

ZPMC

电缆卷筒

Cable Reel

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上海振华重工（集团）宁波伟隆传动机械有限公司
ZPMC Ningbo Weilong Transmission Machinery Co., Ltd.



一、公司简介

ZPMC宁波伟隆传动机械有限公司作为ZPMC下属分公司，专业配套ZPMC品牌的联轴器、移动供电产品。产品广泛应用于岸桥、场桥、散货等装卸机械。

公司通过20年努力，业已形成年产3万台套联轴器和1000台套移动供电产品的生产能力，产品随主机远销世界各大洲84个国家200多个码头。公司通过ISO9001-2000质量体系认证，并配备了完善的检测试验手段，产品符合CCS、CE、LR、CSA认证要求。

I. Introduction of company

As a subsidiary of ZPMC, Ningbo Weilong manufactures all the mobile power supply products and couplings which are widely used on QC, RTG, RMG, ship loader, Stacker-reclaimer.

After 20 years of improving, we have reached the production capacity of 30,000 sets COUPLING and 1,000 sets mobile power supply products per year, and our products are using in more than 200 ports all over the world. Our company has through the certification of China classification society ISO9001:2000, and comply with CCS,CE,LR,CSA certification requirements.



制造车间一角

Workshop



移动供电试验台

Test-bed



二、ZPMC变频式大车电缆卷筒优势介绍

II. Advantages of ZPMC converter control gantry cable reel

1、JPC-DF20系列大车电缆卷筒特性介绍：

1. Characteristic introduction of Series JPC-DF20 gantry cable reel

- ◆ 采用圆柱齿轮减速器，可靠性高。
- ◆ 采用先进的PLC控制技术，在任何工况条件下能与大车保持同步，保证电缆的安全运行。
- ◆ 被大量应用于岸桥，卸船机，斗轮机 etc 长距离频繁作业设备。

- ◆ Adopt the Cylindrical gear reducer, make sure of high reliability.
- ◆ Using the advanced PLC control technology to help make sure the safety of cable.
- ◆ It is widely used in long distance running equipments, such as QC, SHIP UNLOADERS, STACKER&RECLAIMERS.



2、JPC-DF225系列大车电缆卷筒特性介绍：

2. Characteristic introduction of Series JPC-DF225 gantry cable reel

- ◆ 采用硬齿面减速器，传动效率高。体积小，重量轻，传动惯量小。
- ◆ 采用PLC控制驱动，运行速度能达到330米/分。单向行程达850米。
- ◆ 被广泛应用于高速轨道吊，电动轮胎吊的移动供电，可靠性高。

- ◆ Adopt the hardened gear reducer, make sure of high efficiency.
- ◆ Using the advanced PLC control technology, the running speed can reach 330m/min. And the one-way trip can reach 850m.
- ◆ It is widely used in high-speed RMG, E-RTG, and it has high reliability.

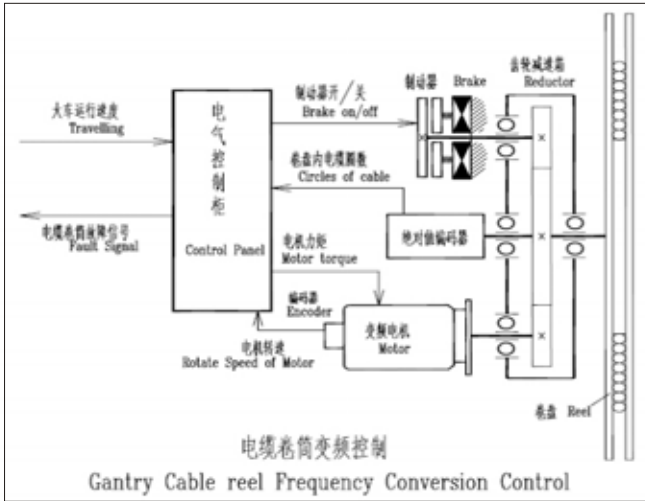


3、大车卷筒的电控优势介绍：

ZPMC大车电缆卷筒采用先进的PLC+变频控制技术，应用独特的速度+力矩控制逻辑，在任何工况下，使电缆运行与大车速度跟随同步，最大程度地保护电缆的安全运行，提高了电缆的使用寿命。

3. Advantages of electric control of gantry cable reel

ZPMC gantry cable reel have a new control theory that is speed closed loop control with dynamic torque limit setting. we can achieve best protection for executive equipment and protect the cable during the running at any working condition. And it also can improve the using life of the cable.

