INTEGRATED PUMPING SYSTEMS

VARIABLE SPEED CONTROLLERS

IPS CONTROLLER

3000

Armstrong Integrated Pumping System Contrllers, IPS Controllers 3000, are completely factory-assembled, tested, and shipped to the job site as integral units ready to receive incoming power supply. These instructions describe the procedures to be followed during installation, commissioning and operation to ensure optimum performance and reliability. When contacting the factory for assistance, please provide the unit Serial Number and other pertinent data, such as IPS model no.

ARMSTRONG

IPS CONTROLLERS 3000

INSTALLATION INSTRUCTIONS

INCOMING SUPPLY – STAND-ALONE IPS CONTROLLERS (NO RACK)

The incoming power supply should be brought in through the bottom of the panel adjacent to the main terminals. Note that this is the only electrical connection required at the panel.

The power supply voltage is **115V/1/60** as standard. Please refer to drawing # IPS_3000_FLD_01 reference number 146 for instructions to connect to IPS Controller terminal block.

INCOMING SUPPLY – IPS SYSTEM ON RACK

The incoming power supply to the IPS Controller is achieved through a tranformer in the main enclosure of the whole IPS System rack. No power connection is required.

NOTE: All electrical wiring should be performed by a qualified electrician in accordance with the latest edition of the National Electrical Code, local codes and regulations.

FIELD DEVICES INSTALLATION INSTRUCTIONS

Before attempting to start configuring the IPS Controller using the display keypad, make sure all the field installed devices such as DP sensors, flow sensors, DP switches are properly installed and wired to the IPS Controller as per wiring diagram # IPS_3000_FLD_01 reference number 146.

NOTE: Please fill in the *IPS Commissioning Check Sheet* (below) which will help you through the set-up procedure of the IPS Controller. The main information required would be the DP sensors set-point and range, the flow sensor range (if applicable) and pump design flow and head for run-out protection.

BUILDING AUTOMATION SYSTEM (BAS) CONNECTION

When the IPS Controller is provided with an RS 485 serial port to communicate serially to the BAS, the standard communication protocol is Modbus, LonWorks or BACnet. Refer to wiring diagram # IPS_3000_FLD_01 reference number 146 for wiring instructions. IPS Controller can also communicate to the BAS by hard wired option. Please refer to the IPS Controller generic terminal block drawing # IPS_3000_TER_01 reference number 145 for the different parameters and data points communicated to the BAS.

IPS Commissioning Check Sheet

(Used for inputting data in the IPS Controller)

The following data should be documented prior to setting up your new IPS controller. By collecting this information and documenting it, you will not only be prepared for the setup process, but you will also have a printed record of the data that was selected. If you have chosen to have an Armstrong Certified Controls Service Technician enter the data onto the IPS Controller, they will require that the Contractor(s) sign off that the mechanical connections and electrical connections are completed prior to visiting the site to commission the controller.

Project Name: _____

Building Address: _____

_____

Contractor Name: _____

IPS Controller Serial Number: _____

Date of Installation / Commissioning: _____

IPS Model Number (e.g. IPS Controller 3001): _____

Armstrong Service Representative (if applicable): _____

System Configuration

Number of Pumps _____

Is there a standby pump _____

Pump make, model, and size _____

Pump(s) legend _____

System design point flow (with units) _____

System design point head (with units) _____

Pump selection point flow _____

Pump selection point head _____

Pump end of curve flow rating _____

Pump end of curve pressure rating _____

Differential Pressure switch (flow switch) ☐ Yes ☐ No

Desired default speed (factory preset at 95%) _____

Minimum drive speed (factory preset at 30%) _____

Number of controller zones (process variables)

Motor Data:

Horsepower _____

Speed _____

Voltage _____

FLA rating _____

Service factor _____

FL efficiency _____

FL slip _____

Power Factor _____

Temperature class _____

* If not known use Pump selection point flow and head

Controlling Data

Process Variables / Controlling Zones

Zone #	1	2	3	4	5	6	7	8	9	10	11
Zone Legend											
DP sensor range											
Zone set-point											

Rate of speed change / ramp time (0 - Full Speed) 20 sec

Minimum Speed (factory set 30%) _____

Maximum Speed (factory set 100%) _____

Flow sensor range _____

Temperature sensor type, range _____

High temperature high alarm set-point _____

Hours of operation before switching lead pump _____

_____

Date & Signature

OPERATOR FUNCTION DISPLAYS

The IPS 3001 / 3002 Controllers displays are divided in three set of displays: Operation, Setup, and Alarm Management. The Operation Displays are used by the operators to view and control the IPS Pumps. The Setup Screens are used to set, view, save, and restore the system specific settings (i.e. number of pumps, sensor range, etc.). The Alarm Management screens are used to display the current alarms.

The list of displays in each set is as follow:

Operation Displays:

- Main Menu
- PLC Diagnostic
- System Overview
- Zone Overview
- Pump Overview

Alarm Management Displays:

- Alarm Screens
    - Interlock System Pressure Fault
    - Pump 1 to 4 Alarm
    - Pump 1 to 4 Run Feedback Alarm
    - Pump 1 to 4 No Flow Alarm
    - Pump 1 to 4 Drive Fault Alarm
    - End of Curve (EOC) Dynamic Pressure (DP) Transmitter Alarm
    - End of Curve (EOC) Flow Transmitter Alarm
    - All Zones Transmitter Alarm
    - Zone 1 to 5 Transmitter Alarm
    - Drive Fault Alarm
    - No More Alarms

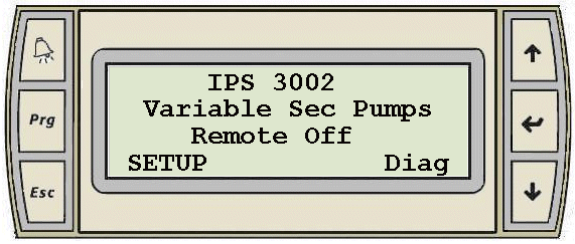
Setup Displays:

The Setup Displays are divided in three levels with each level having the same number of displays with different level of access. Level 0 setup displays are for viewing only and no adjustments can be made. Level 1 setup displays can be used for changing the system setup and restoring the system factory defaults. Level 2 setup displays can be used for changing the system setup, and saving and restoring the system factory defaults. To access Level 1 and 2 an operator need to enter the proper password: Level 1 password is 9393, Level 2 password is 2323.

The list of Setup / Default Displays for every level is as follow:

- Main Setup Screen
- IPS Setup
- Zone Setup
- Zone 1 to 4 Setup
- Pump Setup
- Drive Setup
- Speed Setup
- Design Points Setup
- End of Curve (EOC) Protection Setup
- PLC Clock Setup
- PID Setup
- Building Automation System (BAS) Communication Setup

DISPLAY PANEL – DESCRIPTION OF BUTTONS FUNCTION



- The display panel has six buttons:

- **The Alarm Button** 

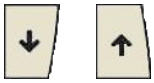
  - The Alarm Button will stay solid White when there are no active alarms.
  - The Alarm Button will flash RED when an alarm is activated.
  - Pressing the Alarm Button will call up the Alarm Display.
  - The Alarm Button will go solid White when all alarms are reset (acknowledged).
  - The Alarm Button will go solid Red when the alarms are reset and there are still some active alarms.
  - The Alarm Button will stay solid White when there are no active alarms.

- **The Prg Button** 

  - Pressing the Prg Button at any time will call up the Main Menu display.

- **The Esc Button** 

  - Pressing the Esc Button will bring you back to the previous display level.
  - For example pressing the Esc button from the Pump Status display will call up the Pump Overview display.

