TORNATECH

LISTEN DEVELOP LEAD

INSTALLATION AND MAINTENANCE MANUAL FOR DIESEL ENGINE FIRE PUMP CONTROLLERS MODEL GPD

ViZi TOUCH

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Introduction 1

Diesel engine fire pump controllers are designed to automatically start a diesel engine driven fire pump upon detection of a pressure drop in the fire protection system. A diesel engine fire pump controller provides automatic & manual starting and stopping. An automatic start is controlled by a pressure transducer or by remote automatic devices such as a deluge valve. A manual start is controlled by remote manual button or by controller pushbutton. The automatic shutdown option provides a 30-minute automatic stop after automatic start once all starting causes have returned to normal. The diesel engine fire pump controller includes two battery chargers to ensure the engine batteries are continuously charged.

Types of Diesel Engine Fire Pump Controllers

FIRE PUMP CATALOG NUMBER

MODEL No. EXAMPLE: GPD-12-120
Model Prefix: GPD, GPDFM
Battery Voltage: 12=12v, 24=24v
Incoming Voltage: 120=110/120V 50/60Hz, 220=208/240V 50/60Hz

Methods of Starting/Stopping

The controllers are available as combination automatic / non-automatic with provision for manual or automatic shutdown (an automatic shutdown is only possible after an automatic start).

METHODS OF STARTING

AUTOMATIC START
The controller will start automatically on low pressure detection by the pressure sensor when the pressure drops below the cut-in threshold.

MANUAL START
The engine can be started by pressing the CRANK 1 or and/or CRANK 2 push button, regardless of the system pressure, when the Main Selector switch is in the HAND position. The Fuel Solenoid Valve will open as soon as a CRANK button is pressed and will remain in this state.

REMOTE MANUAL START
The engine can be started from a remote location by momentarily closing a contact of a manual push button.

REMOTE AUTOMATIC START, DELUGE VALVE START
The engine can be started from a remote location by momentarily opening a contact connected to an automatic device. The controller must be in automatic mode.

SEQUENTIAL START
In case of a multiple pump application, it may be necessary to delay the starting of each motor when there is a water pressure drop to prevent simultaneous starting of all motors.

FLOW START, HIGH ZONE START
The pump can be started by opening/closing a contact on the FLOW/ZONE START/STOP input.

WEEKLY START
The engine can be started (and stopped) automatically at the preprogrammed time.

TEST START
The motor can be started manually by pressing the run test button.

METHODS OF STOPPING

MANUAL STOP

Manual stop is done by pressing the STOP push button. Note that pressing the stop push button will stop the engine only if all starting causes have disappeared.

AUTOMATIC STOP

The automatic stop is possible only after an automatic start and this function has been activated. When this function is Enabled, the motor is automatically stopped 30 minutes (adjustable) after the restoration of the pressure (above the cut-out threshold) given that no other run cause is present.

FLOW STOP, HIGH ZONE STOP

If the controller has been started by the FLOW/ZONE START/STOP input and the signal has returned to normal, the motor will be stopped given that no other run cause is present.

EMERGENCY STOP

The emergency stop is always possible in any running condition and is done by positioning the main selector -switch to the OFF position.

Installation 2

This diesel controller is UL listed and FM certified. The controller is built in accordance with the latest edition of the National Fire Protection Association standard for the Installation of Centrifugal Fire Pumps, NFPA No.20 (Centrifugal Fire Pumps 2013 Edition). The controller is intended to be installed in accordance to NFPA 20-2013 and

in the USA National Electrical Code NFPA 70

In Canada Canadian Electrical Code, Part 1

Others * Local Electrical Codes *

* Only American and Canadian applicable codes have been considered during the design of the controllers and the selection of components.

Except in some cases, the controller is also seismic approved and has been tested in accordance with the ICC-ES AC156, IBC 2015 & CBC 2016 standards. Proper installation, anchoring and mounting is required to validate this compliance report. Refer to this manual and drawings to determine the seismic mounting requirements and location of the center of gravity (you may need to contact factory). The equipment manufacturer is not responsible for the specification and performance of anchorage systems. The structural engineer of record on the project shall be responsible for anchorage details. The equipment installation contractor shall be responsible for ensuring the requirements specified by the structural engineer of record are satisfied. If detailed seismic installation calculations are required, please contact the manufacturer for the performance of this work.

FCC Regulations and Radio Standards Specification (RSS) Rules

To comply with FCC and Industry Canada RF exposure compliance requirements, a separation distance of at least 20 cm must be maintained between the antenna of this device and all nearby persons. This device must not be co-located or operating in conjunction with any other antenna or transmitter.

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.
“Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.”

Location

The controller shall be located as close as practical to the engine/motor it controls and shall be within sight of the engine/motor. The controller shall be located or protected such that it will not be damaged by water escaping from pump or pump connections. Current carrying parts of the controller shall be not less than 12 in. (305 mm) above the floor level.

Working clearances around controller shall comply with NFPA 70, National Electrical Code, Article 110 or C22.1, Canadian Electrical Code, Article 26.302 or other local codes.

The controller is suitable for use in locations subject to a moderate degree of moisture, such as a damp basement. The pump room ambient temperature shall be between 39°F (4°C) and 104°F (40°C) (If a temperature option is included, see the rating label for maximum temperature).

The standard controller enclosure is rated NEMA 2. It is the installer's responsibility to insure that either the standard enclosure meets the ambient conditions or that an enclosure with an appropriate rating has been provided. Controllers must be installed inside a building and they are not designed for outside environment. The paint color may change if the controller is exposed to ultraviolet rays for a long period of time.

Mounting

The fire pump controller shall be mounted in a substantial manner on a single incombustible supporting structure. Wall mounted controllers shall be attached to the structure or wall using all four (4) mounting ears provided on the controller with hardware designed to support the weight of the controller at a height not less than 12 in. (305 mm) above floor level. Floor mounted controllers shall be attached to the floor using all holes provided on the mounting feet with hardware designed to support the weight of the controller. The mounting feet provide the necessary 12 in. (305 mm) clearance for current carrying parts. For seismic applications, the mounting arrangement should be rigid wall and base only. The structural engineer of record on the project shall be responsible for anchorage details.

Storage

If the controller is not installed and energized immediately, Tornatech recommend following the instructions from the chapter 3 of the NEMA ICS 15 standard.

Wiring and Connections

Water Connections

The controller must be connected to the pipe system according to the latest edition of NFPA20 and also to a drain pipe. The water connections are on the left side of the controller. The connection to the system pressure is a Male ½ NPT. If a drain is present, the connection to the drain is a tapered connection for plastic tubing.

Electrical Wiring

The electrical wiring between the power source and the diesel engine fire pump controller shall meet the NFPA 20, Chapter 12.3.5.1, 12.3.5.2 and 12.2.5.3, NFPA 70 National Electrical Code Article 695 or C22.1 Canadian Electrical Code, Section 32-200 or other local codes.

Electrical Connections

A licensed electrician must supervise the electrical connections. The dimension drawings show the area suitable for incoming power and motor connections. No other location shall be used. Only watertight hub fittings shall be used when entering the cabinet to preserve the NEMA rating of the cabinet. The installer is responsible for adequate protection of the fire pump controller components against metallic debris or drilling chips. Failure to do so may cause injuries to personnel, damage the controller and subsequently void warranty.

Energy Consumption

Diesel Controller with boost charger			
Model / State	120VAC	220/240VAC	VDC Output
12VDC / @ No charge	1.0A	1.0A	13.8V
12VDC / @ Full charge*	6A	4A	
24VDC / @ No charge	1.0A	0.5A	27.6V
24VDC / @ Full charge**	9A	6A	

*12 amps through each battery

**10 amps through each battery

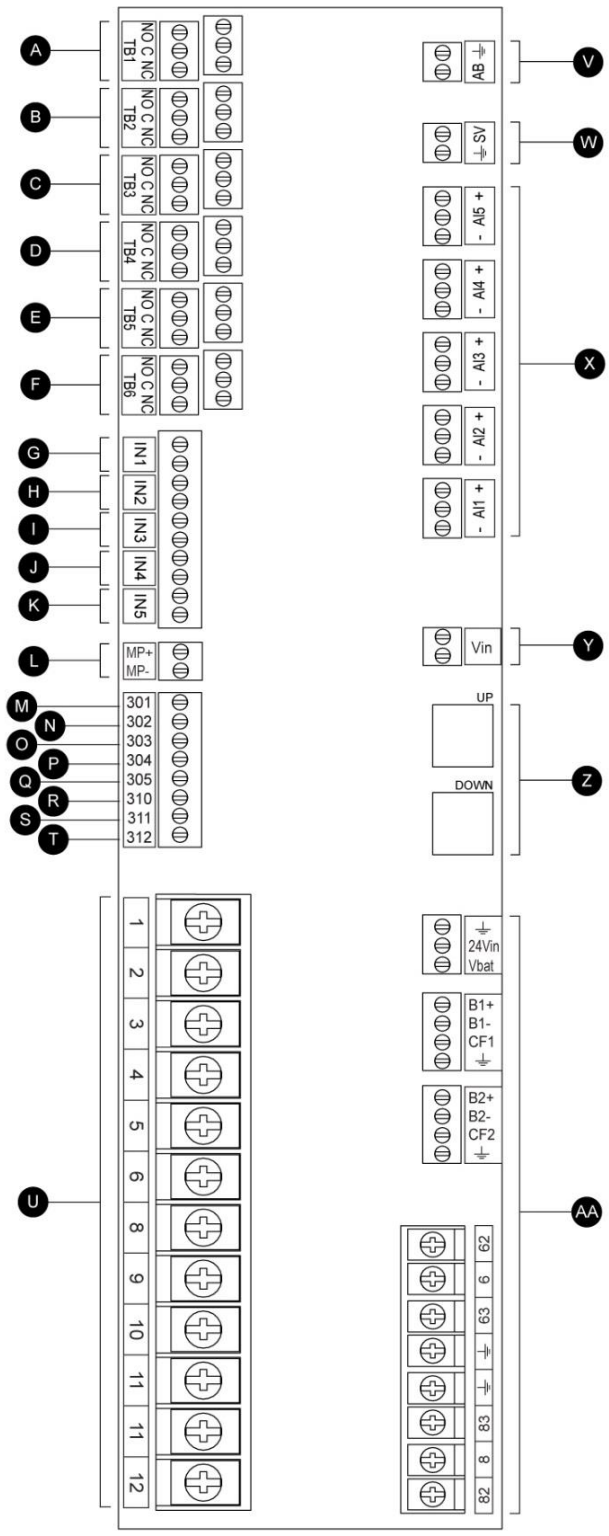
Incoming Power Connections

Diesel engine driven fire pump controllers shall be powered by a dedicated source protected by a fuse or circuit breaker. Verify the label on the cabinet to select the correct protection. Always follow this procedure when connecting or disconnecting the controller: Connect both batteries before connecting the AC power. Disconnect the AC power before disconnecting the batteries. Disconnecting the batteries while the AC is connected may result in severe damage to the controller electronic boards.

Circuit protection

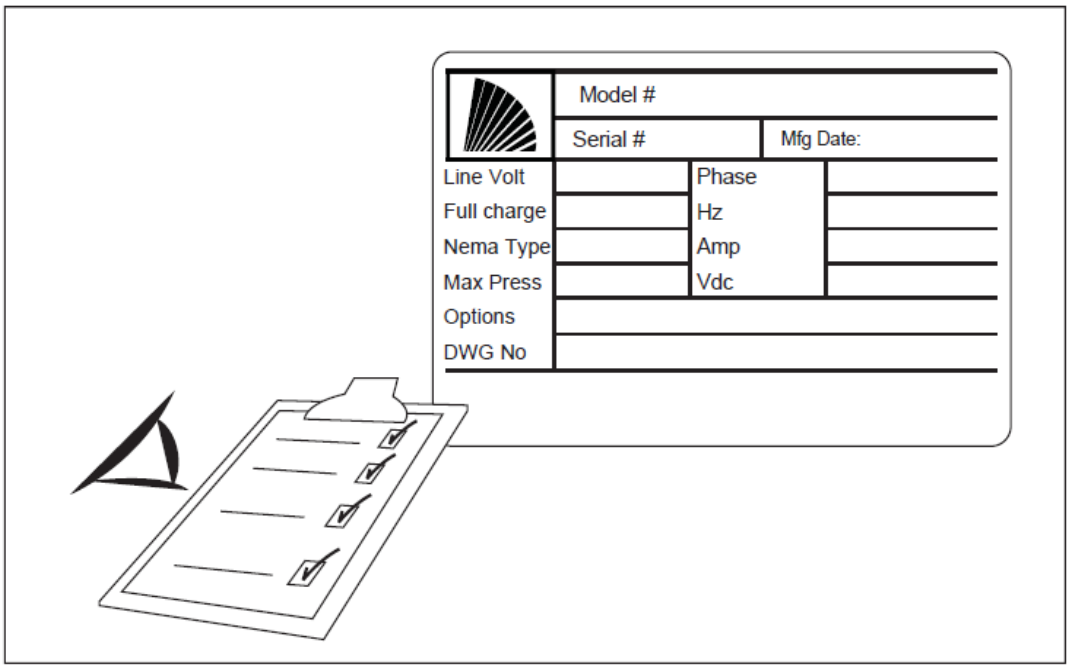
CB1 protects battery charger 1 and CB2 protects battery charger 2. CB3 protects the control circuit from battery 1 and CB4 protects the control circuit from battery 2.
Always follow this procedure when connecting or disconnecting the controller: Connect both batteries before connecting the AC power. Disconnect the AC power before disconnecting the batteries.

Terminal Strip Descriptions

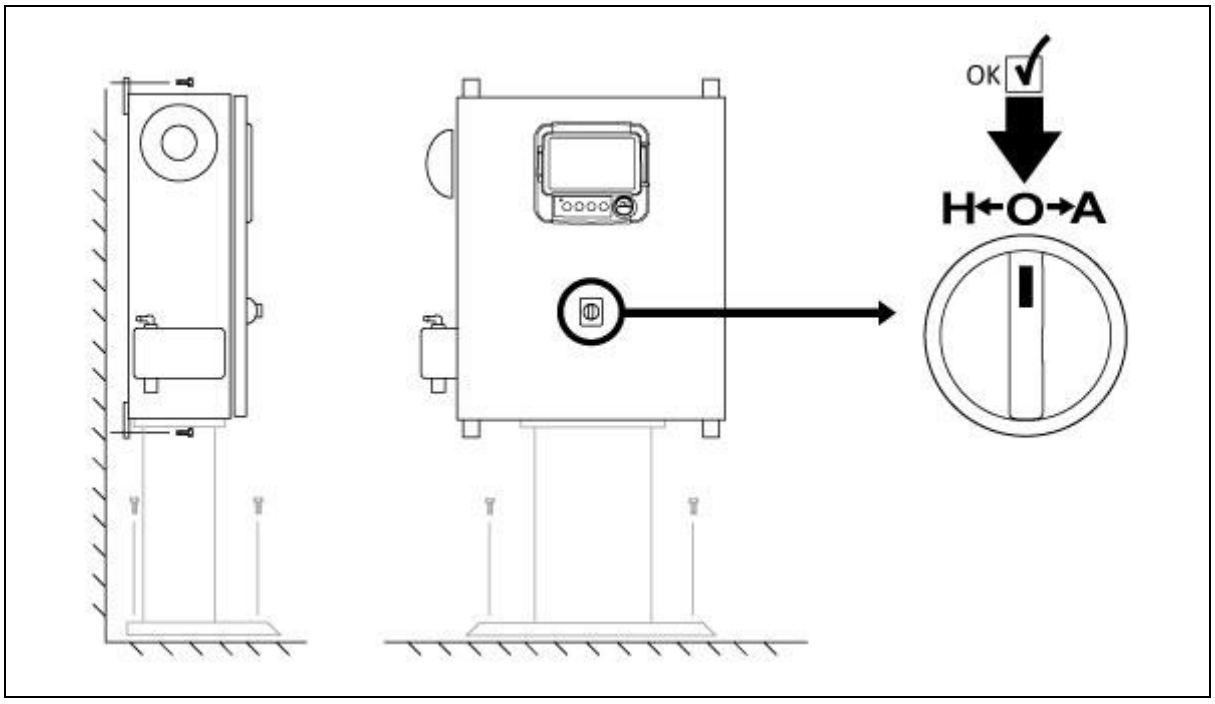


A-F : Alarm Output Terminals
(DPDT Relay, 11/21:Common, 12/22:Normally Closed, 14/24:Normally Open):
A: Controller Trouble (Fail safe)
B: Engine Run
C: Main SS in HAND/OFF position
D: Engine Trouble
E: Pump Room Alarm
F: Optional Output 1
G-T : Field Input Terminal
(Dry Contact Only: Voltage Free):
G: Low Fuel Level (NO)
H: Remote Automatic Start (NC)
I: Deluge Valve Start* (NC) or Water Reservoir Low* (NO)
Verify on drawing
J: Fuel Tank Leak (NO)
K: High Fuel Level (NO)
L: Engine RPM Magnetic Pickup
M: ECMS Elec. Ctrl. Switch in Alternate Position
N: FIM Fuel Injection Malfunction
O: ECMW Elec. Ctrl. Warning
P: ECMF Elec. Ctrl. Fault
Q: PLD Low Suction Pressure
R: High Raw Water Temperature
S: Low Raw Water Flow
T: LET Low Engine Temperature
U : Engine Terminals :
The terminals are numbered according to the standard:
1 - FS : Fuel Solenoid Valve
(ETR - Energized To Run)
2 - ER : Engine Run contact
3 - OS : Engine Overspeed contact
4 - OP : Engine Oil Pressure contact
5 - WT : Engine Coolant Thermostat contact
6 - B1 : Battery #1 positive
8 - B2 : Battery #2 positive
9 - C1 : Start Contactor #1
10 - C2 : Start Contactor #2
11 - GND : Ground
12 - ST : Stop Fuel Solenoid Valve
(ETS - Energized To Stop)
V-AA : Bell / Solenoid Valve / Analog inputs
V: Bell output
W: Test Solenoid Valve
X: Analog inputs
AI1: Discharge Pressure transducer
AI2: Optional additional Discharge Pressure transducer
AI3: Analog Input sensor (depending on the options)
AI4: Analog Input sensor (depending on the options)
AI5: Analog Input sensor (depending on the options)
Y: AC monitoring
Z: CANBUS: UP to ViZiTouch, DOWN to Exp. IO board

