	Match pump head properly; adjust operating conditions; reasonably adjust rotating speed.
6. Excessive pump shaft power or motor overload.	Over-compressed packing gland; packing overheating; internal friction inside pump; bearing damage; misalignment of unit; jamming of balance disc and balance ring; excessively high rotating speed; excessive flow rate; unbalanced three-phase power supply or motor.	Adjust packing gland compression; eliminate friction; replace bearings; perform alignment; clear balance water pipe; adjust rotating speed and operating conditions; resolve unbalanced current of power supply or motor.
7. Excessive bearing temperature rise.	Excessive, insufficient or contaminated grease; unit misalignment; misalignment of bearing housing; bearing damage.	Replace grease; perform proper alignment; replace misaligned parts; replace bearings.
8. Severe shaft seal leakage.	Dry, failed or improperly-sized packing; shaft sleeve wear.	Replace qualified packing or shaft sleeve.
9. Severe air leakage at shaft seal or excessive temperature rise.	Misaligned position of water-seal ring and water-seal inlet; insufficient pressure or flow of sealing water; unclean sealing water.	Adjust position of water-seal ring; increase pressure or flow of sealing water; inject clean sealing water.
10. Severe pump vibration and noise.	Insufficient foundation strength or too light mass, hollow or loose foundation; misalignment and insecure mounting between pump and motor; unbalanced pump impeller or motor fan; loose rotor assembly or internal friction; foreign matters or debris inside pump; excessively large or small flow rate; pump priming loss, cavitation or inlet vortex; excessively tight bearing rotation or raceway scraping; fractured bearing bracket.	Reinforce foundation strength; eliminate hollowing or loosening; perform alignment; fix pump and motor; replace unbalanced components; fasten pump rotor; remove foreign matters/debris and eliminate internal friction; adjust operating conditions; improve pump water-inlet condition to eliminate vortex; replace bearings.

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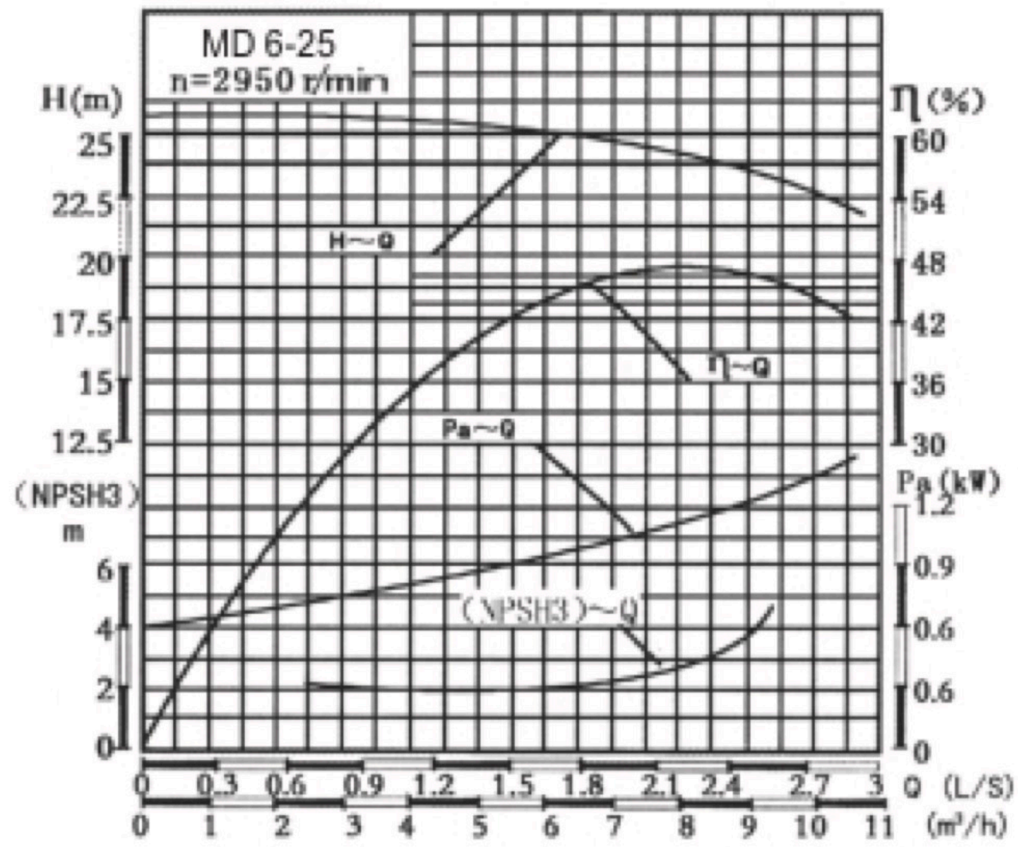
IX. Performance Curves and Operating Performance Table



MD 6–25 Pump Performance Table

Pump Model	Flow Rate Q		Head H	Rotational Speed n	Power (kW)		Efficiency	Required NPSH (NPSHr)	Impeller Diameter	Weight
	(m^3/h)	(L/S)	(m)	(r/min)	Shaft Power	Motor Power	η (%)	(m)	D (mm)	W (kg)
MD 6-25×3	3.75	1.04	76.5	2950	2.37	5.5	33	2.0	138	95
	6.3	1.75	75		2.86		45	2.0		
	7.5	2.08	73.5		3.20		47	2.5		
MD 6-25×4	3.75	1.04	102		3.16	7.5	33	2.0		106
	6.3	1.75	100		3.81		45	2.0		
	7.5	2.08	98		4.27		47	2.5		
MD 6-25×5	3.75	1.04	127.5		3.95	7.5	33	2.0		117
	6.3	1.75	125		4.77		45	2.0		
	7.5	2.08	122.5		5.33		47	2.5		
MD 6-25×6	3.75	1.04	153		4.75	11	33	2.0		128
	6.3	1.75	150		5.72		45	2.0		
	7.5	2.08	147		6.40		47	2.5		
MD 6-25×7	3.75	1.04	178.5		5.53	11	33	2.0		138
	6.3	1.75	175		6.67		45	2.0		
	7.5	2.08	171.5		7.47		47	2.5		
MD 6-25×8	3.75	1.04	204		6.31	15	33	2.0		149
	6.3	1.75	200		7.63		45	2.0		
	7.5	2.08	196		8.53		47	2.5		
MD 6-25×9	3.75	1.04	229.5		7.10	15	33	2.0		159
	6.3	1.75	225		8.58		45	2.0		
	7.5	2.08	220.5		9.60		47	2.5		
MD 6-25×10	3.75	1.04	255		7.90	18.5	33	2.0		170
	6.3	1.75	250		9.54		45	2.0		
	7.5	2.08	245		10.67		47	2.5		
MD 6-25×11	3.75	1.04	280.5		8.68	18.5	33	2.0		180
	6.3	1.75	275		10.50		45	2.0		
	7.5	2.08	269.5		11.73		47	2.5		
MD 6-25×12	3.75	1.04	306		9.47	18.5	33	2.0		191
	6.3	1.75	300		11.44		45	2.0		
	7.5	2.08	294		12.80		47	2.5		

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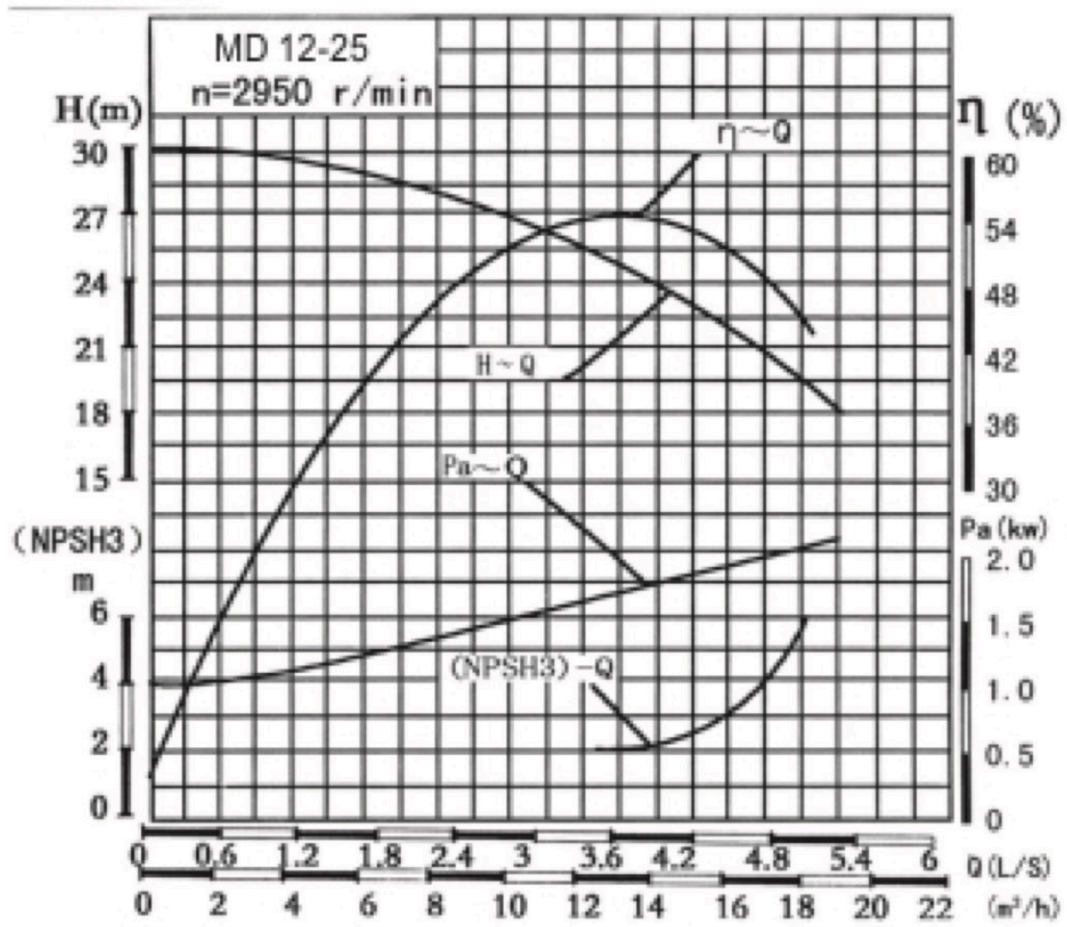

MD 12—25 Pump Performance Table

Pump Model	Flow Rate Q		Head H	Rotational Speed n	Power (kW)		Efficiency	Required NPSH (NPSHr)	Impeller Diameter	Weight
	(m^3/h)	(L/S)	(m)	(r/min)	Shaft Power	Motor Power	η (%)	(m)	D (mm)	W (kg)
MD 12-25×3	7.5	2.08	84.6	2950	3.93	7.5	44	2.0	146	101
	12.5	3.47	75		4.73		54	2.0		
	15.0	4.17	69		5.32		53	2.5		
MD 12-25×4	7.5	2.08	112.8		5.24	11	44	2.0		112
	12.5	3.47	100		6.31		54	2.0		
	15.0	4.17	92		7.09		53	2.5		
MD 12-25×5	7.5	2.08	141		6.55	11	44	2.0		123
	12.5	3.47	125		7.88		54	2.0		
	15.0	4.17	115		8.87		53	2.5		
MD 12-25×6	7.5	2.08	169.2		7.86	15	44	2.0		133
	12.5	3.47	150		9.46		54	2.0		
	15.0	4.17	138		10.64		53	2.5		
MD 12-25×7	7.5	2.08	197.4		9.17	15	44	2.0		144
	12.5	3.47	175		11.04		54	2.0		
	15.0	4.17	161		12.41		53	2.5		
MD 12-25×8	7.5	2.08	225.6		10.48	18.5	44	2.0		154
	12.5	3.47	200		12.62		54	2.0		
	15.0	4.17	184		14.18		53	2.5		
MD 12-25×9	7.5	2.08	253.8		11.78	18.5	44	2.0		165
	12.5	3.47	225		14.19		54	2.0		
	15.0	4.17	207		15.96		53	2.5		
MD 12-25×10	7.5	2.08	282		13.10	22	44	2.0		175
	12.5	3.47	250		15.76		54	2.0		
	15.0	4.17	230		17.74		53	2.5		
MD 12-25×11	7.5	2.08	310.2		14.41	22	44	2.0		185
	12.5	3.47	275		17.34		54	2.0		
	15.0	4.17	253		19.51		53	2.5		
MD 12-25×12	7.5	2.08	338.4		15.72	30	44	2.0		203
	12.5	3.47	300		18.92		54	2.0		
	15.0	4.17	276		21.20		53	2.5		

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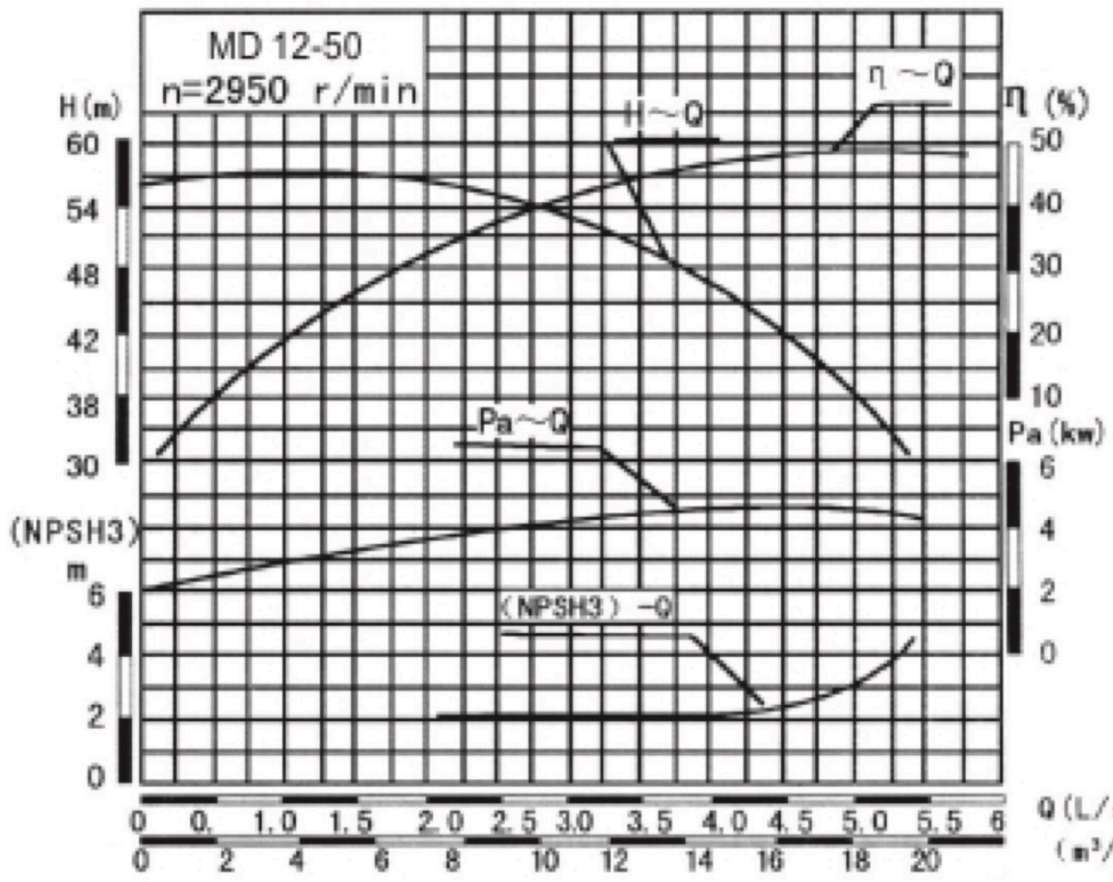
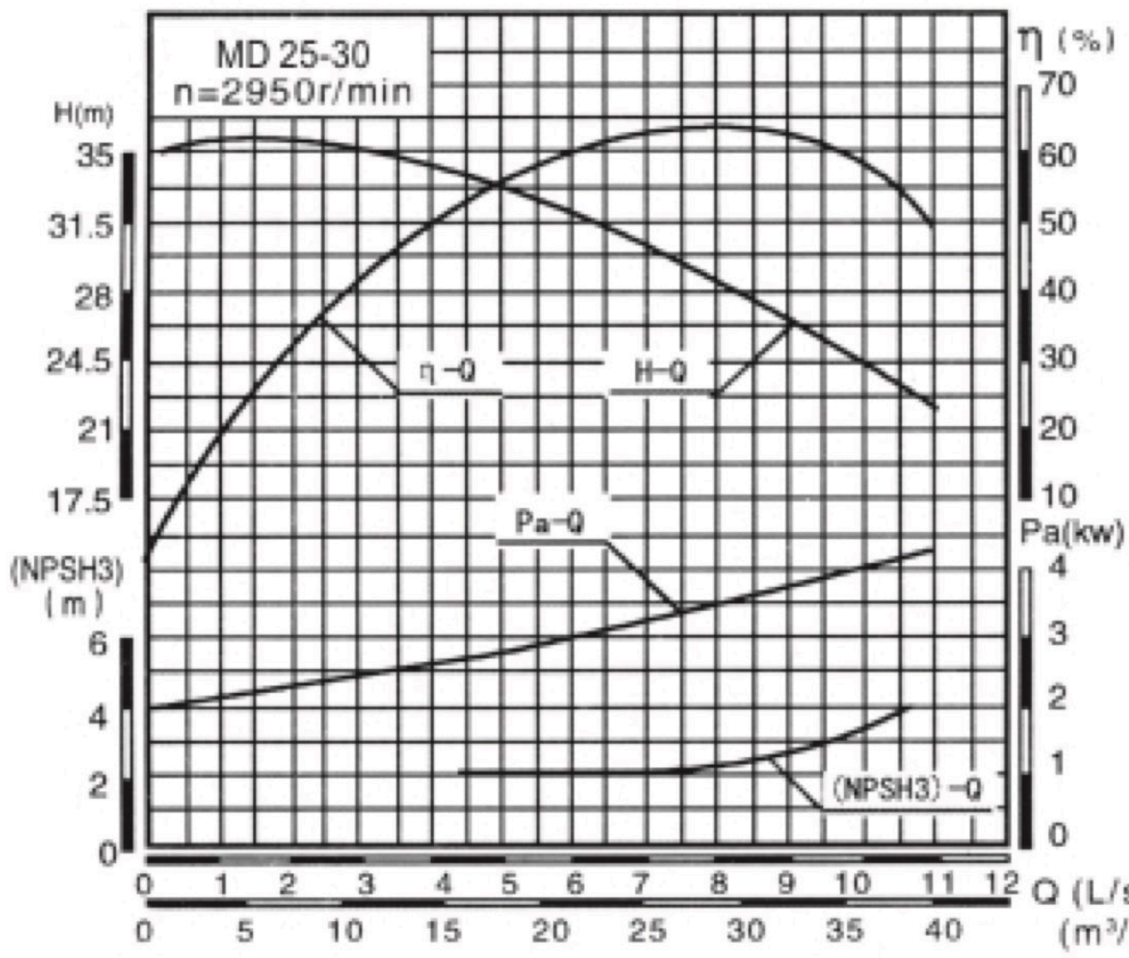