- **The Up and Down Arrow Button** 

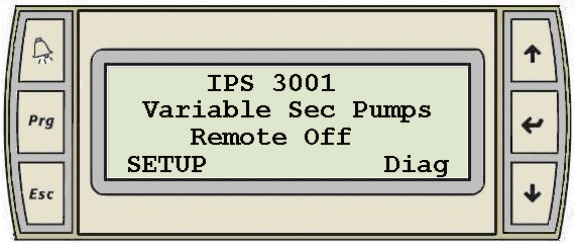
  - When the cursor is at the top left corner of the screen pressing the “Up” or “Down” Arrow buttons will let you navigate between displays.
  - When the cursor is over a digital value pressing the “Up” or “Down” Arrow button will toggle the value.
  - When the cursor is over an analog value pressing the “Up” or “Down” Arrow button will increase or decrease its value respectively.

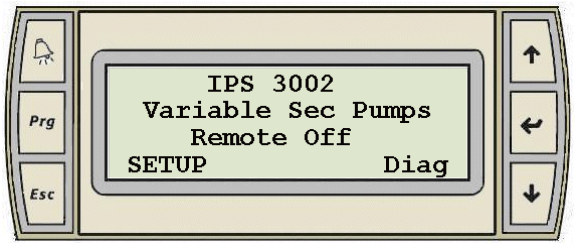
- **The Enter Button** 

  - Pressing the Enter button will move the cursor to the next fields within a display.

OPERATION DISPLAYS

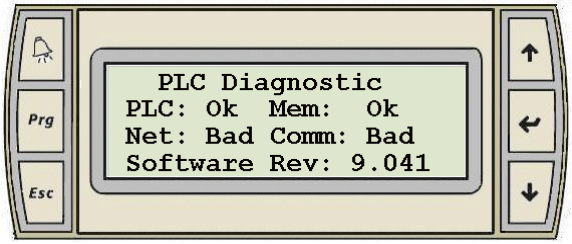
Main Menu





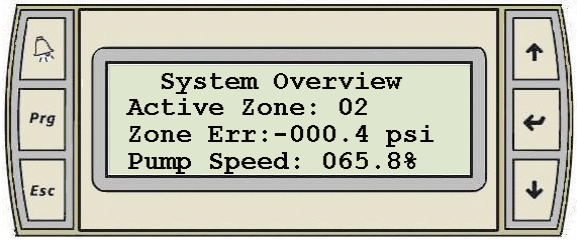
- This is the display for the Main Menu of the Integrated Pump System (IPS).
- Pressing the “Prg” Button at any time will call up the Main Menu display.
- When the cursor is at the top left corner of the screen, pressing the “Up” or “Down” arrow will navigate between the active Operation displays: Main Menu, System Overview, Pressure Overview, Pump Overview, and Pump Control.
- Pressing the “Enter” key will move the cursor over the “R” of “Remote”, the “S” of “Setup”, and the “D” of “Diag”.
- When the cursor is over “Remote” pressing the “Up” or “Down” arrow will toggle between Remote and Local control. The text will toggle between “Remote” and “Local”.
- When the cursor is over “Setup” pressing the “Up” or “Down” arrow will call up the Main Setup Screen (Level 0).
- When the cursor is over “Diag” pressing the “Up” or “Down” arrow will call up the PLC Diagnostic screen.

Diagnostic Display



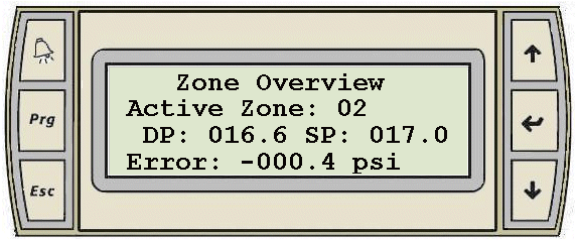
- Line 2 and 3 indicates the PLC, Memory, Network, and Communication status.
- Pressing the “Esc” key will call up the main menu.

System Overview Display



- This display is for viewing only.
- When the cursor is at the top left corner of the screen, pressing the “Up” or “Down” arrow will navigate between the active Operation displays.
- The second line displays the Active Zone.
- The third line displays the Zone Error value.
- The fourth line shows the Pump Speed in percentage.

Zone Overview Display

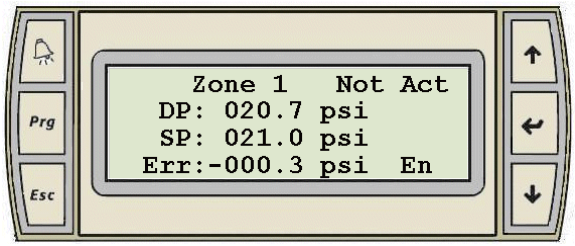


- This display is for viewing only.
- When the cursor is at the top left corner of the screen, pressing the “Up” or “Down” arrow will navigate between the active Operation displays.
- This screen displays the actual value and the setpoint of the dynamic pressure. It also calculates the error.

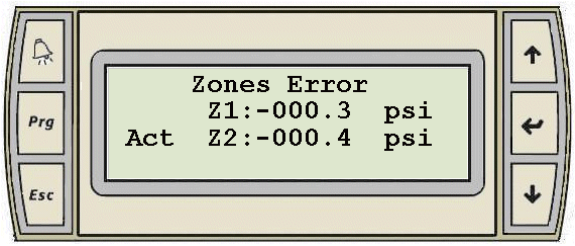
Zone Error Displays

IPS3001:

One Zone

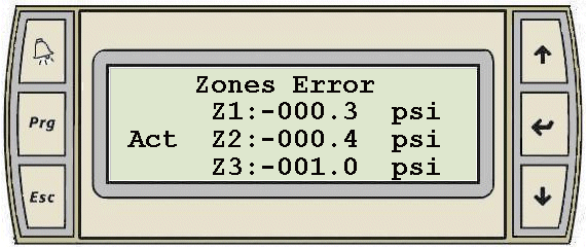


Two Zones

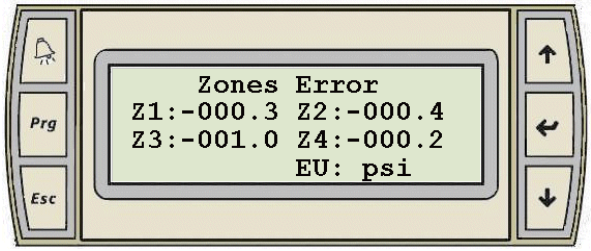


IPS3002:

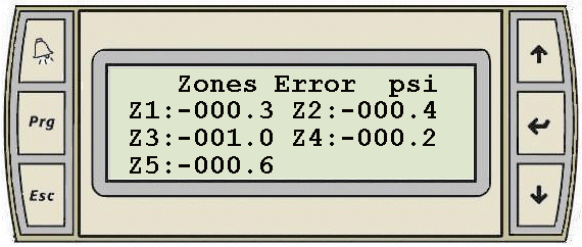
Three Zones



Four Zones



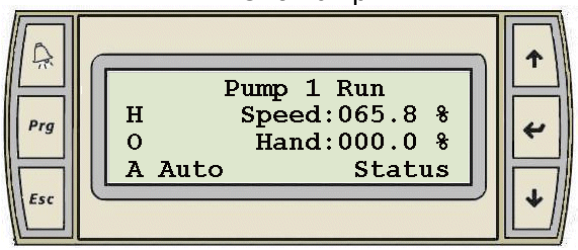
Five Zones



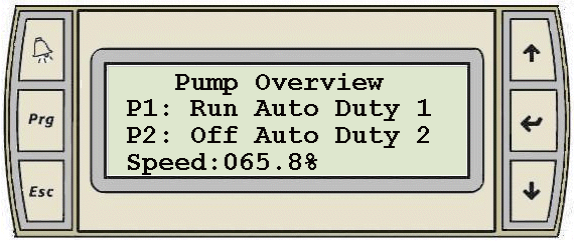
- These displays are for viewing only.
- When the cursor is at the top left corner of the screen, pressing the “Up” or “Down” arrow will navigate between the active Operation displays.
- These screens show the errors of the actual differential pressure values related to the set points for the available zones.
- They also show which zones are active.