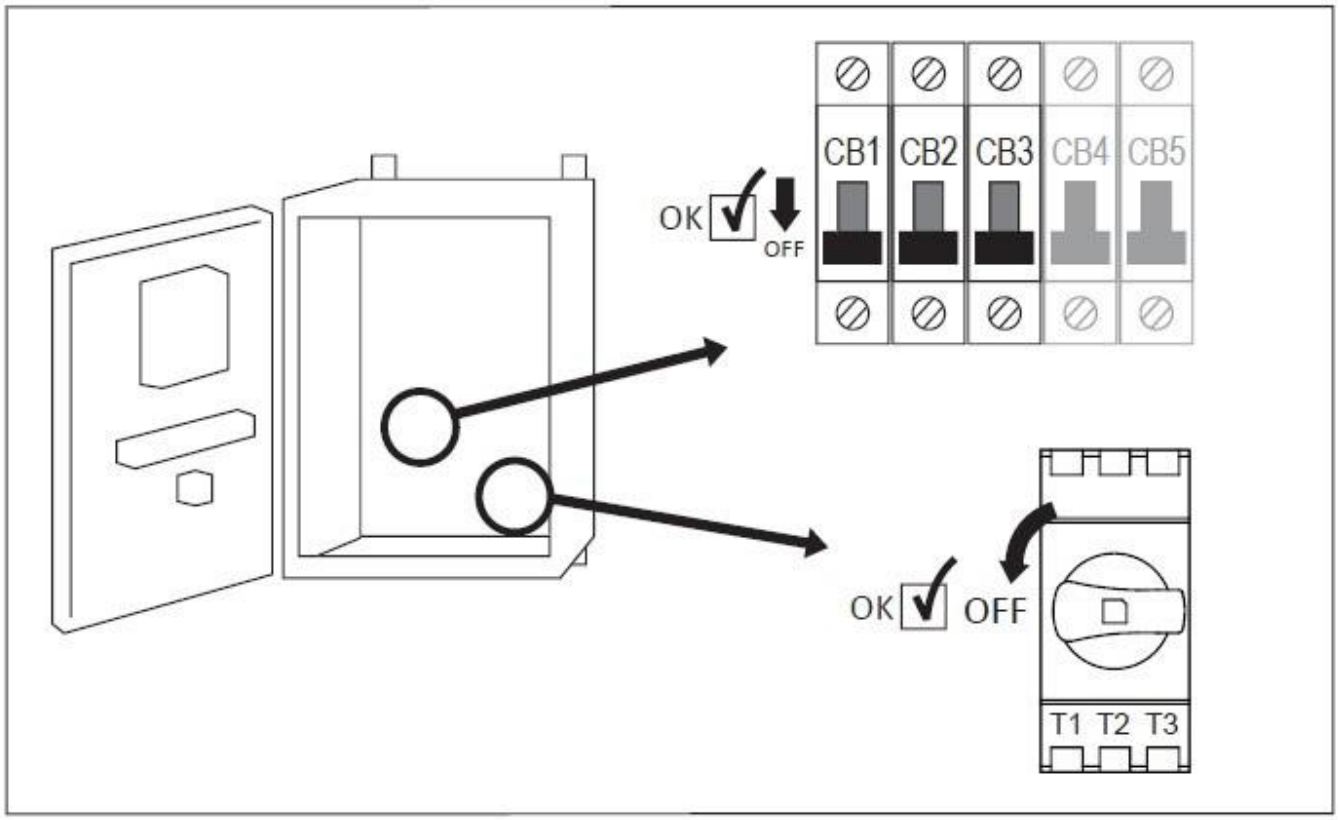
AA: Factory reserved power connections



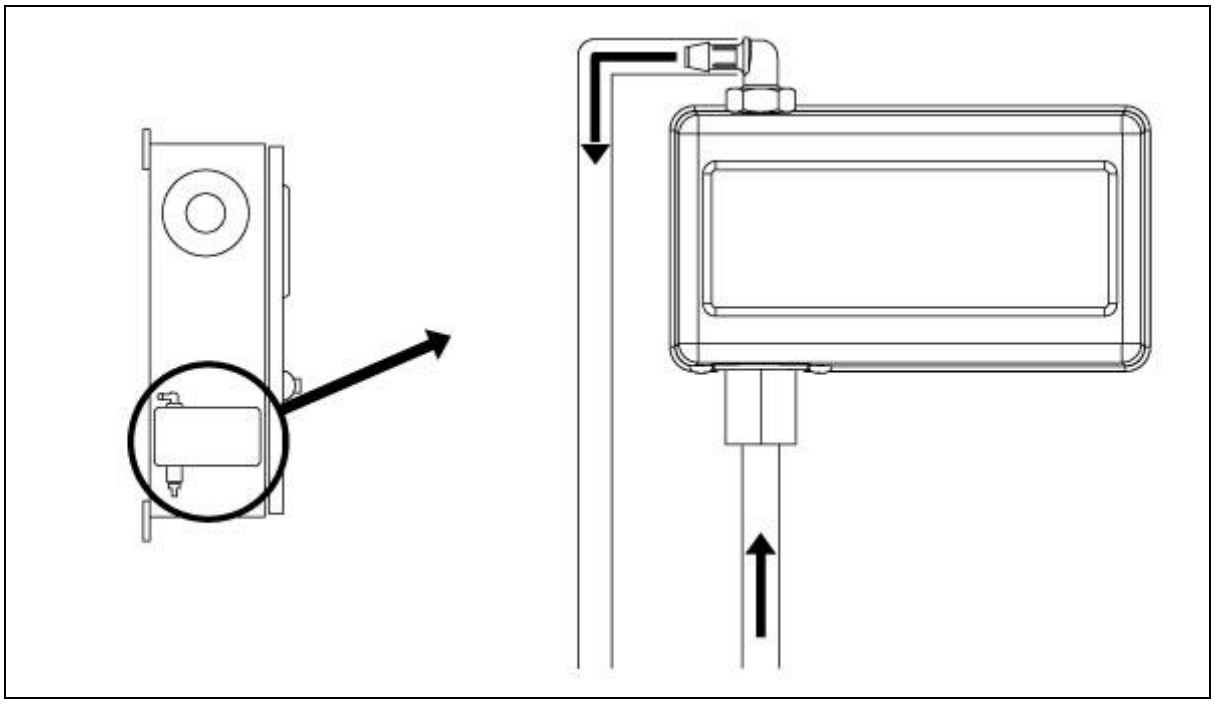
The rating label is the most important label. It must be read carefully to ensure the compatibility between the controller and the installation.



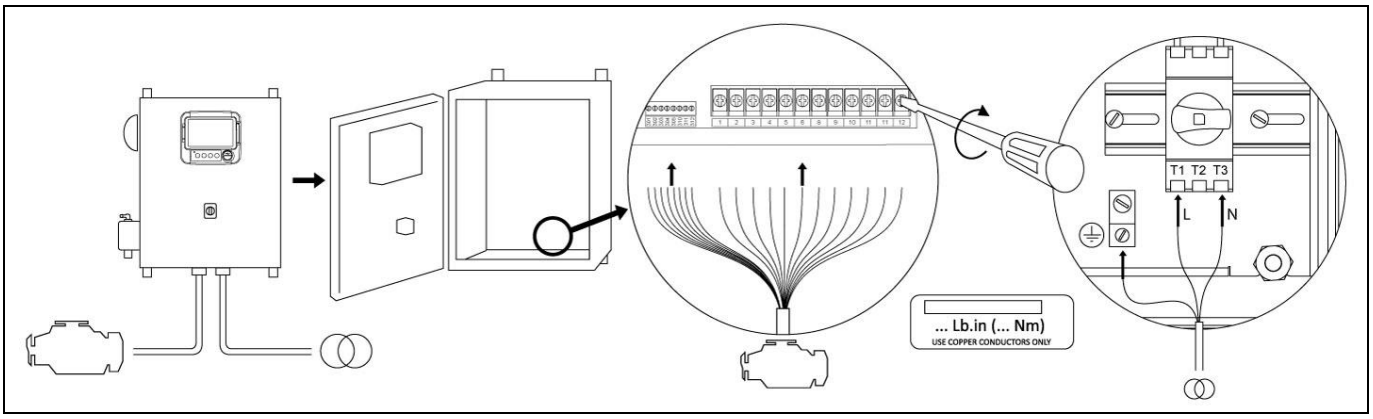
Verify that the controller is installed securely to the wall, or on the mounting stand (optional). Verify the Main Selector Switch is in the “OFF” position. This selector switch is also called the “HOA” and can be placed in 3 positions: “H” Hand/Manual, “O” OFF, “A” Automatic.



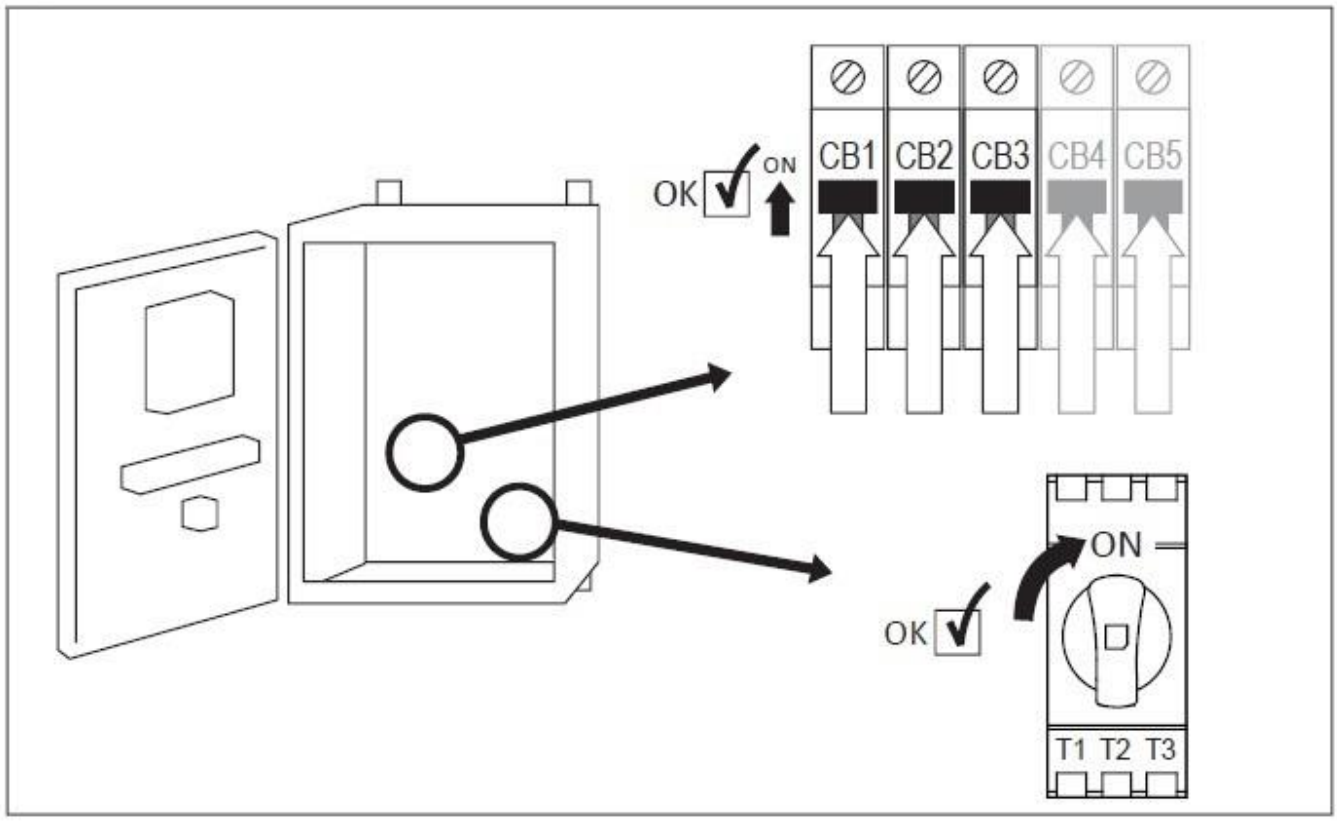
Open the controller's door and verify that the disconnect switch and all circuit breakers are in the "OFF" position.



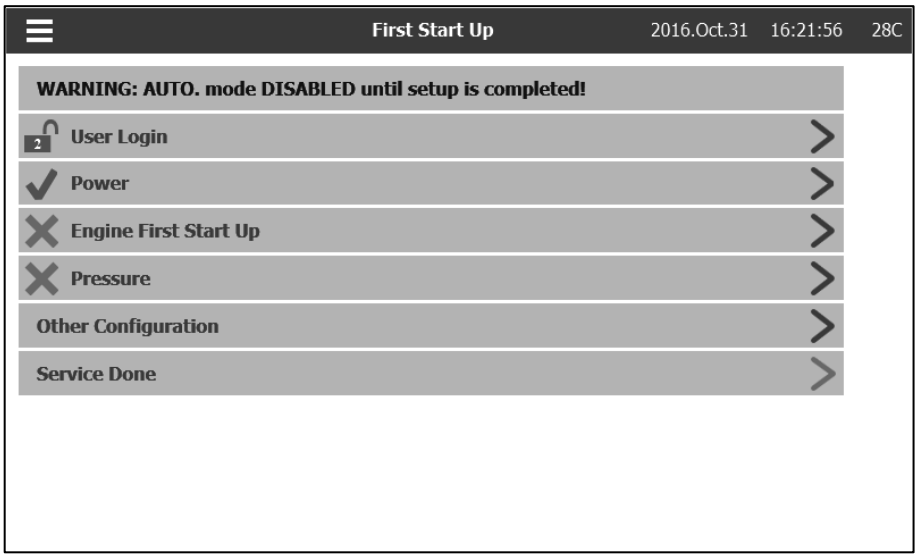
Verify and/or install the proper water connections for the water input and the drain. They must be securely installed and tightened. Refer to the silkscreen markings on the plastic cover.



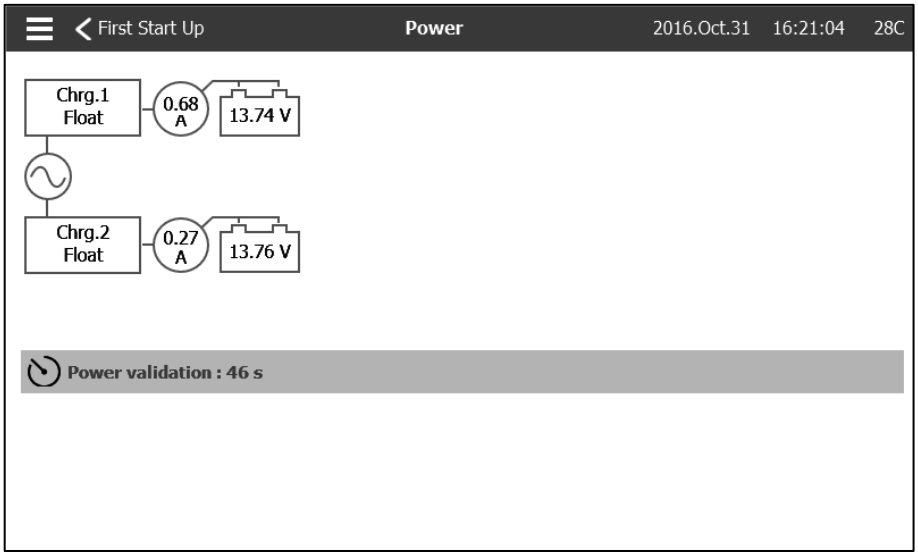
Connect all cables between the engine control panel and the controller engine terminals (Identified as “U” on the IO board diagram displayed in the Terminal Strips Descriptions in the manual). Secure with the appropriate torque as indicated on the torque label and verify all connections. Connect the AC main line and ground to the AC terminal in the controller.



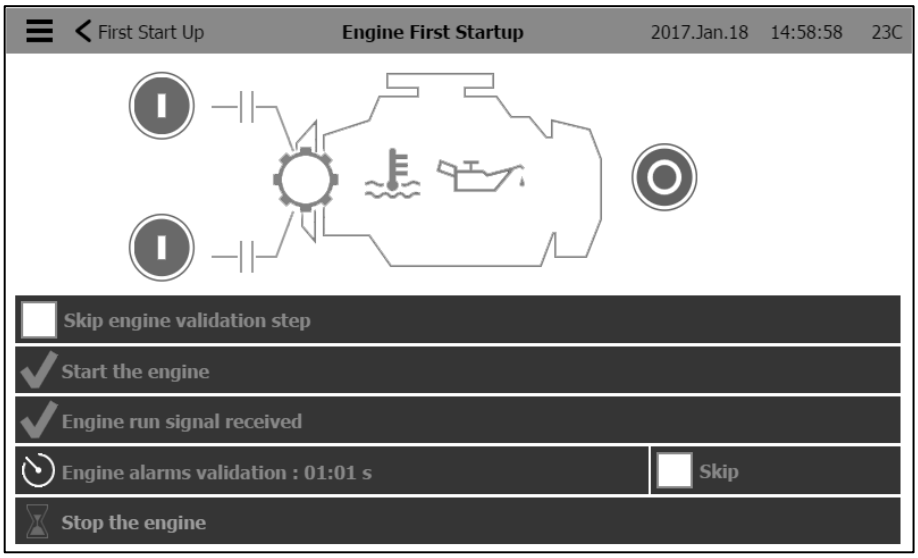
Activate the disconnect switch (if present) and all breakers by setting them to the "on" position. The controller will boot up for the first time.



Once the controller has booted up, the “First Start Up” page appears. Press “User Login” and enter a valid authorization code. Once logged in, press “Power”.



The “Power” page will automatically validate the power if no alarm is detected and if the power meets the requirements. Note: The power validation timer might not appear if all is adequate immediately.
To continue to next step, press “ <First Start Up “.



Press “Engine First Startup” and turn the Main Selector Switch to the “HAND” position.

Note: Before starting the engine, verify that the engine has been officially commissioned (by an authorized engine representative or service dealer) and that the exhaust pipe is connected properly.

Note: You can choose to skip this step completely by selecting “Skip engine validation step”. This selection will be recorded in the logs.

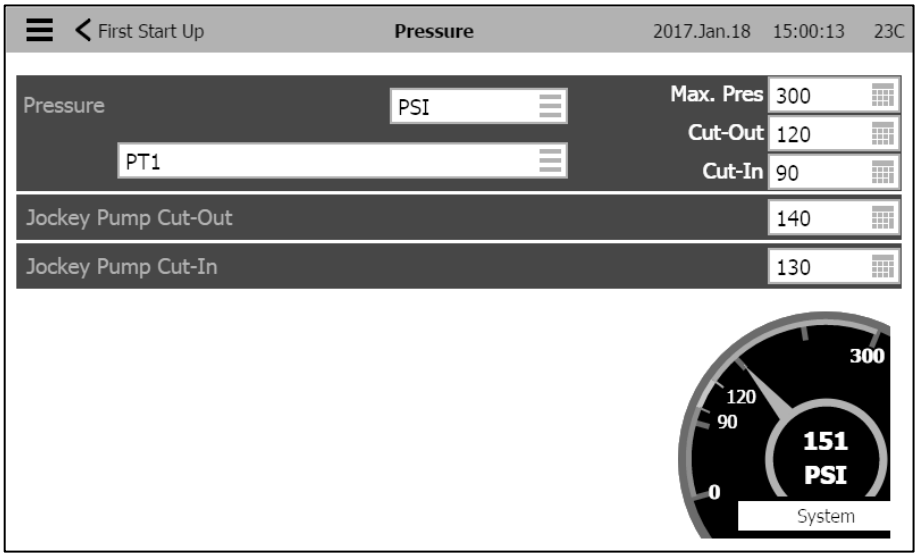
- Press on one or both of the green crank buttons to start the engine.

- With the engine started and running, a timer will start counting.

Note: You can choose to bypass the timer by pressing the “Skip” button. This selection will be recordred in the logs.

- During this time, the controller will verify that no alarms are detected. If an alarm appears, stop the engine by pressing the “STOP” button and then place the Main Selector switch to the OFF position. Take appropriate action to resolve the alarm that has appeared. Do not stop the engine only by turning the Main Selector switch to the “OFF” position. If no alarms are detected by the expiration of the timer, stop the engine by pressing the “STOP” button and then place the Main Selector switch to the OFF position.

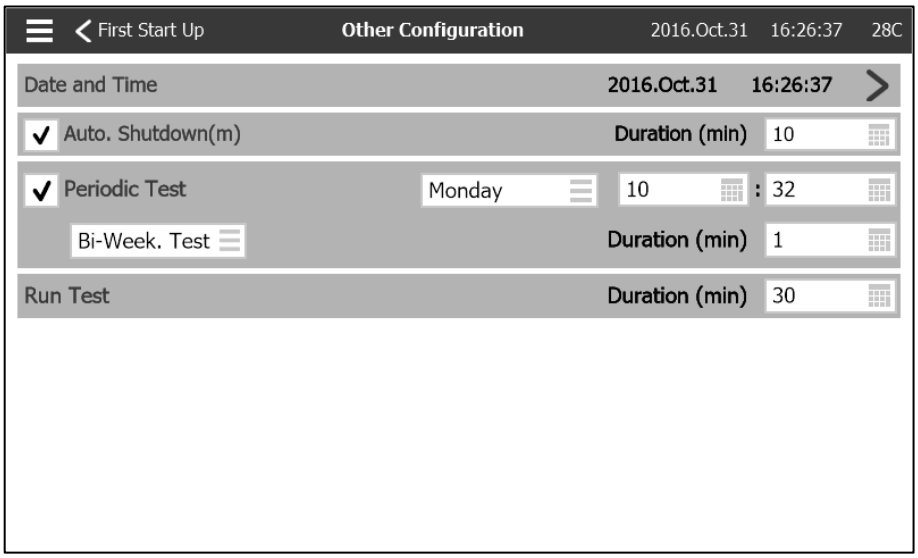
To continue to next step, press “ < First Start Up “.



