TORNATECH

LISTEN DEVELOP LEAD

# INSTALLATION AND MAINTENANCE MANUAL FOR

# VARIABLE SPEED ELECTRIC MOTOR DRIVEN FIRE PUMP CONTROLLERS

# MODEL VPX

ViZi TOUCH

# Introduction 1

Variable speed electric fire pump controllers (VPx) are designed to start an electric motor driven fire pump. A VPx is equiped with a Variable Frequency Drive (VFD) that will regulate the motor speed by controlling the frequency outputted to the motor in order to reach a certain pressure (Setpoint pressure). It can either start the fire pump manually through the local start pushbutton or automatically through the sensing of a pressure drop in the sprinkler system. The fire pump controller is supplied with a pressure transducer. The fire pump can be stopped manually with the local stop pushbutton or automatically after the expiration of a field programmable timer. In both cases, stopping is only allowed if all starting causes have disappeared.

## Types of Variable Speed Electric Fire Pump Controllers

FIRE PUMP CATALOG NUMBER
MODEL No. EXAMPLE: VPA - 208 / 50 / 3 / 60
Model Prefix: VPA
Voltage: 208 V
HP Rating: 50 HP
Phase: 3
Frequency: 60 Hz

## Variable Speed Electric Fire Pump Controllers Mode Switch

The VPx is equipped with a VFD Mode Switch that is located under the Vizitouch. It is protected by a lockable cover, and has 2 positions, VFD and BYPASS. In normal usage the VFD Mode Switch should remain in the VFD mode position.

**VFD:**
The controller will start the motor using the VFD starting mean.

**BYPASS:**
The controller will start the motor using the bypass starting mean.

## Starting mean

**VFD STARTING MEAN**
The variable speed electric fire pump controller is equipped with a Variable Frequency Drive (VFD) which is the primary starting mean. Upon reception of a starting demand, the motor will be started using the VFD. The VFD will adjust the speed of the motor by varying the frequency outputted to the motor to maintain the system pressure at a desired set pressure (Setpoint Pressure).

**BYPASS STARTING MEAN**
A secondary starting mean will take over the motor if the VFD comes to fail or if the VFD mode switch is placed in the Bypass mode position.

**MANUAL VFD BYPASS**
If the mode switch change position while the motor is running, the motor will stop and restart in the new mode.

**AUTOMATIC VFD BYPASS**
When in running in VFD mode, the controller will automatically bypass the VFD following the activation of one of the 3 VFD alarm: VFD FAULT, VFD UNDERPRESSURE or VFD NOT READY. Once the VFD has perform an Automatic VFD Bypass, it will stay in that state until the alarms are manually reset.

**FULL VOLTAGE STARTER**

**MODEL VPA: ACROSS-THE-LINE STARTER**

This model will apply full voltage to the motor when the bypass starting mean is activated.

**REDUCED VOLTAGE STARTERS**

**MODEL VPS: SOLID STATE STARTER**

This model does not require a multi-connection motor. It only requires 3 conductors between the controllerand the motor.

Upon activation of the bypass starting mean, a solid-state starter is utilized to supply a step less ramp-up voltage to the motor until the motor reaches its full speed. At that time, a fully horsepower rated by-pass contactor is energizedconnecting the motor directly to full voltage and eliminating all heat loss within the solid-state starter. This controller also features a soft motor stopping mode and a hard stop mode. For a hard stop, hold the stop pushbutton until the motor stop.

**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 motor can be started by pressing the START push button, regardless of the system pressure.

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

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

EMERGENCY START
The motor can be started manually by using the emergency handle. This handle can be maintained in a closed position. The manual “EMERGENCY RUN” device will always initiate across-the-line starting.

Important: to avoid damaging the contactor, it is recommended to start the motor in this manner:
1) Shutdown the main power by using the main disconnect means,
2) Pull the emergency handle and lock it in closed position,
3) Turn the power back on by using the main disconnect means.

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.

*In VFD mode, if a start requests not based on the system pressure is triggered and the pressure remains above the Setpoint pressure, the motor will run at the minimum speed (VFD parameter).

**METHODS OF STOPPING**

MANUAL STOP
Manual stop is done by pressing the priority STOP push button. Note that pressing the stop push button will prevent the motor from restarting as long as the button is pressed, plus a two second delay.

AUTOMATIC STOP
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 10 minutes after the restoration of the pressure (above the cut-out threshold) given that no other run cause is present.

EMERGENCY STOP
The emergency stop is always possible in any starting condition and is done by using the main disconnecting means located on the door.

# Installation 2

The VPx variable speed electric fire pump controller is cULus listed, FM certified and is intended to be installed in accordance with the latest edition of the Standard of the National Fire Protection Association for the Installation of Centrifugal Fire Pumps, NFPA20 2019 (Centrifugal Fire Pumps) 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.
Proper installation, anchoring and mounting is required to validate this compliance report. Refer to this manual and drawings to determine the 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 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 motor it controls and shall be within sight of the motor. The controller shall be located or protected so that it will not be damaged by water escaping from the 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 the 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).

The standard controller enclosure is rated NEMA 12. 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. 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 fire pump controller shall meet the latest edition of NFPA 20, NFPA 70 National Electrical Code Article 695 or C22.1 Canadian Electrical Code, Section 32-200 or other local codes. Electrical wiring shall be typically sized to carry at least 125% of the full load current (FLC or FLA) of the fire pump motor.

### 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

Standby power: 13W

### Sizing

Incoming power terminals on the controller are suitable to accept wire based on that selection with insulation not less than 60°C. (Refer to terminal diagram for terminal sizes.)
The electrical wiring between the fire pump controller and the pump motor shall be in rigid, intermediate, or liquid tight flexible metal conduit or Type MI cable and meet the requirements of NFPA 70 National Electrical Code or C22.1 Canadian Electrical Code or other local codes.
3-wires plus ground sized at 125% of full load current for models VPA and VPS.

### Incoming Power Connections

Incoming normal power is to be connected to terminals located on the disconnecting means IS.
- For 3 phases motor: identified L1-L2 and L3.

For the transfer switch, incoming alternate power is to be connected to terminals located on the disconnecting means AIS (transfer switch side).
- For 3 phases motor: identified AL1-AL2 and AL3.

**Motor Connections**

Motor wires shall be connected to terminals identified by:
- T1-T2 and T3 located on main contactor (1R) for models VPA and VPS.

It is the responsibility of the installer to obtain connection information on the motor and to assure that the motor is connected as per the motor manufacturer recommendations. Failure to do so may cause injuries to personnel, damage the motor and/or the controller and subsequently void warranty on both items.

**VFD Reforming**

Reforming a VFD is the action of applying voltage to the VFD power path without running a motor. If the drive was not connected to a voltage source for an extended period of time, the capacitors must be restored to their full performance before the motor is started. If the Variable Frequency Drive have not been started for a year or more, a reforming of the VFD needs to be performed. If this is not done, the VFD could be damage from running a motor.

VFD Reforming Required warning: If the VPx detect that the VFD did not run for 365 consecutive days, the “VFD Reforming Required” warning will be activated. While this warning is active, if a starting request occurs, the VPx will start using the bypass starting means even if the Mode Switch is in VFD mode. To remove this warning, a reforming of the VFD must be completed. The “VFD Reforming Required” warning will activate the “Pump Room” common alarm.

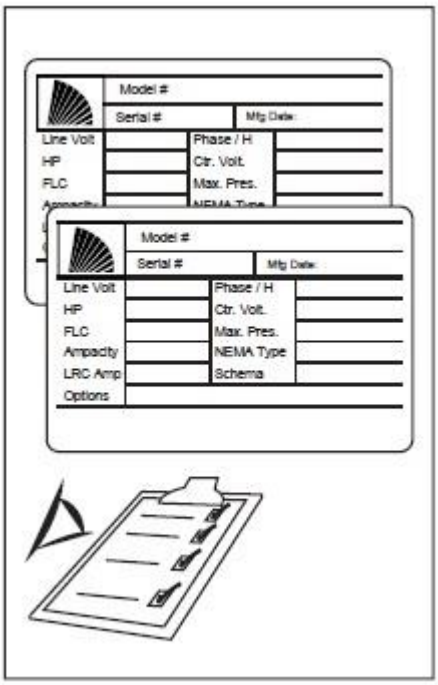
**To perform a VFD Reforming:**

1- Place the mode switch in “VFD” mode.
2- Enter a valid level 2 password.
3- Go to the “VFD Config” page.
   - VFD Reforming start button:
     This is to start the VFD Reforming.
   - VFD Reforming Duration:
     This is to adjust the VFD Reforming duration. It can be changed from 30m to 120m. According to Schneider, if the VFD required a 1 hour reforming after a 1 year inactivity.
   - VFD Reforming Timer:
     Show the time remaining in minutes to a VFD Reforming while it is being performed. Only show time if a VFD Reforming is being performed.
4- Press the “VFD Reforming” button. A textbox will pop up showing that the VPx is performing a Reforming of the VFD. A stop button can be pressed on this popup to stop the VFD Reforming.
5- The “VFD Reforming Timer” will display the time remaining for the VFD Reforming to be completed. Let the “VFD Reforming Timer” expire.

