Project Cases

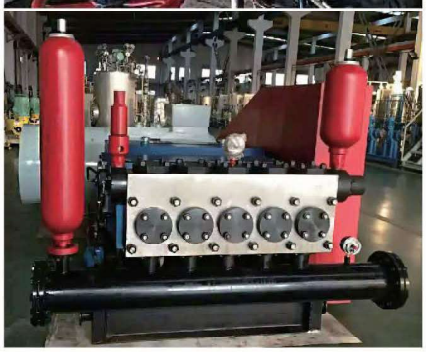
Oilfield Polymer Injection Pump

Crude Oil Transportation Pump

Hydrogen Injection Pump in Petrochemical Industry

Three-plunger Pump for Machinery Plant

Furfural Pump in Chemical Industry



Iran Fertilizer Project

Water Injection Pump for Oilfield

Catalyst Colloid Pump

TEG Circulating Pump

Acetone Booster Pump

Indian Oilfield Project Site

Irrigation Project

Reciprocating Pump in Chemical Industry

Product Introduction

INNO reciprocating pumps, designed according to American Petroleum Institute standard (API674), can represent quality at a worldwide leading level, and many patents the company has obtained can prove that. Products can meet extremely severe working conditions, transport materials accurately and reliably, and meet the highest requirements for pumps of that type.

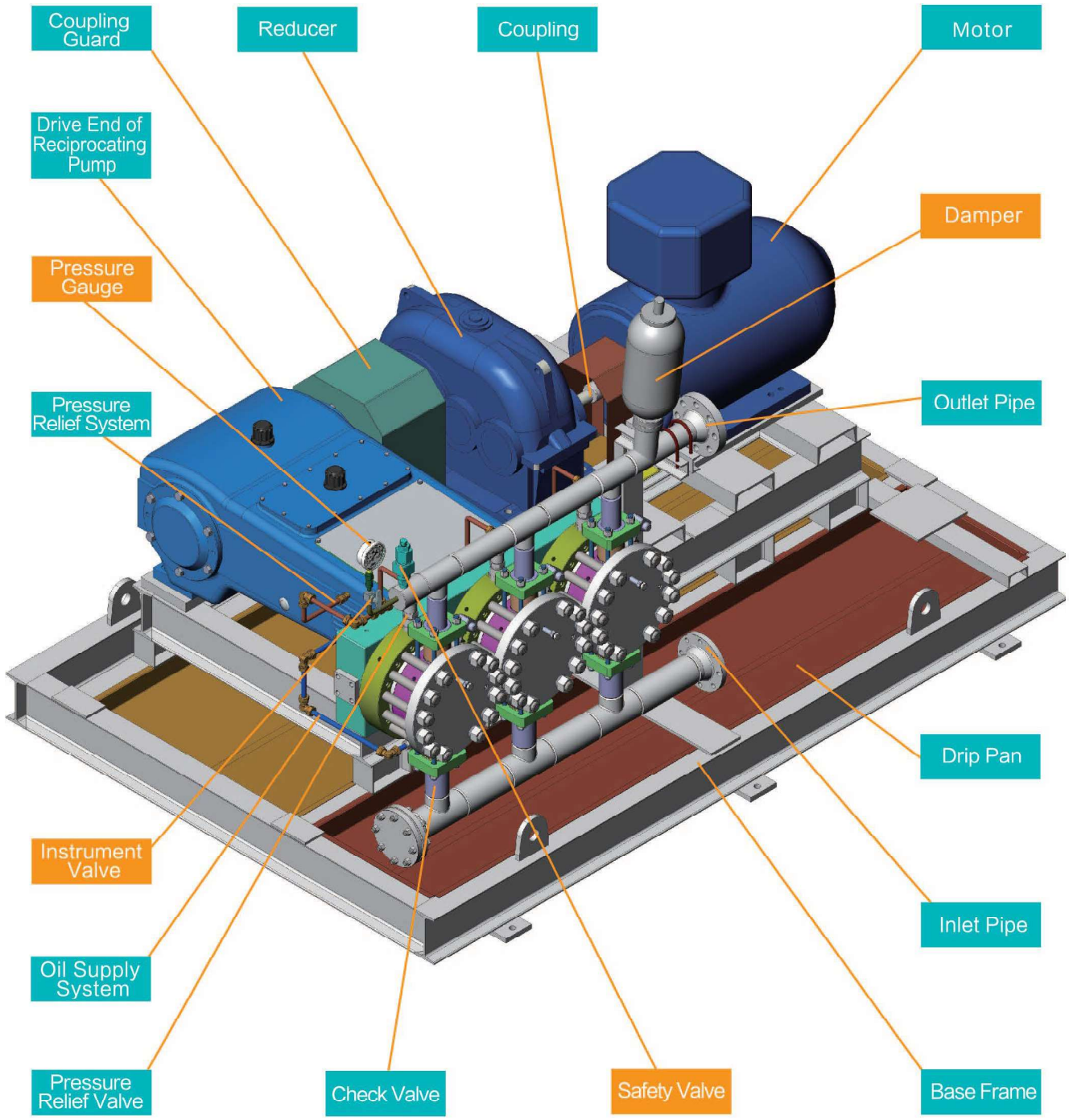
Based on solid technologies, reciprocating pumps in a compact structure are especially popular in the field of equipment manufacturing. The design of process diaphragm pumps ensures no leakage during transportation of toxic, flammable or abrasive media with harsh requirement without restriction from different fields.

Product Application

Products can be used as an oil-gas field water injection pump, polymer injection pump, butanediol charging pump, ammonium carbamate pump, liquid ammonia pump, acetic acid cuprammonia pump, liquid carbon dioxide pump, ammonium dihydrogen phosphate pump, alcohol injection pump, oil hydrogenation refining pump, coal water slurry diaphragm pump, pipeline cleaning pump, coal seam water injection pump, high pressure and ultra-high pressure cleaning pump, fertilizer process pump, salt mine water injection pump, liquid methanol pump, high pressure water dephosphorization pump for metallurgy, high pressure pump for hydraulic press, etc.

- A compact modular structure, a small size and a light weight;
- Good lubricity, small friction coefficient and high efficiency;
- Stable and reliable transmission at drive end with low noise;
- Assembly Forms: Horizontal, vertical, stationary and mobile;
- Power Sources: Motor, diesel engine or solar energy;
- Deceleration Mechanism Types: Double helical gear, worm and gear, reducer and belt pulley;
- Materials of wetted parts can be alloy steel, stainless steel, dual-phase steel, titanium, Hastelloy, etc.;
- Personalized customizationis available according to customer requirements.

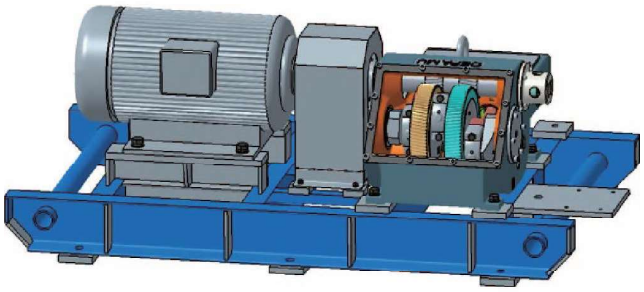
Typical Installation Chart



Note: The above is a typical installation chart for a reciprocating pump, in which, the blue blocks are standard accessories while the yellow ones are optional customers can select based on specific working condition.

Features of Double Helical Gear Reducer

- A small axial force, self-adjustment capability and a long service life of bearing;
- A special design of plunger alignment and short crosshead, a compact structure, and a high transmission precision;
- Double helical gears render a highly simplified design and guarantee a maximum efficiency. Such design minimizes the footprint and the power;
- The crankshaft and the pinion shaft are free from axial loading as a result of the design of double helical gears, and a smooth transmission device renders a long service life and low noise of a pump;
- Forging and shot peening hardening treatment reduce stress of a crankshaft, achieving a firm structure and high fatigue resistance of a pump;
- Reciprocating pressure pushes lubricating oil to act on crosshead pin, connecting rod and sliding bearing; therefore, no additional lubrication system is needed;
- A gear is under detection of pressure and temperature switches, which prevents happening of a low oil level and overload;
- Repairing of all oil sealing can be done externally, which makes repairing easy and convenient; and oil release is not required for repairing.