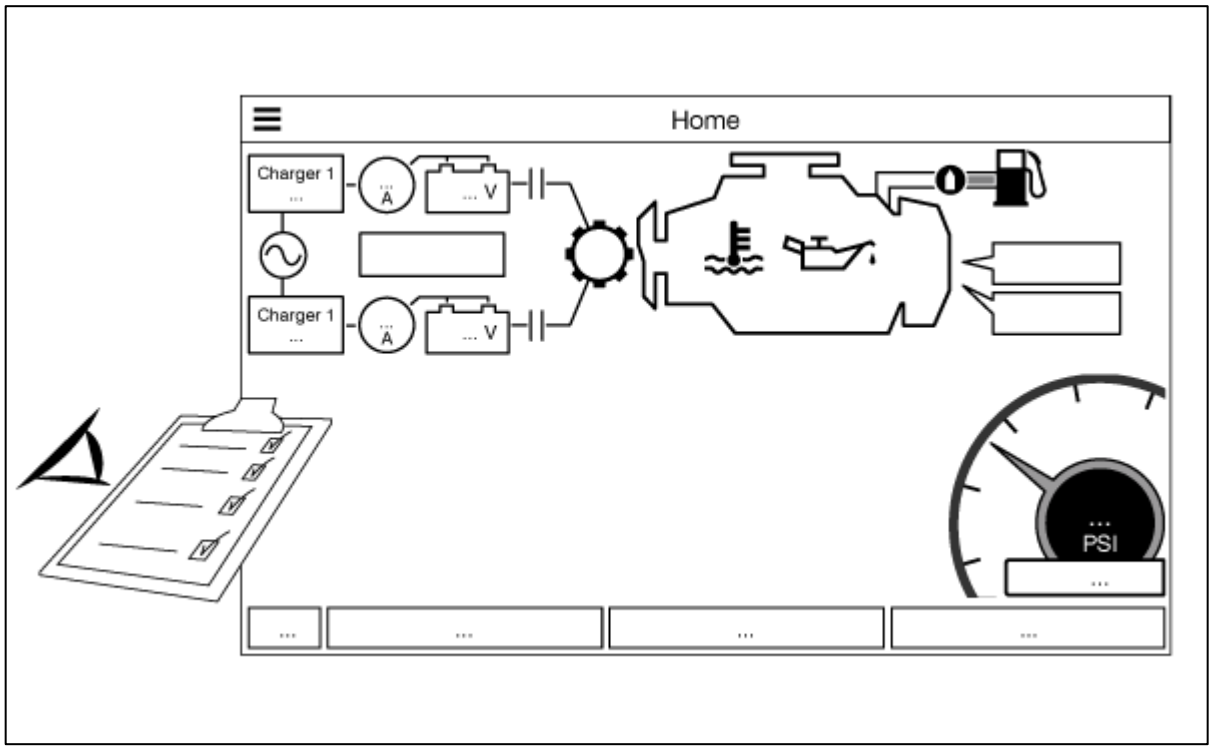
Press “Pressure”.
- Verify that the pressure reading on the screen matches with the calibrated pressure gauge installed on the sensing line.
- Choose the desired units of measurement for pressure reading.
- Adjust, if required, the range of the digital pressure gauge at Max. Pres.
- Insert the Cut-Out and Cut-In pressure values of the fire pump.
- Insert, if so desired, the Cut-Out and Cut-In pressure values of the jockey pump.

Note: The jockey pump Cut-Out and Cut-In values must be set at the jockey pump controller itself. Inserting these values at the Fire Pump Controller is only for pressure recording data purposes.

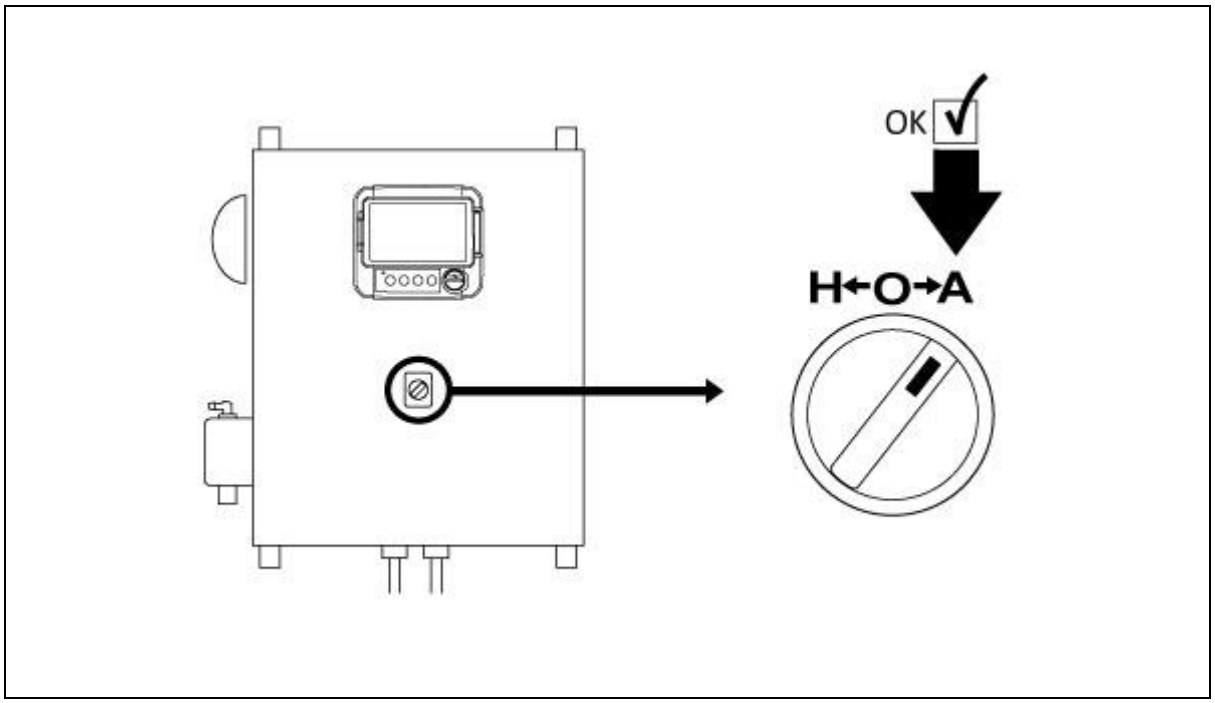
To continue to next step, press “ < First Start Up “.



Go back to the controller start-up page and press the “Other Configuration” button. Enter the time and date. Select the “Automatic shutdown” and the duration the pump will keep running after the automatic stop if an automatic stop is desired. Select the frequency at which the periodic test will occur, the day of the week, the hour and the duration of the test. Also, enter the duration of the Manual Run Test.



From the “Home” page, verify that the displayed values are correct.

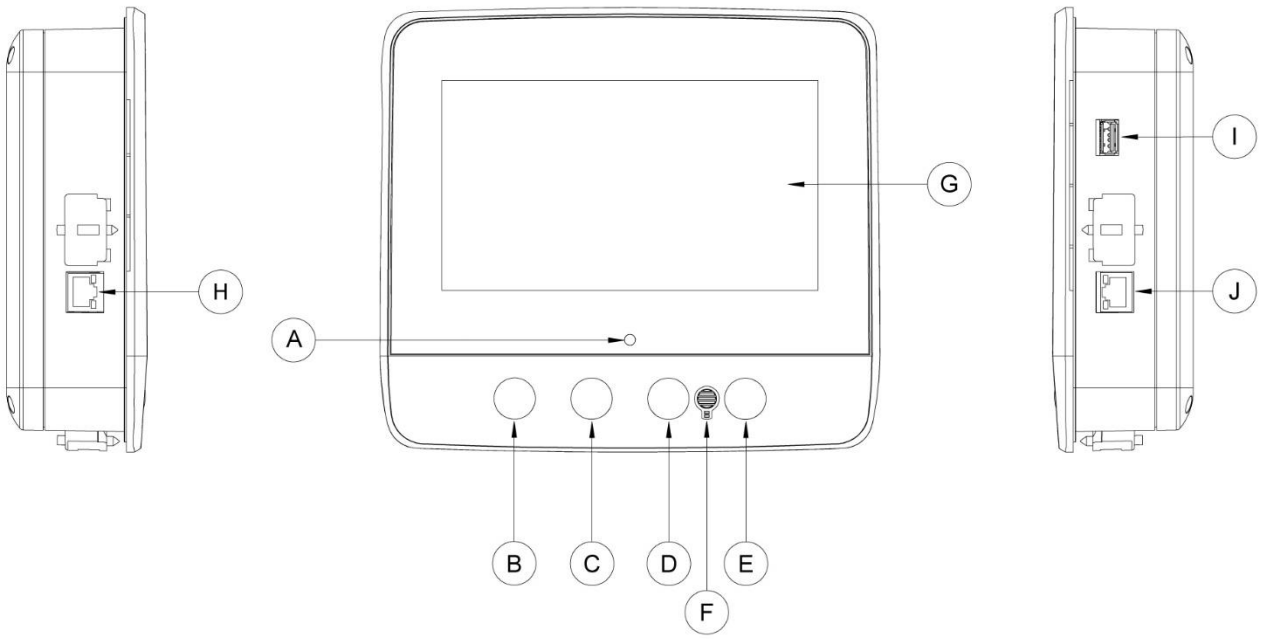


Turn the “Main Selector Switch” to the “AUTO” position to activate the “Automatic” mode. This is the preferred position and from now on, the “Main Selector Switch” should always remain in that position.

The “First Start up” is now completed. The controller is fully installed and configured.

Main Features 3

The ViZiTouch



A: Power LED 3 colors: Pulsing green if the ViZiTouch is properly powered.
B: Crank button 1: Used to manually power the starter with battery 1.
C: Crank 2 button: Used to manually power the starter with battery 2.
D: Stop button: Stops the engine if all the starting conditions are removed.
E: Run Test button: Used to start the manual run test. Be aware that water will flow through the drain during the test.
F: Alarm buzzer
G: Touch Screen: 7 inch color touch screen LCD.
H: CANBUS connector for communication with IO board.
I: Side USB Device connector used for file download, software updates, service reports.
J: Ethernet connector.

Warning
After 2 years of service, the Vizitouch battery may become less efficient and could lose the time after a shutdown.

Alarm Bell

The alarm bell is activated under default faulty conditions stated by the NFPA20 standard.

Any of these conditions will energize the alarm bell but may be silenced, except in some cases, by pressing on the the “Silence bell” button on the Alarms page. When silenced, the alarm bell restarts ringing if a new fault occurs or if the alarm conditions remain unchanged after 24 hours. The alarm bell automatically stops ringing if alarm conditions are not present anymore.

Note: Other optional or user defined conditions can also activate the bell and can be configured by the user. See section 5 and verify drawings affixed inside the cabinet for more details.

First Setup

The First Setup must be done prior to using the controller. Completing the First Setup is the only way to access the

homepage and enable the automatic mode of the controller.

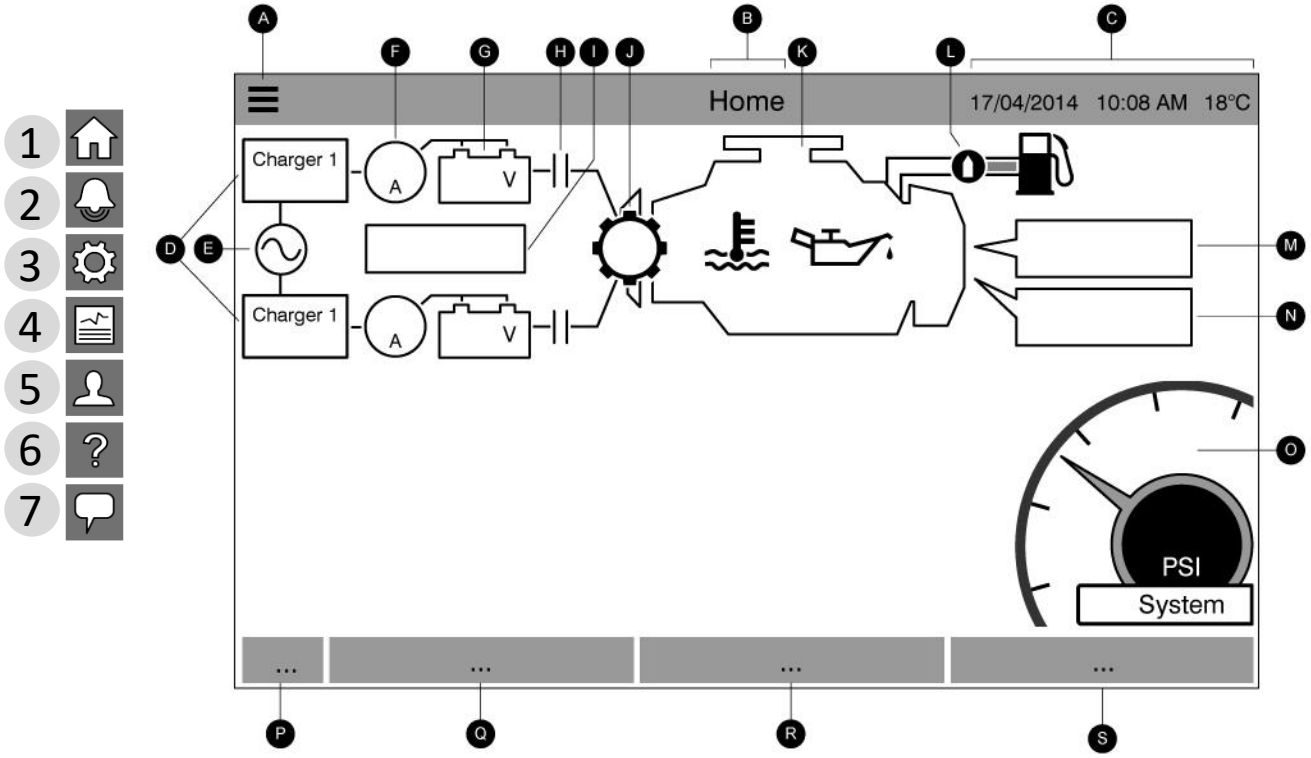
ViZiTouch: Manual Rebooting Method

If required, here is the procedure to manually reboot the ViZiTouch:
1- Turn OFF all disconnecting means to de-energize the ViZiTouch. The ViZiTouch's screen should turn black.
2- Press the stop button or wait until the ViZiTouch's LED extinguishes.
3- Wait 10 seconds.
4- Turn ON all disconnecting means.

Pressure Transducer Test

The controller will test the pressure transducer at least once a week if no manual run test or no weekly test has been conducted. During the test, the pressure reading will drop to zero but the controller will not see it as a starting request. This pressure drop will be recorded in the “Pump Curve” page and in the logs with the message.

Home (Menu) **Home**



The home page displays all controller statuses and important values of the controller. This includes all voltages, currents, pressure, engine state and status, as well as all timers and cranking sequences.

A- Navigation bar: Pressing this icon will open a navigation menu on the left side of the screen:

1- Go to Home page
2- Go to Alarms page
3- Go to Configuration page
4- Go to History page
5- Go to Service page
6- Go to Download Manuals page
7- Select Controller Language

B- Name of the page.

C- Displays the date, time and ambiant temperature. Press on the temperature display to chose the temperature unit.

D- Battery chargers 1 and 2: The state of each charger is displayed by changing the color of the charger icon:

#	Color of the box	Lightning color	Status
1	Green	Green	Normal activities (bellow 2 amps)
2	Green	Yellow	Charging (above 2 amps)
3	Red	Red	Failure
4	Grey	Grey	No AC voltage

E- Alternative current status: Red when there is a failure and green otherwise.

F- Ammeter: Displays the actual current between the charger and the battery in amps.

G- The battery: The battery will be red if it is in failure and green otherwise. The data shows the actual voltage of the battery and the charger in volts.

H- Starter contactor: Grey when non active (open) and green when they are activated (closed) during a crank.

I- Starter state window: This window only appears during a cranking cycle. The counter inside indicates the step timer, ranging from 15 to 0 seconds. As there are two cranking modes, "waiting for crank" and "cranking", two symbols will alternate: a gear during cranking mode and an hourglass during the waiting mode.

J- The starter gear: Grey when non active and green when activated during cranking.

K- The diesel engine: It will be grey if the engine is stopped, green if an "Engine Run" signal is detected and red if a "Fail to start" occurred, after 6 unsuccessful cranking attempts. Inside the engine two major alarms are represented; the "low oil pressure" alarm and the "engine high temperature" alarm. These alarms will stop the engine only if it is running in test mode. When active, the appropriate alarm symbol will turn red.

L- Fuel solenoid valve: This valve controls the flow of fuel to the engine. When the fuel solenoid is activated, the valve will be horizontal, green and the yellow representation of the fuel will flow through the entire pipe. When the "Stop Solenoid valve" is activated, the valve will rotate vertically, become red and the yellow representation of the fuel will stop at the valve, indicating that the fuel does not flow through anymore.

M- Motor starting or stopping cause: A message box will indicate the reason why the motor is running. Possible choices include, but are not limited to:

Local: (Optional) This start cause is triggered if the engine is locally started directly from its own control panel and the option is Enabled.

Manual: The controller receives a manual crank request from one or both of the manual crank membrane buttons while the selector switch is the “HAND” position.

Remote manual: Manual engine starting is activated by a remote start contact.

Deluge: Automatic engine starting is activated by a deluge valve.

Auto: Automatic engine starting is activated by pressure drop.

Remote auto: Automatic motor starting is activated by remote equipment.

Flow: Automatic motor starting is activated by a signal in the FLOW/ZONE START/STOP input.

High zone: Automatic motor starting is activated by a signal in the FLOW/ZONE START/STOP input.

Weekly test: Automatic motor starting is activated by a scheduled test.

Run test: Automatic motor starting is activated by the run test pushbutton.

Alternating current failure: (Optional) Alternating current failure will count the time following an AC Failure and at the end of a predetermined time, will start the engine with an AC FAIL request.

A red rectangular box will indicate the reason why the engine is not running despite the fact that a request is being made. Possible choices include, but are not limited to:

Overspeed: This start cause happens when the controller receives a request to start, but the engines sends an overspeed signal, thus preventing its ability to effectively start the engine.

Fail to start: This start cause happens when the controller receives a request to start, but a “Fail To Start” alarm is active after a cranking sequence failure, thus preventing its ability to effectively start the engine.

Low zone not running: A not running lower zone controller prevents the motor from running. This functionality is optional.

Locked: An interlock signal is preventing the motor from running.

N- Operations timers: This includes the sequential start timer, the run period shutdown timer, the manual test timer, the weekly test timer and the alternating current failure timer.

O- The pressure gage: It allows for a precise reading of the actual system pressure. The cut-in and cut-out are represented by a red and green line on the gage, allowing a quick comparison between the actual pressure and the set points. At the center of the gauge, a digital indicator shows the actual pressure represented also by the needle of the gauge. Just under of the digital pressure indicator, the actual pressure unit is shown. The maximum allowable pressure is also indicated on the gauge and will scale the gauge accordingly.

P- HOA Indicator: Displays the current mode. Hand, Off, Automatic.

Q- Actuation Mode: Displays if the controller is Pressure Actuated or Non-Pressure Actuated.

R- Controller type: Displays if the controller is an Automatic or Non-Automatic type.

S- Shutdown mode: Displays if the shutdown on this controller is Automatic or Manual.

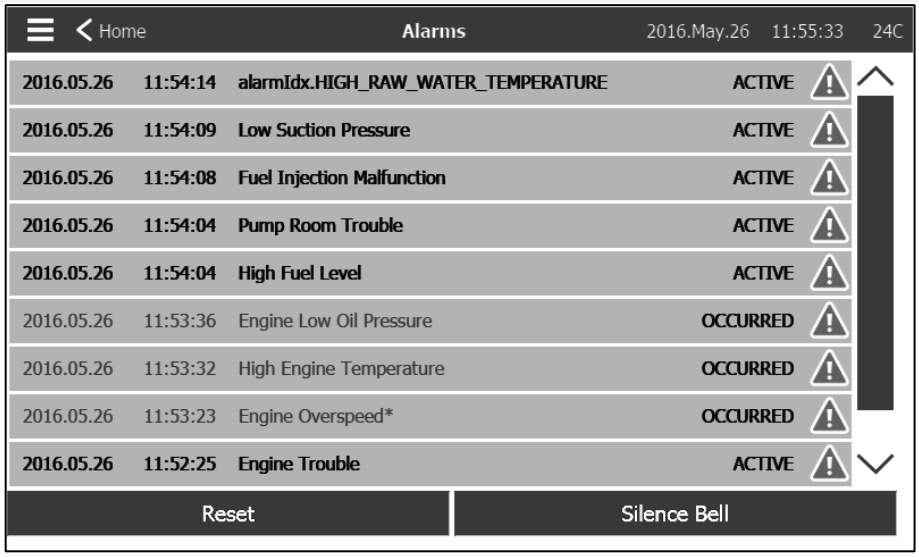
P-Q-R-S: If an alarm or a warning is active, a colored rectangle will appear at the bottom of the screen and will display the error message. This notification will be yellow for a warning and red for an alarm. If more than one error is active, the display will alternate between the error messages. The messages will disappear when the alarm or warning starting cause is no longer present.

Screen Saver

After 5 minutes of inactivity on the ViZiTouch, the screen will dim it's brightness to 25%. After 10 minutes of inactivity on the ViziTouch, the “Black Screen” screen saver will activate. Its goal is to expand the lifetime of the LCD screen. The screen saver will be instantly deactivated if the engine is running or if an alarm is activated. To manually deactivate it, simply touch the screen or any membrane button. After deactivation, the screen saver will always redirect to the “Home” page. It will also log off any user by resetting the security level to 0 and save any new modifications to the settings.

Alarms 5

Alarms (Menu)



This page displays the list of currently active and occurred alarms. Alarms with adjustable parameters can be set in the Config > Advanced > Alarms pages (see section 6).
An alarm is called ACTIVE when its triggering condition is still valid.
An alarm is called OCCURRED when its triggering condition has been active, but is no longer true.
Alarms representing serious concerns will have a red triangle with an exclamation point in the center at the end of the alarm message.
Alarms representing simple warnings will have a yellow triangle with an exclamation point in the center at the end of the alarm message.
Pressing on the Bell Test button will ring the bell for three seconds.
To silence the bell, press the ALARM button or it will silence itself after the expiration of a factory set time.
Pressing on the RESET button will reset OCCURRED alarms only.