MD 12—50 Pump Performance Table

Pump Model	Flow Rate Q		Head H	Rotational Speed n	Power (kW)		Efficiency	Required NPSH (NPSHr)	Impeller Diameter	Weight
	(m³/h)	(L/S)	(m)	(r/min)	Shaft Power	Motor Power	η (%)	(m)	D (mm)	W (kg)
MD 12-50×3	9	2.5	165	2950	11.6	15	38.6	2.0	200	268
	12.5	3.47	150		12.5		42	2.0		
	15	4.17	135		13.5		43	2.5		
MD 12-50×4	9	2.5	220		15.4	22	38.6	2.0		289
	12.5	3.47	200		16.7		42	2.0		
	15	4.17	180		18		43	2.5		
MD 12-50×5	9	2.5	275		19.3	30	38.6	2.0		310
	12.5	3.47	250		20.8		42	2.0		
	15	4.17	225		22.5		43	2.5		
MD 12-50×6	9	2.5	330		23.1	30	38.6	2.0		331
	12.5	3.47	300		25.0		42	2.0		
	15	4.17	270		27.0		43	2.5		
MD 12-50×7	9	2.5	385		27.0	37	38.6	2.0		352
	12.5	3.47	350		29.1		42	2.0		
	15	4.17	315		31.5		43	2.5		
MD 12-50×8	9	2.5	440		30.8	45	38.6	2.0		373
	12.5	3.47	400		33.3		42	2.0		
	15	4.17	360		36.0		43	2.5		
MD 12-50×9	9	2.5	495		34.2	45	38.6	2.0		394
	12.5	3.47	450		37.5		42	2.0		
	15	4.17	405		40.5		43	2.5		
MD 12-50×10	9	2.5	550		38.5	55	38.6	2.0		415
	12.5	3.47	500		41.6		42	2.0		
	15	4.17	450		45.0		43	2.5		
MD 12-50×11	9	2.5	605		42.4	55	38.6	2.0		436
	12.5	3.47	550		45.8		42	2.0		
	15	4.17	495		46.5		43	2.5		
MD 12-50×12	9	2.5	660		49.2	55	38.6	2.0		457
	12.5	3.47	600		50.0		42	2.0		
	15	4.17	540		54.0		43	2.5		

Hebei Ivy Pump Industry Co., Ltd.



MD 25—30 Pump Performance Table

Pump Model	Flow Rate Q		Head H	Rotational Speed n	Power (kW)		Efficiency	Required NPSH (NPSHr)	Impeller Diameter	Weight
	(m³/h)	(L/S)	(m)	(r/min)	Shaft Power	Motor Power	η (%)	(m)	D (mm)	W (kg)
MD 25-30×3	15	4.17	102	2950	8.34	15	50	2.0	160	175
	25	6.94	90		9.89		62	2.0		
	30	8.33	82.5		10.71		63	2.5		
MD 25-30×4	15	4.17	136		11.12	18.5	50	2.0		192
	25	6.94	120		13.19		62	2.0		
	30	8.33	110		14.28		63	2.5		
MD 25-30×5	15	4.17	170		13.90	22	50	2.0		209
	25	6.94	150		16.48		62	2.0		
	30	8.33	137.5		17.85		63	2.5		
MD 25-30×6	15	4.17	204		16.68	30	50	2.0		225
	25	6.94	180		19.78		62	2.0		
	30	8.33	165		21.42		63	2.5		
MD 25-30×7	15	4.17	238		19.46	30	50	2.0		242
	25	6.94	210		23.10		62	2.0		
	30	8.33	192.5		24.99		63	2.5		
MD 25-30×8	15	4.17	272		22.24	37	50	2.0		259
	25	6.94	240		26.40		62	2.0		
	30	8.33	220		28.56		63	2.5		
MD 25-30×9	15	4.17	306		25.02	37	50	2.0		276
	25	6.94	270		29.67		62	2.0		
	30	8.33	247.5		32.13		63	2.5		
MD 25-30×10	15	4.17	340		27.80	45	50	2.0		293
	25	6.94	300		32.96		62	2.0		
	30	8.33	275		35.70		63	2.5		

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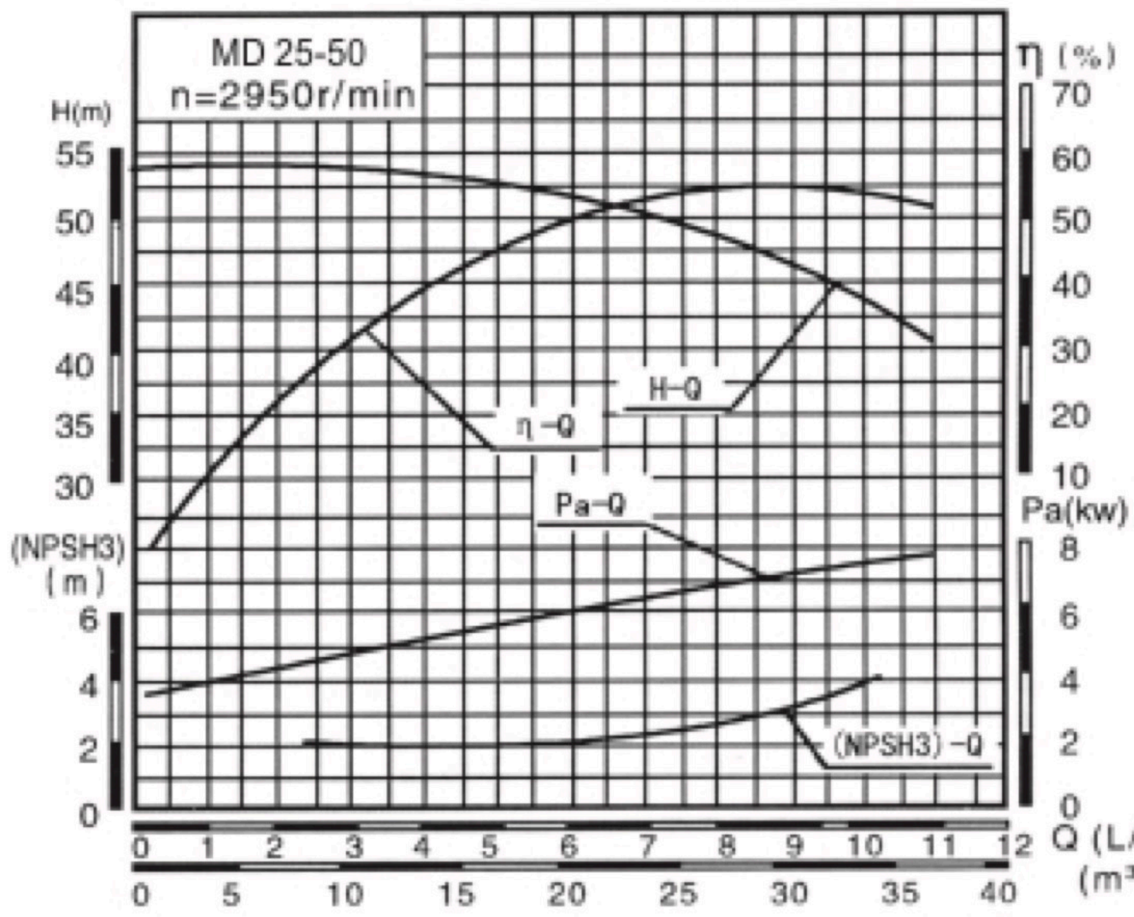

MD 25—50 Pump Performance Table

Pump Model	Flow Rate Q		Head H	Rotational Speed n	Power (kW)		Efficiency	Required NPSH (NPSHr)	Impeller Diameter	Weight
	(m^3/h)	(L/S)	(m)	(r/min)	Shaft Power	Motor Power	η (%)	(m)	D (mm)	W (kg)
MD 25-50×3	15	4.17	157.5	2950	14.3	30	40	2.0	199	272
	25	6.94	150		18.9		52	2.0		
	30	8.33	142.5		20.3		55	2.5		
MD 25-50×4	15	4.17	210		19.1	30	40	2.0		293
	25	6.94	200		25.2		52	2.0		
	30	8.33	190		27.1		55	2.5		
MD 25-50×5	15	4.17	262.5		23.9	37	40	2.0		315
	25	6.94	250		31.5		52	2.0		
	30	8.33	237.5		33.9		55	2.5		
MD 25-50×6	15	4.17	315		28.6	45	40	2.0		335
	25	6.94	300		27.8		52	2.0		
	30	8.33	285		40.7		55	2.5		
MD 25-50×7	15	4.17	367.5		33.4	55	40	2.0		356
	25	6.94	350		44.1		52	2.0		
	30	8.33	332.5		47.5		55	2.5		
MD 25-50×8	15	4.17	420		38.2	75	40	2.0		381
	25	6.94	400		50.4		52	2.0		
	30	8.33	380		54.2		55	2.5		
MD 25-50×9	15	4.17	427.5		43.0	75	40	2.0		398
	25	6.94	450		56.7		52	2.0		
	30	8.33	427.5		61.0		55	2.5		
MD 25-50×10	15	4.17	525		47.7	75	40	2.0		419
	25	6.94	500		63.0		52	2.0		
	30	8.33	475		67.8		55	2.5		
MD 25-50×11	15	4.17	577.5		52.5	90	40	2.0		440
	25	6.94	550		69.3		52	2.0		
	30	8.33	522.5		74.6		55	2.5		
MD 25-50×12	15	4.17	630		57.3	110	40	2.0		461
	25	6.94	600		75.6		52	2.0		
	30	8.33	570		81.4		55	2.5		

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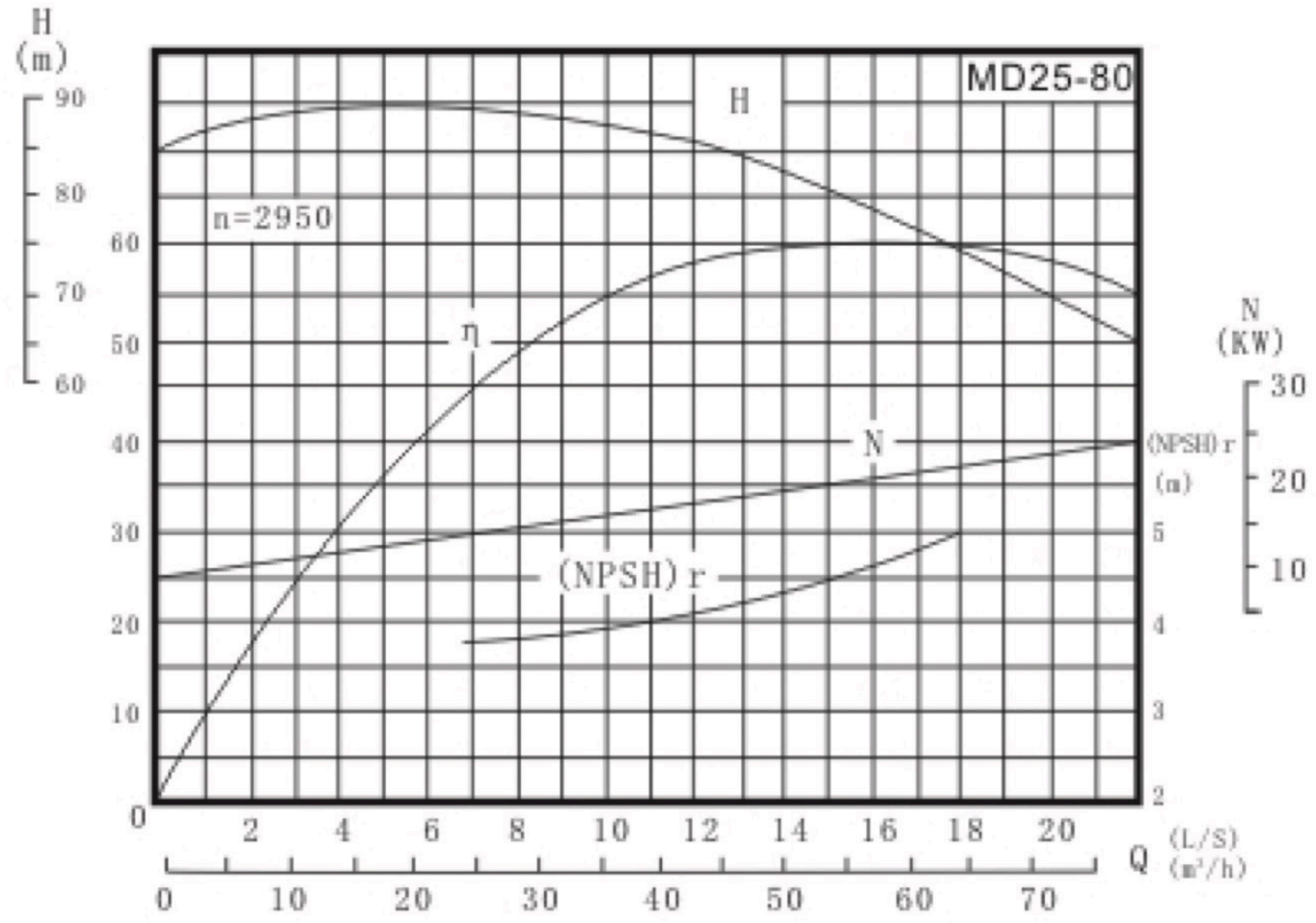

MD 25—80 Pump Performance Table

Pump Model	Flow Rate Q		Head H	Rotational Speed n	Power (kW)		Efficiency η	Required NPSH (NPSHr)	Impeller Diameter D	Weight W
	(m³/h)	(L/S)	(m)	(r/min)	Shaft Power	Motor Power	(%)	(m)	(mm)	(kg)
MD 25-80×2	17.4	4.84	169	2950	19.4	30	41.4	3.1	250	
	25	6.95	159		22.6		48	3.3		
	29.1	8.07	151		22.7		51.8	3.8		
MD 25-80×3	17.4	4.84	253		29.2	45	41.4	3.1		
	25	6.95	239		33.9		48	3.3		
	29.1	8.07	272		34.1		51.8	3.8		
MD 25-80×4	17.4	4.84	338		38.8	55	41.4	3.1		
	25	6.95	318		45.2		48	3.3		
	29.1	8.07	302		45.4		51.8	3.8		
MD 25-80×5	17.4	4.84	422		48.4	75	41.4	3.1		
	25	6.95	397		56.4		48	3.3		
	29.1	8.07	378		56.8		51.8	3.8		
MD 25-80×6	17.4	4.84	506		58	90	41.4	3.1		
	25	6.95	476		67.7		48	3.3		
	29.1	8.07	454		68.1		51.8	3.8		
MD 25-80×7	17.4	4.84	490		67.7	90	41.4	3.1		
	25	6.95	556		79		48	3.3		
	29.1	8.07	530		79.5		51.8	3.8		
MD 25-80×8	17.4	4.84	675		77.5	110	41.4	3.1		
	25	6.95	635		90.2		48	3.3		
	29.1	8.07	605		99.8		51.8	3.8		
MD 25-80×9	17.4	4.84	760		87.2	132	41.4	3.1		
	25	6.95	715		102		48	3.3		
	29.1	8.07	681		102		51.8	3.8		
MD 25-80×10	17.4	4.84	844		96.9	132	41.4	3.1		
	25	6.95	795		113		48	3.3		
	29.1	8.07	757		114		51.8	3.8		
MD 25-80×11	17.4	4.84	928		107	160	41.4	3.1		
	25	6.95	875		124		48	3.3		
	29.1	8.07	833		125		51.8	3.8		
MD 25-80×12	17.4	4.84	1013		110	160	41.4	3.1		
	25	6.95	954		136		48	3.3		
	29.1	8.07	908		136		51.8	3.8		