Features of Belt Pulley Drive

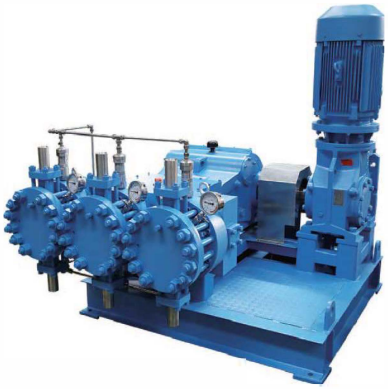
- Able to ease load impact and operate stably with low noise and vibration;
- A simple structure renders convenient adjustment;
- With the function of overload protection;
- Disadvantages: Existence of an elastic slip phenomenon, low transmission efficiency and inability to accurately retain a certain transmission ratio.

Features of Worm Gear Drive

- With a high single-stage transmission ratio and a compact structure;
- Able to operate stably with low noise and vibration;
- Shafts can be arranged vertically without crossing;
- Able to avoid reversing;
- Disadvantages: Big friction, existence of axial force, and a rather low transmission efficiency.

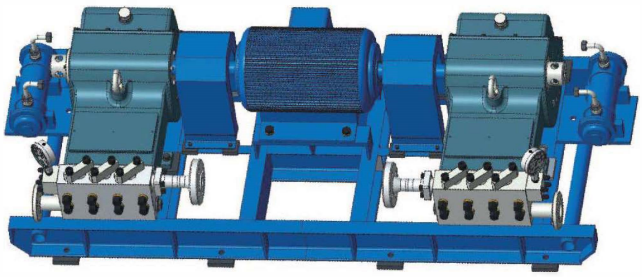
Features of Reducer Drive

- A high transmission efficiency and a stable transmission ratio;
- Able to drive stably, reduce pulsation and absorb vibration;
- Good heat dissipation, reliable performance and a long service life;
- Disadvantages: A rather large footprint.



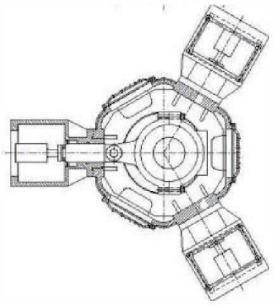
Features of Multiplex Reciprocating Pump

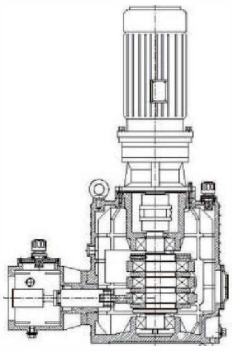
- Under the multi-head design effectively reducing pulsation, the pump is more suitable for application to occasions with a large flow and a high pressure, and can operate stably for a long time;
- The modular design allows for direct packing replacement without dismantling of pump head or pipeline, which greatly cuts down user maintenance cost;
- The design of double helical gears achieves simplicity and a maximum efficiency, which minimizes the footprint and the power;
- It can be converted to a multi-head high pressure process diaphragm pump according to specific working condition.



Features of Star-type Vertical Reciprocating Pump

- A star-type vertical reciprocating pump is in a vertical structure composed of circling reciprocating transmission components driven by single-throw crankshaft. In a simple structure, the pump can be processed easily without leakage;
- The pump has a high bearing capacity, a long service life and high stability, and maintenance can be done easily;
- With a high mechanical efficiency and low friction, the pump is energy-saving and environmentally friendly;
- Due to multi-dimension vertical installation, the pump is free from space limit and more suitable for application to offshore platforms, oil and gas fields, etc.;
- An invention patent has been granted for the pump under the name of “vertical multi-plunger high pressure reciprocating pump”.





Features of Hydraulic End in Plunger Pump

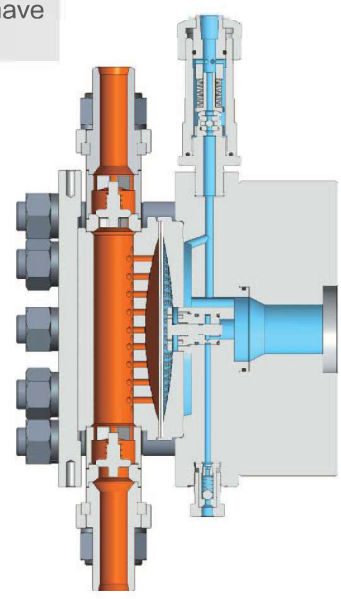
Aviation emery spraying process, adopted for plunger, realizes small friction and high hardness; sealing is made via imported packing with a special internal separation sleeve structure; sealing in that way, together with a specially designed backflow mechanism, lowers the possibility of leakage at hydraulic end;

- A large flow, a high working pressure and low pulsation;
- A strong and high-efficiency power end, an advanced forced lubrication system and adjustable eccentric couplings ensure stable and reliable pump running with small damage. A state patent has been granted for the pump structure with the Patent No. ZL20172114323351 and the Patent Name Three-plunger Reciprocating Pump.
- Good sealing performance of cylinder liner in a sealing structure adopts advanced German technology; packing, featuring self-sealing, shows excellent sealing performance with a sealing force automatically adjustable based on operation pressure;
- Quality integral ceramic plungers and mold combined modified PTFE packing render a low friction coefficient and a long service life, and can meet harsh conditions due to outstanding sealing performance and safeness;
- The advanced modular design allows for direct replacement of plunger and packing without dismantling of pump head;
- Check valve technology, double-guide ball valve spool and combined check valve with forced-return spring ensure reliable and stable check valve performance, low media flow resistance, timely shutoff and very little backflow.
- Pump head bolt technology with self-positioning anti-loose function ensures safe running of a high-pressure pump.

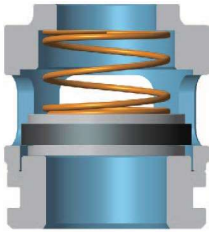
Features of Hydraulic End in Process Diaphragm Pump

Process diaphragm pumps with an invention patent, developed by Depamu based on the structure of its original advanced metering pumps, retain the advantages of hydraulic diaphragm pumps and plunger pumps, like a compact structure, a high efficiency and a high bearing pressure; besides, process diaphragm pumps have overcome the shortcomings of plunger pumps, easy corrosion and easy leakage.

- A diaphragm is used to fully separate media from hydraulic oil and ensure no media leakage. A process diaphragm pump is applicable to occasions of corrosive and toxic media transportation requiring high precision.
- A vent valve can automatically discharge air from hydraulic chamber.
- A compensation valve can timely replenish hydraulic oil into hydraulic chamber, thus stabilizing the oil volume in hydraulic chamber and ensuring measurement accuracy of the pump.
- Hydraulic oil circuit, under a fully enclosed design, prevents from entrance of dust and debris, and avoids blocking and insecurity of the circuit arising during manual operation.
- A double diaphragm pump, carrying all advantages of a diaphragm pump, contains a diaphragm rupture detector as well. When one diaphragm ruptures, the other diaphragm can continue working; meanwhile, the diaphragm rupture detector can send out alarm signals. The pump is applicable to transportation of dangerous media toxic, flammable, explosive and highly corrosive.
- A hydraulic metal diaphragm pump head is applicable to occasions under a high temperature or a high pressure. The max working temperature can reach 451℃ and the max pressure is up to 70 Mpa.
- Variable frequency regulation means regulation of motor power frequency via a VFD to control motor speed, thus changing pump speed to regulate pump flow.

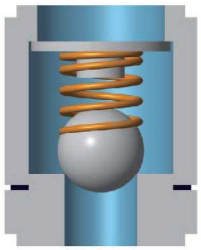


Valve Body System Reliable Check Valve Technology



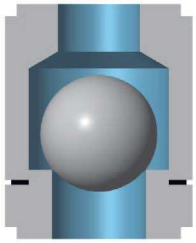
Planar Pressure Reset Type Check Valve

The working pressure can reach more than 200 bar; with the features of a simple structure, wide opening flow way, small reverse current, light weight, rapid reset, etc., the valve is applicable to transportation of media with a large flow, high pressure and low viscosity via injection pumps, alcohol injection pumps and cleaning pumps.