The table displays system events:
- Date and time stamp of the alarm in the YYYY.MM.DD format.
- Alarm message.
- State: OCCURRED or ACTIVE.
- Color Code Icon:
Red: The event is an alarm.
Yellow: The event is a warning.

Complete list of alarms:

Common Alarms. A common alarm is an alarm that is activated when one or more of a certain type of conditions are active. There are 3 common alarm:

Engine Trouble. Activated when one or more of these conditions are active :
- High Coolant Temperature (5)
- Engine Low Coolant Temperature (312)
- Engine Low Oil Pressure (4)
- Engine Fail to Start
- Engine Fail when Running
- Engine Overspeed* (3)

- ECM Selector Switch in Alternate Position (301)
- ECM Fault (304)
- Engine Fuel Injection Malfunction (302)
- PLD Low Suction Pressure (305)
- High Raw Water Temperature (310)
- Low Raw Water Flow (311)
- Battery Failure 1-2
- DC Failure
- Over Pressure

Pump Room Trouble. Activated when one or more of these conditions are active :
- Fuel Tank Leak
- Low Fuel Level
- High Fuel Level
- AC Failure
- Low Pump Room Temperature
- Low Suction Pressure
- Water Reservoir Low
- Water Reservoir Empty

CTRL Trouble: Important: this relay is normally energized when the controller is in normal condition. The relay is de-energized when controller trouble is detected (fail safe). Activated when one or more of these conditions are active :
- Charger Failure 1-2
- DC failure
- Default Solenoid Valve
- Weekly Test Cut-In Not Reached

Regular alarms list:

- AC Failure: Monitors the AC power and activates on a failure.

- DC Failure: Monitor the DC power from the batteries and activates if both batteries fail.

- Battery 1-2 Fail: Monitors the status of batteries and activates on a failure. This occurs when the battery is disconnected, is of the wrong type or is unable to be recharged.

- Charger 1-2 Fail: Monitors the state of battery chargers and activates on a failure. This occurs when the battery charger has a defect, is not properly powered, or is unable to provide the needed current. The charger will also change to Boost Fault mode if during a boost test, the voltage does not rise. A NC dry contact is also connected from the charger to the IO Board. The alarm will activated if this contact open for the time set on the Charger Fail alarm page. Charger readings are not updated during cranking and/or running, due to reading instability under load. As soon as the engine returns to an idle state, all readings and failure analysis are reactivated.

- Service Required: Activates when service is due for the controller. This occurs when the date set in the service page has passed, or if no service has ever been done.

- Weak Battery 1-2: Activates if the battery voltage falls below the weak battery factory set point.

- Loss of Continuity 1-2: Activates if the engine start contactors are disconnected from the controller.

- Weekly Test Cut-In Not Reached: Activates if the Cut-In is not reached during a manual or a weekly run test. At the end of the 20s timer, if the Cut-In is not reached, the test may still be successful at starting the engine if the pressure has dropped by at least 5 PSI.

- Check Weekly Test Solenoid: Activates if the pressure does not drop a minimum of 5 PSI during the manual run test or the weekly test. Indicates a failure with the Test Solenoid Valve.

- Pressure Transducer fault detected: Occurs if the pressure reading is out of its normal range. Additionnally, if an optional dual pressure sensor is installed, it will be activated if the two pressure transducers show different readings. Further investigation is advised to determine what caused the different readings. Note that the controller will always choose the lowest pressure reading to determine the actual system pressure.

- Overpressure: Activates if the analog readout of the discharge pressure goes higher than the overpressure set point in the alarm page.

- Underpressure: Activates if the analog readout of the discharge pressure goes lower than the “Under Pressure” set point in the alarm page.

- Low Suction Pressure: Activates if the analog readout of the suction pressure is Enabled and goes lower than the low suction pressure set point in the alarm page.

- Water Reservoir Low: Activates if the “Water Reservoir Low” contact input (IN3) is triggered or if the analog readout of the water reservoir is Enabled and is lower than the water reservoir low set point in the alarm page.

- Fuel Tank Leak: Activates if the “Fuel Tank Leak” contact input (IN4) is triggered.

- Low Fuel Level: Activates if the “Low Fuel Level” contact input (IN1) is triggered or if the analog readout of the fuel level is Enabled and goes lower than the low fuel level set point alarm.

- High Fuel Level: Activates if the “High Fuel Level” contact input (IN5) is triggered or if the analog readout of the fuel level is Enabled and goes higher than the high fuel level set point alarm.

- Engine Fail When Running: Activates if the “Engine Run” signal is lost while the engine is running. The engine will try to start the cranking sequence once again if the starting causes are not back to normal.

- Engine Fail to Start: Activates if the engine fail to start after the complete 6 attempts crank sequence. The engine will turn red.

- ECM Selector Switch in Alternate Position: Activates if the specific “ECM” (Electronic Control Module) input (301) is triggered on the engine connector strip.

- ECM Warning: Activates if the specific “ECM” input (303) is triggered on the engine connector strip.

- ECM Fault: Activates if the specific “ECM” input (304) is triggered on the engine connector strip.

- FIM: Activates if the specific FIM (Fuel Injection Malfunction) input (302) is triggered on the engine connector strip.

- PLD Low Suction Pressure: Activates if the specific PLD (Pressure Limiting Device) input (305) is triggered on the engine connector strip.

- High Raw Water Level: Activates if the specific input is (310) triggered on the engine connector strip.

- Low Raw Water Flow: Activates if the specific input (311) is triggered on the engine connector strip.

- Engine High Temperature: Activates if the specific “High Temp” input (5) is triggered on the engine connector strip and the engine is running. A 3 hour timer will start when the engine stops, and if the condition is still present, the alarm will be activated. This alarm will stop the engine only if triggered during a manual run test or a weekly test.

- Engine Low Temperature: Activates if the specific “Low Temp” input (312) is triggered on the engine connector strip.

- Engine Low Oil Pressure: Activates if the specific “Low Oil Pressure” input (4) is triggered on the engine connector strip and the engine is running. This alarm will stop the engine only if triggered during a manual run test or a weekly test.

- Engine Overspeed*: Activates if the specific “Overspeed” input (3) is triggered on the engine connector strip and the engine is running. This alarm will immediately stop the engine and cannot be reset by using the reset button on the alarm page. The alarm must be reset on the engine itself and the controller must be turned OFF and ON with the HOA selector switch to complete the reset procedure for this alarm.

- Battery1-2 Overvoltage: Activates if the voltage of the specific battery is higher than the specified overvoltage set point.

- Water Reservoir High: Activates if the optional “Water Reservoir High” contact input is triggered or if the analog readout of the water level is Enabled and goes higher than the “High Water Level” set point alarm page.

- IO Exp Comm Error: Activates if communication with the Expansion IO board could not be established for 15 seconds.

- Pump on demand: Activates when the pressure is below the cut-in set-point on an automatic pressure actuated controller.

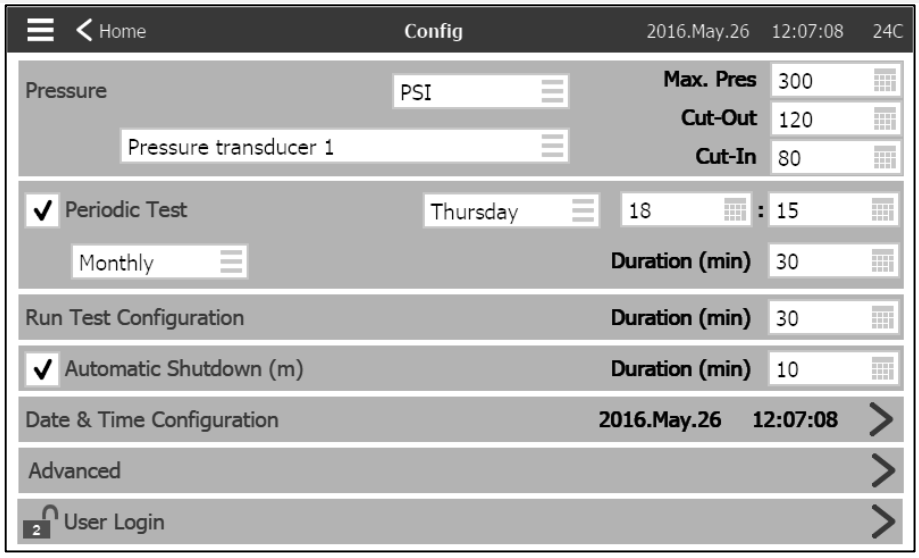
- Bell Silenced: Activates when a audible alarm has been silenced.

- Engine Run: Activates when the input “Engine Run“ (2) is active on the engine strip of the IO card.

- Invalid Cut-In: Activates when the Cut-In value is not acceptable. (0 or higher than the Cut-Out).

Configuration 6

Config (Menu) **Config**



The main configuration page is used to setup all basic configuration parameters and provides a quick means of changing the most common settings.
There are seven (7) access parameter boxes; Pressure, Periodic Test, Run Test, Automatic Shutdown, Date & Time, Advanced and User Login. Each parameter requires a specific access level to set or change values.

User Login:
The padlock icon indicates the current authorization level. A locked padlock indicates that only basic settings can be changed. Press on the padlock to enter an authorization code to unlock additional settings. An unlocked padlock showing an authorization number indicates that some settings are unlocked. Press on the padlock again when you have concluded your operation to logout and to save any changes made in the configuration.

Pressure:
The main pressure parameters can be set inside the box at the top of the page.
- Pressure reading: Can be selected as PSI, kPa, bar, FoH, or mH20.
- Input Device: Can be selected as Pressure transducer 1 or 2
- Maximum Pressure: Can be set between the Cut-Out value and 9999.
- Cut-Out: Can be set between the Cut-In value and the Maximum Pressure value. (The Cut-Out should be set before the Cut-In).
- Cut-In: Can be set below the Cut-Out value.

Periodic Test:
The Periodic Test can be selected as “weekly”, “every other week” or “monthly”. The day of the week, the time of day for the test and the test Duration can also be specified in this box.

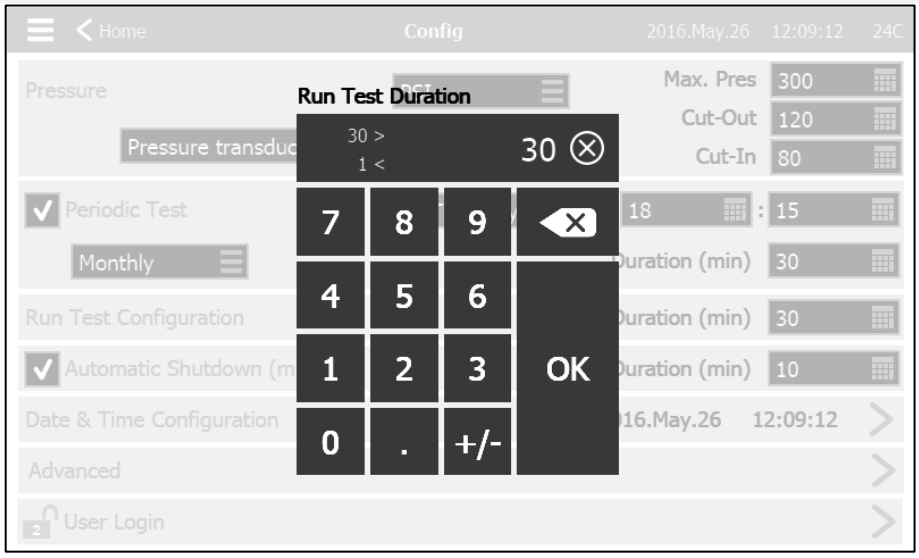
Run Test Configuration:
The Run Test Configuration box is where the duration of the run test time is set. A timer between 1 and 30 minutes can be selected.

Automatic Shutdown:
If enabled, the Automatic Shutdown will automaticly stop the pump after the demand dissapears. A timer between 1 and 1440 minutes can be selected.

Advanced:
Go to the advanced configuration pages.

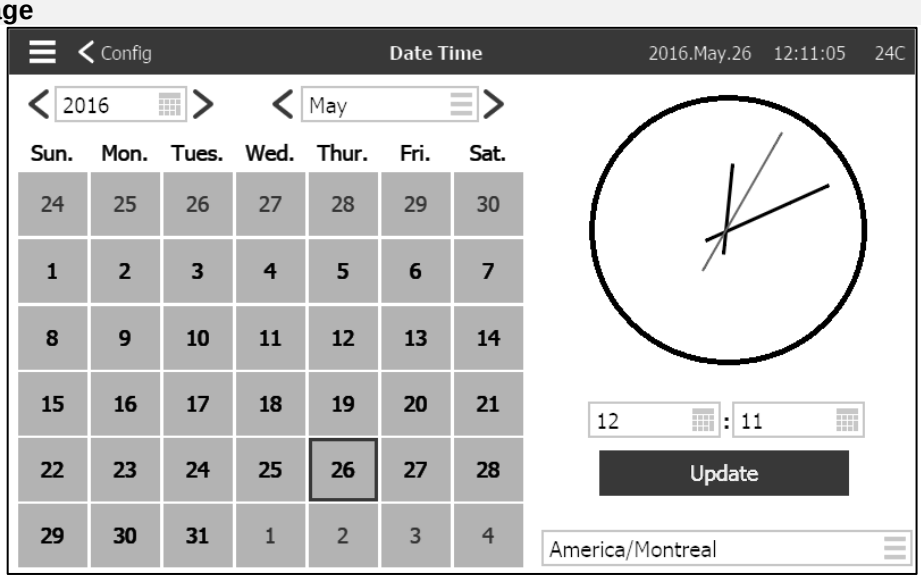
Date & Time Configuration:
Select to display the Date Time page.

NumPad Page



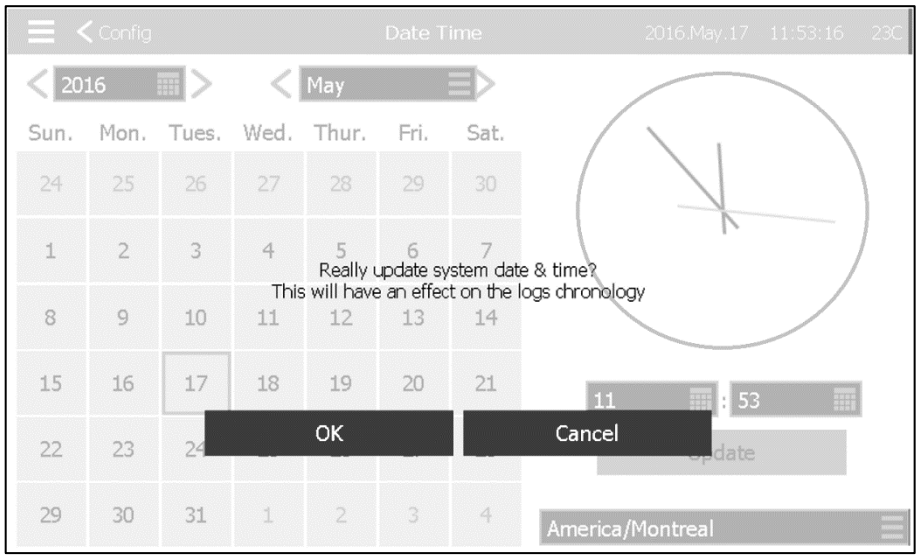
The NumPad is activated every time the user presses on a white square box representing a number that can be set. On top of the NumPad, the current parameter is shown. The box at the top of the NumPad displays the range of values accepted for that particular parameter. The box will turn red if the value entered is out of range. Pressing the “X” button in the circle will set the value to zero “0”. Once a value that falls within the range is selected, the box will turn blue. The button with a blue “X” inside a white arrow is used as a “backspace”. Pressing the “OK” button will enter the new value and the screen will return to the previous page. Pressing anywhere outside the numpad view will cancel the edition process and leave the value previously selected.

Date and Time Page

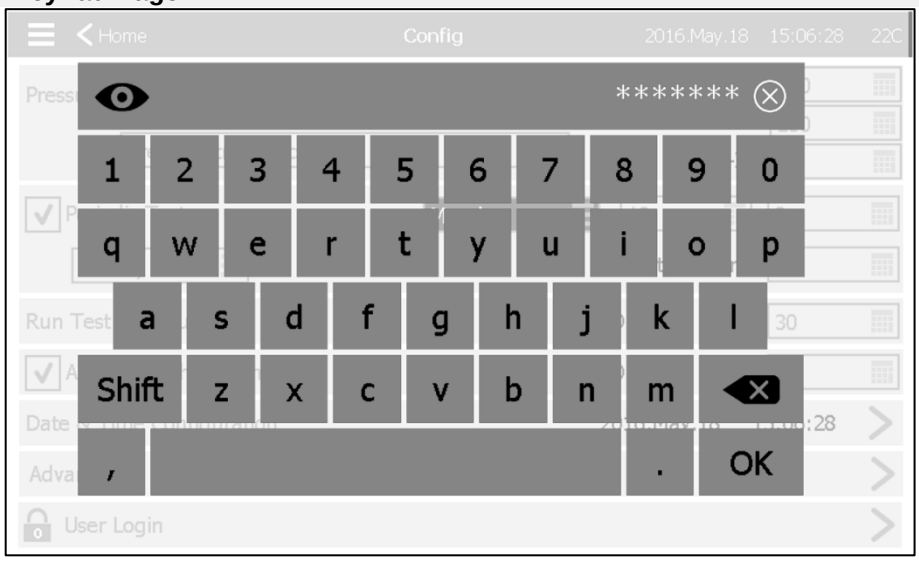


Select the Year by pressing inside the year box and enter the value, or use the left and right arrows to simply decrement or increment the value. Likewise, select the month by pressing on the month box and select the value from the list shown, or use the left and right arrows to cycle through the choices.
Once set, press on the proper day to select the actual day, if different. The time is set by pressing the two square boxes under the clock; the left sets the hours and the right sets the minutes. Press the Update button to commit the

changes. A dialog box will appear to confirm the change “Date and Time”. The user may cancel the changes by pressing the “Cancel” button. Please note that changing the date and time will have an effect on the logs chronology.
The time zone can also be changed using the box in the bottom-right corner.



User Login Page / KeyPad Page



User Login KeyPad:
This page allows the user to log into a higher security level by entering a password. If the password is valid, the text field will turn green and if it is invalid, the text field will turn red. An “X” button appears in the text field as soon as a character is entered, allowing for a quick erase of the written password.

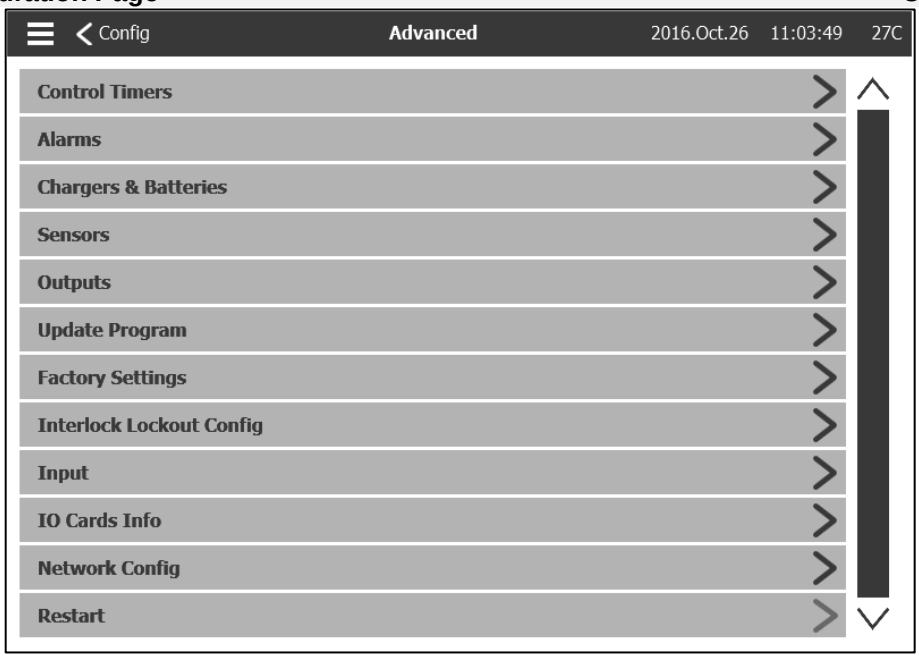
Shortly after being entered, each character will be displayed as an “*”. To view the whole password, press the eye on the top left corner.

If the password is invalid for a consecutive number of times, the user will be redirected to the “Service Dealer” page, allowing the user to communicate with the appropriate Service Dealer.