Pump Overview Displays

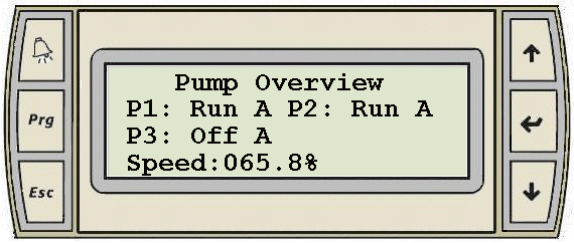
One Pump



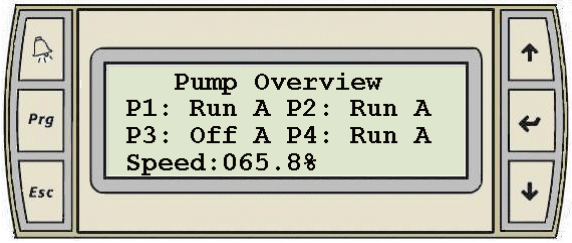
Two Pumps



Three Pumps

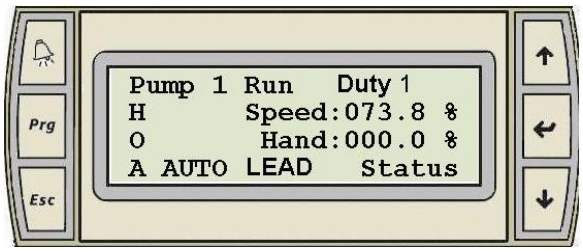


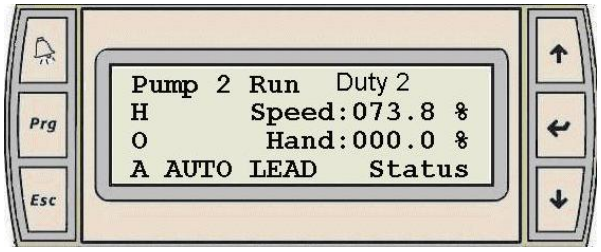
Four Pumps (IPS3002)



- The Pump Overview screen for the selected amount of pumps will be the only one to be active and displayed.
- This display is for viewing only.
- When the cursor is at the top left corner of the screen, pressing the “Up” or “Down” arrow will navigate between the active Operation displays.
- This screen will display for each pump: the run feedback “Off or Run”, and the mode “Hand-Off-Auto” or “H-O-A”.
- This screen will also display the speed of the pumps and which pump is the Lead pump.

Variable Speed Pump Control Display

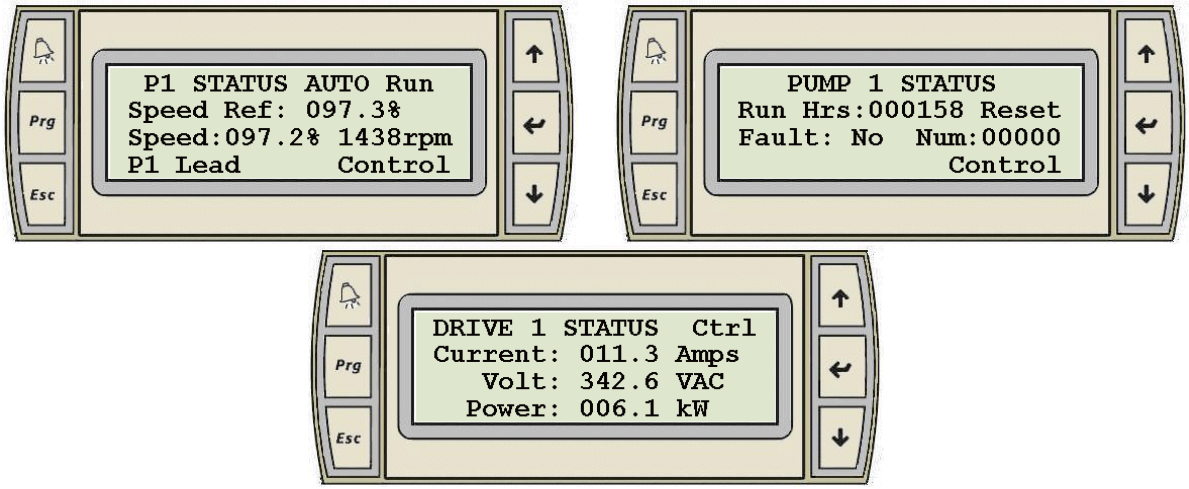




- There are similar displays for Pump 1 to 4.
- Only the displays corresponding to the number of pumps selected will be active and displayed. For example if the number of pumps is set to two on the pump setup display, only the control display for pump 1 and 2 will be active.
- When the cursor is at the top left corner of the screen pressing the “Up” or “Down” arrow will navigate between all active operation displays.
- The following information is displayed for the corresponding pump:
  - The top line indicates the Pump number, the pump running status (Run, Stop), and the pump parallel status (Duty 1, Duty 2, Duty 3, or Duty 4).
  - Line 2, 3, and 4 at the left of the screen is used to select the Pump Mode: Hand (H), Off (O), or Auto (A).
  - The Pump Mode is indicated on line 2, 3, and 4 beside the H-O-A selector. The picture above indicates the pump is in Auto mode.
  - Line 2 at the right of the screen indicates the pump speed.
  - Line 3 at the right of the screen is used to set the pump speed in Hand mode.
- Pressing the “Enter” key will move the cursor as follow: H, O, Hand, A, Lead, Status, and back to the top left corner.
- When the cursor is over “H”, “O”, or “A” pressing the “Up” or “Down” key will change the pump mode to Hand, Off, Auto correspondingly.

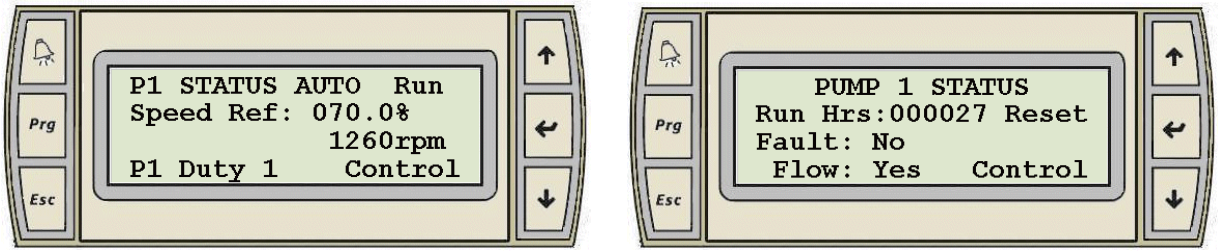
- When the cursor is over Hand, pressing the “Up” or “Down” arrow will increase or decrease the pump speed when the pump is in Hand mode. When the value for the Hand speed is set to the desired value you must press the “Enter” key for the controller to use the new Hand Speed value.
- When the cursor is over Lead, pressing the “Up” or “Down” arrow will set the pump as lead pump. A pump can only be set as Lead pump if it is in Auto mode and it is not in alarm.
- When the cursor is over Status pressing the “Up” or “Down” arrow will call up the Pump Status Display.