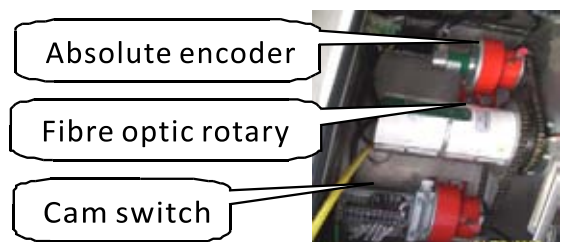


4、高压滑环箱的性能介绍：

- ◆相间绝缘距离大，安全性高，箱内空间大，便于维护保养。
- ◆可配置凸轮限位开关、绝对值编码器，光缆耦合器等元件。
- ◆箱体防护等级达IP65，全不锈钢结构，与主机同寿命。

4. Characteristic introduction of HV slip ring

- ◆Long insulation distance between the phases, so the safety is well. Large space inside the box, so it is easy for maintaining.
- ◆It can be fitted with cam limit switch, absolute encoder, fibre optic rotary etc.
- ◆The housing is made of stainless steel, the protection class is IP65.



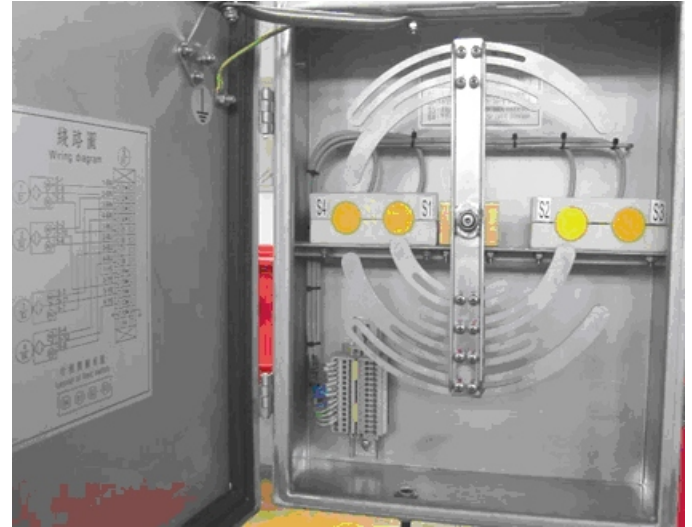
5、缓冲式导缆架的性能介绍：

- ◆ 导缆架具有极大的缓冲行程，能在冲击工况下有效地保护电缆。
- ◆ 智能化的运行信号反馈，使大车主控能及时判断电缆，满足过紧和过松，从而有效地保证电缆的安全运行。



5. Characteristic introduction of guider

- ◆ The guider has long buffer distance, help to keep the cable safe.
- ◆ It has intelligent advantage of signal feedback, so the main control system can know the cable running direction in time, so it can control to keep the cable from overtension or slack.



