



TORNATECH

LISTEN DEVELOP LEAD

**INSTALLATION AND MAINTENANCE MANUAL FOR
DIESEL ENGINE FIRE PUMP CONTROLLERS
MODEL GFD**



Table of Contents

-  1. Introduction
-  2. Installation
-  3. Main Features
-  4. Home
-  5. Alarms
-  6. Configuration
-  7. History
-  8. Technical Documents



Table of Contents

Introduction.....	5
Types of Diesel Engine Fire Pump Controllers	5
Methods of Starting/Stopping	5
Installation	7
Location.....	7
Mounting	7
Storage.....	7
Wiring and Connections	7
Water Connections.....	7
Electrical Wiring	8
Electrical Connections.....	8
Energy Consumption.....	8
Sizing.....	8
Incoming Power Connections	8
Circuit protection	8
Terminal Strip Descriptions	9
Quick Start-Up Guide	10
Main Features	19
The ViZiTouch	19
Alarm Bell	20
First Setup	20
Home.....	21
Home (Membrane button)	21
Screen Saver	23
Alarms	24
Alarms (Membrane button)	24
Configuration	28
Config (Membrane button)	28
NumPad Page.....	29
Date and Time Page	29
User Login Page / KeyPad Page	30
Advanced Configuration Page	31
Details of the Advanced Configuration Page	31
Volt-Current Calibration.....	31
Timers Page.....	33
Inputs/Outputs Configuration	34
Inputs/Outputs Expansion board 1-2-3-4.....	35
Update Program Page	36
Factory Settings	37
Reset to Factory Settings Page	38

The Sensors Pages.....	38
Interlock Lockout	41
History	43
History (Membrane button)	43
Details of the History Page	44
Events Page	44
Download to USB Device.....	44
The Statistics.....	46
All Time Statistics.....	46
Pressure Curves	46
Graphical Mode.....	46
Textual Mode	47
Technical Documents.....	48

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: GFD-12-120

Model Prefix: GFD

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

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 2016 Edition). The controller is intended to be installed in accordance to NFPA 20-2016 and

in the USA	National Electrical Code NFPA 70
In Canada	Canadian Electrical Code, Part 1
Others	Local Electrical Codes

This controller can be used with non-approved engine, using the optional control by analog senders (Magnetic pickup, oil pressure and engine temperature senders, all shown using on-screen gauges on the ViZiTouch. Find more information on the senders section of this manual.

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 IP55. 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.

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

Sizing

Wiring between controller and engine (terminals 301,302,303,304,305,310,311,312,2,3,4,5) must be stranded #14AWG as minimum.

Wiring between controller and engine (terminals 1,9,10,12) must be stranded #10AWG as minimum.

Wiring between controller and engine (terminals 6,8,11) must be stranded #8AWG as minimum.

Power supply wiring must be stranded #14 AWG as minimum.

Incoming power supply terminals are sized for #16 to #6 AWG wire.

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.

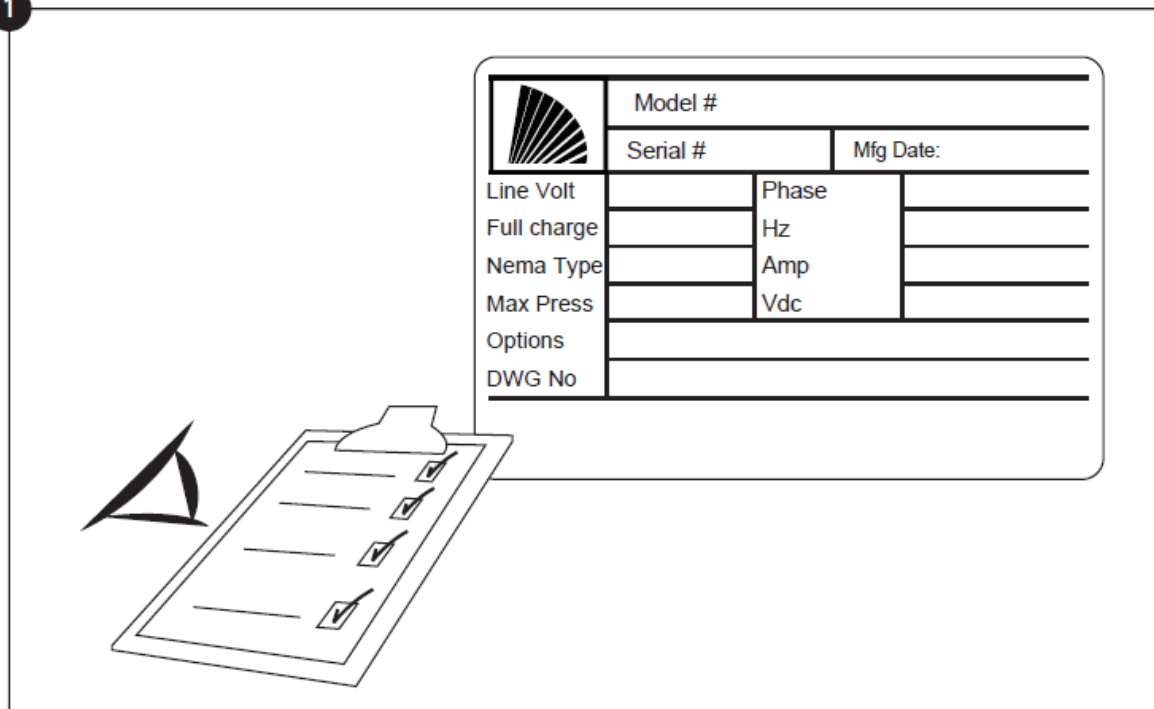
Circuit protection

CB1 protects battery charger 1 and charger 2, and allows the AC power to be disconnected from the battery chargers. CB2 protects control circuit from battery 1 and CB3 protects 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.

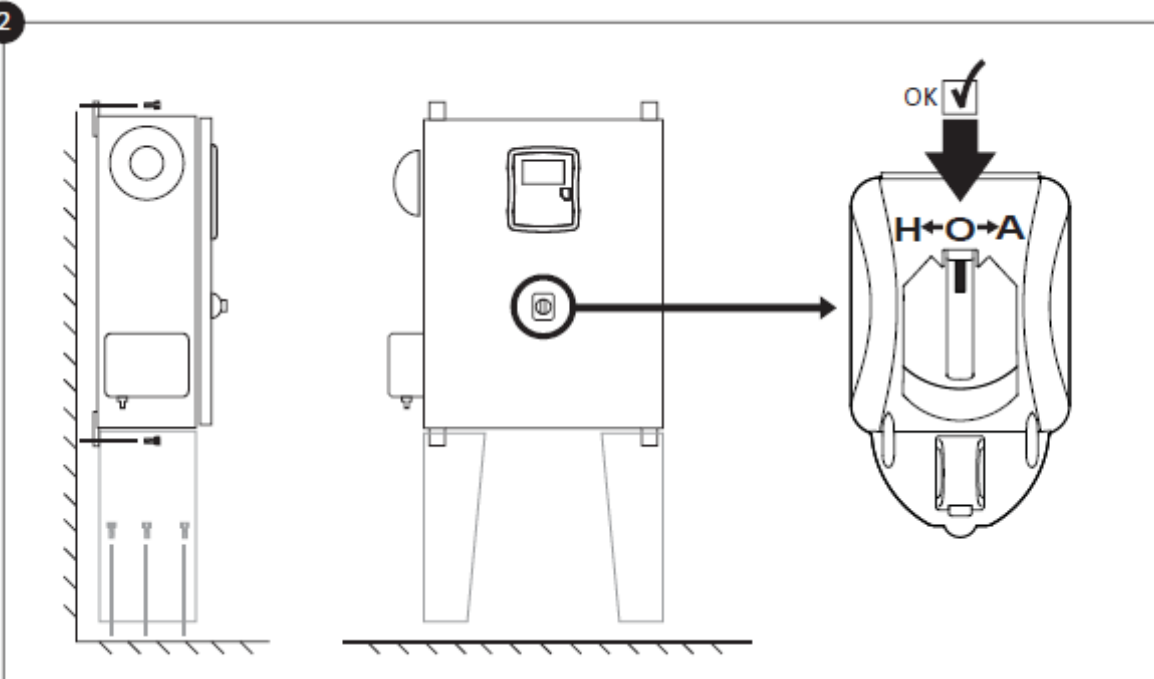
Quick Start-Up Guide

1

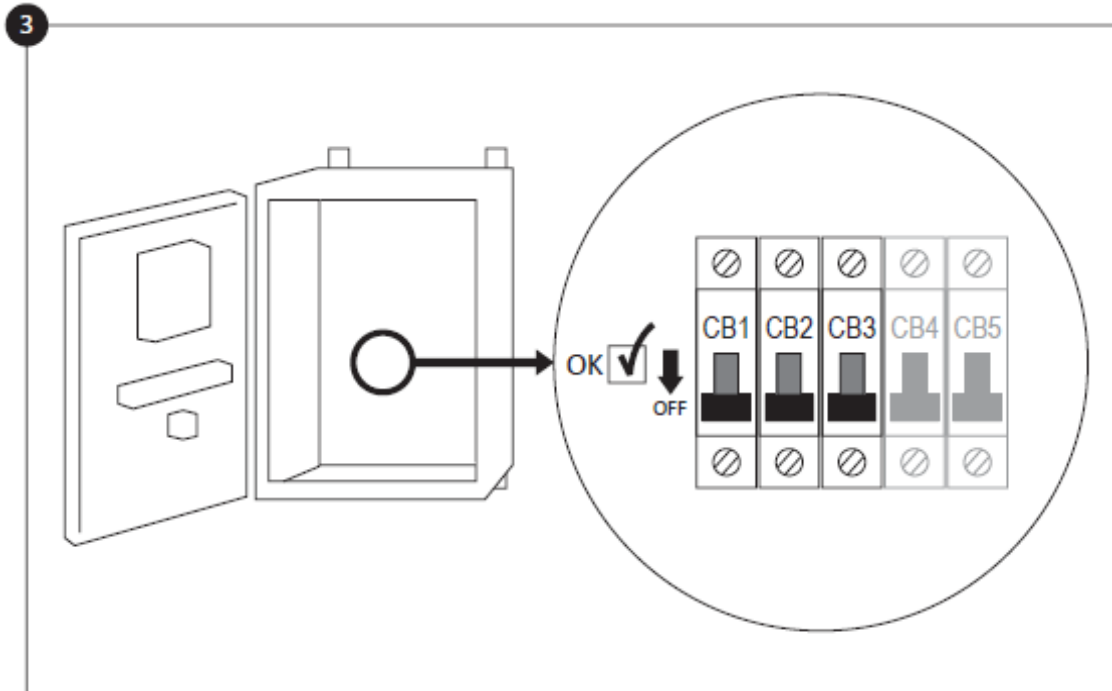


The rating label is the most important label. It must be read carefully to ensure the compatibility between the controller and the installation.