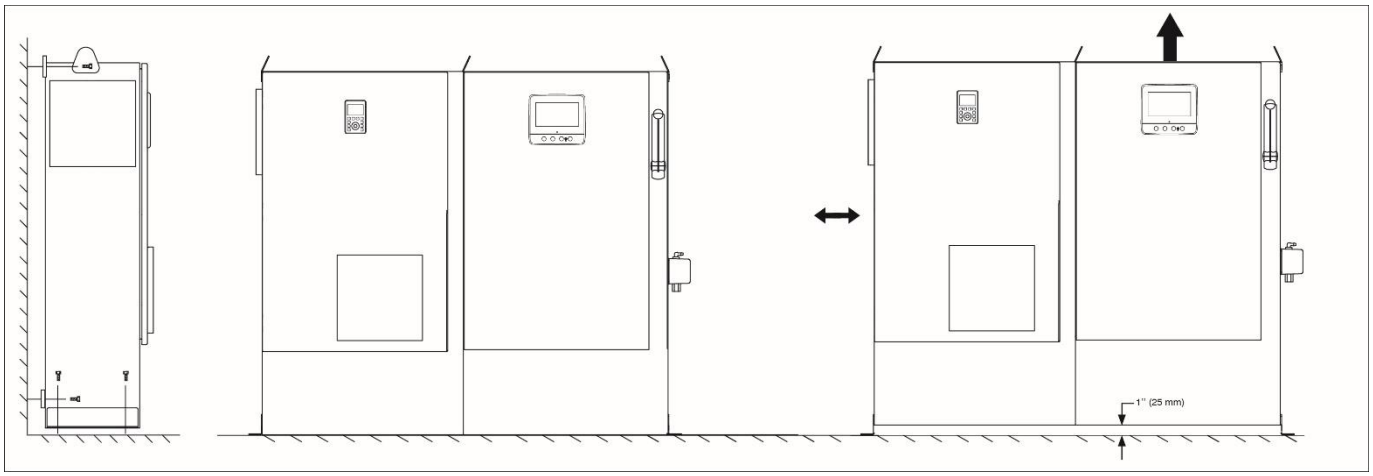
The VFD Reforming will be interupted if:
- On the Popup display, the Stop button is pressed;
- A Starting request is activated;
- The Mode Switch is placed in Bypass mode;

When the VFD Reforming is interupted:
- The “VFD Reforming Required” warning is still active;
- The “VFD Reforming Timer” will be reset;

When the reforming is Completed:
- The “VFD Reforming Required” warning is disactivated.

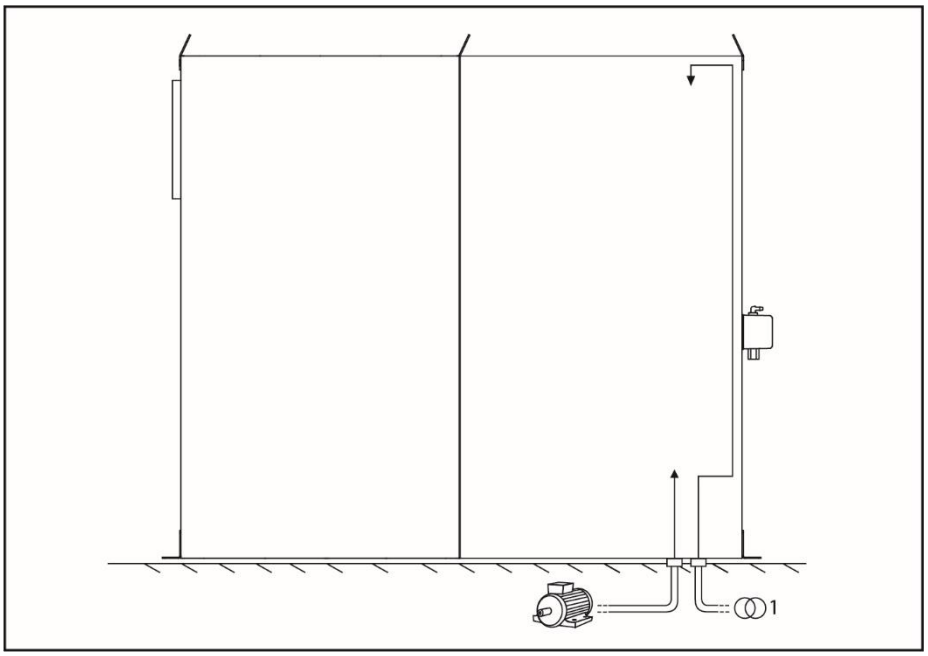


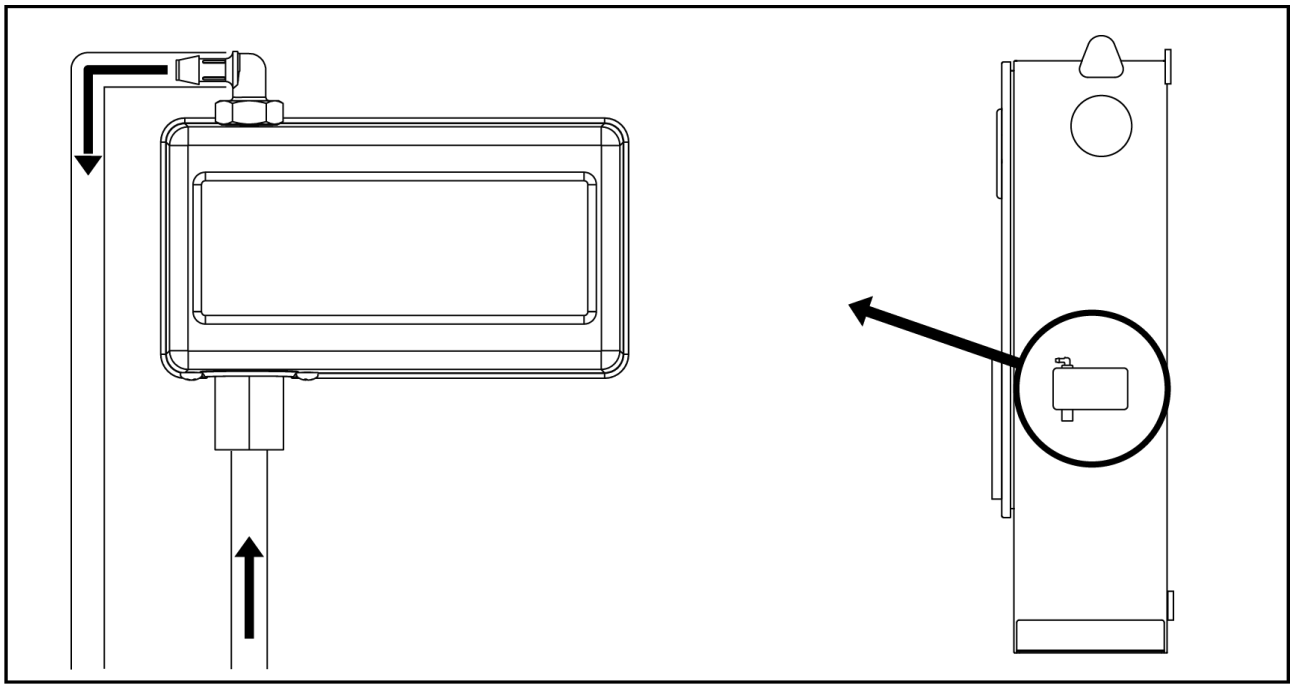

The rating label is the most important label. It must be read carefully to ensure the compatibility between the controller and the installation.



