QUICK START GUIDE

HydroTOUCH Pump Controllers

VSD

Single Phase - FPC-43X21 (1-12 Pumps)

Three Phase - FPC-43X20 (1-12 Pumps)

Introduction

The HydroTOUCH range of pump controllers is an market leading, second generation multi-pump controller designed to operate up to 12 pumps. It features a wide range of advanced control options and a highly flexible array or input and output signals, both digital and analogue. Incorporating an easy set-up wizard and a user friendly touch screen, operation of these sophisticated controllers is a breeze! HydroTOUCH VSD controllers have been designed for three different control operations - Pressure, Level, Temperature and Flow, and are highly customisable to suit your specific application.

For more information on the operation of the HydroTOUCH VSD controller see the HydroTOUCH VSD Operation Manual.

Safety

This control panel has been designed and built for applications that are Commercial and/or Industrial in nature, operation, function and location. If the control panel is to be used in Domestic/Residential applications, where specific Wiring Rules in respect of 'electrical supply' protection may apply, it is the responsibility of the installing electrician to ensure compliance with relevant standards.

- Prior to installation, ensure power supply is isolated.
- Power supply must be circuit breaker protected (qualified electrician to determine appropriate amp rating).
- It is highly recommended that RCDs are NOT used to protect the supply to this panel. The VSDs in this panel have EMC filtering which can cause nuisance tripping of RCDs. It is recommended to use alternative protection for the incoming cables. If RCDs are required, type B RCDs must be used, taking into consideration the VSD earth leakage current to avoid nuisance tripping.
- Electrical connection to the panel must be carried out in accordance with the following pages.
- Additions or modifications to the control panel are not permitted and will void warranty.
- The controller is not intended for use by children or infirm persons without supervision.
- Repairs to the controller must only be carried out by a suitably qualified electrician.

This manual makes use of the following symbols to indicate warnings that must be paid specific attention to:

Damage to equipment or personal harm may occur if this instruction is not followed

Electrical risk (electrocution hazard) may occur if this instruction is not followed

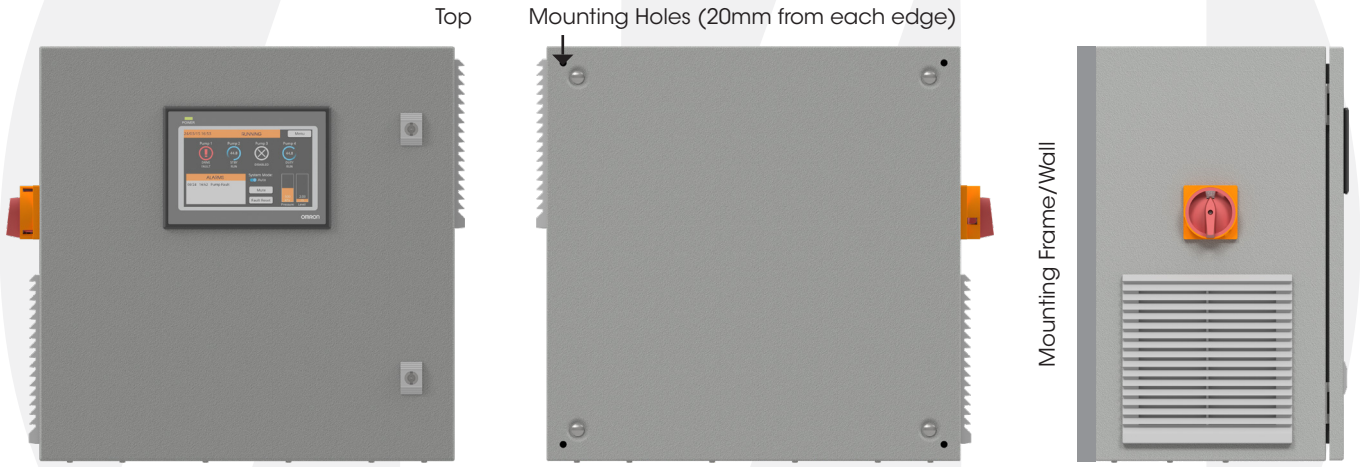
Harmonic Consideration

With all variable speed drives there will be some harmonic distortion on the main power supply. The drives used in the HydroTOUCH VSD have internal filters to reduce the amount of distortion, however in some applications additional filtering may be required. If additional harmonic filtering is required to meet site specifications this can be requested. See below an excerpt from the Australian Standard AS/NZS 61000.3.6 "Limits - Assessment of emission limits for distorting loads in MV and HV power systems":

'Power utility companies and Australian Standards stipulate maximum harmonic levels which apply at a customer's PCC (point of common coupling). Generally, the maximum permissible harmonic levels are given in terms of % THVD however to achieve a reduction in THVD, the customer is required to reduce their THID through the use of harmonic mitigation equipment. Commonly, THVD levels are required to be between 5-8%, however this will vary from state to state. IEEE STD 519 (1992) and AS/NZS 61000.3.6 (2001) are two widely used harmonic limit standards, however other standards may also be relevant including AS/NZS 61000.3.2 2007. Please confirm harmonic requirements with your utility provider. For more information please refer to the relevant standard.'

Step 1 - Installation

- Controller enclosure must be mounted in a vertical position.
- Ensure mounting method does not compromise enclosure weatherproof rating.
- Ensure access to main isolator is not restricted.
- Ensure cables/conduits entering the panel have mechanical protection and that the penetrations are sealed and do not compromise the weatherproof rating of the enclosure.



Step 2 - Connections

Warning: All electrical connections must be carried out by a suitably qualified and registered electrician

Follow the relevant controller's **Inner Door Label** on the inside of the enclosure door for specific power, pump and sensor connections to the din rail mount terminals.

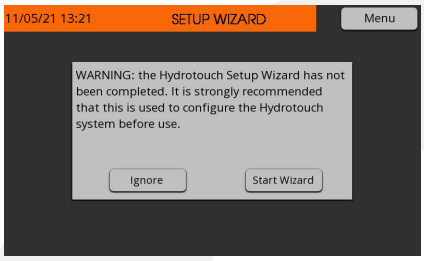
Step 3 - Powerup

When safe to do so, switch on electrical supply to panel. Check correct supply voltage before turning on the main isolator.

Step 4 - Setup Wizard

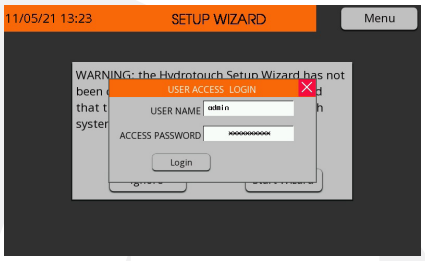
4.1 - Initial Warning

The following screen will appear when the HydroTOUCH VSD if powered up for the first time. The Setup Wizard should be used to configure the controller before operation. Press 'Start Wizard' to start the setup process.



