GCE 光彩电器

海水节能系统用户手册

Energy Saving System for Sea Water User manual

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目 录 Content

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1 引言 Preface

随着船舶航运业竞争日益激烈以及社会对环保认识的提高，节能减排已成为世界关注的问题。在新造船项目中，节能技术的应用也越来越受船东的关注。常规海水冷却系统一般按照最大工况需求来设计，实际使用过程中，往往出现”大马拉小车”的现象，油耗浪费相当大。目前，变频技术已经相当成熟，产品成本也在不断下降。为此，通过变频控制技术优化海水冷却系统成为可能，并且通过优化设计可以提高船型的智能化程度，降低了船舶的运行成本。

GCE 根据多年的从事船舶自动化控制的经验，结合船东和船级社的意见，开发了拥有自主产权的海水节能系统,以下是关于海水节能系统的介绍。

With the increasing competition of shipping industry and increasing society's awareness of environmental protection, energy conservation and emission reduction have become a concern of the world. In new shipbuilding projects, the use of energy-saving technologies is also becoming increasingly popular with shipowners. Conventional sea water cooling system is usually designed according to the requirements of the maximum working conditions. In actual use, the phenomenon of "big horse-drawn car" is often present, and the fuel consumption is quite wasteful. At present, the frequency conversion technology has been quite mature and the cost of products has been falling. Therefore, the optimization of seawater cooling system by frequency conversion control technology has become the system, and the optimization design can improve the intelligence of the ship type and reduce the operation cost of the ship.

GCE according to many years of experience in ship automation control, combined with the opinions of the owner and classification society, developed with independent property rights of sea water energy saving system, the following is the introduced of sea water energy saving system.

2 介绍 Introduces

2.1 关于此文档 This document

编写此文档的目的是为了全面的介绍 GCE 开发的海水节能系统，包括系统构成，功能介绍，硬件配置和软件调整等。本系统主要控制设备均采用施耐德品牌海事认证产品，PLC 采用 Modicon 系列(CPU 为 M340),人机界面采用 HMI GXU 5512 系列,变频器使用的是 ATV630 系列；通讯网络采用工业以太网。

The purpose of this document is to comprehensively introduce the seawater energy saving system developed by GCE,including system composition,function introduction,hardware configuration and software adjustment.The main control equipment of the system used for marine authentication of Schneider brand PLC used schneider Modicon series (CPU is M340).The human-computer interface adopts used

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Schneider HMI GXU 5512 series, and the converter used ATV630D55N4 series. The communication network adopts industrial Ethernet.

2.2 主要器件介绍 Main device introduction

●可编程逻辑控制器(PLC Programmable Logic Controller)

PLC通过采集外部参数，能够实现起动停止海水泵和变频器，根据设置参数来自动调整模拟量的输出调整变频器的输出。

PLC can realize starting stop pump and frequency converter, and adjust the output of the analog volume by automatically adjusting the output of the analog quantity according to the setting parameters.

●人机交互界面(HMI Human Machine Interface)

通过工程技术人员程序开发，能够使HMI通过通讯线路将PLC采集到的数据，用更直观的方式显示出来，不同的操作人员有不同的权限，通过点击按钮可以启动停止泵和变频器，改变参数能够调节控制过程(比如泵的起动顺序)，变频器输出的频率和幅度曲线可以通过改变PID参数来实现。

Through the program development of engineering and technical personnel, make the HMI PLC data collected over a communications line, in a more intuitive way, different operators have different permissions, by clicking on the button to start the pump and the inverter, change the parameters to adjust control process (such as pump starting sequence), by changing the parameters of PID, the curve of the inverter output frequency and amplitude.

●变频器(VFD Variable Frequency Device)

变频装置是本系统的执行环节，它控制着泵的速度，通过调整输出频率改变泵浦转速从而达到节能目的。根据泵组的要求(功率,IP级别)我们可以选择不同的VFD产品.

The frequency conversion device is the execution unit of the system, which controls the speed of the pump. By adjusting the output frequency to change the pump speed to achieve the purpose of energy saving According to the requirements of on-site pump (power, IP grade), we can choose different VFD.

● 通讯接口(Communication Interface)

我们可以提供Modbus TCP/IP或Modbus RTU接口，将数据发送到第三方，例如AMS系统等。

We can provide Modbus TCP/IP or Modbus RTU interface, send data to the third part system , such as AMS etc.

2.3 系统图 System diagram

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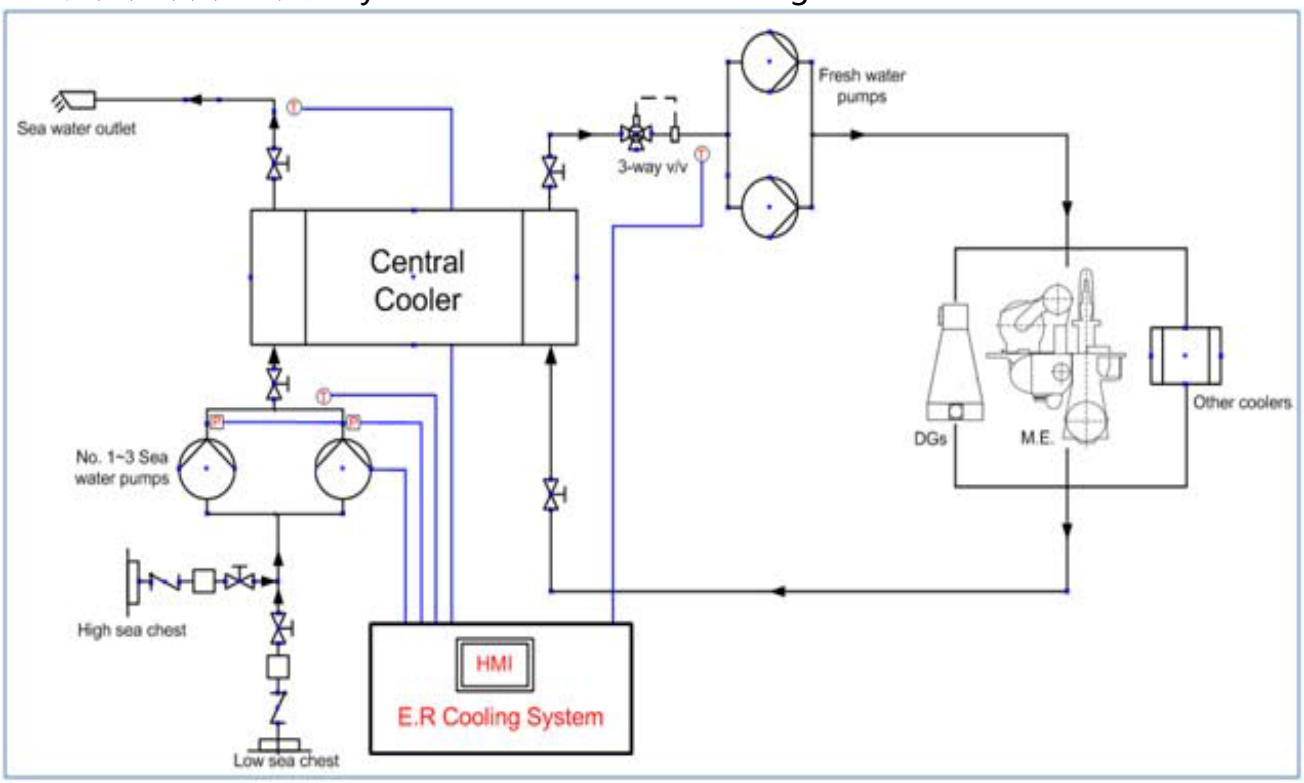
● 系统控制示意图 system control schematic diagram



