SANNOVA

ELECTRIC MOTOR FIRE PUMP CONTROLLER

OPERATING INSTRUCTIONS

MODEL FPX

contents

contents

Security Introduction

For more information,please visit the official website of SANNOVA(www.sannova.biz)

dangerous

Do not attempt to install or maintain the device when it is powered on!Connecting powered devices may result in death, personal injury, or significant property damage.Before performing any operation, it is necessary to confirm that there is no voltage and always follow recognized safety procedures,The controller disconnect switch must be in the "off" position,Only then can the chassis door be opened.SANNOVA is not responsible for any misuse or incorrect installation of its products.

introduction

The electric fire pump controller is used to start the fire pump driven by the electric motor.It can manually start the fire pump through the panel start button,It is also possible to automatically start the fire pump by detecting the pressure drop of the automatic sprinkler fire extinguishing system.The fire pump controller is equipped with pressure sensors.The fire pump can be manually stopped by the local stop button,It can also automatically stop after the programmable timer countdown on site.In both cases, it can only be stopped after all startup reasons have disappeared.

technical data

rated	value
rated working current le	According to the motor (horsepower/kilowatt)
rated operational voltage Ue	According to the rated value of the controller label
Rated working frequency	50/60Hz

standard ambient temperature	4℃-40℃
altitude	≤2000 meter
relative humidity	5%-80%
Pollution level	3
Standard protection level	NEMA Type 2
standby power	10W

Type of electric fire pump controller

Model Example：FPA-60F
A is the startup mode code: direct startup
60 is rated power: 60HP
F is voltage frequency: 380V 50HZ

Direct Start

This model is applicable to places where local public facilities or power capacity allow for full voltage start-up.After receiving the start command, the controller will apply full voltage to the motor.

Star Delta Start

This model requires multiple motor connections, and 6 wires are needed between the controller and the motor.After receiving the start command, the motor will be connected to the corresponding circuit through a star connection.After a certain delay, the motor is reconnected to the circuit in the triangular connection configuration,And apply full voltage to the motor winding through a closed-loop conversion switch sequence.

Methods of Starting/Stopping

The controller has two modes: automatic and non automatic,Used for manual and automatic stop (automatic stop can only be achieved after automatic start).

METHODS OF STARTING

AUTOMATIC START

When the pressure drops below the connection threshold,The controller will

automatically start when the pressure sensor detects low pressure.

MANUAL START

Regardless of the system pressure, press the "start" button to start the motor.

REMOTE MANUAL START

Start the motor by temporarily closing the contacts of the manual button.

REMOTE AUTOMATIC START,DELUGE VALVE START

The motor can be remotely started by temporarily opening the contacts connected to the automatic device.

Emergency start

The emergency handle can be used to manually start the motor. The handle can be kept in the closed position.

Sequential start

For multi pump applications, it may be necessary to delay the automatic start of all motors when the pressure drops,To prevent all motors from starting simultaneously.

WEEKLY START

The engine can automatically start (stop) at pre programmed times.

TEST START

Manually press the run test button to start the motor.

METHODS OF STOPPING

MANUAL STOP

Press the priority 'stop' button  to complete the manual stop.

AUTOMATIC STOP

It can only stop automatically when automatic start occurs and this feature is enabled.After enabling this feature (Automatic Shutdown on the settings page),As long as there are no other operating reasons, the motor will automatically stop 10 minutes after restoring pressure.

EMERGENCY STOP

Emergency stop may be required under any start-up conditions,Emergency stop can be achieved by using the main power-off method on the door.

Installation

The electric fire pump controller should be securely installed on a stable support structure.

Ground installation

The floor standing controller should be connected to the floor using all the holes provided on the mounting feet.

Wall mounted installation

The wall mounted controller should use the 4 metal mounting lugs provided on the controller and be fixed to a rigid wall structure with appropriate bolts.

Location

The controller should be located close to the motor being controlled and protected to prevent damage from the sprayed water flow.The live parts of the controller shall not be lower than 12 inches (305 mm) above the ground.

The standard controller enclosure protection level is NEMA2.It needs to be installed in a standard compliant environment and provide appropriate protection. The controller needs to be installed inside the building,Long term exposure to ultraviolet radiation in the external environment can cause color changes in the paint surface.

Wiring and Connection

Water pipe joint

Connect the controller to the piping system and drainage pipes according to NFPA20.The water pipe joint is located on the left side of the controller.The pipeline joint for system pressure is 1/2NPT thread, and if drainage is required, the joint is 3/8 NPT thread.

Electrical connection

The electrical wiring between the power supply and the fire pump controller shall comply with NFPA 20, NFPA 70 National Electrical Code Section 695 or Canadian Electrical Code C22.1 Sections 32-200 or any applicable local regulations.The size of electrical wiring should usually be able to carry at least 125% of the full load current (FLA of the fire pump motor).

Attention: Electrical connections must be made under the supervision of a certified

electrician.When entering the cabinet, waterproof hub accessories must be used to maintain the NEMA rating of the cabinet.The installation personnel are responsible for taking appropriate measures to protect the fire pump controller components from damage caused by metal fragments or drill cuttings.Otherwise, it may result in personal injury, damage to the controller, and ultimately void the warranty.

Input power connection

The normal power input should be connected to the terminal located on the disconnect device.

-For three-phase motors：Identified as L1-L2 and L3.