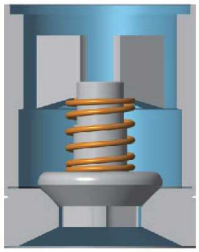
Spherical Pressure Reset Type Check Valve

With the features of a simple structure, good self-cleaning ability, good sealing, stable operation and good fluidity, it can be used for transportation of media with strict performance and solid particles, is especially applicable to occasions requiring a high accuracy and a low flow, and widely used in equipment with high demand in accurate flow measurement and pressure retaining.



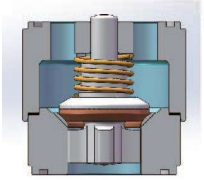
Spherical Automatic Reset Type Check Valve

With the features of a simple structure, rapid reset, good sealing and stable running, it can be used to transport media with a high viscosity and solid particles, and is applicable to special occasions with requirement of good sealing, a high viscosity and a high pressure.



Double Orientation Cone Reset Type Check Valve

With the features of quick reset, high precision, good sealing, low noise, low wearing, etc., it is applicable to transportation of media with a large flow and a high viscosity, and is especially suitable in occasions with strict requirement of environment noise.

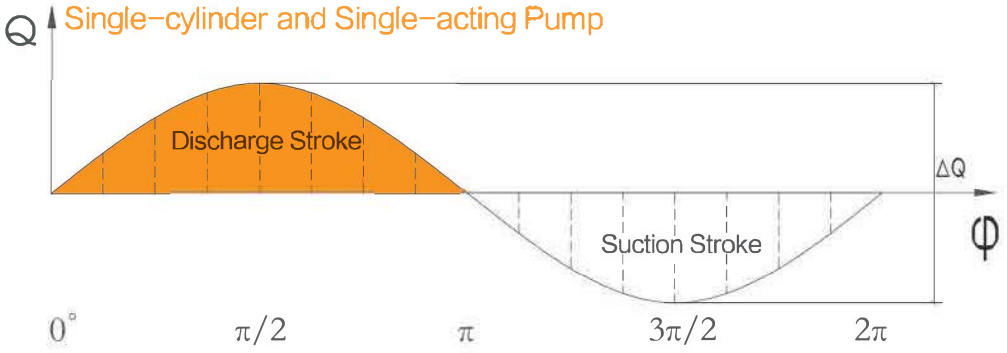


Double Orientation Spherical Reset Type Check Valve

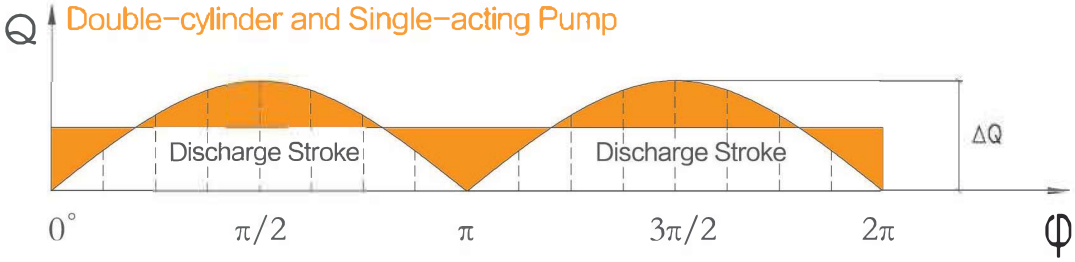
With the features of quick reset, high precision, good sealing, high wear resistance, high corrosion resistance, low noise, etc., it is applicable to transportation of media with a large flow, corrosivity, a high viscosity and particles, and is especially suitable for transportation of media containing many particles.

Flow Performance Curve

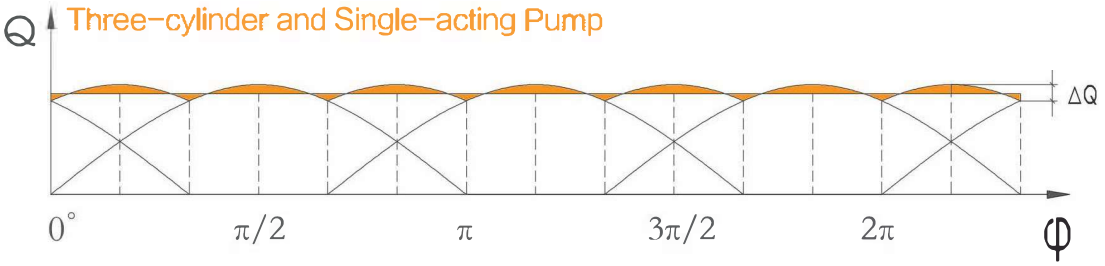
Single-cylinder and Single-acting Pump



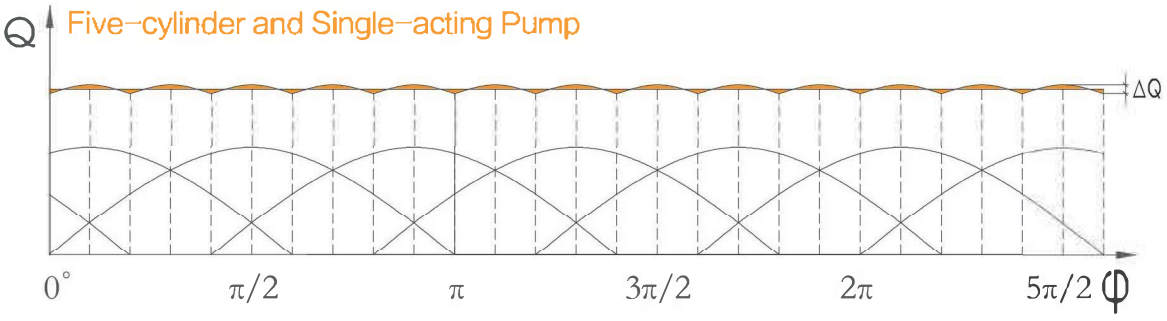
Double-cylinder and Single-acting Pump



Three-cylinder and Single-acting Pump



Five-cylinder and Single-acting Pump



Output Flow Performance

Product Code

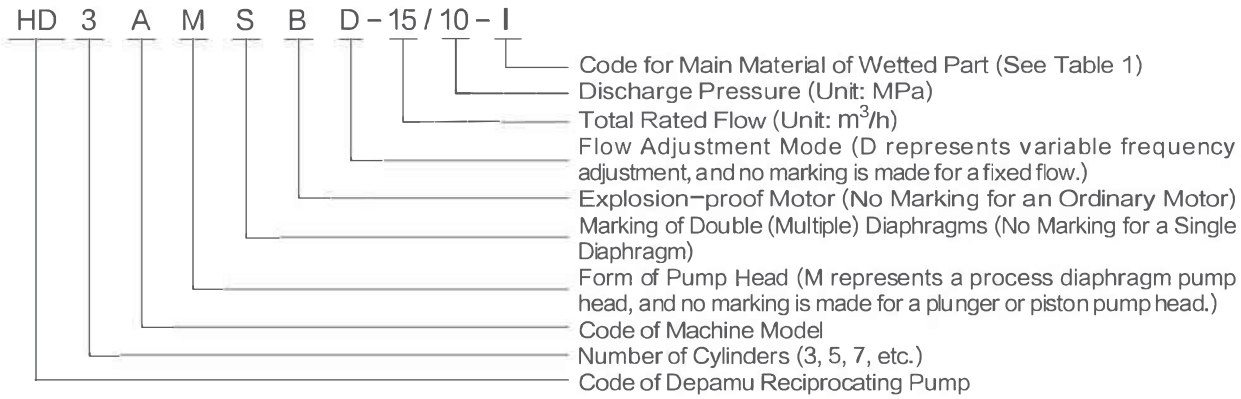


Table 1 Code for Main Material of Wetted Part

Code	Ⅰ	Ⅱ	Ⅲ	Ⅴ*	Ⅷ	Ⅸ
Material	304	316	316L	PTFE	CS	904

Ⅹ	Ⅺ	Ⅻ	XIII	XIV	XV
Duplex SS	Ti Alloy	Hastelloy C	Alloy 20	2Cr13	Others

Note: Materials with "*" mean mere application to a process diaphragm pump with a discharge pressure below 2.5MPa.