2.4 缩略语 Abbreviations

AC	Alternating Current(交流)
AMS	Alarm and Monitoring System(报警和监控系统)
BCC	Bridge Control Console(桥楼控制台)
CAN	Control Area Network(控制区域网络 CAN总线)
C/F	Chief Engineer(轮机长)
DC	Direct Current(直流)
DG	Diesel Generator(柴油机)
ECC	Engine Control Console(集中控制台)
ECR	Engine Control Room(集中控制室)
EMC	Electro Magnetic Compatibility(电磁兼容性)
FB	Function Block(功能块)
HMI	Human Machine Interface(人机交互界面)
I/O	Input /Output(输入/输出)
LAN	Local Area Network(局域网)
PC	Personal Computer(个人电脑)
PLC	Programming Logic Controller(可编程逻辑控制器)
UPS	Uninterruptible Power Supply(不间断电源)
VFD	Variable Frequency Device (变频器)

3 功能描述 Functional description

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海水节能系统是一套集成的解决方案，它的智能化和人性化主要通过 PLC 和 HMI 来实现，它主要具有以下功能：

The cooling system is an integrated solution. Its intelligence and humanization are mainly realized through PLC and HMI. It mainly has the following functions.

●泵组控制 The pump control

●能效管理 Energy efficiency management

●报警系统 Alarm Syetem

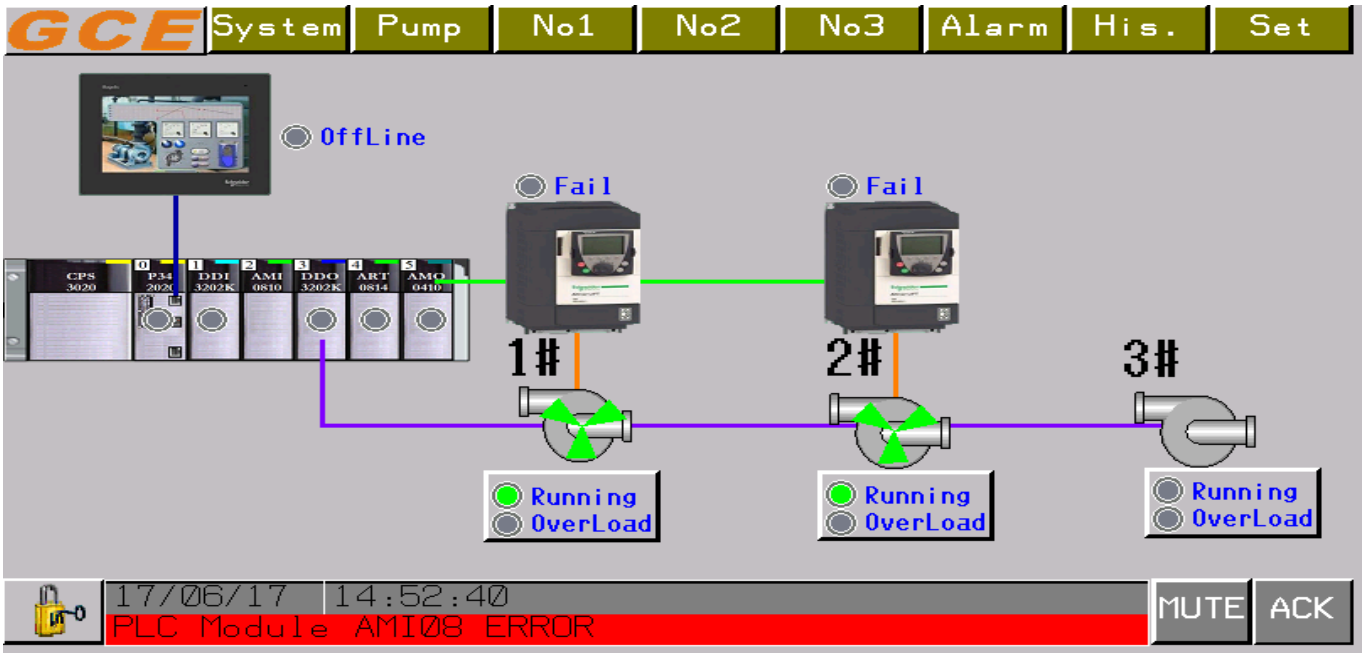
●通讯接口 Communication interface

3.1 泵组控制 The pump control

3.1.1 状态显示 Status display

●点击 System 显示界面是控制系统中 3 台泵的电器配置

Click on the System Display is 3 pumps control system of electrical configuration



从图中可以看出 1 号泵和 2 号泵都是可以通过变频器调速运行，3 号泵只能全速运行和停止，3 台泵都能够手动和自动起动和停止，1 号泵和 2 号泵能够手动和自动调整 VFD 输出频率来调整海水泵转速。

Can be seen from the figure no.1 pump and no.2 pump can be run by frequency converter speed control, no. 3 pump can run at full speed and stop, no.3 pump can be manual and automatic start and stop, no. 1 and no. 2 pump can be manually and automatically adjust VFDS output frequency to adjust pumps rotate speed.