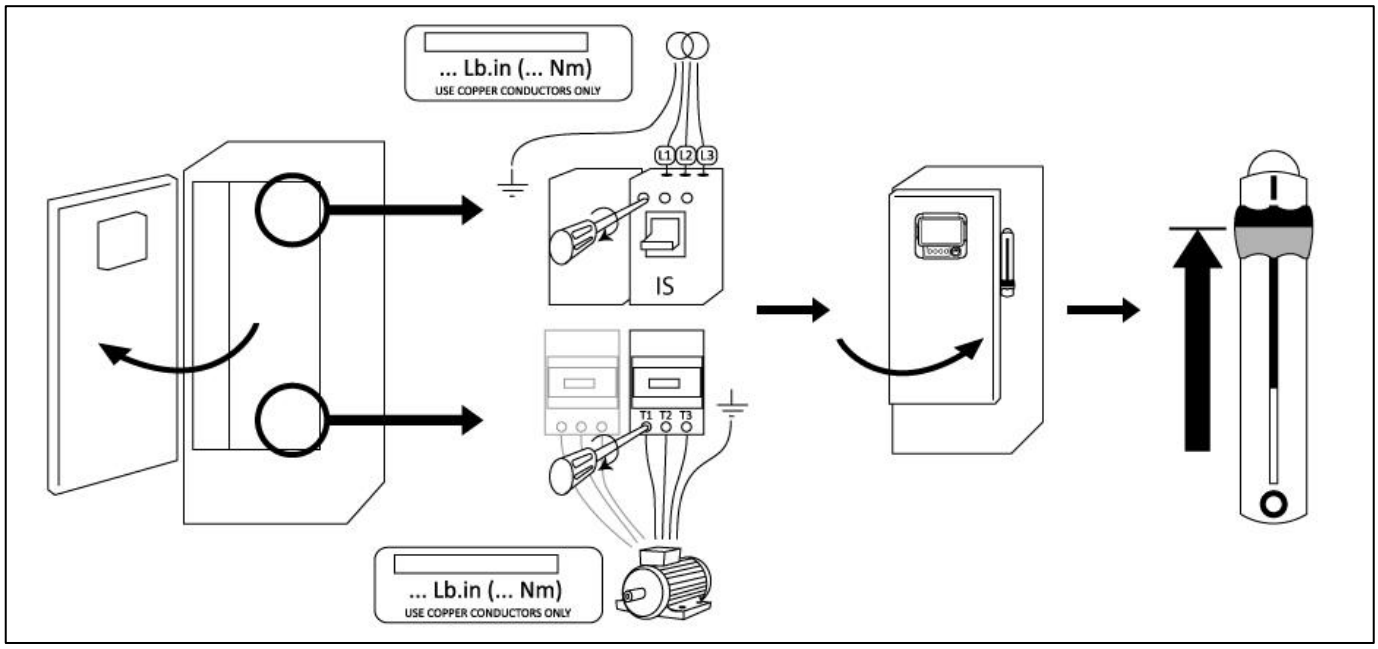

Verify that the controller is installed securely on the wall, or on the mounting stand.

Make sure to drill holes for the motor and power connections and run the cables inside the panel, all in accordance with the specifications in order to minimize interference with other equipment.



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 the input power and the motor on their respective terminals. Secure with the appropriate torque as indicated on the torque label and verify all connections.

Remove the Graphic Display Terminal from the VFD and place it on the mounting braket on the enclosure door.

Secure the door in closed position then put the circuit breaker disconnecting means in ON position. Verify the readings on the controller main screen.

**VFD Settings – Motor parameters**

On the Graphic Display Terminal, go to the “Simply Start” Menu. Verify that all the information on this menu is the same as the one on the motor name plate:

1- Motor Standard:
   Choose between 50 and 60Hz.
2- Nominal Motor Power:
   If Motor Standard is set to 60Hz, the Nominal Motor Power is in Hp. If the Motor Standard is set to 50Hz, the Nominal Motor Power is in kW.
3- Nominal Motor Voltage:
   Enter the motor voltage.
4- Nominal motor current:
   Enter the motor Full Load Current (FLA or FLC).
5- Nominal motor frequency:
   Choose between 50 and 60Hz.
6- Nominal motor speed:
   Enter nominal motor speed in rpm.
7- Max frequency:
   Should be set to the Nominal Motor Frequency (50 or 60Hz).

**VFD Settings – Basic Parameters**

Continue on the Simply Start menu and modify or validate the next parameters:

1- Acceleration ramp time
2- Deceleration ramp time
3- Low speed
4- High speed

Refer to the VFD Parameters List for the factory settings values.

**VFD Settings – AUTOTUNE**
The Autotune procedure allows the VFD to acquire electrical motor characteristics and enhance the VFD performance. It is recommended to perform an Autotune one time, during the first startup.

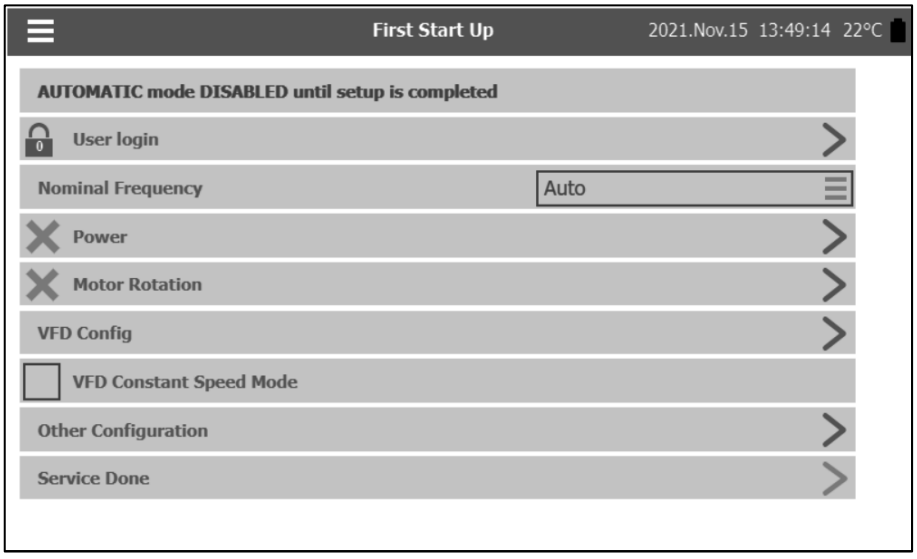
While doing the Autotune the VFD will scan the motor and acquire information about the motor.

Before starting the Autotune on the VFD, read the whole procedure. Then perform step by step.

1- Place the Mode switch on the VFD position.
2- On the Vizitouch. Enter a level 2 password.
3- Go to the “VFD Config” page and press the “VFD Autotune” button. The VPx will close the VFD isolating contactors. This will energize the VFD power path and allow the VFD to be connected to the motor. The VFD isolating contactors will remain closed for 3 minutes. During that time, you can perform the Autotune on the VFD display.
4- On the VFD Graphic Display Terminal, go to the “Simply Start” menu
5- Go to the “Autotuning” parameter and press OK to enter the “Autotuning” page.
6- Select “Apply Autotuning” and press OK.
7- A Warning will be displayed on screen. Press OK.
8- Autotune will be performed. You can validate it is completed by going on the “Simply Start” menu and look at the “Autotuning Status”. It should be at “Autotuning Done”.
9- On the Vizitouch, press the “Stop” button on the Autotune popup.
10- Place the VFD mode switch on the Bypass position.

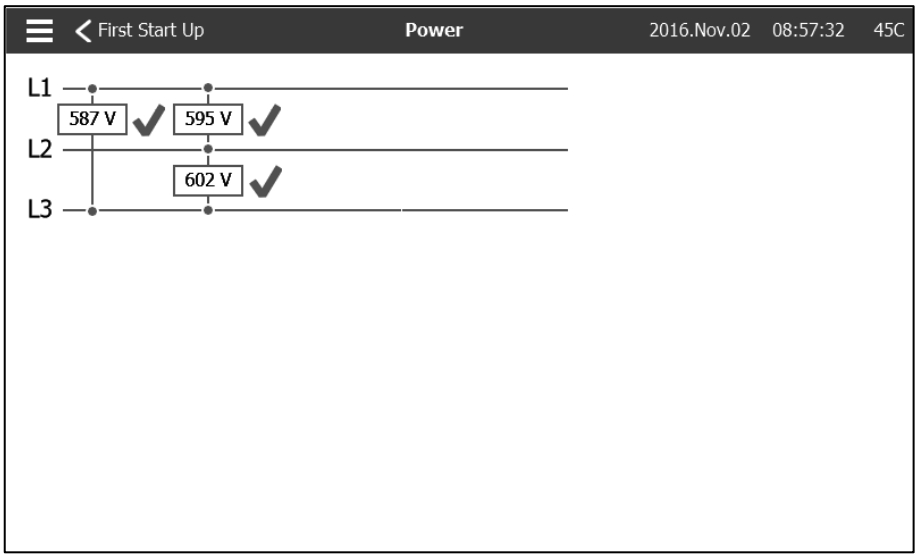
**NOTE:** During Autotuning, the motor might make small movement. Noise development and oscillations of the system are normal. This may take for several seconds. Do not interrupt the process.