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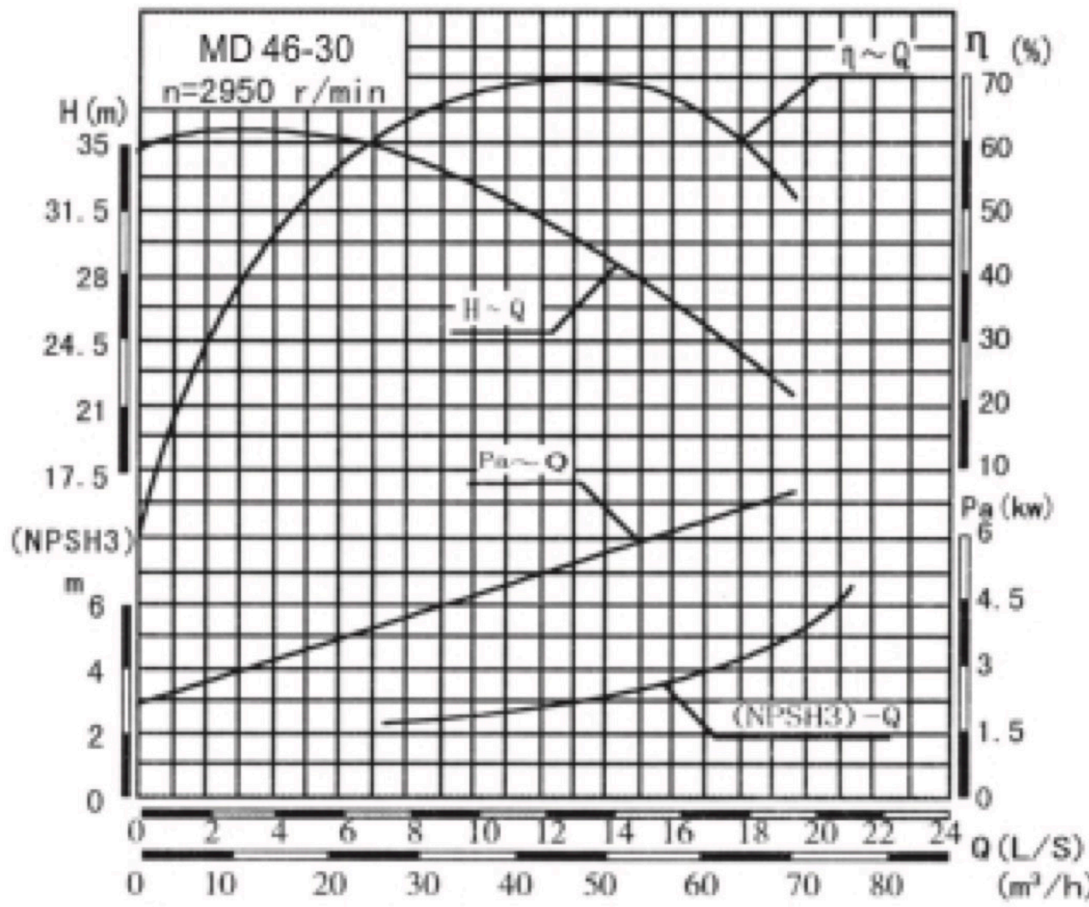
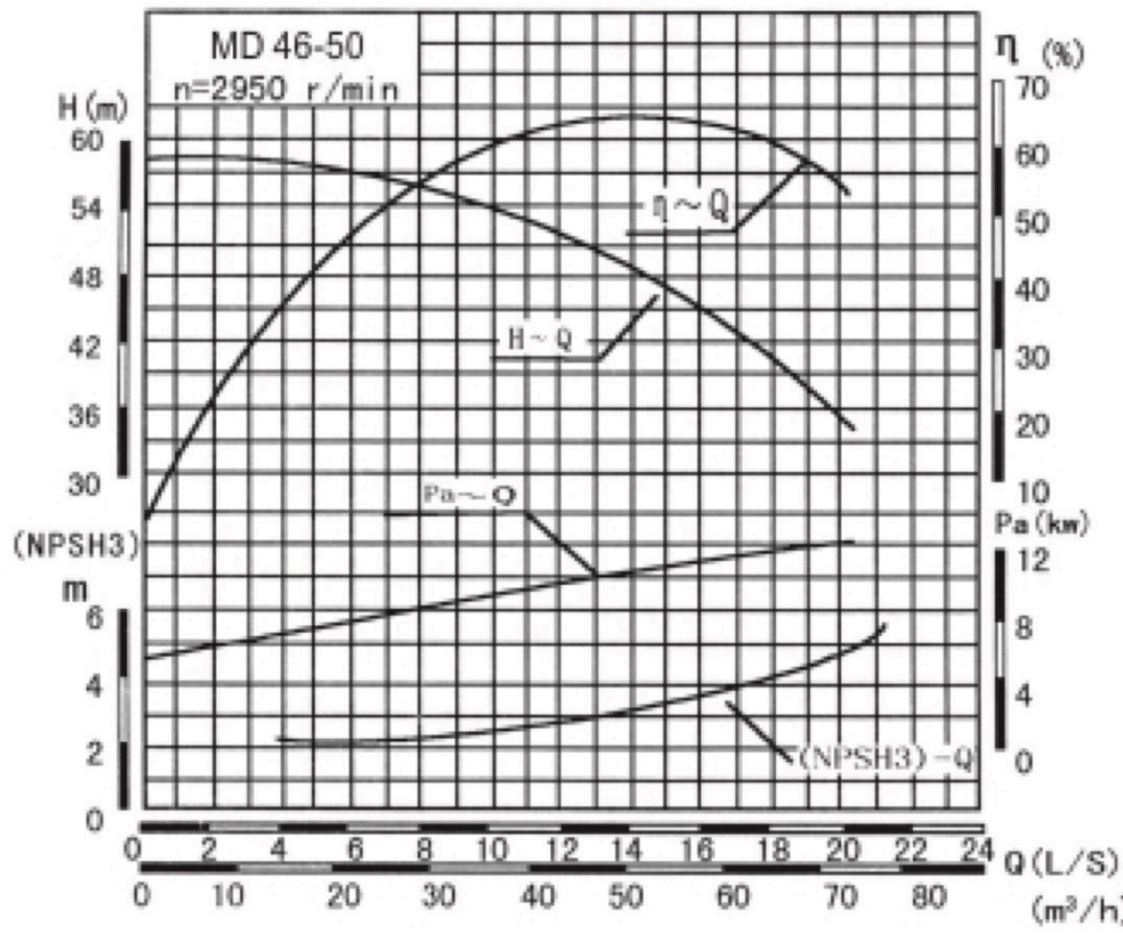


MD 46—30 Pump Performance Table

Pump Model	Flow Rate Q		Head H	Rotational Speed n	Power (kW)		Efficiency	Required NPSH (NPSHr)	Impeller Diameter	Weight
	(m^3/h)	(L/S)	(m)	(r/min)	Shaft Power	Motor Power	η (%)	(m)	D (mm)	W (kg)
MD 46-30×3	30	8.33	102	2950	13.03	22	64	2.2	164	188
	46	12.8	90		16.12		70	3.0		
	55	15.3	78		17.85		68	3.5		
MD 46-30×4	30	8.33	136		17.37	30	64	2.2		205
	46	12.8	120		21.49		70	3.0		
	55	15.3	104		23.80		68	3.5		
MD 46-30×5	30	8.33	170		21.72	37	64	2.2		222
	46	12.8	150		26.87		70	3.0		
	55	15.3	130		29.75		68	3.5		
MD 46-30×6	30	8.33	204		26.06	37	64	2.2		239
	46	12.8	180		32.24		70	3.0		
	55	15.3	156		35.70		68	3.5		
MD 46-30×7	30	8.33	238		30.40	45	64	2.2		256
	46	12.8	210		37.61		70	3.0		
	55	15.3	182		41.65		68	3.5		
MD 46-30×8	30	8.33	274		34.74	55	64	2.2		273
	46	12.8	240		42.98		70	3.0		
	55	15.3	208		47.60		68	3.5		
MD 46-30×9	30	8.33	306		39.90	55	64	2.2		290
	46	12.8	270		48.36		70	3.0		
	55	15.3	234		53.55		68	3.5		
MD 46-30×10	30	8.33	340		43.44	75	64	2.2		307
	46	12.8	300		53.04		70	3.0		
	55	15.3	260		59.50		68	3.5		

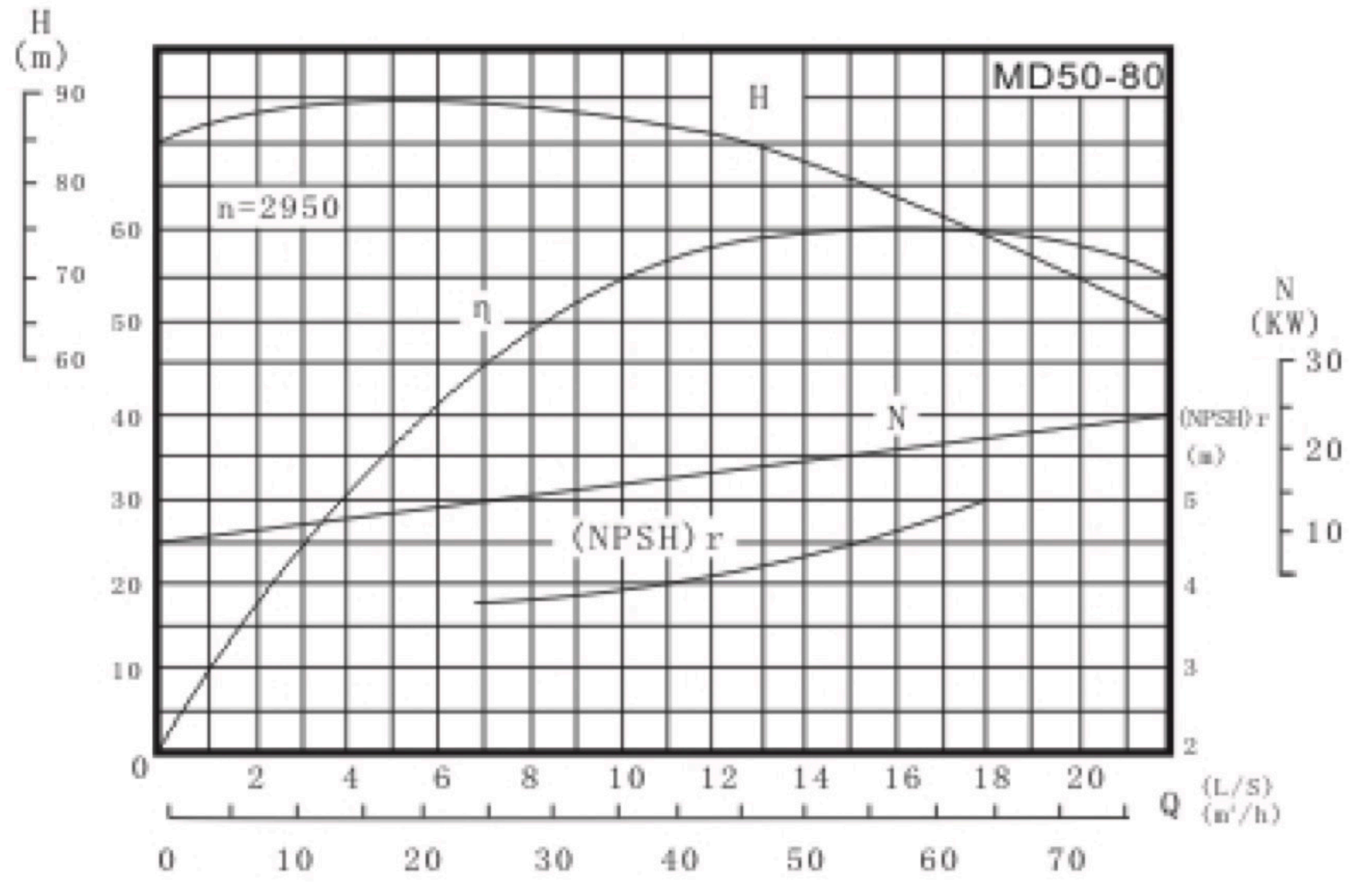
Hebei Ivy Pump Industry Co., Ltd.



MD 46—50 Pump Performance Table

Pump Model	Flow Rate Q		Head H	Rotational Speed n	Power (kW)		Efficiency	Required NPSH (NPSHr)	Impeller Diameter	Weight
	(m^3/h)	(L/S)	(m)	(r/min)	Shaft Power	Motor Power	η (%)	(m)	D (mm)	W (kg)
MD 46-50×3	30	8.33	166.5	2950	25.19	37	54	2.2	210	279
	46	12.8	150		29.83		63	3.0		
	55	15.3	138		32.30		64	3.5		
MD 46-50×4	30	8.33	222		33.59	45	54	2.2		302
	46	12.8	200		39.77		63	3.0		
	55	15.3	180		43.06		64	3.5		
MD 46-50×5	30	8.33	277.5		41.98	55	54	2.2		327
	46	12.8	250		49.71		63	3.0		
	55	15.3	230		53.83		64	3.5		
MD 46-50×6	30	8.33	333		50.38	75	54	2.2		350
	46	12.8	300		59.65		63	3.0		
	55	15.3	276		64.59		64	3.5		
MD 46-50×7	30	8.33	388.5		58.78	75	54	2.2		374
	46	12.8	350		69.60		63	3.0		
	55	15.3	322		75.36		64	3.5		
MD 46-50×8	30	8.33	444		67.18	90	54	2.2		397
	46	12.8	400		79.54		63	3.0		
	55	15.3	368		86.12		64	3.5		
MD 46-50×9	30	8.33	499.5		75.57	110	54	2.2		419
	46	12.8	450		89.48		63	3.0		
	55	15.3	414		96.89		64	3.5		
MD 46-50×10	30	8.33	555		83.97	110	54	2.2		443
	46	12.8	500		99.42		63	3.0		
	55	15.3	460		107.66		64	3.5		
MD 46-50×11	30	8.33	610.5		92.37	132	54	2.2		460
	46	12.8	550		109.36		63	3.0		
	55	15.3	506		118.42		64	3.5		
MD 46-50×12	30	8.33	666		100.8	132	54	2.2		490
	46	12.8	600		119.3		63	3.0		
	55	15.3	552		129.2		64	3.5		

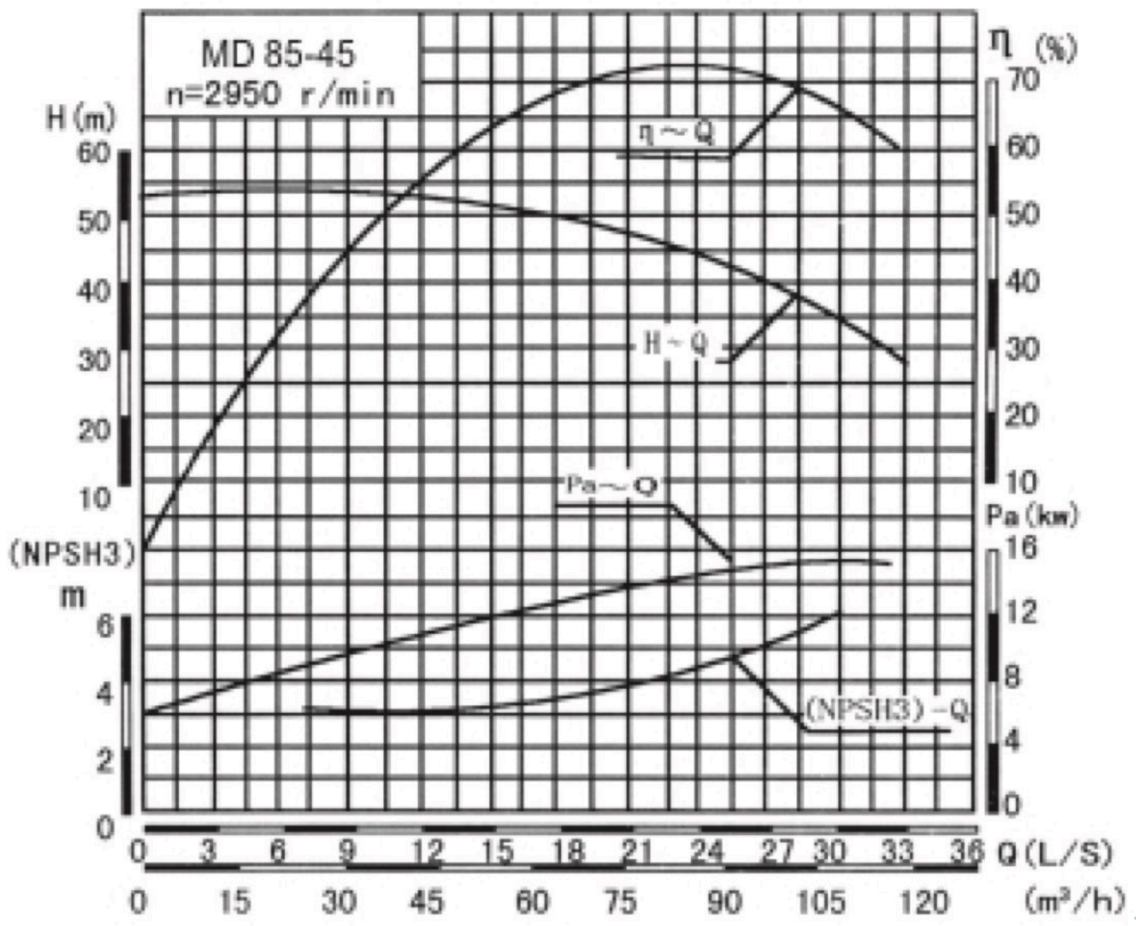
Hebei Ivy Pump Industry Co., Ltd.