If the password is valid, the “Configuration” page will reload and the access security level will be shown inside the lock. To log off, click on the lock and the user security level will return to “0”

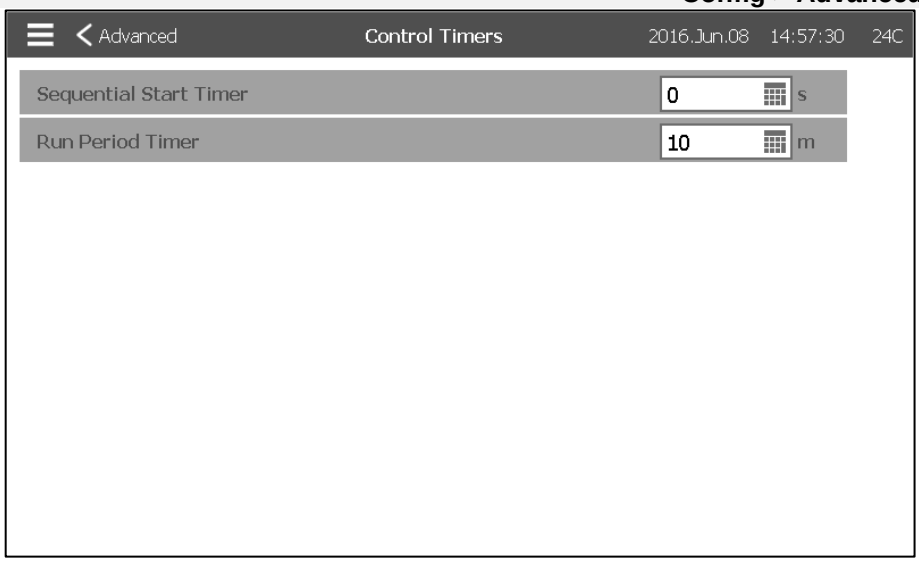
Other KeyPads:
The KeyPad is activated every time the user presses on a grey rectangle box with white text representing a text that can be set. The “X” button allows the user to cancel editing the value. The back arrow erases the last entered character. Simply click the “OK” button once the value is set. This type of text field is mostly used to generate a digital text indication for a custom alarm input.

Advanced Configuration Page **Config > Advanced**



This page is the portal to all the advanced configuration parameters of the ViZiTouch. Pressing on a tab will redirect to the corresponding page.

Control Timers **Config > Advanced > Control Timers**

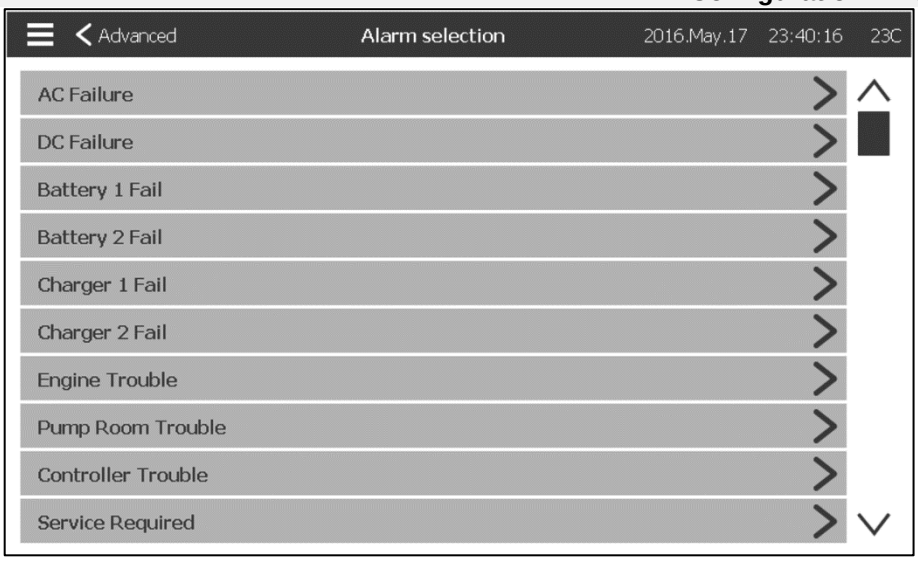


This page is used to adjust the timers.

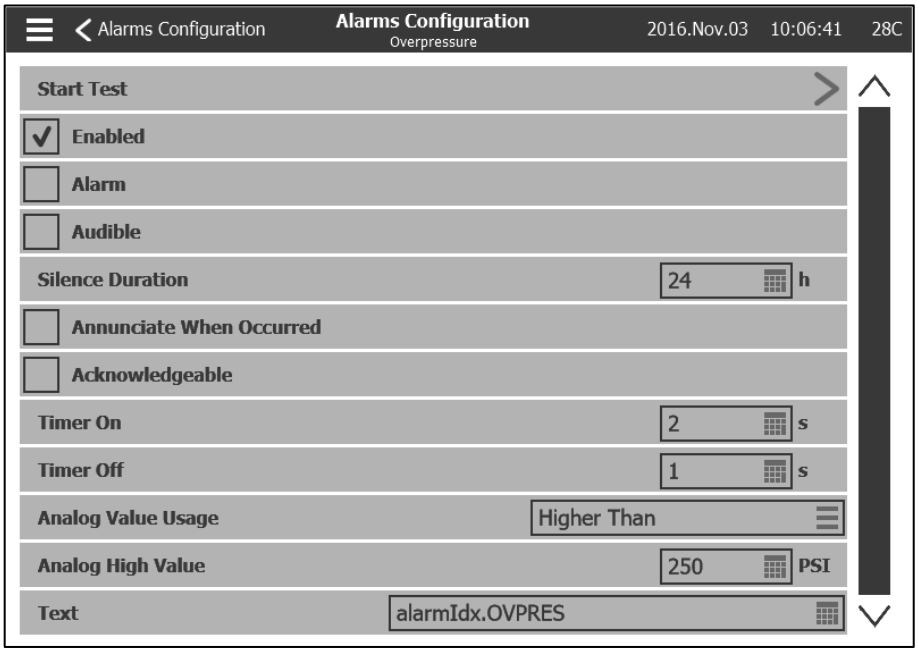
Sequential Start Timer
This timer sets the time delay between a demand becoming active and the starting of the engine. (Optional).
Time Range: 0-3600 Seconds

Run Period Timer
This timer sets the time the engine will keep running after the demand is resolved.
Time Range: 1-1440 Minutes

Alarms **Configuration > Advanced > Alarms**



Most alarms are not configurable in the field, but some are with the appropriate password level. If it's configurable, the checkboxes will be in white. Otherwise the checkboxes will be grey. Also, the two last fields: Value Usage and Analog Value are not always visible.



Start Test: The alarm can be tested using this button. This test will only announce the chosen alarm. It will activate the bell if the alarm is audible and will activate any output relays associated with this alarm. The test will not activate other common alarms or other components. To stop the testing, press the “Stop Test” button.

Enable: Check this box to enable the Alarm/Warning.

Alarm: Makes this signal an alarm (red display). Otherwise, it will be a warning (yellow display).

Audible: Check this box to make the bell ring while this alarm is active.

Silence Duration: Set the time this Alarm will remain silenced.

Annunciate when occurred: Check this box to keep activated any associated relay even when this alarm has occurred.

Acknowledgeable: Check this box to make the alarm acknowledgeable. If an alarm is ackowledged, the bell will be silenced and the alarm IO board Output will stop being active. To acknowledge an alarm, go to the alarm list page and press the blue “Active” status on the right of the alarm. The “Active” status should change to “Acknowledge”.

Timer On: It is the time delay between the triggering of the condition and the activation of the alarm.

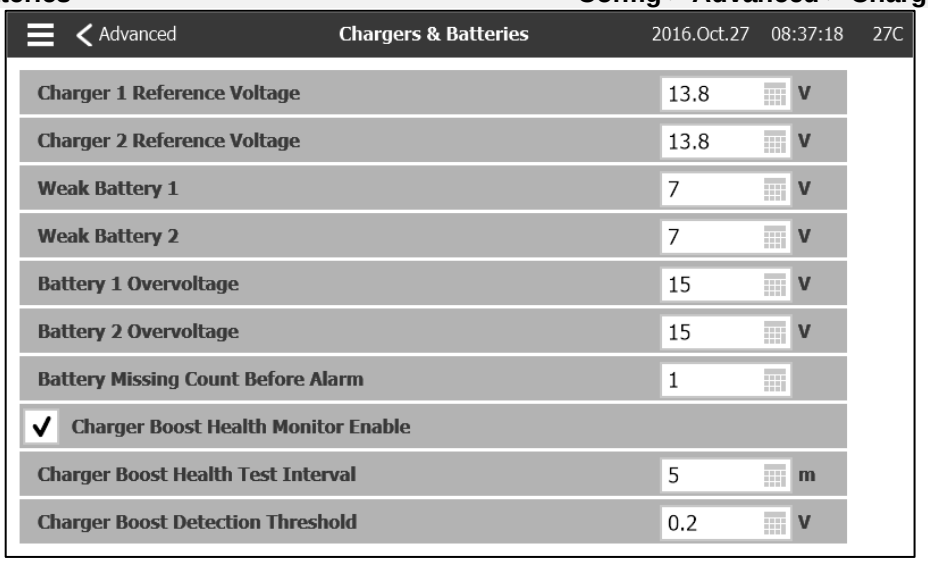
Timer Off: It is the time delay between the stopping of the condition and the deactivation of the alarm.

Analog Value Usage: It is used to describe the activation range of the alarm. “Lower Than”, “Higher Than” and “Between” can be selected. The corresponding value has to be entered.

Text: This field can be used to change the name of the alarm that will be displayed while this alarm is active. Note that changing the factory set name of an alarm will disable any translation of this alarm to different languages.

Hysteresis: In the “Analogue Value Usage” field, it is possible to chose “Hysteresis Low Setpoint” and “Hysteresis High Setpoint”. Both Analog Low Value and High Value needs to be selected for this mode to be effective. For the “Hysteresis Low Setpoint”, the alarm will be trigger if the chosen signal goes below the “Low Setpoint” and will be reset when the signal rise above the “High Setpoint”. For the “Hysteresis High Setpoint”, the alarm will be trigger if the chosen signal goes above the “High Setpoint” and will be reset when the signal falls below the “Low Setpoint”.

Chargers and Batteries **Config > Advanced > Chargers and Batteries**



This page is used to adjust some features of the batteries and chargers.

Charger 1-2 reference voltage: This is the normal voltage of the chargers in float mode and serves as a reference to trigger the “charger fail” alarm.

Weak battery 1-2: Under this voltage, the batteries are considered weak. The alarm “weak battery” is then activated.

Battery 1-2 overvoltage: Over this voltage, the batteries are considered in overvoltage. The alarm “battery overvoltage” is then activated.

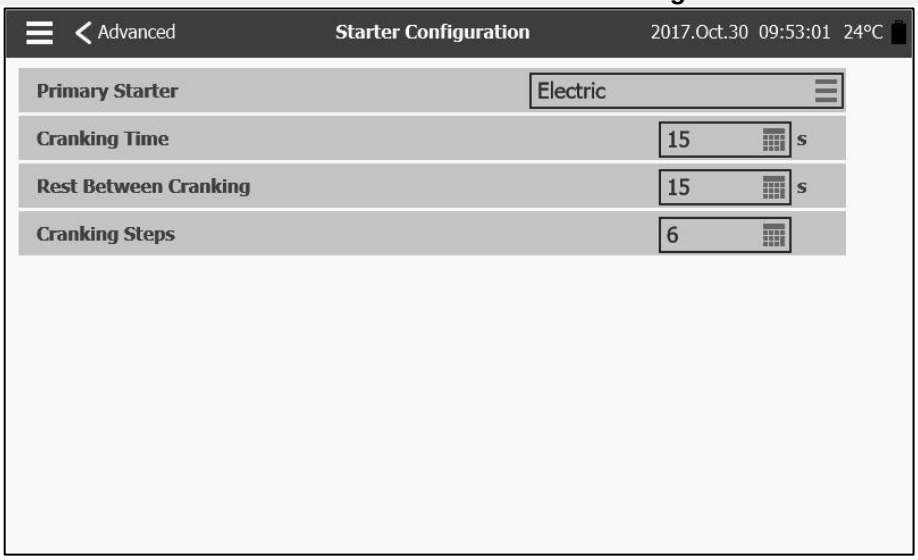
Battery missing count before alarm: This is the number of “battery missing” test that needs to be failed before the “battery failed” alarm is triggered.

Charger boost health monitor enable: If checked, this feature will enable the monitoring of the chargers boost health.

Charger boost health test interval: This is the minimum interval between two charger boost tests.

Charger boost detection threshold: This is the minimum value the voltage has to raise during a boost test for the test to be consider as a success.

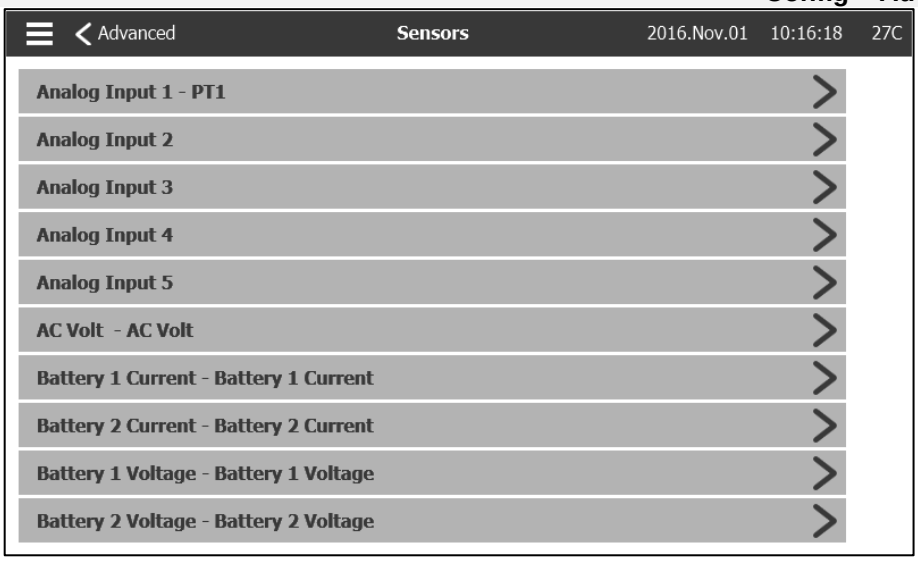
Starter Configuration **Config > Advanced > Starter Configuration**



This page displays information on the charger configuration. If more than one starter is installed, it will be possible to choose which starter will be activated first.

Cranking Time: Duration of a cranking step.
Rest between cranking: Durantion of the pauses between two cranking steps.
Cranking Steps: Number of times the controller will activate the starter.

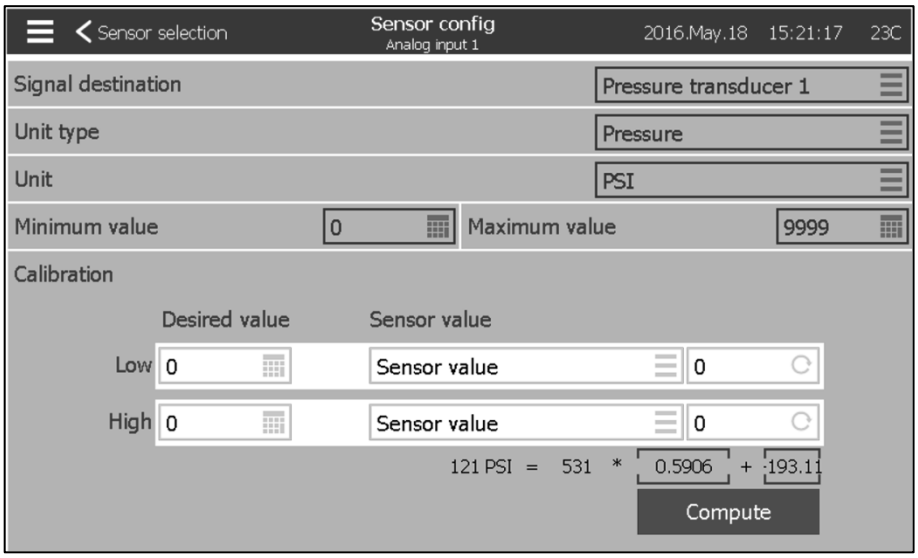
Sensor Selection **Config > Advanced > Sensors**



Important Notice!
Every analog sensor cable used for this controller should be shielded. The shield has to be grounded on the motor

side. Not complying to these recommendations may affect the controller good functioning and void its warranty.

Five analog sensors, an AC voltage sensor, two battery current sensors and two battery voltage sensors can be calibrated by accessing this page. The Analog Input 1 is dedicated to the Pressure Transducer. The other Analog Input depends on the controller options.



Every sensor, except the AC Voltage can be calibrated the same way. The Signal destination, the Unit type, the Unit, the Min and Max values are variables that are set in factory but the calibration can be made in the field.

There are three ways of calibrating a sensor that can be chosen in the windows below "Sensor value".

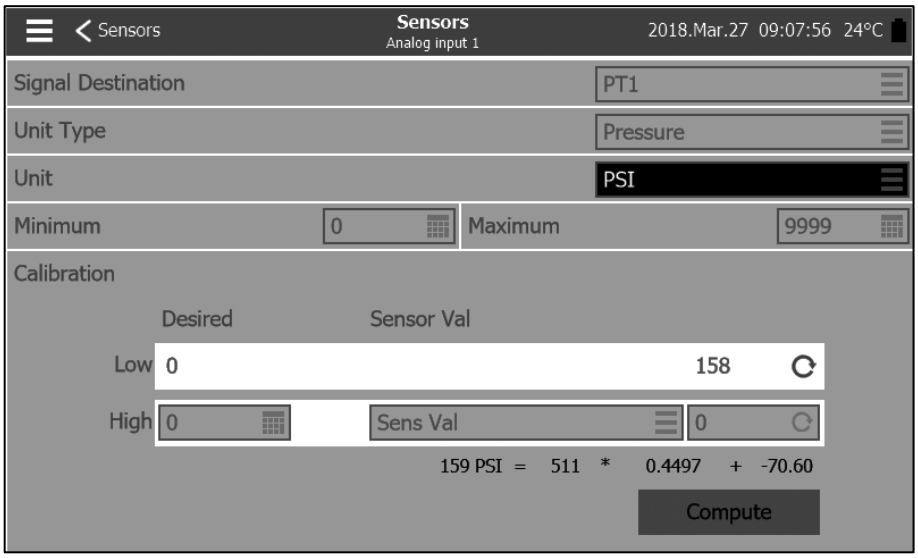
-Sensor value: Connect an external measurement tool that is already calibrated (like a Manometer to calibrate a pressure sensor). Bring the system to calibrate to a low point. While looking at the measurement tool, press the read button (the button with a circular arrow). The value that was displayed on the measurement tool when the read button was pressed needs to be enter in the "Low" window below the Desired value. Repeat these steps with a high value. Then press compute. For the PT1, only a high value is required.

-Theorical voltage: Use a graphic of the theorical sensor's voltage response (usually given in the datasheet of the sensor). Enter a low point (value, voltage) and a high point. Then press compute.

-Theorical current: Same as the theorical voltage, but with amperes.

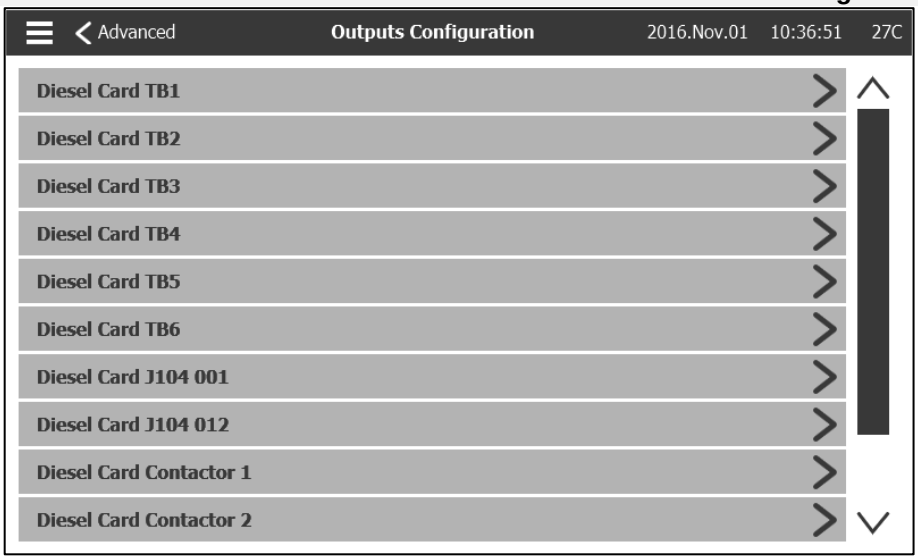
For better results, use two points that are far apart, but in the normal range of the sensor.

For the AC voltage, only one point is needed.



For the pressure transducer PT1, the low point (zero) is automatically acquired during first power up. It can be re-acquired by pressing the blue round arrow. The high point needs to be entered in order to calibrate the sensor.