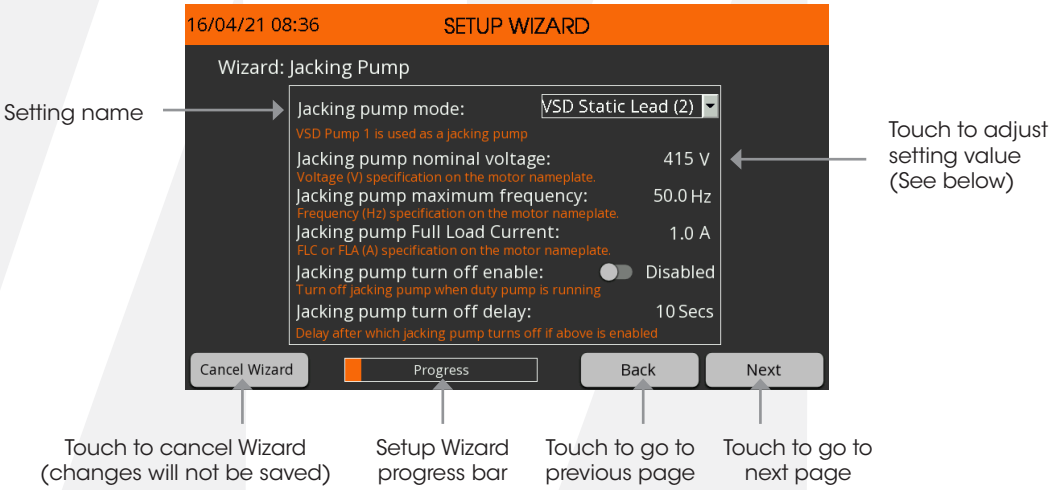
4.2 - Login

Login is required to access the Setup Wizard. For access to the Setup Wizard use the following login: **User name: admin, password: 5555.** Then press 'Start Wizard' again. **Note -** When entering the password, the pre-populated 'x's do not need to be deleted. Enter above password over the top.



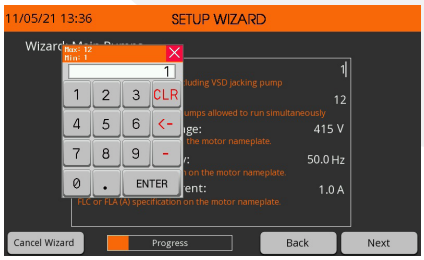
Setup Wizard Operation

The Setup Wizard is where the controller is configured for operation. Some settings will have been factory set, such as the number of pumps, and will not need to be adjusted. If any settings need to be adjusted after operation has begun, the Setup Wizard can be accessed from the Main screen by tapping on the menu in the top-right corner then tap the on Setup Wizard.



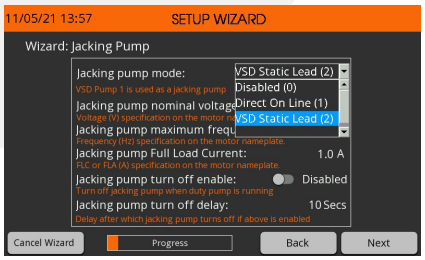
Setting Adjustment - Value

If a value setting, such as *Jacking pump turn off delay*, is pressed on, the keyboard screen will appear and the desired value can be entered or the process cancelled.

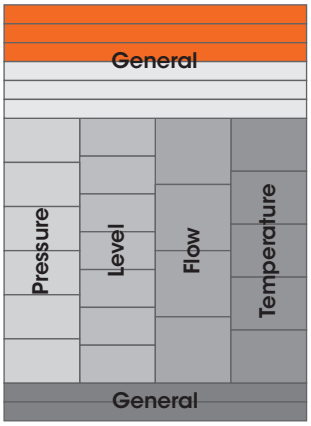


Setting Adjustment - Selection

If a selection setting, such as *Jacking pump mode*, is pressed on, a drop down list of all the available options for the setting will appear and the desired option can be selected.

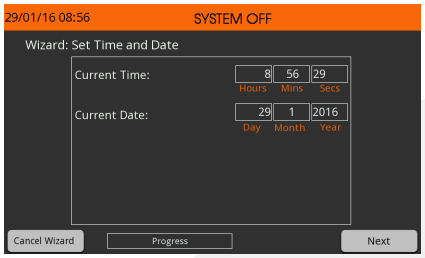


Step 4 - Setup Wizard



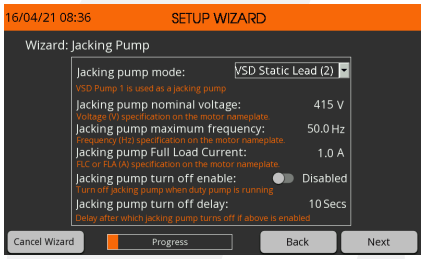
4.3 - Set Time and Date

Enter the current time and date.



4.4 - Jacking Pump

The Setup Wizard page for configuring the DOL or VSD jacking pump, if required. The required settings will display depending on the selection. If no jacking pump is required, set to 'Disabled' and move to the next Wizard page to configure the main pumps.



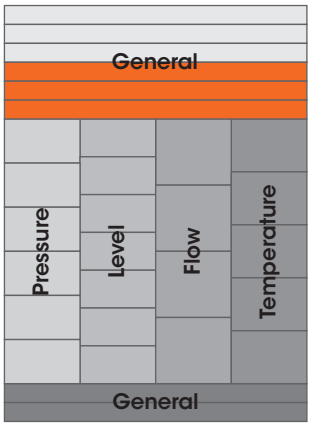
Jacking pump mode	'Disabled' = Pump 1 is a main pump, 'DOL' = When in sleep an assigned output is closed to enable a jacking pump, 'VSD' = Pump 1 configured to operate as a jacking pump.
Jacking pump nominal voltage	Set the voltage as specified on the VSD jacking pump nameplate.
Jacking pump maximum frequency	Set the frequency as specified on the VSD jacking pump nameplate.
Jacking pump full load current	Set the full load current as specified on the VSD jacking pump nameplate.
Jacking pump turn off enable	If enabled the jacking pump will turn off after the *Jacking pump turn off delay* when at least 1 main pump is operating.
Jacking pump turn off delay	Time of concurrent jacking and main pump running before jacking pump is switched off.

4.5 - Main Pumps

The Setup Wizard page for configuring the main pumps.

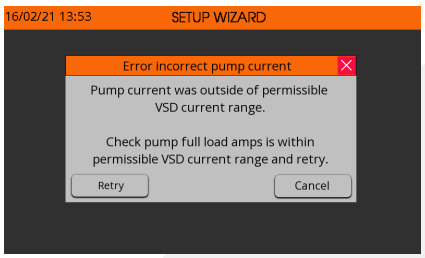
Number of pumps	Total number of pumps connected which configures the display and pump selection. This setting is factory set and does not require adjustment.
Pump limit	Maximum number pumps to be running at the same time. Used to limit max flow or max power requirements.
Pump nominal voltage	Set the voltage as specified on the pump nameplate.
Maximum frequency	Set the frequency as specified on the pump nameplate.
Pump full load current	Set the full load current as specified on the pump nameplate.