MD 50—80 Pump Performance Table

Pump Model	Flow Rate Q		Head H	Rotational Speed n	Power (kW)		Efficiency	Required NPSH (NPSHr)	Impeller Diameter	Weight
	(m^3/h)	(L/S)	(m)	(r/min)	Shaft Power	Motor Power	η (%)	(m)	D (mm)	W (kg)
MD 50-80×2	32.4	9	177	2950	30.7	55	51	3.8	250	
	50.4	14	165		36.7		60	4.3		
	66.2	18.4	146		43.9		60	4.8		
MD 50-80×3	32.4	9	266		46.0	75	51	3.8		
	50.4	14	247		55.0		60	4.3		
	66.2	18.4	219		65.9		60	4.8		
MD 50-80×4	32.4	9	354		61.3	110	51	3.8		
	50.4	14	329		73.3		60	4.3		
	66.2	18.4	292		87.8		60	4.8		
MD 50-80×5	32.4	9	443		76.7	132	51	3.8		
	50.4	14	412		91.7		60	4.3		
	66.2	18.4	365		110		60	4.8		
MD 50-80×6	32.4	9	532		92.0	160	51	3.8		
	50.4	14	494		110		60	4.3		
	66.2	18.4	438		132		60	4.8		
MD 50-80×7	32.4	9	620		107	185	51	3.8		
	50.4	14	576		128		60	4.3		
	66.2	18.4	511		154		60	4.8		
MD 50-80×8	32.4	9	709		123	220	51	3.8		
	50.4	14	658		147		60	4.3		
	66.2	18.4	584		176		60	4.8		
MD 50-80×9	32.4	9	797		138	220	51	3.8		
	50.4	14	741		165		60	4.3		
	66.2	18.4	657		198		60	4.8		
MD 50-80×10	32.4	9	886		153	280	51	3.8		
	50.4	14	823		183		60	4.3		
	66.2	18.4	730		220		60	4.8		
MD 50-80×11	32.4	9	975		169	315	51	3.8		
	50.4	14	905		202		60	4.3		
	66.2	18.4	803		242		60	4.8		
MD 50-80×12	32.4	9	1063		184	315	51	3.8		
	50.4	14	988		220		60	4.3		
	66.2	18.4	876		263		60	4.8		

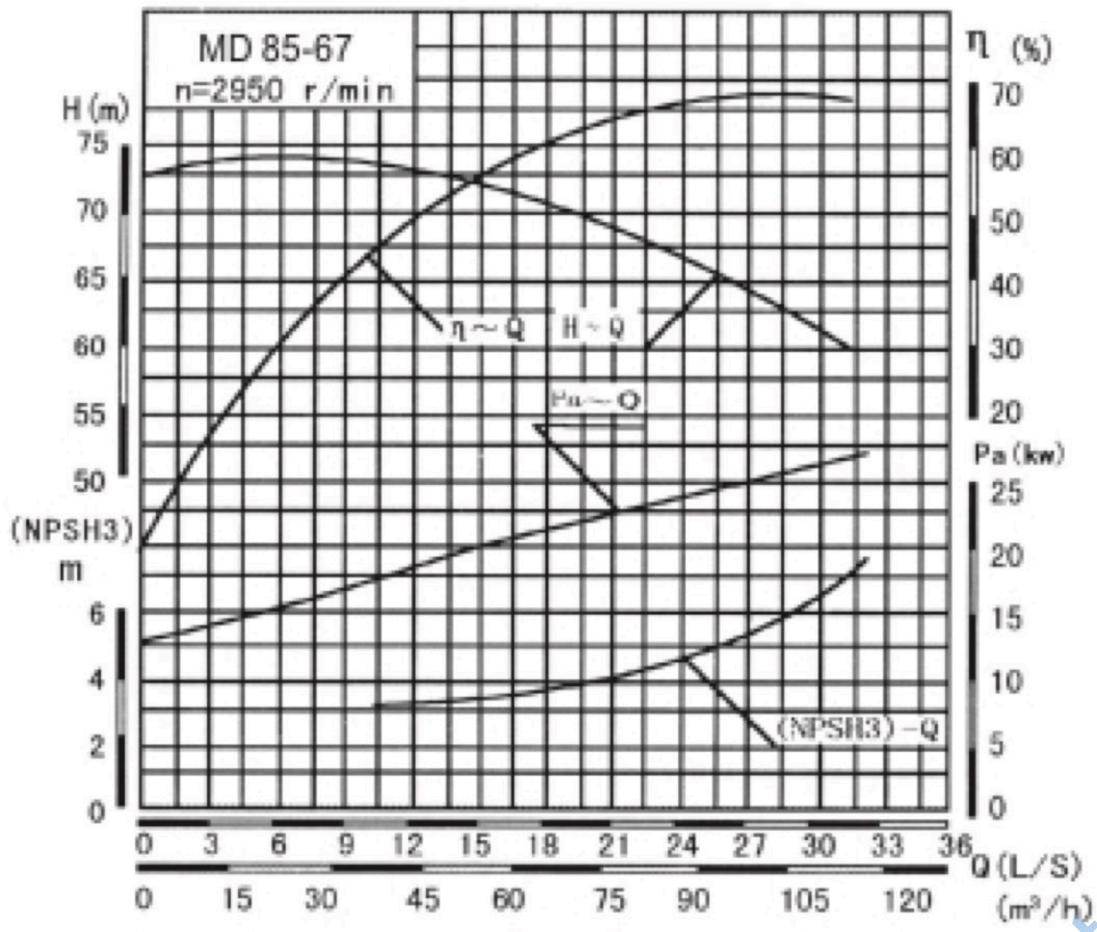
Hebei Ivy Pump Industry Co., Ltd.



MD 85—45 Pump Performance Table

Pump Model	Flow Rate Q		Head H	Rotational Speed n	Power (kW)		Efficiency	Required NPSH (NPSHr)	Impeller Diameter	Weight
	(m^3/h)	(L/S)	(m)	(r/min)	Shaft Power	Motor Power	η (%)	(m)	D (mm)	W (kg)
MD 85-45×2	55	15.3	102	2950	24.25	37	63	3.2	200	187
	85	23.6	90		28.94		72	4.2		
	100	27.8	78		30.35		70	5.2		
MD 85-45×3	55	15.3	153		36.38	55	63	3.2		211
	85	23.6	135		43.4		72	4.2		
	100	27.8	117		45.32		70	5.2		
MD 85-45×4	55	15.3	204		48.5	75	63	3.2		236
	85	23.6	180		57.87		72	4.2		
	100	27.8	156		60.7		70	5.2		
MD 85-45×5	55	15.3	255		60.63	90	63	3.2		263
	85	23.6	225		72.34		72	4.2		
	100	27.8	195		75.86		70	5.2		
MD 85-45×6	55	15.3	306		72.75	110	63	3.2		287
	85	23.6	270		86.81		72	4.2		
	100	27.8	234		91.04		70	5.2		
MD 85-45×7	55	15.3	357		84.88	132	63	3.2		312
	85	23.6	315		101.3		72	4.2		
	100	27.8	273		106.2		70	5.2		
MD 85-45×8	55	15.3	408		97.0	132	63	3.2		337
	85	23.6	360		115.7		72	4.2		
	100	27.8	312		121.4		70	5.2		
MD 85-45×9	55	15.3	459		109.1	160	63	3.2		361
	85	23.6	405		130.4		72	4.2		
	100	27.8	351		136.6		70	5.2		

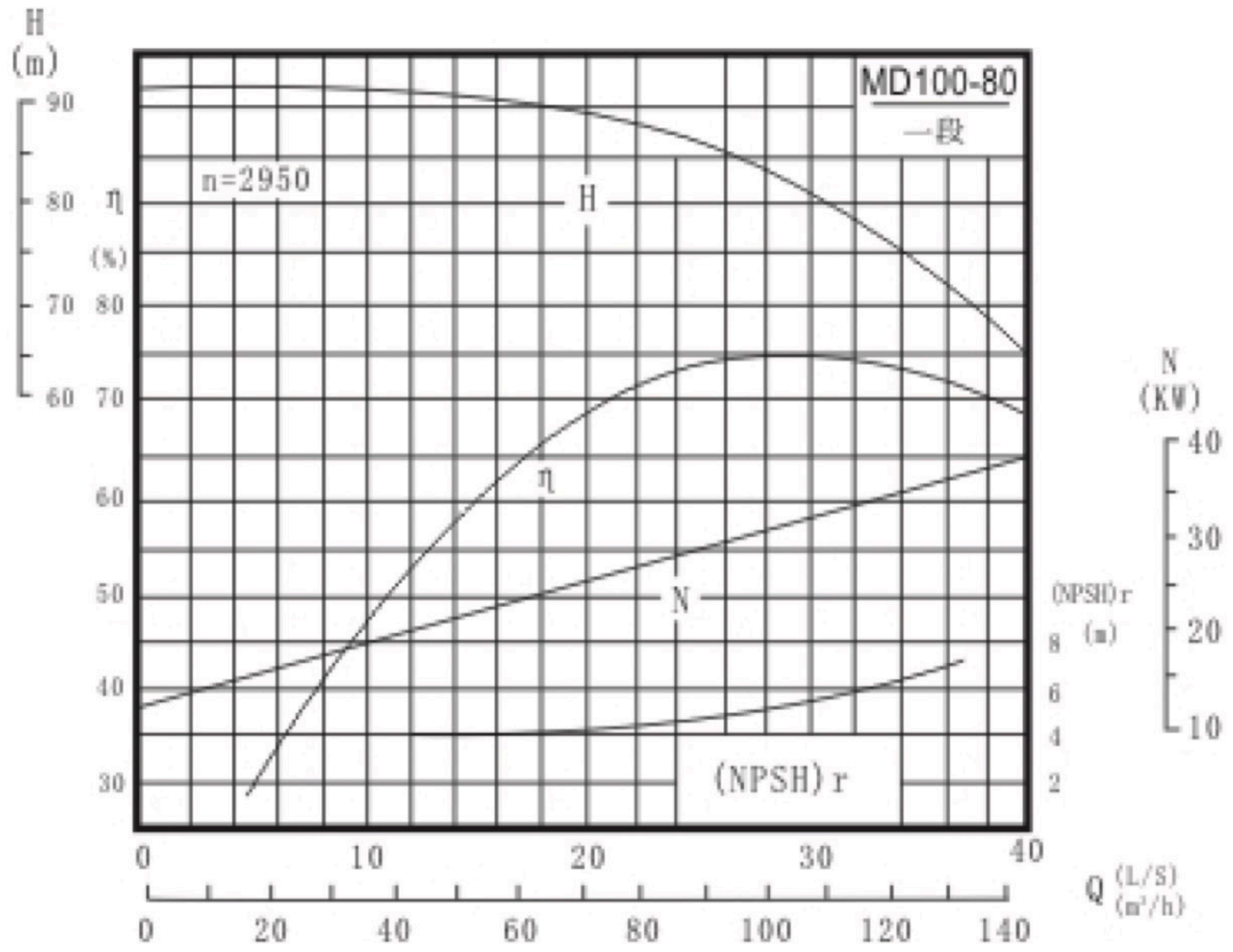
Hebei Ivy Pump Industry Co., Ltd.



MD 85—67 Pump Performance Table

Pump Model	Flow Rate Q		Head H	Rotational Speed n	Power (kW)		Efficiency	Required NPSH (NPSHr)	Impeller Diameter	Weight
	(m^3/h)	(L/S)	(m)	(r/min)	Shaft Power	Motor Power	η (%)	(m)	D (mm)	W (kg)
MD 85-67×3	55	15.3	216	2950	57.77	90	56	3.4	235	952
	85	23.6	201		69.44		67	4.2		
	100	27.8	189		75.64		68	5.2		
MD 85-67×4	55	15.3	288		77.03	110	56	3.4		1024
	85	23.6	268		92.59		67	4.2		
	100	27.8	252		100.92		68	5.2		
MD 85-67×5	55	15.3	360		96.3	132	56	3.4		1145
	85	23.6	335		115.74		67	4.2		
	100	27.8	315		126.15		68	5.2		
MD 85-67×6	55	15.3	432		115.55	160	56	3.4		1435
	85	23.6	402		138.9		67	4.2		
	100	27.8	378		151.4		68	5.2		
MD 85-67×7	55	15.3	504		134.8	185	56	3.4		1558
	85	23.6	469		162.04		67	4.2		
	100	27.8	441		176.6		68	5.2		
MD 85-67×8	55	15.3	576		154.06	220	56	3.4		1700
	85	23.6	536		185.2		67	4.2		
	100	27.8	504		201.85		68	5.2		
MD 85-67×9	55	15.3	648		173.3	250	56	3.4		1860
	85	23.6	603		208.3		67	4.2		
	100	27.8	567		227.1		68	5.2		

Hebei Ivy Pump Industry Co., Ltd.



MD 100—80 Pump Performance Table

Pump Model	Flow Rate Q		Head H	Rotational Speed n	Power (kW)		Efficiency	Required NPSH (NPSHr)	Impeller Diameter	Weight
	(m^3/h)	(L/S)	(m)	(r/min)	Shaft Power	Motor Power	η (%)	(m)	D (mm)	W (kg)
MD100-80×2	50	14.2	181		43.2		57	4.0		
	102	28.2	165		61.9	90	74	4.8		
	131	36.5	143		70.9		72	6.2		
MD100-80×3	50	14.2	271		64.7		57	4.0		
	102	28.2	248		93.1	132	74	4.8		
	131	36.5	214		106		72	6.2		
MD100-80×4	50	14.2	361		86.2		57	4.0		
	102	28.2	331		124	160	74	4.8		
	131	36.5	285		141		72	6.2		
MD100-80×5	50	14.2	541		110		57	4.0		
	102	28.2	414		155	220	74	4.8		
	131	36.5	356		178		72	6.2		
MD100-80×6	50	14.2	541		132		57	4.0		
	102	28.2	497		186	250	74	4.8		
	131	36.5	427	2950	214		72	6.2	250	
MD100-80×7	50	14.2	631		154		57	4.0		
	102	28.2	590		217	280	74	4.8		
	131	36.5	498		249		72	6.2		
MD100-80×8	50	14.2	721		176		57	4.0		
	102	28.2	663		248	350	74	4.8		
	131	36.5	566		285		72	6.2		
MD100-80×9	50	14.2	811		198		57	4.0		
	102	28.2	746		297	350	74	4.8		
	131	36.5	640		320		72	6.2		
MD100-80×10	50	14.2	902		220		57	4.0		
	102	28.2	820		310	400	74	4.8		
	131	36.5	711		256		72	6.2		
MD100-80×11	50	14.2	992		242		57	4.0		
	102	28.2	912		341	440	74	4.8		
	131	36.5	782		392		72	6.2		
MD100-80×12	50	14.2	1082		264		57	4.0		
	102	28.2	994		372	500	74	4.8		
	131	36.5	854		427		72	6.2		

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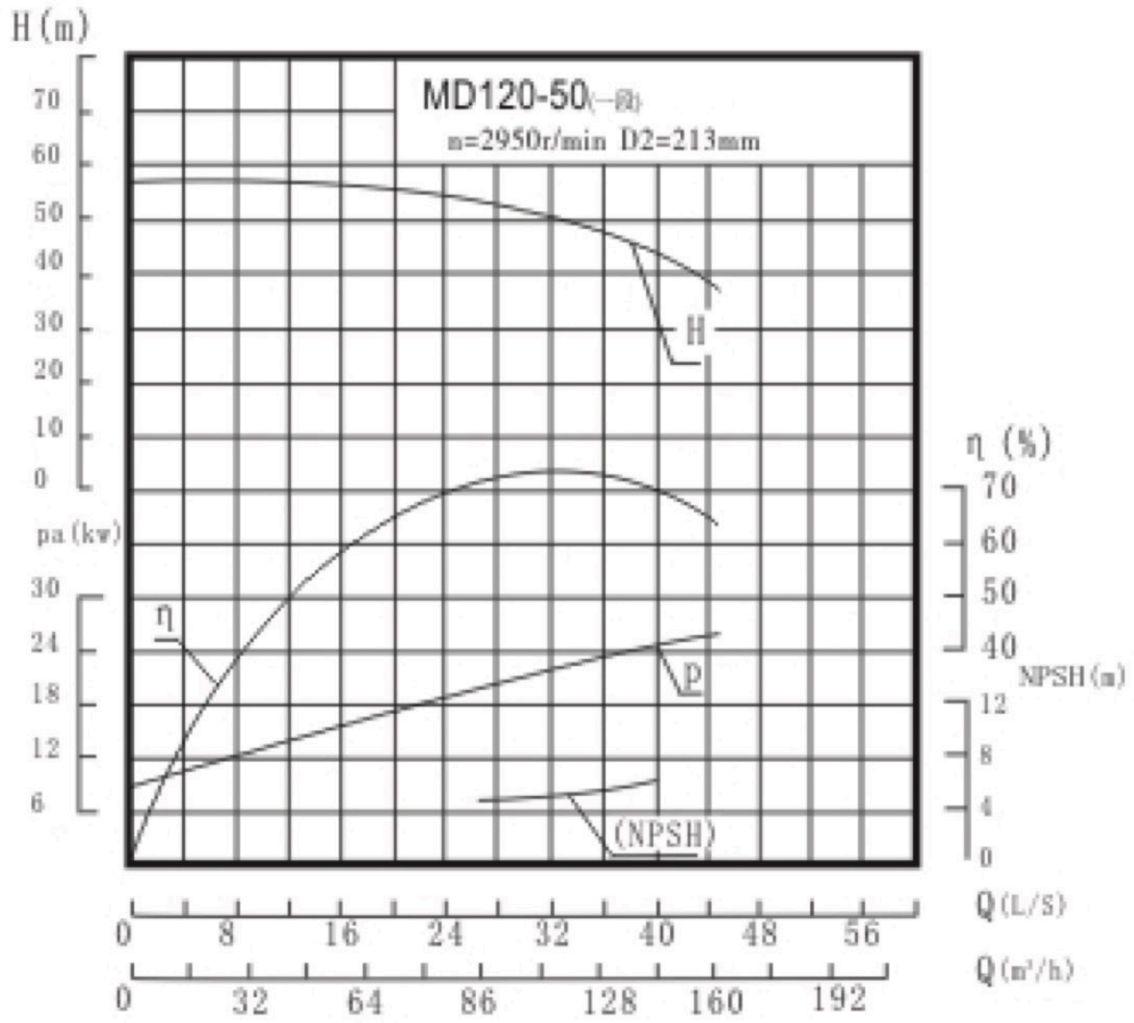