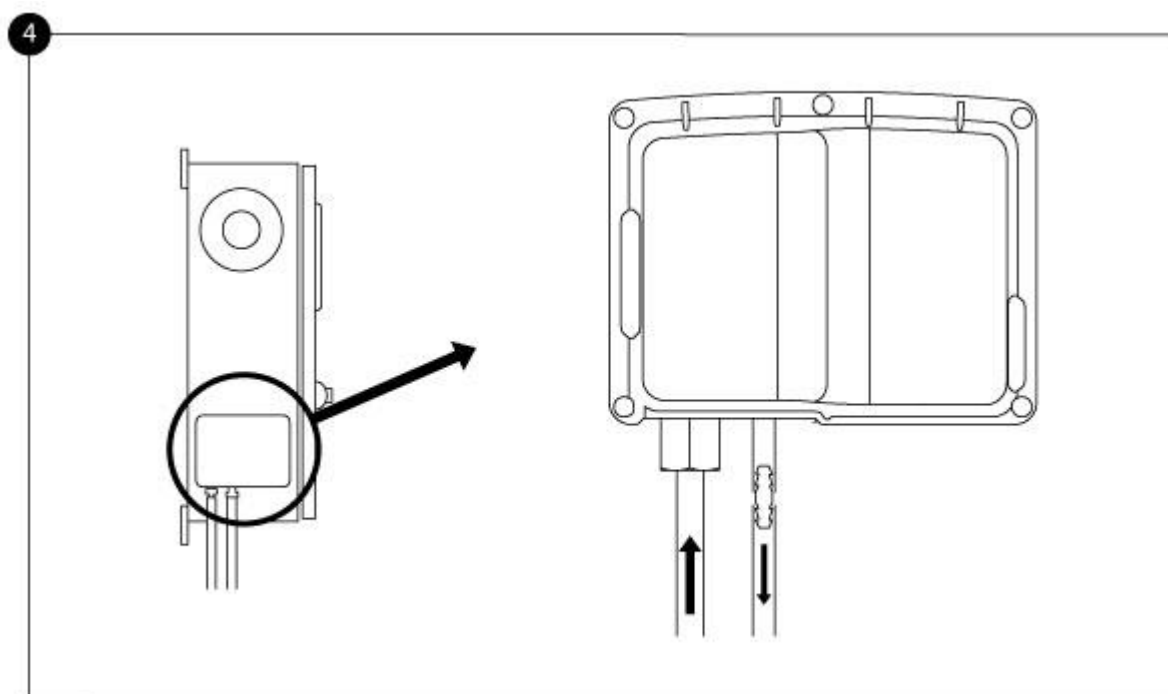
2



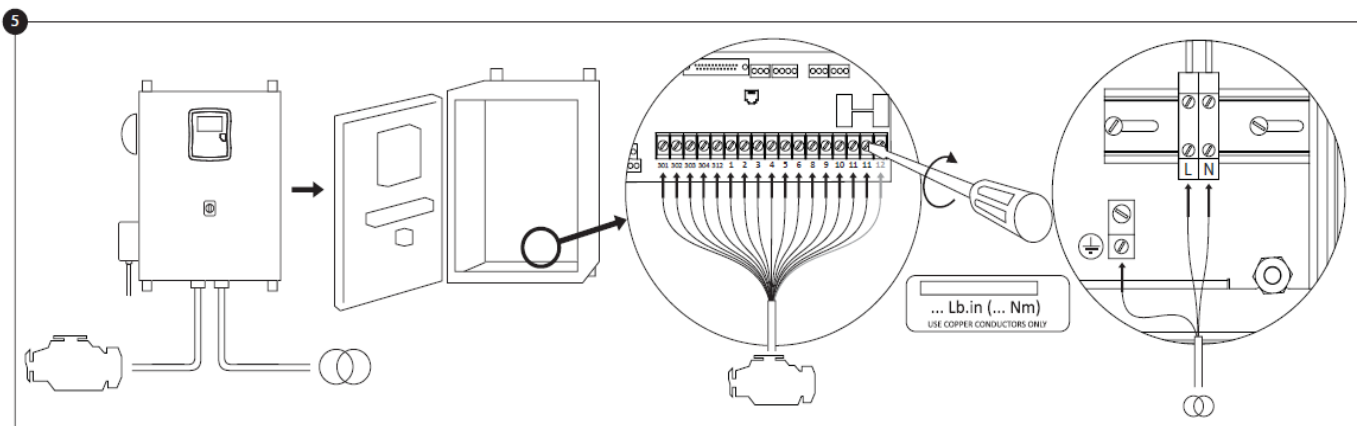
Verify that the controller is installed securely to the wall, or on the mounting stand (optional). Verify the Main Selector Switch is in the "OFF" position. This selector switch is also called the "HOA" and can be placed in 3 positions: "H" Hand/Manual, "O" OFF, "A" Automatic.



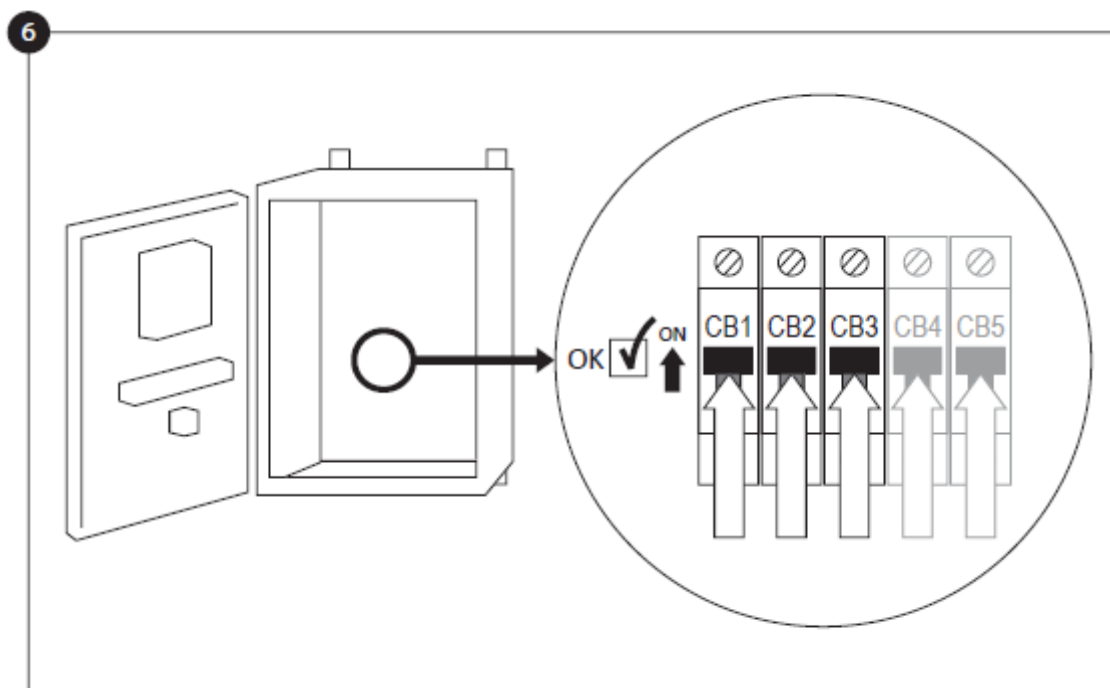
Open the controller's door and verify all circuit breakers are in the lower "OFF" position.



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.

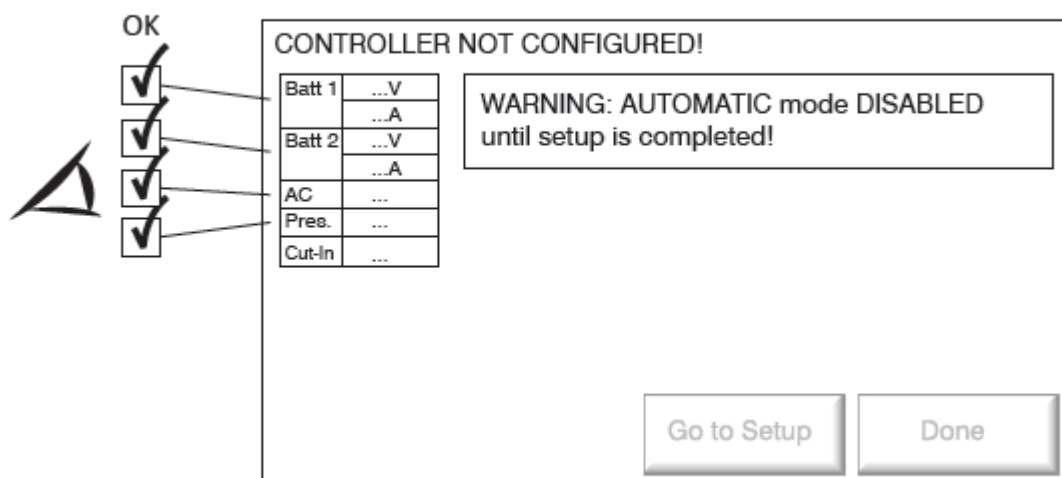


Connect all engine cables between the control panel and the controller engine terminals (Identified as “S” on the IO board diagram that is displayed in the Terminal Strip Descriptions in the manual). Secure with the appropriate torque as indicated on the torque label and verify all connections. Connect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



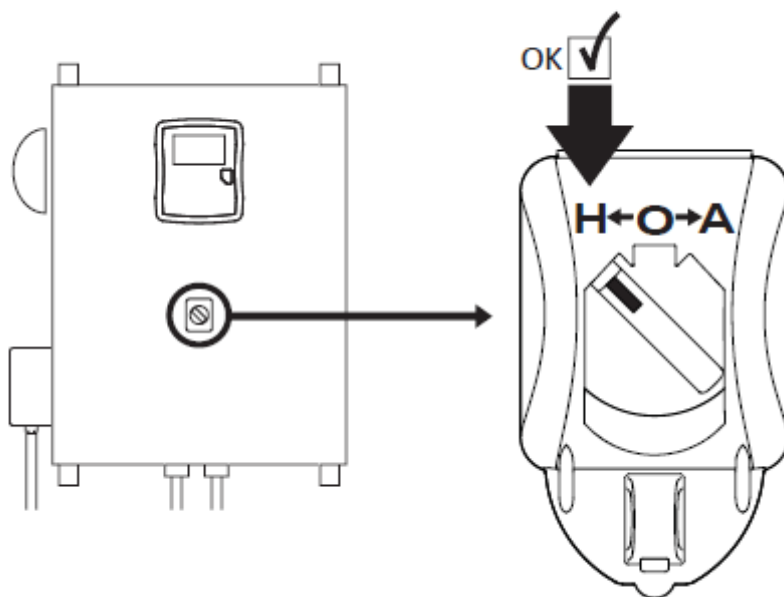
Activate the disconnect switch (if present) and all breakers by setting them to the "on" position. The controller will boot up for the first time.

7



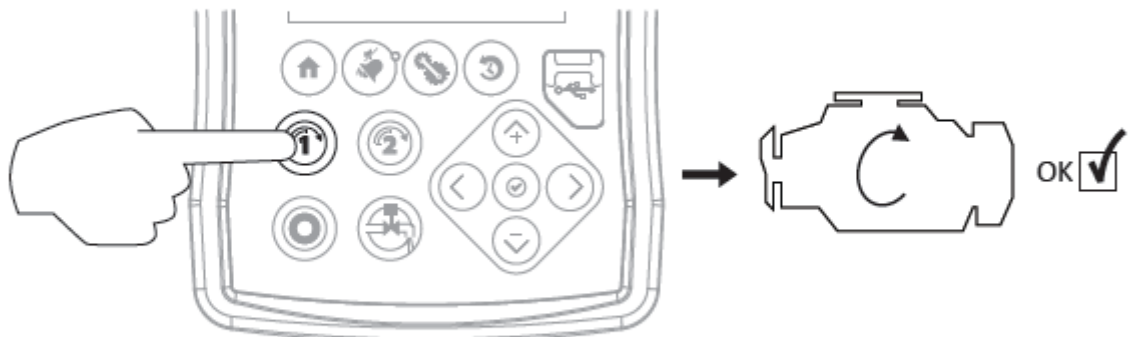
The “First Setup” page replaces the Homepage until the “First Setup” is done. Verify that the controller reads the batteries voltage and current. Verify the “AC” is “OK” and not “FAIL”. Verify that the pressure reading is correct.