Motor connection

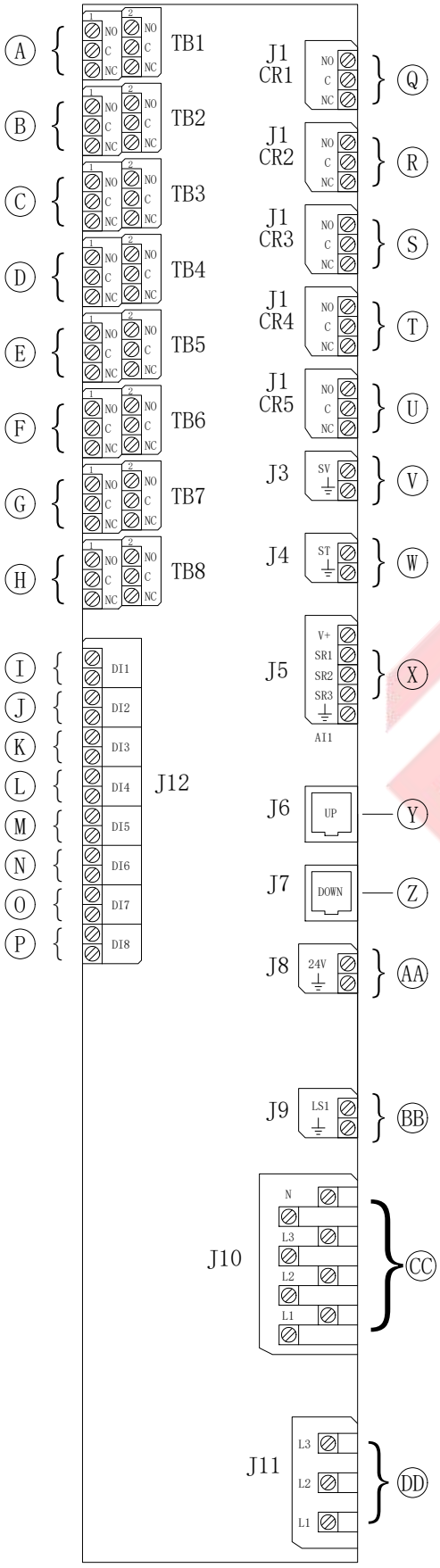
The motor wires should be connected to the terminals marked as follows:

-T1-T2 and T3 are located on the main contactor (K1M) of FPA model

-For the FPY model, T1-T2 and T3 are located on the contactor (K1M), while T6-T4 and T5 are located on the contactor (K1D)

The installation personnel are responsible for obtaining the connection information of the motor and ensuring that the motor is connected according to the motor manufacturer's recommendations.If not done, it may result in personal injury, damage to the motor and/or controller,Subsequently, this led to the invalidation of the warranty for this project.

Terminal board description



A-H： Alarm output terminal (relay passive output, 2C/0)

A: configurable

B: configurable

C: configurable

D: configurable

E: configurable

F: configurable

G: configurable

H: configurable

I-P: On site input terminal

I: configurable

J: configurable

K: configurable

L: configurable

M: configurable

N: configurable

O: configurable

P: configurable

Q: Main coil power relay

R: Delay coil power relay

S: Configurable output terminal (relay passive output)

T: Configurable output terminal (relay passive output)

U: Configurable output terminal (relay passive output)

V: Test solenoid valve

W: shunt release

X: Pressure sensor (configurable)

Y: Connection between display board and IO board

Z: IO board and expansion board connection (reserved)

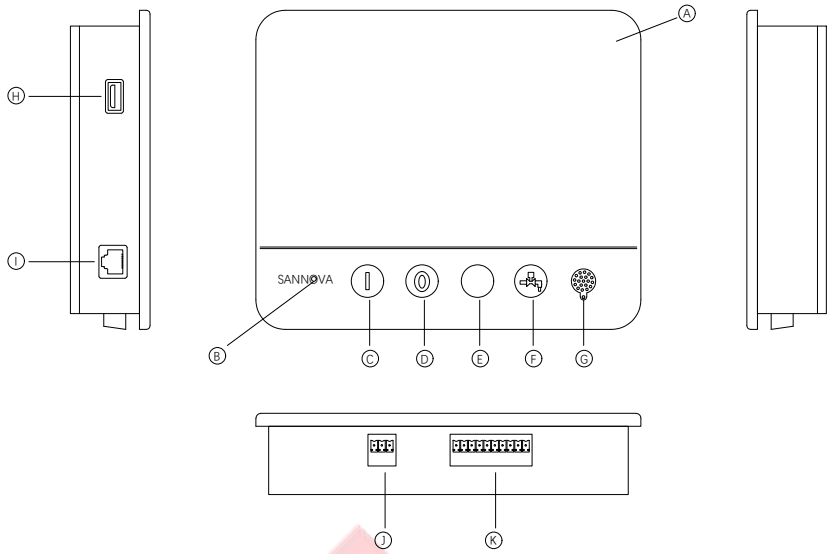
AA: Factory reservation

BB: Emergency handle limit switch

CC: Current detection

DD: power input

Major Function



A: Touch screen: 7-inch color capacitive screen.
B: Power indicator light (normally green, red when an alarm occurs).
C: Start button: used to manually start the motor.
D: Stop button: used to stop the motor when there are no starting conditions.
E: Unused
F: Run test button:Used for manually starting and running tests.
G: Buzzer: When the alarm bell is activated, the buzzer will sound.
H: Backend USB interface:Used for software updates and log exports.
I: Interface for communication with IO board.
J: Power Supply.
K: Control panel input port

warn

The back of the display panel is equipped with button batteries. After 2 years of service,SANNOVA's battery efficiency may decrease and time may be lost after shutdown.

alarm bell

The alarm bell will activate under the fault conditions specified in NFPA20 standard.

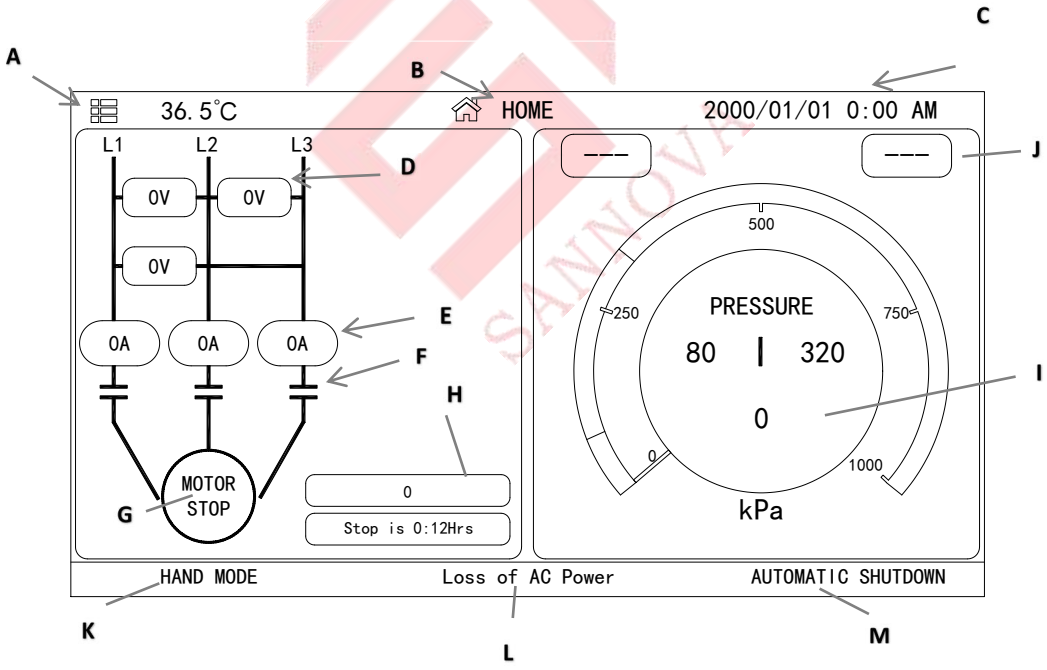
Any of these conditions will activate the alarm bell, which can also be configured on the alarm configuration page,But in some cases, the alarm can be muted by pressing the mute button on the "Alarms" page,When silent, if a new fault condition occurs or the alarm condition remains unchanged after 24 hours, the alarm bell will ring again.If the alarm condition no longer exists, the ringing will automatically stop.

