

250KN 电动系泊绞车
250KN Electric Mooring Winch

说明书
Operation manual
电气部分
(Electric parts)

安装、使用该产品之前，请阅读使用说明书！

Please read this manual carefully before
Installation & operation

河南德钧实业有限公司

Henan Dejun Industrial Co., LTD

2023.08

一、电气控制系统介绍 Introduction of electric control system

概述 Brief introduction

交流变频电动绞车控制箱作为对绞车电动机以及刹车的控制之用，实现正反转，变速与制动，采用 AC440V/60HZ 电源，控制箱选用专业变频器、施耐德接触器等优质元器件；控制线路具有失压保护、过载保护。

AC inverter control box of electric winch is used to control the motor of winch and brake to realize positive and negative rotation, speed change and braking. The power supply is AC440V/60HZ. The control box uses professional inverter, Schneider contactor and other high-quality components. The control circuit has the function of loss-power protection, overload protection.

二、本机电气控制系统组成 Components in electric control

- 1、电控箱 Electric control box
- 2、近控操作台 Local control
- 3、遥控器 Remote control

三、控制箱符合下列标准 Applying standards & rules

- 1、《钢质海船入级与建造规范》

China Classifications for the Construction and classification of Sea-going Vessels

- 2、GB/T3783-92 《船用低压电气基本标准》

GB/T3783-92 General specification for low-voltage apparatus in ships

- 3、GJB202-80 《舰船低压电气基本标准》

GJB 202-80 General specification for low-voltage apparatus in ships

四、环境条件 Working Condition

- 1、环境温度 Environmental temperature: $-25^{\circ}\text{C}\sim+45^{\circ}\text{C}$
- 2、能承受海上潮湿空气影响 Could bear moist air on sea
- 3、能适应凝露、油雾、盐雾、霉菌环境。
Could bear sweat, oil mist, salt fog & mould
- 4、倾斜: $\pm 22.5^{\circ}$ Inclination: $\pm 22.5^{\circ}$
摇摆: $\pm 22.5^{\circ}$ Swing: $\pm 22.5^{\circ}$
- 5、船舶正常营运产生的振动和冲击。

Could bear normal vibration & shock when ship is sailing.

- 6、应能承受交流电源的电压变化为额定电压的+6%~ -10%，频率变化为额定频率的±5%。

Could withstand +6% to -10% of rated voltage and ±5% of rated frequency.

五、技术参数 Technical specification

- 1、工作制 Service character: S1
- 2、电制 Power supply: AC440V 60HZ
- 3、控制电压 Control power: AC220V
- 4、电液制动器: AC440V
- 6、电机 Electric motor
型号 Model: YZ315S-8-H 440V
功率 Power: 55KW
额定电流 Rated current: 98.6A

六、系统保护 System Protection Device

- 1、短路保护: QF1-NSC-200A
Short Circuit protection: QF1-NSC-200A
- 2、过电流保护: 变频器
Excess current protection: Inverter
- 3、紧急停止: EM'CY stop

七、防护等级 Protection degree of control system

- 控制箱 control box: IP44
机旁操作台 Local control: IP56

八、控制原理说明 Control principle

- 1、控制系统采用变频器控制主电机速度，电机输出端采用电液制动器刹车与电机运行同步工作，电液制动器在断电情况下，自动刹紧。

The control system uses the inverter to control the electric motor speed, and the motor output side uses the electro-hydraulic brake to brake, which simultaneously working with the motor. The electro-hydraulic brake is tightly braked when power is off.

- 2、控制系统机旁操作台采用电位器选择收/放缆速度，正反转采用开关选择。

The local control box uses potentiometer to select the pull in/pay out speed, and

uses the switch to realize positive and negative rotation.

- 3、用户还可以采用配套的遥控器，遥控绞车的收缆/放缆动作，遥控时的速度由机旁操作台上的电位器选择设置好。

The user can also use the supporting remote control to remote control the action of pull in/pay out, and the speed during the remote control is set by the potentiometer on the local control panel.

- 4、在绞车运行过程中，如果出现过载或者变频器故障，控制系统会自动停机并报警。

When the winch is running, if overload or inverter faults occurs, the control system will automatically stop and alarm.

- 4、过载保护，电机的过载保护由变频器设置好参数，自动进行保护。

Overload protection: The overload protection of the motor is set up by the inverter to automatically protect.

- 5、控制系统的保护采用保险丝。The control system is protected by fuse.

6、控制系统机旁操作台设有 LIGHT LOAD/HEAVY LOAD 选择，LIGHT LOAD 模式下，主电机频率 0-60HZ 调整，HEAVY LOAD 模式下主电机频率 0-80HZ 调整。（HIGH SPEED 模式为绞车无负载情况下选择使用！）

There is a switch LIGHT LOAD/HEAVY LOAD on local control panel. In LIGHT LOAD mode, the frequency of electric motor is adjusted between 0 and 60hz; In HEAVY LOAD mode, the frequency of electric motor is adjusted between 0 and 80hz.