●点击 Pump 显示的是冷却水循环图

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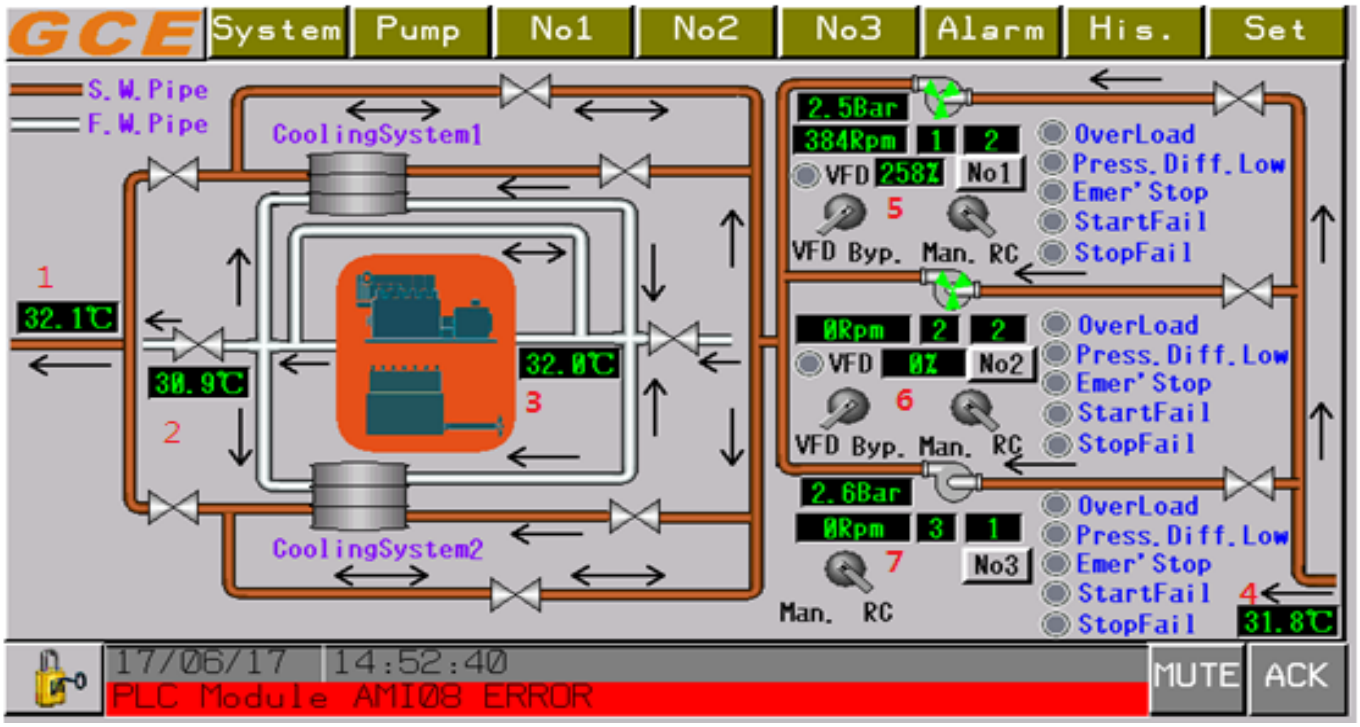
Click on the Pump The cooling water cycle diagram is shown



这个界面显示了海水冷却系统的基本参数：

This interface shows the basic parameters of the seawater cooling system

1. 海水出口温度 Sea water outlet temperature
2. 淡水出口温度 Fresh water outlet temperature
3. 淡水进口温度 Fresh water inlet temperature
4. 海水进口温度 Sea Water inlet temperature
5. 1 号泵参数(泵进口压力、转速、备用顺序、Standby 状态、VFD 故障、VFD 输出百分比)

   No.1 pump parameters (inlet pressure,speed,Standby order,Standby state,VFD failure,VFD output percentage)
6. 2 号泵参数(泵进口压力、转速、备用顺序、Standby 状态、VFD 故障、VFD 输出百分比)

   No.2 pump parameters (inlet pressure,speed,Standby order,Standby state,VFD failure,VFD output percentage)
7. 3 号泵参数(海水泵海水进口压力,转速,备用顺序,Standby 状态)

   No.3 pump parameters (sea water inlet pressure,speed,Standby order,Standby status)

3.1.2 单台泵参数显示 Single pump parameters display

●点击 No1, No2 或者 No3 会显示出 3 台海水泵的操作和运行参数画面

Click on the No1, No2 or No3 The operation and operation parameters of the three water pumps will be shown.

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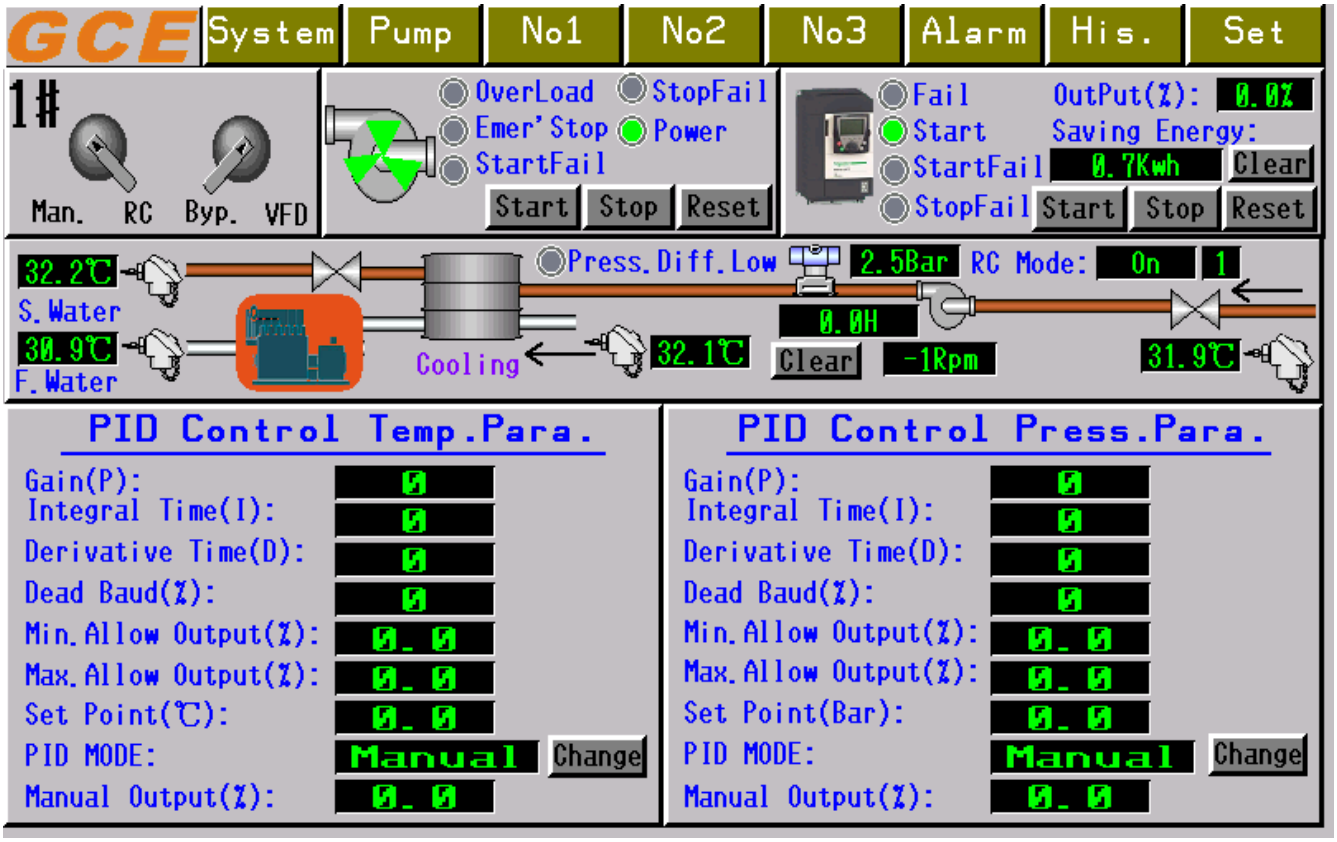
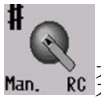


●1#这是 1 号泵的界面 This is the interface of No.1 pump

● 

泵有手动和自动两种控制模式, 这里只是显示, 操作是由外部面板的选择开关来完成。

The pump has both manual and automatic control modes, which only show that the operation is completed by the selector of the external panel.