First parameter setting

-Check if the pressure reading on the homepage is accurate.
-Select the unit for pressure reading.
-Set the "cut_out" and "cut_in" pressure values for the fire pump.
-Set the full load current on the factory settings page.

Before using the controller, the following parameters need to be set:
1. Pressure sensor calibration
There is a corresponding page for pressure calibration. After entering the password on the settings page, enter the Sensor ->Analog Input PT1 page.Firstly, lower the system pressure to 0KPA, then click to enter and modify the parameter to 0,Then increase the pressure to 2000KPA, click to modify the parameter to 2000, and finally press calculate.
Attention: During calibration, do not leave this page.

Homepage



The homepage displays the status of all controllers and important information about the controllers.Including voltage, current, pressure, motor status, and all timers.
A: Navigation bar: Clicking on this icon will open the navigation menu on the left side of the screen:

1−Go to the 'Home' page
2−Go to the 'Alarms' page
3−Go to the 'History' page

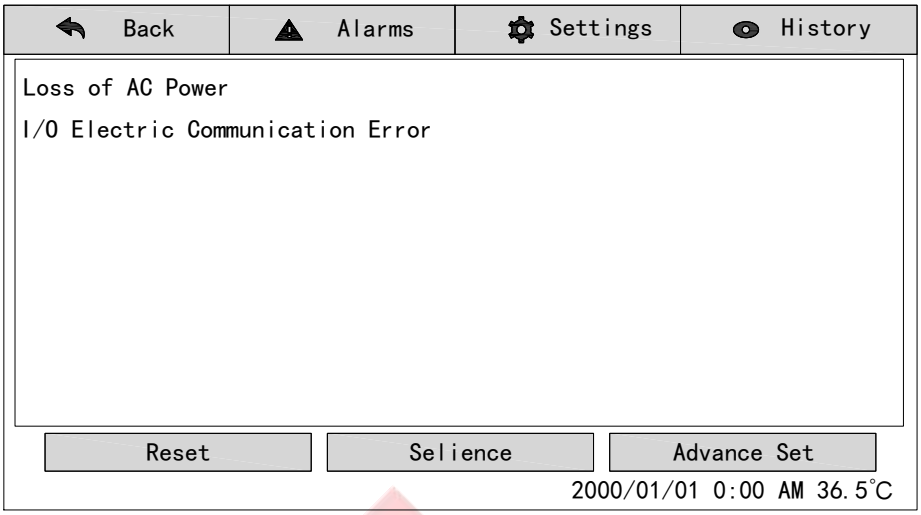
4-Go to the 'Settings' page

B: Page name.
C: Display date, time, and ambient temperature.
D: Electric motor power supply voltage. Each box represents a single phase voltage between two adjacent lines.
E: electric current. Each ellipse represents the current of a line.
F: Motor contact: Dynamic display of contactors that open or close based on signals sent to the main coil.
G: Motor status: If the motor stops running, it will display "Motor Stop"; if the motor is running, it will display "Motor Running".Clicking on the motor icon will take you to the history page, which will display all previous events.
H: The number of motor starts and the cumulative running/stopping time of the motor.
I: Real time pressure gauge: allows for precise reading of actual system pressure.The pressure gauge displays the settings for connection (between the yellow and red parts) and disconnection (between the green and yellow parts).These values will also be represented by the red and green lines on the pressure gauge for quick comparison between the actual pressure and the set value.The actual pressure and units (PSI, BAR, etc.) will be displayed at the bottom of the pressure gauge. The maximum allowable pressure will also be displayed on the pressure gauge with corresponding scales.
J: Reserved function
K: Status indication: Display current mode: manual, off, automatic.
L: Alarm homepage display: Existing alarm information will be displayed alternately within this box.
M: Off mode: Display whether the controller is automatically or manually turned off.

Screen Saver

After being idle for 5 minutes, the screen brightness of SANNOVA will decrease to 0,Black screen protection is designed to extend the lifespan of LCD screens.If the motor is running or an alarm occurs, the screen saver will be immediately disabled.To manually deactivate, simply touch the screen or press any button.

Alarms(menu)



This page lists the current alerts that have occurred.You can set alarms with adjustable parameters on the "Configure Advanced Alarm" page.If there is currently an alarm bell ringing, please press the "mute" button to silence the alarm bell.Pressing the 'Reset' button will only reset alarms that have already occurred.

Complete alarm list for motor controller

−Pump Run： Activated when the pump is running.

−Loss of AC Power： Activated when the normal power supply is detected to have completely lost power.

−Failed to Start： Activate when startup fails.

−Fail while Run

−System Over Pressure：Activated when the system pressure is greater than the cut-off pressure.

−System Low Pressure： Activated when the system pressure is less than the cut in pressure.

−High Pump Room Temperature

−Low Pump Room Temperature

−I/O Electric Communication Error

−Remote Start： Activated when the remote start input contact is activated.

−Deluge Valve Start： Activated when the rain shower valve at the input port is activated.