8



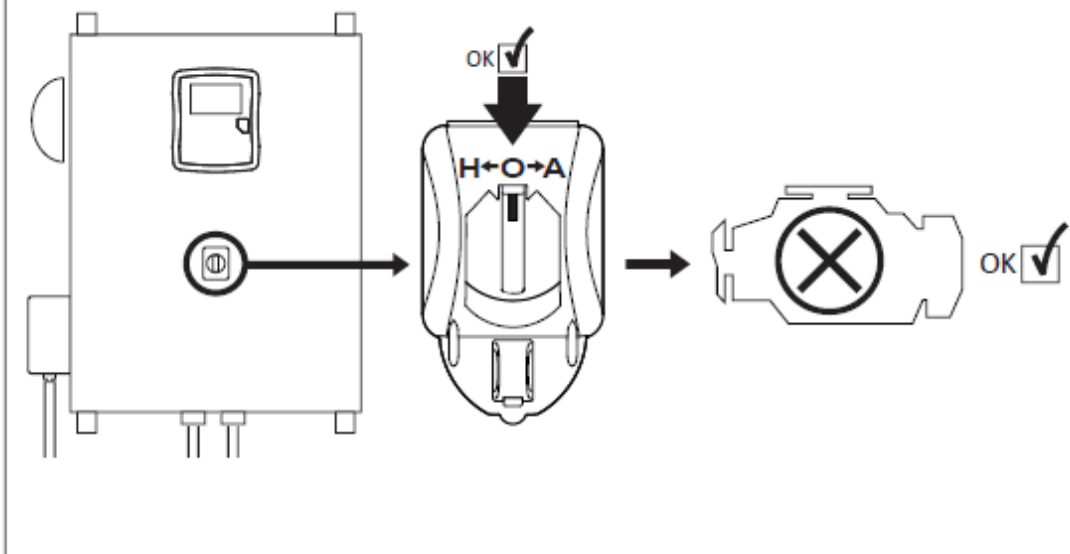
Turn the Main Selector Switch in the “HAND” position.

9



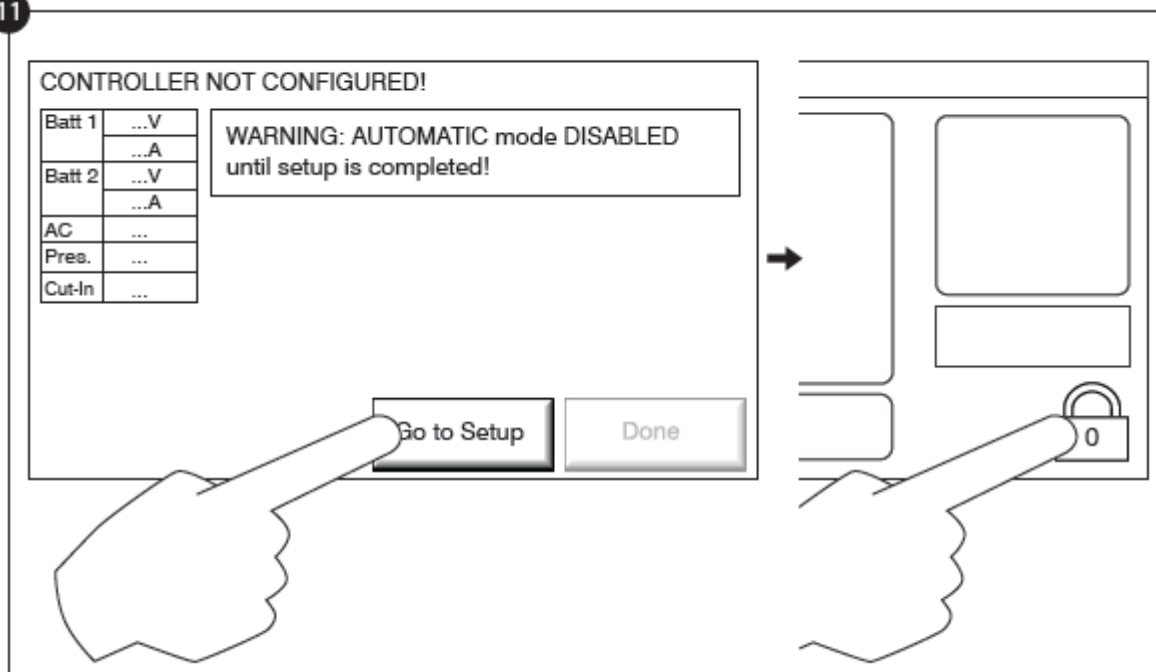
Before trying to start the engine, verify that the engine setup is complete and the exhaust pipe is connected properly. Start the engine manually by using the “Crank 1” membrane button. Verify that the engine has started and is running properly.

10



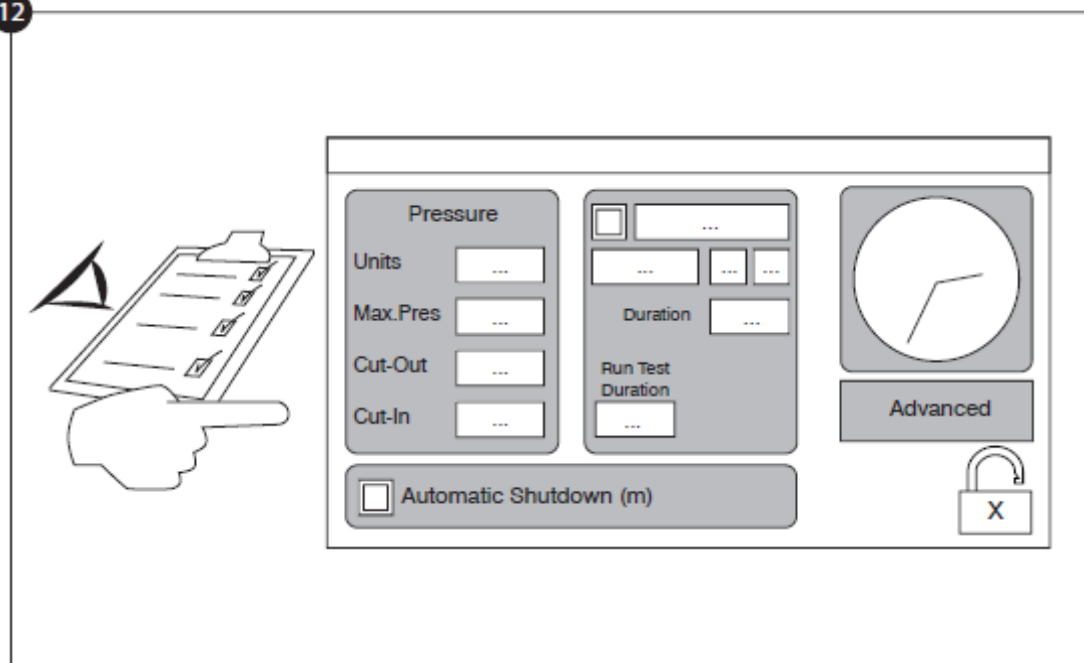
Stop the engine by turning the “Main Selector Switch” in the “OFF” position.

11



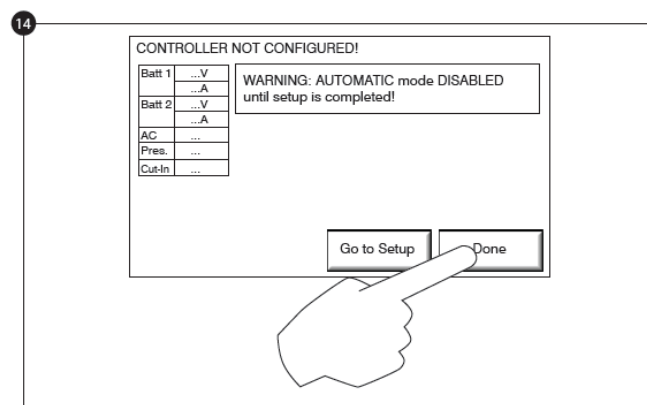
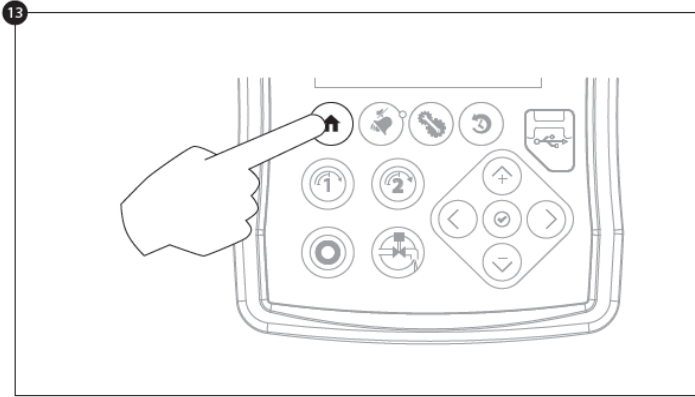
Click on the “Go to Setup” button. The “Config” page is now visible. Click on the “padlock” button to log in with your password. If needed, read the “User Login / KeyPad” section for more information on how to enter your password. Once a valid password is confirmed, the “Config” page will be visible again with the “padlock” showing that it is open the actual user security level.

12

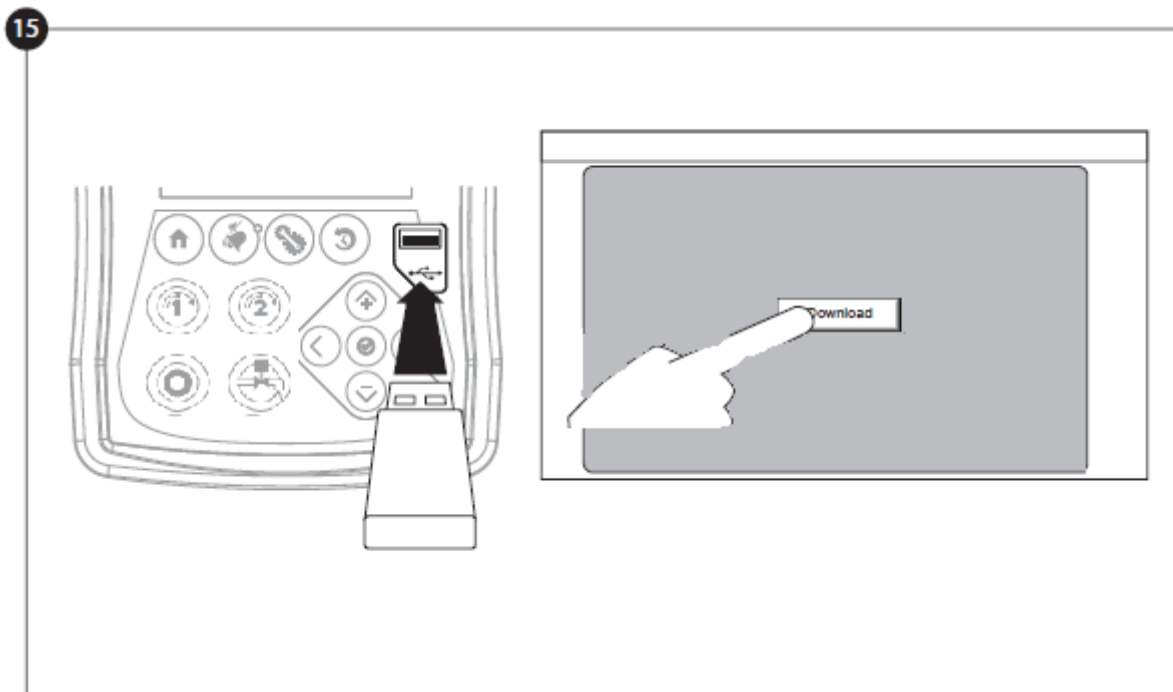


Select the controller pressure units, cut-in and cut-out. Verify that all other parameters on the setup page are correct.