● 

泵通过变频器或越控来控制, 这里只是显示, 操作是由外部面板的选择开关来完成。

The pump is controlled by inverter or bypass, which only show that the operation is completed by the selector of the external panel.

3.1.3 泵的起动和停止 Pump starting and stopping

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●  泵有没有运行，如果中间有交替出现的绿色三角，那就表示海水泵在运行，否则就是停止

If there is an alternate green triangle in the middle, it means that the pump is running or it will stop

● 

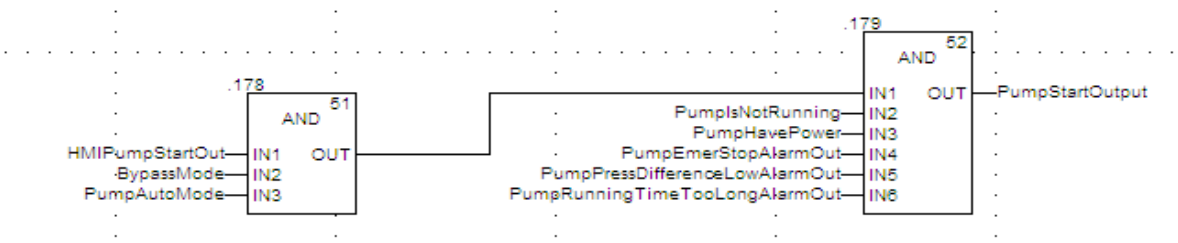
泵的报警(过载，紧急停止，起动失败，停止失败)，电源指示

The pump alarm (overload, emergency stop, start failure, stop failure), power indicator

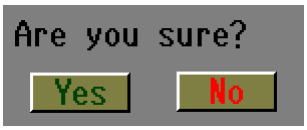
● 

泵的起动，停止，报警复位，起动按键在满足以下条件下

The pump starting, stop, alarm reset, starting button is satisfied the following condition



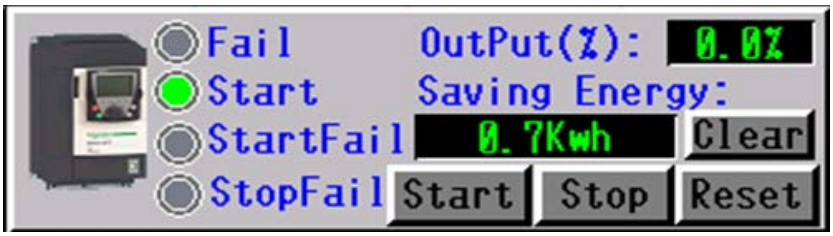
点击按键会显示对话框 click the button to display the dialog box



点击 Yes 会输出起动信号， 点击 No 则取消起动。

Click on the Yes Will output start signal, click No Cancel starting.

3. 1. 4 变频器的起动和停止 The starting and stopping of the VFD



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● 变频器有没有运行，如果变频器上交替出现半圆形的绿色，那就表示变频器在运行, 否则就是停止。

If the VFD is running, if there is a half-round green in the frequency converter, that means the converter is running, otherwise it will stop.

● 变频器的报警(故障, 起动失败, 停止失败)和起动输出指示

VFD alarm (failure, start failure, stop failure) and starting output instructions

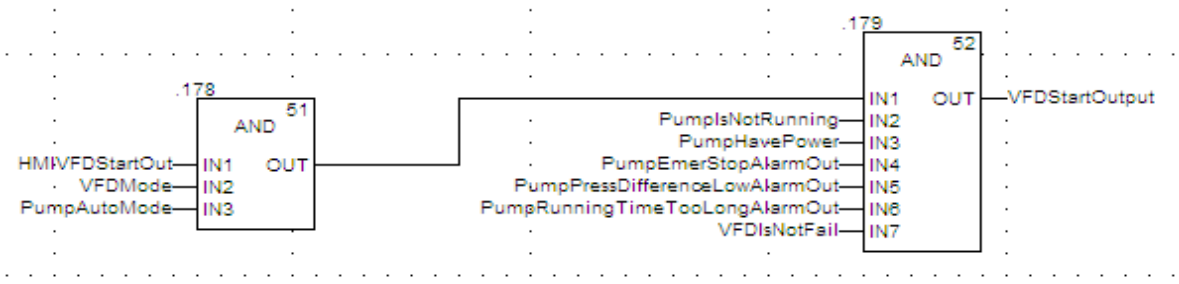
● 变频器输出百分比 VFD output percentage

● VFD 运行模式下节省的能源(KWH), 登录后可以清除

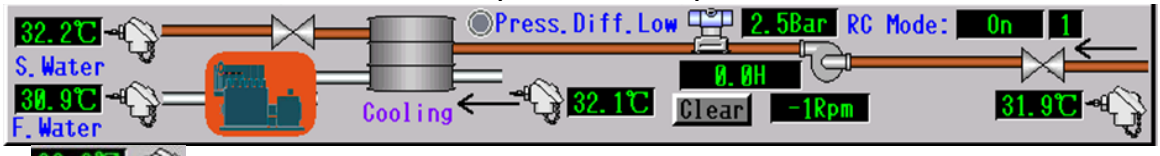
The energy savings in the VFD run mode (KWH), which can be cleared after logging in

● 变频器的起动，停止，复位按键，起动按键在满足以下条件下，点击按键会弹出询问对话框，功能和 3.1.3 一样。

VFD start, stop, reset button, start button is satisfied the following conditions, clicking the key will pop up the query dialog box, which is the same as 3.1.3.



3.1.5 综合运行状态指示 comprehensive operation status indication



● 这样的图标表示海水出口,淡水出口,海水进口,淡水进口的温度，其中海水出口温度会在 45℃报警,淡水进口温度会在 40℃报警,淡水出口温度会在 55℃报警,如果发生断线报警,相对应的探头就会不停的闪烁,数字显示也会变成 9999℃

This icon indicates sea water,freshwater outlet,sea water,fresh water inlet temperature, including sea water outlet temperature in 45 ℃ alarm, in fresh water inlet temperature 40 ℃ alarm, fresh water outlet temperature can be in 55 ℃ alarm, in the event of disconnection alarm, corresponding to the probe will keep flashing, digital display can also be 9999 ℃.