Necessary Conditions for Model Selection

Please provide the following technical parameters in as many details as possible when ordering in order to get a most suitable reciprocating pump:

01 Technical Conditions of Pump

- Pump Type: Process Diaphragm Type, Plunger Type
- Continuity: Continuous, Intermittent
- Max Flow: m^3/h
- Actual Max Discharge Pressure: MPa
- Wetted Part Material: 304, 316, 2Cr13, CS, etc.
- Adjustment Mode: Variable Frequency
- Ordinary or Explosion-proof Motor: In case of an explosion-proof motor, the specific explosion-proof level and the altitude shall be indicated.
- Power Supply: Three-phase, Single-phase, Voltage, Frequency
- Pipeline Material
- Inlet Pressure

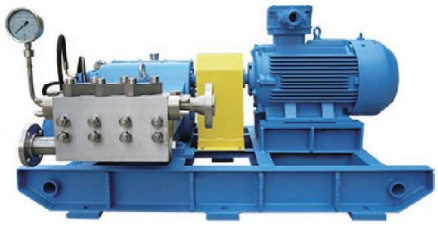
02 Description of Pumping Liquid

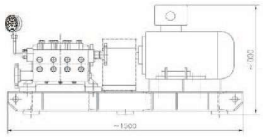
- Liquid Name:
- Concentration: %
- Temperature: ℃
- Density: kg/m^3
- Viscosity: mPa.s
- Corrosivity: PH
- Particle Size: um

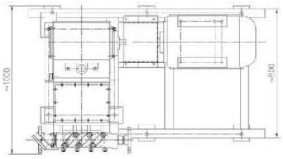
INNO

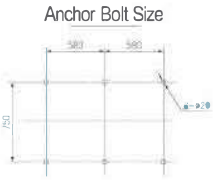
HD3C(M)

- Performance Parameter: Flow range: 0.35–8.59 m^3/h;
  Pressure range: 1.4–38.2 MPa;
- Main Application Fields: Applicable to oil and gas field pumps for injection of water, polymer and alcohol, chemical and fertilizer process pumps, carbon dioxide pumps as well as pumps for cleaning, dephosphorization and rust removal; without media leakage, the pump is especially suitable for transportation of media toxic, corrosive and volatile;
- Installation Form: Horizontal, vertical, stationary and movable;
- Drive Mode: Internal-meshing double helical gears, external reducer, belt pulley and variable frequency speed control.







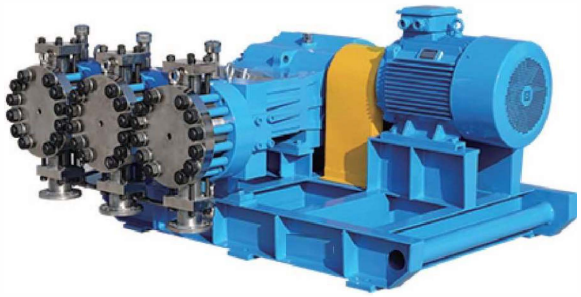


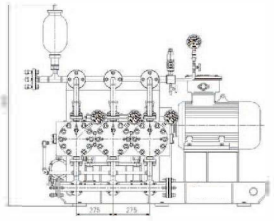
spm	mm	20	25	30	35	40	45	50
102	MPa / m^3/h / kw	0.35	0.54	0.78	1.06	1.38	1.75	2.16
	2.2	19.5	12.5	8.6	6.4	4.9	3.8	3.1
	3	26.5	17.0	11.8	8.7	6.6	5.2	4.2
	4	35.4	21.1	14.7	10.8	8.3	6.5	5.3
115	MPa / m^3/h / kw	0.39	0.61	0.88	1.19	1.56	1.98	2.44
	2.2	17.3	11.0	7.7	5.6	4.3	3.4	2.8
	3	23.5	15.1	10.5	7.7	5.9	4.6	3.8
	4	31.4	20.1	13.9	10.2	7.8	6.2	5.0
	5.5	38.2	24.4	17.0	12.5	9.5	7.5	6.1
180	MPa / m^3/h / kw	0.61	0.95	1.37	1.87	2.44	3.09	3.82
	2.2	11	7.1	4.9	3.6	2.8	2.2	1.8
	3	15	9.6	6.7	4.9	3.8	3.0	2.4
	4	20	12.8	8.9	6.5	5.0	4.0	3.2
	5.5	27.6	17.6	12.2	9.0	6.9	5.4	4.4
	7.5	37.6	24.1	16.7	12.3	9.4	7.4	6.0
257	MPa / m^3/h / kw	0.87	1.36	1.96	2.67	3.49	4.41	5.45
	3	10.5	6.7	4.7	3.4	2.6	2.1	1.7
	4	14.0	9.0	6.2	4.6	3.5	2.8	2.2
	5.5	19.3	12.4	8.6	6.3	4.8	3.8	3.1
	7.5	26.3	16.8	11.7	8.6	6.6	5.2	4.2
	11	38.2	24.4	17.0	12.5	9.5	7.5	6.1
320	MPa / m^3/h / kw	1.09	1.70	2.44	3.32	4.34	5.5	6.79
	3	8.5	5.4	3.8	2.8	2.1	1.7	1.4
	4	11.3	7.2	5.0	3.7	2.8	2.2	1.8
	5.5	15.5	9.9	6.9	5.1	3.9	3.1	2.5
	7.5	21.1	13.5	9.4	6.9	5.3	4.2	3.4
	11	31.0	19.8	13.8	10.1	7.8	6.1	5.0
	11	38.2	24.4	17.0	12.5	9.5	7.5	6.1
405	MPa / m^3/h / kw	1.37	2.15	3.09	4.21	5.5	6.96	8.59
	5.5	12.2	7.8	5.4	4.0	3.1	2.4	2.0
	7.5	16.7	10.7	7.4	5.5	4.2	3.3	2.7
	11	24.5	15.7	10.9	8.0	6.1	4.8	3.9
	15	33.4	21.4	14.8	10.9	8.4	6.6	5.3
	18.5	38.2	24.4	17.0	12.5	9.5	7.5	6.1

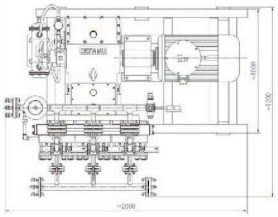
Note: spm: Pump Speed spm mm: Plunger Diameter mm kw: Power kw
MPa: Discharge Pressure MPa m^3/h: Theoretical Flow m^3/h

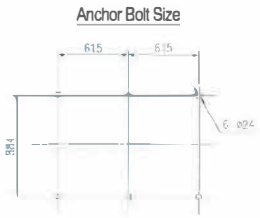
HD3E(M)

- Performance Parameter: Flow range: 0.76–10.74 m³/h; Pressure range: 3.1–50.9 MPa;
- Main Application Fields: Applicable to oil and gas field pumps for injection of water, polymer and alcohol, chemical and fertilizer process pumps, carbon dioxide pumps as well as pumps for cleaning, dephosphorization and rust removal; without media leakage, the pump is especially suitable for transportation of media toxic, corrosive and volatile;
- Installation Form: Horizontal, vertical, stationary and movable;
- Drive Mode: Internal-meshing double helical gears, external reducer, belt pulley and variable frequency speed control.