(HEAVY LOAD mode is to choose in the case of no load.)

九、操作方法 Method of operation

- 1、首先合上主控制箱里面的断路器：QF1, QF2, QF3，控制箱门上的电源指示灯亮。

First, close breakers in the main control box: QF1, QF2, QF3, the power indicator on the control door will be on.

- 2、如果发现电机加热指示灯亮，可以将电机加热开关关闭（电机加热是在电机受潮的情况下才需要开启！）。

If the motor heater light is on, turn off the motor heater button (motor heater is to be turned on when the motor is damp!).

3、将控制箱上的紧急停止按钮按箭头方向旋转弹出！

Rotate the E/M stop of the control box to pop out in the direction of the arrow!

下一步至机旁操作台上操作 Next control on the local panel:

1、至机旁操作台上将紧急停止按钮按箭头方向旋转弹出！

Rotate the E/M stop of the local control box to pop out in the direction of the arrow!

2、将控制模式选择至 Local ，按下控制电源开关 绿色启动按钮，控制电源指示灯亮。

Rotate the control mode to Local, press the green start button of the power switch, and control power indicator will be on.

3、绞车在空载情况下，可以选择 HEAVY LOAD，有负载的情况下，请选择 LIGHT LOAD 模式，然后开始选择 PULL IN 或者 PAY OUT ,再缓慢旋转调速旋钮，选择想要的速度。

When no-load, the user can choose HEAVY LOAD; When there is load, please choose the LIGHT LOAD mode, and then start to choose PULL IN or PAY OUT, rotate the speed knob slowly to choose the required speed.

4、如果选择 HEAVY LOAD 时，调速旋钮可以在 0-80HZ 之间选择，该模式下不能带负载运行！如果选择 LIGHT LOAD 时，调速旋钮可以在 0-60HZ 之间选择。

If choose HEAVY LOAD ,speed knob can be choosed between 0 and 80hz,the winch works without no load.If choose LIGHT LOAD ,speed knob can be choosed between 0 and 60hz.

※**注意 1:** 冷却风机的出风方向是向电机方向，请调整好风机相序，确认风机运行方向。变频电机风机随电机运行而工作，主电机停止工作后，风机会延时停止，该时间在控制箱内部可以调整（一般设置 1min 至 3min）。

※**Note 1:** The air outlet direction of the cooling fan is toward the motor. Please adjust the phase sequence of the fan and confirm the running direction of the fan. The inverter motor fan works with the motor. After the main motor stops working, the fan

will stop with a delay. The time can be adjusted inside the control box (generally set 1 min to 3 min).

※**注意 2:** 在选择 **PULL IN** 或者 **PAY OUT** 过程中，开关必须在 **0** 位停止 3S 以上方可换向操作！短时间内也不要过分频繁的收缆/放缆操作（小于 10 次/min），否则很可能会出现变频器报故障！

※**Note 2:** In the process of selecting **PULL IN** or **PAY OUT**, the switch must be stopped at the position “0” for more than 3 seconds before reversing operation! Do not pull in/pay out too frequently in a short period of time (less than 10 times /min), otherwise the inverter may report fault.

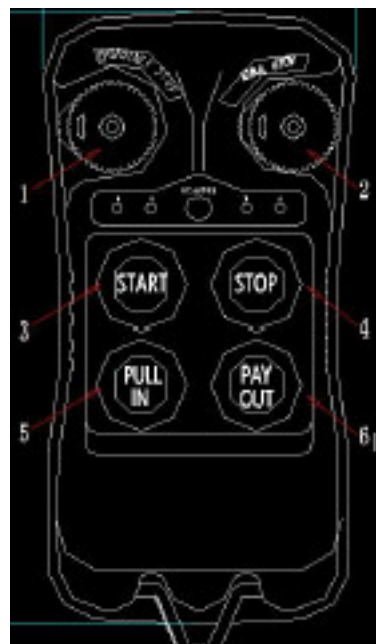
3、紧急情况下，可按下任意一个紧急停止按钮，电机立即停止运行并刹车。

In emergency situations, the user can press any E'M stop button, the motor stops running and brakes immediately.

遥控器操作 Remote control:

- 1、首先在机旁操作台上按下**控制电源开关** 红色按钮，将控制模式开关选择至 **Remote**,再拿出配套的遥控发射器：

First,press the red button of the power switch on local control panel, and select control mode to **Remote**,then use the supporting remote control.



2、确认遥控器已经安装了 2 个 1.5V/5# 电池,然后旋转 1# 电源开关旋钮弹出。
Verify that two 1.5V/5# batteries are installed on the remote control, then rotate 1# power switch knob to eject.

3、再将 2# 紧急停止开关旋转弹出,确认弹出后,再按一下 2# 紧急停止按钮
再一次将 2# 紧急停止开关旋转弹出,激活遥控器!