Perform the Autotune on a stopped and cold motor as heat can influence the tuning result.

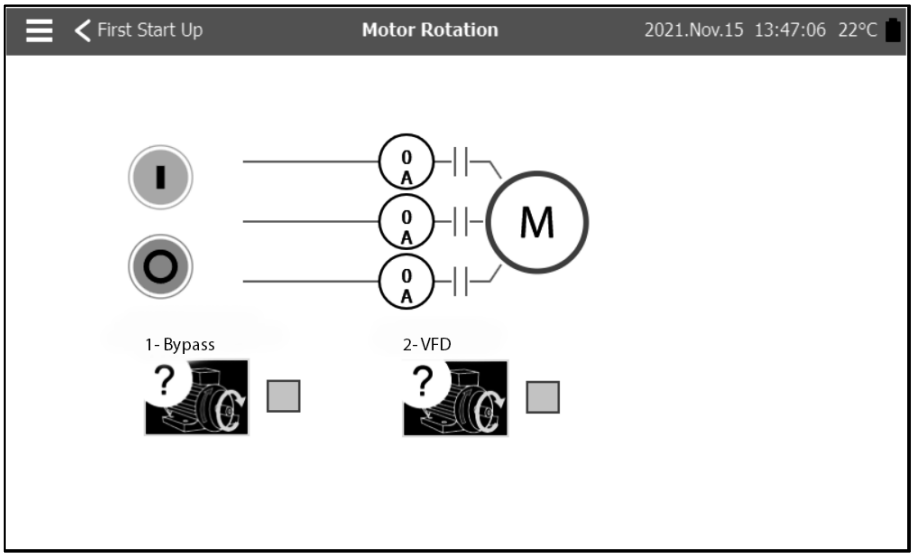



Once the VFD parameters has been verify and the Autotune has been performed, continue with the “First Start Up” page. The controller will automatically detect and display the frequency of the power source. It is then possible to manually choose the frequency of the voltage.
Press “User Login” and enter a valid authorization code.

Once logged in, check the “VFD Constant Speed Mode” box. Then press “Power”.

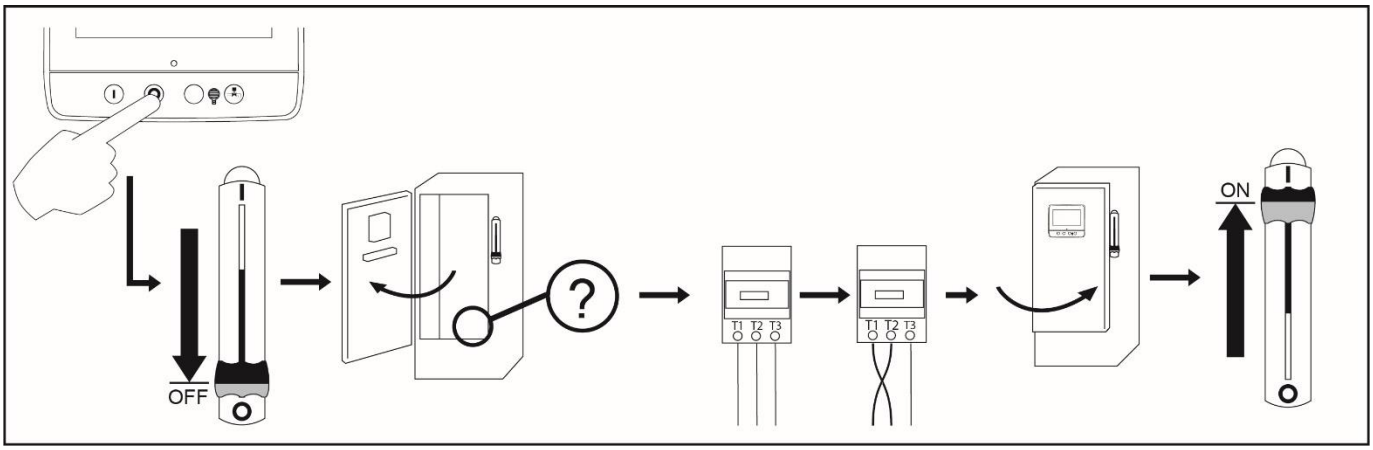



This page is used to verify the supply voltage. It displays the voltage that the controller reads between each phases for the “Line Voltage”, the “Normal Voltage” (N1-N2-N3) and the “Alternate Voltage” (A1-A2-A3).
If one of these voltages is not the same as the controller's Nominal voltage, a red “X” will be displayed beside the incorrect voltage reading.
If the Alternate power phases are not in the same order as the Normal power phases, a warning signal will display at the bottom of the screen. To fix this problem, change the power wire connections A-AL1 and B-AL2 on the Alternate side Isolation switch.
If the voltage reading are accurate (green check marks), go back to the “Controller Start-up” page and press the “Motor rotation”.




Place VFD mode switch in BYPASS mode.

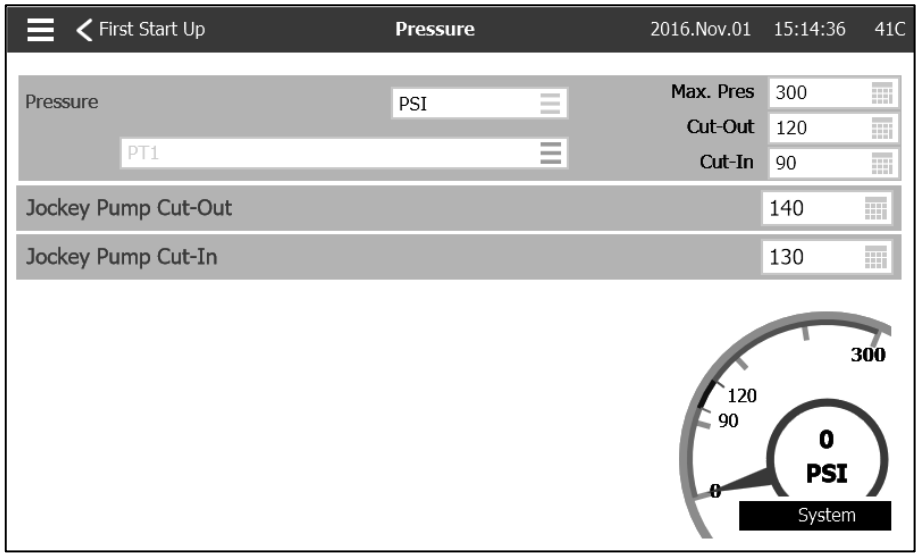
Press the “Start” button to start the electric motor and validate that the electric motor is rotating in the correct direction. Press the “Stop” button to stop the electric motor. If it is not rotating in the correct direction adjust the motor connections as per below.




Place VFD mode switch in VFD mode.

Press the “Start” button to start the electric motor and validate that the electric motor is rotating in the correct direction. Press the “Stop” button to stop the electric motor. If it is not rotating in the correct direction, go on the Graphic Display Terminal, and change the “**Output phase rotation**” **PHr** parameter on the “**Complete settings > Motor parameter > Motor Control**” menu.