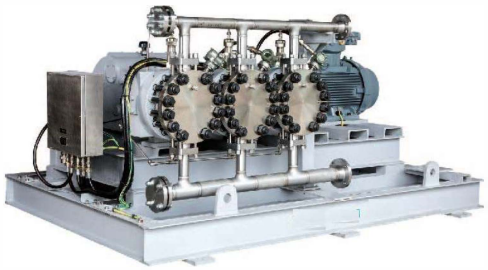


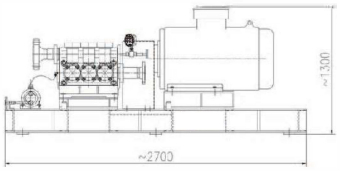
spm	mm	25	30	35	40	45	50
90	MPa / m³/h / kw	0.76	1.09	1.48	1.93	2.45	3.02
	5.5	22.3	15.5	11.4	8.7	6.9	5.6
	7.5	30.4	21.1	15.5	11.9	9.4	7.6
	11	44.6	30.9	22.7	17.4	13.8	11.1
	15	50.9	35.4	26.0	19.9	15.7	12.7
128	MPa / m³/h / kw	1.07	1.55	2.11	2.75	3.48	4.3
	7.5	21.4	14.8	10.9	8.3	6.6	5.3
	11	31.3	21.8	16.0	12.2	9.7	7.8
	15	42.7	29.7	21.8	16.7	13.2	10.7
	18.5	50.9	35.4	26.0	19.9	15.7	12.7
180	MPa / m³/h / kw	1.51	2.18	2.96	3.87	4.90	6.04
	7.5	15.2	10.5	7.8	5.9	4.7	3.8
	11	22.3	15.5	11.4	8.7	6.9	5.6
	15	30.4	21.1	15.5	11.9	9.4	7.6
	18.5	37.5	26.0	19.1	14.6	11.6	9.4
	22	44.6	30.9	22.7	17.4	13.8	
	30	50.9	35.4	26.0	19.9	15.7	
257	MPa / m³/h / kw	2.16	3.11	4.23	5.52	6.99	8.63
	11	15.6	10.8	8.0	6.1	4.8	3.9
	15	21.3	14.8	10.9	8.3	6.6	5.3
	18.5	26.2	18.2	13.4	10.3	8.1	6.6
	22	31.2	21.7	15.9	12.2	9.6	7.8
	30	42.6	29.6	21.7	16.6	13.1	
	37	50.9	35.4	26.0	19.9	15.7	
320	MPa / m³/h / kw	2.69	3.87	5.26	6.88	8.70	10.74
	11	12.5	8.7	6.4	4.9	3.9	3.1
	15	17.1	11.9	8.7	6.7	5.3	4.3
	18.5	21.1	14.6	10.8	8.2	6.5	5.3
	22	25.1	17.4	12.8	9.8	7.7	6.3
	30	34.2	23.7	17.4	13.4	10.5	8.5
	37	42.2	29.3	21.5	16.5	13.0	
	45	50.9	35.4	26.0	19.9	15.7	

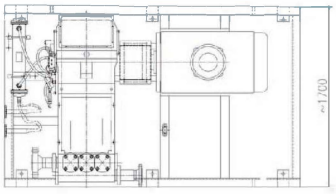
INNO

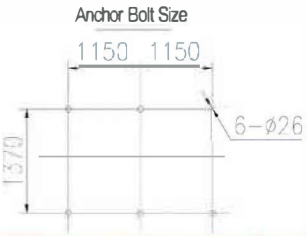
HD3H(M)

- Performance Parameter: Flow range: 2.74–32.14 m³/h;
  Pressure range: 2.2–41.6 MPa;
- Main Application Fields: Applicable to oil and gas field pumps for injection of water, polymer and alcohol, chemical and fertilizer process pumps, carbon dioxide pumps as well as pumps for cleaning, dephosphorization and rust removal; without media leakage, the pump is especially suitable for transportation of media toxic, corrosive and volatile;
- Installation Form: Horizontal, vertical, stationary and
- movable;
  Drive Mode: Internal–meshing double helical gears, external reducer, belt pulley and variable frequency speed control.







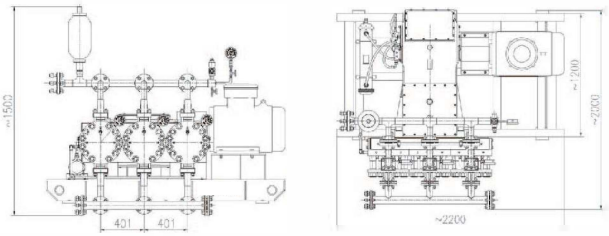


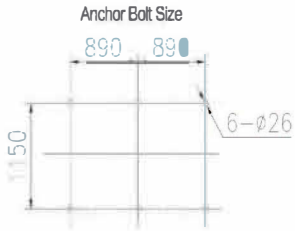
spm	mm	35	40	45	50	55	60	65	70	75	80
112	MPa / m³/h / kw	2.74	3.58	4.53	5.60	6.77	8.06	9.46	10.97	12.6	14.33
	18.5	20.6	15.8	12.5	10.1	8.4	7.0	6.0	5.2	4.5	4.0
	22	24.5	18.8	14.8	12.0	9.9	8.4	7.1	6.1	5.3	4.7
	30	33.5	25.6	20.2	16.4	13.6	11.4	9.7	8.4	7.3	6.4
	37	41.3	31.6	25.0	20.2	16.7	14.0	12.0	10.3	9.0	7.9
185	MPa / m³/h / kw	3.84	5.02	6.35	7.85	9.49	11.3	13.26	15.38	17.65	20.08
	18.5	14.7	11.3	8.9	7.2	6.0	5.0	4.3	3.7	3.2	2.8
	22	17.5	13.4	10.6	8.6	7.1	6.0	5.1	4.4	3.8	3.4
	30	23.9	18.3	14.4	11.7	9.7	8.1	6.9	6.0	5.2	4.6
	37	29.5	22.5	17.8	14.4	11.9	10.0	8.5	7.4	6.4	
	45	35.8	27.4	21.7	17.6	14.5	12.2	10.4	9.0	7.8	
	55	41.6	31.8	25.2	20.4	16.8	14.1	12.1	10.4	9.1	
235	MPa / m³/h / kw	4.88	6.38	8.07	9.97	12.06	14.35	16.84	19.53	22.42	25.51
	18.5	11.6	8.9	7.0	5.7	4.7	3.9	3.4	2.9	2.5	2.2
	22	13.8	10.6	8.3	6.8	5.6	4.7	4.0	3.4	3.0	2.6
	30	18.8	14.4	11.4	9.2	7.6	6.4	5.5	4.7	4.1	3.6
	37	23.2	17.8	14.0	11.4	9.4	7.9	6.7	5.8	5.0	
	45	28.2	21.6	17.1	13.8	11.4	9.6	8.2	7.0	6.1	
	55	34.5	26.4	20.8	16.9	14.0	11.7	10.0	8.6	7.5	
	75	41.6	31.8	25.2	20.4	16.8	14.1	12.1	10.4	9.1	
264	MPa / m³/h / kw	5.49	7.17	9.07	11.2	13.55	16.12	18.92	21.94	25.19	28.66
	30	16.7	12.8	10.1	8.2	6.8	5.7	4.9	4.2	3.6	3.2
	37	20.6	15.8	12.5	10.1	8.4	7.0	6.0	5.2	4.5	4.0
	45	25.1	19.2	15.2	12.3	10.2	8.5	7.3	6.3	5.5	
	55	30.7	23.5	18.6	15.0	12.4	10.4	8.9	7.7	6.7	
	75	41.6	31.8	25.2	20.4	16.8	14.1	12.1	10.4	9.1	
296	MPa / m³/h / kw	6.15	8.03	10.17	12.55	15.19	18.08	21.21	24.6	28.24	32.14
	30	14.9	11.4	9.0	7.3	6.0	5.1	4.3	3.7	3.3	2.9
	37	18.4	14.1	11.1	9.0	7.5	6.3	5.3	4.6	4.0	
	45	22.4	17.1	13.5	11.0	9.1	7.6	6.5	5.6	4.9	
	55	27.4	20.9	16.6	13.4	11.1	9.3	7.9	6.8	6.0	
	75	37.3	28.6	22.6	18.3	15.1	12.7	10.8	9.3	8.1	
	90	41.6	31.8	25.2	20.4	16.8	14.1	12.1	10.4	9.1	

Note: spm: Pump Speed spm mm: Plunger Diameter mm kw: Power kw
MPa: Discharge Pressure MPa m³/h: Theoretical Flow m³/h

HD3K(M)

- Performance Parameter: Flow range: 2.97–34.81 m^3/h;
  Pressure range: 3.0–46.8 MPa;
- Main Application Fields: Applicable to oil and gas field pumps for injection of water, polymer and alcohol, chemical and fertilizer process pumps, carbon dioxide pumps as well as pumps for cleaning, dephosphorization and rust removal; without media leakage, the pump is especially suitable for transportation of media toxic, corrosive and volatile;
- Installation Form: Horizontal, vertical, stationary and movable;
- Drive Mode: Internal-meshing double helical gears, external reducer, belt pulley and variable frequency speed control.