Variable Speed Pump Status Displays for VFD Drive Communication



- There are similar displays for Pump 1 to 4.
- Only the displays corresponding to the number of pumps selected will be active and displayed.
- When the cursor is at the top left corner of the screen pressing the “Up” or “Down” arrow will navigate between all active pump status displays.
- Display 1 Line 1 indicates the pump mode “Hand-Off-Auto”, and the run feedback “Off or Run”.
- Display 1 Line 2 indicates the speed reference (speed command sent by PLC).
- Display 1 Line 3 indicates the drive actual speed in percent and RPM (Actual feedback from drive).
- Display 1 Line 4 indicates the pump parallel status “Duty 1, Duty 2, Duty 3, Duty 4”.
- Display 2 Line 2 indicates the total number of running hours since the last reset.
- Display 2 Line 3 indicates if the drive is faulted and the fault number.
- Display 3 Line 1 to 3 indicates the drive current, voltage, and power.
- Pressing the “Enter” key on display 1 and 3 will move the cursor as follow: Control, and back to the top left corner.
- Pressing the “Enter” key on display 2 will move the cursor as follow: Reset, Control, and back to the top left corner
- When the cursor is over Reset pressing the “Up” or “Down” arrow will reset the number of run hours to zero.
- When the cursor is over Control pressing the “Up” or “Down” arrow will call up the Pump Control Display.
- Pressing the “Esc” button at anytime will call up the Pump Overview display.

Variable Speed Pump Status Displays for No VFD Drive Communication

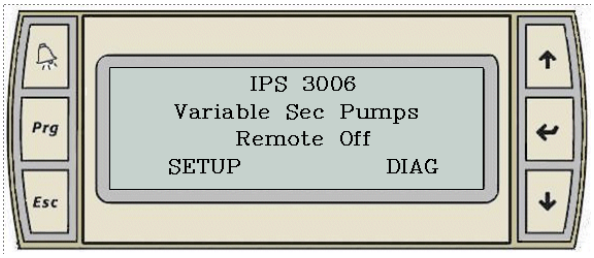


- There are similar displays for Pump 1 to 4.
- Only the displays corresponding to the number of pumps selected will be active and displayed.

- When the cursor is at the top left corner of the screen pressing the “Up” or “Down” arrow will navigate between all active pump status displays.
- Pressing the “Enter” key on display 1 will move the cursor as follow: Control, and back to the top left corner.
- Pressing the “Enter” key on display 2 will move the cursor as follow: Reset, Control, and back to the top left corner
- When the cursor is over Reset pressing the “Up” or “Down” arrow will reset the number of run hours to zero.
- When the cursor is over Control pressing the “Up” or “Down” arrow will call up the Pump Control Display.
- Pressing the “Esc” button at anytime will call up the Pump Overview display.

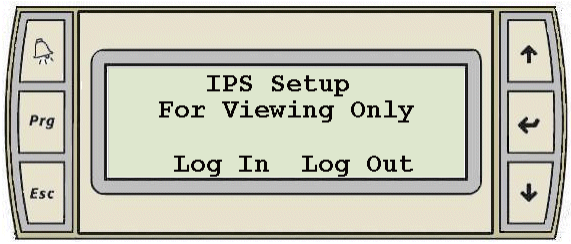
SYSTEM SETUP DISPLAYS

To go to the “Main Setup Screen” first go to the “Main Menu” by pressing the “Prg” button.

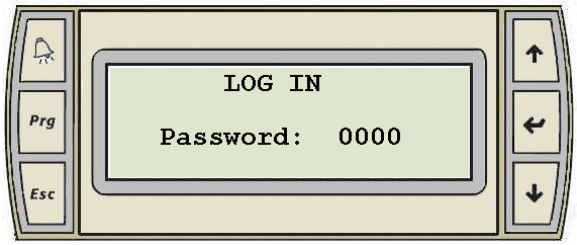


- Press the “Enter” key to move the cursor over “Setup”.
- When the cursor is over “Setup” pressing the “Up” or “Down” arrow will call up the Main Setup Screen.

Main Setup Display (Level 0)



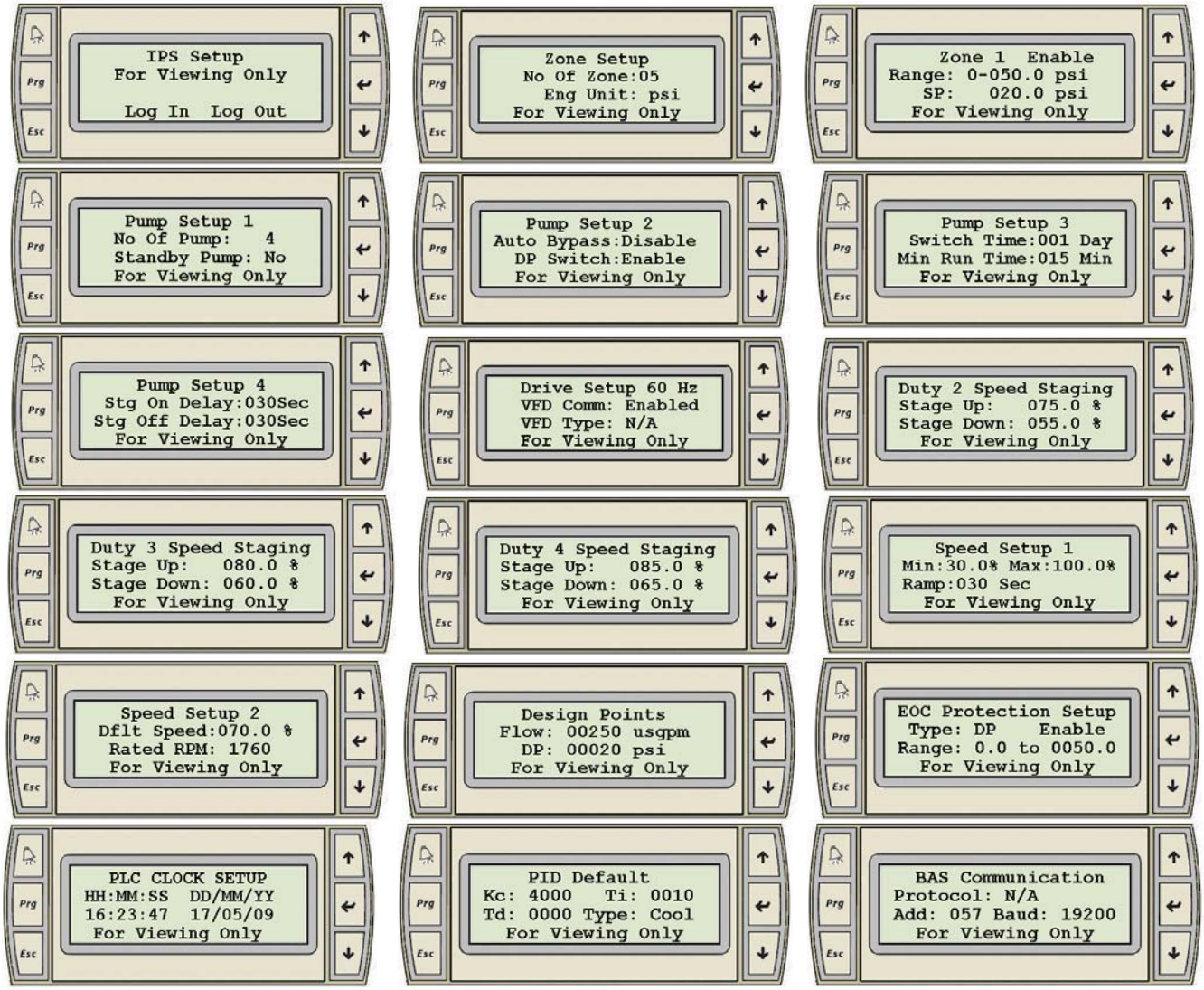
- This display is for viewing only. Level 0 setup display.
- The Setup Displays are divided in three levels with each level having the same number of displays with different level of access. Level 0 setup displays are for viewing only and no adjustment can be made. Level 1 setup displays can be used for changing the system setup and restoring the system factory defaults. Level 2 setup displays can be used for changing the system setup, and saving and restoring the system defaults.
- To access Level 1 and 2 an operator need to enter the proper password: Level 1 password is 9393, Level 2 password is 2323.
- Pressing the “Enter” key will move the cursor over “Log In” and “Log Out”.
- When the cursor is over “Log In” pressing the “Up” or “Down” arrow will call up the “Log In” display.