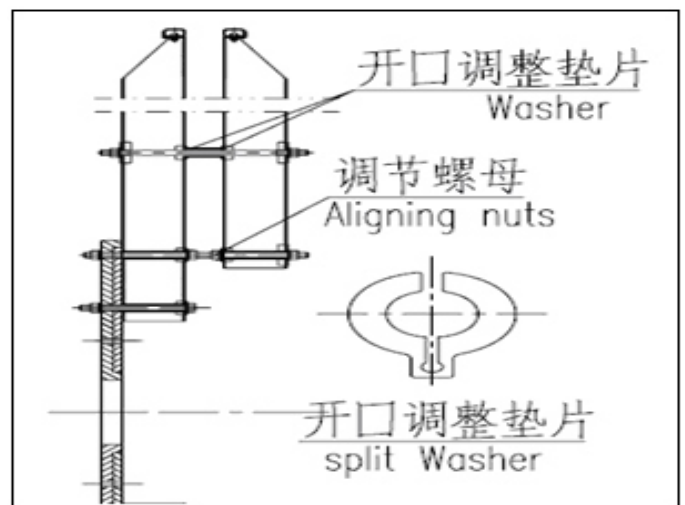
6、组合式卷盘性能介绍：

- ◆ 组合式卷盘能根据电缆直径变化可调整，方便日后维护和更新电缆调整时需要。
- ◆ 结构轻，惯量小，刚性好。



6. Characteristic introduction of combined cable reel

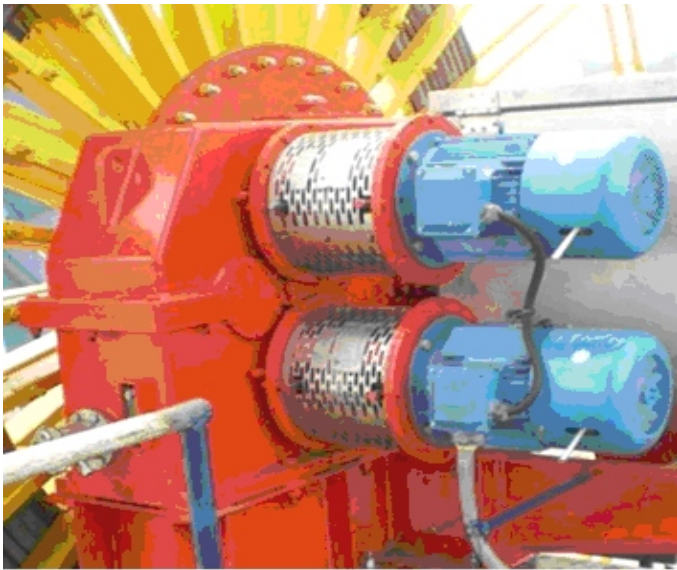
- ◆ The reel can be adjusted according to the cable diameter. So it is simple for maintaining or cable replacing.
- ◆ Light structure, small inertia, well rigidity.



三、ZPMC磁滞式大车电缆卷筒优势介绍

1、JPC-DM20系列磁滞式大车电缆卷筒特性介绍：

- ◆磁滞力矩驱动，在任何工况下，使电缆处于恒张力状态，简单可靠。
- ◆根据大车不同行走距离，可作分级力矩控制，保证电缆始终处于安全使用范围。
- ◆能广泛应用于卸船机，斗轮机，岸桥等行走速度 ≤ 60 米/分的港机设备。



2、JPC-DM50(30)系列磁滞式大车电缆卷筒特性

- ◆磁滞式驱动及分级控制性能同上，但小扭矩多头磁滞驱动能减少磁滞联轴器工作发热量，提高使用寿命。
- ◆立式安装，结构紧凑。能满足门机类小型机械的安装空间。
- ◆大量被应用于门机、龙门吊、起重机、卸船机、装船机等设备。



III. Advantages of ZPMC Magnetic Coupling gantry cable reel

1. Characteristic introduction of Series JPC-DM20 Magnetic Coupling gantry cable reel

- ◆The magnetic torque can help to keep the cable safe.
- ◆According to the travel distance of crane, the torque can be divided into different steps.
- ◆It is widely used in the machine which travel speed is less than 60m/min, such as QC, SHIP UNLOADER, STACKER&RECLAIMERS etc.



2. Characteristic introduction of Series JPC-DM50 (30) Magnetic Hysteresis gantry cable reel

- ◆The characteristic is the same as the above, and the small torque can reduce the heat of coupling, so it can improve the using life.
- ◆Vertical Installation and compact structure. So it needs small installing space.
- ◆It is widely used in the machine such as portal crane, goliath crane, unloader and ship loader.