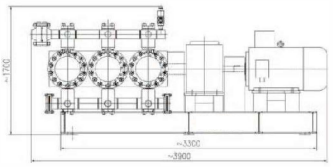


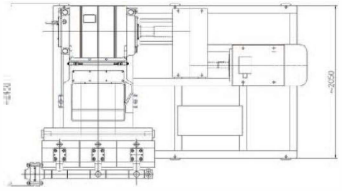
spm	mm	35	40	45	50	55	60	65	70	75	80
132	MPa / m^3/h / kw	2.97	3.88	4.91	6.06	7.34	8.73	10.25	11.89	13.65	15.53
	30	30.9	23.7	18.7	15.1	12.5	10.5	9.0	7.7	6.7	5.9
	37	38.1	29.2	23.0	18.7	15.4	13.0	11.0	9.5	8.3	7.3
	45	46.3	35.5	28.0	22.7	18.8	15.8	13.4	11.6	10.1	8.9
185	MPa / m^3/h / kw	4.16	5.44	6.88	8.50	10.28	12.24	14.36	16.66	19.12	21.76
	30	22.0	16.9	13.3	10.8	8.9	7.5	6.4	5.5	4.8	4.2
	37	27.2	20.8	16.4	13.3	11.0	9.3	7.9	6.8	5.9	5.2
	45	33.1	25.3	20.0	16.2	13.4	11.3	9.6	8.3	7.2	6.3
	55	40.4	30.9	24.4	19.8	16.4	13.8	11.7	10.1	8.8	7.7
	75	46.8	35.8	28.3	22.9	18.9	15.9	13.6	11.7	10.2	9.0
235	MPa / m^3/h / kw	5.29	6.91	8.75	10.80	13.06	15.55	18.25	21.16	24.29	27.64
	30	17.4	13.3	10.5	8.5	7.0	5.9	5.0	4.3	3.8	3.3
	37	21.4	16.4	12.9	10.5	8.7	7.3	6.2	5.4	4.7	4.1
	45	26.0	19.9	15.7	12.8	10.5	8.9	7.5	6.5	5.7	5.0
	55	31.8	24.4	19.2	15.6	12.9	10.8	9.2	8.0	6.9	
	75	43.4	33.2	26.2	21.3	17.6	14.8	12.6	10.8	9.4	
	90	46.8	35.8	28.3	22.9	18.9	15.9	13.6	11.7	10.2	
264	MPa / m^3/h / kw	5.94	7.76	9.82	12.13	14.68	17.47	20.50	23.77	27.29	31.05
	30	15.4	11.8	9.3	7.6	6.3	5.3	4.5	3.9	3.4	3.0
	37	19.1	14.6	11.5	9.3	7.7	6.5	5.5	4.8	4.1	3.6
	45	23.2	17.7	14.0	11.4	9.4	7.9	6.7	5.8	5.0	
	55	28.3	21.7	17.1	13.9	11.5	9.6	8.2	7.1	6.2	
	75	38.6	29.6	23.4	18.9	15.6	13.1	11.2	9.7	8.4	
	90	46.3	35.5	28.0	22.7	18.8	15.8	13.4	11.6	10.1	
296	MPa / m^3/h / kw	6.66	8.70	11.02	13.60	16.45	19.58	22.98	26.65	30.60	34.81
	30	17.0	13.0	10.3	8.3	6.9	5.8	4.9	4.2	3.7	3.3
	45	20.7	15.8	12.5	10.1	8.4	7.0	6.0	5.2	4.5	4.0
	55	25.3	19.3	15.3	12.4	10.2	8.6	7.3	6.3	5.5	
	75	34.4	26.4	20.8	16.9	13.9	11.7	10.0	8.6	7.5	
	90	41.3	31.6	25.0	20.3	16.7	14.1	12.0	10.3	9.0	
	110	46.8	35.8	28.3	22.9	18.9	15.9	13.6	11.7	10.2	

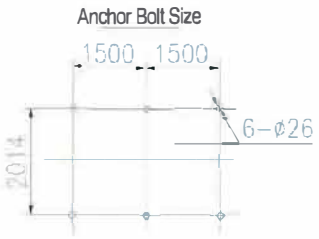
INNO

HD3M(M)

- Performance Parameter: Flow range: 2.52–94.61 m³/h;
  Pressure range: 2.5–160.3 MPa;
- Main Application Fields: Applicable to oil and gas field pumps for injection of water, polymer and alcohol, chemical and fertilizer process pumps, carbon dioxide pumps as well as pumps for cleaning, dephosphorization and rust removal; without media leakage, the pump is especially suitable for transportation of media toxic, corrosive and volatile;
- Installation Form: Horizontal, vertical, stationary and movable;
- Drive Mode: Internal-meshing double helical gears, external reducer, belt pulley and variable frequency speed control.





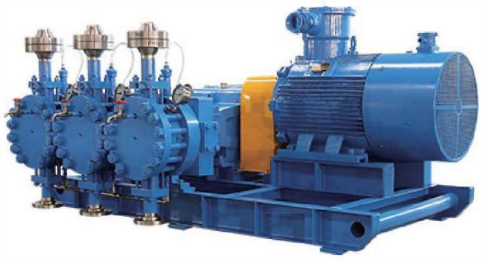


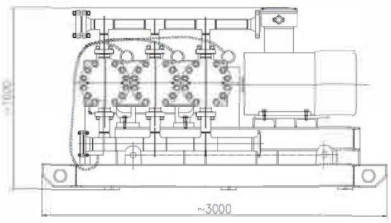
spm	mm	30	35	45	50	70	80	95	100	110	130
132	MPa / m³/h / kw	2.52	3.43	5.67	7.00	13.72	17.91	25.26	27.99	33.87	47.30
	55	66.8	49.1	29.7	24.1	12.3	9.4	6.7	6.0	5.0	3.6
	75	91.1	66.9	40.5	32.8	16.7	12.8	9.1	8.2	6.8	4.9
	90	109.3	80.3	48.6	39.4	20.1	15.4	10.9	9.8	8.1	5.8
	110	133.6	98.2	59.4	48.1	24.5	18.8	13.3	12.0	9.9	7.1
	132	160.3	117.8	71.3	57.7	29.5	22.5	16.0	14.4	11.9	8.5
185	MPa / m³/h / kw	3.53	4.81	7.94	9.81	19.22	25.11	35.40	39.23	47.47	66.30
	55	47.7	35.0	21.2	17.2	8.8	6.7	4.8	4.3	3.5	2.5
	75	65.0	47.8	28.9	23.4	11.9	9.1	6.5	5.9	4.8	3.5
	90	78.0	57.3	34.7	28.1	14.3	11.0	7.8	7.0	5.8	4.2
	110	95.3	70.0	42.4	34.3	17.5	13.4	9.5	8.6	7.1	5.1
	132	114.4	84.1	50.8	41.2	21.0	16.1	11.4	10.3	8.5	6.1
	160	138.7	101.9	61.6	49.9	25.5	19.5	13.8	12.5	10.3	7.4
	185	160.3	117.8	71.3	57.7	29.5	22.5	16.0	14.4	11.9	8.5
spm	mm	35	40	45	50	55	60	65	70	75	80
235	MPa / m³/h / kw	4.48	6.10	10.09	12.46	24.42	31.89	44.97	49.83	60.29	84.21
	75	51.2	37.6	22.7	18.4	9.4	7.2	5.1	4.6	3.8	2.7
	90	61.4	45.1	27.3	22.1	11.3	8.6	6.1	5.5	4.6	3.3
	110	75.1	55.1	33.4	27.0	13.8	10.6	7.5	6.8	5.6	4.0
	132	90.1	66.2	40.0	32.4	16.5	12.7	9.0	8.1	6.7	4.8
	160	109.2	80.2	48.5	39.3	20.1	15.4	10.9	9.8	8.1	5.8
	185	126.2	92.7	56.1	45.4	23.2	17.8	12.6	11.4	9.4	6.7
	200	136.5	100.3	60.7	49.1	25.1	19.2	13.6	12.3	10.2	7.3
	220	150.1	110.3	66.7	54.0	27.6	21.1	15.0	13.5	11.2	8.0
264	MPa / m³/h / kw	5.04	6.86	11.34	13.99	27.43	35.83	50.52	55.98	67.74	94.61
	90	54.7	40.2	24.3	19.7	10.0	7.7	5.5	4.9	4.1	2.9
	110	66.8	49.1	29.7	24.1	12.3	9.4	6.7	6.0	5.0	3.6
	132	80.2	58.9	35.6	28.9	14.7	11.3	8.0	7.2	6.0	4.3
	160	97.2	71.4	43.2	35.0	17.8	13.7	9.7	8.7	7.2	5.2
	185	112.4	82.6	49.9	40.5	20.6	15.8	11.2	10.1	8.4	6.0
	200	121.5	89.2	54.0	43.7	22.3	17.1	12.1	10.9	9.0	6.5
	220	133.6	98.2	59.4	48.1	24.5	18.8	13.3	12.0	9.9	7.1
	250	151.8	111.6	67.5	54.7	27.9	21.4	15.1	13.7	11.3	8.1