MD 120—50 Pump Performance Table

Pump Model	Flow Rate Q		Head H	Rotational Speed n	Power (kW)		Efficiency	Required NPSH (NPSHr)	Impeller Diameter	Weight
	(m^3/h)	(L/S)	(m)	(r/min)	Shaft Power	Motor Power	η (%)	(m)	D (mm)	W (kg)
MD120-50×2	96	26.7	110	2950	39.44	55	73	3.2	213	
	120	33.3	100		44.54		73.3	5.1		
	140	38.9	84.6		48.8		67.5	6.7		
MD120-50×3	96	26.7	165		59.09	90	73	3.2		
	120	33.3	150		66.88		73.3	5.1		
	140	38.9	126.9		71.68		67.5	6.7		
MD120-50×4	96	26.7	220		78.79	110	73	3.2		
	120	33.3	200		89.17		73.3	5.1		
	140	38.9	169.2		95.57		67.5	6.7		
MD120-50×5	96	26.7	275		98.49	132	73	3.2		
	120	33.3	250		111.46		73.3	5.1		
	140	38.9	211.5		119.46		67.5	6.7		
MD120-50×6	96	26.7	330		118.18	160	73	3.2		
	120	33.3	300		133.75		73.3	5.1		
	140	38.9	253.8		143.36		67.5	6.7		
MD120-50×7	96	26.7	385		137.88	200	73	3.2		
	120	33.3	350		156.04		73.3	5.1		
	140	38.9	296.1		167.25		67.5	6.7		
MD120-50×8	96	26.7	440		157.58	200	73	3.2		
	120	33.3	400		178.33		73.3	5.1		
	140	38.9	338.4		191.14		67.5	6.7		
MD120-50×9	96	26.7	495		177.28	220	73	3.2		
	120	33.3	450		200.63		73.3	5.1		
	140	38.9	380.7		215.03		67.5	6.7		

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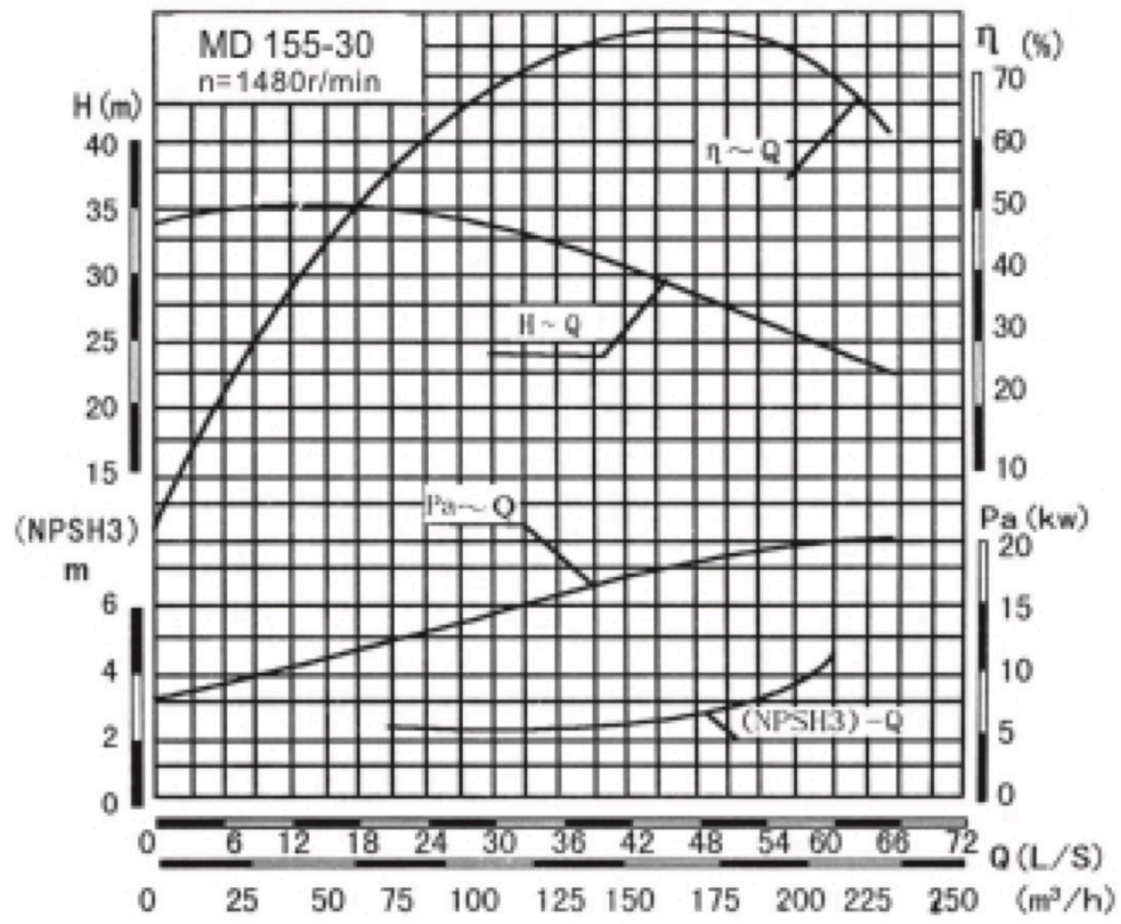

MD 155—30 Pump Performance Table

Pump Model	Flow Rate Q		Head H	Rotational Speed n	Power (kW)		Efficiency	Required NPSH (NPSHr)	Impeller Diameter	Weight
	(m^3/h)	(L/S)	(m)	(r/min)	Shaft Power	Motor Power	η (%)	(m)	D (mm)	W (kg)
MD155-30×2	100	27.8	65	1480	27.66	55	64	2.3	305	484
	155	43	60		33.77		75	2.7		
	185	51.4	55		36.95		75	3.0		
MD155-30×3	100	27.8	97.5		41.2	75	64	2.3		575
	155	43	90		50.65		75	2.7		
	185	51.4	82.5		55.42		75	3.0		
MD155-30×4	100	27.8	130		55.32	90	64	2.3		660
	155	43	120		67.54		75	2.7		
	185	51.4	110		73.9		75	3.0		
MD155-30×5	100	27.8	162.5		69.15	110	64	2.3		750
	155	43	150		84.42		75	2.7		
	185	51.4	137.5		92.37		75	3.0		
MD155-30×6	100	27.8	195		82.98	132	64	2.3		840
	155	43	180		101.3		75	2.7		
	185	51.4	165		110.8		75	3.0		
MD155-30×7	100	27.8	227.5		96.81	160	64	2.3		930
	155	43	210		118.2		75	2.7		
	185	51.4	192.5		129.3		75	3.0		
MD155-30×8	100	27.8	260		110.6	185	64	2.3		1020
	155	43	240		135.1		75	2.7		
	185	51.4	220		147.8		75	3.0		
MD155-30×9	100	27.8	292.5		124.5	185	64	2.3		1110
	155	43	270		152.0		75	2.7		
	185	51.4	247.5		166.3		75	3.0		
MD155-30×10	100	27.8	325		138.3	220	64	2.3		1200
	155	43	300		168.8		75	2.7		
	185	51.4	275		184.7		75	3.0		

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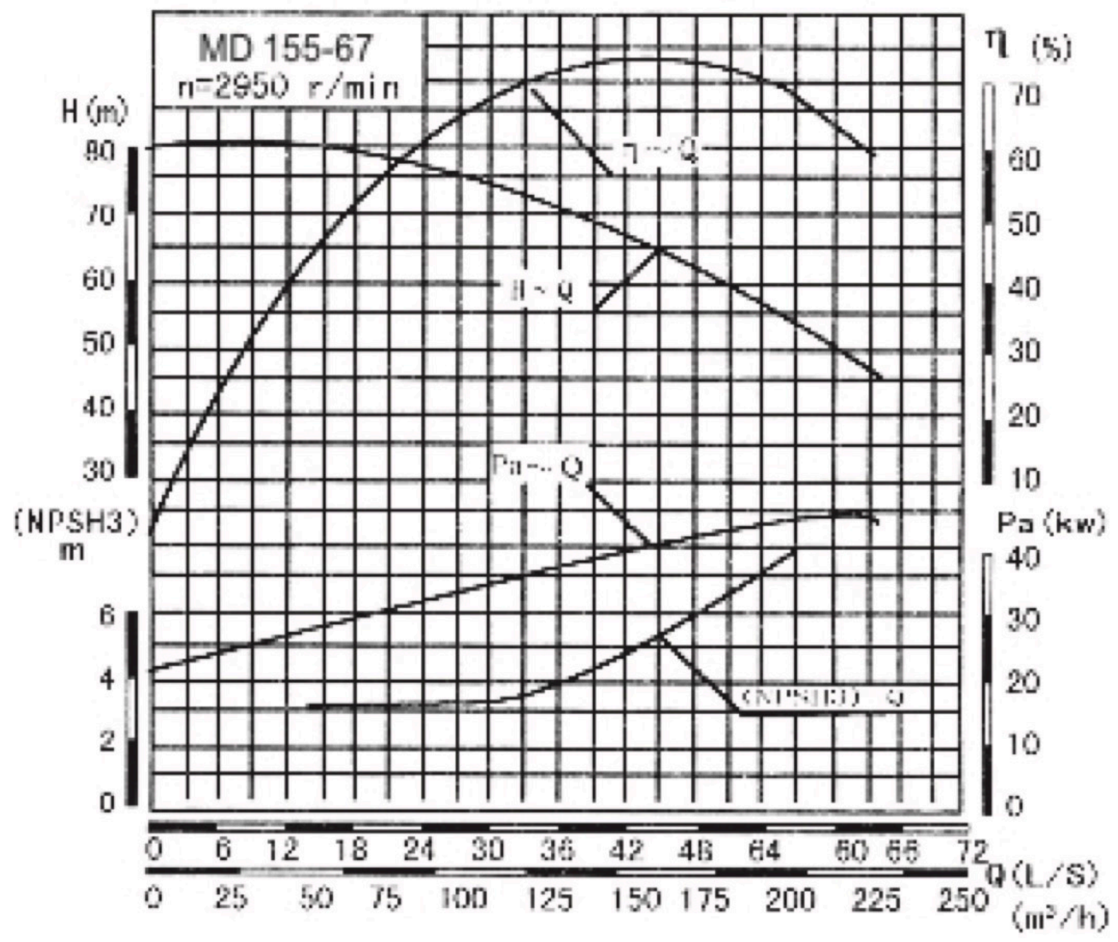

MD 155—67 Pump Performance Table

Pump Model	Flow Rate Q		Head H	Rotational Speed n	Power (kW)		Efficiency	Required NPSH (NPSHr)	Impeller Diameter	Weight
	(m³/h)	(L/S)	(m)	(r/min)	Shaft Power	Motor Power	η (%)	(m)	D (mm)	W (kg)
MD155-67×3	100	27.8	228	2950	97	132	64	3.2	235	952
	155	43	201		114.7		74	5.0		
	185	51.4	177		123.9		72	6.6		
MD155-67×4	100	27.8	304		129.4	185	64	3.2		1024
	155	43	268		152.9		74	5.0		
	185	51.4	236		165.1		72	6.6		
MD155-67×5	100	27.8	380		161.7	220	64	3.2		1145
	155	43	335		191.1		74	5.0		
	185	51.4	295		206.4		72	6.6		
MD155-67×6	100	27.8	456		194	280	64	3.2		1435
	155	43	402		229.3		74	5.0		
	185	51.4	354		247.7		72	6.6		
MD155-67×7	100	27.8	532		226.4	315	64	3.2		1558
	155	43	469		267.5		74	5.0		
	185	51.4	413		285		72	6.6		
MD155-67×8	100	27.8	608		258.7	355	64	3.2		1700
	155	43	536		305.7		74	5.0		
	185	51.4	472		330.3		72	6.6		
MD155-67×9	100	27.8	684		291.1	400	64	3.2		1860
	155	43	603		344		74	5.0		
	185	51.4	531		371.6		72	6.6		

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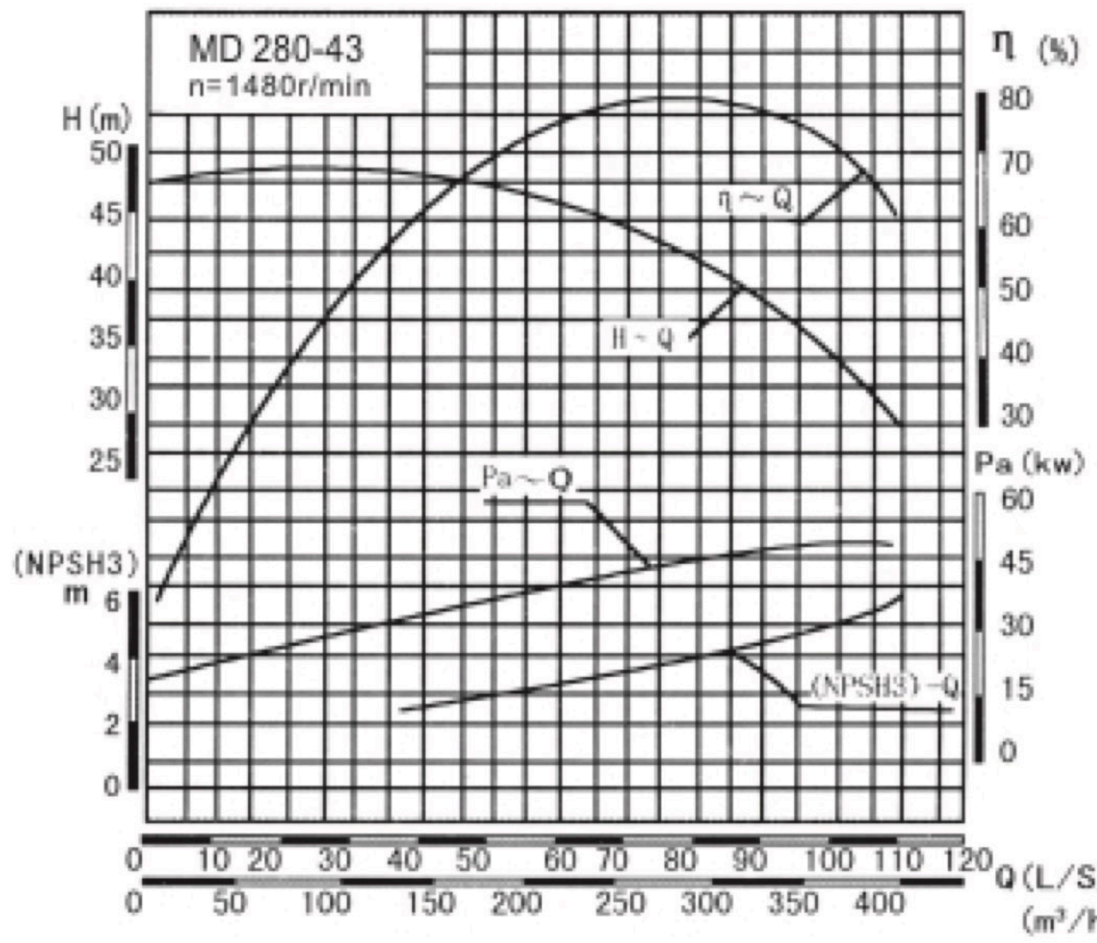

MD 280—43 Pump Performance Table

Pump Model	Flow Rate Q		Head H	Rotational Speed n	Power (kW)		Efficiency	Required NPSH (NPSHr)	Impeller Diameter	Weight
	(m^3/h)	(L/S)	(m)	(r/min)	Shaft Power	Motor Power	η (%)	(m)	D (mm)	W (kg)
MD280-43×2	185	51.4	94	1480	68.6	110	69	3.0	360	750
	280	77.8	86		85.17		77	4.0		
	335	93.1	76		92.4		75	4.5		
MD280-43×3	185	51.4	141		103	160	69	3.0		875
	280	77.8	129		127.7		77	4.0		
	335	93.1	114		138.7		75	4.5		
MD280-43×4	185	51.4	188		137.3	220	69	3.0		1000
	280	77.8	172		170.3		77	4.0		
	335	93.1	152		184.9		75	4.5		
MD280-43×5	185	51.4	235		171.6	250	69	3.0		1130
	280	77.8	215		212.9		77	4.0		
	335	93.1	190		231.1		75	4.5		
MD280-43×6	185	51.4	282		205.9	315	69	3.0		1260
	280	77.8	258		255.5		77	4.0		
	335	93.1	228		277.3		75	4.5		
MD280-43×7	185	51.4	329		240.2	355	69	3.0		1420
	280	77.8	301		298.1		77	4.0		
	335	93.1	266		323.6		75	4.5		
MD280-43×8	185	51.4	376		274.5	400	69	3.0		1580
	280	77.8	344		304.7		77	4.0		
	335	93.1	304		369.8		75	4.5		
MD280-43×9	185	51.4	423		308.9	450	69	3.0		1740
	280	77.8	387		383.2		77	4.0		
	335	93.1	342		416		75	4.5		