Step 4 - Setup Wizard



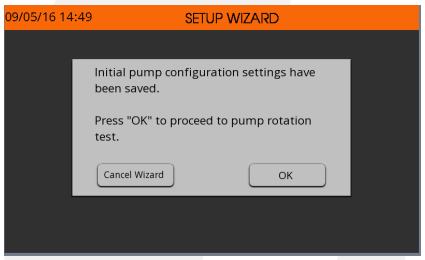
Incorrect Pump Current Warning

If the pump current entered on the previous pages is outside the VSD's acceptable current range, the below warning screen will appear. Press 'Retry' to restart the Setup Wizard.



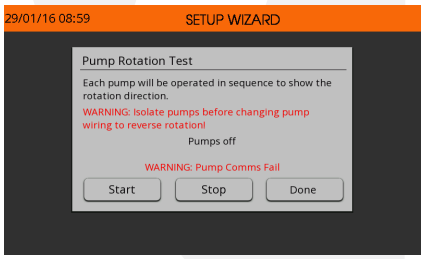
4.6 - Initial Settings Saved

After the main pumps Wizard screen has been configured, the below screen will appear. The system will briefly restart before the Wizard can be continued. Press 'OK' to continue the Setup Wizard.



4.7 - Pump Rotation Test

The pump rotation test allows the user to check the rotation of the pumps. Pressing the start button will cycle through each pump, running slowly, allowing it to be checked for correct rotation. If rotation is incorrect, ensure power to the pump is isolated then change the wiring.



4.8 - Installation Type

Select the system type as pressure, level, flow or temperature. This will configure the wizard with specific pages for each control type. See the following pages of this manual for info on each system type:

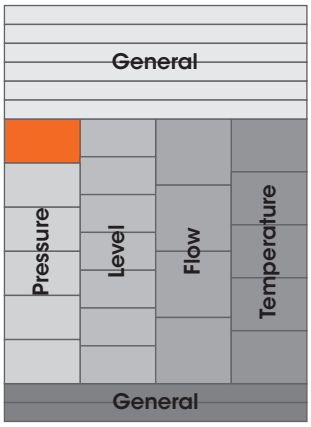
Constant Pressure - See '4.9A - Pressure Control Setup' on page 6.

Proportional Level - See '4.9B - Level Control Setup' on page 10.

Constant Flow - See '4.9C - Flow Control Setup' on page 13.

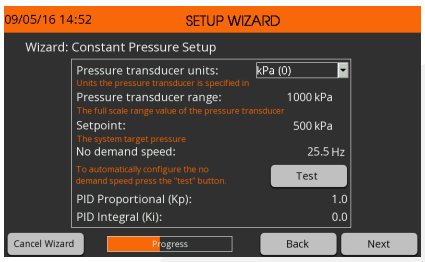
Constant Temperature - See '4.9D - Temperature Control Setup' on page 15.

Step 4 - Setup Wizard



4.9A - Pressure Control Setup - Analog & Speed Settings

The Wizard page for configuring the analog settings, *no demand speed* and PID control in the pressure system type.



Pressure transducer units	Configures the units used for all pressure values.
Pressure transducer range	The max range used for scaling all pressure values.
Setpoint	Target *Setpoint* to be reached by the system.
No demand speed	Once the duty pump speed has dropped below the *No demand speed* for 10 seconds the system will go to sleep. Run the 'Test' to find the correct *no demand speed* for the system.
PID proportional (Kp)	Proportional is the controlled speed response based on the feedback distance from *setpoint*. 'Increase' = More responsive, 'Decrease' = Less responsive. See below for more information on setting the PID.
PID integral (Ki)	Integral is the controlled speed response based on feedback time from *setpoint*. 'Increase' = Slower response, 'Decrease' = Faster response. See below for more information on setting the PID.

Additional information for setting the No Demand Speed

The *No demand speed* is a critical parameter for the proper operation of the VSD Pressure configuration, particularly for the correct operation of the sleep, pipe fill and destaging functions. The no demand is to be set at the speed (Hz) at which one pump achieves the *setpoint* against a dead head (shut discharge valve). If the system is operating as a mains boosting system with fluctuating mains pressure it is best to set the *no demand speed* for the highest incoming mains pressure.

No demand speed test:

- Enter the required operating *setpoint* in the Setup Wizard before initiating the test.
- Press the no demand speed 'Test' button
- Open the main valve/tap of the system, then press 'Start Test'.
- Slowly close the main tap/valve until just leaking a tiny amount of water, wait for the speed to stabilise, then press 'Complete'. This will automatically set the *no demand speed*.
- If the speed is 20Hz the test failed, run the test again. This time try reopening the valve then closing with a slightly larger leak.

Alternatively, if there is no main discharge valve and no water is being used, follow these steps:

- Enter the required operating *setpoint* then exit the Setup Wizard.
- Ensure that the system pressure is less than the required *setpoint*.
- Put one pump into manual on the pump screen at an initial speed of 25Hz.
- Check if the pressure reading is at the required *setpoint*.
- If not increase the *manual speed* in small steps until system pressure is at the required *setpoint*.
- Once the *setpoint* is reached read the pump speed on the main screen. The *no demand speed* should be set 0.5Hz above this.
- Restart the Wizard and manually enter this speed as the *No Demand Speed*.

If the *setpoint* is changed then the *no demand speed* will need to be recalculated because it relates to the pump performance at the system pressure.

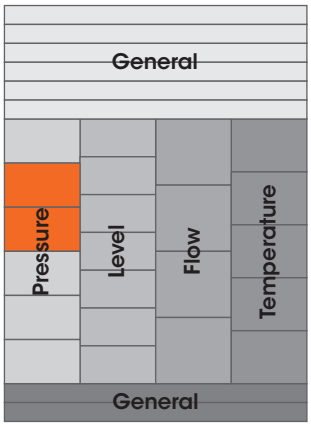
Additional information for setting the PID

The PID algorithm is used to control the speed of the pumps in the pressure VSD configuration to maintain a stable *setpoint*. Generally larger pumps will need to have a slower PID response to smaller pumps. Care must be taken adjusting these values as they can cause the system to become unstable. Also if the VSD acceleration and deceleration times are too large these delays can cause the system pressure to oscillate. It is best to keep the VSD acceleration and deceleration as quick as possible without causing drive high DC bus faults. Below are some tips to setting the PID:

- ***Proportional*** - Increasing the proportional will increase the speed of the PID causing quicker response accelerating and decelerating. Too fast or too slow can cause system pressure over shoot. Set between 0.5(slow) and 2(fast).
- ***Integral*** - Increasing the integral will smooth out the PID when close to the set point. This increases the time to get to stable set point if flow is not changing. Set between 1 (fast/unstable) to 50 (slow/stable).
- ***Derivative*** - Derivative should be left at 1 and not be changed.

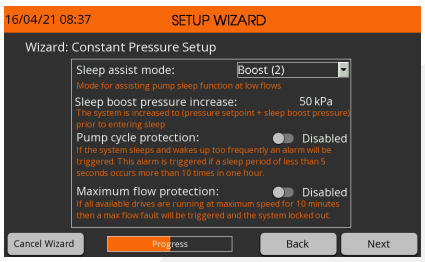
Note - PID responsiveness changes based on the analog range. Increasing the analog range will slow down the PID. For example, at 1000kPa with P = 1 and I = 10 would be similar to 1600kPa with P=1 and I = 3.

