

Special Pump

Weima Original

Special Pump-Double Acting Pump

Double Acting Pump designed and developed by Weima is used for well with high reservoir pressure and sufficient liquid supply, especially those where conventional pumps cannot meet the displacement requirements.

Characteristics:

1. There are two pump cavities in the pump structure, which can complete two drawings and two discharges of crude oil in one reciprocating stroke of the plunger, thereby greatly improving the liquid production rate compared with the pumps with the same diameter and working parameters.
2. The rod has a large downward resistance, and it is not suitable for wells with excessive crude oil viscosity or severe sand production.
3. The plunger cannot lift out from the barrel, the tubing needs to be lifted when do pump inspection, and it needs to be equipped with a on-off tool.

The selection of fittings materials, various heat treatment processes and surface treatment processes can be applied to meet the requirements of well conditions for product strength, corrosion resistance and wear resistance.

Product Specification:

Tubing Size	3-1/2"	3-1/2"
Pump Diameter	3-1/4"	3-3/4"
Max OD of pump	4.500"	4.500"
Code	30-325THDP	40-375THDP

Displacement:

The calculation formula of displacement is as follows:

$$P = C \times S \times N$$

P : Daily displacement, BPD;

S : Stroke length, in;

N : Frequency of strokes per minute, times/min;

C : Pump constant, as follows:

Pump Diameter	3-1/4"	3-3/4"
Pump Constant	2.095	2.921



Special Pump - Large Diameter Pump

The large diameter pump designed and developed by Weima is to design the oversized pump for a given casing size well. The outer diameter of the plunger shall be larger than the inner hole of the tubing. Generally, a large-size tubing is connected to the pump to meet the plunger stroke. In addition, the plunger cannot go down through the tubing, so the entire pump body needs to go down the well with the tubing, then the plunger is connected with the sucker rod by using the on-off tool. For the tubing drain operation, it can choose oil drain above pump or oil drain valve.

Characteristics:

1. In a given casing size well, a large diameter pump can be operated to increase the production of the well;
2. Lifting tubing job is required for maintenance;

The selection of fittings materials, various heat treatment processes and surface treatment processes can be applied to meet the requirements of well conditions for product strength, corrosion resistance and wear resistance.

Product specification:

Tubing Size	2-3/8"	2-7/8"	3-1/2"	3-1/2"
Pump Diameter	2-1/4"	2-3/4"	3-1/4"	3-3/4"
Barrel OD	2.750"	3.250"	3.750"	4.500"
Sucker Rod thread	3/4"	7/8"	7/8"	7/8"
Connecting Tubing Thread	2-3/8"-8EU	2-7/8"-8EU	3-1/2"-8EU	3-1/2"-8EU
Code	20-225OTP	25-275OTP	30-325OTP	30-375OTP

Displacement:

The calculation formula of displacement is as follows:

$$P = C \times S \times N$$

P : Daily displacement, BPD;

S : Stroke length, in;

N : Frequency of strokes per minute, times/min;

C : Pump constant, as follows:

Pump Diameter	2-1/4"	2-3/4"	3-1/4"	3-3/4"
Pump Constant	0.590	0.881	1.231	1.639





Special Pump-Double Sealed Rod Pump

The Double Sealed Rod Pump designed and developed by Weima applies the combination of mechanical seal and cup seal (There are three combinations: both seal are on the top of the pump barrel, both seal are at the bottom of the pump barrel, and both seal are distributed at both ends of the pump barrel), which greatly improves the sealing between the pump and the seating, and extend the service life on one hand; and guarantees the reliability of cycle operations on the other hand.

Specifications (Can be chosen Thin Wall Barrel or Heavy Wall Barrel, with code of H or W)

Tubing Size		2-3/8"	2-7/8"	2-7/8"	3-1/2"
Pump Diameter		1-1/4"	1-1/2"	1-3/4"	2-1/4"
Produ ct No.	Top Double Sealed	20-125RHACAM	25-150RHACAM	25-175RHACAM	30-225RHACAM
	Bottom Double Sealed	20-125RHBCBM	25-150RHBCBM	25-175RHBCBM	30-225RHBCBM
	Top and Bottom Double Sealed	20-125RHACBM	25-150RHACBM	25-175RHACBM	30-225RHACBM

Displacement: Calculation is the same as that of API rod pump.