Once the configuration is done, click on the “Home” membrane button. The “First Setup” page will be displayed

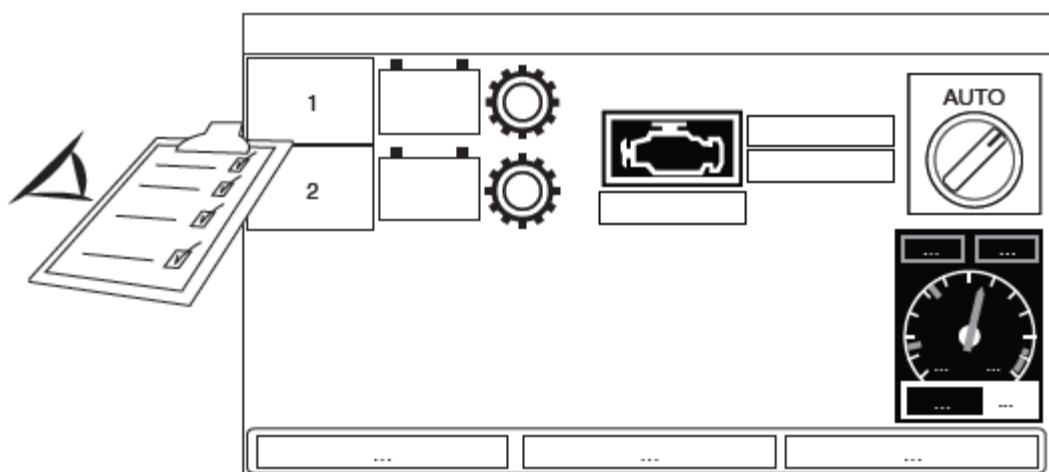


When satisfied with the controller settings, press the "Home" button on the membrane, acknowledge the changes by pressing the done button. If the done button is unavailable, ensure that a sufficient authorization code has been entered.



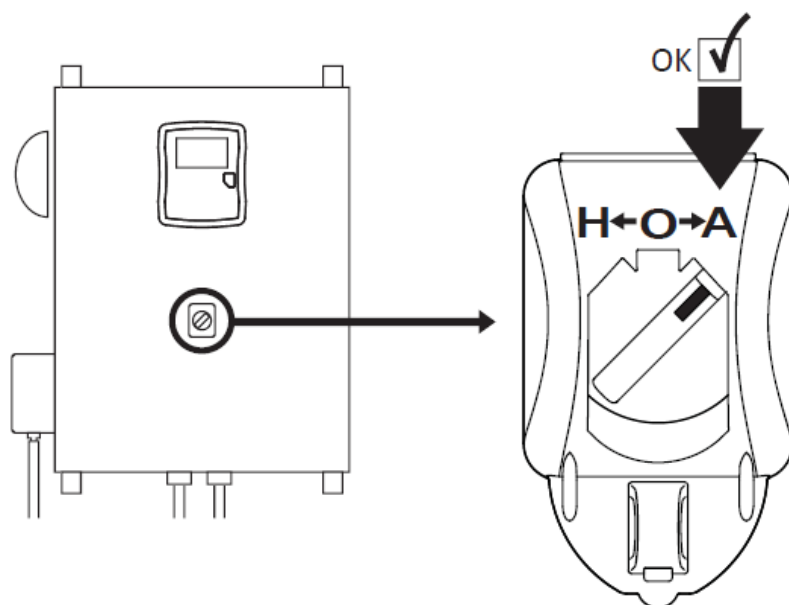
Proceed with the download step to save the report.

16



Press the home page button to verify that the displayed values are correct.

17



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.

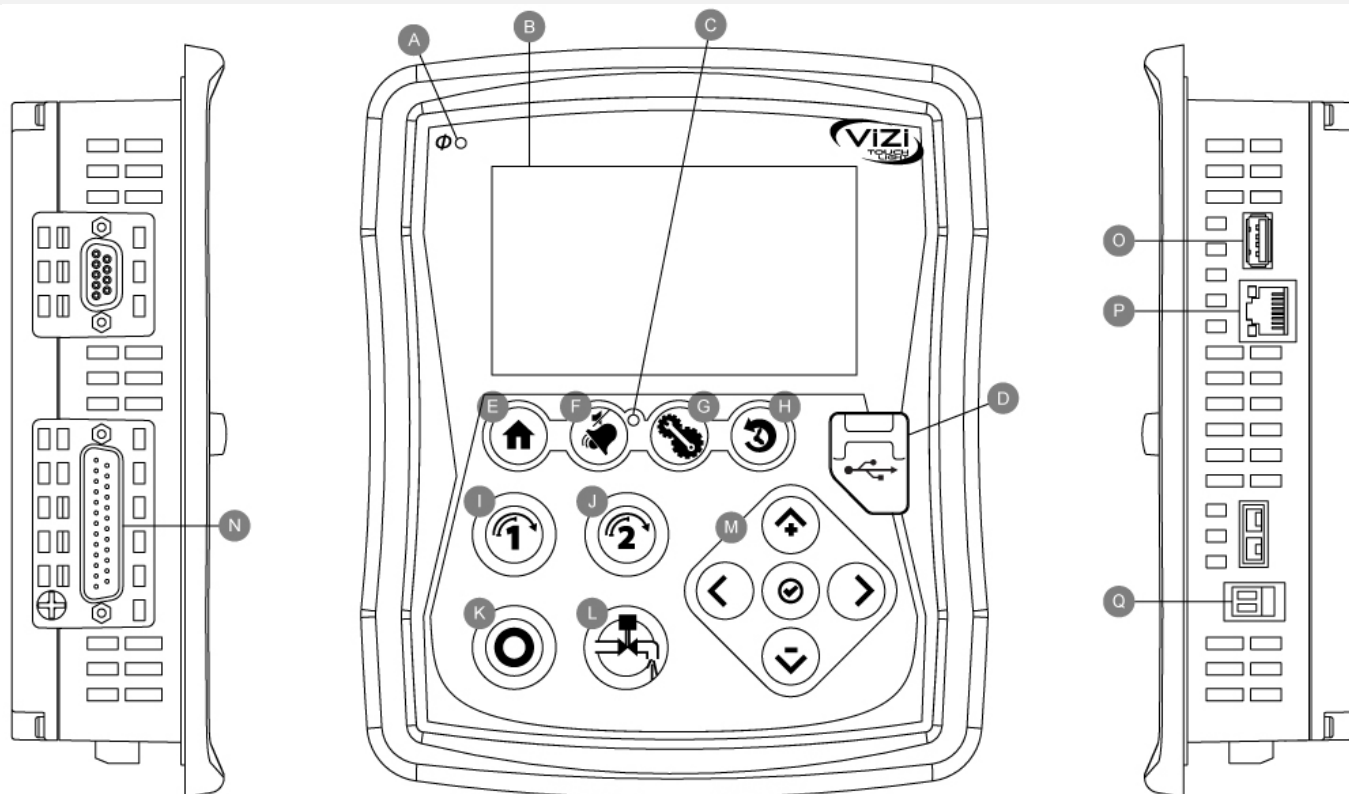


The “First Start up” is now completed. The controller is fully installed and configured.

Main Features

3

The ViZiTouch



- A: Power LED: Indicates if the ViZiTouch is properly powered.
- B: Touch Screen: 4.2 inches color touch screen LCD.
- C: Alarm LED: Indicates if an alarm is currently active.
- D: Front USB Connector: USB Device connector used for file download, software updates, service reports.
- E: Home button: Used to navigate to the Home page.
- F: Alarm button: Used to navigate to the Alarm page. It also allows the user to silence the alarm bell, hence the small "no speaker" symbol in the upper right corner of the button.
- G: Config button: Used to navigate to the Configuration page.
- H: History button: Used to navigate to the History page.
- I: Crank 1 button: Used to manually crank the starter from battery 1 while in "HAND" mode.
- J: Crank 2 button: Used to manually crank the starter from battery 2 while in "HAND" mode.
- K: Stop button: Used to stop the engine if all starting conditions are gone.
- L: Run Test button: Used to start the manual run test. Be aware that water will flow through the drain during the test.
- M: Contextual navigation pad: Used to facilitate the navigation on specific pages. A small icon representing the contextual navigation pad will appear at the bottom right corner of a page if the pad is active. By clicking on the small pad icon, a menu explaining the specific functions of the arrows will appear. For example, it is possible to switch between the graphical or the table mode on the logs page, as well as navigate through the tables.
- N: CAN bus connector to IO cards
- O: USB 2.0 connector
- P: Ethernet connector
- Q: Alarm Bell 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 and under optional or user defined conditions. Any of these conditions will energize the alarm bell but may be silenced, except in some cases, by pressing on the “Alarms / silence” membrane button. 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.

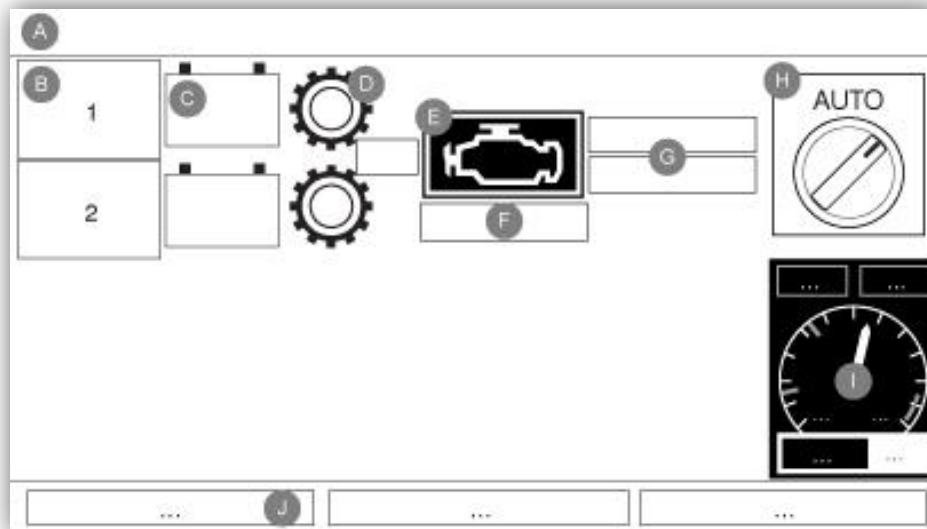
Note: other external conditions may trigger optional conditions depending of the factory settings. Verify drawings affixed inside the cabinet.

Default Conditions :

- Engine Overspeed
- Engine Low Oil Pressure
- Engine High Coolant Temperature
- Engine Fail to Start
- Battery Failure 1-2
- System Overpressure
- Engine Fuel Injection Malfunction
- DC Failure
- IO Cards Communication Loss
- CAN System Failure
- File System Failure

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.



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

The entire background will become red if an alarm becomes active. This feature will help the user identify a problem even at a significant distance away from the controller.

A: Navigation bar which contains general information about:

- The language (the language may be changed by pressing on it)
- The page title
- The alarm banner (warning and alarm messages may be shown)
- The date and time (adjustable in the Configuration page)

B: Battery charger state. It may become one of three colors and also explicitly describes the current battery charger state.

POWER UP – Green
 BULK – Green
 OVER_CHARGE – Green
 FLOAT – Green
 STOP – Grey
 CHARGER_FAIL – Red
 NO_AC – Red
 BATTERY_FAIL – Green

C: Battery. The battery will be red if it is in failure and green otherwise. The first line of data shows the actual voltage of the battery in volts and the second line shows the actual current in amperage.

D: Starter gear. It represents the current step of the cranking sequence. The counter inside indicates the step remaining time, counting down from 15 to 0 seconds. As there are two cranking modes, “waiting for crank” and “cranking”, the gear will alternate between yellow and green, allowing the user to know exactly the state of the cranking sequence. Between the two contactors, a counter is visible. It indicates the current step inside the cranking

sequence. It will stay on a step during the 15 seconds of wait and on the 15 seconds of cranking and then will count on until the sixth step, which is the end of the cranking sequence.

E: Diesel engine. It will be grey if the engine is stopped, green if an “Engine Run” signal is detected and red if an “Overspeed” or “Fail to start” occurred, after 6 unsuccessful cranking attempts. The engine will be yellow if running in test mode.

F: Representation of the motor starting or stopping cause. A green capsule will indicate the reason why the engine is running, and a red capsule will indicate reason it is not running when it should. Possible choices are:

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 – It receives a manual crank request from one or both of the manual crank membrane buttons while the selector switch is the “HAND” position.