Step 4 - Setup Wizard



4.10A - Pressure Control Setup - Sleep & System Protections

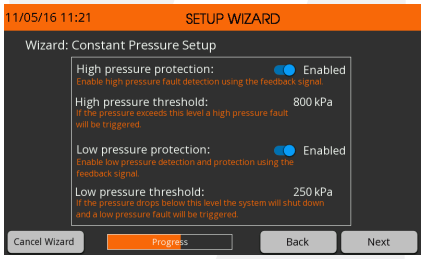
The Wizard page for configuring the sleep assist mode, pump cycle protection and maximum flow protection in the pressure system type.



Sleep assist mode	When the pump speed is not varying more than 0.1Hz for 20 seconds the system, if set to 'Speed minimise', will slowly drop the pump speed by to try and reach the *No demand speed*. If set to 'Boost' the system will adjust the *setpoint* to '*setpoint + Sleep boost pressure increase*' to increase the system pressure before returning to the normal *setpoint*. This should slow the pump speed to below the *No demand speed* if there is no system demand.
Sleep boost pressure increase	This is the target pressure above the setpoint which the sleep boost will try and reach before returning to normal operation.
Pump cycle protection	If the system goes to sleep but wakes up within 5 seconds 10 times within an hour, the fault will be activated. The system will be locked out, alarming and shutting down the pumps.
Maximum flow protection	If all available pumps are running at maximum flow for 10 minutes, the fault will be activated. The system will be locked out, alarming and shutting down the pumps.

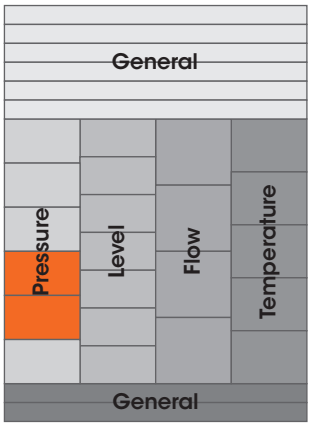
4.11A - Pressure Control Setup - High & Low Pressure Protection

The Wizard page for configuring the high and low pressure protection in the pressure system type.



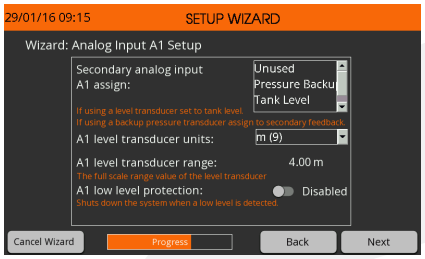
High pressure protection	If enabled the analog feedback is used for triggering the high pressure fault.
High pressure threshold	When the *High pressure protection* is enabled and the analog feedback goes above this threshold the high pressure fault will activate. The system will be locked out, alarming and shutting down the pumps.
Low pressure protection	If enabled the analog feedback is used for triggering the low pressure fault.
Low pressure threshold	When the *Low pressure protection* is enabled and the analog feedback goes below this threshold for 30 seconds, the low pressure fault will activate. The pump speed must be above the *No demand speed* for this to activate. The system will shut down the pumps and wait 60 seconds before auto restart. 5 failed restarts will active a lockout.

Step 4 - Setup Wizard



4.12A - Pressure Control Setup - Analog Input A1

The Wizard page for configuring the Analog Input A1 as a backup pressure transducer or tank level transducer, if required. The level transducer settings on this page will only display if the 'Tank Level' option is selected.



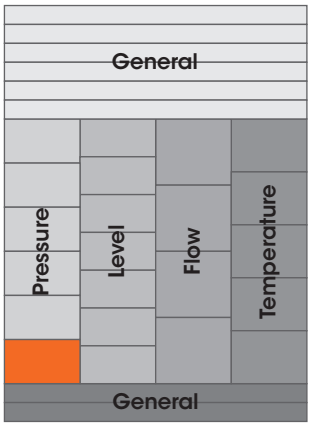
Secondary analog input A1 assign	If using a backup pressure transducer, set to 'Pressure backup'. If using a level transducer to monitor tank level, set to 'Tank level', then adjust the settings below as required.
A1 level transducer units	Configures the units used for all level values.
A1 level transducer range	The max range used for scaling all level values.
A1 low level protection	If enabled and the analog tank level value goes below the *A1 low level protection threshold*, the fault will be activated. The system will be locked out, alarming and shutting down the pumps.
A1 low level protection threshold	If the analog tank level goes below this threshold the *A1 low level protection* fault will be activated.

4.13A - Pressure Control Setup - Valve Control

The Wizard page for configuring valve control in the pressure system type. **Note -** The valve output will need to be assigned on the 'Assign Digital BMS' Wizard page for the valve control to operate. This should be requested when ordering.

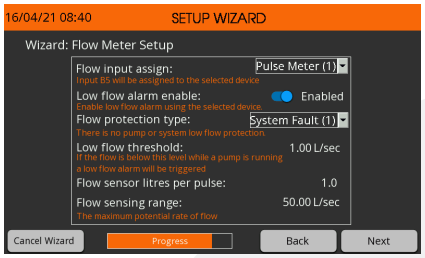
Mains bypass enable	If enabled, the valve output will be used for a normally open mains bypass valve, energising it shut during normal operation and de-energising the valve open on digital low level, system off, disabled or lockout.
Mains tank fill enable	If enabled and the *Secondary analog input A1 assign* is set to 'Tank Level', the top up control output will be used for a normally closed tank top up valve using the *Top up start level* and *Top up stop level*.
Top up stop level	The analog level at which the valve output will be deenergised to close the valve. Must be above the *Top up start level*.
Top up start level	The analog level at which the valve output will be energised to open the valve. Must be below the *Top up stop level*.

Step 4 - Setup Wizard



4.14A - Pressure Control Setup - Low Flow Protection

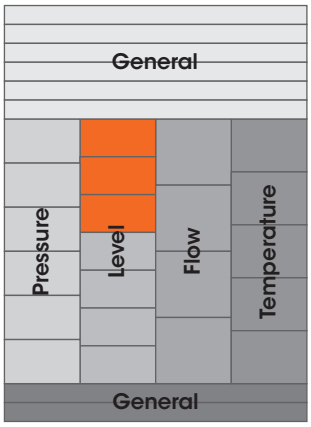
The Wizard page for setting up the low flow protection in the pressure system type.