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Top double sealed

Bottom double sealed

Top & bottom double sealed

Special Pump—Two-stage Anti-gas Rod Pump

The two-stage anti-gas rod pump designed and developed by Weima adopts a slender upper plunger connect with a larger diameter lower plunger in series to divide the lower pump barrel into upper and lower two working chambers. The annular area of lower working chamber is much larger than the upper working chamber. After the oil and gas mixture enters into the upper working chamber from the lower working chamber, the volume compresses and the pressure increases; when the plunger moves upward again, the upper working chamber compresses again and the pressure increases, close the middle valve and open the upper oil outlet valve to achieve crude oil extraction.

The size ratio of the annular area of the upper and lower working chambers can be designed according to oil and gas ratio. When the oil-gas ratio is large, its size ratio will also increase.

As when the plunger is descending, the upper oil outlet valve of the pump is closed, so the liquid column at the upper part of the plunger helps the plunger to descend, and the force of the sucker rod string is better.

Specifications (Can be chosen Thin Wall Barrel or Heavy Wall Barrel, with code of H or W)

Tubing Specification		2-7/8"	3-1/2"	3-1/2"
Pump Diameter		1-3/4"&1-1/4"	2-1/4"&1-1/4"	2-1/4"&1-1/2"
Product No.	Bottom mechanical sealed	25-175/125RHBM(FQ)	30-225/125RHBM(FQ)	30-225/150RHBM(FQ)
	Bottom cup sealed	25-175/125RHBC(FQ)	30-225/125RHBM(FQ)	30-225/150RHBM(FQ)



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Bottom mechanical sealed

Bottom cup sealed



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Special Pump-Long Plunger Sand Setting Pump



In wells with sand, grit often wears the plunger and the working surface of the pump barrel, which results in an increase in the fit clearance, a reduction in pump efficiency, and even a serious pump stuck in severe cases. In addition, for open sand content wells, ordinary pumps bury phenomenon is serious. In this regard, Weima designed and developed a long plunger sand setting pump that can be used in wells with high sand content and interstitial wells with sand content of less than 3%.

Characteristics:

1. High pump efficiency. The traveling valve cage of the pump is always exposed outside the barrel, the oil production resistance is small and the plunger descending resistance is small, so heavy oil extraction can be carried out;

2. The matching structure of the short pump barrel and the long plunger. The plunger always contacts the pump barrel, so that the grit in the string is not easy to enter into the fit clearance between the pump barrel and the plunger;

3. Lateral liquid inlet with sand settling tail pipe structure;

4. The pump is connected to the sand-settling tail pipe under the pump, the length is 100-200m, and the lower part is provided with a sealing wire plug;

5. Not suitable for wells with high oil-gas ratio.

The selection of fittings materials, various heat treatment processes and surface treatment processes can be applied to meet the requirements of well conditions for product strength, corrosion resistance and wear resistance.

Product Specification:

Tubing Size	2-7/8"	2-7/8"	3-1/2"	4-1/2"
Pump Diameter	1-1/2"	1-3/4"	2-1/4"	2-3/4"
Barrel OD	3.625"	3.625"	4.500"	5.563"
Sucker Rod thread	3/4"	7/8"	7/8"	1"
Connecting Tubing Thread	2-7/8"-8EU	2-7/8"-8EU	3-1/2"-8EU	4-1/2"-8EU
Code	25-150FS	25-175FS	30-325FS	40-375FS

Displacement:

The calculation formula of displacement is as follows:

$$P = C \times S \times N$$

P : Daily displacement, BPD;

S : Stroke length, in;

N : Frequency of strokes per minute, times/min;

C : Pump constant, as follows:

Pump Diameter	1-1/2"	1-3/4"	2-1/4"	2-3/4"
Pump Constant	0.262	0.357	0.590	0.881

Special Pump-Heavy Oil Pump

In the process of oil field exploitation, people usually call crude oil with a relative density greater than 0.9 and a viscosity of more than 100mpa*s when the surface is degassed at 50°C as a heavy oil or a heavy crude oil. The characteristic of high viscosity crude oil is poor liquidity, high resistance and difficult to exploit. If conventional oil pumps are used to exploit heavy oil, the following problems will occur:

1. Suspension weight of the sucker rod changes greatly, that is, the maximum load on the upstroke increases and the minimum load on the down stroke decreases;
2. The torque of pumping unit gearbox increases and engine power increases;
3. Sucker rods have worse working conditions, which can easily cause fatigue damage to sucker rods;
4. Due to the heavy oil resistance, the valve ball close slowly by gravity. The flow resistance is large, and the speed of opening the valve ball is slow. Therefore, in heavy oil production, the inlet valve and the outlet valve are often delayed to open and close, cause to pump efficiency reduced.