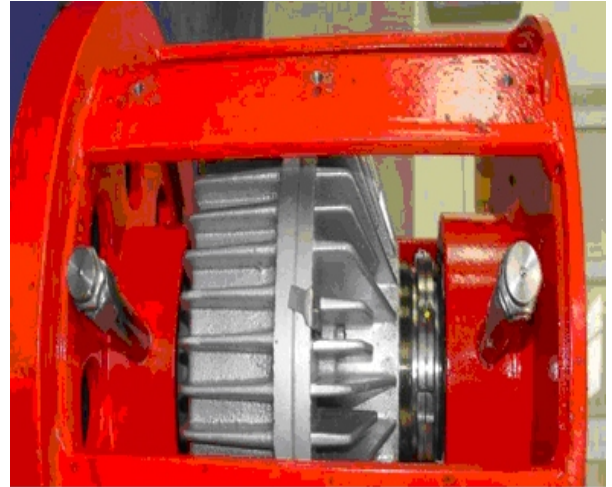


3、磁滞联轴器特性介绍：

- ◆ 永磁力矩驱动、使电缆始终处于软性牵引状态、不受大车行走快慢、冲击等工况影响。无需与电控匹配、简单可靠。
- ◆ 永磁力矩不受工况、气候影响、恒定不变。可按力矩需要作适量调整，简单方便。
- ◆ 除定期润滑外，维护量小，安全可靠。

3. The introduction of Magnetic coupling:

- ◆ Driven by the magnetic torque, so the cable is at the condition of soft traction. And it will not be affected by the travel speed of crane or any other condition.
- ◆ The magnetic torque is constant and it will not be changed by any working conditions or climate conditions. Besides, the adjusting method of change the torque value is simple.
- ◆ It needs little maintenance besides the periodic lubrication, so it is safe and reliable.



四、ZPMC-全变频吊具电缆卷筒优势介绍 *IV. Advantages of ZPMC converter spreader cable reel*

1、结构特点:

ZPMC全变频吊具电缆卷筒适应范围大,其应用的场合不受电缆自重,起升高度、吊具加速度等限制。最大速度可达到240m/min。是目前可靠性高,结构最优化形式之一。

1. Structure characteristic

The ZPMC frequency converter spreader cable reel can fit for kinds of occasions because of no limit of cable quality, raising height or acceleration. And the max speed is 240m/min.

卷盘结构 Cable reel structure

卷筒结构 Cable drum structure



卷盘特点:

- ◆ 电缆单排多层排绕. 无需排缆机构, 结构简单, 电缆运行不产生旋转摩擦力, 电缆使用寿命长;
- ◆ 硬齿面减速器, 体积小, 重量轻; 转动惯量小;
- ◆ 轴向占用空间小, 能满足双吊具布置;

Cable reel characteristic:

- ◆ The cable winding structure is mono spiral, so there is no rotating friction during the running, and it helps to improve the using life of cable.
- ◆ Hardened reducer, small volume and quality.
- ◆ Small axial space, so it can satisfied the requirements of double cable reel layout.

卷筒特点:

- ◆ 适用于桥吊任何工况下垂直作业. 特别在起升速度 $V > 150\text{m/min}$, 工作风速大于 22m/s 的场合;

Cable drum characteristic:

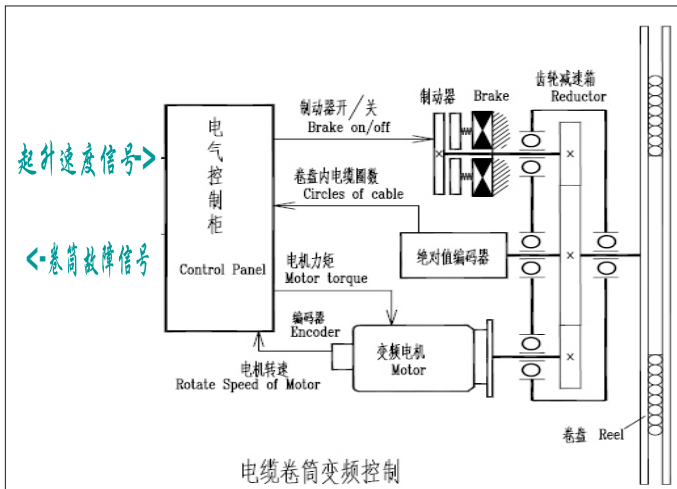
- ◆ It can fit for all kinds of working condition, and special for the condition where raising speed $V > 150\text{m/min}$ and wind speed larger than 22m/s .