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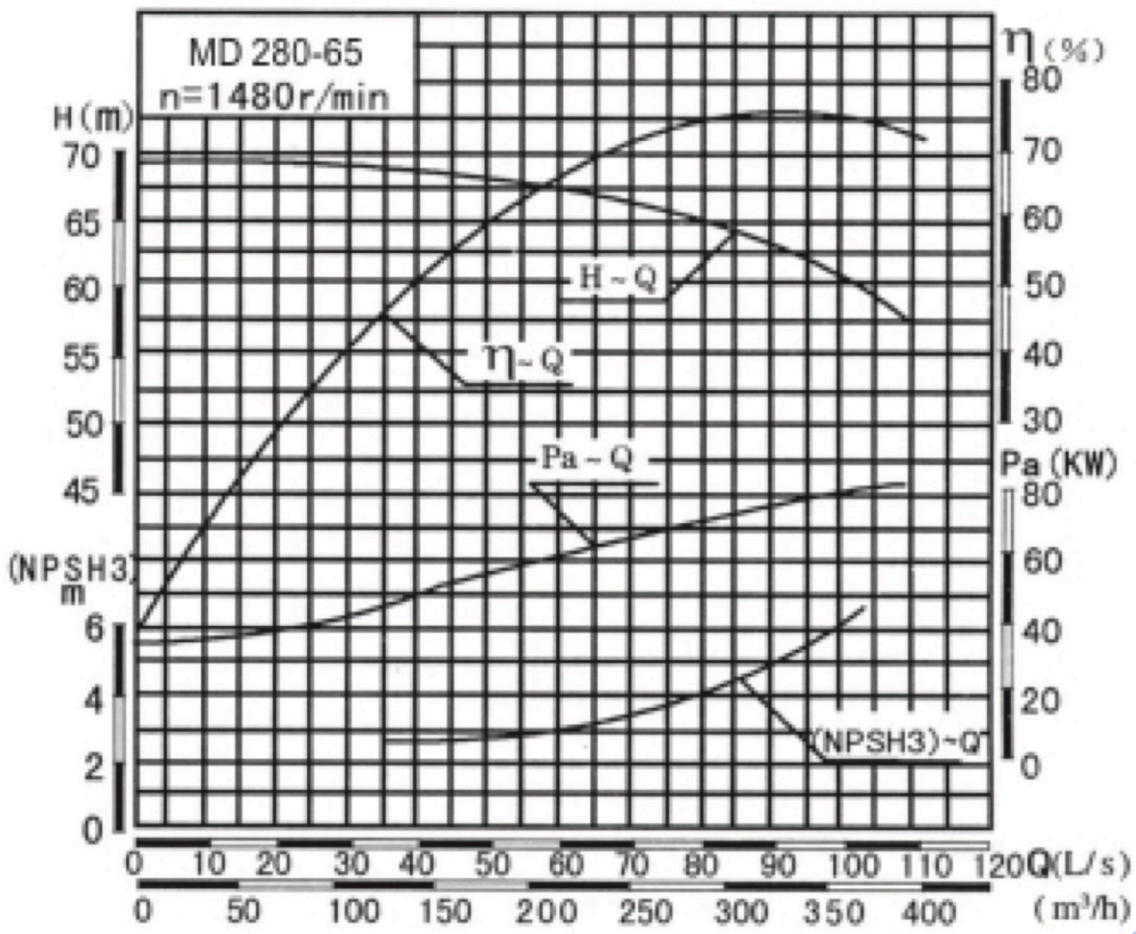

MD 280—65 Pump Performance Table

Pump Model	Flow Rate Q		Head H	Rotational Speed n	Power (kW)		Efficiency	Required NPSH (NPSHr)	Impeller Diameter	Weight
	(m^3/h)	(L/S)	(m)	(r/min)	Shaft Power	Motor Power	η (%)	(m)	D (mm)	W (kg)
MD280-65×3	185	51.4	204	1480	168.5	250	61	2.8	430	820
	280	77.8	195		198.5		73	3.7		
	335	93.1	186		226.3		75	5.0		
MD280-65×4	185	51.4	272		224.7	315	61	2.8		980
	280	77.8	260		271.6		73	3.7		
	335	93.1	248		301.7		75	5.0		
MD280-65×5	185	51.4	340		280.8	400	61	2.8		1140
	280	77.8	325		339.5		73	3.7		
	335	93.1	310		377.1		75	5.0		
MD280-65×6	185	51.4	408		337	500	61	2.8		1300
	280	77.8	390		407.4		73	3.7		
	335	93.1	372		452.5		75	5.0		
MD280-65×7	185	51.4	476		393.1	560	61	2.8		1460
	280	77.8	455		475.3		73	3.7		
	335	93.1	434		528		75	5.0		
MD280-65×8	185	51.4	544		449.3	630	61	2.8		1620
	280	77.8	520		543.2		73	3.7		
	335	93.1	496		603.3		75	5.0		
MD280-65×9	185	51.4	612		505.5	710	61	2.8		1780
	280	77.8	585		611.1		73	3.7		
	335	93.1	558		678.8		75	5.0		
MD280-65×10	185	51.4	680		561.6	800	61	2.8		1940
	280	77.8	650		679		73	3.7		
	335	93.1	620		754.2		75	5.0		

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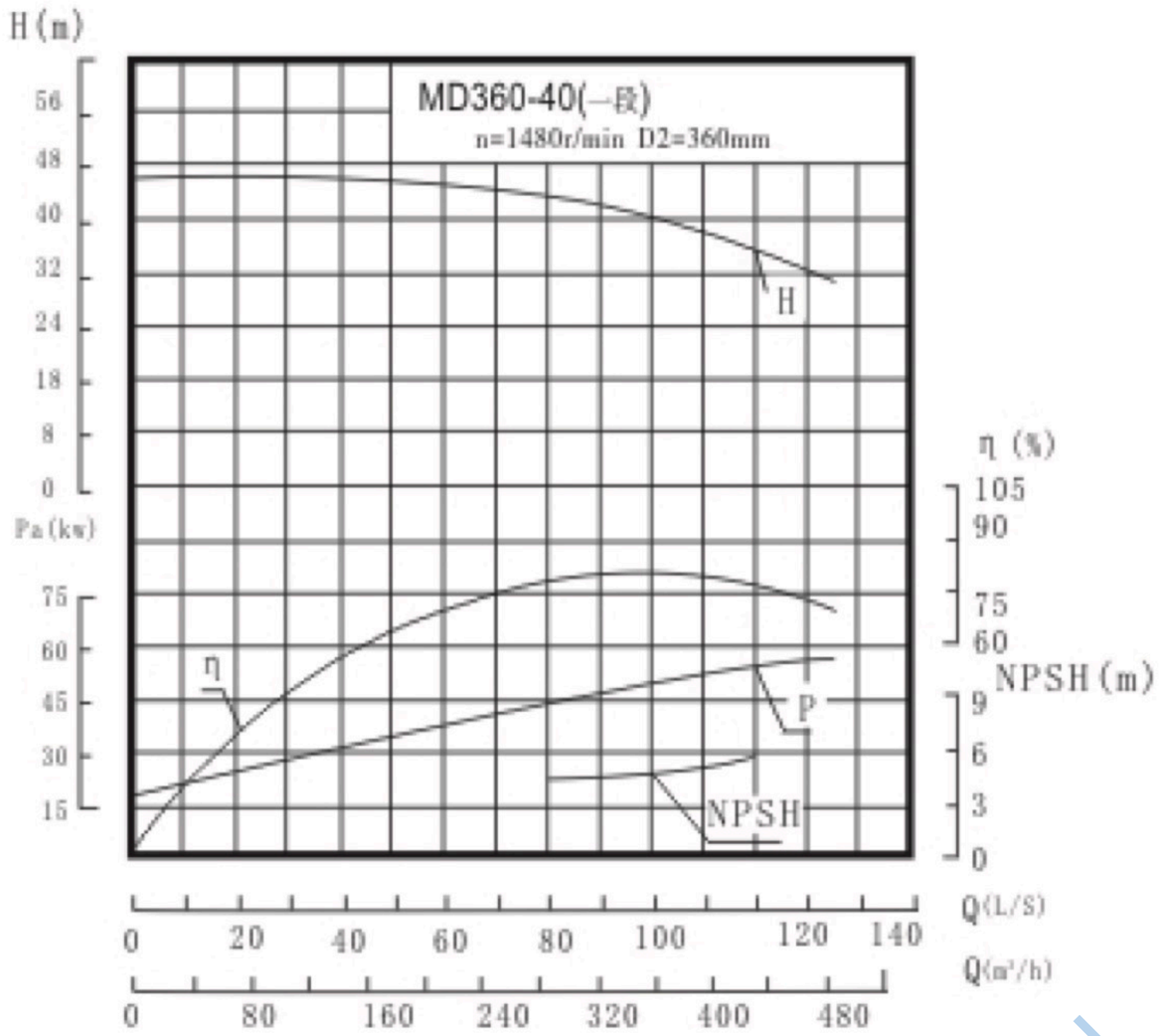

MD 360—40 Pump Performance Table

Pump Model	Flow Rate Q		Head H	Rotational Speed n	Power (kW)		Efficiency	Required NPSH (NPSHr)	Impeller Diameter	Weight
	(m^3/h)	(L/S)	(m)	(r/min)	Shaft Power	Motor Power	η (%)	(m)	D (mm)	W (kg)
MD360-40×2	300	83.3	84		89.1		77	4.65		
	360	100	80		98.1	132	80	4.7		
	440	122.2	71		110.5		77	5.4		
MD360-40×3	300	83.3	126		133.7		77	4.65		
	360	100	120		147.2	185	80	4.7		
	440	122.2	106.5		165.8		77	5.4		
MD360-40×4	300	83.3	168		175.2		77	4.65		
	360	100	160		196.2	250	80	4.7		
	440	122.2	142		221.1		77	5.4		
MD360-40×5	300	83.3	210		222.8		77	4.65		
	360	100	200		245.3	315	80	4.7		
	440	122.2	177.5		276.3		77	5.4		
MD360-40×6	300	83.3	252		257.4		77	4.65		
	360	100	240	1480	294.1	400	80	4.7	360	
	440	122.2	213		331.5		77	5.4		
MD360-40×7	300	83.3	294		311.9		77	4.65		
	360	100	280		343.1	450	80	4.7		
	440	122.2	248.5		386.7		77	5.4		
MD360-40×8	300	83.3	336		356.5		77	4.65		
	360	100	320		392.2	500	80	4.7		
	440	122.2	284		441.9		77	5.4		
MD360-40×9	300	83.3	378		401.1		77	4.65		
	360	100	360		441.2	560	80	4.7		
	440	122.2	319.5		497.2		77	5.4		
MD360-40×10	300	83.3	420		445.6		77	4.65		
	360	100	400		490.2	630	80	4.7		
	440	122.2	355		552.4		77	5.4		

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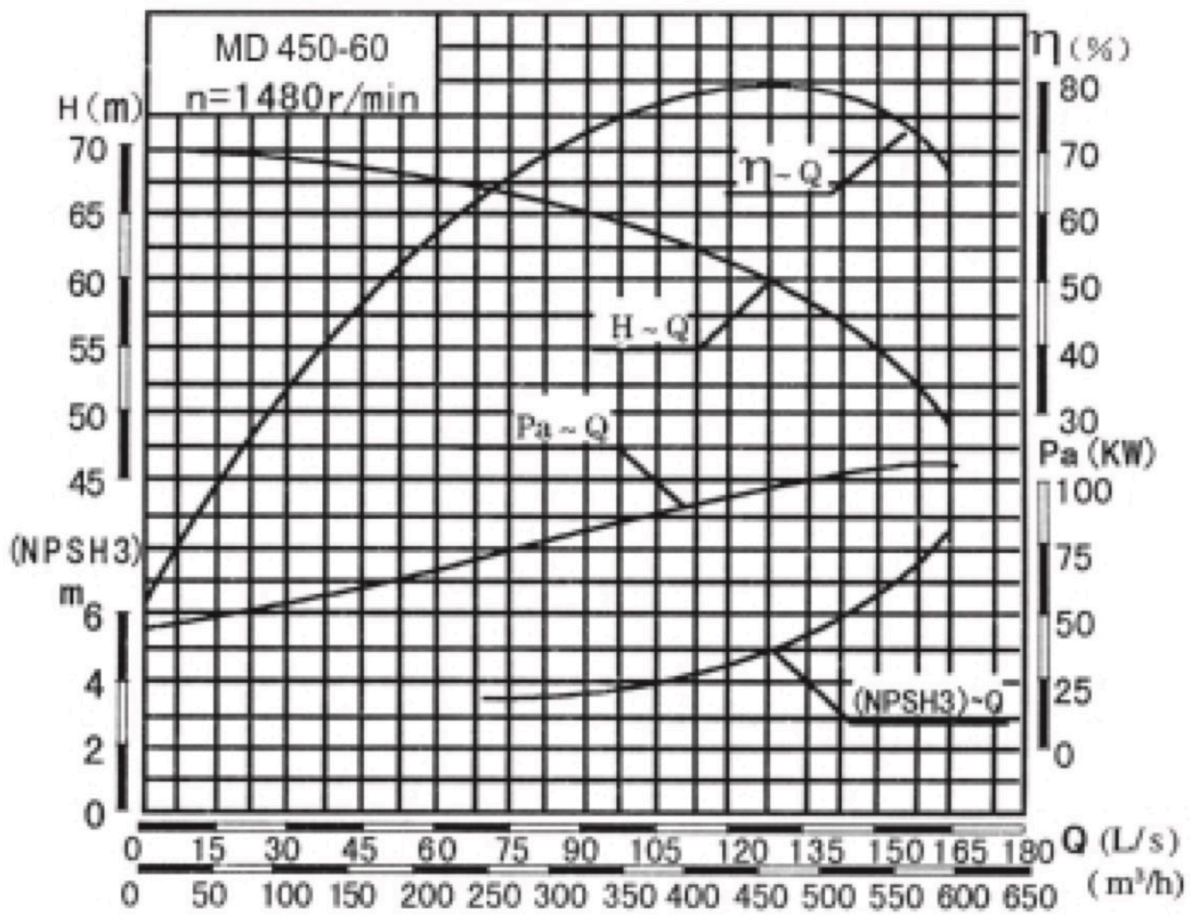
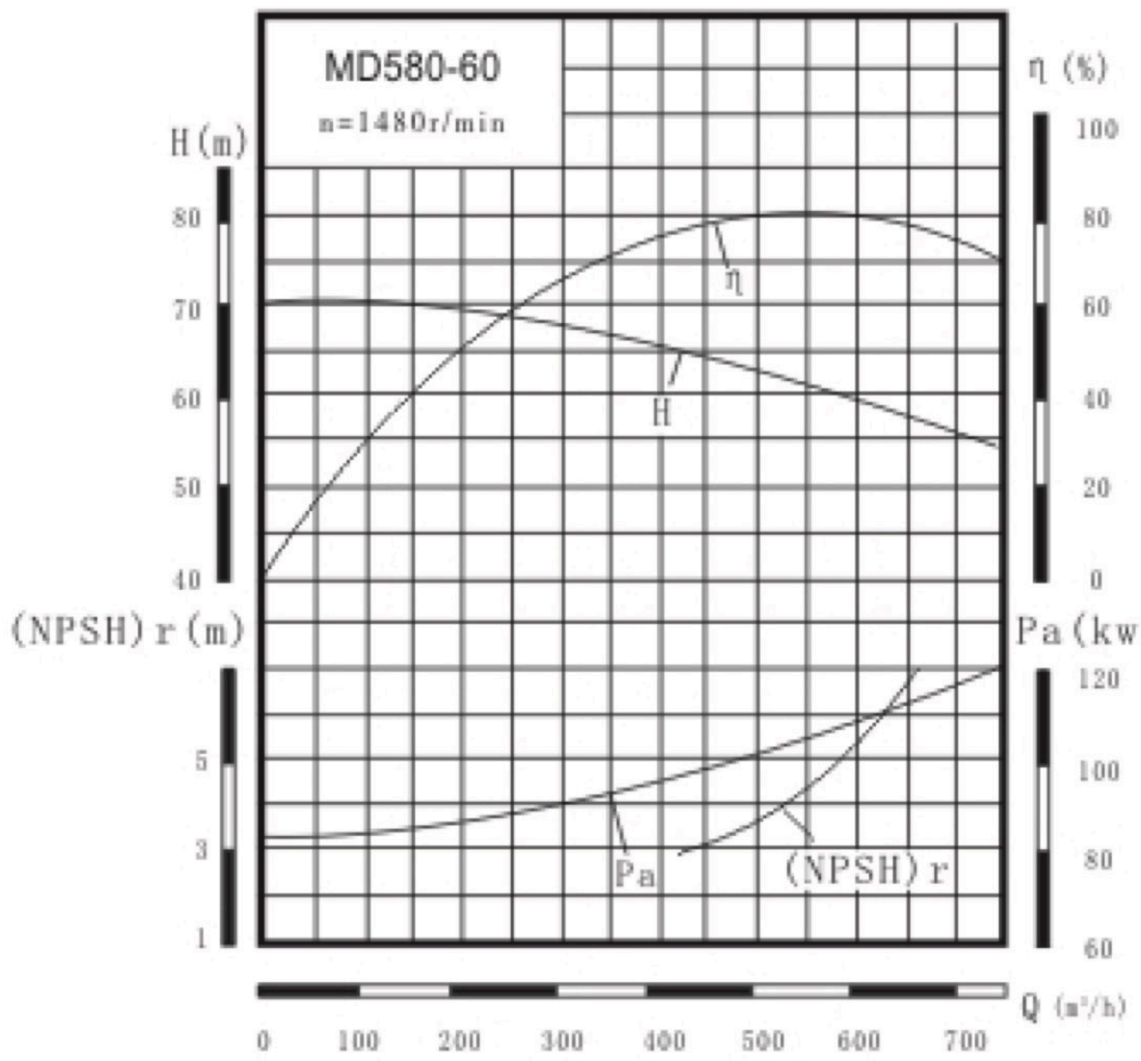


MD 450—60 Pump Performance Table

Pump Model	Flow Rate Q		Head H	Rotational Speed n	Power (kW)		Efficiency	Required NPSH (NPSHr)	Impeller Diameter	Weight
	(m^3/h)	(L/S)	(m)	(r/min)	Shaft Power	Motor Power	η (%)	(m)	D (mm)	W (kg)
MD450-60×2	355	93.1	130	1480	164.7	220	72	3.8	430	1500
	450	125	120		186.15		79	4.9		
	500	139	114		199.0		78	6.0		
MD450-60×3	355	93.1	195		247.1	315	72	3.8		1750
	450	125	180		279.2		79	4.9		
	500	139	171		298.5		78	6.0		
MD450-60×4	355	93.1	260		329.4	450	72	3.8		2000
	450	125	240		372.3		79	4.9		
	500	139	228		398		78	6.0		
MD450-60×5	355	93.1	325		411.8	560	72	3.8		2250
	450	125	300		465.4		79	4.9		
	500	139	285		497.5		78	6.0		
MD450-60×6	355	93.1	390		494.4	630	72	3.8		2500
	450	125	360		558.5		79	4.9		
	500	139	342		597		78	6.0		
MD450-60×7	355	93.1	455		576.5	710	72	3.8		2750
	450	125	420		651.5		79	4.9		
	500	139	399		696.5		78	6.0		
MD450-60×8	355	93.1	520		658.9	900	72	3.8		3000
	450	125	480		744.6		79	4.9		
	500	139	456		796		78	6.0		
MD450-60×9	355	93.1	585		741.2	1000	72	3.8		3250
	450	125	540		837.7		79	4.9		
	500	139	513		895.6		78	6.0		
MD450-60×10	355	93.1	650		823.6	1120	72	3.8		3500
	450	125	600		930.6		79	4.9		
	500	139	570		995.1		78	6.0		

Hebei Ivy Pump Industry Co., Ltd.