From the above, it can be known that the use of conventional oil pumps for heavy oil wells may cause a reduction of pump efficiency or inability of pumping. For this reason, the special pump we designed must have the ability to overcome viscous resistance. According to the characteristics of heavy oil wells, Weima uses the pressure of the tubing liquid column to assist the sucker rod to descend, and has designed several special heavy oil pumps.

Special Pump-Hydraulic Feedback Pump

The hydraulic feedback pump designed by our company can exploit crude oil with viscosity > 4000mpa*s.

Characteristics:

The upper and lower barrels and the upper and lower plungers are connected in series connection to form a sealed pump cavity. The oil inlet valve is only installed on the plunger to achieve the purpose of closing the upper traveling valve in the down stroke and achieving the purpose of hydraulic feedback force.

The pump has no standing valve, no oil drain device can be installed downhole. It can be used for down-hole testing and steam injection thermal recovery without moving tubing string.

The selection of fittings materials, various heat treatment processes and surface treatment processes can be applied to meet the requirements of well conditions for product strength, corrosion resistance and wear resistance.

Product Specification:

Tubing Size	2-7/8"	3-1/2"	3-1/2"
Pump Diameter	2 1/4"-1 1/2"	2 3/4"-1 1/2"	2 3/4"-1 3/4"
Barrel OD	3.625"	4.500"	4.500"
Sucker Rod thread	3/4"	7/8"	7/8"
Connecting Tubing Thread	2-7/8"-8EU	3-1/2"-8EU	3-1/2"-8EU
Code	25-225/150Y	30-275/150YF	30-275/175YFK

Displacement:

The calculation formula of displacement is as follows:

$$P = C \times S \times N$$

P : Daily displacement, BPD;

S : Stroke length, in;

N : Frequency of strokes per minute, times/min;

C : Pump constant, as follows:

Pump Diameter	2 1/4"-1 1/2"	2 3/4"-1 1/2"	2 3/4"-1 3/4"
Pump Constant	0.327	0.618	0.524



Special Pump-Eccentric Pump

The eccentric pump designed by our company can exploit crude oil with viscosity > 4000mpa*s.

Characteristic:

The upper and lower barrels and the upper and lower plungers are connected in series connection to form a sealed pump cavity. The oil inlet valve is set at the side of the pump body. During the down stroke, the upper plunger oil outlet valve is closed to achieve the purpose of hydraulic feedback force.

The pump does not need to be installed with a drain device, the sucker rod can be lifted for downhole testing, steam injection thermal recovery and oil drain operations.

The selection of fittings materials, various heat treatment processes and surface treatment processes can be applied to meet the requirements of well conditions for product strength, corrosion resistance and wear resistance.

Product Specification:

Tubing Size	2-7/8"	3-1/2"	3-1/2"
Pump Diameter	2 1/4"-1 1/2"	2 3/4"-1 1/2"	2 3/4"-1 3/4"
Barrel OD	4.500"	5.250"	5.250"
Sucker Rod thread	3/4"	7/8"	7/8"
Connecting Tubing Thread	2-7/8"-8EU	3-1/2"-8EU	3-1/2"-8EU
Code	25-225/150PFK	30-275/150PFK	30-275/175PFK

Displacement:

The calculation formula of displacement is as follows:

$$P = C \times S \times N$$

P : Daily displacement, BPD;

S : Stroke length, in;

N : Frequency of strokes per minute, times/min;

C : Pump constant, as follows:

Pump Diameter	2 1/4"-1	2 3/4"-1 1/2"	2 3/4"-1 3/4"
Pump Constant	0.327	0.618	0.524