−Manual Mode

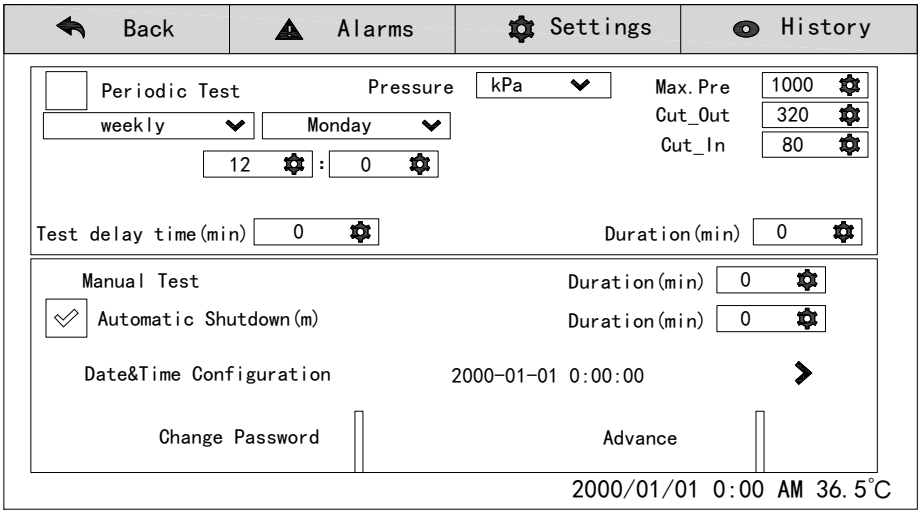
−Auto Mode

−Pump On Demand： Activated when the pressure is lower than the set value of the pressure driven controller.

−Manual Test ON

−Automatic Test ON
−System Error
−Common Alarm
−Alarm Bell Silenced
−Water Level Below Normal
−Water Level Near Empty
−Normal Phase Reversal
−Phase Loss L1： If the first phase connected to the normal power supply does not meet the standard, this alarm will be activated.
−Phase Loss L2：If the second phase connected to the normal power supply does not meet the standards, this alarm will be activated.
−Phase Loss L3： If the third phase connected to the normal power supply does not meet the standard, this alarm will be activated.
−Lock Rotor Current
−Under Current：Activated when the current is below 30% of FLA and the motor has been running for 15 seconds.
−Over Current：Activated when the current exceeds 150% of FLA.
−Under Voltage： Activated when the normal power supply voltage is below 80% of the rated voltage.
−Over Voltage：Activated when the normal power supply voltage is higher than 115% of the rated voltage.
−Phase Unbalanced： Activated when the difference between normal power supply voltage readings exceeds 10% of the rated voltage.
−Motor Trouble
−Emergency Start
−Lock out

Configuration(menu)



The settings page is used to set all basic configuration parameters and provides shortcuts for changing the most common settings.
There are seven parameter boxes in total: pressure, periodic testing, running testing, automatic shutdown, date and time, advanced settings, and user password modification.

pressure:

The main parameters of pressure can be set in the box at the top of the page.

pressure uint: PSI, KPA, and BAR units can be selected.

Max pressure: It can be set between the "cut-out" value and 9999.

cut-out : It can be set between the "cut-in" value and the maximum pressure value. (The 'cut-out' value should be set before the 'cut-in' value)

cut-in: Settings can be made below the 'cut-out' value.

Periodic test:

Periodic testing can be selected as "weekly", "every other week", or "monthly".You can also select which day of the week, which time period of the day, and the duration of the test within this box.

automatic shutdown:

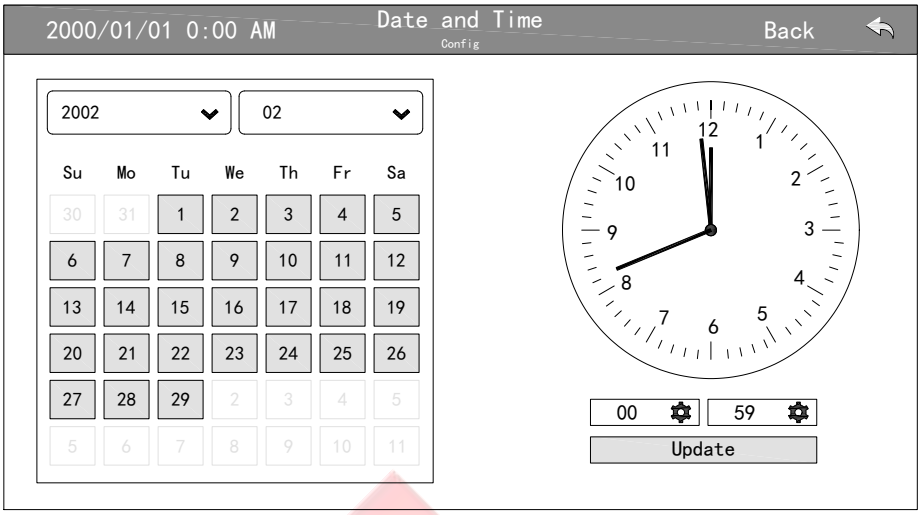
If enabled, the 'automatic shutdown' function will automatically stop the pump after the demand disappears.

advance:

After entering the password, go to the advanced configuration page.

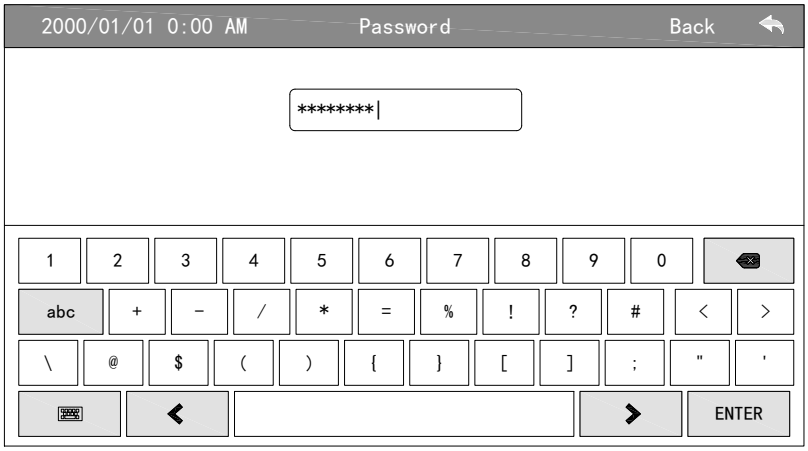
Time and date configuration

Enter the 'Date Time' page.