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- 

简易的冷却系统图 Simple cooling system diagram
- 

压差低报警 Differential pressure alarm
- 

海水泵压力 Sea water pump pressure
- 

海水泵单次运行时间 Sea water pump operation time
- 

海水泵转速 Sea pump speed
- 

目前状态和备车顺序 Present status and standby order

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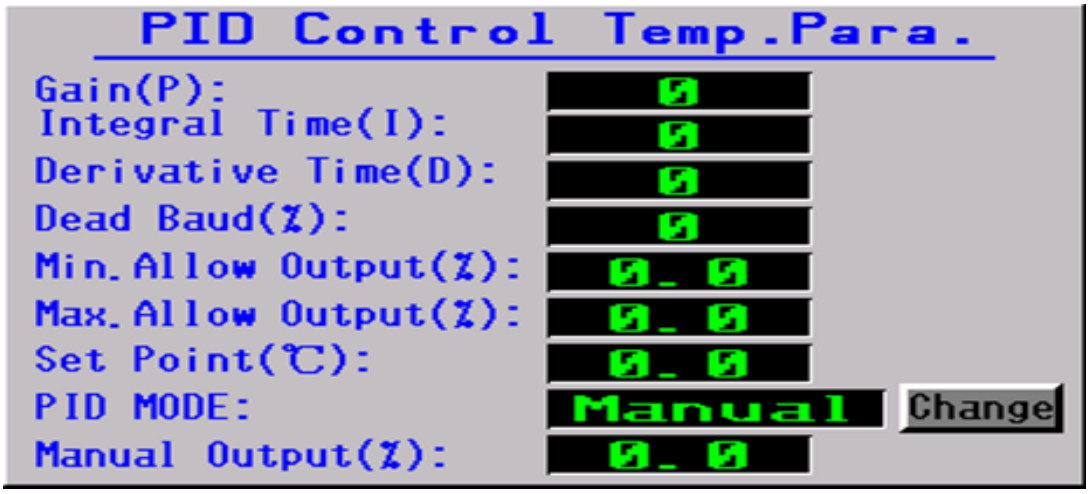
3.2 能效管理 Energy efficiency management

3.2.1 淡水出口温度的调节 Adjustment of the temperature of fresh water outlet



这是自动调节变频器的一个重要功能,有自动和手动两种功能:

This is an important function of automatic frequency converter, which has two functions: automatic and manual.

●输出最小值Min.Allow Output(%): ,登录后可以设定输出最小值。在调速过程中,泵的转速不能太低,否则会引起无功损耗的增加。

Output minimum Min.Allow Output(%): , The minimum output value can be set after logging in. In the process of speed adjustment, the pump speed cannot be too low, otherwise it will cause the increase of reactive power loss

●输出最大值Max.Allow Output(%): ,登录后可以设置输出的最大值,这可以限制电机一直在高负荷运行。

Output maximum Max.Allow Output(%): , After logging in, you can set the maximum output value, which can limit the motor to be running at a high load.

3.2.1.1 手动模式 Manual mode

系统上电后默认的是手动模式,在这种模式下, PID MODE: Manual 方框里会显示”Manual”字样。

在这种模式下,登录后可以设置Manual Output(%): ,如果设置的值不小于设定的最小值同时也不大于设置的最大值,这时在温度调节模式下对变频器的输出就是你设定的这个值,但是最终的输出值是多少,还是要和压力模式下的输出进行比较才能决定。

The default mode on the system is manual mode, in this mode, PID MODE: Manual The box will display "Manual".In this mode, the login can be set Manual Output(%): , if set the value of the set is not less than the minimum at the same time also not greater than the maximum value is set, then the temperature control mode of the inverter output is the value you set, but how much is the final output value, or a comparison of the output

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and pressure mode can decide

3.2.1.2 自动模式 Automatic mode

在登录后通过点击Change按键,可以将 PID MODE 设置为 Auto 模式,在这种模式下的控制是比较复杂的:

● Gain(P): 0 比例参数 KP 的作用是加快系统的响应速度，提高系统的调节精度。随着 KP 的增大系统的响应速度越快，系统的调节精度越高，但是系统易产生超调，系统的稳定性变差，甚至会导致系统不稳定。KP 取值过小，调节精度降低，响应速度变慢，调节时间加长，使系统的动静态性能变坏

● Integral Time(I): 0 积分作用参数 Ti 的一个最主要作用是消除系统的稳态误差。Ti 越大系统的稳态误差消除的越快，但 Ti 也不能过大，否则在响应过程的初期会产生积分饱和现象。若 Ti 过小，系统的稳态误差将难以消除，影响系统的调节精度。另外在控制系统的前向通道中只要有积分环节总能做到稳态无静差。从相位的角度来看一个积分环节就有 90° 的相位延迟，也许会破坏系统的稳定性

● Derivative Time(D): 0 微分作用参数 Td 的作用是改善系统的动态性能，其主要作用是在响应过程中抑制偏差向任何方向的变化，对偏差变化进行提前预报。但 Ti 不能过大，否则会使响应过程提前制动，延长调节时间，并且会降低系统的抗干扰性能

● Dead Baud(%): 0 调整死区,调整到设定值的这个范围内就不再进行调整了,这是设定的允许出现的误差范围

● Set Point(℃): 0.0 (0-100℃)自动模式下,淡水出口温度需要达到的设定点在 PID 调整过程中,系统会按照用户设置的 PID 各个参数的值,调整幅度和调整速度由你设置的 PID 参数来决定,输出的值会在最大值和最小值之间调整,所以在实际调试过程中一定要设置好一组的参数会非常好用,整个调节过程总体上来说是一种反向调节的过程,随着淡水出口温度的增高而加速变频器。

After login click on the Change, The PID MODE can be set to Auto MODE, and the control in this MODE is more complicated.

● Gain(P): 0 The function of the proportional parameter KP is to accelerate the response speed of the system and improve the precision of the system.As KP increases the response speed of the system, the system is more accurate, but the system is prone to hypermodulation, the stability of the system is poor, and even the system is unstable.KP is too small, the adjustment accuracy is reduced, the response speed is slow, the adjustment time is lengthened, so that the dynamic static performance of the system becomes bad.