- Pressing the “Enter” key will move the cursor above the number area.
- When the cursor is over the number area, pressing the “Up” or “Down” arrow will increase or decrease the password number.
- When you reach the value you want “9393” for level 1, or “2323” for level 2, press the “Enter” key. This will call up the Main Setup Display for the password you selected.
- If you enter a wrong password value nothing will happen.

- After a password is entered, it will log out automatically after 5 minutes.

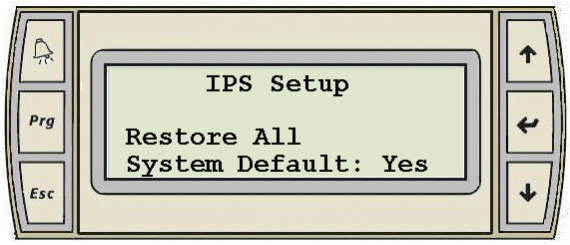
- When the cursor is over “Log Out” pressing the “Up” or “Down” arrow will clear the password and take away the access to Level 1 and 2 setup screen.
- When the cursor is at the top left corner of the screen pressing the “Up” or “Down” arrow will navigate between the Level 0 Setup Displays.
- These displays will give anybody a quick look at all the system setup.
- The following are all the level 0 setup displays:

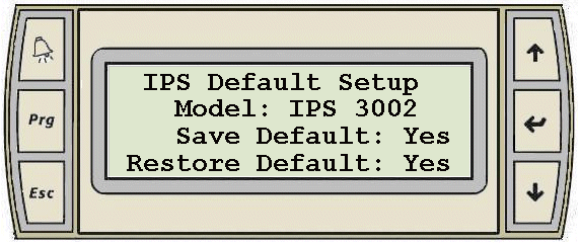


- Only the displays relevant to the system setup will be active and visible.

SETUP / DEFAULT DISPLAYS – LEVEL 1 AND LEVEL 2

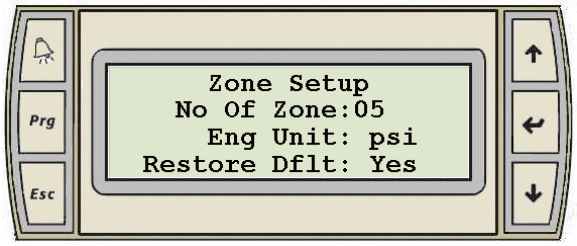
Main Setup Displays

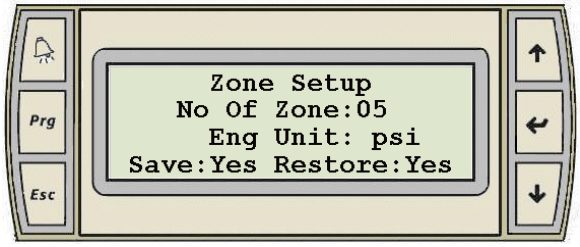




- These are the first displays to appear when entering the Log In password for Level 1 and 2 respectively.
- When the cursor is at the top left corner of the screen, pressing the “Up” or “Down” arrow will navigate between the active setup screens of the respective Level.
- On the Level 1 display pressing the “Enter” key will move the cursor over “Yes”.
- When the cursor is over “Yes” pressing the “Up” or “Down” arrow will **Restore the default settings for all the values in all the setup displays**. This is indicated by the text changing from “Yes” to “Done” for a few seconds.
- On the Level 2 display pressing the “Enter” key will move the cursor over the text beside “Model”, over “Yes” beside “Save Default”, and “Restore Default”.
- When the cursor is over the text beside “Model”, pressing “Up”, or “Down” arrow will change the controller type between IPS 3001 and IPS 3002.
- When the cursor is over “Yes” beside “Save Default” pressing the “Up” or “Down” arrow will **Save the Setup Values in all Setup Displays as Default Values**. The text will change between “Yes” to “Ok” for a few seconds.
- When the cursor is over “Yes” beside “Restore Default” pressing the “Up” or “Down” arrow will **Restore the Default Settings for all the Values in all the Setup Displays**. The text will change between “Yes” to “Ok” for a few seconds.

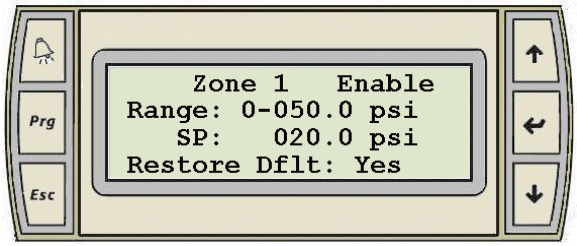
Zone Main Setup / Default Displays

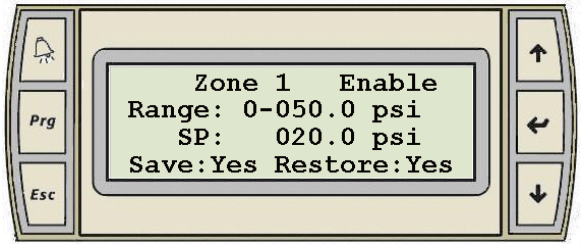




- When the cursor is at the top left corner of the screen, pressing the “Up” or “Down” arrow will navigate between the active setup screens of the respective Level.
- Pressing the “Enter” key will move the cursor over both values, over “Yes” beside Save and Restore and back at the top left corner.
- When the cursor is over the value beside “No of Zone”, press the “Up” or “Down” key to select the number of zones.
- When the cursor is over the value beside “Eng Unit”, press the “Up” or “Down” key will select between: psi, ft, Kpa, m, and bar.
- When the cursor is over “Yes” beside “Save” pressing the “Up” or “Down” arrow will **Save the settings on this screen as Default Values**. The text will change between “Yes” to “Ok” for a few seconds.
- When the cursor is over “Yes” beside “Restore Dflt” or “Restore” pressing the “Up” or “Down” arrow will **Restore the Default Settings for the settings on this screen**. The text will change between “Yes” to “Ok” for a few seconds.