2、卷盘电控和主要配置件特点：

- ◆ZPMC-全变频吊具电缆卷筒采用闭环控制，使电缆在任何工况下能与吊具同步，精确的线性控制，能使电缆受力最小，故障率最低；（见图1）
- ◆滑环箱采用：底架支承、抱指式触点、镀银滑环，不受小车振动影响，可靠性极高；（见图2）
- ◆电缆缓冲器能有效补偿电缆运行时的不同步性、使电缆在冲击情况下不受损伤。同时配备了极限保护开关，使挂舱时电缆得到有效保护。（见图3）
- ◆电机输出和滑环箱连接均采用弹性联轴器连接，在吊具下降、提升快速切换过程中起到缓冲阻尼作用，使系统运行无冲击，可靠性高；（见图4）

2. Electrical control characteristic of cable reel:

- ◆ZPMC spreader cable reel have a new control theory that is speed closed loop control with dynamic torque limit setting; we can achieve best protection for executive equipment.(See Pic.1).
- ◆The slip ring box has high reliability, and it will not be affected by the vibration (See Pic.2).
- ◆The cable bumper can help to compensate the un-asynchronism during the cable running, and it has protect switch on it. If there is any abnormal and the cable reaches its' limit place, the limit switch will turn on to stop the cable reel from running. So it can help to protect the cable from breaking(See Pic.3).
- ◆The flexible coupling is using to connect the motor and slip ring. So it can help to reduce the impact force during the running and keep high reliability (See Pic. 4).



(图1 Pic. 1)



(图2 Pic. 2)



(图3 Pic. 3)



(图4 Pic. 4)

五、ZPMC--磁滞+变频吊具电缆卷筒优势介绍

1、结构特点：

磁滞+变频控制吊具电缆卷筒是ZPMC专利产品，其能借助磁滞软牵引的特性，使吊具电缆免受挂舱损伤。运行安全、可靠。

适用工况：

- A) 吊具速度 $V = 160\text{m}/\text{min}$;
- B) 加速度 $a = 0.75\text{m}/\text{s}^2$;
- C) 最大起升高度 $H = 56\text{m}$;
- D) 电缆芯数小于45芯；



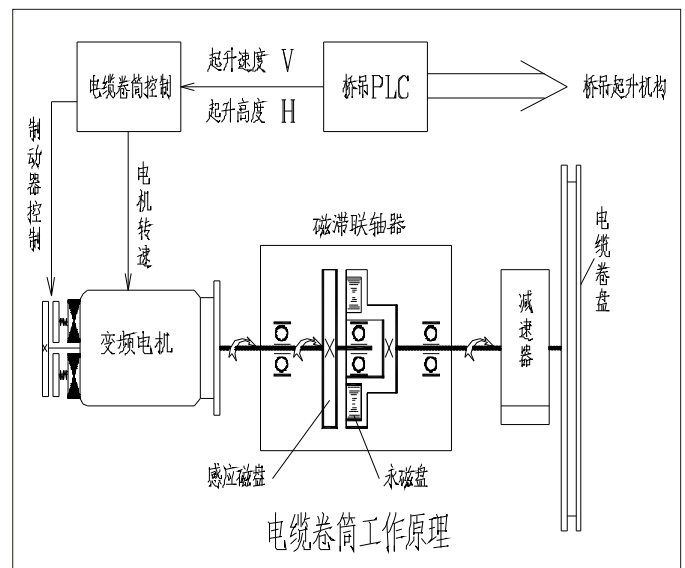
V. Advantage of ZPMC Magnetic Hysteresis+Frequency Converter spreader cable reel

1. Structure characteristic:

ZPMC magnetic hysteresis + frequency converter spreader cable reel is the patented product of ZPMC. By the using of magnetic coupling, the cable reel can running safety and reliability.

Applicable specification:

- A) Max. spreader speed less than 160m/min;
- B) Max. spreader Acceleration less than 0.75m/s²;
- C) Max. spreader travel less than 56m;
- D) Max. spreader cable cores less than 45 cores.