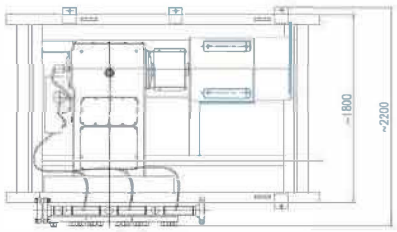
Note: spm: Pump Speed spm mm: Plunger Diameter mm kw: Power kw
MPa: Discharge Pressure MPa m³/h: Theoretical Flow m³/h

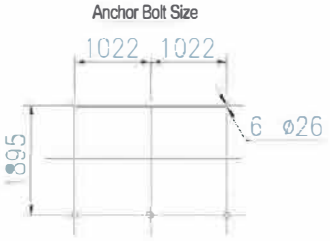
HD3N(M)

- Performance Parameter: Flow range: 2.69–85.98 m³/h;
  Pressure range: 2.8–84.9 MPa;
- Main Application Fields: Applicable to oil and gas field pumps for injection of water, polymer and alcohol, chemical and fertilizer process pumps, carbon dioxide pumps as well as pumps for cleaning, dephosphorization and rust removal; without media leakage, the pump is especially suitable for transportation of media toxic, corrosive and volatile;
- Installation Form: Horizontal, vertical, stationary and movable;
- Drive Mode: Internal-meshing double helical gears, external reducer, belt pulley and variable frequency speed control.







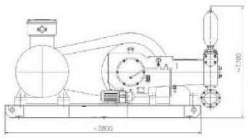


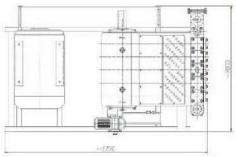
spm	mm	30	35	40	45	50	55	60	70	80	90	100	110	120
132	MPa / m³/h	2.69	3.66	4.78	6.05	7.46	9.03	10.75	14.63	19.11	24.18	29.86	36.13	42.99
	kw 55	62.6	46.0	35.2	27.8	22.5	18.6	15.7	11.5	8.8	7.0	5.6	4.7	3.9
	75	84.9	62.4	47.7	37.7	30.6	25.3	21.2	15.6	11.9	9.4	7.6	6.3	5.3
185	MPa / m³/h	3.77	5.13	6.69	8.47	10.46	12.66	15.06	20.50	26.78	33.89	41.84	50.63	60.25
	kw 55	44.7	32.8	25.1	19.9	16.1	13.3	11.2	8.2	6.3	5.0	4.0	3.3	2.8
	75	60.9	44.8	34.3	27.1	21.9	18.1	15.2	11.2	8.6	6.8	5.5	4.5	3.8
	90	73.1	53.7	41.1	32.5	26.3	21.8	18.3	13.4	10.3	8.1	6.6	5.4	4.6
	110	84.9	62.4	47.7	37.7	30.6	25.3	21.2	15.6	11.9	9.4	7.6	6.3	5.3
235	MPa / m³/h	4.78	6.51	8.5	10.76	13.29	16.08	19.13	26.04	34.02	43.05	53.15	64.31	76.54
	kw 75	48.0	35.2	27.0	21.3	17.3	14.3	12.0	8.8	6.7	5.3	4.3	3.6	3.0
	90	57.6	42.3	32.4	25.6	20.7	17.1	14.4	10.6	8.1	6.4	5.2	4.3	3.6
	110	70.4	51.7	39.6	31.3	25.3	20.9	17.6	12.9	9.9	7.8	6.3	5.2	4.4
	132	84.4	62.0	47.5	37.5	30.4	25.1	21.1	15.5	11.9	9.4	7.6	6.3	5.3
264	MPa / m³/h	5.37	7.31	9.55	12.09	14.93	18.06	21.50	29.26	38.22	48.37	59.71	72.25	85.98
	kw 90	51.2	37.7	28.8	22.8	18.4	15.2	12.8	9.4	7.2	5.7	4.6	3.8	3.2
	110	62.6	46.0	35.2	27.8	22.5	18.6	15.7	11.5	8.8	7.0	5.6	4.7	3.9
	132	75.2	55.2	42.3	33.4	27.1	22.4	18.8	13.8	10.6	8.4	6.8	5.6	4.7
	160	84.9	62.4	47.7	37.7	30.6	25.3	21.2	15.6	11.9	9.4	7.6	6.3	5.3
296	MPa / m³/h	6.03	8.20	10.71	13.56	16.74	20.25	24.10	32.81	42.85	54.23	66.95	81.01	96.41
	kw 110	55.9	41.0	31.4	24.8	20.1	16.6	14.0	10.3	7.9	6.2	5.0	4.2	3.5
	132	67.0	49.3	37.7	29.8	24.1	19.9	16.8	12.3	9.4	7.4	6.0	5.0	4.2
	160	81.3	59.7	45.7	36.1	29.3	24.2	20.3	14.9	11.4	9.0	7.3	6.0	5.1

INNO

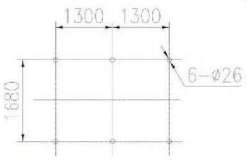
HD5J(M)

- Performance Parameter: Flow range: 3.37–78.99 m^3/h;
  Pressure range: 3.0–83.5 MPa;
- Main Application Fields: Applicable to oil and gas field pumps for injection of water, polymer and alcohol, chemical and fertilizer process pumps, carbon dioxide pumps as well as pumps for cleaning, dephosphorization and rust removal; without media leakage, the pump is especially suitable for transportation of media toxic, corrosive and volatile; low pulsation renders stable transport;
- Installation Form: Horizontal, vertical, stationary and movable;
- Drive Mode: Internal-meshing double helical gears, external reducer, belt pulley and variable frequency speed control.