Then rotate 2# E'M stop to eject,After confirming this, press the 2# E'M Stop button again,then rotate 2# E'M stop to activate the remote!

4、按一下 3# 启动按钮,此时,机旁操作台上的控制电源指示灯亮起。按一下 4# 按钮,机旁操作台上的控制电源指示灯灭。

Press 3# start button,at this time, the control power indicator light on the local control panel will be on. Press 4# button, and the control power indicator light on the local panel will go out.

5、在机旁操作台上将速度选择旋钮选择到想要的频率,设置的频率数值在控制箱变频器的显示屏上可以看到。

Select the speed knob to the desired frequency on local panel, and the set frequency value is displayed on the control panel.It can be seen on the display screen of the inverter.

注意: 遥控状态下, 高低速选择由机旁操作台选择设置!

Note: Under remote control, the high and low speed selection is set by the local control panel!

6、按下 5# 或者 6# 按钮,电机开始按设置的速度运行,一旦松开按钮,电机即停止运行。

Press 5# or 6# button, the motor starts to run at the set speed, once the button is released, the motor will stop running.

※ .变频器出厂前,工厂已经进行了调试,并进行了必要的设置;用户在使用过程中,如果想修改变频器参数,请仔细阅读变频器使用说明书。

※ Before the inverter leaves the factory, the factory has been debugged and the necessary settings have been made; When user in use, if want to modify the inverter parameters, please read the inverter manual.

当控制系统出现报警时，首先至机旁操作台查看报警原因：

When the control system alarms, first check the reasons for the alarm on the local panel.

1、风机故障：一般是控制风机的热继电器 FR1 动作引起，首先检查风机是否能够正常旋转，是否缺相，然后再按 FR1 热继电器上的复位按键。

Fan fault: It is generally caused by the action of the thermal relay FR1 that controls the fan. First, check whether the fan can rotate normally and whether it is out of phase, and then press the reset button on the thermal relay FR1.

2、制动器故障：一般是控制电液制动器的热继电器电机的 FR2 动作引起，首先检查制动器电机是否缺相，电机是否过热，然后再按 FR2 热继电器上的复位按键。

Brake fault: It is generally caused by the action of the thermal relay FR2 that controls the electro-hydraulic brake. First, check whether the brake motor is out of phase and whether the motor is overheated, and then press the reset button on the FR2 thermal relay.

3、变频器故障：首先查看变频器显示屏上故障代码，对照变频器说明书查看是什么报警，一般变频器故障报警，可以在机旁操作台上按一下故障复位按钮清除报警报警，特殊报警需要按一下变频器上的 STOP/RESET 按键。

Inverter fault: first check the fault code on the display screen of the inverter, and check what alarm according to the instruction manual of the inverter. For general fault alarms, user can press the fault reset button on the local control panel to clear the alarm. For special alarms, user need to press STOP/RESET button on the inverter.

十、安装与维护 Installation and maintenance

1、把箱体通过安装孔固定于垂直的板壁上，按接线图接好线，并确认无误。

Fix the control box by the vertical walls or flat deck, connect all cables and make sure they are connected correctly.

2、按操作规程操作就可使系统正常工作。

The winch will work normally according to operating manual.

3、控制箱应进行定期维护，一般检查为每半个月一次，严格检查为每三个月一

次，检查前需切断系统供电。

The control box should be maintained regularly. The normally inspection is once every half a month, and the strict inspection is once every three months. Before the inspection, the power supply of the system should be cut off.

a)检查各元器件的安装情况，紧固件是否松动,元器件中是否有损坏

Check if all components are fixed and if there is any components damaged.

b)控制箱的绝缘电阻是否符合要求,极其恶劣的环境条件下应 $\geq 5M\Omega$ 。

Check if the earth resistor meets the requirement. Under severe working condition the resistance should be $\geq 5M\Omega$.

c)接地装置是否完好。

Check if the earth resistor is working correctly.

d)检查控制器是否有其他异常现象

Check if there is any other abnormal on the control system.

十一、运输与保管 Transportation and storage

控制箱出厂时均有木制的包装箱，包装箱在运输和保管过程中不得受雨水侵袭，应放置在没有雨雪侵入、空气流通和干燥的仓库中，同时必须防止各种有害气体侵入，严禁与化学药品、酸碱及蓄电池等保存在同一仓库内，包装箱在搬运过程中，应特别注意避免冲撞。

The control system is packed by wooden case while ex-work. During transportation and storage, it should be dry and avoid water or snow soaking. During transportation, it should be taken carefully and avoid big shock. For storage, it should be placed on dry and ventilated position. It should avoid the corrosion of harmful gas. Also it should not be stored in the same warehouse with chemical, acid or alkali items or battery. Special attention should be paid to avoid collision during handling of packing cases.

十二、电控箱控制系统原理图

Electric control system schematic Drawing

(As attached)