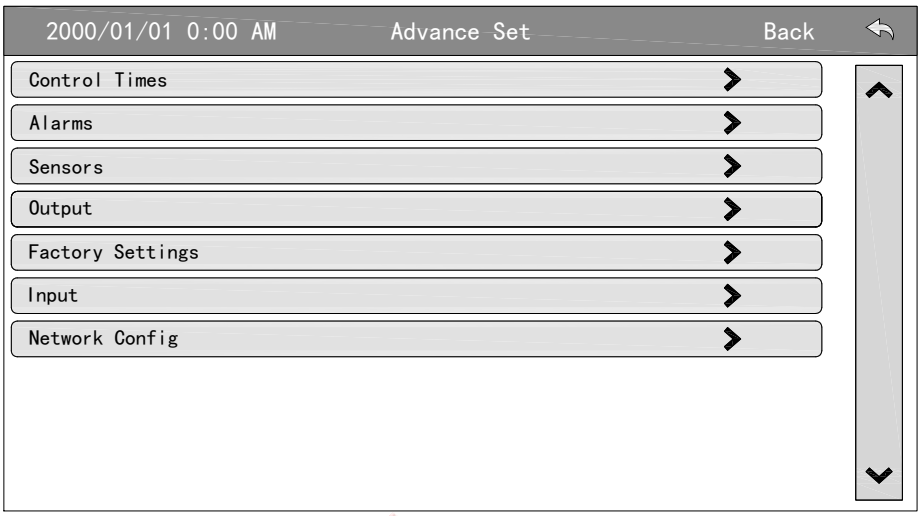


Click on the year box to select the year, swipe up and down to select the year value, and similarly, click on the month box to select the month, swipe up and down from the list to select the month.After setting, if the dates are different, click on the appropriate date to select the actual date.
Press the two boxes below the clock to set the time;Set hours on the left and minutes on the right.Click the 'Update' button to submit the changes. Confirm the change to 'Date and Time' in the pop-up dialog box.Users can click the 'Cancel' button to cancel the changes. Please note that changing the date and time will affect the log table.

Note: The first time you click on the main settings page to modify parameters or jump to the page, you will enter the password input page,Entering the correct password will take you back to the settings page to continue with the setup process.

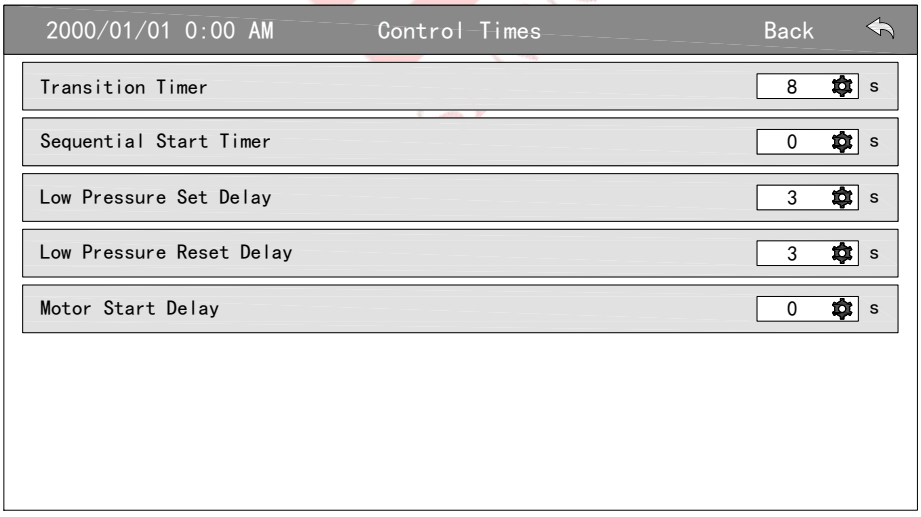


Advance



This page is the entrance to all advanced parameter configurations, clicking on the tab will direct you to the corresponding page.

Control Times



This page is used to adjust the timer.

Transition Timer

This timer is used to set the time delay for starting the voltage reduction and full voltage conversion.

Sequential Start Timer

This timer is used to set the time delay from demand activation to engine start

Low Pressure Set Delay

When the system pressure is lower than the cut in pressure, the low pressure start signal will only be effective after the set delay time.

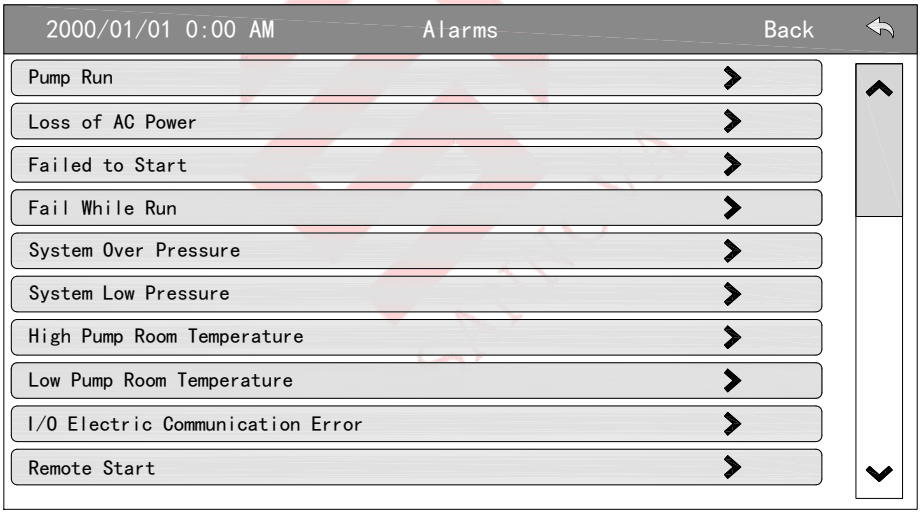
Low Pressure Reset Delay

When the system pressure exceeds the cut in pressure, the low-pressure start signal will disappear after a set delay time.

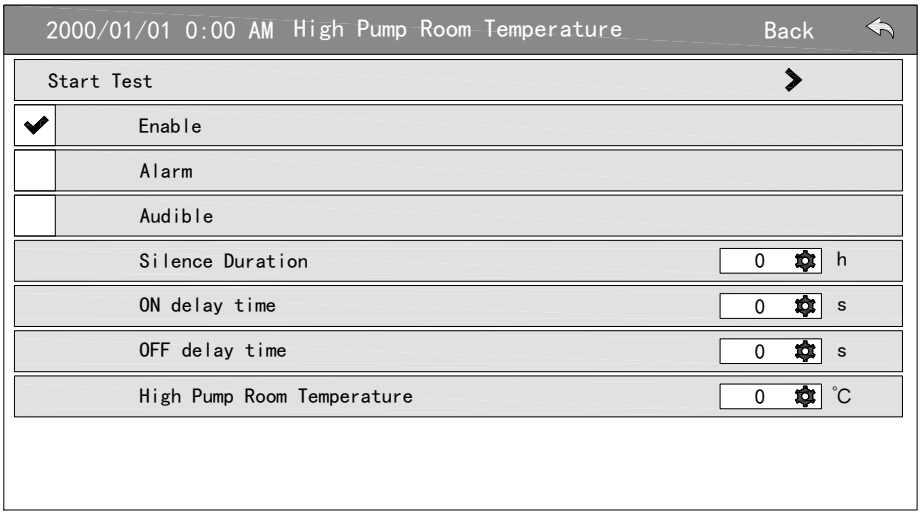
Motor Start Delay

This timer is used to receive a time delay when the motor starts.