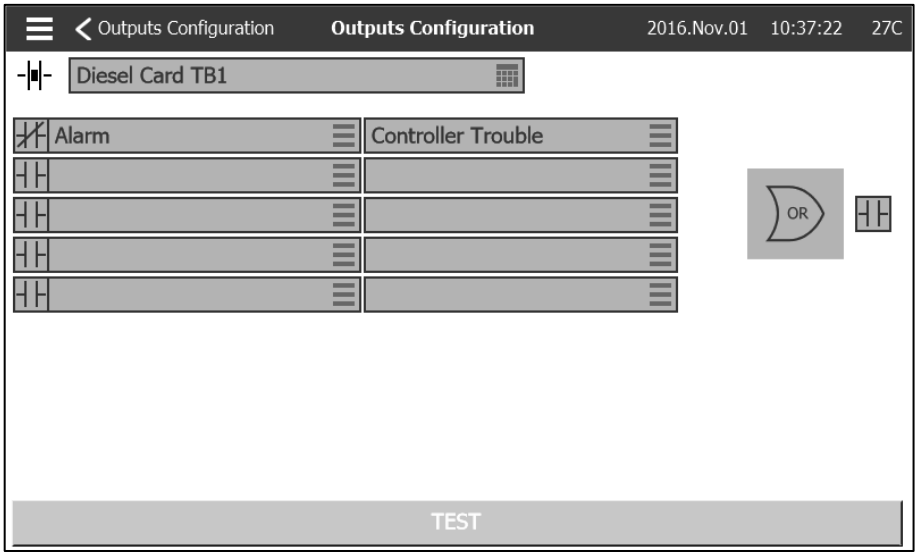
Outputs **Config > Advanced > Outputs**



This page is used to choose the logic of the signals that will activate the Outputs on the IO board and to test those Outputs.

- CTRL Trouble (TB1)
- Engine Run (TB2)
- HOA in Manual or OFF (TB3)
- Engine Trouble (TB4)
- Pump Room Trouble (TB5)
- Optionnal Output 1 (TB6)
- Fuel Solenoid (1)
- Stop Solenoid (12)
- Contactor 1 (9)
- Contactor 2 (10)
- Test Solenoid Valve
- Alarm Bell

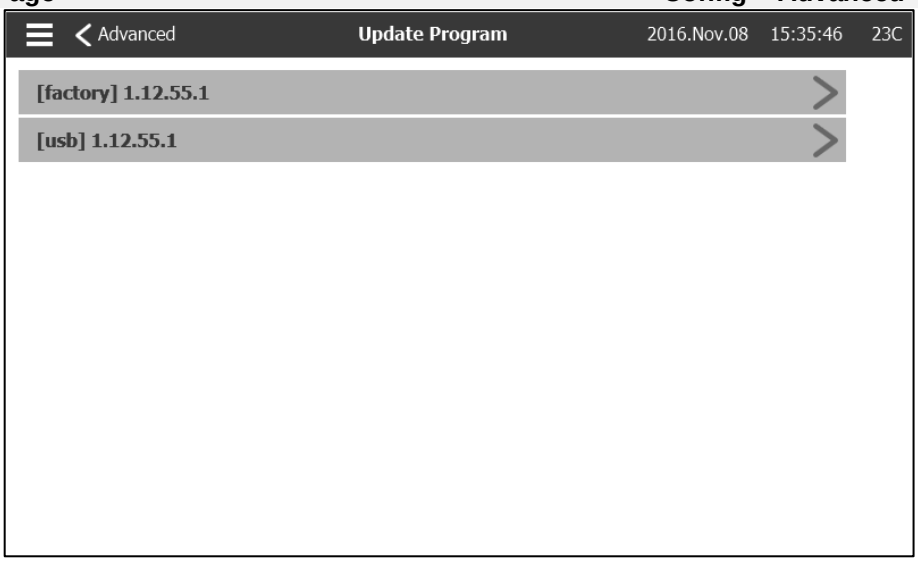
Pressing on an Output will lead to this page:



The first box from the top is used to change the name of the Output. For the output's logic, a combination of 5 digital inputs can be selected. Each input can be an alarm or a signal from a list and can be inverted by pressing the NO/NC contact symbol at the left of the screen. A logical AND or OR can combine the chosen inputs and the exit can also be inverted by pressing the NO/NC contact symbol at the right of the screen.

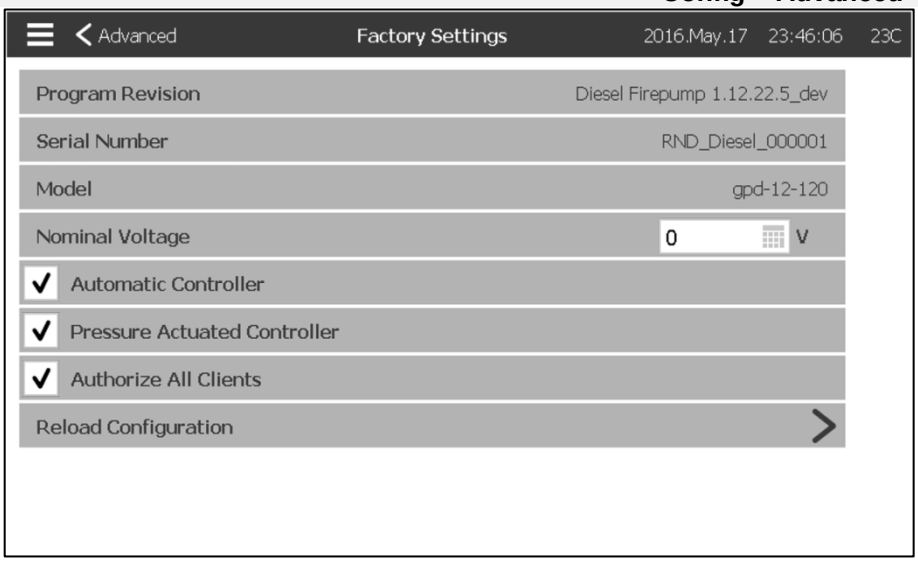
Pressing the “Test” button, at the bottom of the screen, will change the state of the output for one second. Note: activating some outputs may cause the motor to start.

Update Program Page **Config > Advanced > Update Program**



This page is used to update the controller software. A USB key or a network connection with the software update is needed.

Factory Settings **Config > Advanced > Factory Settings**



This page is used to visualize the program version, the serial number and the model of the controller.

Some parameters can be changed on this page, but be careful, modifying a parameter will change the basic operation of the controller. Afterwards the controller may no longer respect the NFPA standard.
- Automatic Controller: Enable automatic starting causes.
- Pressure Actuated Controller: Enable the automatic controller to start following a pressure drop.

It is possible to reload a past configuration by pressing the "reload configuration" button. Dates with an "*" are settings following a "Service".

Do not change a parameter on this page without previously consulting a Tornatech representant.

Interlock Lockout **Config > Advanced > Interlock Lockout**

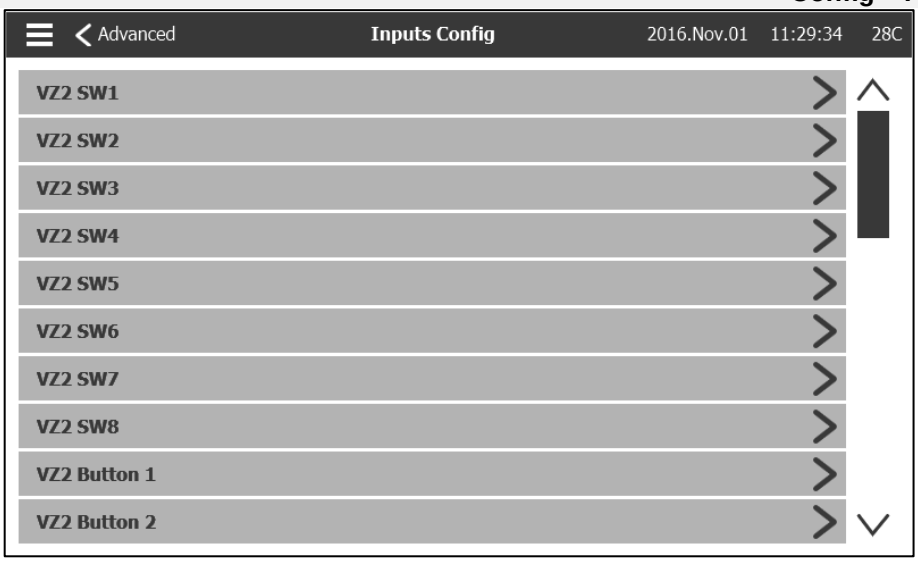
This page is used to configure the Lockout input and the Interlock output parameters. To be active those options need to be assigned to an Input or an Output on the IO board.

Lockout is an Input that disables the engine from starting.
-Shutdown Engine: If enabled, the lockout signal will also act as a shutdown and will stop the engine if it is running.
-Enable in Manual: If checked, activation of the lockout input will prevent the Manual start.
-Enable in Automatic: If checked, activation of the lockout input will prevent the Automatic start.

-Enable in Remote: If checked, activation of the lockout input will prevent the Remote start.
-Enable in Flow: If checked, activation of the lockout input will prevent the Flow start.

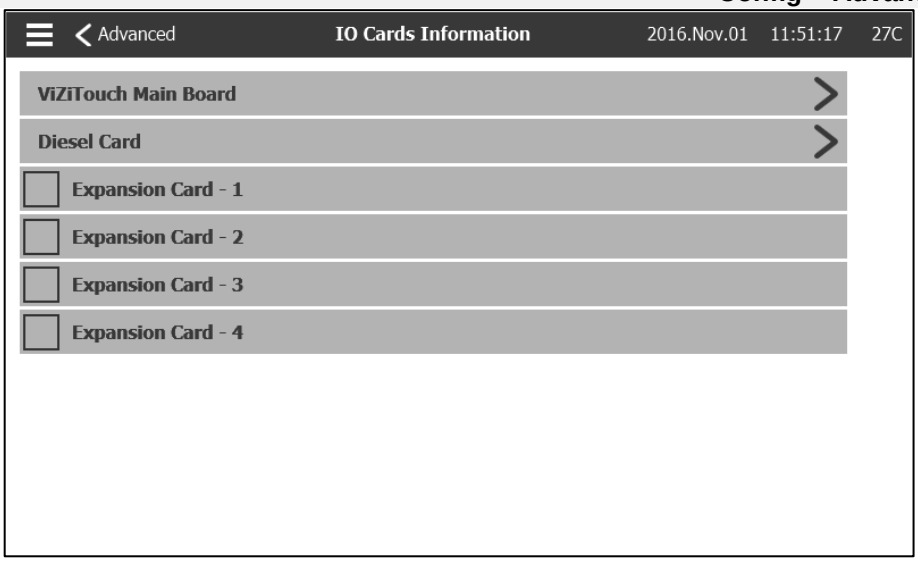
Interlock is an Output that prevents a second engine from starting.
-Engine Run Required: If enabled, the controller will wait to have Engine Run before putting Interlock active.
-Enable in Manual: If checked, this option will activate the output Interlock on a Manual start.
-Enable in Automatic: If checked, this option will activate the output Interlock on a Automatic start.
-Enable in Remote: If checked, this option will activate the output Interlock on a Remote start.
-Enable in Flow: If checked, this option will activate the output Interlock on a Flow start.

Inputs **Config > Advanced > Inputs**



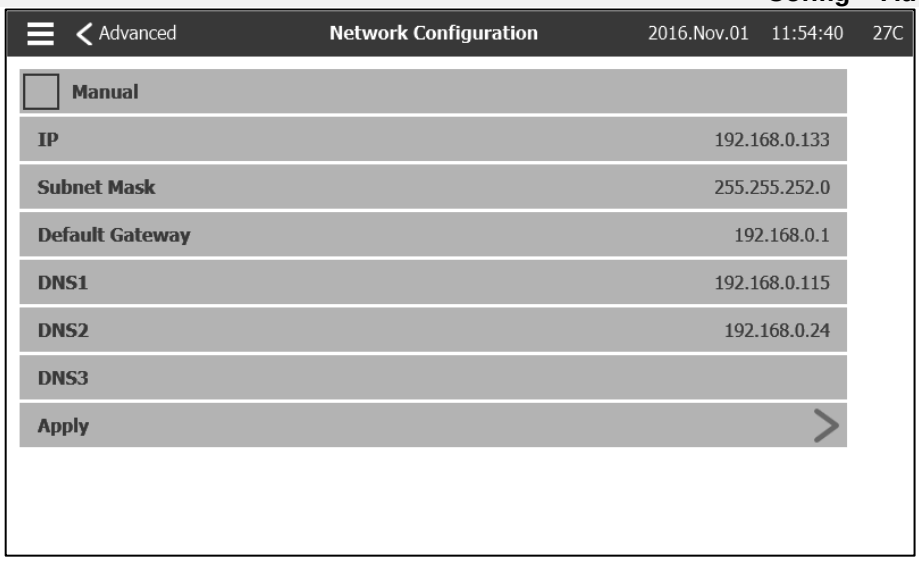
This page is for vizualisation purpose only. It allow the user to verify which signal is mapped on which controller's input.

I/O Card Info **Config > Advanced > IO Card Info**



This page is used to visualize the ViZitouch and the IO Card registers by pressing on the blue arrows on the right of the screen. Expansion Cards can also be installed via this page.

Network **Config > Advanced > Network**



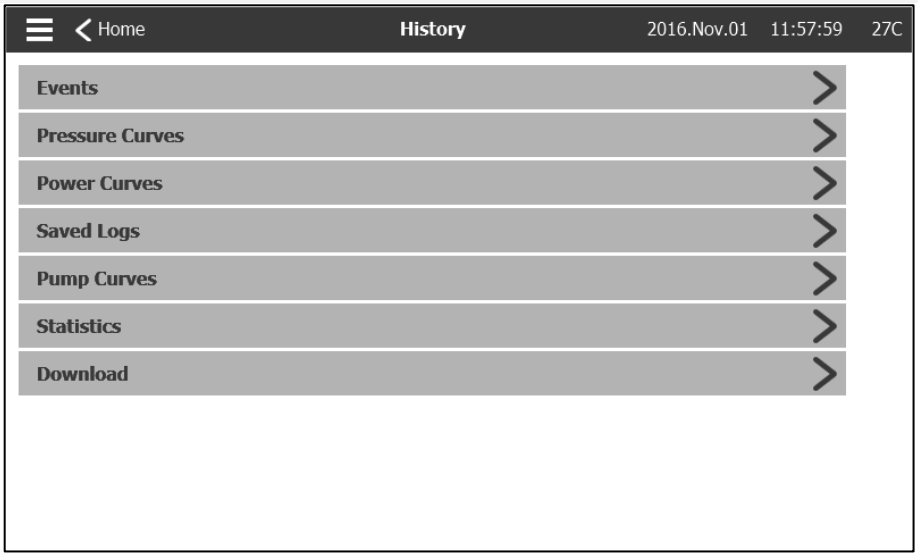
This page displays the IP address, the Subnet Mask, the Default Gateway and the DNS1-2-3 of the controller. All those parameter can be changed manually by checking the box on the upper left corner. To apply the change, press on the blue arrow in the bottom right corner.

Reboot ViZiTouch **Config > Advanced > Reboot ViZitouch**

If this button is pressed, the ViZiTouch will reboot. Any change will be saved.

History 7

History (Menu) **History**



This page is used to access all data related to events, statistics, pressure history, power logs and the downloading of this information via one of the two USB ports.

-Events: This button leads to the “Events” page, which displays the events from the most recent 500 logs. Each event log contains the date and time of occurrence as well as a brief description of the event.

-Pressure/Power Curves: This button leads to the “Pressure Curves” / “Power Curves” page accordingly, which displays all relevant pressure/power information from the most recent 500 logs.

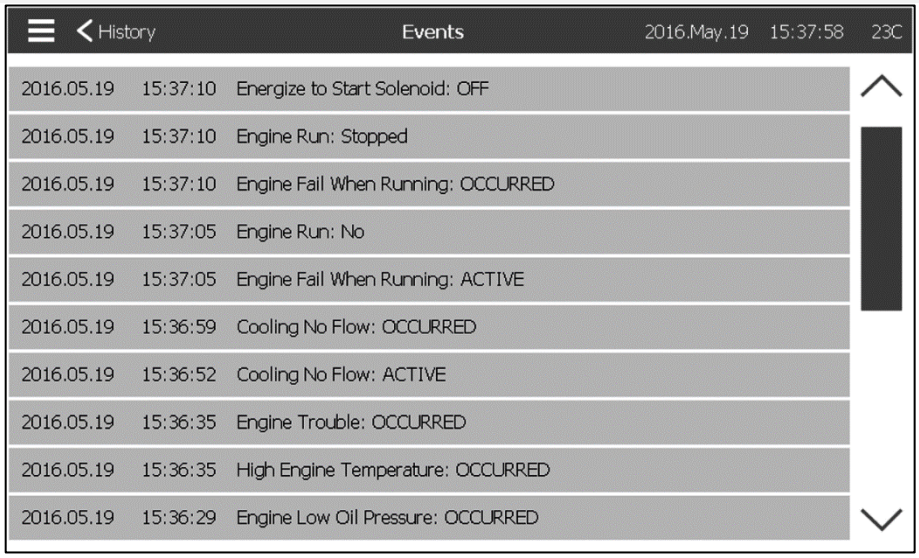
-Saved Logs: This button leads to a page where past logs can be viewed.

-Pump Curve: This button leads to the “Pump Curves” page.

-Statistics: This button leads to the “Statistics” page, which leads to “All Time Statistics”, “First Service Statistics” and “Last Service Statistics” pages.

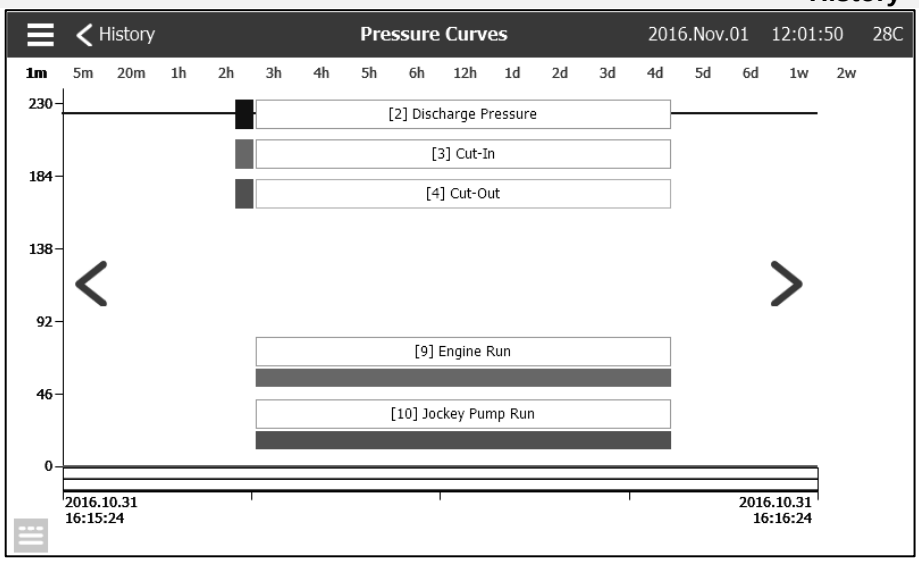
-Download: This button leads to the “Download” page, which allows the user to download information, including the user manual, drawings, logs, statistics and configuration.

Events Page **History > Events**

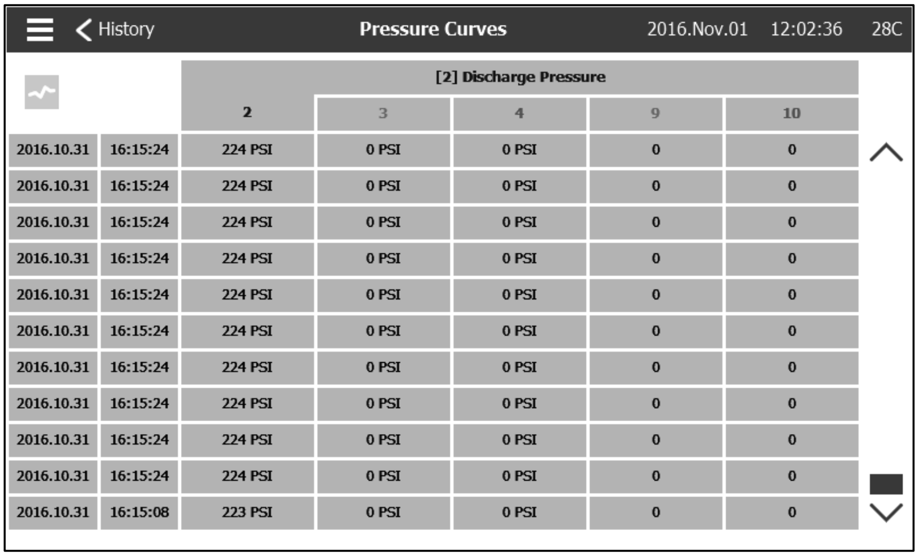


The Events Page shows the events from the last 500 logs which occurred in chronological order. The first column is the date, the second one is the time of occurrence and the third column is the “Event message”. To obtain a log that is older than thoses events, visit the “Saved Logs”.