Zone Setup \ Default Displays (Similar for Zone 1 – 5)

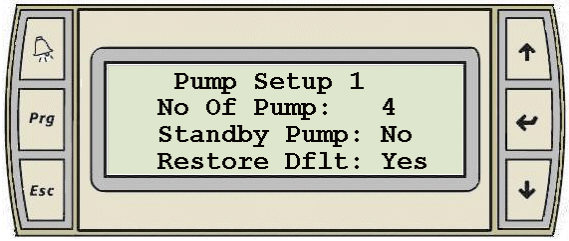


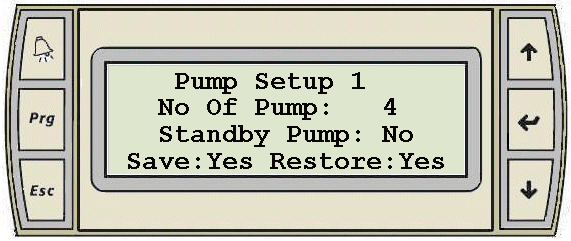


- These screens are available for each of the Zones from 1 to 5.
- When the cursor is at the top left corner of the screen, pressing the “Up” or “Down” arrow will navigate between the active setup screens of the respective Level.
- Pressing the “Enter” key will move the cursor over the text beside “Sensor”, the value beside “Range”, over the Pressure Setpoint ”SP”, over “Yes” beside “Save” and “Restore”, and back at the top left corner.
- When the cursor is over the “Range”, pressing the “Up” or “Down” key will set the range for the pressure sensor to the desired value.
- When the cursor is over the “SP”, pressing the “Up” or “Down” key will select the pressure setpoint value.
- When the cursor is over “Yes” beside “Save” pressing the “Up” or “Down” arrow will **Save the settings on this screen as Default Values**. The text will change between “Yes” to “Ok” for a few seconds.
- When the cursor is over “Yes” beside “Restore Dflt” or “Restore” pressing the “Up” or “Down” arrow will **Restore the Default Settings for the settings on this screen**. The text will change between “Yes” to “Ok” for a few seconds.

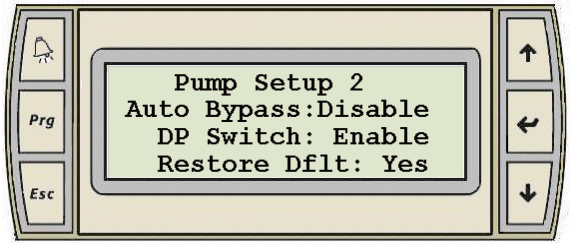
Pump Setup \ Default Displays

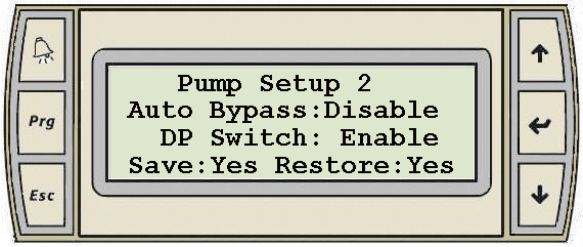
Following setup screens are available for Level 1 and Level 2 secured setup.





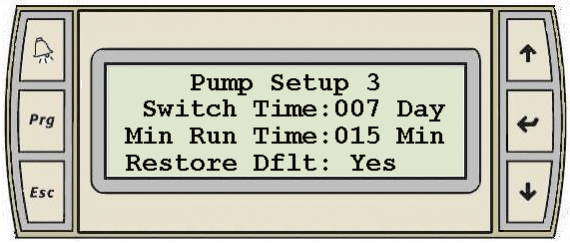
- When the cursor is at the top left corner of the screen, pressing the “Up” or “Down” arrow will navigate between the active setup screens of the respective Level.
- Pressing the “Enter” key will move the cursor over the text beside “No Of Pump”, the value beside “Standby Pump”, over “Yes” beside Save and Restore, and back at the top left corner.
- When the cursor is over the text beside “No Of Pump” pressing the “Up” or “Down” key will increase, or decrease the number of pumps available.
- When the cursor is over the value beside“Standby Pump”, pressing the “Up” or “Down” key will enable (Yes) or disable (No) the Standby feature for the pumps.
- When the cursor is over “Yes” beside “Save” pressing the “Up” or “Down” arrow will **Save the settings on this screen as Default Values**. The text will change between “Yes” to “Ok” for a few seconds.
- When the cursor is over “Yes” beside “Restore Dflt” or “Restore” pressing the “Up” or “Down” arrow will **Restore the Default Settings for the settings on this screen**. The text will change between “Yes” to “Ok” for a few seconds.

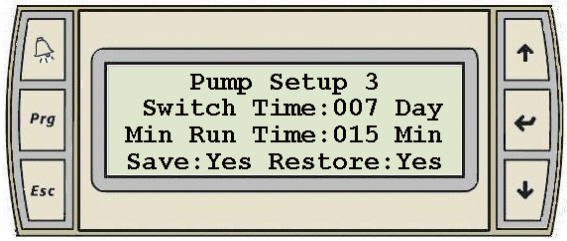




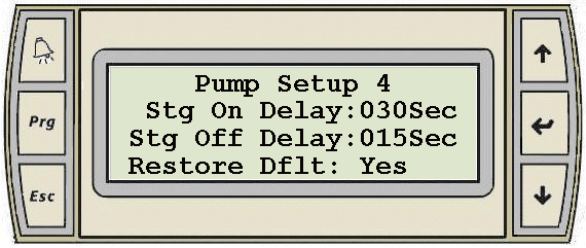
- When the cursor is at the top left corner of the screen, pressing the “Up” or “Down” arrow will navigate between the active setup screens of the respective Level.

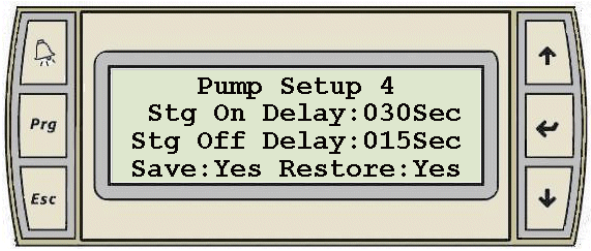
- Pressing the “Enter” key will move the cursor over the text beside “Auto Bypass”, the text beside “DP Switch”, over “Yes” beside Save and Restore, and back at the top left corner.
- When the cursor is over the text beside “Auto Bypass” pressing the “Up” or “Down” keys will select between disabling (Disabled), and enabling (Enabled) the Auto Bypass feature.
- When the cursor is over the text beside “DP Switch” pressing the “Up” or “Down” keys will select between disabling (Disabled), and enabling (Enabled) the DP Switch.
- When the cursor is over “Yes” beside “Save” pressing the “Up” or “Down” arrow will **Save the settings on this screen as Default Values**. The text will change between “Yes” to “Ok” for a few seconds.
- When the cursor is over “Yes” beside “Restore Dflt” or “Restore” pressing the “Up” or “Down” arrow will **Restore the Default Settings for the settings on this screen**. The text will change between “Yes” to “Ok” for a few seconds.





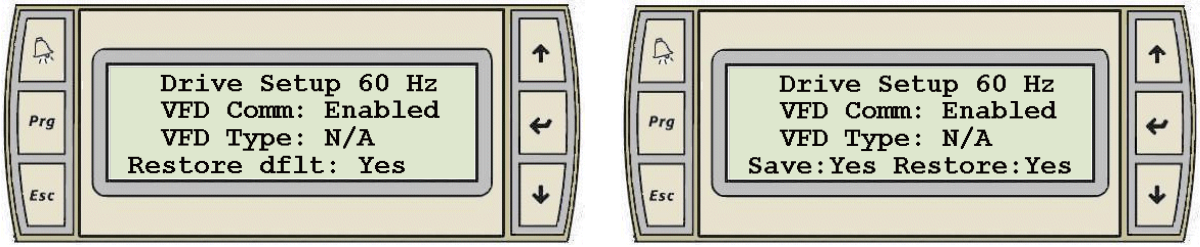
- When the cursor is at the top left corner of the screen, pressing the “Up” or “Down” arrow will navigate between the active setup screens of the respective Level.
- Pressing the “Enter” key will move the cursor over the value beside “Switch Time”, the value beside “Min Run Time”, the “Yes” beside Save and Restore, and back at the top left corner.
- When the cursor is over the value beside “Switch Time”, pressing the “Up” or “Down” keys will set the lead pump switching time setpoint to the desired value.
- When the cursor is over the value beside “Min Run Time”, pressing the “Up” or “Down” keys will set the lag pump minimum running time setpoint to the desired value.
- When the cursor is over “Yes” beside “Save” pressing the “Up” or “Down” arrow will **Save the settings on this screen as Default Values**. The text will change between “Yes” to “Ok” for a few seconds.
- When the cursor is over “Yes” beside “Restore Dflt” or “Restore” pressing the “Up” or “Down” arrow will **Restore the Default Settings for the settings on this screen**. The text will change between “Yes” to “Ok” for a few seconds.