Flow input assign	The flow input will be assigned to the selected device, a 'Flow Switch' or 'Pulse Meter'.
Low flow alarm enable	If enabled the selected device will be used to trigger the low flow protection.
Flow protection type	'System Lockout' = If a pump runs with no flow for 30 seconds then the system will be inhibited. 'Pump Fault' = If a pump runs with no flow for 30 seconds then it will be inhibited and another pump brought into operation. The controller will attempt to restart the inhibited pump or system after a 60 second delay. If 5 consecutive restarts fail to achieve flow the pump or system will be locked out. 'Sleep' = If pumps run with no flow for 30 seconds they will be shut down and system will sleep.
Low flow threshold	When the *Low flow protection* is enabled and the analog feedback goes below this threshold for 30 seconds, the low flow fault will activate. The pump speed must be above the *No demand speed* for this to activate. The system will shut down the pumps and wait 60 seconds before auto restart. 10 failed restarts will active a lockout.
Flow sensor litres per hour	The litres per hour used to calculate the flow rate and totalised volume.
Flow sensor range	The max range used for scaling all flow values and the max flow displayed on the trend graph.

Skip to '4.16 - Assign Digital BMS' on page 18 of this Quick Start Guide to continue the Setup Wizard.

Step 4 - Setup Wizard



4.9B - Level Control Setup - Analog Settings & Control Direction

The Wizard page for setting the level units, transducer range and control direction in the level system type.

Tank level units	Configures the units used for all level values.
Level transducer range	The max range used for scaling all level values.
Level control operation	Sets the control direction as 'Empty' or 'Fill'.

4.10B - Level Control Setup - Analog & Speed Settings

The Wizard page for setting the analog setpoint, duty start and standby start levels, minimum speed and full speed level.

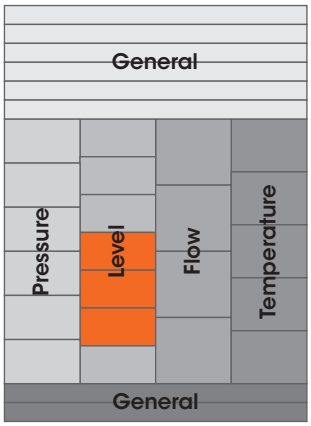
Setpoint	Target *Setpoint* stop level to be reached by the system.
Duty start level	The analog level at which the system will wake up from sleep and the duty pump will start. Ensure this is set below the *setpoint* if the *level control operation* = 'Fill', or above the *setpoint* if the *level control operation* = 'Empty'.
Standby start step	The analog level incremental step from the *Duty start step* at which the standby pumps will start.
Minimum speed	This is the speed the pumps will be running at when the analog value is at the *setpoint*.
Full speed level	The analog level threshold at which the VSDs will be running at maximum speed. Ensure this is set below the *setpoint* if the *level control operation* = 'Fill', or above the *setpoint* if the *level control operation* = 'Empty'.

4.11B - Level Control Setup - High & Low Level Protection

The Wizard page for configuring the high and low level protections.

High level protection	If enabled the analog feedback is used for triggering the high level fault.
High level threshold	When the *High level protection* is enabled and the analog feedback goes above this threshold for 5 seconds, the high level fault will activate, triggering an alarm.
Low level protection	If enabled the analog feedback is used for triggering the low level fault.
Low level threshold	When the *Low level protection* is enabled and the analog feedback goes below this threshold for 3 seconds, the low level fault will activate. The system will be locked out, triggering an alarm and shutting down the pumps.

Step 4 - Setup Wizard



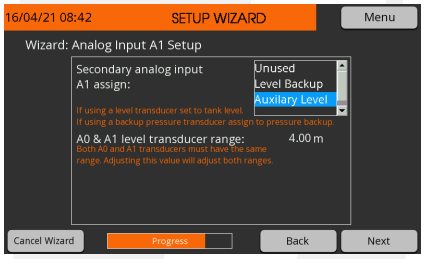
4.12B - Level Control Setup - System Protections

The Wizard page for configuring the pump cycle and max flow protections in the level system type.

Pump cycle protection	If the system goes to sleep but wakes up within 5 seconds 10 times within an hour, the fault will be activated. The system will be locked out, alarming and shutting down the pumps.
Maximum flow protection	If all available pumps are running at maximum flow for 10 minutes, the fault will be activated. The system will be locked out, alarming and shutting down the pumps.

4.13B - Level Control Setup - Analog Input A1

The Wizard page for configuring the Analog Input A1 as a backup or auxiliary tank level transducer, if required. If the 'Auxiliary Level' option is selected, auxiliary high and low protections can be configured on pages 33-34 of the parameters list.



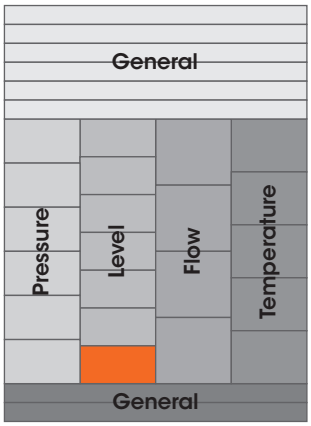
Secondary analog input A1 assign	If using a backup level transducer, set to 'Level Backup'. If using a level transducer to monitor level in an additional tank, set to 'Auxiliary level'.
A0 & A1 level transducer range	The max range used for scaling all level values. This must be the same as the A0 input *level transducer range* set on the first level setup wizard page. Adjusting the value here adjust both ranges.

4.14B - Level Control Setup - Valve Control

The Wizard page for configuring valve control in the level system type. **Note -** The valve output will need to be assigned on the 'Assign Digital BMS' Wizard page for the valve control to operate. This should be requested when ordering.

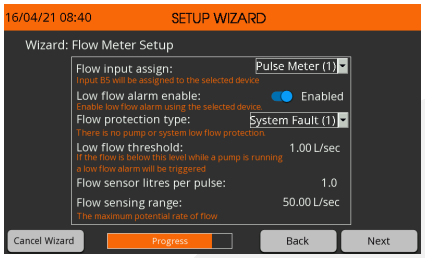
Mains tank fill enable	If enabled, the top up control output will be used for a normally closed tank top up valve using the *Top up start level* and *Top up stop level*.
Top up stop level	The analog level at which the valve output will be deenergised to close the valve. Must be above the *Top up start level*.
Top up start level	The analog level at which the valve output will be energised to open the valve. Must be below the *Top up stop level*.
Well wash enable	If enabled, when the system has pumped down to the *setpoint* and the pumps have stopped, and the time since the last well wash has exceeded 24 hours, the well wash valve will be energised open for 5 minutes. **Note -** The *well wash enable* is unavailable if the *mains tank fill enable* is in use.

Step 4 - Setup Wizard



4.15B - Level Control Setup - Low Flow Protection

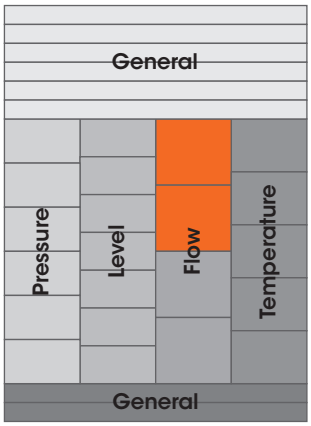
The wizard pages for setting up the low flow protection, for the level system type.