Pressure Curves **History > Pressure Curves**



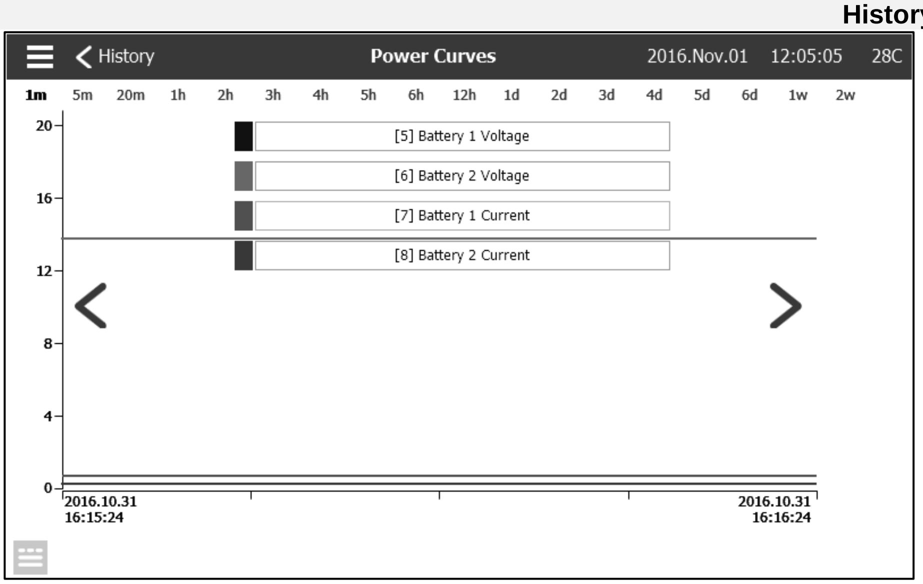
On this page, a graphic of the “System Pressure”, the “Cut-in”, the “Cut-Out”, the main pump “Engine Run” and the “Jockey Pump Run” through time can be viewed. By pressing on the screen, the caption will disappear or will be displayed. The time scale can be changed by pressing the time span desired on top of the screen (from 1 minute to 2 weeks). The blue arrows on both sides of the graphic are used to navigate through time. The blue button in the bottom left corner leads to the table used to generate this graph.



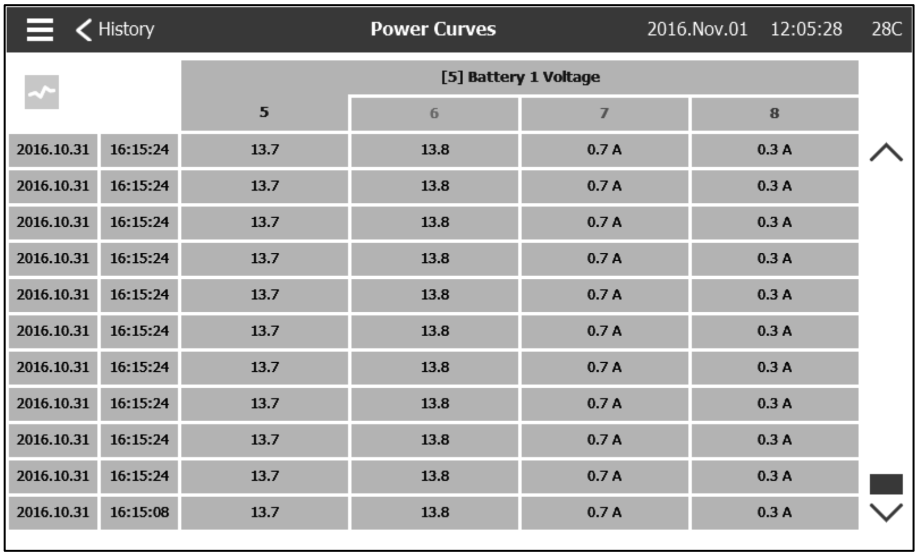
		[2] Discharge Pressure				
		2	3	4	9	10
2016.10.31	16:15:24	224 PSI	0 PSI	0 PSI	0	0
2016.10.31	16:15:24	224 PSI	0 PSI	0 PSI	0	0
2016.10.31	16:15:24	224 PSI	0 PSI	0 PSI	0	0
2016.10.31	16:15:24	224 PSI	0 PSI	0 PSI	0	0
2016.10.31	16:15:24	224 PSI	0 PSI	0 PSI	0	0
2016.10.31	16:15:24	224 PSI	0 PSI	0 PSI	0	0
2016.10.31	16:15:24	224 PSI	0 PSI	0 PSI	0	0
2016.10.31	16:15:24	224 PSI	0 PSI	0 PSI	0	0
2016.10.31	16:15:24	224 PSI	0 PSI	0 PSI	0	0
2016.10.31	16:15:24	224 PSI	0 PSI	0 PSI	0	0
2016.10.31	16:15:08	223 PSI	0 PSI	0 PSI	0	0

This table allows viewing of the exact values used to generate the Pressure Curves with the precise time. Pressing the blue button on the top left corner will return to the graph page.

Power Curves **History > Power Curves**



On this page, a graphic of the “Battery 1 Voltage”, the “Battery 2 Voltage”, the “Battery 1 Current” and the “Battery 2 Current” through time can be viewed. By pressing on the screen, the caption will disappear or will be displayed. The time scale can be changed by pressing the time span desired on top of the screen (from 1 minute to 2 weeks). The blue arrows on both sides of the graphic are used to navigate through time. The blue button in the bottom left corner leads to the table used to generate this graph.

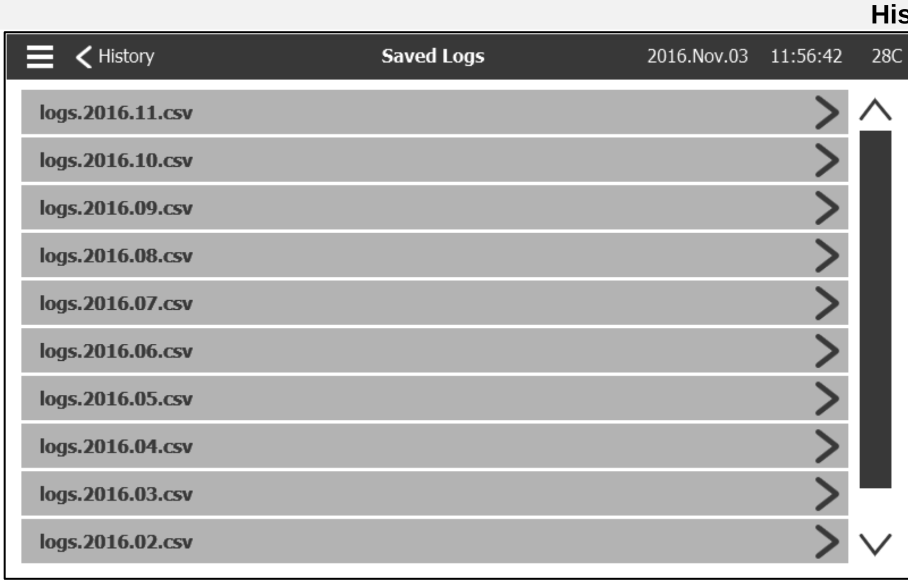


		[5] Battery 1 Voltage			
		5	6	7	8
2016.10.31	16:15:24	13.7	13.8	0.7 A	0.3 A
2016.10.31	16:15:24	13.7	13.8	0.7 A	0.3 A
2016.10.31	16:15:24	13.7	13.8	0.7 A	0.3 A
2016.10.31	16:15:24	13.7	13.8	0.7 A	0.3 A
2016.10.31	16:15:24	13.7	13.8	0.7 A	0.3 A
2016.10.31	16:15:24	13.7	13.8	0.7 A	0.3 A
2016.10.31	16:15:24	13.7	13.8	0.7 A	0.3 A
2016.10.31	16:15:24	13.7	13.8	0.7 A	0.3 A
2016.10.31	16:15:24	13.7	13.8	0.7 A	0.3 A
2016.10.31	16:15:24	13.7	13.8	0.7 A	0.3 A
2016.10.31	16:15:08	13.7	13.8	0.7 A	0.3 A

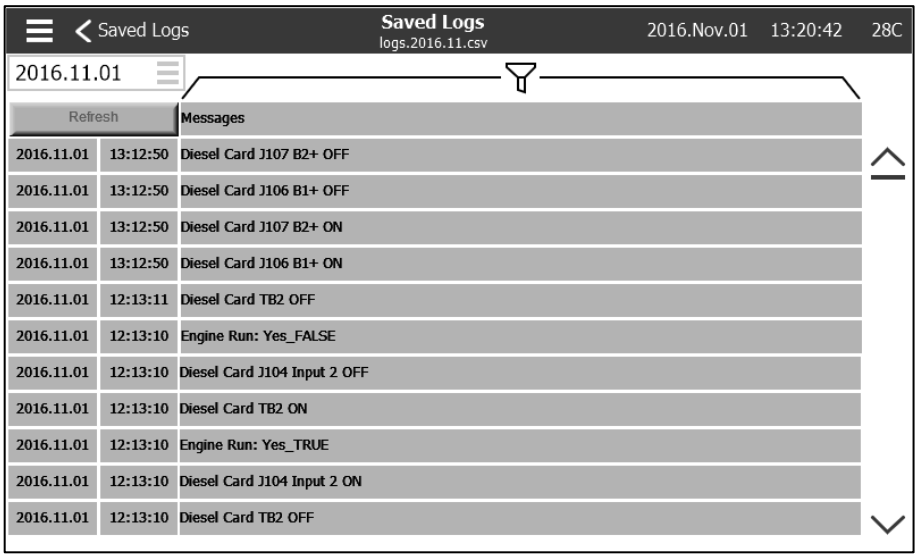
This table allows viewing of the exact values used to generate the Power Curves with the precise time. Press the blue button on the top left corner to return to the graph page.

Saved Logs

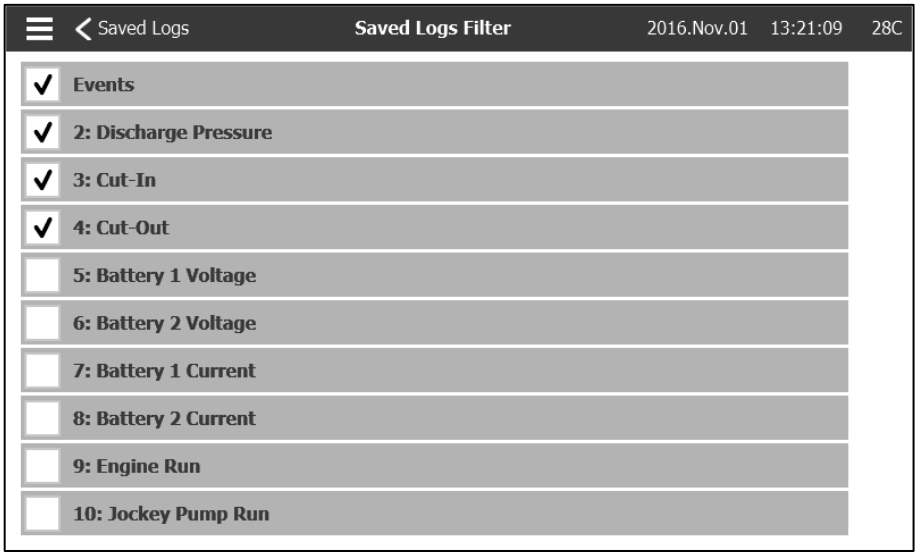
History > Saved Logs



This page is used to access all past log files. Each log file is a CSV file containing the time, the date, the Cut-in, the Cut-out, the system pressure, the battery voltages and currents, the engine run signal, the jockey pump run signal and the log event message. Each file can contain up to 1 MB of data. The month and year is integrated in the title. At the beginning of each month, a new CSV file is created. Each time a CSV file is full, a new one is created with an incremented number in the title. Press on the file to consult this content.



The logs are arranged chronologically. To select the displayed data, press on the filter icon in the top center of the screen.

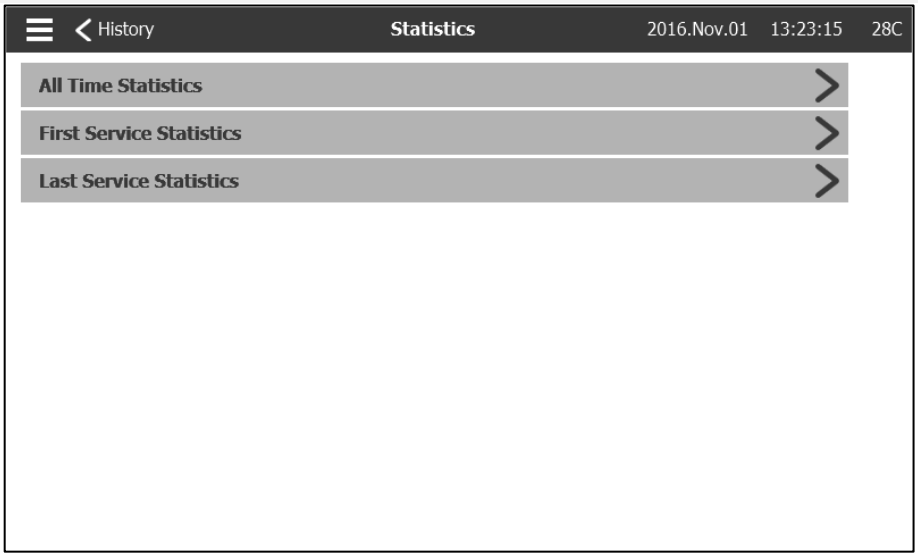


From this page, the selected values will be displayed. Press on “Log File” at the top left of the screen to go back to the logs table.

Pump Curves **History > Pump Curves**

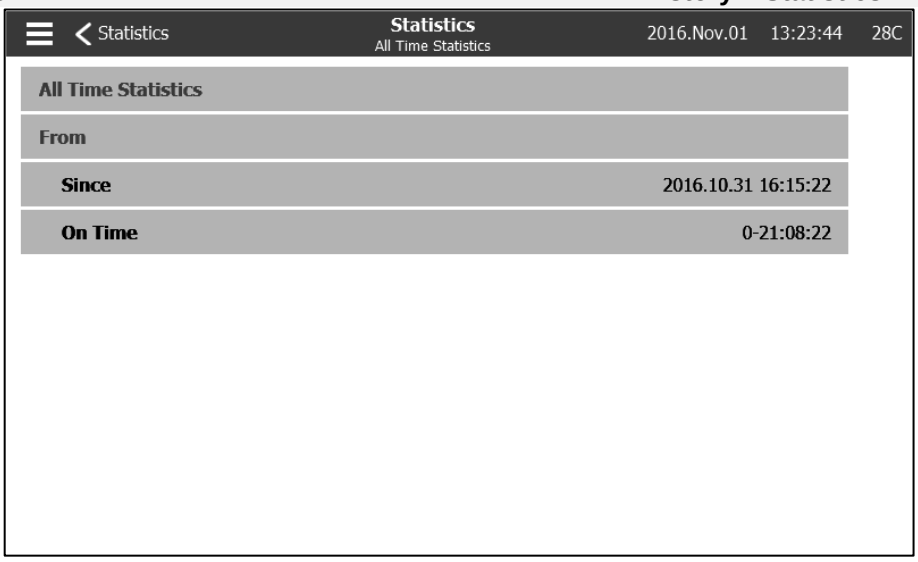
This page is intended to help the customer generate the pump performance curve. In Auto mode, the controller will sample the water flow exiting the pump, the system pressure and the suction at the entrance of the pump. The appropriate sensor has to be installed for this mode to work. Each time the variation of a variable is important enough, the controller will record the values and ring the bell. In manual mode, the user can manually enter the values to generate the pump curve.

Statistic **History > Statistics**



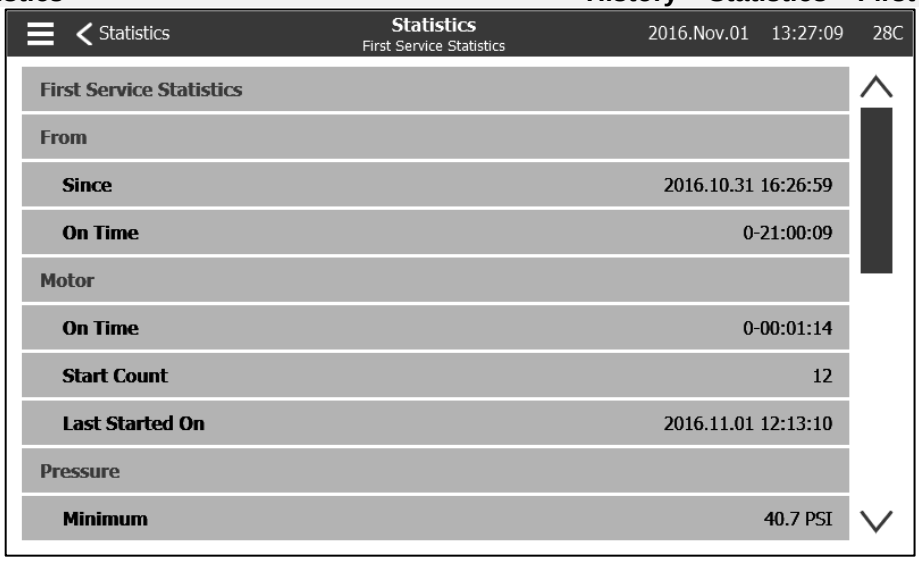
This page leads to 3 other Statistics pages: “All Time Statistics”, “First Service Statistics” and “Last Service Statistics”.

All Time Statistics **History > Statistics > All Time Statistics**



The “All Time Statistics” contains two parameters:
- Since: The date the controller has been powered for the first time.
- On Time: The amount of time the controller has been On for.

First Service Statistics **History > Statistics > First Service Statistics**



This page allows the user to view the “First Setup Statistics”. The parameters are:
From:
- Since: Date of the first setup
- On Time: Time the controller spent On, in DAYS-HOURS:MINUTES-SECONDS

Engine:
- On Time: Time the engine spent On, in DAYS-HOURS:MINUTES-SECONDS
- Start Count: Number of times the engine has started
- Last Started on: Last time the engine started

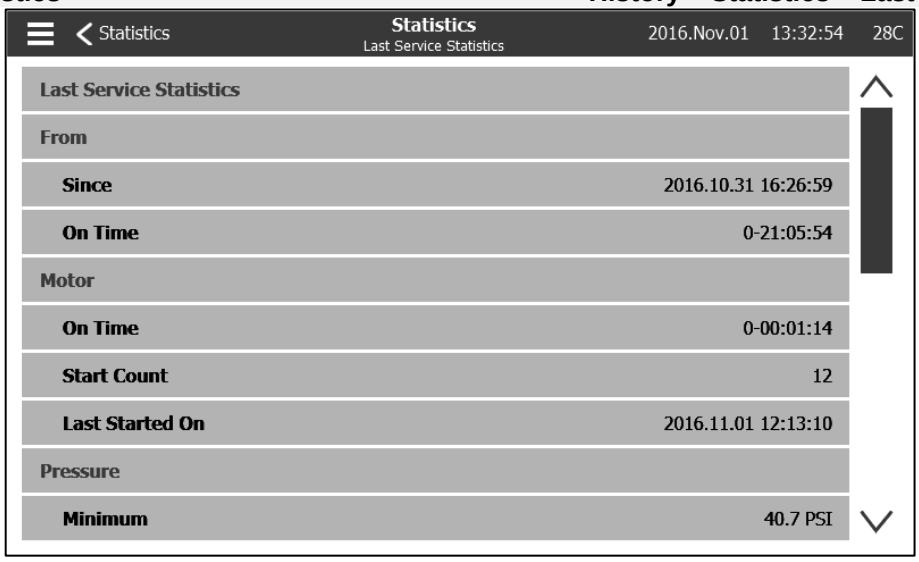
Pressure:
- Minimum: Smallest pressure value
- Minimum Occurred On: Date the smallest value happened
- Maximum: Biggest pressure value
- Maximum Occurred On: Date the biggest value happened
- Average: Average pressure since first start-up

Temperature
- Minimum: Smallest temperature value
- Minimum Occurred On: Date the smallest value happened
- Maximum: Biggest temperature value
- Maximum Occurred On: Date the biggest value happened
- Average: Average temperature since first start-up

Jockey Pump Running
- On Time: Time the Jockey Pump spent On, in DAYS-HOURS:MINUTES-SECONDS
- Start Count: Number of times the Jockey Pump has started
- Last Started On: Last time the Jockey Pump started

Last Service Statistics

History > Statistics > Last Service Statistics



This page allows the user to view the “Last Setup Statistics”. The parameters are the same as the ones from the “First Setup Statistics” page but from the “Last Service”.