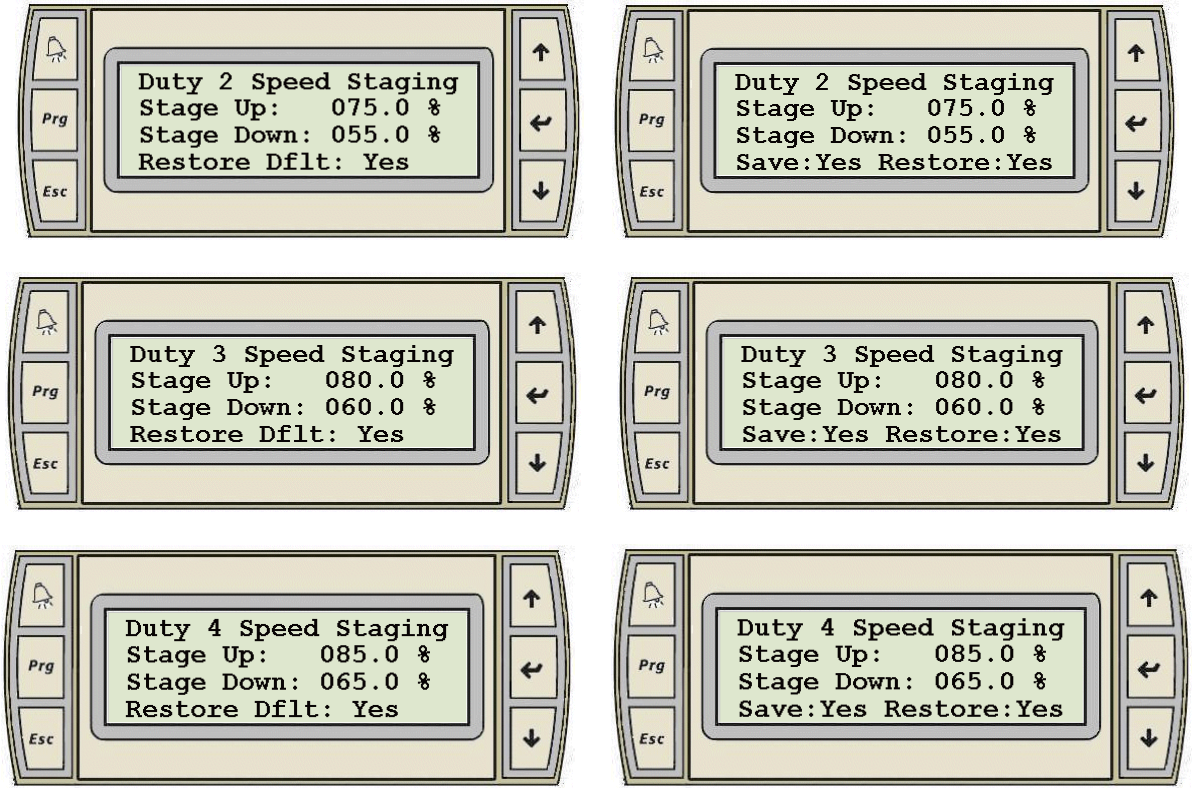
- When the cursor is at the top left corner of the screen, pressing the “Up” or “Down” arrow will navigate between the active setup screens of the respective Level.
- This display is only active when the suction pressure sensor is enabled.
- Pressing the “Enter” key will move the cursor over the value beside “Stg On Delay”, the value beside “Stg Off Delay”, over “Yes” beside Save and Restore, and back at the top left corner.
- When the cursor is over the value beside “Stg On Delay”, pressing the “Up” or “Down” key will set the Staging On Delay time Setpoint to the desired value.
- When the cursor is over the value beside “Stg Off Delay”, pressing the “Up” or “Down” key will set the Staging Off Delay time Setpoint to the desired value.
- When the cursor is over “Yes” beside “Save” pressing the “Up” or “Down” arrow will **Save the settings on this screen as Default Values**. The text will change between “Yes” to “Ok” for a few seconds.
- When the cursor is over “Yes” beside “Restore Dflt” or “Restore” pressing the “Up” or “Down” arrow will **Restore the Default Settings for the settings on this screen**. The text will change between “Yes” to “Ok” for a few seconds.

Drive Setup / Default Displays



- When the cursor is at the top left corner of the screen, pressing the “Up” or “Down” arrow will navigate between the active setup screens of the respective Level.
- Pressing the “Enter” key will move the cursor over the text beside “VFD Comm”, the text beside “VFD Type”, over “Yes” beside Save and Restore, and back at the top left corner.
- When the cursor is over the value beside “VFD Comm”, pressing the “Up” or “Down” key will enable or disable the VFD communication.
- When the cursor is over the value beside “VFD Type”, pressing the “Up” or “Down” key will choose among N/A, E7, FC 102, ACH 550 and establish the type.
- When the cursor is over “Yes” beside “Save” pressing the “Up” or “Down” arrow will **Save the settings on this screen as Default Values**. The text will change between “Yes” to “Ok” for a few seconds.
- When the cursor is over “Yes” beside “Restore Dflt” or “Restore” pressing the “Up” or “Down” arrow will **Restore the Default Settings for the settings on this screen**. The text will change between “Yes” to “Ok” for a few seconds.

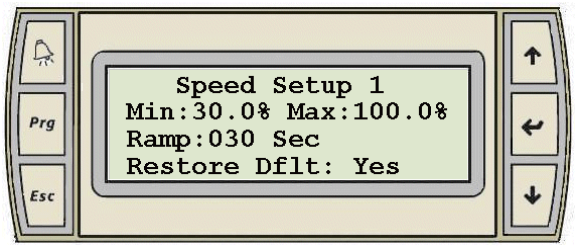
Duty Pumps Speed Staging Setup \ Default Displays

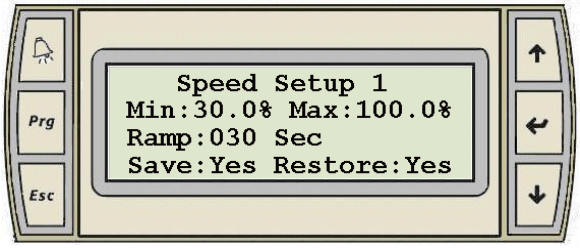


- When the cursor is at the top left corner of the screen, pressing the “Up” or “Down” arrow will navigate between the active setup screens of the respective Level.
- Pressing the “Enter” key will move the cursor over the value beside “Stage Up”, the value beside “Stage Down”, over “Save: Yes” and “Restore: Yes”, and back at the top left corner.

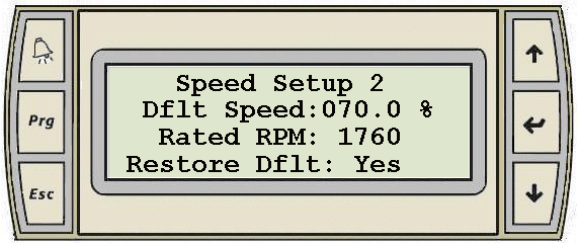
- When the cursor is over the value beside “Stage Up” is the pump speed (in percentage) at which the next lag pump will start up.
- When the cursor is over the value beside “Stage Down” is the pump speed (in percentage) at which the last lag pump will shut down.
- When the cursor is over “Yes” beside “Save” pressing the “Up” or “Down” arrow will **Save the settings on this screen as Default Values**. The text will change between “Yes” to “Ok” for a few seconds.
- When the cursor is over “Yes” beside “Restore Dflt” or “Restore” pressing the “Up” or “Down” arrow will **Restore the Default Settings for the settings on this screen**. The text will change between “Yes” to “Ok” for a few seconds.