Flow input assign	The flow input will be assigned to the selected device, a 'Flow Switch' or 'Pulse Meter'.
Low flow alarm enable	If enabled the selected device will be used to trigger the low flow protection.
Flow protection type	'System Lockout' = If a pump runs with no flow for 30 seconds then the system will be inhibited. 'Pump Fault' = If a pump runs with no flow for 30 seconds then it will be inhibited and another pump brought into operation. The controller will attempt to restart the inhibited pump or system after a 60 second delay. If 5 consecutive restarts fail to achieve flow the pump or system will be locked out. 'Sleep' = If pumps run with no flow for 30 seconds they will be shut down and system will sleep.
Low flow threshold	When the *Low flow protection* is enabled and the analog feedback goes below this threshold for 30 seconds, the low flow fault will activate. The pump speed must be above the *No demand speed* for this to activate. The system will shut down the pumps and wait 60 seconds before auto restart. 10 failed restarts will active a lockout.
Flow sensor litres per hour	The litres per hour used to calculate the flow rate and totalised volume.
Flow sensor range	The max range used for scaling all flow values and the max flow displayed on the trend graph.

Skip to '4.16 - Assign Digital BMS' on page 18 of this Quick Start Guide to continue the Setup Wizard.

Step 4 - Setup Wizard



4.9C - Flow Control Setup - Flow Sensor & PID Settings

The Wizard page for setting the flow units and range, setpoint and PID control in the flow system type.

Flow units	Configures the units used for all flow values.
Flow sensor litres per pulse	The litres for every pulse used to calculate the flow rate and totalised volume.
Flow sensing range	The max range used for scaling all flow values and the max flow displayed on the trend graph.
Setpoint	Target flow *Setpoint* to be reached by the system.
PID proportional (Kp)	Proportional is the controlled speed response based on the feedback distance from *setpoint*. 'Increase' = More responsive, 'Decrease' = Less responsive. See below for more information on setting the PID.
PID integral (Ki)	Integral is the controlled speed response based on feedback time from *setpoint*. 'Increase' = Slower response, 'Decrease' = Faster response. See below for more information on setting the PID.

Additional information for setting the PID

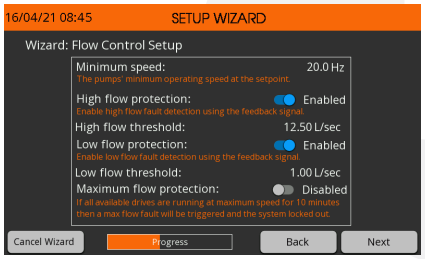
The PID algorithm is used to control the speed of the pumps in the pressure VSD configuration to maintain a stable *setpoint*. Generally larger pumps will need to have a slower PID response to smaller pumps. Care must be taken adjusting these values as they can cause the system to become unstable. Also if the VSD acceleration and deceleration times are too large these delays can cause the system pressure to oscillate. It is best to keep the VSD acceleration and deceleration as quick as possible without causing drive high DC bus faults. Below are some tips to setting the PID:

- ***Proportional*** - Increasing the proportional will increase the speed of the PID causing quicker response accelerating and decelerating. Too fast or too slow can cause system pressure over shoot. Set between 0.5(slow) and 2(fast).
- ***Integral*** - Increasing the integral will smooth out the PID when close to the set point. This increases the time to get to stable set point if flow is not changing. Set between 1 (fast/unstable) to 50 (slow/stable).
- ***Derivative*** - Derivative should be left at 1 and not be changed.

Note - PID responsiveness changes based on the analog range. Increasing the analog range will slow down the PID. For example, at 1000kPa with P = 1 and I = 10 would be similar to 1600kPa with P=1 and I = 3.

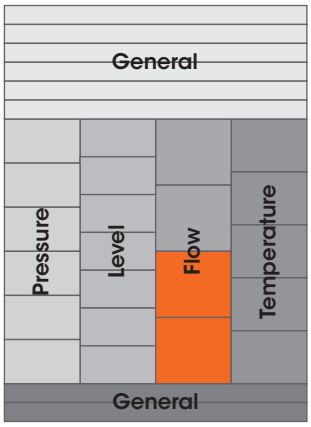
4.10C - Flow Control Setup - Speed Settings & Flow Protections

The Wizard page for setting the minimum speed and the high, low and max flow protections.



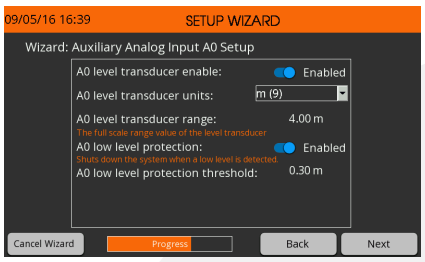
Minimum speed	This is the minimum speed the pumps will be able to run at.
High flow protection	If enabled the analog feedback is used for triggering the high flow fault.
High low threshold	When the *High flow protection* is enabled and the analog feedback goes above this threshold for 10 seconds the high flow fault will activate, triggering an alarm.
Low flow protection	If enabled the analog feedback is used for triggering the low flow fault.
Low flow threshold	When the *Low flow protection* is enabled and the analog feedback goes below this threshold for 30 seconds, the low flow fault will activate. The pump speed must be above the *No demand speed* for this to activate. The system will shut down the pumps and wait 60 seconds before auto restart. 10 failed restarts will activate a lockout.
Maximum flow protection	If all available pumps are running at maximum flow for 10 minutes, the fault will be activated. The system will be locked out, alarming and shutting down the pumps.

Step 4 - Setup Wizard



4.11C - Flow Control Setup - Auxiliary Analog Input A0

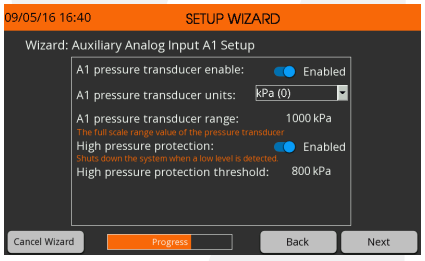
The Wizard page for configuring the Analog Input A0 for a tank level transducer, if required. If not required, set to disabled and skip this page.



A0 level transducer enable	If enabled a level transducer can be used to monitor tank level. If in use, adjust the settings below as required.
A0 level transducer units	Configures the units used for all level values.
A0 level transducer range	The max range used for scaling all level values.
A0 low level protection	If enabled and the analog tank level value goes below the *A0 low level protection threshold*, the fault will be activated. The system will be locked out, alarming and shutting down the pumps.
A0 low level protection threshold	If the analog tank level goes below this threshold the *A0 low level protection* fault will be activated.

4.12C - Flow Control Setup - Auxiliary Analog Input A1

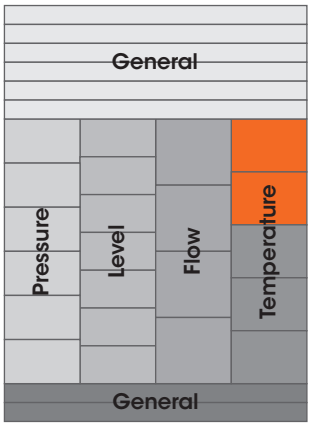
The Wizard page for configuring the Analog Input A1 for a pressure transducer, if required. If not required, set to disabled and skip this page.



