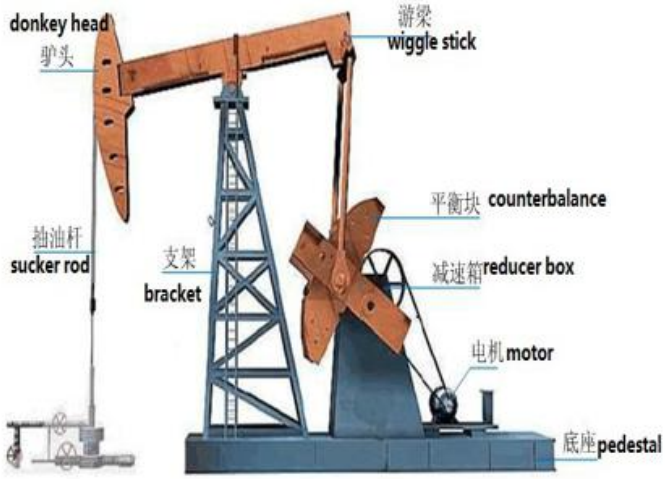
permanent magnet motor

1. Background

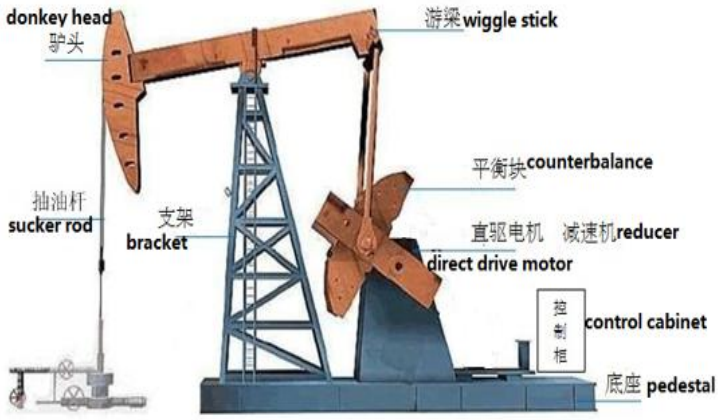
At present, the beam pumping unit power transmission adopts: motor - belt drive - reducer - four - rod mechanism.

This type of pumping unit has many power transmission links, great energy loss in power transmission process, with great safety risk, frequent operation and maintenance, and high maintenance cost.

2.product introduction



primary transmission mode



current transmission mode

Disc type permanent magnet direct drive system is a new product developed by Weimm Co.,Ltd..It adopts low speed、 high torque permanent synchronous motor to

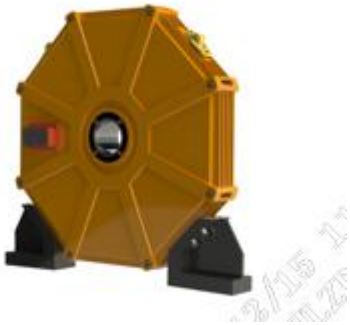
directly drive the input shaft of the reducer for operation,and it cancel belt drive system,high-efficiency and energy-saving,safe and reliable.

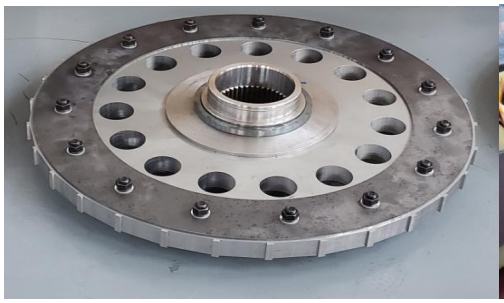
Beam pumping unit power transmissin adopts: motor - belt transmission - reducer - four - rod mechanism.

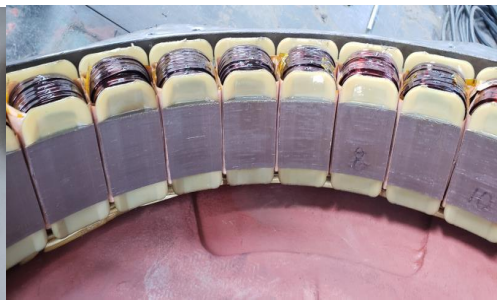
The disk type permanent magnet direct drive system makes the driving chain of pumping unit become: permanent magnet direct drive motor - reducer - four-rod mechanism.

3.permanent magnet motor

The overall appearance of the motor is flat type, the internal stator is independent centralized winding mode , and the permanent magnet adopts embedded installation cooling mode: the unique embedded structure with natural cooling can operate within a wide speed range, support weak magnetic lift, and can maintain zero speed full torque.