● Integral Time(I): 0 The primary function of the integral parameter Ti is to eliminate the steady-state error of the system. The larger the system, the faster the steady-state error of the system will be eliminated, but the Ti cannot be too large, otherwise the saturation will occur in the initial stage of the response process. If Ti is too small, the steady-state error of the system will be difficult to eliminate, affecting the accuracy of the

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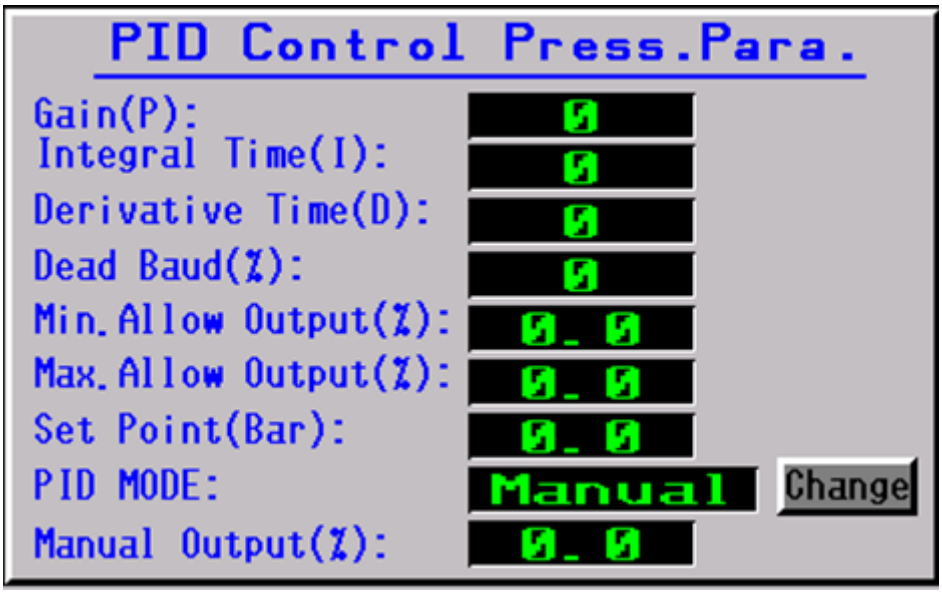
system. In addition, in the front of the control system, there is always a steady state. From the point of view of phase an integral part of 90 ° phase delay, may damage the system stability.

● Derivative Time(D): 0 The function of the differential action parameter Td is to improve the dynamic performance of the system. Its main function is to control the deviation in any direction during the response process, and predict the deviation change in advance. But the Ti cannot be too big, otherwise it will make the response process brake early, extend the adjustment time, and reduce the anti-interference performance of the system.

● Dead Baud(%): 0 Adjust the dead zone, adjust to the range of the set value no longer adjust, this is a set of allowed error range.

● Set Point(℃): 0.0 (0-100 ℃) automatic mode, the outlet temperature of the fresh water needed to reach the set point in the process of PID adjustment, the system will according to the user, set the value of all parameters of the PID adjustment range and speed is decided by you to set the PID parameters, the output value will be between the maximum and the minimum adjustment, so in actual debugging process must set up a set of parameters will be very good, the whole process of adjusting the overall is a reverse adjustment, the process of acceleration transducer as the fresh water outlet temperature increases.

3.2.2 关于海水泵压力的调节 Regulation of pressure of sea water pump



这是自动调节变频器的一个重要功能,有自动和手动两种功能:

This is an important function of automatic frequency converter, which has two functions: automatic and manual.

●输出最小值 Min.Allow Output(%): 0.0 ,登录后可以设定输出最小值,在调速过程中,泵的转速不能太低,否则会引起无功损耗的增加

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Output minimum Min. Allow Output(%): 0.0, The minimum output value can be set after login. During the speed adjustment process, the pump speed cannot be too low, otherwise it will cause the increase of reactive power loss.

● 输出最大值Max. Allow Output(%): 0.0,登录后可以设置输出的最大值,这可以限制电机一直在高负荷运行

Output maximum Max. Allow Output(%): 0.0, After logging in, you can set the maximum output value, which can limit the motor to be running at a high load.

3.2.2.1 手动模式 Manual mode

系统上电后默认的是手动模式,在这种模式下, PID MODE: Manual 方框里会显示”Manual”字样。

在这种模式下,登录后可以设置Manual Output(%): 0.0,如果设置的值不小于设定的最小值同时也不大于设置的最大值,这时在压力调节模式下对变频器的输出就是你设定的这个值,但是最终的输出值是多少,还是要和压力模式下的输出进行比较才能决定。

The default mode on the system is manual mode, in this mode, PID MODE: Manual The box will display "Manual".

In this mode, the login can be set Manual Output(%): 0.0, If set the value of the set is not less than the minimum at the same time also not greater than the maximum value is set, then the pressure regulation mode of the inverter output is the value you set, but how much is the final output value, or a comparison of the output and pressure mode can decide

3.2.2.2 自动模式 Automatic mode

在登录后通过点击Change按键,可以将 PID MODE 设置为 Auto 模式,在这种模式下的控制是比较复杂的:

● Gain(P): 0 比例参数 KP 的作用是加快系统的响应速度，提高系统的调节精度。随着 KP 的增大系统的响应速度越快，系统的调节精度越高，但是系统易产生超调，系统的稳定性变差，甚至会导致系统不稳定。KP 取值过小，调节精度降低，响应速度变慢，调节时间加长，使系统的动静态性能变坏

● Integral Time(I): 0 积分作用参数 Ti 的一个最主要作用是消除系统的稳态误差。Ti 越大系统的稳态误差消除的越快，但 Ti 也不能过大，否则在响应过程的初期会产生积分饱和现象。若 Ti 过小，系统的稳态误差将难以消除，影响系统的调节精度。另外在控制系统的前向通道中只要有积分环节总能做到稳态无静差。从相位的角度来看一个积分环节就有 90° 的相位延迟，也许会破坏系统的稳定性

● Derivative Time(D): 0 微分作用参数 Td 的作用是改善系统的动态性能，其主要作用是在响应过程中抑制偏差向任何方向的变化，对偏差变化进行提前预报。但 Ti 不能过大，否则会使响应过程提前制动，延长调节时间，并且会降低系统的抗干扰性能

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● Dead Baud(%): 0 调整死区,调整到设定值的这个范围内就不再进行调整了,这是设定的允许出现的误差范围

● Set Point(Bar): 0.0 自动模式下,海水压力需要达到设定点

在 PID 调整过程中,系统会按照用户设置的 PID 各个参数的值,调整幅度和调整速度由你设置的 PID 参数来决定,输出的值会在最大值和最小值之间调整,所以在实际调试过程中一定要设置好一组的参数会非常好用。压力调整在调整过程中是正向过程,压力越低，外部输出越大。

After login Click on the Change The PID MODE can be set to Auto MODE, and the control in this MODE is more complicated.

● Gain(P): 0 The function of the proportional parameter KP is to accelerate the response speed of the system and improve the precision of the system.As KP increases the response speed of the system, the system is more accurate, but the system is prone to hypermodulation, the stability of the system is poor, and even the system is unstable.KP is too small, the adjustment accuracy is reduced, the response speed is slow, the adjustment time is lengthened, so that the dynamic static performance of the system becomes bad

● Integral Time(I): 0 The primary function of the integral parameter Ti is to eliminate the steady-state error of the system. The larger the system, the faster the steady-state error of the system will be eliminated, but the Ti cannot be too large, otherwise the saturation will occur in the initial stage of the response process. If Ti is too small, the steady-state error of the system will be difficult to eliminate, affecting the accuracy of the system. In addition, in the front of the control system, there is always a steady state. From the point of view of phase an integral part of 90 ° phase delay, may damage the system stability

● Derivative Time(D): 0 The function of the differential action parameter Td is to improve the dynamic performance of the system. Its main function is to control the deviation in any direction during the response process, and predict the deviation change in advance. But the Ti cannot be too big, otherwise it will make the response process brake early, extend the adjustment time, and reduce the anti-interference performance of the system

● Dead Baud(%): 0 Adjust the dead zone, adjust to the range of the set value no longer adjust, this is a set of allowed error range

● Set Point(Bar): 0.0 Under automatic mode, the water pressure needs to be set up

In PID adjustment process, the system will according to the user, set the value of all parameters of the PID adjustment range and speed is decided by you to set the PID parameters, the output value will be between the maximum and the minimum adjustment, so in actual debugging process must set up a set of parameters will be very useful.