A1 pressure transducer enable	If enabled, a pressure transducer can be used to monitor the system pressure. If in use, adjust the settings below as required.
A1 pressure transducer units	Configures the units used for all pressure values.
A1 pressure transducer range	The max range used for scaling all pressure values.
High pressure protection	If enabled and the analog pressure value goes above the *High pressure protection threshold*, the fault will be activated. The system will be locked out, alarming and shutting down the pumps.
High pressure protection threshold	If the analog pressure goes above this threshold the *High pressure protection* fault will be activated.

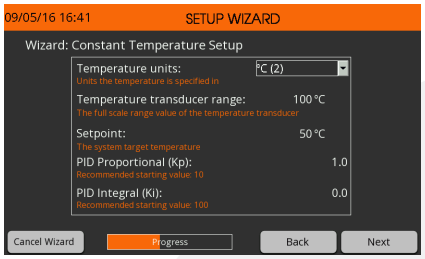
Skip to '4.16 - Assign Digital BMS' on page 18 of this Quick Start Guide to continue the Setup Wizard.

Step 4 - Setup Wizard



4.9D - Temperature Control Setup - Analog & PID Settings

The Wizard page for setting the temperature units, analog range, setpoint and PID control in the temperature system type.



Temperature units	Configures the units used for all temperature values.
Temperature transducer range	The max range used for scaling all temperature values.
Setpoint	Target *Setpoint* to be reached by the system.
PID proportional (Kp)	Proportional is the controlled speed response based on the feedback distance from *setpoint*. 'Increase' = More responsive, 'Decrease' = Less responsive. See below for more information on setting the PID.
PID integral (Ki)	Integral is the controlled speed response based on feedback time from *setpoint*. 'Increase' = Slower response, 'Decrease' = Faster response. See below for more information on setting the PID.

Additional information for setting the PID

The PID algorithm is used to control the speed of the pumps in the pressure VSD configuration to maintain a stable *setpoint*. Generally larger pumps will need to have a slower PID response to smaller pumps. Care must be taken adjusting these values as they can cause the system to become unstable. Also if the VSD acceleration and deceleration times are too large these delays can cause the system pressure to oscillate. It is best to keep the VSD acceleration and deceleration as quick as possible without causing drive high DC bus faults. Below are some tips to setting the PID:

- ***Proportional*** - Increasing the proportional will increase the speed of the PID causing quicker response accelerating and decelerating. Too fast or too slow can cause system pressure over shoot. Set between 0.5(slow) and 2(fast).
- ***Integral*** - Increasing the integral will smooth out the PID when close to the set point. This increases the time to get to stable set point if flow is not changing. Set between 1 (fast/unstable) to 50 (slow/stable).
- ***Derivative*** - Derivative should be left at 1 and not be changed.

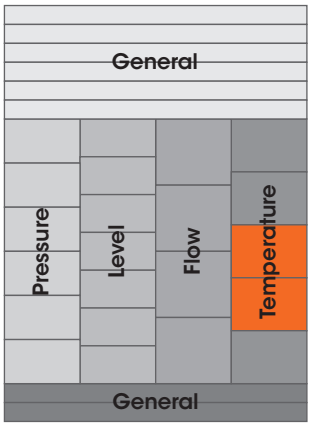
Note - PID responsiveness changes based on the analog range. Increasing the analog range will slow down the PID. For example, at 1000kPa with P = 1 and I = 10 would be similar to 1600kPa with P=1 and I = 3.

4.10D - Temperature Control Setup - Control Direction, Speed & Alternation Settings

The Wizard page for setting the control direction, minimum speed and duty change period in the temperature system type.

Temperature control operation	Sets the control direction as 'Heat' or 'Cool'.
Minimum speed	This is the minimum speed the pumps will be able to run at.
Duty change period	The duty pump running time before initiating a duty change to the next pump with the least run hours.

Step 4 - Setup Wizard



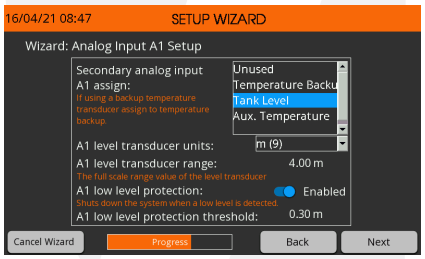
4.11D - Temperature Control Setup - High & Low Temp Protections

The Wizard page for configuring the high and low temperature protections.

High temperature protection	If enabled the analog feedback is used for triggering the high temperature fault.
High temperature threshold	When the *High temperature protection* is enabled and the analog feedback goes above this threshold for 10 seconds the high temperature fault will activate, triggering an alarm.
Low temperature alarm	If enabled the analog feedback is used for triggering the low temperature fault.
Low temperature threshold	When the *Low temperature protection* is enabled and the analog feedback goes below this threshold for 10 seconds, the low temperature fault will activate, triggering an alarm.

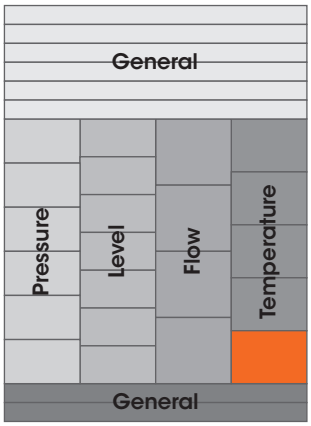
4.12D - Temperature Control Setup - Analog Input A1

The Wizard page for configuring the Analog Input A1 as a backup or auxiliary temperature sensor or a tank level transducer, if required. The level transducer settings will only display if the 'Tank Level' option is selected. If 'Auxiliary Temperature' is selected, auxiliary alarms can be configured on the following Wizard page.



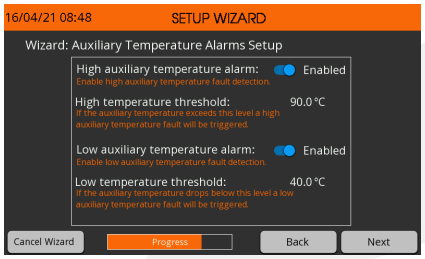
Secondary analog input A1 assign	If using a backup temperature transducer, set to 'Temperature backup'. If using a level transducer to monitor tank level, set to 'Tank level', then adjust the settings below as required. If using an auxiliary temperature sensor, set to 'Aux temp' and adjust the settings on the following page as required.
A1 level transducer units	Configures the units used for all level values.
A1 level transducer range	The max range used for scaling all level values.
A1 low level protection	If enabled and the analog tank level value goes below the *A1 low level protection threshold*, the fault will be activated. The system will be locked, alarming and shutting down the pumps.
A1 low level protection threshold	If the analog tank level goes below this threshold the *A1 low level protection* fault will be activated.