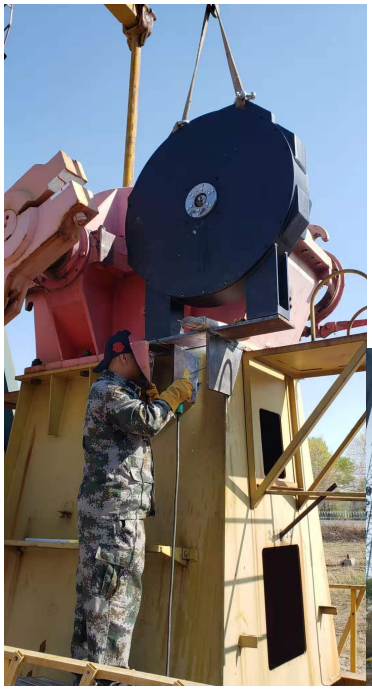


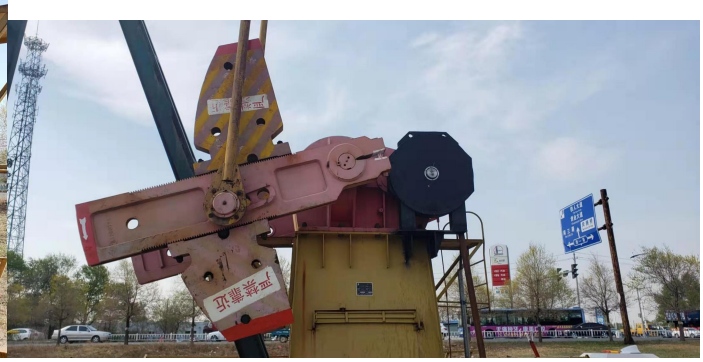


4. Motor installation position

at the belt wheel position of the reducer, so the motor is made into a pancake shape, and the motor shaft uses a hollow shaft.The whole system does not need belt.Simple installation,connection structure of automatic alignment

No changes to the original brake system.





5.control system

1. Control of any stroke frequency can be realized;

2. Flexible control of operation process to reach the maximum energy saving point;

3, Improve pump efficiency's control,realize slow down fast up control, achieve the maximum liquid intake, improve pump efficiency and oil production;

5. Digitalized oilfield information, can realize remote control,remote data transmission,and can be customized according to the user's requirements.

6.Model parameters

item	machine mode	(Kw) power	(r/min) rotate speed	(N.m) rated torque
1	8	22	112	1100
2		30	168	
3		37	224	
4	10	30	128	1700
5		37	192	
6		45	255	
7	12	37	159	2200
8		45	198	
9		55	238	

7.product advantage

system structure

1：The whole system does not need belts.

2：Compared with other direct drive motors of the same type, our product is simple to install and adopts the connection structure of automatic alignment. In the installation process, there is no need for detailed measurement and adjustment of concentricity and perpendicularity, which simplifies the installation process.At the same time, the weight of the motor is effectively distributed on the base, avoiding the pressure and influence of the motor weight on the shaft of the reducer, improving the reliability of the equipment operation and extending the service life of the equipment.

8.economic evaluation

item	22kW 8type pumping unit (motor+belt)22kW	22kW 8type pumping unit(direct drive permanent magnet motor)22KW
one-time investment cost of equipment	RMB Two hundred and fifty thouand (include control system)	RMB eighty thousand
maintenance cost	RMB twelve thousand	0
operation cost	RMB forty three point eight thousand	RMB thirty thousand

It saves 13,800 yuan/person of electricity fee and 12,000 yuan/person of maintenance fee every year, and it can recover the investment cost in two years.

9.energy-saving analysis of the disc permanent magnet direc drive system

type、quantity of driving motor	30KW asynchronous	23KW direct drive motor
motor efficiency(%)	80	93
speed reducer efficiency(%)	85	85
belt transmission efficiency	90	no
total transmission efficiency(%)	61.2	79.05
shaft power (kW)	18.36	18.36
total input power (kW)	30	23.23

To sum up, the power saving rate will be up to 25% after the disc permanent magnet direct drive system is applied.Other benefits brought by the system are also very significant. It is of great significance to promote the disc permanent magnet direct drive system. This technology has incomparable advancement compared with the traditional driving mode, and has achieved stage breakthrough in oil recovery driving technology.Disc permanent magnet direct drive system is the

representative of modern advanced oil recovery equipment. The promotion of this product can save a lot of energy and reduce environmental pollution.Expanding the project will yield enormous economic, social and environmental benefits.From the aspects of technology, economy, environmental protection and social benefits, the project is feasible.Therefore, it is necessary to promote the development of the project rapidly.

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