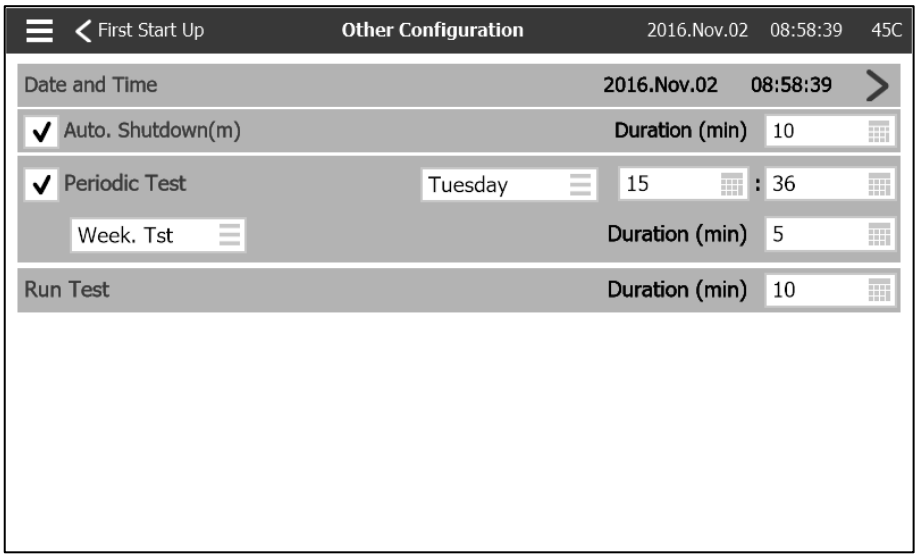
Once the motor rotation has been checked, go back to the controller start-up page and press the “Verify pressure” button.



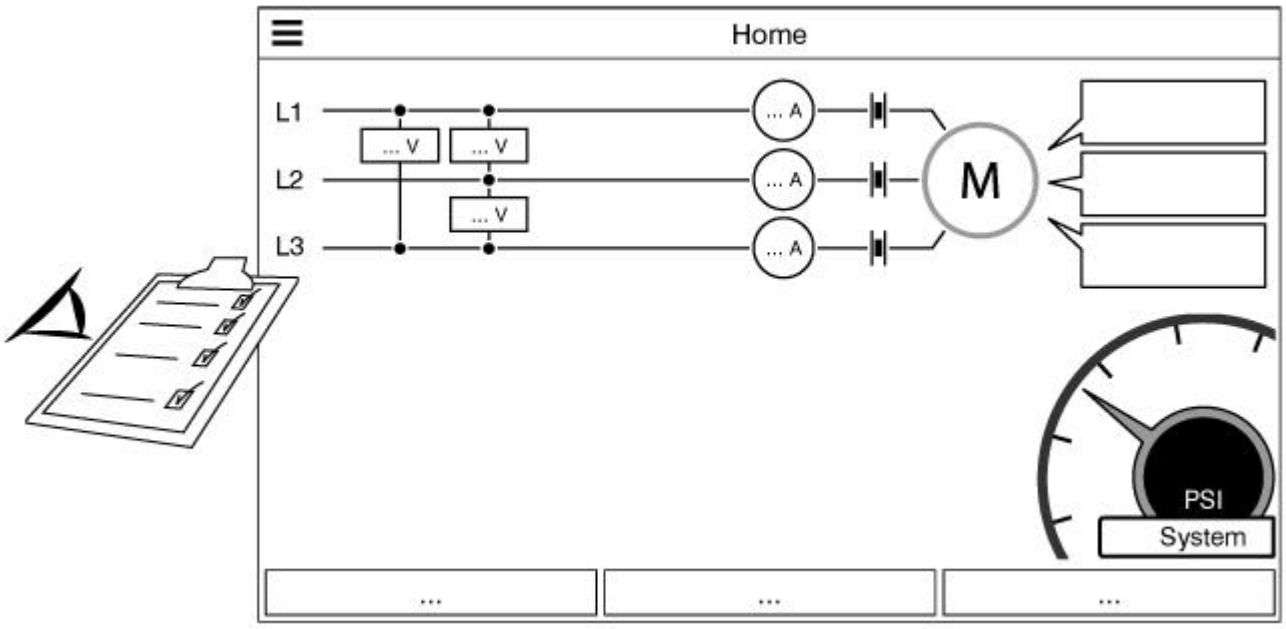

Press “Pressure”.
- Verify that the pressure reading on the screen matches with the calibrated pressure gauge installed on the sensing line.
- Choose the desired units of measurement for pressure reading.
- Adjust, if required, the range of the digital pressure gauge at Max. Pres.
- Insert the Cut-Out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

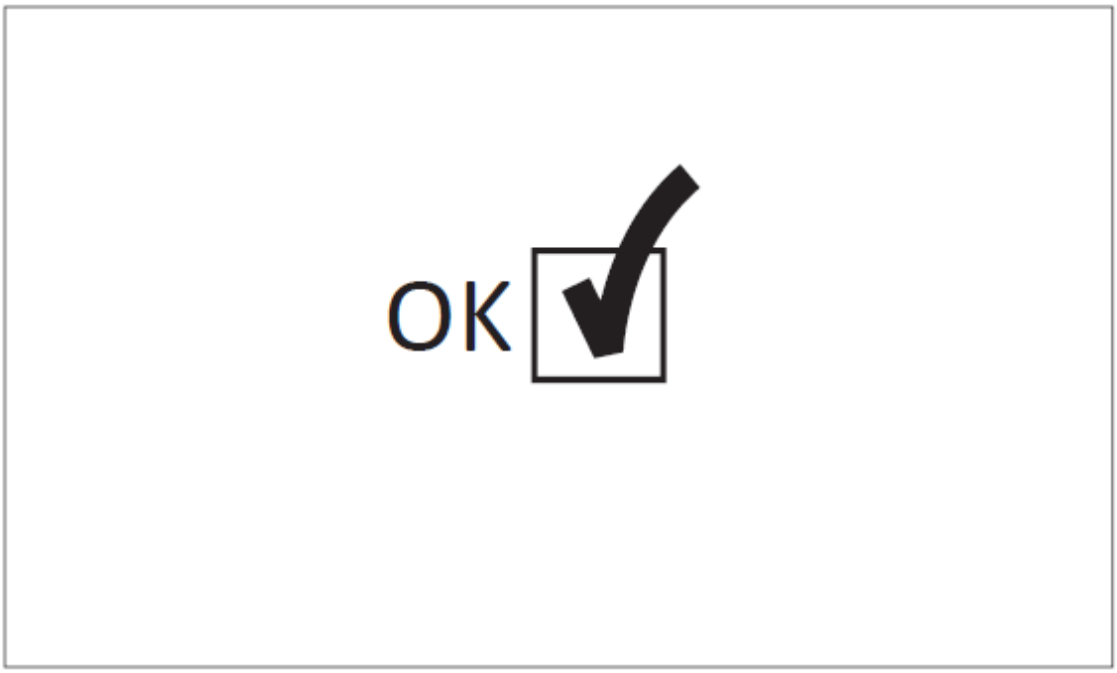
To continue to next step, press “ < First Start Up “.




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.



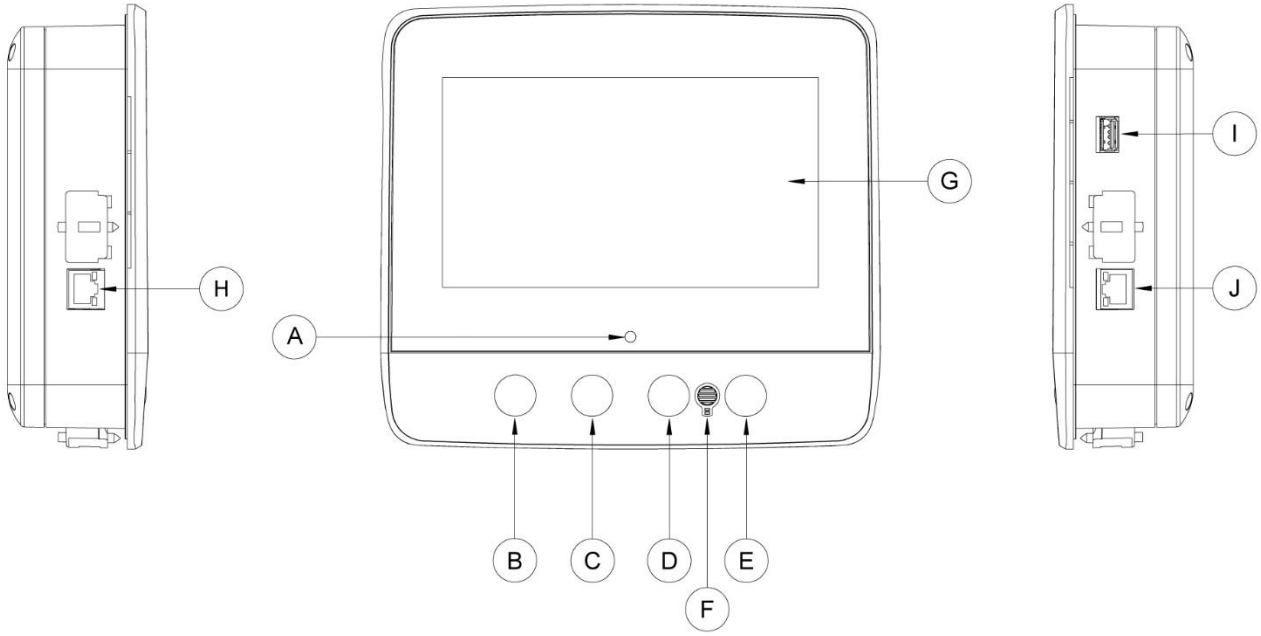

The “First Start up” is now completed. The controller is installed and configured.