EMERGENCY – Optional: It receives a manual crank request from the emergency pushbutton while the selector switch is the “HAND” position.

REMOTE MANUAL: Manual engine starting activated by a remote start contact.

DELUGE: Automatic engine starting activated by a deluge valve.

PNEUMATIC: Optional: Automatic engine starting activated by the “Fail to Start” Alarm.

AUTO: Automatic engine starting activated by pressure drop.

REMOTE AUTO: Automatic motor starting activated by remote equipment.

WEEK TEST: Automatic motor starting activated by a scheduled test.

MANUAL TEST: Automatic motor starting activated by the run test pushbutton.

AC FAIL – AC Fail will count the time following an AC Failure and at the end of a predetermined timer, will start the engine with an AC FAIL request when this option is enabled.

A red capsule will indicate the reason why the motor is not running despite the fact that a request is being made. Possible causes are:

DC FAIL – This failure happens when the controller receives a request to start, but has no DC Power, thus preventing its ability to effectively start the engine.

OVERSPEED – This start cause happens when the controller receives a request to start, but the engine sends an “Overspeed” signal, thus preventing its ability to effectively start the engine.

FAILSTART – This failure 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 until this alarm is reset.

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

G: Operations timers including the sequential start timer, the run period shutdown timer, the manual test timer, the weekly test timer and the AC Fail timer.

H: The HOA Selector switch. The three positions indicate the actual position of the HOA, “HAND” for manual mode, “OFF” and “AUTO” for automatic mode. The controller should always be left in the “AUTO” position.

I: Discharge pressure gauge. It allows for a precise reading of the actual system pressure. The red box on the upper left corner of the gauge indicates the value of the Cut-In set point and the green box on the upper right corner

represents the Cut-Out set point. These values will also be represented by a red and a green lines on the gage, allowing a quick comparison between the actual pressure and the set points. At the bottom of the gauge, a digital indicator shows the actual discharge pressure represented also by the needle of the gauge. Just right of the digital pressure indicator, the actual pressure unit is shown. Finally, the maximum allowable pressure is also indicated on the gauge and will scale the gauge accordingly. The discharge pressure gauge is also a button linking to the "Gauge" page, where all active gauges are displayed.

J: Displays three statuses that describe the primary configuration of the controller: Pressure actuated or Non-pressure Actuated, Automatic Controller or Non-automatic, Manual or Automatic Shutdown.

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 (Membrane button)

Alarms

Date	Time	Alarm	State

Displays the list of currently active and occurred alarms. An alarm is called ACTIVE when its triggering condition is present. An alarm is called OCCURED when its triggering condition has been active, but is no longer true. Alarms with an "*" symbol must be reset by turning the Main Selector switch to the "OFF" position. Alarms representing serious concerns are RED. Alarms representing simple warnings are YELLOW. To silence the bell press the ALARM button or it will silence itself after the expiration of a factory set timer. Pressing on the RESET button will reset OCCURED alarms only.

The bell test button will activate the alarm bell for 3 seconds.

The table displays system events:

- Date and Time: Date and time stamp of the alarm in the YYYY.MM.DD format
- Message: Alarm message
- State: OCCURED or ACTIVE
- Color Code:
 - Red: The event is an alarm
 - Yellow: The event is a warning

Complete list of alarms :

Common Alarms:

Engine Trouble: The Engine Trouble common alarm is active when one or more of these conditions are active :

- Engine 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)
- Engine ECM Selector Switch in Alternate Position (301)
- Engine 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: A common alarm activated when the following events occur:

- 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 controller is in normal condition. The relay is de-energized when controller trouble is detected (fail safe). The controller trouble common alarm is active when one or more of these conditions are active :

- Charger Failure 1-2
- DC failure
- Default Solenoid Valve
- Cut-In not reached during test

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

- Battery 1-2 Fail: Monitors the status of battery 1 and activates on a failure. This occurs when the battery is disconnected, is the wrong type or is unable to be recharged. When disconnecting a battery, there will be a delay before the alarm is activated. The boost signal will be active a minute later, or more if a ghost current is detected. If there is no response from the battery, it will execute a second test 30 seconds later, and then activate the battery failure alarm.

- Charger 1-2 Fail: Monitors the state of battery charger 1 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. It 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. If this contact opens for 1 minute, the alarm will be activated. Chargers 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 set point in the factory settings page.

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

- Low Pump Room Temp: Activates if the optional programmable input "Low Pump Room Temp" is activated by an external signal.

- Low Spare Temperature: Activates if the analog readout of the spare temperature input is Enabled and is lower than the low spare temperature set point in the "Spare temperature" sensor page.

- WT CI Not Reached: Activates if the Cut-In is not reached during a manual run test or a weekly test timer. At the end of the 255s 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.

- WT Check WT 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.

- PT fault detected: 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. Also, if the voltage powering the transducer is below 0.5V or over 4.5V the alarm will be activated.
- Overpressure: Activates if the analog readout of the discharge pressure goes higher than the overpressure set point in the discharge pressure sensor page.
- Underpressure: Activates if the analog readout of the discharge pressure goes lower than the "Under Pressure" set point in the discharge pressure sensor 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 suction pressure sensor page.
- Force start on flow: Activates if an external contact triggers flow switch input or if the analog readout of the flow is Enabled and goes higher than the flow force start on flow set point in the flow sensor page.
- Water Res. Low: Activates if the "Water Reservoir Low" contact input 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 "Water Level" sensor page.
- Water Res. Empty: Activates if an external contact triggers the optional "Water Reservoir Empty" input.
- Main Relief Valve Open: Activates if an external contact triggers the optional "Main Relief Valve Open" input.
- Fuel Tank Leak: Activates if the "Fuel Tank Leak" contact input is triggered,
- Low Fuel Level: Activates if the "Low Fuel Level" contact input is triggered or if the analog readout of the fuel level is Enabled and goes lower than the low fuel level set point in the "Fuel Level" sensor page.
- High Fuel Level: Activates if the "High Fuel Level" contact input is triggered or if the analog readout of the fuel level is Enabled and goes higher than the high fuel level set point in the "Fuel Level" sensor page.
- 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.
- Engine ECM: Activates if the specific "ECM" input is triggered on the engine connector strip.
- Engine ECM Warning: Activates if the specific "ECM" input is triggered on the engine connector strip.
- Engine ECM Fault: Activates if the specific "ECM" input is triggered on the engine connector strip.
- Engine FIM: Activates if the specific "FIM" input is triggered on the engine connector strip.
- Engine PLD Low Suction Pressure: Activates if the specific "305" input is triggered on the engine connector strip.
- Engine High Raw Water Temperature: Activates if the specific "310" input is triggered on the engine connector strip.
- Engine Low Raw Water Flow: Activates if the specific "311" input is triggered on the engine connector strip.
- Engine High Temperature: Activates if the specific "High Temp" input 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 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 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 to complete the reset procedure for this alarm.
- Io_expX-inX alarm: Activates if the specific expansion programmable input on the specific expansion board is activated and triggered.
- Battery1-2 Overvoltage: Activates if the voltage of the specific battery is higher than the specified overvoltage set point.
- High Water Level: Activates if the optional “High Water Level” 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 in the “Water_Level” sensor page.
- Low ambient temperature: Activates when the ambient temperature is below the factory set value (5 Celsius).
- High ambient temperature: Activates when the ambient temperature is above the factory set value (40 Celsius).
- IO Diesel Communication Error: Activates if no communication with the diesel IO board could be established for 15 seconds. This alarm is critical and triggers the bell. If this alarm persists for more than 1 minute the controller will reboot to try and fix the problem.
- IO Expansion Communication Error: Activates if no communication with the Expansion IO board could be established for 15 seconds.
- Communication System Failure: Activates when the communication task has stopped responding. This alarm condition is critical and will be followed by a controller reboot to try and fix the problem.
- File System Failure: Activates when a file system error is detected. This alarm condition is critical and will be followed by a controller reboot to try and fix the problem.
- Pump on demand: Activates when the pressure is below the cut-in set-point on an automatic pressure actuated controller.

Config (Membrane button)

Config

Setup all basic configuration parameters.

The main configuration page provides a quick means of changing the most common settings. 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.

Access Level 0:

-The “Advanced” button activates the advanced configuration pages.

- Date and Time adjustment are accessed by pressing the clock. Refer to the “Date and Time” page for more information.

Access Level 1:

Inside the left box, the main pressure parameters can be set.

- Adjustment of the pressure reading “Unit of measure”: PSI, kPa, bar, FoH, mH2O
- Maximum pressure of system (between the Cut-Out value and 9999)
- Cut-Out adjustment (between the Cut-Out value and the Maximum Pressure value). It should be set before setting the Cut-In
- Cut-In adjustment (between 0 and the Cut-Out value)

Inside the middle box, the parameters linked to the different tests can be set.

The next set of parameters is the periodic test schedule which consists of three editable fields. The first field is the day of the week and the time, in hours and minutes. Simply press the appropriate button to set these values accordingly. The next editable field located just below is the periodic test duration in minutes. The last section of the middle box is the duration of the manual “Run Test”, labelled with the “Run Test” icon button as seen on the membrane. Press the button to modify the value of the manual “Run Test” duration.

Inside the lower box, the Automatic Shutdown may be activated and the duration of the “Run Period Timer” is shown. To edit the “Run Period Timer”, refer to the “Timers” page in the advanced configuration pages.

NumPad Page

X

Description

Max
Min

Value X

7

8

9

← X

4

5

6

OK

1

2

3

0

.

+/-

The NumPad is activated every time the user clicks on a white square box representing a number that can be set. On top of the NumPad, the current parameter is shown. The text will flash red if the value entered is invalid and the OK button will be black, indicating that the value is out of range. The MIN and MAX show the range of values accepted for that particular parameter. The “X” button allows the user to cancel editing the value. The back arrow erases the last entered number and the “CA” button clears the whole text field. Simply click the “OK” button once the value is set.

Date and Time Page

<< < > >>

X

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Save

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Confirm changes

WARNING: Changing the date and time will affect the LOGs chronology. Are you sure you want to commit your changes?

Cancel

Save

The Date and Time can be configured by selecting the current month and year by pressing the arrow buttons on each side of the "Month-Year" display and selecting the day of the month by selecting the actual day. 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 Save 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.

User Login Page / KeyPad Page

×

1	2	3	4	5	6	7	8	9	0
q	w	e	r	t	y	u	i	o	p
a	s	d	f	g	h	j	k	l	
Shift	z	x	c	v	b	n	m	← ×	
,							.	OK	

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. A "X" button appears in the text field as soon as a character is entered, allowing for a quick erase of the written password.

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 clicks 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 and the "CA" button clears the whole text field. 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

Config > Advanced

Timers

Discharge Pressure

Program. Field I/O

Volt Current Calibration

Interlock Lockout

Factory Settings

Update Program

This page is the portal to all the advanced configuration parameters of the ViZiTouch.

All timers, sensors, factory settings, software update, service dealer and debug pages may be accessed simply by clicking on the appropriate buttons.

Since two of the analog inputs are using the same physical connector, only one of these can be installed at once. These analog inputs are shown in the grey box surrounded by a black dotted line. Each time one of these sensors is installed, the other will turn orange, preventing the dual installation of these sensors.

All buttons are set to security "Level 0" except "Update Program" which is set at "Level 1" security.

Details of the Advanced Configuration Page

Volt-Current Calibration

Config > Advanced > Calibration Voltage-Current

Config > Advanced > Voltage

		Actual	Desired	
Main Voltage	AC		<input type="text"/>	COMPUTE
Voltage	Battery 1		<input type="text"/>	COMPUTE
	Battery 2		<input type="text"/>	COMPUTE

↶

→

This page is used to calibrate all analog voltages. The actual column shows the actual value calculated by the ViZiTouch. The "desired" column allows a level 2 user to enter the desired value read from a calibrated external device (multimeter). For the AC voltage and the 2 DC voltage, the calibration is done by entering the desired value and pressing on the "COMPUTE" buttons. The DC values must be entered with no batteries connected, to allow the

calibration of the battery chargers in the “power supply” mode. To do so, simply turn the batteries circuit breaker to OFF.