Alarms



The alarm can be configured, and the last field does not always appear as' high pump room temperature '.



Start Test： This button can be used to test the alarm.This button will only test the selected alarm.If an alarm can be heard, it will activate the alarm bell and activate any output relay associated with this alarm.

Enable：Check this box to enable alerts.

Alarm：Check this box to activate the alarm bell.

Audible：Check this box to ring when the alarm is activated.

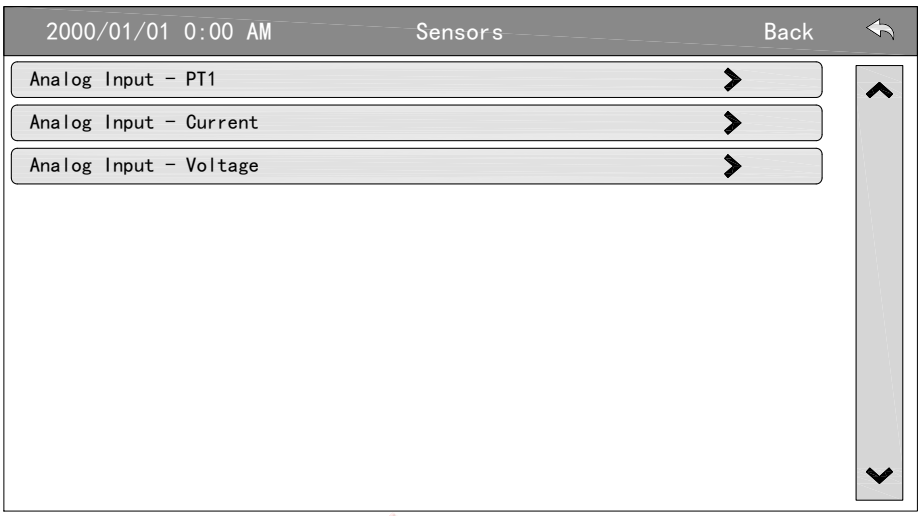
Slience Duration：Set the time for the alarm to remain silent.

ON delay time：If a corresponding alarm signal appears, a corresponding time delay is required to detect this alarm.

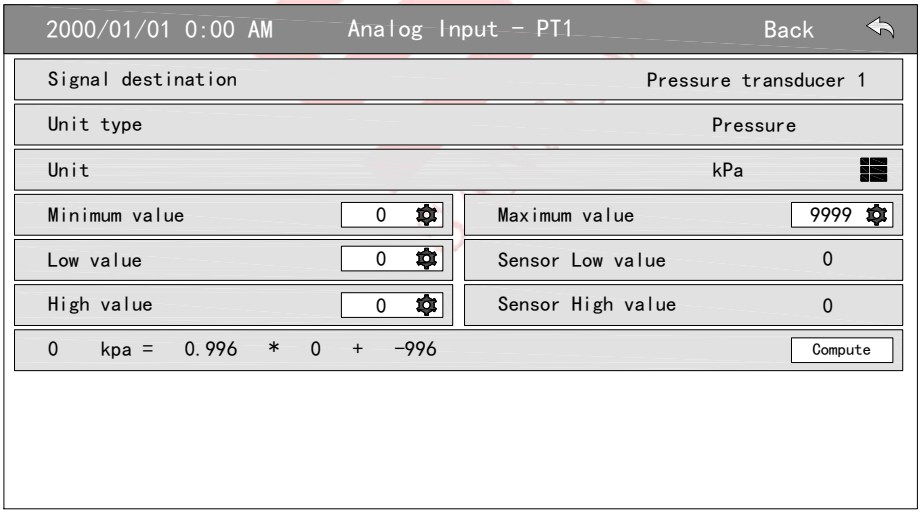
OFF delay time： If the alarm has already disappeared, the signal of the alarm disappearance can only be received after a delay.

High pump room temperature(Simulated value): Used to describe the activation range of an alarm,There are "below", "above", and "between". Corresponding values must be entered.

Sensor



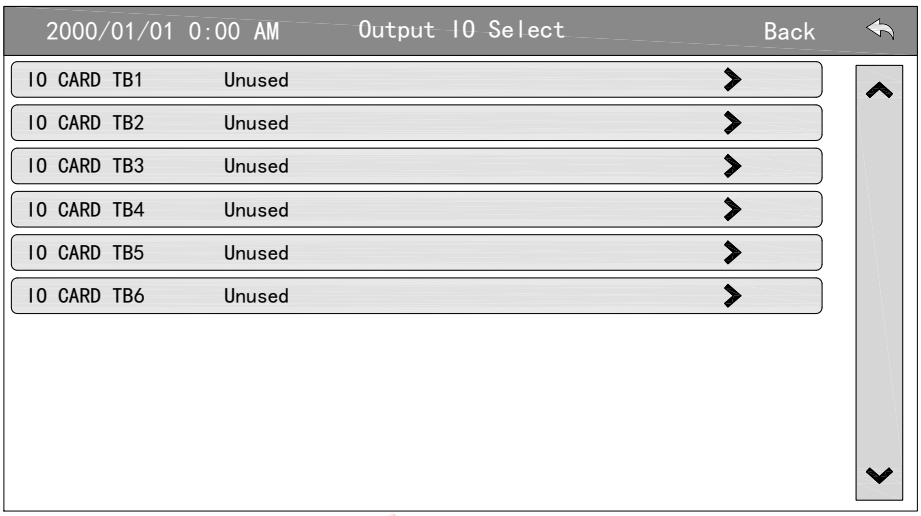
You can select calibration pressure sensor, voltage sensor, and battery current sensor on this page.Among them, Analog Input 1 (PT1) is dedicated to pressure sensors. Other analog inputs depend on the options of the controller.