Step 4 - Setup Wizard



4.13D - Temperature Control Setup - Auxiliary Temp Alarms

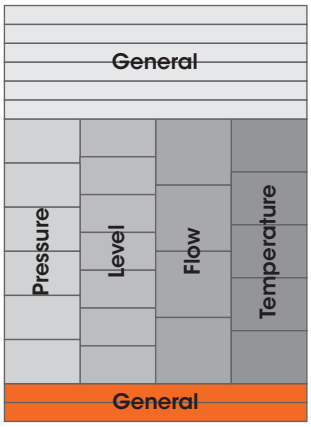
The Wizard page for configuring the auxiliary high and low temperature alarms, if the A1 Analog Input is set to 'Auxiliary Temperature'. on the previous Wizard page. These settings will not display if this option is not selected.



High auxiliary temperature alarm	If enabled the A1 analog feedback is used for triggering the high auxiliary temperature fault.
High temperature threshold	When the *High auxiliary temperature protection* is enabled and the A1 analog feedback goes above this threshold for 10 seconds the high auxiliary temperature fault will activate, triggering an alarm.
Low auxiliary temperature alarm	If enabled the A1 analog feedback is used for triggering the low auxiliary temperature fault.
Low temperature threshold	When the *Low auxiliary temperature protection* is enabled and the analog feedback goes below this threshold for 10 seconds, the low auxiliary temperature fault will activate, triggering an alarm.

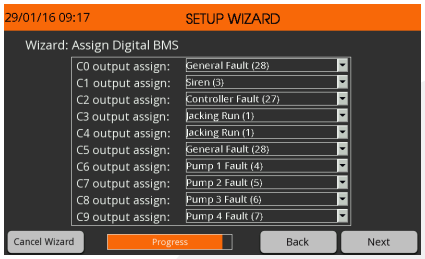
Skip to '4.16 - Assign Digital BMS' on page 18 of this Quick Start Guide to continue the Setup Wizard.

Step 4 - Setup Wizard



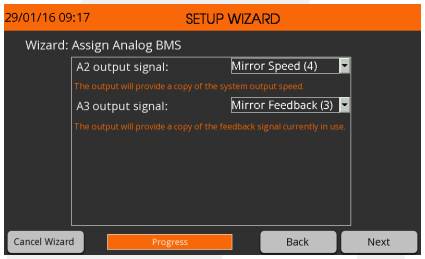
4.16 - Assign Digital BMS

The wizard pages for assigning the digital BMS outputs. These will typically be preset to match the din rail terminals provided in the HydroTOUCH VSD controller.



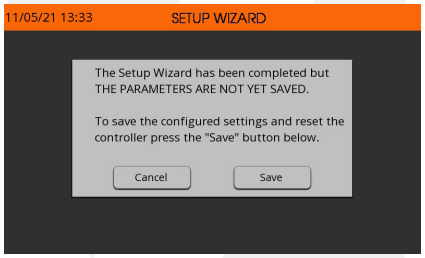
4.17 - Assign Analog BMS

The wizard pages for assigning the analog BMS outputs. Din rail mount terminals are not provided for these connections as standard, but they can be wired directly to the module if required.



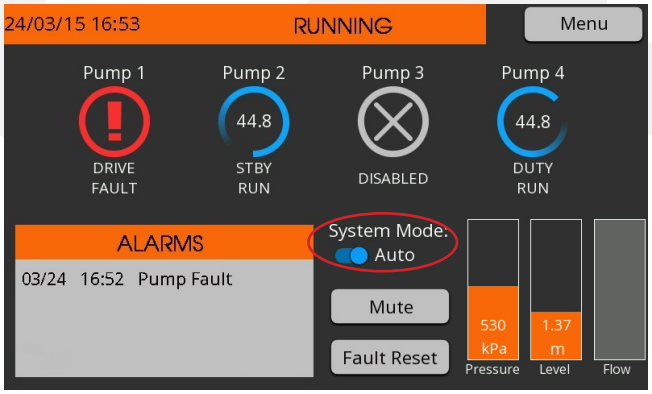
4.18 - Save

Once the Setup Wizard is complete, press save to save the settings and proceed to the main screen to begin operation.



Step 5 - Put System in Auto

On the main screen, touch on the System Mode toggle to put the system in Auto mode and begin operation.



Quick Start Complete

The controller is now configured and has begun operation. For more information on the operation of the HydroTOUCH VSD controller, see the **HydroTOUCH VSD Operation Manual.**

User Settings

Setting Name	User Setting	Setting Name	User Setting
Jacking Pump		Main Pumps	
Jacking pump mode		Number of pumps	
Jacking pump nominal voltage		Pump limit	
Jacking pump maximum frequency		Pump nominal voltage	
Jacking pump full load current		Maximum frequency	
Jacking pump turn off enable		Pump full load current	
Installation Type			
Pressure Control Setup		Level Control Setup	
Pressure transducer units		Tank level units	
Pressure transducer range		Level transducer range	
Setpoint		Level control operation	
No demand speed		Tank level units	
PID proportional (Kp)		Level transducer range	
PID integral (Ki)		Level control operation	
High pressure protection		Setpoint	
High pressure threshold		Duty start step	
Low pressure protection		Standby start step	
Low pressure threshold		Minimum speed	
Secondary analog input A1 assign		Full speed level	
A1 level transducer units		High level protection	
A1 level transducer range		High level threshold	
A1 low level protection		Low level protection	
A1 low level protection threshold		Low level threshold	
Mains bypass enable		Pump cycle protection	
Well wash enable		Maximum flow protection	
Mains tank fill enable		Secondary analog input A1 assign	
Top up stop level		A0 & A1 level transducer range	
Top up start level		Mains tank fill enable	
Flow input assign		Top up stop level	
Low flow alarm enable		Top up start level	
Flow protection type		Well wash enable	
Low flow threshold		Flow input assign	
Flow sensor litres per hour		Low flow alarm enable	
Flow sensor range		Flow protection type	
		Low flow threshold	
		Flow sensor litres per hour	
		Flow sensor range	

User Settings

Flow Control Setup		Temperature Control Setup	
Flow units		Temperature units	
Flow sensor litres per pulse		Temperature transducer range	
Flow sensing range		Setpoint	
Setpoint		PID proportional (Kp)	
PID proportional (Kp)		PID integral (Ki)	
PID integral (Ki)		Temperature control operation	
Minimum speed		Minimum speed	
High flow protection		Duty change period	
High low threshold		High temperature protection	
Low flow protection		High temperature threshold	
Low flow threshold		Low temperature alarm	
Maximum flow protection		Low temperature threshold	
A0 level transducer enable		Secondary analog input A1 assign	
A0 level transducer units		A1 level transducer units	
A0 level transducer range		A1 level transducer range	
A0 low level protection		A1 low level protection	
A0 low level protection threshold		A1 low level protection threshold	
A1 pressure transducer enable		High auxiliary temperature alarm	
A1 pressure transducer units		High temperature threshold	
A1 pressure transducer range		Low auxiliary temperature alarm	
High pressure protection		Low temperature threshold	
High pressure protection threshold			
Assign Digital BMS			
C0 output assign		C6 output assign	
C1 output assign		C7 output assign	
C2 output assign		C8 output assign	
C3 output assign		C9 output assign	
C4 output assign		C10 output assign	
C5 output assign			
Assign Analog BMS			
A2 output assign		A3 Output Assign	