To finalize the controller commissioning, it is important to refer to the VPx Complete Setup procedure to adjust the advanced parameters of the VFD. This will assure the VFD response correctly and in a timely manner to a pressure
drop.

This procedure can only be done by an trained technician.

# Main Features 3

## The ViZiTouch




A: Power LED 3 colors: Pulsing green if the ViZiTouch is properly powered.
B: Start button: Used to manually start the motor.
C: Stop button: Used to stop the motor if all starting conditions are gone.
D: Not used.
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 Buzzer

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

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

Note: Other optional or user defined conditions can also activate the alarm buzzer 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

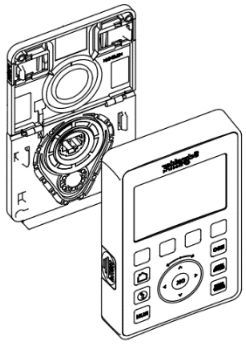
If required, here is the procedure to manually reboot the ViZiTouch:
1- Turn OFF all disconnecting means to de-energize the ViZiTouch. The ViZiTouch's screen should turn black.
2- Press the stop button or wait until the ViZiTouch's LED extinguishes.
3- Wait 10 seconds.
4- Turn ON all disconnecting means.

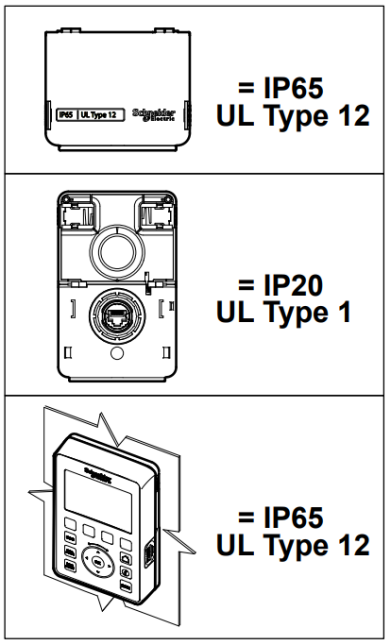
## Pressure Transducer Test

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.

## Graphic Display Terminal

The VPx is equiped with a ATV630 Altivar Process Variable Speed Drive (VFD) from Schneider. To modify a parameters on the VFD, use the Graphic Display Terminal situated on the VFD.



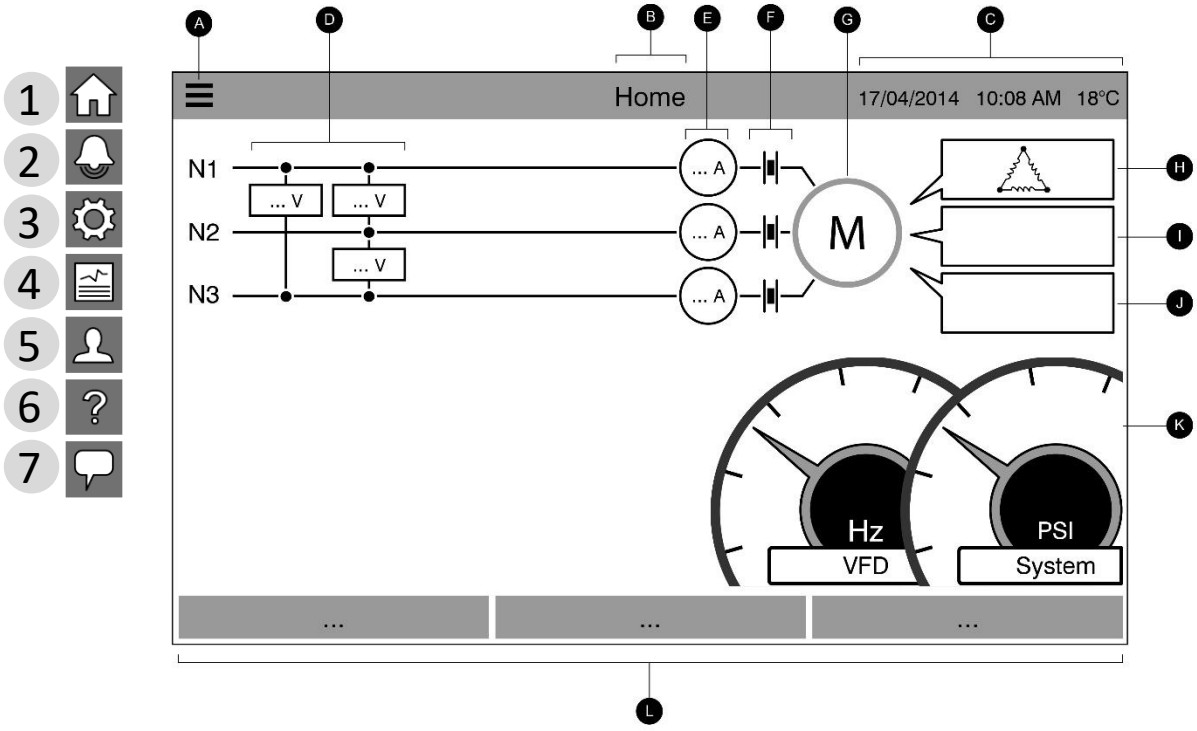

It is possible to remove the Graphic Display Terminal and to place it on the enclosure door using the door mounting kit. The UL IP is Type 12 if the door mounting kit is in the closed position without the Graphic Display Terminal or if the Graphic Display Terminal is installed. If the door mounting kit is in the open position without the Graphic Display Terminal, the UL IP is Type 1.

## Cooling system

The VPx is rated for an ambient temperature of 40°C. The enclosure is cooled using a combination of fan and air outlet filter rated NEMA type 12. The fans and air outlet filters must be periodically inspected and cleaned from excess dust.

# Home 4

**Home (Menu)** **Home**




The home page displays all controller statuses and important values of the controller. This includes all voltages, currents, pressures, motor state and status, as well as all timers and motor starting 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 Manual page
7-Select controller language

B: Name of the page.

C: Displays the date, time and ambient temperature.

D: Motor power voltage. Each box represents an individual phase voltage between the two adjacent lines.

E: Current. Each circle represents an individual line current.

F: Motor contacts. An animation shows the contactor opened or closed depending on the signal sent to the main coil.

G: The electric motor. It will be grey if the motor is stopped, green if a “Motor Run” signal is detected and red if a “Fail to start” has occurred. Pressing on the motor will redirect the user to the “Last Service Statistics” page, which monitors all relevant statistics concerning the controller since the last service.

H: The motor configuration symbol shows how the motor is wired to the contactor(s). This symbol is used to show if the motor is in a starting configuration (Wye wiring, for example) or in a permanent running configuration (i.e. delta wiring)

 Permanent delta motor connection.

 Permanent Variable Speed Drive connection

 Temporary solid state starter motor connection.

I: Representation of the motor starting or stopping cause. The reason why the motor is running will be displayed in a message box. Possible choices include, but are not limited to:

EMERGENCY: Manual motor starting activated by the emergency handle.

MANUAL: Manual motor starting activated by the START push button.

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

DELUGE: Automatic motor starting activated by a deluge valve.

AUTO: Automatic motor starting activated by pressure drop.

REMOTE AUTO: Automatic motor starting activated by remote equipment.

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

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

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

RUN TEST: Automatic motor starting activated by the run test push button.

This message can also indicate the reason why the motor is not running despite the fact that a request is being made. Possible choices include, but are not limited to:

LOAD SHED: The transfer switch has transferred to the alternate position and the motor starting is delayed to reduce the load on the alternate power source. This functionality is optional.