On this page, variables such as signal endpoint, unit type, unit, minimum and maximum pressure values have been set.For pressure sensor PT1, it is necessary to set a calibration point with high and low values in order to calibrate the sensor.

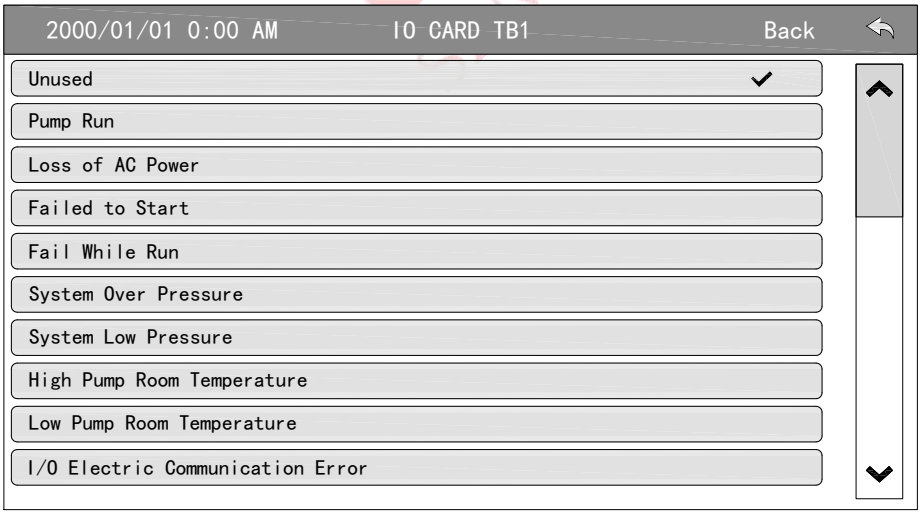
If the current and voltage on the homepage differ significantly from the actual situation, you can adjust the percentage on the current and voltage sensor page until it approaches the actual situation.

Output



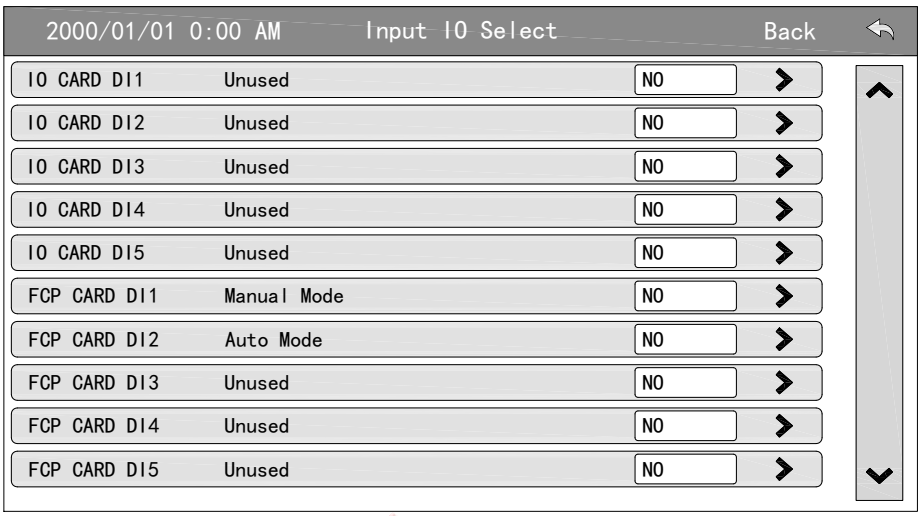
This page is used to select the logic of the activation signal output on the IO board and test these outputs.You can configure outputs other than IO CARD CR1 and IO CARD CR2 on this page.

Pressing one of the outputs will take you to this page:



Click on a tab on this page, and a dialog box will pop up. Click OK to set the corresponding output port.
If the status or alarm corresponding to the tab appears, the corresponding relay on the IO board will close.

Input

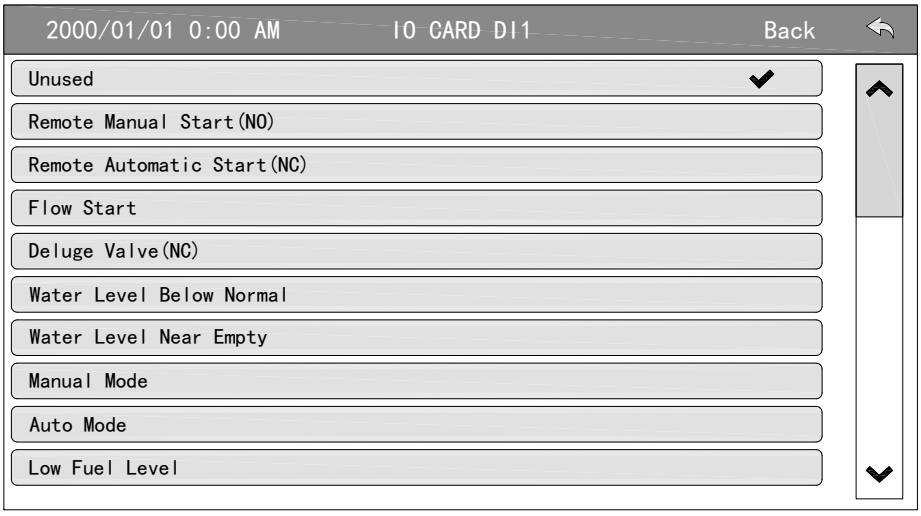


When NO (normally open) is selected, it indicates that the signal line is invalid when disconnected and valid when closed.
When NC (normally closed) is selected, it indicates that the signal line is valid when closed and invalid when disconnected.