2. 卷筒电控特点：

- ◆ 因磁滞联轴器的作用，电缆的张力始终处于限定值以下，具有良好的挂舱保护功能，能有效保证发生电缆不发生拉断的事故；
- ◆ 吊具电缆卷筒的控制既有磁滞的力矩限定，又有变频的速度控制，是一种开环“模糊控制”的独特方式，易于电控调试和控制；
- ◆ 性能稳定可靠，电气调试精度较低，维修方便。

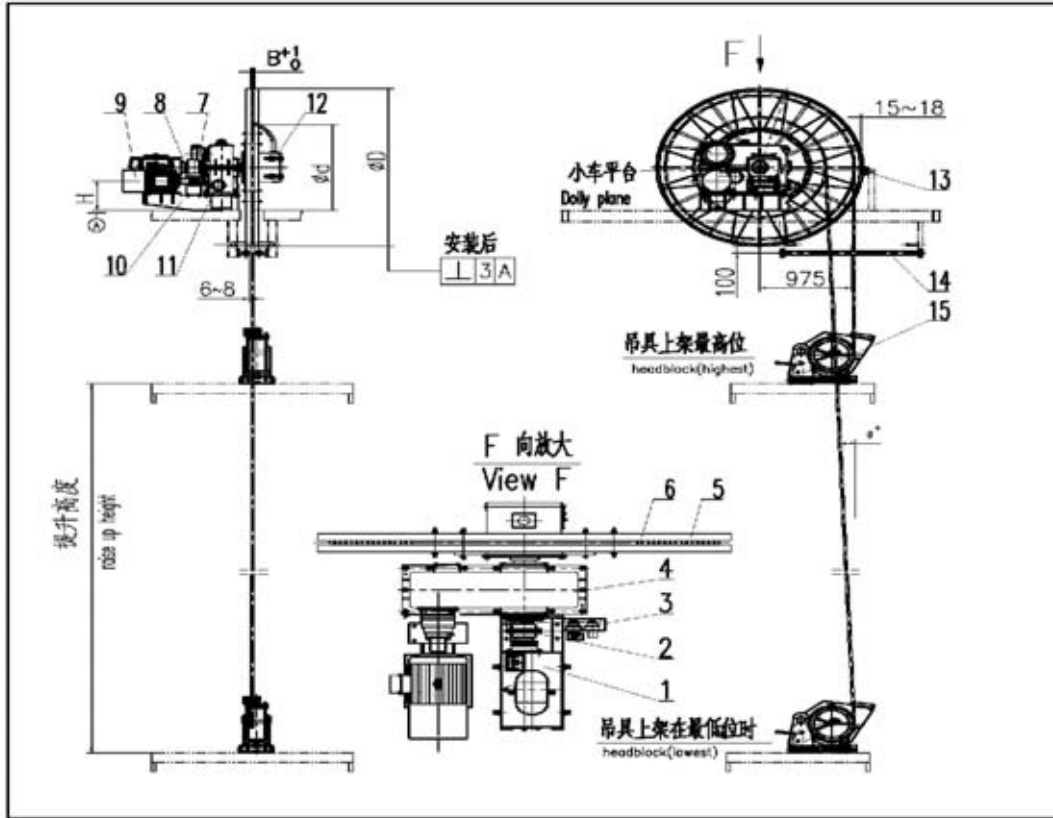
2. Advantages of reel electrical control

- ◆ By the using of magnetic hysteresis coupling, the cable tension can be protected to less than the limit value. So it can help to protect the cable out of broking.
- ◆ The control of spreader cable reel is a special type which combines with the torque limit of magnetic coupling and speed control of frequency converter. So it is easy for controlling.
- ◆ Reliability and easy for maintaining.