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The pressure adjustment is a positive process in the adjustment process. The lower the pressure, the larger the external output.

3.2.3 最终输出结果 Final output

如果海水泵采用的是 VFD 输出模式,那么在温度控制模式下和压力控制模式下选择较大的值作为最终向 VFD 的输出值。

If the sea water pump adopts the VFD output mode, then under the temperature control mode and under the pressure control mode, the larger value is selected as the output value of the final VFD.

3.2.4 海水泵的特殊情况下的处理 Treatment of water pumps in special circumstances

3.2.4.1 在”Run”模式下的起动 Sart under the "Run" mode

点击Set按键进入到设置 1 界面,在显示器的右半部分会看到这样的几个控件组成的功能, ,在登录后可以设置泵的起动顺序。

Click on the Set Press the button to enter the 1 interface, and the right half of the display will see the functions of such controls, After login, you can set the starting sequence of the pump.

●点击Reset按键可以使 3 个泵复位系统默认起动顺序

Click on the Reset The default starting sequence of 3 pump reset system can be made

●点击每一个Set按键,可以改变每台泵的起动顺序 1->2->3->1.

Click on each one Set You can change the starting sequence of each pump 1->2->3->1.

●点击Save按键,保存设置好的起动顺序

Click on the Save Save the set starting sequence.

●需要注意的是点击Run按键,这必须是在 3 台泵都没有运行,并且都在自动模式下才能动作,如果符合以上的条件,点击按键后,顺序在前的 2 台泵会自动起动

What you need to be aware of is the click Run This must be done in three pumps, and it can be operated in automatic mode. If the above conditions are met, click the key and the first two pumps will start automatically.

3.2.4.2 压差低报警后海水泵的切换起动

The changeover start of sea water pump after low pressure differential pressure

在压差开关信号进入 PLC 延时 10 秒后,Press. Diff. Low 会报警,如果剩余没有运行的海水泵当中满足运行条件,也就是在”StandBy”模式下,会停掉当前泵，自动起动下一台优先级高的海水泵,如果没有”StandBy”的泵,那么只报警不停泵和起泵。

10 seconds after the voltage difference switch signal enters the PLC, Press. Diff. Low Will call the police, if the remaining satisfy operating conditions of the sea water pump is not running, which is in "StandBy" mode, will stop the current pump, automatic starting a high priority under the sea water pump, if there is no "StandBy" pump, so only alarm on pump.

3.2.4.3 单次运行时间过长 海水泵的切换起动

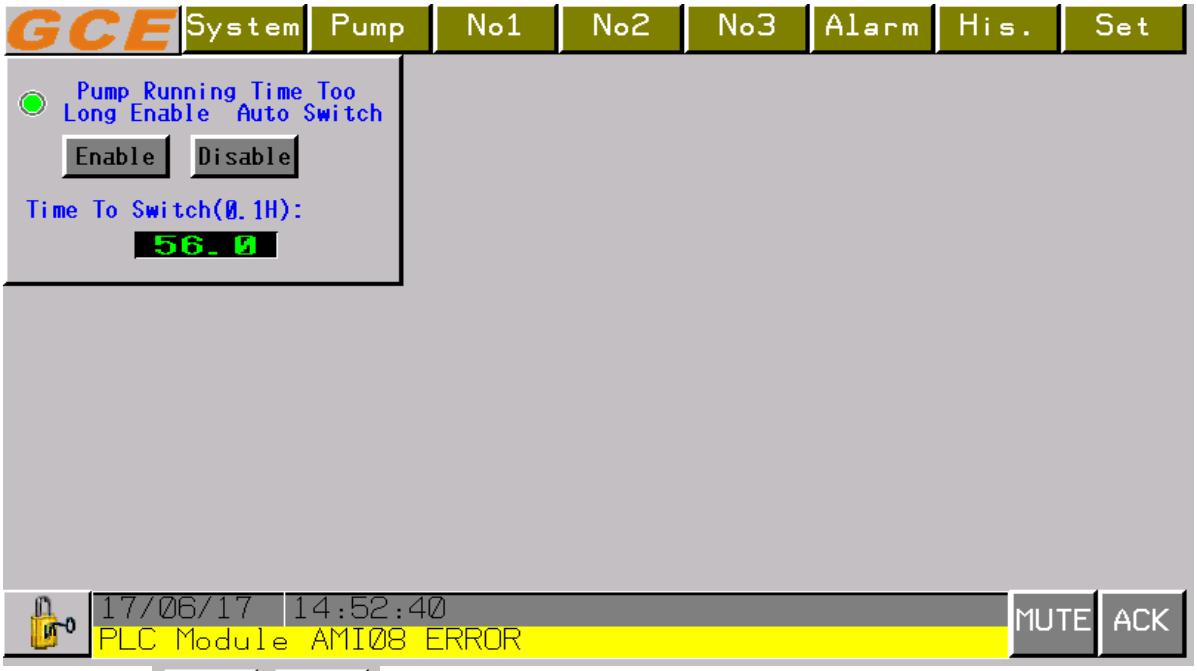
The changeover start of sea water pump under over long time running.

●这个功能主要是为了防止海水泵单次运行时间过长带来的泵的损耗

The main purpose of the function is to prevent the water pump from running too long

● 点击 ->Set2 会进入 Set2 设置界面

Click on the ->Set2 I'm going to go into the Set2 setting interface



通过点击 Enable Disable 来使能或者禁止这个功能

You can clicking on the Enable Disable To enable or disable the function.