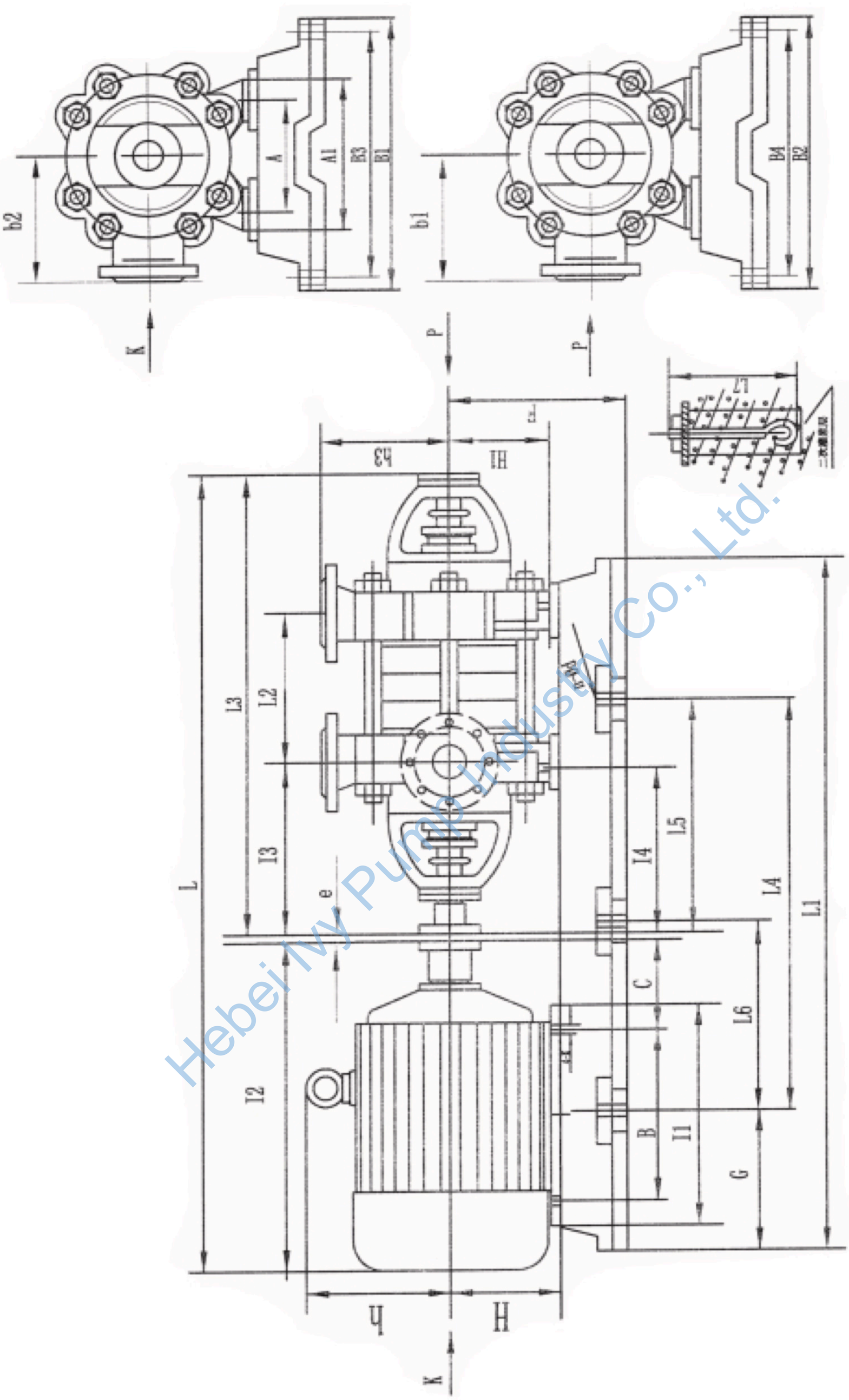


MD 580—60 Pump Performance Table

Pump Model	Flow Rate Q		Head H	Rotational Speed n	Power (kW)		Efficiency η	Required NPSH (NPSHr)	Impeller Diameter D	Weight W
	(m³/h)	(L/S)	(m)	(r/min)	Shaft Power	Motor Power	(%)	(m)	(mm)	(kg)
MD580-60×3	450	125.0	195	1480	302.5	450	79	3	442	
	580	161.1	180		346.7		82	4.5		
	638	177.2	165		358.1		80	6		
MD580-60×4	450	125.0	260		403.3	560	79	3		
	580	161.1	240		462.3		82	4.5		
	638	177.2	220		477.8		80	6		
MD580-60×5	450	125.0	325		504.2	710	79	3		
	580	161.1	300		577.9		82	4.5		
	638	177.2	275		597.3		80	6		
MD580-60×6	450	125.0	390		605.0	800	79	3		
	580	161.1	360		693.4		82	4.5		
	638	177.2	330		716.7		80	6		
MD580-60×7	450	125.0	455		705.8	900	79	3		
	580	161.1	420		809.0		82	4.5		
	638	177.2	385		836.2		80	6		
MD580-60×8	450	125.0	520		806.7	1120	79	3		
	580	161.1	480		924.6		82	4.5		
	638	177.2	440		955.6		80	6		
MD580-60×9	450	125.0	585		907.5	1250	79	3		
	580	161.1	540		1040.2		82	4.5		
	638	177.2	495		1075.1		80	6		
MD580-60×10	450	125.0	650		1008.3	1250	79	3		
	580	161.1	600		1155.7		82	4.5		
	638	177.2	550		1194.5		80	6		

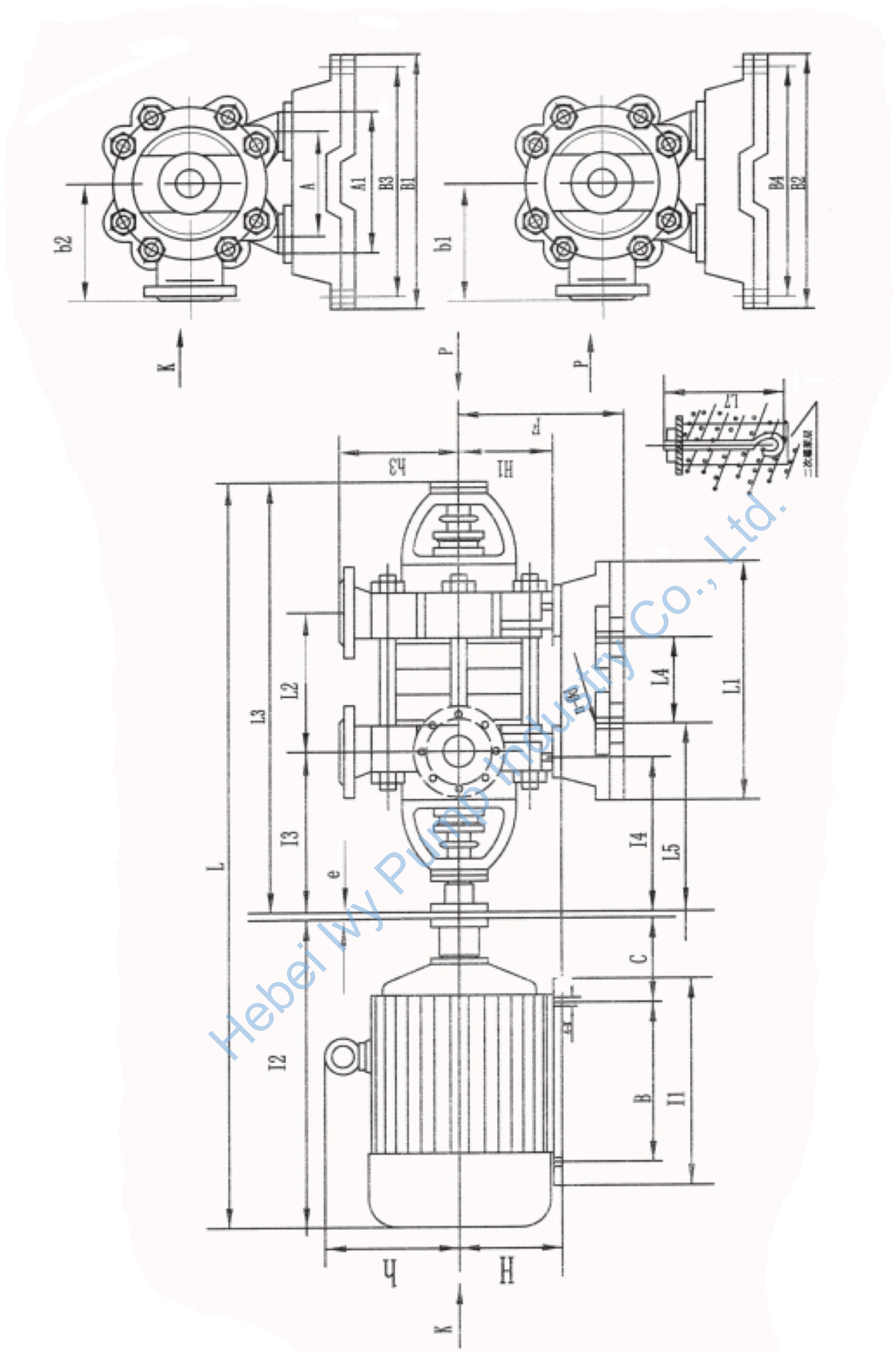
Hebei Ivy Pump Industry Co.,Ltd.

X. Installation Drawing (Base) and Installation Dimension Table of MD-type Multistage Wear-resistant Mining Pump



Pump Outline and Installation Drawing (Common Base)

Hebei Ivy Pump Industry Co., Ltd.



Pump Outline and Installation Diagram (Separate Base)

Hebei Wy Pump Industry Co., Ltd.

MD-type Wear-resistant Multistage Mining Centrifugal Pump Outline and Installation Dimension Table

Unit: mm

Pump Model	Number of Stages	Base	Pump Outline and Installation Dimension																														Anchor Bolt	Motor	
			L	L_0	L_2	L_3	L_4	L_5	L_6	l_1	l_2	l_3	l_4	A	A_1	B	B_1	B_2	B_3	B_4	h_0	h_2	C	H	H_1	h	h_1	h_3	h_4	e	k	G	F	n-d	nd×L7	Model	Power (kw)
MD6-25	3	共同底座	1187	870	180	702	565	367	0	190	482	272	272	216	265	140	415	415	350	350	170	210	181	132	150	183	18	25	170	3	12	160	220	4—φ24	M20×300	Y132S$_1$-2	5.5
	4		1237	940	230	752	620	432									400	400	340	340												160	215			Y132S$_2$-2	7.5
	5		1287		280	802																														
	6		1482	1135	330	852	720	312		260	627			254	320	210	450	400	385	340		255	230	160		225	20				160	240			Y160L$_1$-2	11
	7		1532	1220	380	902	820	497									460	420	400	360												180	245				
	8		1582	1340	430	952	840	502									460	395	400	360												195	245			Y160L$_2$-2	15
	9		1632		480	1002																														
	10		1682	1520	530	1052	935	602		305	682					254	510	–	455	–												220	245			Y160L-2	18.5
	11		1787		580	1102																														
	12		1837		630	1152																														
MD12-25	3	共同底座	1187	870	180	702	565	367	0	190	482	272	272	216	265	140	415	415	350	350	170	210	181	132	150	183	18	30	170	3	12	165	220	4—φ25	M20×300	Y132S$_1$-2	7.5
	4		1383	1135	230	752	720	312		260	627			254	320	210	450	400	340	340		255	230	160		225	20				160	240			Y160L$_1$-2	11
	5		1432		280	802																														
	6		1482		330	852																													Y160L$_2$-2	15
	7		1532	1220	380	902	820	497									460	420	400	360												180	245				
	8		1637	1340	430	952	840	502		305	682					254	460	395	400	360												195	245			Y160L-2	18.5
	9		1687		480	1002																														
	10		1767	1440	530	1052	910	572		315	712			279	355	241	500	440	425	380		280	243	180		250	22				200	260			Y180M-2	22
	11		1817		580	1102																														
	12		1937	1570	630	1152	990	592		375	782			318	395	305	540	420	470	345		305	255	200		275	25				19	200	280			Y200L$_1$-2	30
MD12-50	2	共同底座	1347	1061	174	718	734	416	–	260	625	280	318	254	320	210	530	530	480	480	240	255	228	160	200	260	20	35	240	3	15	170	300	4—φ20	M16×300	Y160L$_1$-2	11
	3		1397		224	768																													Y160L$_2$-2	15
	4		1523	1166	274	818	788	455		315	710			279	355	241						280	241	180		275	22				19	197			Y180M-2	22
	5		1652	1331	324	868	896	506		375	780			318	395	305						305	253	200		305	25					210	310			Y200L$_1$-2	30
	6		1872	1540	419	1096	1050	683		375	780	358	383				565	565	500	500												240		4—φ24	M20×300	Y200L$_2$-2	37
	7		1932		479	1156																														
	8		2042	1690	539	1216	1190	793		400	823			356	435	311	610	560	550	500		335	262	225		330	28					240	330			Y225M-2	45
	9		2102		599	1276																														
	10		2257	1951	659	1336	1436	953	718	445	918			406	490	349	650	530	600	480		365	311	250		365	30				24	258	350	6φ24		Y250M-2	55
	11		2317		719	1396																														
	12		2377		779	1456																														

Hebei Ivy Pump Industry Co., Ltd.

MD-type Wear-resistant Multistage Mining Centrifugal Pump Outline and Installation Dimension Table

Unit: mm

Pump Model	Number of Stages	Base	Pump Outline and Installation Dimension																																Anchor Bolt	Motor	
			L	L_0	L_2	L_3	L_4	L_5	L_6	l_1	l_2	l_3	l_4	A	A_1	B	B_1	B_2	B_3	B_4	b_0	b_2	C	H	H_1	h	h_1	h_2	h_3	e	k	G	F	n-d	nd×L7	Model	Power (kw)
MD25-30	3	共同底座	1482	1115	230	851	590	354	0	260	627	336	321	254	320	210	500	500	435	435	210	255	290	160	170	225	20	35	210	4	15	260	245	4—Φ30	M24×400	Y160M$_1$-2	15
	4		1602	1270	295	916	860	436		305	682					254	510	510	440	440												210	260			Y160L-2	18.5
	5		1697	1320	360	981	890	556		315	712			279	355	241	510	510	440	440		280	243	180		250	22					230	270			Y180M-2	22
	6		1832	1430	425	1046	920	541		375	782			318	395	305	540	490	480	420		305	255	200		275	25				19	235	270			Y200L$_2$-2	30
	7		1898	1500	490	1112	1050	661									550	530	490	490													225	295				
	8		1962	1640	555	1176	1070	811									550	530	490	490													380	295			Y200L$_3$-2	37
	9		2027		620	1241																														
	10		2142	1720	685	1306	1130	861		400	832			356	435	311	620	530	540	470		335	271	225		305	28					385	310			Y225M-2	45
MD25-50	3	共同底座	1727	1460	245	945	500	558	–	375	778	361	328	318	395	305	560	560	500	–	300	305	255	200	210	250	25	40	270	4	19	290	320	4—Φ24	M20×300	Y200L$_1$-2	30
	4		1787		305	1005																														
	5		1847		365	1065								356	435	311																			Y200L$_2$-2	37
	6		1945	1510	425	1119	960	713		400	822						750	530	530	460		335	264	225		305	28					300	370			Y225M-2	45
	7		2102	1690	485	1179	1220	673	660	445	919	355	322	406	490	349	670	550	600	480		365	310	250		325	30				24	210	360	6—Φ24		Y250M-2	55
	8		2210	1900	545	1229	1180	683	580	490	977			457	550	368	715	580	640	500		400	334	280		360	35					380	430			Y280S-2	75
	9		2280	2180	605	1299	1430	933	715								770	630	690	590													395	420				
	10		2340		665	1359																														
	11		2450		725	1419				540	1027					419																			Y280M-2	90
	12		2511	2220	785	1479	1490	883	750					508	630	406	830	580	760	520		525	360	315			45				28	370	525			Y315S-2	110
MD46-30	3	共同底座	1569	1115	230	852	590	347	0	315	713	337	322	279	355	241	500	500	435	435	210	280	244	180	170	250	22	35	210	4	15	260	250	4—Φ24	M20×300	Y180M-2	22
	4		1701	1300	295	917	915	492		375	780			318	395	305	550	500	480	430		305	254	200		275	25				19	200	285			Y200L$_1$-2	30
	5		1766	1370	360	982	920	517									550	500	480	430													215	280			Y200L$_2$-2	37
	6		1831	1430	425	1047	920	542									540	490	480	420													235	270				
	7		1951	1540	490	1112	1110	672		400	835			356	435	311	600	530	525	455		335	274	225		305	28				24	210	405			Y225M-2	45
	8		2107	1770	555	1177	1100	672		445	926			406	490	349	650	580	500	440		365	319	250		325	30					250	330			Y250M-2	55
	9		2172		620	1242																														
	10		2286	1880	685	1302	1240	697		490	980			457	550	368	720	650	550	460		400	335	280		360	35					250	365			Y280S-2	75

Hebei Ivy Pump Industry Co., Ltd.