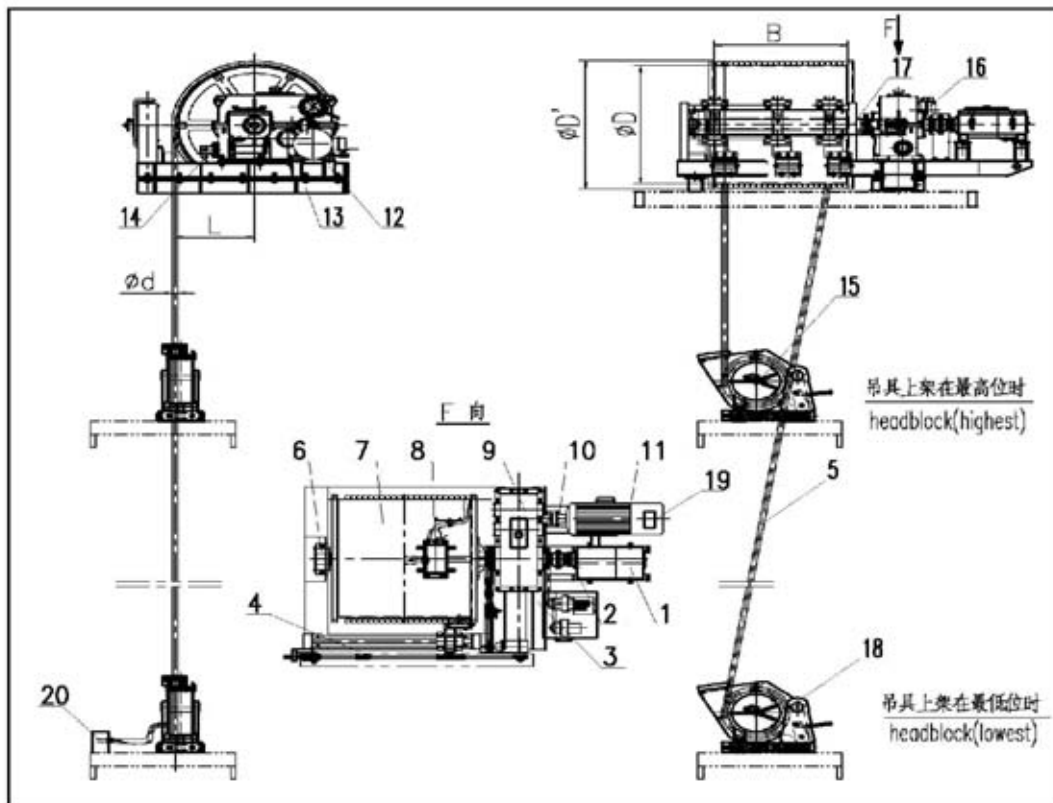
六、ZPMC吊具电缆卷盘系统的常见布置方式

VI. Normal structure of ZPMC spreader cable reel

卷盘结构 Cable reel structure



卷筒结构 Cable drum structure





七、ZPMC电缆卷筒遍天下

VII.ZPMC cable reel spread the world

ZPMC电缆卷筒遍布全球200多个码头。截止2012年9月，各类大车和吊具电缆卷盘生产数量已超2500台套，主要分布地区如下：

The ZPMC cable reel has been used in more than 200 ports all over the world. And the total number of ZPMC cable reel which under the running is over 2500 sets until Sep. 2012.

Parts of the users are as follow:

地区 Region	集装箱机械 Container Machinery	散货机械 Bulk Machinery	主要用户 Main User
中国大陆港口 Chinese Mainland ports	More than 1200 sets	More than 200 sets	Chinese coastal ports
中国台湾 Chinese Taiwan ports	48 sets	16 sets	Taipei, Gaoxiong, Keelung
中国香港 Hongkong ports	51 sets	32 sets	HIT;CGOS
美洲 America ports	116 sets	66 sets	Los Angeles, New York, Virginia, Auckland, New Jersey
中东 Middle East ports	202 sets	92 sets	Egypt, Oman; Iran, Iraq, Dubai, Arab
亚洲 Asia ports	260 sets	102 sets	Thailand, Pasistan, Philippines, Vietnam
欧洲 Eroupe ports	196 sets	63 sets	Euromax Holland, France, UK
非洲 Africa ports	72 sets	33 sets	South Africa, Morocco, Angola Cameroon, Kenya

我们的产品遍天下 ZPMC PRODUCTS SPAN THE WORLD
产品已进入49个国家和地区97个港口 ZPMC products Have Entered into 97 Ports in 49 Countries and Area

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