Anchor Bolt Size

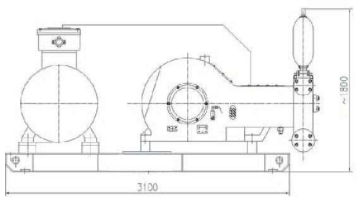


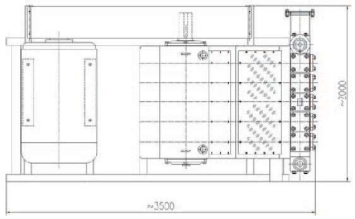
spm	mm	35	40	45	50	55	65	70	80	90	100
92	MPa / m^3/h / kw	3.37	4.40	5.57	6.88	8.33	11.63	13.49	17.62	22.30	27.53
	30	27.2	20.8	16.5	13.3	11.0	7.9	6.8	5.2	4.1	3.3
	37	33.6	25.7	20.3	16.5	13.6	9.7	8.4	6.4	5.1	4.1
	45	40.8	31.3	24.7	20.0	16.5	11.8	10.2	7.8	6.2	5.0
	55	49.9	38.2	30.2	24.5	20.2	14.5	12.5	9.6	7.5	6.1
	75	68.1	52.1	41.2	33.3	27.6	19.7	17.0	13.0	10.3	8.3
	90	81.7	62.5	49.4	40.0	33.1	23.7	20.4	15.6	12.4	10.0
148	MPa / m^3/h / kw	5.42	7.09	8.97	11.07	13.40	18.71	21.70	28.34	35.87	44.28
	45	25.4	19.4	15.4	12.4	10.3	7.4	6.3	4.9	3.8	3.1
	55	31.0	23.8	18.8	15.2	12.6	9.0	7.8	5.9	4.7	3.8
	75	42.3	32.4	25.6	20.7	17.1	12.3	10.6	8.1	6.4	5.2
	90	50.8	38.9	30.7	24.9	20.6	14.7	12.7	9.7	7.7	6.2
	110	62.0	47.5	37.5	30.4	25.1	18.0	15.5	11.9	9.4	7.6
	132	74.5	57.0	45.0	36.5	30.2	21.6	18.6	14.3	11.3	9.1
spm	mm	35	40	45	50	55	60	65	70	75	80
185	MPa / m^3/h / kw	6.78	8.86	11.21	13.84	16.75	23.39	27.12	35.43	44.84	55.36
	55	24.8	19.0	15.0	12.2	10.1	7.2	6.2	4.8	3.8	3.0
	75	33.8	25.9	20.5	16.6	13.7	9.8	8.5	6.5	5.1	4.1
	90	40.6	31.1	24.6	19.9	16.4	11.8	10.2	7.8	6.1	5.0
	110	49.6	38.0	30.0	24.3	20.1	14.4	12.4	9.5	7.5	6.1
	132	59.6	45.6	36.0	29.2	24.1	17.3	14.9	11.4	9.0	7.3
	160	72.2	55.3	43.7	35.4	29.2	20.9	18.1	13.8	10.9	8.8
	185	83.5	63.9	50.5	40.9	33.8	24.2	20.9	16.0	12.6	10.2
235	MPa / m^3/h / kw	8.61	11.25	14.24	17.58	21.27	29.71	34.45	45.00	56.96	70.32
	90	32.0	24.5	19.3	15.7	12.9	9.3	8.0	6.1	4.8	3.9
	110	39.1	29.9	23.6	19.1	15.8	11.3	9.8	7.5	5.9	4.8
	132	46.9	35.9	28.4	23.0	19.0	13.6	11.7	9.0	7.1	5.7
	160	56.8	43.5	34.4	27.9	23.0	16.5	14.2	10.9	8.6	7.0
	185	65.7	50.3	39.8	32.2	26.6	19.1	16.4	12.6	9.9	8.1
	200	71.0	54.4	43.0	34.8	28.8	20.6	17.8	13.6	10.7	8.7
264	MPa / m^3/h / kw	9.68	12.64	16.00	19.75	23.90	33.37	38.71	50.56	63.98	78.99
	132	41.7	32.0	25.3	20.5	16.9	12.1	10.4	8.0	6.3	5.1
	160	50.6	38.7	30.6	24.8	20.5	14.7	12.6	9.7	7.7	6.2
	185	58.5	44.8	35.4	28.7	23.7	17.0	14.6	11.2	8.8	7.2
	200	63.2	48.4	38.3	31.0	25.6	18.3	15.8	12.1	9.6	7.7
	220	69.6	53.3	42.1	34.1	28.2	20.2	17.4	13.3	10.5	8.5
	250	79.1	60.5	47.8	38.7	32.0	22.9	19.8	15.1	12.0	9.7

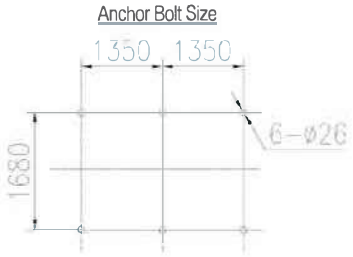
Note: spm: Pump Speed spm mm: Plunger Diameter mm kw: Power kw
MPa: Discharge Pressure MPa m^3/h: Theoretical Flow m^3/h

HD5P(M)

- Performance Parameter: Flow range: 4.65–96.89 m^3/h;
  Pressure range: 5.3–104 MPa;
- Main Application Fields: Applicable to oil and gas field pumps for injection of water, polymer and alcohol, chemical and fertilizer process pumps, carbon dioxide pumps as well as pumps for cleaning, dephosphorization and rust removal; without media leakage, the pump is especially suitable for transportation of media toxic, corrosive and volatile; low pulsation renders stable transport;
- Installation Form: Horizontal, vertical, stationary and movable;
- Drive Mode: Internal-meshing double helical gears, external reducer, belt pulley and variable frequency speed control.







spm	mm	35	40	45	50	55	65	70	80	90	100
92	MPa / m^3/h / kw	4.65	6.07	7.68	9.48	11.47	16.03	18.59	24.28	30.73	37.93
	110	72.4	55.5	43.8	35.5	29.3	21.0	18.1	13.9	11.0	8.9
	132	86.9	66.6	52.6	42.6	35.2	25.2	21.7	16.6	13.1	10.6
	160	104.0	79.6	62.9	51.0	42.1	30.2	26.0	19.9	15.7	12.7
148	MPa / m^3/h / kw	7.48	9.76	12.36	15.26	18.46	25.78	29.90	39.05	49.43	61.02
	132	54.0	41.4	32.7	26.5	21.9	15.7	13.5	10.3	8.2	6.6
	160	65.5	50.1	39.6	32.1	26.5	19.0	16.4	12.5	9.9	8.0
	200	81.9	62.7	49.5	40.1	33.2	23.7	20.5	15.7	12.4	10.0
	220	90.1	69.0	54.5	44.1	36.5	26.1	22.5	17.2	13.6	11.0
	250	102.3	78.4	61.9	50.1	41.4	29.7	25.6	19.6	15.5	12.5
185	MPa / m^3/h / kw	9.34	12.20	15.45	19.07	23.07	32.23	37.38	48.82	61.78	76.28
	132	43.2	33.1	26.2	21.2	17.5	12.5	10.8	8.3	6.5	5.3
	160	52.4	40.1	31.7	25.7	21.2	15.2	13.1	10.0	7.9	6.4

spm	mm	35	40	45	50	55	60	65	70	75	80
185	MPa / m^3/h / kw	9.34	12.20	15.45	19.07	23.07	32.23	37.38	48.82	61.78	76.28
	200	65.5	50.1	39.6	32.1	26.5	19.0	16.4	12.5	9.9	8.0
	220	72.0	55.2	43.6	35.3	29.2	20.9	18.0	13.8	10.9	8.8
	250	81.9	62.7	49.5	40.1	33.2	23.7	20.5	15.7	12.4	10.0
	280	91.7	70.2	55.5	44.9	37.1	26.6	22.9	17.6	13.9	11.2
	315	103.2	79.0	62.4	50.5	41.8	29.9	25.8	19.7	15.6	12.6
235	MPa / m^3/h / kw	11.87	15.50	19.62	24.22	29.31	40.94	47.48	62.01	78.48	96.89
	220	56.7	43.4	34.3	27.8	23.0	16.4	14.2	10.9	8.6	6.9
	250	64.5	49.3	39.0	31.6	26.1	18.7	16.1	12.3	9.7	7.9
	280	72.2	55.3	43.7	35.4	29.2	20.9	18.0	13.8	10.9	8.8
	315	81.2	62.2	49.1	39.8	32.9	23.5	20.3	15.5	12.3	9.9
	355	91.5	70.1	55.4	44.8	37.1	26.5	22.9	17.5	13.8	11.2
	400	103.1	79.0	62.4	50.5	41.8	29.9	25.8	19.7	15.6	12.6