Config > Advanced > Current

Battery 1 2650 **mA**

2650 Read < 8880 Read ZERO COMPUTE

Battery 2 2725

2725 Read < 8880 Read ZERO COMPUTE

This page is used to calibrate all analog currents. The first number right beside the Battery 1 and Battery 2 text shows the actual current reading. First, Set the CB2 Breaker in the OFF position. This will disconnect the battery. Press the ZERO button. Then, put the CB2 breaker back in the ON position. Connect a small charge to the 6 and 11 terminals, to create a low current around 2600 mA. Enter this value in the most left field of battery 1, and press the Read button. Then, connect a bigger charge to the 6 and 11 terminals, around 8800 mA. Write the measured value in the second text field, and press the second read button. Finally, press the COMPUTE button to complete the calibration. Repeat for the second battery, linked to CB4 Breaker and terminals 8 and 11.

Battery Test Configuration

Number of Missing Test Before Alarm Battery Test

Battery Missing Current Threshold

Max Current for Boost Test Batt.1 Batt.2

Voltage Coast Drop Detection Enable ☐

Battery Fail From Engine RPM During Crank ☐

Charger 1 Power Supply Voltage Reference

Charger 2 Power Supply Voltage Reference

☐ Disconnect Battery

This page is used to adjust the calibration of the battery test.

Number of Missing Test Before Alarm : It is the number of consecutive fail test that must occurred before triggering the Battery Failure alarm.

Battery Missing Current Threshold : It is the threshold, in Amps, to test if a battery is connected. This is the amount that the current in Amps has to rise during a boost test to determine that the battery is connected. If a false battery failure alarms appears, it may be necessary to lower this value.

Max Current for Boost Test : Under this current value in Amps, no test on the battery is made.

Voltage Coast Drop Detection Enable : If enable, this second condition on the battery test is activated. On smaller battery, the rise in current during a boost test might be too small to have a conclusive test. This second test verifies the capacitive effect on the battery line after a boost sequence.

Battery Fail From Engine RPM During Crank : If enable, the Battery Fail alarm will be activated if no RPM is read after a crank cycle

Charger 1-2 Power Supply Voltage Reference : This is the voltage that is applied by the battery charger in power supply mode (no battery connected). To measure this voltage, the battery must be disconnected.

Timers Page

Config > Advanced > Timers1-2

Config > Advanced > Timers1

Engine Starting and Stopping Sequential Start Timer <input type="text"/> s Run Period Timer <input type="text"/> m		Local Request Detection Timer On <input type="text"/> s
Fail When Running Timer <input type="text"/> s	Energize to Stop <input type="checkbox"/> Permanent Timer On <input type="text"/> s	

Config > Advanced > Timers2

Low Oil Pressure Delay <input type="text"/> s	AC Failure Enable <input type="checkbox"/> Start Delay <input type="text"/> m
High Water Level Alarm Timer On <input type="text"/> s	High Fuel Level Alarm Timer On <input type="text"/> s
Low Water Level Alarm Timer On <input type="text"/> s	Low Fuel Level Alarm Timer On <input type="text"/> s

Most common timers for fire pump control can be configured here. Note that any timer set to 0 will remove the delay in the decision process.

Access level 1:

- Engine starting and stopping:

The main timer settings are the "Sequential Start Timer" (seconds), which allows a delayed response on an automatic start request, the "Run Period Timer" (minutes), which in case of an automatic shutdown controller sets the time before the controller will stop the engine when all conditions are back to normal. The Energize to Stop setting must be selected in Factory. If selected, the timer can be configurable on site.

Config > Advanced > IO Diesel Input Selection

Field programmable Input 3

Field programmable Input 4

Field programmable Input 5

The Deluge Valve Start Signal is Normally Closed
Alarms Signals are configurable on the next page

This page, if logged in, allows the re-assignment of 3 programmable inputs by pressing on the signal name. If the Deluge Valve signal is selected, it will be assigned as a normally closed input. Proceed with caution as this may cause the engine to start. If an alarm signal is chosen, it can be configured on the next page (Enabled, NO/NC, Audible, Importance (Alarm or Warning)). The available signals are:

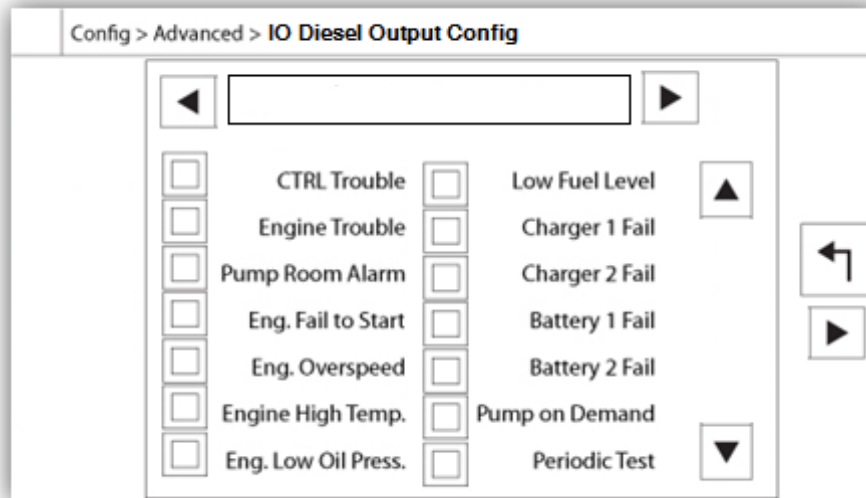
- Low Fuel Level, High Fuel Level, Fuel Tank Leak
- Water Reservoir Empty, Water Reservoir Low, Water Reservoir High
- Flow Meter ON, Main Relief Valve Open
- Low Suction Pressure
- Lockout
- Remote Manual Start
- Deluge Valve Start (NC)

Config > Advanced > IO Diesel Input Config

Field programmable Input 3

Field programmable Input 4

The Deluge Valve Start Signal is Normally Closed
Alarms Signals are configurable on the next page



This page allows the configuration of alarm signals on the inputs, and outputs relay signals. Two buttons located far right navigates between the input and output section of the page.

Input:

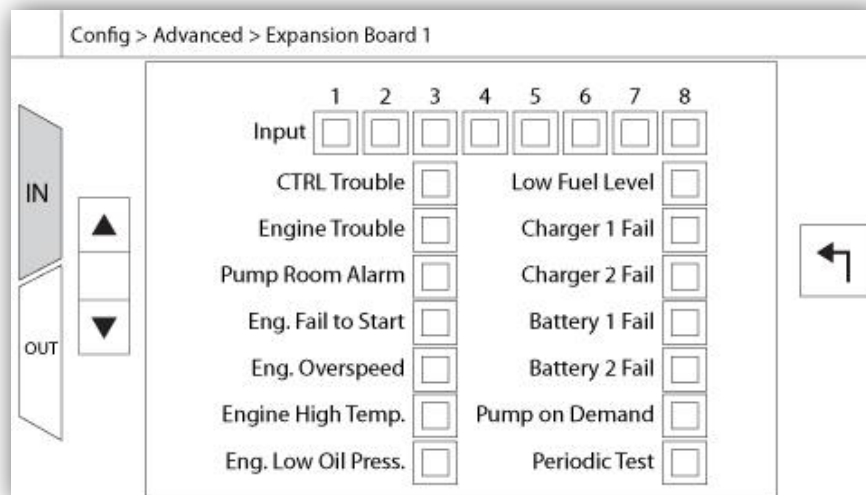
The input page has four elements: The NO/NC setting, the “Digital Text Indication” field, the “Alarm Bell Icon” and the “Alarm Icon”. Each one can be enabled or disabled. The first step is to click on the square button beside the text field to activate the management of the input signal. If the “Alarm Bell Icon” is enabled, the input signal will trigger the Alarm Bell. If the “Alarm Icon” is enabled, the input signal will be treated as an alarm, if not, as a warning. As on the output page, the buttons at the top allow for an easy navigation between all available inputs of the diesel board.

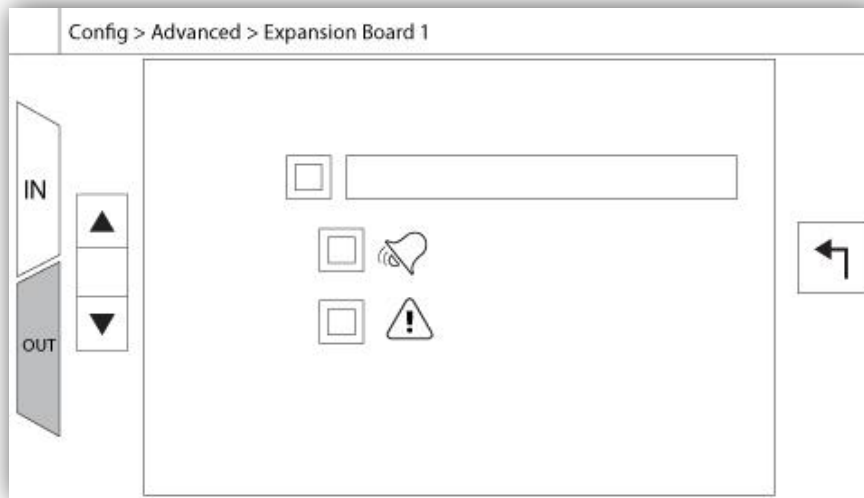
Output:

The configuration is performed by pressing on the square box located beside one of the signal needed. The box will swap between BLANK (none), a NO (normally open) and a NC (normally close) symbol, allowing the desired configuration to be obtained. The final state of the output signal is a logical “OR” combination of all selected signal.

Inputs/Outputs Expansion board 1-2-3-4

Config > Advanced > Expansion Board 1-2-3-4





This page allows the configuration of both programmable inputs and outputs available on an IO Expansion board. Two buttons located far right navigates between the input and output section of the page.

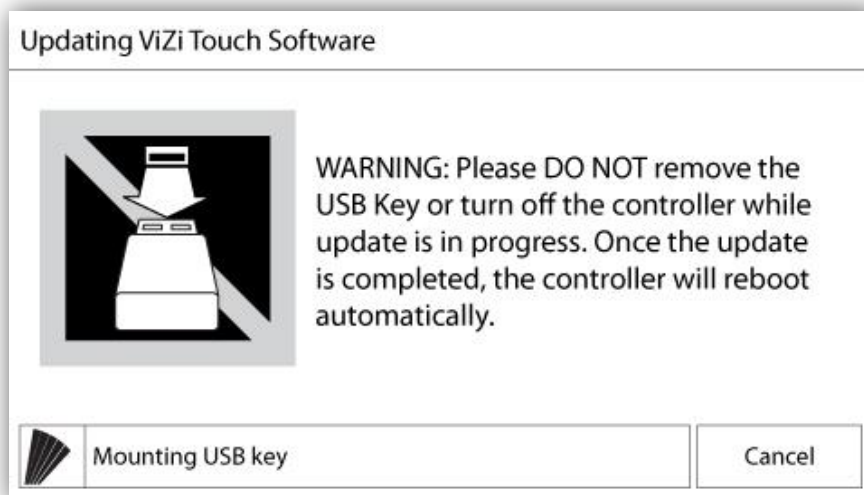
Input:

The input page has four elements: The NO/NC setting, the "Digital Text Indication" field, the "Alarm Bell Icon" and the "Alarm Icon". Each one can be Enabled or disabled. The first step is to click on the square button beside the text field to activate the management of the input signal. If the "Alarm Bell Icon" is Enabled, the input signal will trigger the Alarm Bell. If the "Alarm Icon" is Enabled, the input signal will be treated as an alarm, if not, as a warning. As on the output page, the buttons at the top allow for an easy navigation between all available inputs of the diesel board.