LOCKED ROTOR CURRENT (not on GPL models): A locked rotor current alarm has not been cleared on the alarms page and prevents the motor from starting.

LOW PRESSURE: A low suction pressure prevents the motor from running, This functionality is optional.

LOW WATER: A low water reservoir level prevents the motor from running, This functionality is optional.

TRANSFER STOP: The transfer switch is transferring between power source and the motor is temporarily stopped in the process.

LOW ZONE: 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

J: SETPOINT PRESSURE: The VFD SETPOINT PRESSURE is displayed here and needs to be entered on the VFD using the SoMove software or the VFD graphical display terminal. By default, it is reed by an IO board Analog Input and displayed on the Home page of the Vizitouch.

or

Timers: The sequential start timer (on-delay) will start timing upon an Automatic start request (pressure drop, deluge valve or remote auto signal). The motor will only start if the request stays active for the duration of this timer. The “Duration” of the run period timer (off –delay) for automatic shutdown will start timing once the start request disappears. The pump will stop at the expiration of this timer if the starting reason is no longer present. If a periodic test has been programmed, the remaining time will be displayed. If a manual run test has been energized, the remaining time will be displayed.

K: The discharge pressure gauge. It allows for a precise reading of the actual system pressure.The Cut-In (between the yellow and the red section) and the Cut-Out (between the green and the yellow section) set point values are indicated on the gauge. These values will also be represented by a red and green line on the gauge, allowing a quick comparison between the actual pressure and the set points. The actual pressure is shown in the centre of the gauge along with the unit of measure (psi, bar etc). The maximum allowable pressure is also indicated on the gauge and will scale the gauge accordingly. A full screen image of the gauge will appear by pressing anywhere on the gauge.

And

The VFD frequency gauge. This displays the frequency at which the VFD is running. It is only working when running using the VFD.

L: Status Bar. The Status Bar appears across the bottom of the display. It 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.

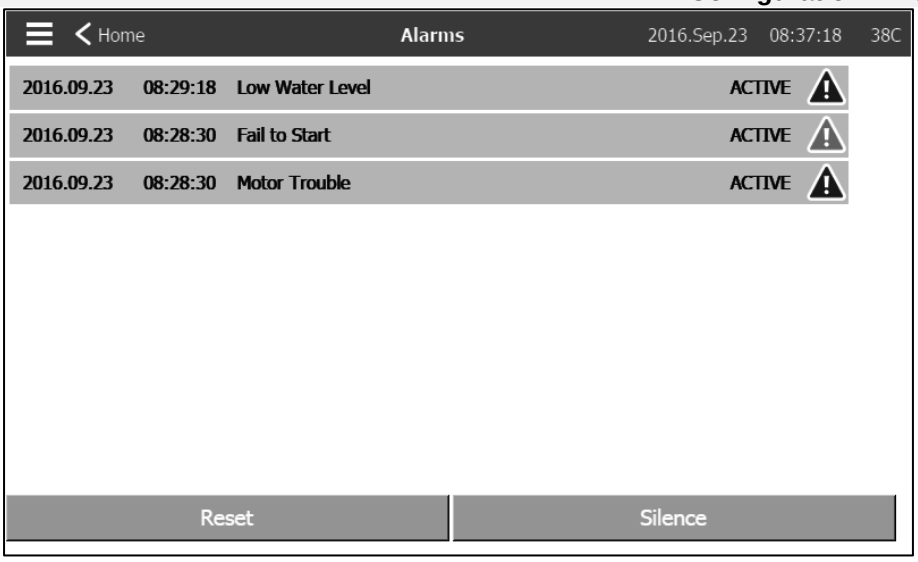
If an alarm or a warning is active, a colored rectangle will appear over the Status Bar and will display the error message. This notification will be yellow for a warning and red for an alarm. If more than one error is active, the display will alternate between the error messages. The messages will disappear 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)** **Configuration > Advanced > Alarms**




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 SILENCE button.
Pressing on the RESET button will reset OCCURRED alarms only.
Alarms ending with ** are available on transfer switch models only

The table displays system events:
- Date and time stamp of the alarm in the YYYY.MM.DD HH:mm:SS 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 :
- Normal Phase Reversal: Activates when the phase order on the normal power does not match the correct value of the controller. Each time a service is acknowledged on the ViZiTouch, the controller synchronizes the correct phase order to the one detected on the normal power.

- Phase Loss L1: This alarm is activated if the first phase of the normal power connection does not meet the qualification criteria.

- Phase Loss L2: Activates if the second phase of the normal power connection does not meet the qualification criteria.

- Phase Loss L3: Activates if the third phase of the normal power connection does not meet the qualification criteria.

- Lock Rotor Current: Activates when a lock rotor condition has been detected on the normal power. Note that the motor will not be permitted to start on the normal power as long as this alarm has not been reset from the alarms page.

- Fail to start: Activates if there is and under-current draw of two phases when the motor should be running. A 20 second factory set delay is used to give the motor enough time to start before signaling this alarm.

- Loss of power: Activates when a complete loss of normal power is detected.

- 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.

- Undercurrent: Activates when current is under 30% of FLA and the motor has been running for 15 seconds.

- Overcurrent: Activates when current is above 150% of FLA.

- Undervoltage: Activates when normal power voltage is below 80% of nominal voltage.

- Overvoltage: Activates when normal power voltage is above 115% of nominal voltage.

- Phase Unbalanced: Activates when there is a difference of more than 10% of nominal voltage between the normal power voltage readings.

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

- WT Check WT Solen: 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: Occurs if the pressure reading is out of its normal range. Additionally, 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.

- I/O Electric Communication Error: Activates if no communication between the ViZiTouch and the electric I/O card could be established for 15 seconds. This alarm is critical and triggers the bell as well as deactivating the failsafe Power Available output relay. If this alarm persists for more than 1 minute, the controller will reboot to try to fix the problem.

- Low ambient temperature: Activates when the ambient temperature is below the factory set value (5° Celsius).

- Control Voltage Not Healthy: Activates when the 24VAC power input to the I/O cards is below the acceptable functional range.

- Motor Trouble: Activates when a motor related alarm condition is present (overcurrent, undercurrent, fail to start or ground fault).

- Pump Room Alarm: Activates when a pump room related alarm condition is present (overvoltage, undervoltage, phase unbalanced).

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

- Invalid Cut-In: Activates when the Cut-In value is not acceptable on a pressure actuated controller.

**VFD Alarms**
The alarms on the VFD are automatically reset except if you remove the VFD graphic display terminal while the motor is running. To reset this alarm or any other VFD alarms displayed on the Vizitouch, press the Alarm Reset button on the Alarm page. Some other major alarms on the VFD can only be removed by doing a hard reset of the whole controller.

- VFD FAULT: Activated upon reception of the VFD Fault signal coming from the VFD.

- VFD UNDERPRESSURE: Activated after 15s continuous of the motor running with the system pressure under the SETPOINT PRESSURE. Start counting when a start request is active, and no LOCKOUT is active.

- VFD NOT READY: Activated, if 5s after powering the VFD, the Vizitouch did not receive the VFD READY signal from the VFD or a MOTOR RUN status (5% of the FLA measured by the CTs).

- VFD BYPASS: Activated when the VFD mode switch is in BYPASS position or when the VFD mode switch is in VFD position, and one of the 3 above alarm is activated. This alarm can only be reset manually and only while the motor is not running. Ether by changing the VFD mode switch position from BYPASS to VFD or by pressing the Alarm Reset button on the Alarm page when the motor is not running.

- INVALID VFD SETPOINT: Activated if the VFD Setpoint is lower or equal to the Cut-In. This is a warning that does not ring the bell.