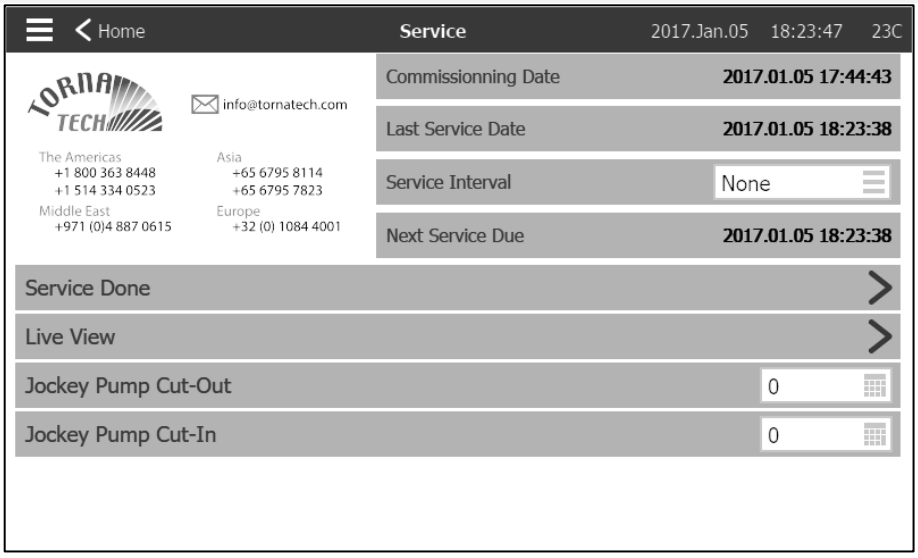
Download

History > Download

This page is used to download Statistics, PCB information, name plate information, logs, the manual, the factory settings and the current settings. A USB key needs to be inserted in the USB slot prior to entering this page in order to download.

Service 8

Service



Informations on how to reach technical support, concerning the commissioning date, the last service date and the next service due date is available on this page. It is the client responsibility to make sure that the proper maintenance is done on the controller. A reminder for the “Service” can be selected from these options: OFF, ½ year, 1 year, 1 ½ years, 2 years and 3 years. The next service will be determined using the last service and the chosen service interval. This service must be done by an accredited technician.

A proper password must be enter for the “Service Done” button to be available. This button should only be pressed by an authorized person after a completed service.

The “Live View” page is where the user can grant or refuse the remote access demands.

The “Nameplate Information” page contains all the information found on the nameplate.

The Jockey Pump Cut-Out and Cut-In can be set on this page.

It is possible to install a custom Service card on this page. Contact Tornatech for more information.

Download Manuals 

Pressing on the question mark will redirect to the download page. A pdf version of the manual can be downloaded on an USB device.

Language 10

The language displayed on the ViZiTouch can be selected on this page.

How to Test:

Charger 1 Fail
Unpower the charger 1 by putting the circuit breaker in the off position.

Charger 2 Fail
Unpower the charger 2 by putting the circuit breaker in the off position.

DC Failure
Switch Circuit Breaker 3 (CB3) and Circuit Breaker 4 (CB4) in Off position or disconnect #6 and #8 engine wires (See drawing for more details).

Faulty Pressure Transducer
Disconnect the Pressure Transducer. Depending on your sensor type, put a jumper between positive pin (left) or negative pin (right) and signal pin (middle) of this connector (See drawing for more details).

Weekly Test Check Solenoid Valve
Disconnect the Solenoid Valve. Switch the HOA selector switch to the Auto position. Press the Run Test button (Yellow button on the membrane). Wait until the test ends. (Note: The engine will start.)

Controller Trouble
To activate this common alarm, at least one of the following alarms must be active: Charger Failure 1, Charger Failure 2, DC Failure, Faulty Pressure Transducer or Weekly Test Check Solenoid Valve.

Low Fuel Level
Put a jumper between Low Fuel Level input and ground (See drawing for more details).

High Fuel Level
Put a jumper between High Fuel Level input and ground (See drawing for more details).

Fuel Tank Leak
Put a jumper between Fuel Tank Leak input and ground (See drawing for more details).

AC Failure
Make sure both batteries are connected and all circuit breakers are in the ON position. Switch the disconnect switch to "OFF" position.

Low Ambient Temperature
You need to be logged in to modify these settings. Go to Config>Advanced>Alarms>Low Ambiant Temp. Change the Low Ambiant Temperature setpoint to the maximum allowable.

High Ambient Temperature
You need to be logged in to modify these settings. Go to Config>Advanced>Alarms>High Ambiant Temp. Change the High Ambiant Temperature setpoint to the minimum allowable.

Low Suction Pressure
Disconnect Suction Pressure connector. Depending of your sensor type, put a jumper between positive pin (left) or negative pin (right) and signal pin (middle) of this connector (See drawing for more details). Start the engine.

Water Reservoir Empty
Put a jumper between Water Reservoir Empty input and ground (See drawing for more details).

High Water Level
Put a jumper between High Water Level input and ground (See drawing for more details).

Water Reservoir Low
Put a jumper between Water Reservoir Low input and ground (See drawing for more details).

Pump Room Alarm
To activate this common alarm, at least one of the following alarms must be active: Low Fuel Level, High Fuel Level, Fuel Tank Leak, AC Fail, Low Ambient Temperature, High Ambient Temperature, Low Suction Pressure, Water Reservoir Empty, High Water Level or Water Reservoir Low.

Fail to Start
Disconnect #1, #9, #10 and #12 engine wires (See drawing for more details). Start the cranking sequence (Example: Remove Remote Automatic Start jumper). Wait until the cranking sequence ends.

Overspeed
If your engine has an overspeed switch, switch it to the ON position. If not, disconnect #3 engine wire (See drawing for more details) and put a jumper between #3 and #6. (Note: You don't need to start the engine to activate this alarm.)

Electronic Control Module Selector Switch in Alternate Position (301)
Disconnect #301 engine wire. Put a jumper between #301 input and ground (See drawing for more details).

Fuel Injection Malfunction (302)
Disconnect #302 engine wire. Put a jumper between #302 input and ground (See drawing for more details).

Electronic Control Module Warning (303)
Disconnect #303 engine wire. Put a jumper between #303 input and ground (See drawing for more details).

Electronic Control Module Fault (304)
Disconnect #304 engine wire. Put a jumper between #304 input and ground (See drawing for more details).

Low Engine Temperature (312)
Disconnect #312 engine wire. Put a jumper between #312 input and ground (See drawing for more details).

Low Oil Pressure
Disconnect #4 engine wire (See drawing for more details). Put a jumper between #4 and ground. Start the engine.

High Engine Temperature
Disconnect #5 engine wire (See drawing for more details). Put a jumper between #5 and ground. Start the engine.

Battery 1 Failure
Disconnect #6 engine wire (See drawing for more details).

Battery 2 Failure
Disconnect #8 engine wire (See drawing for more details).

Weak Battery 1
You need to be logged in to modify these settings. Go to Config>Advanced>Alarms>WeakBattery1. Change the Weak Battery 1 setpoint to the maximum allowable.

Weak Battery 2
You need to be logged in to modify these settings. Go to Config>Advanced>Alarms>WeakBattery2. Change the Weak Battery2 setpoint to the maximum allowable.

Battery 1 Overvoltage
You need to be logged in to modify these settings. Go to Config>Advanced> Alarms>Battery1Overvoltage. Change the Overvoltage Battery 1 setpoint to the minimum allowable.

Battery 2 Overvoltage
You need to be logged in to modify these settings. Go to Config>Advanced> Alarms>Battery2Overvoltage. Change the Overvoltage Battery 2 setpoint to the minimum allowable.

Loss of Continuity 1
Disconnect #9 engine wire (See drawing for more details). Wait 1-2 minutes.

Loss of Continuity 2
Disconnect #10 engine wire (See drawing for more details). Wait 1-2 minutes

Underpressure
You need to be logged in to modify these settings. Go to Config>Advanced> Alarms>Underpressure. Change the Underpressure setpoint to the maximum allowable.

Overpressure
You need to be logged in to modify these settings. Go to Config>Advanced> Alarms>Overpressure. Change the Overpressure setpoint to the minimum allowable.

Low Pneumatic Pressure
Put a jumper between the Low Pneumatic Pressure input and ground (See drawing for more details). Take note that this alarm will stop the pneumatic cranking sequence.

Engine Trouble
To activate this common alarm, at least one of the following alarms must be active: Fail to start, Overspeed, Electronic Control Module Selector Switch in Alternate Position (301), Fuel Injection Malfunction (302), Electronic Control Module Warning (303), Electronic Control Module Fault (304), Low Engine Temperature (312), Low Oil Pressure, High Engine Temperature, Battery 1 Failure, Battery 2 Failure, Loss of Continuity 1, Loss of Continuity 2, Overpressure or Low Pneumatic Pressure

Low Spare Temperature
Disconnect the Spare Temperature connector. Depending of your sensor type, put a jumper between positive pin (left) or negative pin (right) and signal pin (middle) of this connector (See drawing for more details).

WT CI Not Reached
You need to be logged in to modify these settings. Go to the Config page. Change Cut-In to 0. Press Run Test button (Yellow button of the membrane). Wait until the test ends.

Flow Start
Put a jumper between the Flow Start input and ground (See drawing for more details).

Cooling No Flow
Put a jumper between the Cooling No Flow input and ground (See drawing for more details).

Flow Meter On
Put a jumper between the Flow Meter On input and ground (See drawing for more details).

Engine Fail When Running
Start the engine. Depending of your engine type, disconnect #1 or put a jumper between #12 and #6 to stop the engine. (See drawing for more details).

IO Diesel Communication Error
Press Reset button of the Diesel IO Board (Small button close to the phone jack)

IO Expansion 1 Communication Error
Press the Reset button of the Expansion 1 IO Board (Small button close to the phone jack)

IO Expansion 2 Communication Error
Press the Reset button of the Expansion 2 IO Board (Small button close to the phone jack)

IO Expansion 3 Communication Error
Press the Reset button of the Expansion 3 IO Board (Small button close to the phone jack)

IO Expansion 4 Communication Error
Press the Reset button of the Expansion 4 IO Board (Small button close to the phone jack)

Low Pump Room Temperature
Put a jumper between Low Pump Room Temperature input and ground (See drawing for more details).

Main Relief Valve Open
Put a jumper between Main Relief Valve Open input and ground (See drawing for more details).

Pump on Demand
Open the pressure line to simulate a pressure drop. The engine will start and the Pump On Demand warning will appear.

Invalid Cut-In
You need to be logged in to modify these settings. Go to the Config page. Change the Cut-In to 0. (Note: The engine will start.)

Pneumatic Fail to Start
Disconnect the TB6 relay connector. Disconnect #1, #9, #10 and #12 engine wires (See drawing for more details). Start cranking sequence (Example: Remove Remote Automatic Start jumper). Wait until the cranking sequence ends.

Hydraulic Fail to Start
Disconnect the TB6 relay connector. Disconnect #1, #9, #10 and #12 engine wires (See drawing for more details). Start cranking sequence (Example: Remove Remote Automatic Start jumper). Wait until the cranking sequence ends.

Patents

Country	Title	Grant No
CA	Mechanical activator for contactor	2741881
US	Mechanical activator for contactor	US8399788B2
CA	Mechanical activator for electrical contactor	165512
CA	Mechanical activator for electrical contactor	165514
US	Mechanical activator for electrical contactor	D803794
US	Mechanical activator for electrical contactor	Patent pending
EP	Mechanical activator for electrical contactor	002955393-0001/2
AE	Mechanical activator for electrical contactor	Patent pending
AE	Mechanical activator for electrical contactor	Patent pending
CA	Fire pump digital operator	163254
US	Fire pump digital operator interface	D770313
AE	Fire pump digital operator interface	Patent pending
EP	Fire pump digital operator interface	002937250-0001
CA	System and method for detecting failure in a pressure sensor of a fire pump system	Patent pending
US	System and method for detecting failure of a pressure sensor in a fire pump system	Patent pending

TORNATECH MODEL GPD DIESEL FIRE PUMP CONTROLLER
PRE- FIELD ACCEPTANCE TEST
CHECK LIST

Note: This document should be an official indication of whether or not the installation and general condition of the equipment is adequate for a field acceptance test. This document should also aid the individual responsible for executing the field acceptance test to decide whether or not to carry out the field acceptance test of the equipment.

Installation Check List:		**YES**	**NO**
1	Verify that the nameplate voltages of the Fire Pump Controller corresponds with the AC voltage available and the DC starting voltage of the engine.		
2	Visual inspection for any damage to the exterior of the Fire Pump Controller. Make sure the enclosure, alarm bell, selector switch, membrane and display are not damaged.		
3	Verify that the Fire Pump Controller has been installed within sight of the pump and engine or motor.		
4	Verify that the Fire Pump Controller has been installed not less than 12 inches from the floor of the mechanical room.		
5	Verify that all electrical connections to the Fire Pump Controller are done using liquid tight conduit and connectors.		
6	With the Fire Pump Controller door open, visually inspect for any drill chips, dirt or foreign objects in the bottom of the enclosure, loose wires, broken components and general proper electrician workmanship.		
7	Verify that the correct AC voltage is supplied to the controller by taking a voltage reading at the L1 & N (120V) or L1 & L2 (220-240) terminals.		
8	Verify that the terminal connections between the Fire Pump Controller and the engine (1 to 12 and 301,302,303,304,305,310,311,312) are properly done.		
9	Verify that wiring to terminals #6, #8 (batteries) and #11 (ground) are of the appropriate gauge size. See label inside controller.		
10	Verify proper grounding of the Fire Pump Controller.		
Initial Power-Up Check List:		**YES**	**NO**
1	Verify that the selector switch is in the “OFF” position		
2	With the Fire Pump Controller door open, turn to “ON” the circuit breakers CB3 and CB4 (DC) then CB1 and CB2 (AC), then IS1. This sequence is very important.		
3	Close the Fire Pump Controller door. Verify on the ViZiTouch Homepage that the correct battery voltage appears.		
4	Place the selector switch in the “HAND” position. Verify that no alarms are displayed on the screen.		
5	Place the selector switch in the “AUTO” position. Verify that no alarms are displayed on the screen.		
Manual and Automatic Start Check List:		**YES**	**NO**
1	Place the selector switch in the “Hand” position.		
2	Verify the starting of the engine by pressing the “Battery # 1 Manual Crank” membrane button.		
3	Stop the engine by placing the selector switch to the “OFF” position.		
4	Verify the starting of the engine by pressing the “Battery # 2 Manual Crank” membrane button.		
5	Stop the engine by placing the selector switch to the “OFF” position.		
6	Set the Cut-Out and Cut-In settings by following the ViZiTouch documentation. You need to be logged in to modify these settings. Verify the automatic start by dropping the system pressure below the Cut-In setting.		
7	Stop the engine by pressing the “Stop” pushbutton. Note: The engine will only stop if the system pressure is above the Cut-Out setting.		

Tornatech Controller S/N: _____

Installation address: _____

_____

_____

Check list completed? _____Yes _____ No

Check list completed by: _____

Company: _____

Date: _____

Witnessed By: _____

Comments: _____

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TORNATECH MODEL GPD
DIESEL ENGINE FIRE PUMP CONTROLLER
FIELD ACCEPTANCE TEST REPORT

Note: This document is the Tornatech official Field Acceptance Test report which follows the latest NFPA 20 requirements of article 14.2.6 Controller Acceptance Test pertinent to diesel engine driven fire pump controllers. Tornatech strongly recommends that a pre-field acceptance verification (Tornatech document GPD-PREFAT-001-E Pre-Field Acceptance Test Check List) be completed before this official field acceptance test.

Complete this first section if it was not completed during the Pre-Field Acceptance test

Manual and Automatic Start Check List:		**YES**	**NO**
1	Place the selector switch in the “Hand” position.		
2	Verify the starting of the engine by pressing the “Battery # 1 Manual Crank” membrane button.		
3	Stop the engine by placing the selector switch to the “OFF” position.		
4	Verify the starting of the engine by pressing the “Battery # 2 Manual Crank” membrane button.		
5	Stop the engine by placing the selector switch to the “OFF” position.		
6	Set the Cut-Out and Cut-In settings by following the ViZiTouch documentation. You need to be logged in to modify these settings. Verify the automatic start by dropping the system pressure below the Cut-In setting.		
7	Stop the engine by pressing the “Stop” pushbutton. Note: The engine will only stop if the system pressure is above the Cut-Out setting.		
Battery # 1		**YES**	**NO**
1	3 manual starts		
2	3 automatic starts		
3	1 RUN TEST start		
4	1 remote/deluge valve start		
5	Start and Run the engine at full speed after 1 crank cycle		
Battery # 2		**YES**	**NO**
1	3 manual starts		
2	3 automatic starts		
3	1 RUN TEST start		
4	1 remote/deluge valve start		
5	Start and Run the engine at full speed after 1 crank cycle		
Visual/Audible Alarm Verification		**YES**	**NO**
1	Battery failure: - On the terminal strip, disconnect wire #6 for battery1. Wait for the alarm, then reconnect the wire. - On the terminal strip, disconnect wire #8 for battery2. Wait for the alarm, then reconnect the wire. - Audible and visual alarm will appear for battery failure and controller trouble. Note: it is important to return the wires back to their original place and reset the alarms in order to continue the tests.		
2	Charger failure: - Switch either circuit breaker #1 (CB1) or circuit breaker #2 (CB2) to the OFF position to test either charger. - Audible and visual alarm will appear for charger failure and controller trouble Warning: Do not switch both CB1 and CB2 off at the same time. Note: it is important to return the circuit breaker back to its original position and reset the alarms in order to continue the tests.		
3	Engine high coolant temperature: - Start the engine either manually or automatically. - With the engine running, place a jumper between terminals 5 & 11 or simulate high coolant signal coming from the engine. - If the engine was started manually, a visual and audible alarm will be present and		

	the engine will not shutdown. To shutdown, turn the selector switch to the OFF position. - If the engine was started automatically, a visual and audible alarm will be present and the engine will not shutdown. To shutdown, turn the selector switch to the OFF position. - Note: Please remove the jumpers and reset the alarm in order to continue to the next simulation.		
4	Engine low oil pressure: - Start the engine either manually or automatically. - With the engine running, place a jumper between terminals 4 & 11 or simulate engine low oil pressure from the engine. The alarm will annunciate after 8 seconds. - If the engine was started manually, a visual and audible alarm will be present and the engine will not shutdown. To shutdown, turn the selector switch to the OFF position. - If the engine was started automatically, a visual and audible alarm will be present and the engine will not shutdown. To shutdown, turn the selector switch to the OFF position. Note: Please remove the jumpers and reset the alarm in order to continue to next simulation.		
5	Engine Overspeed: - Start the engine either manually or automatically. - With the engine running, place a jumper between terminals 6 & 3 or simulate overspeed from the engine. - An audible and visual alarm will be present and the engine will shutdown whether it was started manually or automatically. Note: Please remove jumpers and reset the alarm in order to continue to next simulation. Note: The speed switch must be reset on the engine itself.		
6	Engine fail to start: - At the terminal strip, disconnect wires #9 and #10 - Place the controller selector switch to Auto and initiate automatic engine start or start engine by pressing the Run Test Button The controller will go through its cranking cycle as follows: - 15 second cranking from battery #1 - 15 second rest - 15 second cranking from battery #2 - 15 second rest - This cycle will repeat itself three times per battery, hence six times. - Audible and visual alarm for engine fail to start will appear. - Switch the engine control panel back to OFF position and reset the alarm.		
7	Stop the engine by pressing the “Stop” pushbutton. Note: The engine will only stop if the system pressure is above the Cut-Out setting.		

Field Settings:

Cut-Out Pressure: _____

Cut-In Pressure: _____

Minimum run period timer activated?

Yes: _____ Set at _____minutes. No: _____

Sequential Start Timer?

Yes: _____ Set at _____seconds. No: _____

Weekly Test Enabled?

Yes: _____ Start (date and time) _____ No: _____

Stop (date and time) _____

Alarm Contacts Connections:

Selector switch in OFF or HAND connected? _____Yes _____ No

Engine Run connected? _____Yes _____ No

Engine Trouble connected? _____Yes _____ No

Controller Trouble connected? _____Yes _____ No

Other contacts supplied and connected?
Yes: _____
No: _____

Tornatech Controller S/N: _____

Installation address: _____

_____

Field Acceptance Test completed? _____Yes _____ No

Field Acceptance completed by: _____

Company: _____

Date: _____

Witnessed By: _____

Company: _____

The undersigned witness has been made aware of the NFPA20 article 14.4 Periodic Inspection, Testing and Maintenance which stipulates that “Fire pumps shall be inspected tested and maintained in accordance with NFPA25 – Standard for the Inspection, Testing and Maintenance of Water Based Fire Protection Systems”
Comments: _____

_____

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_____

_____

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