可以对单次运行时间 Time To Switch(0.1H): 56.0 进行设置，起动和停止泵和 3.2.2 一样。

You can have a single run time Time To Switch(0.1H): 56.0 set. Starting and stopping pumps are the same as 3.2.2

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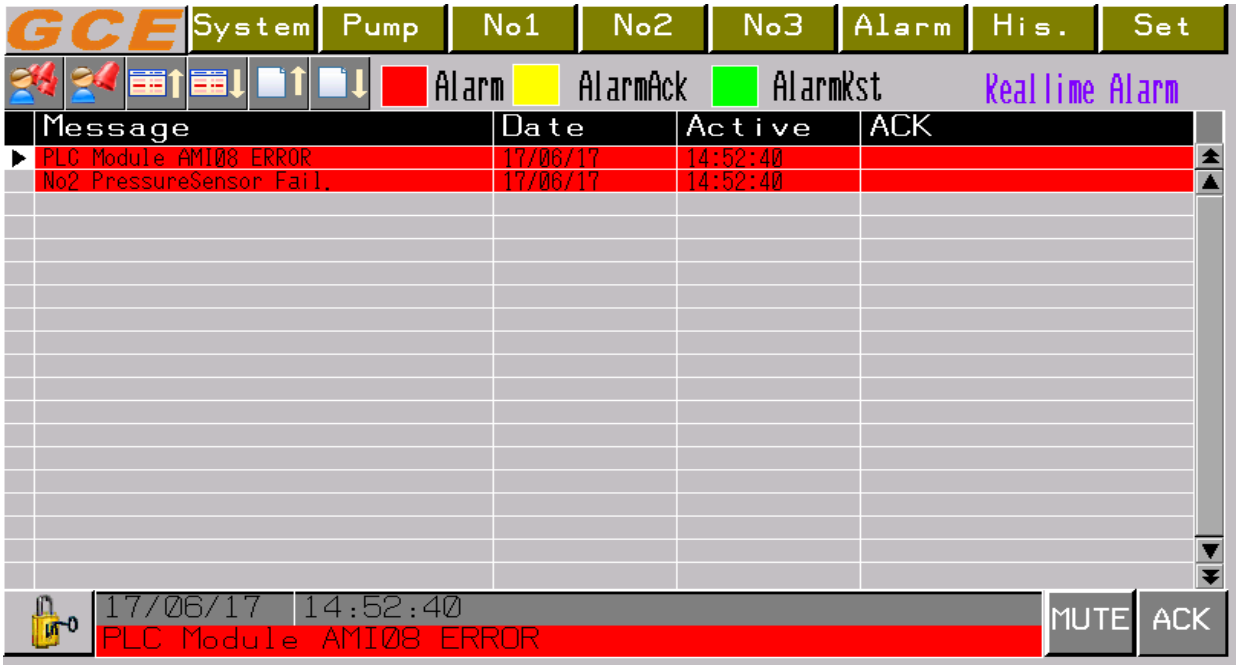
3.3 报警系统 Alarms system

3.3.1 实时报警 real-time alarm

●点击 Alarm 进入实时报警界面

Click on the Alarm Enter the real-time alarm interface



报警列表里有 4 项内容 There are 4 items in the alarm list

1. Message 当前的报警内容 Present alarm content
2. Date 发生报警的日期 Date of occurrence of alarm
3. Active 开始报警的时间 Start the alarm clock
4. ACK 报警确认的时间 Time of alarm confirmation

点击 MUTE 可以消音,但界面不会有任何改变,点击 ACK 按键对报警点进行确认,用 3 种颜色表示报警点不同的状态.

Click on the MUTE Can be mute, But there won't be any changes in the interface, Click on the ACK Confirm the alarm point, Use 3 colors to indicate different status of alarm points

有报警没有确认 There is no confirmation of alarm

有报警并且已经确认 There is an alarm and confirmed

已经恢复的报警,但是只在历史报警列表里有,在实时报警列表里不会出现

The alarm has been restored, but only in the history alarm list, not in the real-time alarm list.

● 基本上每个界面的下方都会有最近一条报警信息

Basically, there's a recent alarm message on the bottom of each interface

这显示的是最近的一条报警 This shows is a latest alarm

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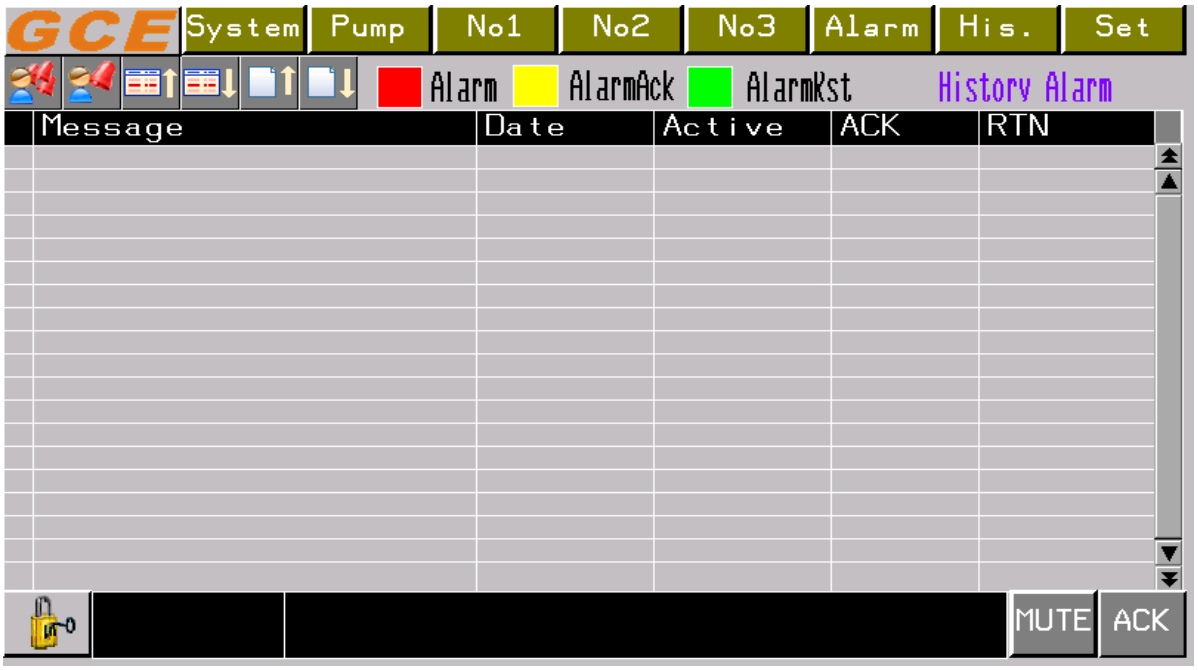
3.3.2 历史报警 History alarm

●点击 His. 进入历史报警界面

Click on the His. Enter the history alarm interface



历史报警可以记录正在发生和已经发生了的报警以及动作,基本内容和实时报警差不多,但是可以记录已经发生过并且已经恢复了的报警.

The history alarm can record the alarm and action that is happening and already occurred. The basic content is similar to the real-time alarm, but it can record the alarm that has happened and has been restored.

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3.4 通讯接口 Communication Interface

本系统对外部留有标准的 TCP/IP ModBus_RTU Server 或者 RS485 ModBus_RTU Slaver 通讯协议,外部设备可以通过以太网或者 RS485 轻松的连接到本系统,读取到本设备的详细运行数据和报警数据，必要的时候也可以远程对本系统设备进行控制.

This system outside of standard TCP/IP ModBus_RTU Server or RS485 ModBus_RTU Slaver communication protocol, external devices through Ethernet or RS485 easily connected to the system, read the details of the equipment operation data and alarm data, this system equipment necessary can also remote control.