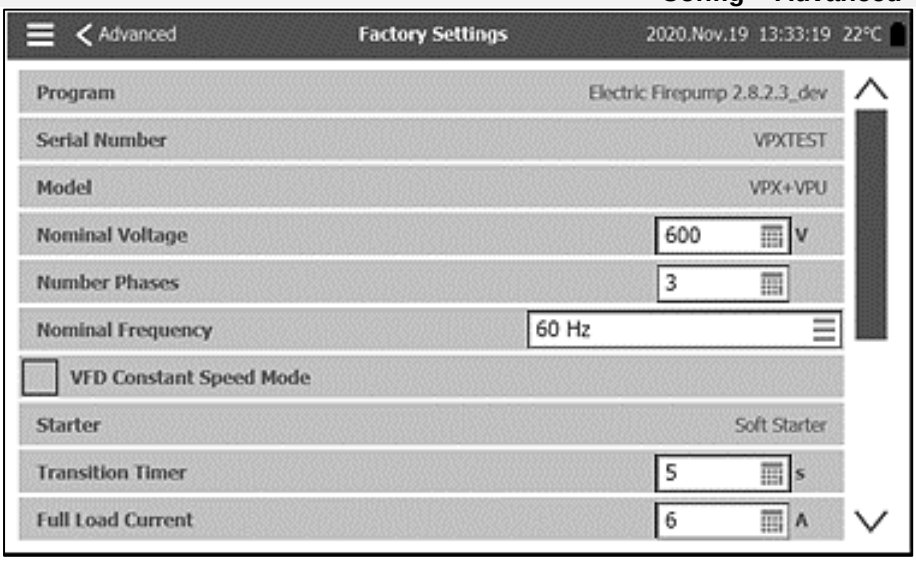
- OVERPRESSURE: Activated if the system pressure is higher than 115% of the VFD Setpoint. This alarm can be activated even if the motor is not running. A purple zone on the system pressure gauge indicates the overpressure threshold.

- VFD REFORMING REQUIRED: Activated if the VFD has not run for 365 consecutive days. Will prevent the VPx from starting the motor using the VFD and will only start in Bypass mode. Complete a VFD Reforming to reset the alarm. See “VFD Reforming” in the “Installation” section of this document for the directives on how to do a VFD Reforming.

**Config (Menu)** **Config**

Two menus have specific detail for the VPx. Those two menus will be covered in detail.

**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 representive.

**VFD Constant Speed Mode**

**The VFD Constant Speed Mode is a feature used primarily for commissioning of the VPx controller. It is intended to be used only for trouble shooting and to find the optimal Variable Speed Drive parameters.

The Constant Speed Mode will disable the pressure limiting control that is done by the VFD and will drive the motor at a constant speed upon reception of a manual starting request. The constant speed parameter “Preset speed 2” [SP2] needs to be entered on the VFD using the VFD graphic display terminal.

**To enable:**
- A level 2 password is required.
- Place the VFD mode switch in the VFD position.
- Check the “VFD Constant Speed Mode” box.

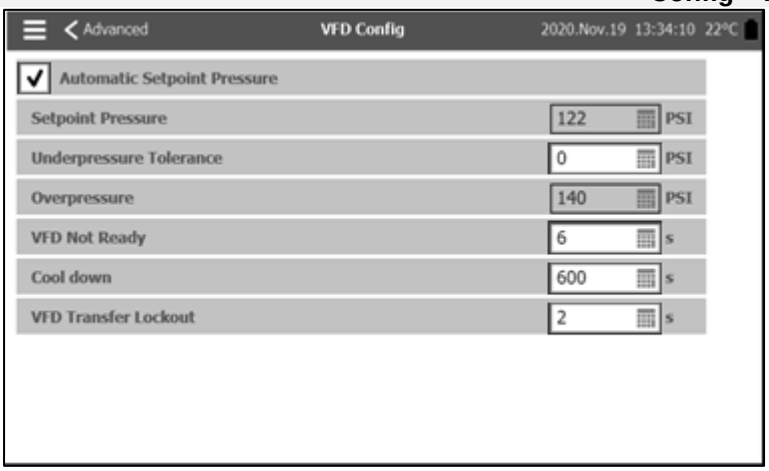
**To disable:**

- Log out.
- Place the VFD mode switch in the BYPASS position.
- Uncheck the “VFD Constant Speed Mode” box.

A warning “VFD CONSTANT SPEED MODE” will be activated when this mode is enable.

To start the motor in Constant Speed Mode, press the Manual Start Pushbutton while this mode is enable. The VFD Constant Speed Mode can only be started using a Manual starting request. Any other type of starting request will disable this mode and start the motor in the normal VFD mode. Any other type of starting request while the motor runs in Constant Speed Mode will quit this mode and start the motor in the normal VFD mode. It is recommended to lower the Cut-in and Cut-out parameters while running in Constant Speed Mode so that the controller won’t exit the Constant Speed Mode.

**VFD Config** **Config > Advanced > VFD Config**




This page is to modify and to vision parameters specifics to the usage of the VFD.

**Automatic Setpoint Pressure:** Can be unchecked to stop the automatic acquisition of the Setpoint Pressure via the analog input.

**Setpoint Pressure:** Displayed in red if it is below the Cut-in. Can be manually modified when the “Automatic Setpoint Pressure” box is unchecked. This is the value that will be displayed on the Home page and is not a value that is written on the VFD. Use the Graphic Display Terminal to modify the VFD Setpoint Pressure.

**Underpressure Tolerance:** This is the tolerance the system pressure can be below the Setpoint Pressure before activating the “VFD Underpressure” alarm thus the automatic bypass.

**Overpressure:** Automatically set at 115% of the Setpoint Pressure.

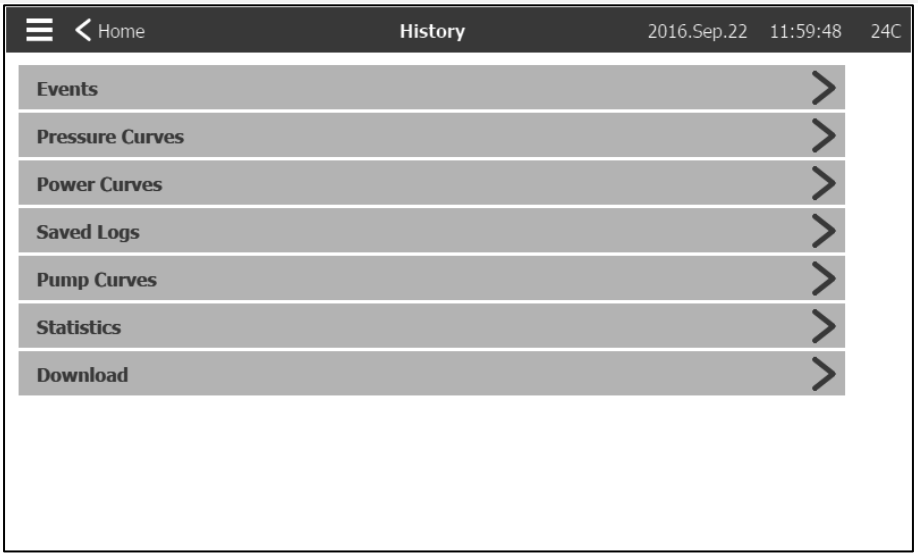
**VFD Not Ready:** The timer to activate the VFD Not Ready alarm.

**Cool down:** How much time the fan will stay active after the motor stop.

**VFD Transfer Lockout:** Lockout time between VFD transfer from VFD to BYPASS.

# 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.

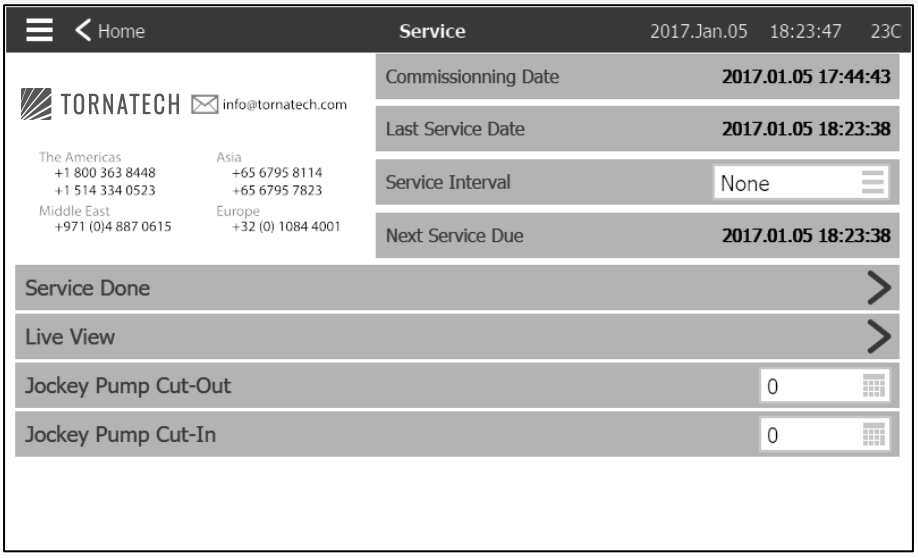
-Pump Curve: This button leads to the “Pump Curves” page.

-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.

# 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.

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