MD-type Wear-resistant Multistage Mining Centrifugal Pump Outline and Installation Dimension Table

Unit: mm

Pump Model	Number of Stages	Base	Pump Outline and Installation Dimension																																Anchor Bolt	Motor	
			L	L_0	L_2	L_3	L_4	L_5	L_6	L_1	L_7	L_8	L_9	A	A_1	B	B_1	B_2	B_3	B_4	b_0	b_2	C	H	H_1	h	h_1	h_2	h_3	e	k	G	F	n-d	nd×17	Model	Power (kw)
MD46-50	3	共同底座	1733	1460	245	945	500	558		375	784	361	328	318	395	305	360	560	500	500	300	305	254	200	210	275	25	40	270	4	19	290	320	4—Φ24	M20×300	Y200L$_2$-2	37
	4		1827	1510	305	1000	960	714	-	400	823	356	324	356	435	311	750	530	530	460		335	282	225		305	28					300	370			Y225M-2	45
	5		1979	1560	365	1060	1000	524		445	915			406	490	349	630	510	580	460		365	308	250		325	30					270	385			Y250M-2	55
	6		2101	1780	425	1120	1135	624	570	490	977			457	550	368	710	580	640	510		400	332	280		360	35				24	320	430			Y280S-2	75
	7		2161		485	1180																											6—Φ24			
	8		2271	1900	545	1240	1180	684	580	540	1027	356	324	457	550	419	715	580	640	500	300	400	332	280	210	360	35	40	270	4	24	380	430	4—Φ24	M20×300	Y280M-2	90
	9		2521	2220	605	1300	1485	904	750	570	1217			508	630	406	840	600	760	530		525	358	315		550	45				28	380	520	6—Φ24		Y315S-2	110
	10		2581		665	1360										457	830	580	760	520											370	525			Y315M-2	132
	11		2751	2220	725	1420	1490	884	750	680	1327																										
	12		2811		785	1480																															
MD85-45	2	共同底座	1627	1230	203	835	850	417	-	375	783	334	317	318	395	305	380	580	515	515	250	305	256	200	210	275	25	40	250	4	19	185	310	4—Φ24	M20×300	Y200L$_2$-2	37
	3		1846	1450	277	909	950	492	-	445	928			406	490	349	650	600	590	520		365	321	250		325	30				24					Y250M-2	55
	4		1966	1635	351	983	1070	557	510	490	979	326	312	457	550	457	760	600	700	580		400	334	280		360	35					280	400			Y280S-2	75
	5		2090	1750	425	1057	1110	562	555	540	1029					419	770	590	680	520												330	400			Y280M-2	90
	6		2356	1800	499	1131	1150	612	580	570	1221			508	630	508	770	585	680	510		525	362	315		550	45				28	345	430	6—Φ24		Y315S-2	110
	7		2540	1930	573	1205	1220	668	653	680	1331						820	625	750	560												355	430			Y315M-2	132
	8		2614	2170	647	1279	1350	762	603								830	650	760	570												470	430			Y315L$_2$-2	160
	9		2688		721	1353																															
MD85-67	3	单独底座	2441	765	371	1409	402	634	-	540	1027	559	559	457	550	419	-	670	-	600	350	400	332	280	270	360	35	50	350	5	24	-	420	4—Φ28	M24×300	Y280M-2	90
	4		2829		459	1497				680	1327			508	630	406						525	358	315		550	45				28					Y315S-2	110
	5		2917		547	1585										457																			Y315M-2	132
	6		3005	945	635	1673	580									508																			Y315L$_2$-2	160
	7		3263		723	1761				760	1497			610	730	500						500	396	355		680	52									Y315L$_2$-2	185
	8		3351	1125	811	1849	760									560																			Y355M-2	220
	9		3439		899	1937																													Y335M-2	250

Hebei Ivy Pump Industry Co., Ltd.

MD-type Wear-resistant Multistage Mining Centrifugal Pump Outline and Installation Dimension Table

Unit: mm

Pump Model	Number of Stages	Base	Pump Outline and Installation Dimension																																					Anchor Bolt	Motor	
			L	L_0	L_1	L_2	L_3	L_4	L_5	l_1	l_2	l_3	l_4	A	A_1	B	B_1	B_2	B_3	B_4	b_0	b_2	C	H	H_1	h	h_1	h_2	h_3	e	k	G	F	n-d	nd×L7	Model	Power (kw)
MD155-30	2	共同底座	2056	1550	310	1133	1060	605	530	445	919	430	435	406	490	349	650	650	590	590	330	365	312	250	280	325	30	50	350	4	24	–	–	6—Φ30	M24×300	Y250M-4	55
	3		2231	1760	425	1248	1270	645	635	490	979			457	550	368	720	720	650	650		400	334	280		360	35									Y280S-4	75
	4		2396	1880	540	1363	1200	645	600	540	1029					419	760	760	680	680												330	410			Y280M-4	90
	5		2511	2040	655	1478	1330	685	670	570	1219			508	630	406	800	740	710	660		525	390	315		550	45				–	250	460			Y315S-4	110
	6		2931	2420	770	1593	1810	1015	915	680	1329			308		457	820	660	760	600	330										28	290	445			Y315M$_1$-4	132
	7		3041		885	1708										508																			Y315L$_1$-4	160
	8		3156	2610	1000	1823	1610	1005	810	760	1499			610	730	500	830	680	740	605		655	428	335		680	52					420	455			Y315L$_2$-4	185
	9		3271		1115	1988																																				
	10		3556	2880	1230	2053	1750	1075	870							560	925	660	860	600												485	500			Y355M-4	220
MD155-67	3	单独底座	2739	765	371	1407	400	632	–	680	1327	557	557	508	630	508	–	670	–	400	350	525	358	315	270	550	45	–	350	5	28	–	420	4—Φ28	M24×400	Y315M$_1$-2	132
	4		2997		459	1495				760	1497			610	730	500						655	396	355		680	52									Y315L$_2$-2	185
	5		2085		547	1583										560																			Y355M-2	220
	6		3173	945	635	1671	580									630																			Y355L$_1$-2	280
	7		3261		723	1759																													Y355L$_2$-2	315
	8		4051	1125	811	1817	760			1200	2202			710	870	1000						860	452	400		1300					35					Y4002-2	355
	9		4142		899	1935																													Y4003-2	400
MD280-43	2	单独底座	2413	495	373	1190	180	505	–	570	1217	388	448	308	630	406	–	800	–	730	450	525	388	315	330	550	45	–	400	6	28	–	480	8—Φ28	M24×400	Y315S-4	110
	3		2653	625	503	1320	310			680	1327					457																			Y315L$_1$-4	160
	4		2953	755	633	1450	440			760	1497			610	730	560						655	426	355		680	52									Y355M-4	220
	5		3083	885	763	1580	570																													Y355M$_1$-2	250
	6		3213	1015	893	1710	700							710	870	630															35					Y355L$_1$-4	315
	7		4080	1145	1023	1872	830	537		1200	2202	420	480			1000						860	492	400		740	–									Y4002-4	355
	8		4210	1275	1153	2002	960																													Y4003-4	400
	9		4340	1405	1283	2132	1090																													Y4004-4	450

Hebei Ivy Pump Industry Co., Ltd.

MD-type Wear-resistant Multistage Mining Centrifugal Pump Outline and Installation Dimension Table

Unit: mm

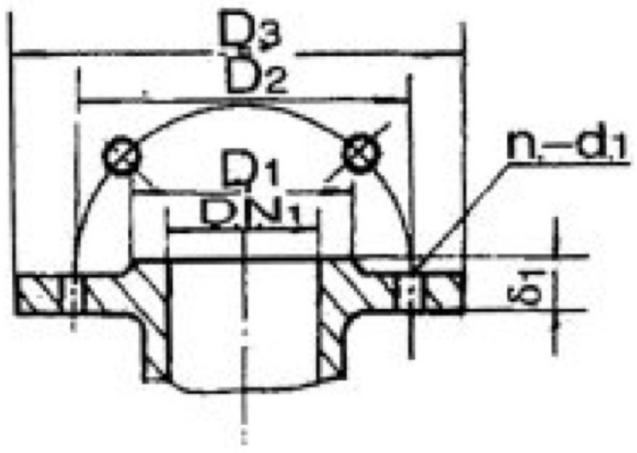
Pump Model	Number of Stages	Base	Pump Outline and Installation Dimension																																Anchor Bolt	Motor	
			L	L_0	L_1	L_2	L_3	L_4	L_5	l_1	l_2	l_3	l_4	A	A_1	B	B_1	B_2	B_3	B_4	b_3	b_2	C	H	H_1	h	h_1	h_2	h_3	e	k	G	F	n-d	md×L7	Model	Power (kw)
MD280-65	3	单独底座	3172	690	475	1638	310	712	–	760	1500	627	642	610	730	560	–	870	–	790	500	655	426	355	380	680	52	–	500	7	28	–	530	6—Φ35	M30×630	Y355M$_1$-4	250
	4		3302	820	605	1768	440									630																				Y355L$_0$-4	315
	5		4107	950	735	1898	570			1200	2202			710	870	1000						860		400		740										Y4003-4	400
	6		4347	1080	865	2028	700															930	492	450		800	–									Y4501-4	500
	7		4477	1210	995	2158	830			1340	2312			800	950	1120															35					Y4502-4	560
	8		4607	1340	1125	2288	960																													Y4503-4	630
	9		4737	1470	1255	2418	1090																													Y4504-4	710
	10		2577	1600	1385	2548	1230			1490	2402			900	1080	1250						970	567	500		820					42					Y5001-4	800
MD450-60	2	单独底座	3056	615	421	1549	235	689	–	760	1500	591	629	610	730	560	–	930	–	830	500	655	426	355	410	680	–	–	550	7	28	–	560	4—Φ42	M36×630	Y355M-4	220
	3		3209	770	574	1702	388									630																				Y355L$_0$-4	315
	4		4064	920	727	1855	541			1200	2202			710	870	1000						860	450	400		740					35					Y4004-4	450
	5		4217	1075	880	2008	694																													Y4502-4	560
	6		4480	1230	1033	2161	847			1340	2312			800	950	1120						930	492	450		–										Y4503-4	630
	7		4633	1380	1186	2314	1000																													Y4504-4	710
	8		4786	1535	1339	2467	1153																													Y5002-4	900
	9		5029	1685	1492	2620	1306			1490	2402			900	1080	1250						970	567	500							42					Y5003-4	1000
	10		5182	1840	1645	2773	1459																													Y5004-4	1120

Hebei Ivy Pump Industry Co., Ltd.

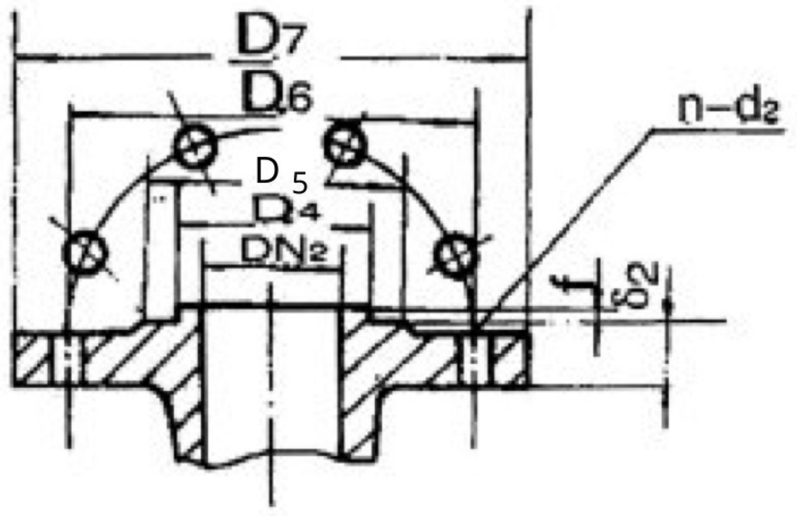
XI. MD Series Pump Inlet and Outlet Flange Dimensions Table

Unit: mm

Suction Flange



Discharge Flange Dimensions



Pump Model	Inlet Flange Dimensions						Discharge Flange Dimensions							
	DN_1	D_1	D_2	D_3	δ_1	n-d_1	DN_2	D_4	D_5	D_6	D_7	δ_2	f	n-d_2
MD6-25	40	80	100	130	18	4–13.5	40	75	88	110	150	20	4	4–17.5
MD12-25	50	90	110	140	18	4–13.5	40	75	88	110	150	20	4	4–17.5
MD12-50	50	102	125	165	20	4–17.5	50	87	102	135	180	26	4	4–22
MD25-30	65	110	130	160	20	4–17.5	65	109	122	145	185	28	4	8–17.5
MD25-50	65	128	150	190	20	4–17.5	65	120	133	170	215	30	4	8–22
MD46-30	80	128	150	190	22	4–17.5	65	109	122	145	185	28	4	8–17.5
MD46–50	80	128	150	190	22	4–17.5	80	120	133	170	215	30	4	8–22
MD85-45	100	148	170	210	24	4–17.5	100	149	158	190	235	30	4.5	8–22
MD85-67	100	148	170	210	22	8–17.5	100	149	168	200	250	34	4.5	8–26
MD155-30	150	211	240	285	24	8–22	150	203	211	250	300	32	4.5	8–26
MD155-67	150	202	225	265	26	8–17.5	150	203	242	280	345	38	4.5	8–33
MD280-43	200	268	295	340	28	8–22	200	259	285	320	375	38	4.5	12–30
MD280-65	200	268	295	340	30	12–22	200	259	285	345	415	44	4.5	12–36
MD450-60	250	320	355	405	32	12–26	250	312	345	400	470	48	4.5	12–36

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Pipeline Loss Reference Table

Pipe Diameter (mm)	Flow Rate (L/S)																							
	1	2	4	6	8	10																		
25	3.27	13																						
40	3.5	14	55				15	20																
50	0.8	3.1	13	29					25	30														
65		0.8	3.2	7.1	13	20					40	50												
75		0.4	1.6	3.3	5.9	9.6	21.6						60	70										
100			0.4	0.8	1.3	2.1	6.8	8.6	13	19.4					80	90								
125				0.23	0.4	0.63	1.3	2.7	4.1	5.9	10.7						100	110						
150					0.16	0.26	0.58	1.1	1.6	2.3	4.2	6.4	9.4						120	130				
175						0.11	0.27	0.5	0.74	1.05	1.9	2.9	4.3	5.8	7.7	9.6					140	160		
200							0.13	0.26	0.37	0.53	0.93	1.5	2.1	2.9	3.7	4.7	6.1	7.2	8.5				180	200
250								0.07	0.12	0.18	0.30	0.48	0.68	0.93	1.2	1.5	1.9	2.3	2.8	3.3	3.7	4.9	5.2	
300										0.07	0.12	0.19	0.27	0.37	0.49	0.6	0.76	0.9	1.1	1.3	1.5	2.0	2.4	3.0

Brief Table of Straight-Pipe Friction Loss (for estimation only)
Loss head per 100 m straight pipe, based on new cast-iron pipe; double the value for old pipes.

Equivalent Straight-Pipe Length for Valves and Elbows (per piece)

Type	Equivalent Straight Pipe Diameter Multiplier	Remarks
Full-port gate valve	12	Double the value if not fully open
Standard elbow	25	
Check Valve	100	
Foot valve	100	Double the capacity for partial blockage

Note: Example: For 100 mm diameter pipe, foot-valve equivalent length = 100 × 100 = 10000 mm = 10 m. At flow rate 8 L/s, table shows 1.3 m loss per 100 m straight pipe. Loss for 10 m equals 0.13 m. That is, one foot-valve at 8 L/s produces head loss of 0.13 m.

Maximum Flow Limit for Given Pipe Diameter

Pipe Diameter (mm)	Maximum Flow Rate (l/s)	Maximum Flow Velocity (m/s)	Pipe Diameter (mm)	Maximum Flow Rate (l/s)	Maximum flow velocity (m/s)
25	1	2.04	125	30.0	2.44
40	2.5	1.69	150	43.0	2.45
50	4.17	2.12	175	60.0	2.49
65	6.67	2.01	200	83.3	2.69
75	10.0	2.26	300	133.0	2.72
100	18.4	2.33	350	192.0	2.71

Exceeding these limits will cause sharp increase of pipeline loss.

Hebei Ivy Pump Industry Co., Ltd.