Output:

The configuration is performed by pressing on the square box located beside one of the signal needed. The box will swap between BLANK (none), a NO (normally open) and a NC (normally close) symbol, allowing the desired configuration to be obtained. On top of all outputs signals available, it is possible to link in the same way the expansion board inputs to the selected output in any combination. The final state of the output signal is a logical "OR" combination of all selected signal.

Update Program Page



This procedure is highly important and must be attempted with care. Please make sure to contact the factory prior to using the Update Software function.

Config > Advanced > Factory Settings

☐ Automatic Controller

☐ Pressure Actuated

☐ 2VIZ004 ☐ 2VIZ016

Battery 1 Over Voltage V

Battery 2 Over Voltage V

Charger

AC Voltage

DC Voltage

Engine RPM ☐

☐ Enable

Teeth

Serial #

Model

Program

Reset to Factory Sett.

⬅

The factory settings are always pre-configured at the factory and set the main parameters of the controller.

Left Section:

Automatic Controller – Non-Automatic Controller: An automatic controller will respond to automatic start requests, like a pressure drop announced by a pressure transducer or a pressure switch, a deluge valve signal or a remote automatic start trigger. A non-automatic controller will only start the engine on manual requests.

Pressure Actuated – Non-Pressure Actuated: A pressure actuated controller has at least one pressure transducer installed and will monitor the system pressure at all time. In an automatic controller, the pressure drop will trigger a starting sequence of the engine automatically. A non-pressure actuated controller may be equipped with a pressure transducer or pressure switch. In this last case the controller does not take into account the system pressure to trigger a starting sequence.

Battery 1-2 Overvoltage value: This field allows the set point of the Overvoltage alarm to be configured. Usually, this value is set to about 4 Volts above the nominal value of the batteries.

“Reset to Factory Settings”: This button redirects to the “Reset to Factory Settings” page. This is a major operation that must be used with care and only if the factory was contacted first. See the “Reset to Factory Settings” help for more details.

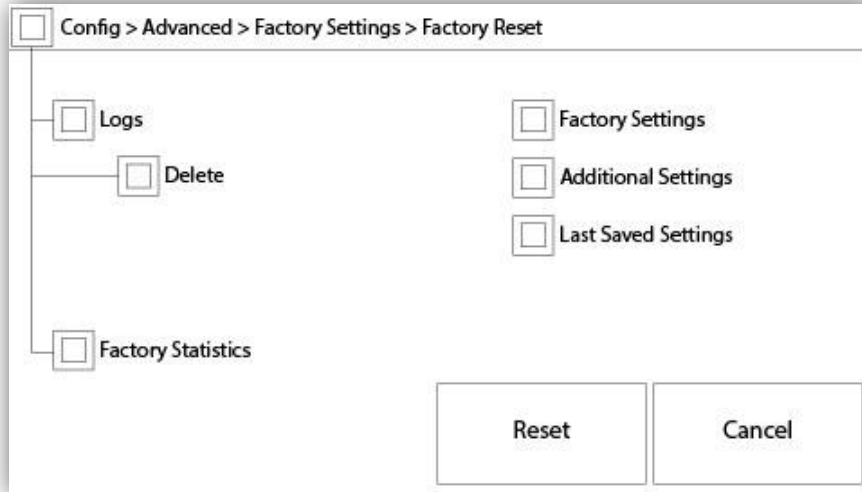
Right Section:

The first two settings set the nominal AC and DC voltage for the controller.

The following section enables the “Engine RPM” counter. The engine’s magnetic pickup has to be connected to the “U” terminal on the Diesel - IO board. If this signal is enabled, the “Teeth” parameter must be set according to the exact number of “teeth” on the magnetic pickup gear. This parameter will allow the ViZiTouch to calculate precisely the engine actual RPM with a fast refresh rate. The value will be shown in the upper-right corner of the homepage, over the symbolic “RPM” image. This is the only setting available to a “Level 1” user on the “Factory Settings” page.

Technical information about the controller: Serial Number, Battery Charger Type, Model Name and Software Revision.

Reset to Factory Settings Page



This page will reset the ViZiTouch to the original factory configuration, thus clearing all subsequent configurations performed during the life of the controller.

This procedure should only be used as a last attempt to bring back the controller to a usable state.

User “Level 2”:

The “RESET” button will be activated (will become blue) only if no square buttons from the left column are activated and the “Last Saved Settings” from the right column is not activated as well. A “Level 2” user can only reset the “Factory Settings” and/or the “Additional Settings” from the right column.

The “Factory Settings” reset will restore the controller to its original factory configuration and service state. This means that the first service will be undone, automatic mode settings, as well as the controller’s “Homepage” will be deactivated until “First Service” is completed again. Please refer to the “Quick Start-Up” guide for more information on how to perform the “First Start-Up” and how to complete the “Field Acceptance Test Report”.

Please note that all logs, pump curves and statistics will not be reset.

The “Additional Settings” reset will update the controller with an additional configuration sent by the manufacturer. It does not perform a true “Factory Reset”. Its purpose is to allow an update of configuration variables that can only be updated by Tornatech Inc.

All other square buttons on this page are “Level 9” security and can only be used by certified Tornatech representatives, unless otherwise specified. The first square in the upper left corner performs the “Select all” function for these parameters.

The Sensors Pages

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.

Config > Advanced > Discharge Pressure

Sensor

PT1

Calib.

Range

Calibration

<

In the ViZiTouch, all sensors refer to analog input connectors on the I/O board. They all have similar settings and configuration.

The “Installed” selection (“Level 2” security): Install or uninstall this sensor from the ViZiTouch configuration.

Discharge Pressure: To set the pressure system unit, go the “Config” page. All pressure transducers share the same unit.

The “Source” button (4 choices): (“Level 2” security)

- None: No pressure transducer or pressure switch is installed.
- PT1 (factory standard): Only the AI1 terminal on the “T” terminal strip is Enabled.
- PT2: Only the AI2 terminal on the “T” terminal strip is Enabled.
- AUTO (factory installed option): AI1 and AI2 are installed and arranged for a redundancy system. The ViZiTouch will always consider the lowest of the two pressure values as the reference. Additional alarms, like “PT fault detected” become Enabled This alarm is triggered when the two transducers provides values that are different by more than a pre-set delta value. The ViZiTouch will never make a decision as to which transducer is faulty; it will only reveal that there is a problem with one of them. The service dealer should test both transducers to find out which one is faulty.

Suction Pressure: To set the pressure system unit, go the “Config” page. All pressure transducers share the same unit.

The “suction pressure” sensor shares the same analog input (AI4) as the water level sensor. Only one of them can be installed at all time. Prior to installing one of them, the other one must be uninstalled by visiting its own sensor page.

Flow: The “Flow” sensor shares the same analog input (AI3) as the spare temperature sensor. Only one of them can be installed at all time. Prior to installing one of them, the other one must be uninstalled by visiting its own sensor page.

The “Unit” button is located just right of the “Installed” selection. Click on it to select the appropriate “Flow” Unit, the factory pre-set unit is the GPM.

Flow Start:

- Enable/Disable the “Flow Start” condition by pressing the square button. If this alarm is Enabled, it will also start the engine by means of a “FLOW” request.
- Alarm Bell Icon: Activates the bell when a “Flow Start” occurs.
- Alarm Icon: If selected, the “Flow Start” event will be an alarm. If unselected, it will be a warning.
- Value: Flow value at which the “Flow Start” event will change state.
- Timer On: Timer used to buffer the activation of the “Flow Start” signal by the ViZiTouch.

Water Level: The “Water Level” sensor shares the same analog input (AI4) as the suction pressure sensor. Only one of them can be installed at all time. Prior to installing one of them, the other one must be uninstalled by visiting its own sensor page. The “Water Level” sensor has no unit, since it is monitoring the “Water Level” as a percentage.

Spare Temperature: The “Spare Temperature” sensor shares the same analog input (AI3) as the Flow sensor. Only one of them can be installed at all time. Prior to installing one of them, the other one must be uninstalled by visiting its own sensor page. The “Unit” button is located just right of the “Installed” selection. Click on it to select the appropriate “Spare Temperature” Unit, the factory pre-set unit is the Celsius.

Fuel Level (GPD Model Only): The “Fuel Level” sensor has no unit, since it is monitoring the “Fuel Level” as a percentage.

The Calibration method is the same for all sensors.

CALIBRATION:

The Calibration button: (“Level 2” security for the choice of calibration, but “Level 1” security for the calibration procedure itself.) There are 4 ways to calibrate every sensor:

- 0-10V: Theoretical calibration with 0-10V sensor. Simply enter a value in the system pressure unit for 0V and another value for 10V. Click on the “Apply” button to confirm the calibration. The resulting measured pressure is shown in the lower right corner of the “Sensor” box. Make sure the dipswitch package right below the “T” terminals is set to “0-10V” for that particular sensor (refer to the drawing). The switches are labelled and are each linked to one analog input, in this case “1 or 2”. *Important Note: A set of jumpers is also associated with each analog input. **MAKE SURE THE CONTROLLER IS COMPLETELY POWERED OFF BEFORE MOVING A JUMPER. THIS INCLUDES REMOVING THE AC AND DC POWER.** The jumper can be placed on “5Vdc”, “12Vdc” and “Vaux” and represents the powered DC value of the sensor. The factory pre-set position is “5Vdc”. If an installed sensor has a power value of “5Vdc”, then the “0-10V” theoretical calibration must be calculated accordingly. Please contact manufacturer for more information.

- 4-20mA: Theoretical calibration with 4-20mA sensor. Simply enter a value in the system pressure unit for 4mA and another value for 20mA. The procedure explained above also applies in this case.

-Field Calibration: This is the factory pre-set method and the only one that is an actual calibration. Selecting this calibration method will generate the Calibration box situated in the lowest part of the sensor page. It is very important that the same care is used when selecting the appropriate dipswitch setting and jumper position. Please refer to the “0-10V” section above.

1. Two actual points (low and high) are required.
2. Set the lowest point (usually 0).
3. Press the left read button.
4. Press the left rectangle text field and enter the value read on the external calibrated gauge.
5. Set a high point (usually the highest possible value will create the best calibration).
6. Press the right read button.
7. Press the right rectangle text field and enter the value read on the external calibrated gauge.
8. Press the calculate button to finish the calibration. If the settings are incorrect, the calculate button will remain red and if correct, the button will turn blue. The resulting measured value is shown in the lower right corner of the “Sensor” box.

- On/Off: Use the input with a dry contact sensor, for example a float switch. The only parameter to set for this method is the NO/NC buttons, effectively selecting between a normally open and a normally close switch. Click on the “Apply” button to confirm the calibration.

The Alarms Section: (“Level 1” security)

The “DRY” button can enable or disable the “Dry Contact Input” on the IO board. There are two modes when Enabled, either “Normally open, NO” or “Normally close, NC”. Each mode is represented by the standard NO/NC symbols.

- Enable/Disable the corresponding alarm/warning condition by pressing the square button.
- Alarm Bell Icon: Activates the bell when the condition occurs.
- Alarm Icon: If selected, the occurring condition will be an alarm. If unselected, it will be a simple warning.
- RESET: Value at which the condition will go from the "ACTIVE" state to the "OCCURRED" state.
- SET: Value at which the system will activate the corresponding condition.

Interlock Lockout

Config > Advanced > Interlock Lockout

Config > Advanced > Interlock Lockout

Interlock

☐ Interlock in Emergency ☐ Interlock in Remote

☐ Interlock in Manual ☐ Interlock in Flow

☐ Interlock in Automatic

☐ Engine Run Required

Config > Advanced > Interlock Lockout

Lockout

☐ Lockout in Emergency ☐ Lockout in Remote

☐ Lockout in Manual ☐ Lockout in Flow

☐ Lockout in Automatic

☐ Shutdown Engine

These pages allow 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 I/O board.