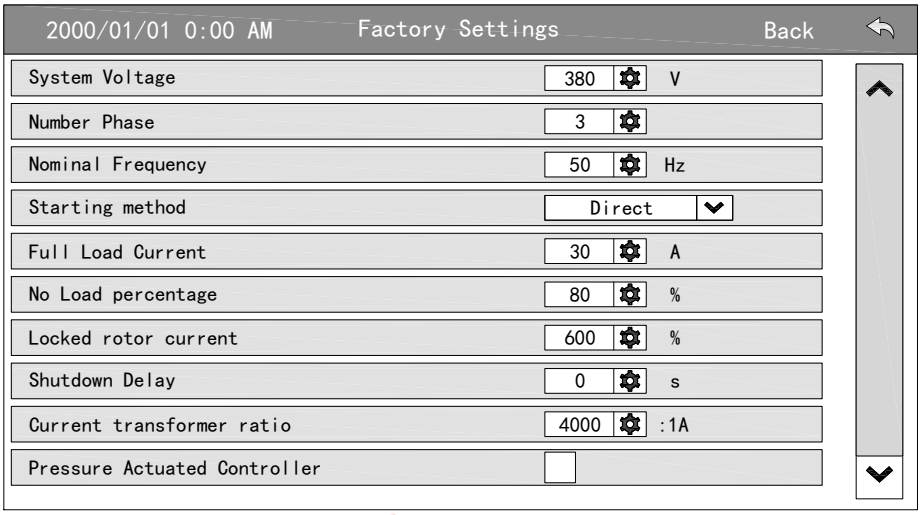
Select on this page, please refer to the IO motherboard electrical diagram for details.

The following are the optional input port functions:

The NO and NC in parentheses are recommended modes, which ultimately depend on the user.



Factory Settings



On this page, some parameters can be changed, but be cautious as modifying parameters will alter the basic operation of the controller.After making changes on this page, the controller may no longer comply with NFPA standards.

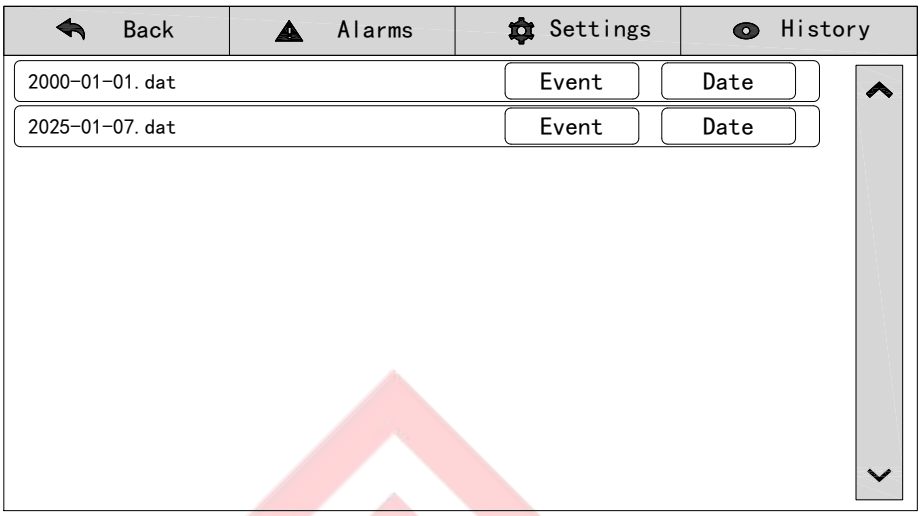
Pressure Actuated Controller： Enable the automatic controller to start after the pressure drops.

Deluge valve： After selecting the rain shower valve for a certain input port, this box needs to be checked.

Multiple Pump Type： Default Check

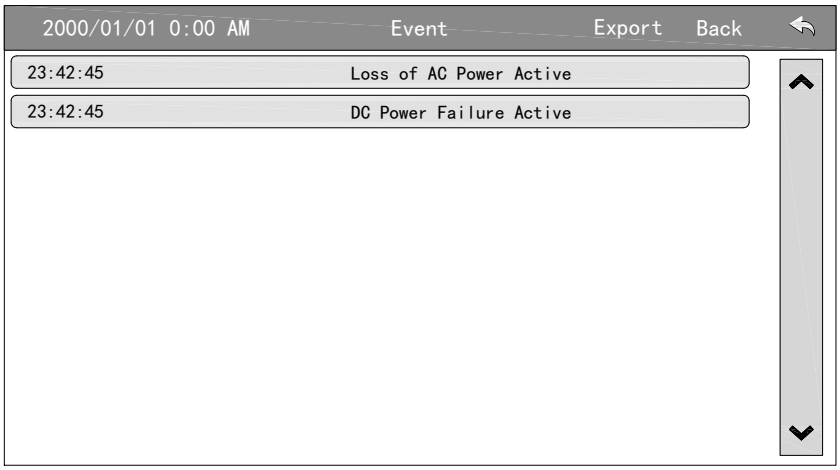
History

History(menu)



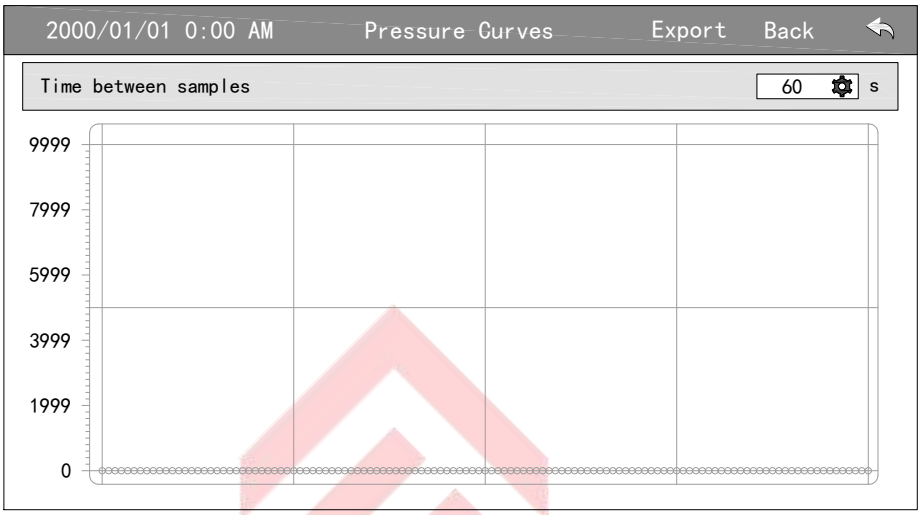
Event

Click this button to enter the 'Event Page', which will display the events in the log for the current day. Each event log contains the date and event of occurrence, as well as a brief description of the event.



pressure curves

Click the "Data" button to enter the corresponding "Pressure Curve" page, where the following figure will be displayed
Click the export button to export the corresponding log or curve files for the day. You need to insert a USB drive into the USB port on the side of the panel, otherwise a prompt dialog box (File open fail) will appear.



Update

Please refer to the FPXV1-Manual-EN manual for details on updating programs and exporting logs through a USB drive.