Lockout is an Input that disables the engine from starting.

- Enable in emergency: If checked, this option will prevent the electronic assistance on an Emergency start.
- Enable in manual mode: If checked, this option will prevent the Manual start.
- Enable in automatic mode: If checked, this option will prevent the Automatic start.
- Enable in remote manual mode: If checked, this option will prevent the Remote Manual start.
- Enable in "start/stop" mode: If checked, this option will prevent the "start/stop" mode.
- Shutdown Engine: If enabled, the lockout signal will also act as a shutdown and will stop the engine if it is running.

Interlock is an Output that prevents a second engine from starting.

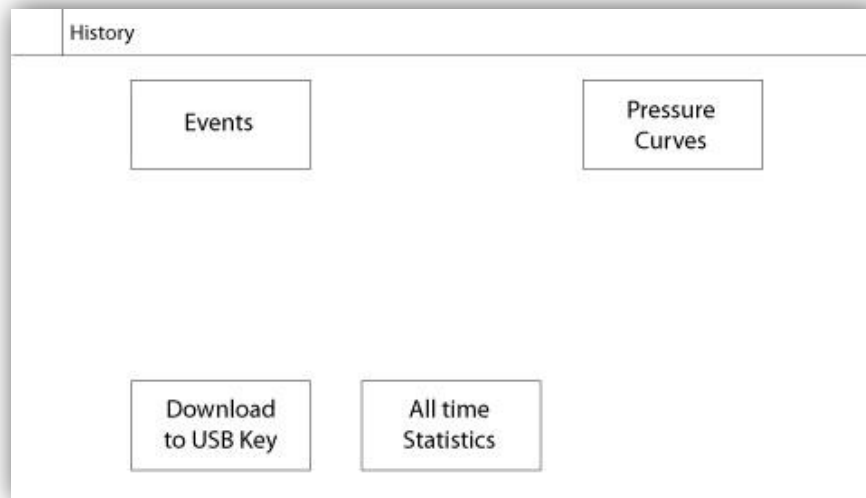
- Enable in emergency: If checked, this option will activate the output "interlock" on an Emergency start.
- Enable in manual mode: If checked, this option will activate the output "interlock" on a Manual start.
- Enable in automatic: If checked, this option will activate the output "interlock" on a Automatic start.

- Enable in Remote Manual mode: If checked, this option will activate the output "interlock" on a Remote Manual start.
- Enable in "start/stop" mode: If checked, this option will activate the output "interlock" on a "start/stop" mode.
- Engine Run required: If enabled, the controller will wait to have the Engine Run signal before activating the Interlock output.

History 7

History (Membrane button)

History



Select a specific page within the History section. Everything related to the statistics, events, pressure, power logs and the download to USB is available within the History page.

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

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

-All Time Statistics: This button leads to the “All Time Statistics” page, which displays the date and time of the first power up, the date and time when the first start-up was completed and the total “On Time” of the controller. These statistics can never be reset.

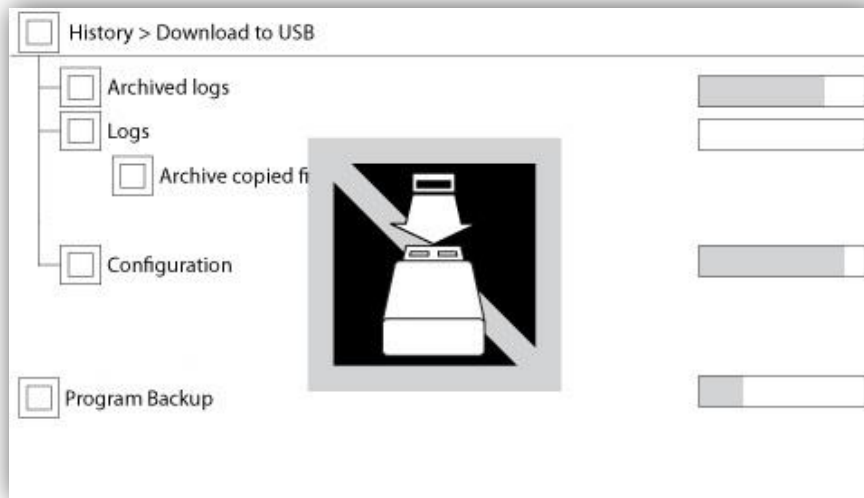
-Pressure: This button leads to the “Pressure Curves” page, which displays all relevant pressure information.

History > Events Log			
	Date	Time	Message
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

It shows the last 500 events 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 500 events, visit the "Download to USB Device" page and select "Events". This method will generate a file containing all events logs in the ViZiTouch history.

The contextual navigation pad is implemented in this page. It allows quick navigations functions, like "previous page", "next page", "first page" and "last page". As always, clicking on the Navigation Pad Icon in the lower right corner of the screen will pop-up the Navigation Pad functions specific for this page.





To download information from the ViZiTouch to a USB Device a user with at least a "level 1" password must be logged in. The first square beside the title is a "Select All" button. Pressing it will select all categories except "Archive copied files", which serves a separate purpose. The "Download to USB" button will execute the command. The entire right side is filled with different progress bars, to help monitor the current transfer. If a USB Device is not present or if there is an error, a message saying "Could not mount USB drive" will appear and any further action is cancelled. To try again, remove the device, re-insert and press the button once more.

-Archived logs: All logs files that were archived using the "Archive copied files" square button. The purpose of archiving files is to free up memory on the ViZiTouch by archiving older log files.

-Logs: All logs are currently available in the ViZiTouch memory. A "Comma Separated Values" or ".csv" file is created every day and is named accordingly. Most software in modern computers will be able to read and interpret these files. The log files contain the event logs, the pressure logs and the power logs.

-Configuration: All configuration parameters contained in a ".txt" file, including but not limited to nominal values, serial number, calibration parameters.

Program Backup: A compressed and encrypted file, only readable by the ViZiTouch. This allows the user to copy a complete ViZiTouch to another one. **IMPORTANT:** The ViZiTouch is not in service while downloading the program backup.

The Statistics

All Time Statistics

History > All Time Statistics

History > All Time Statistics	
First Power Up	
First Start Up	
On Time	

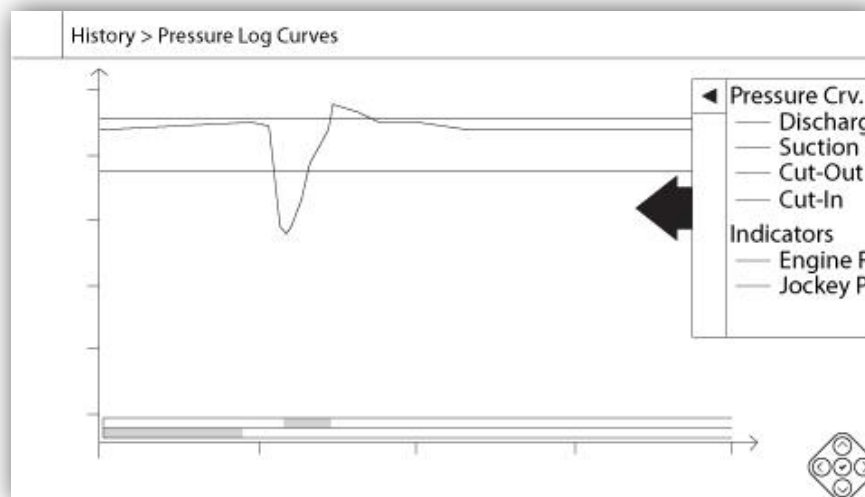
All statistics shown here are calculated since the controller's first start-up was done. All dates are in the YYYY.MM.DD format and all time references are in the HH:MM:SS format.

- First Power Up: Date and time of when the controller was first powered up.
- First Start Up: Date and time of when the controller's first start-up was completed.
- On Time: Total duration of controller powered on since the first power-up. In Day.Hour.Minutes.

Pressure Curves

Graphical Mode

History > Pressure Log Curves



The vertical axis represents the pressure in the actual unit selected. Its scale is dynamic and will resize depending on the highest recorded value. The horizontal axis represents time and period. The left part of the horizontal axis shows the beginning of the current scope and the right part shows the end of the scope. Located just right of the axis, the total scope time is shown. The contextual navigation pad can be used in this page. It allows quick navigations functions, like "Zoom in", "Zoom out", "Rewind", "Forward" and "Textual Mode". As always, clicking on the Navigation Pad Icon in the lower right corner of the screen will pop-up the Navigation Pad functions specific for this page. By pressing the right or left buttons on the navigation pad, the time will shift back or forth by the quarter of the current zoom setting, allowing a quick user-friendly navigation.

The grey vertical bar with a blue arrow, located far right of the screen, is the legend. Clicking on it will display an accurate description of the different curves (Discharge pressure, Suction pressure when available, Cut-In and Cut-Out) each with their respective colors.

Between the “0” pressure value and the horizontal axis, a short series of narrow horizontal zones are displayed. They are described in the “Indicators” section of the legend. These zones indicate when the engine was running and when a jockey pump was running by colorizing small sections of the horizontal zone whenever the condition is occurring.

As indicated earlier, the “Textual Mode” is available by pressing the “Select” button on the navigation pad. This will represent the pressure logs in a table form, allowing for a more precise reading (see “Textual Mode” right below).

Textual Mode

History > Pressure Log Text

History > Pressure Log Text										
	Date	Time	Unit	Psuc	Pdis	C.I.	C.O.	E.	JP	
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										

The “Pressure Log text” shows a table with 10 rows. The total number of rows available is 500 and the logs are sorted in chronological order. To see more logs, please download all logs on a USB Device.

Description of the columns :

- Date: Date when the log was recorded
- Time: Time when the log was recorded
- Unit: Actual pressure unit when the log was recorded
- Suc.: Suction pressure value
- Dis.: Discharge pressure value
- C.I.: Cut-In value when the log was recorded
- C.O.: Cut-Out value when the log was recorded
- ER: The cell will become green if the engine was running for that specific pressure log.
- JP: The cell will become green if the jockey pump was running for that specific pressure log.

The contextual navigation pad is implemented in this page. It allows for quick navigation functions, like “Page Up”, “Page Down”, “First Page”, “Last Page” and “Graphical Mode”. As always, clicking on the Navigation Pad Icon in the lower right corner of the screen will pop-up the Navigation Pad functions specific for this page. By pressing these buttons, the displayed rows will shift, allowing a quick user-friendly navigation.

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 2 (CB2) and Circuit Breaker 3 (CB3) 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 On position. Switch Circuit Breaker 1(CB1) in Off position and disconnect J44 from IO board.

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).

Weak Battery 1

You need to be logged in to modify these settings. Press Config button (On the membrane). Go to Config>Advanced>Factory Settings 2. Change Weak Battery 1 setpoint to maximum allowable.

Weak Battery 2

You need to be logged in to modify these settings. Press Config button (On the membrane). Go to Config>Advanced>Factory Settings 2. Change Weak Battery 2 setpoint to maximum allowable.

Battery 1 Overvoltage

You need to be logged in to modify these settings. Press Config button (On the membrane). Go to Config>Advanced>Factory Settings 2. Change Overvoltage Battery 1 setpoint to minimum allowable.

Battery 2 Overvoltage

You need to be logged in to modify these settings. Press Config button (On the membrane). Go to Config>Advanced>Factory Settings 2. Change Overvoltage Battery 2 setpoint to minimum allowable.

Battery 2 Failure

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

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. Press Config button (On the membrane). Go to Config>Advanced>Discharge Pressure. Change Underpressure setpoint to maximum allowable.

Overpressure

You need to be logged in to modify these settings. Press Config button (On the membrane). Go to Config>Advanced>Discharge Pressure. Change Overpressure setpoint to 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. Press Config button (On the membrane). 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. Press Config button (On the membrane). Change 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 GFD 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 CB2 and CB3 (DC) then CB1 (AC). 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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