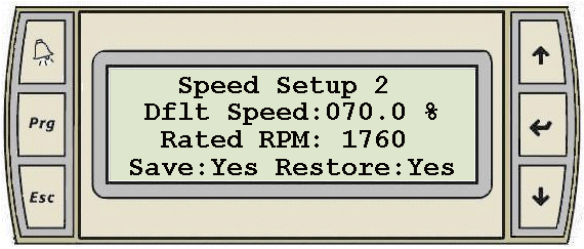
Pump Speed Setup \ Default Displays





- When the cursor is at the top left corner of the screen, pressing the “Up” or “Down” arrow will navigate between the active setup screens of the respective Level.
- Pressing the “Enter” key will move the cursor over the value beside “Min”, the value beside “Max”, the value beside “Ramp”, over “Yes” beside Save and Restore, and back at the top left corner.
- When the cursor is over the value beside “Min”, pressing the “Up” or “Down” key will set the minimum speed Setpoint to the desired value.
- When the cursor is over the value beside “Max”, pressing the “Up” or “Down” key will set the maximum speed Setpoint to the desired value.
- When the cursor is over the value beside “Ramp”, pressing the “Up” or “Down” key will set the speed ramp time Setpoint to the desired value.
- When the cursor is over “Yes” beside “Save” pressing the “Up” or “Down” arrow will **Save the settings on this screen as Default Values**. The text will change between “Yes” to “Ok” for a few seconds.
- When the cursor is over “Yes” beside “Restore Dflt” or “Restore” pressing the “Up” or “Down” arrow will **Restore the Default Settings for the settings on this screen**. The text will change between “Yes” to “Ok” for a few seconds.

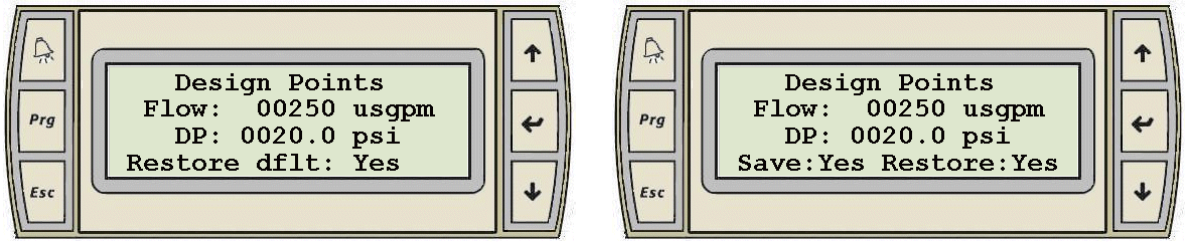




- When the cursor is at the top left corner of the screen, pressing the “Up” or “Down” arrow will navigate between the active setup screens of the respective Level.
- Pressing the “Enter” key will move the cursor over the value beside “Dflt Speed”, over the value beside “Rated RPM”, over “Yes” beside Save and Restore, and back at the top left corner.
- When the cursor is over the value beside “Dflt Speed”, pressing the “Up” or “Down” key will set the default speed Setpoint to the desired value.
- When the cursor is over the value beside “Rated RPM”, pressing the “Up” or “Down” key will set the RPM to the rated value.
- When the cursor is over “Yes” beside “Save” pressing the “Up” or “Down” arrow will **Save the settings on this screen as Default Values**. The text will change between “Yes” to “Ok” for a few seconds.

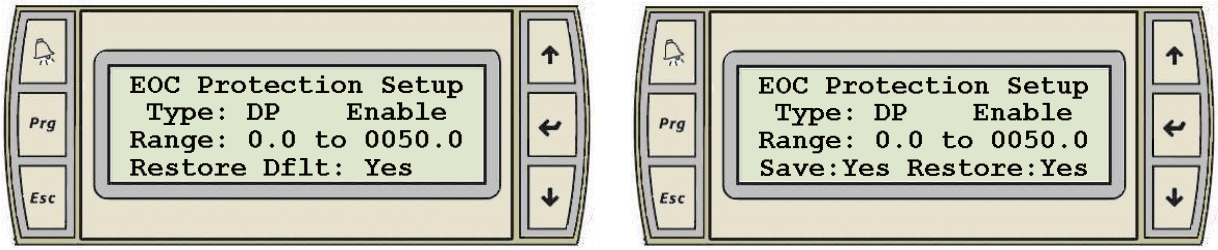
- When the cursor is over “Yes” beside “Restore Dflt” or “Restore” pressing the “Up” or “Down” arrow will **Restore the Default Settings for the settings on this screen**. The text will change between “Yes” to “Ok” for a few seconds.

Flow and Differential Pressure Setup \ Default Displays



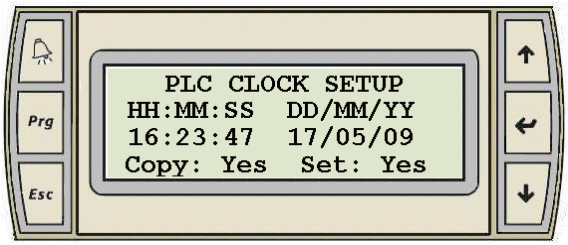
- When the cursor is at the top left corner of the screen, pressing the “Up” or “Down” arrow will navigate between the active setup screens of the respective Level.
- Pressing the “Enter” key will move the cursor over the value beside “Flow”, over the value beside “DP”, over “Yes” beside Save and Restore, and back at the top left corner.
- When the cursor is over the value besides “Flow”, pressing the “Up” or “Down” key will set the Flow Setpoint to the desired value.
- When the cursor is over the value besides “DP”, pressing the “Up” or “Down” key will set the Differential Pressure Setpoint to the desired value.
- When the cursor is over “Yes” beside “Save” pressing the “Up” or “Down” arrow will **Save the settings on this screen as Default Values**. The text will change between “Yes” to “Ok” for a few seconds.
- When the cursor is over “Yes” beside “Restore Dflt” or “Restore” pressing the “Up” or “Down” arrow will **Restore the Default Settings for the settings on this screen**. The text will change between “Yes” to “Ok” for a few seconds.

EOC Protection Setup \ Default Displays



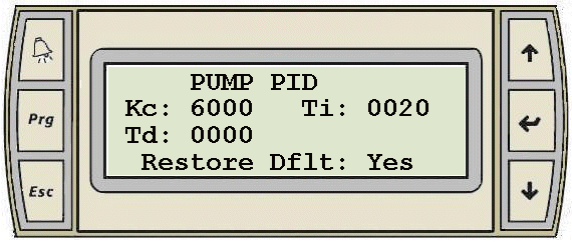
- When the cursor is at the top left corner of the screen, pressing the “Up” or “Down” arrow will navigate between the active setup screens of the respective Level.
- Pressing the “Enter” key will move the cursor over the text beside “Typed”, the “Enable/Disable” feature, over the minimum and maximum values beside “Range”, over “Yes” beside “Save” and “Restore”, and back at the top left corner.
- When the cursor is over the text beside “Type”, pressing the “Up” or “Down” key will select among the “DP”, or “Flow” types.
- When the cursor is over the “Enable/Disable” text, pressing the “Up” or “Down” key will enable or disable the EOC protection feature.
- When the cursor is over the values beside “Range”, pressing the “Up” or “Down” key will set the minimum and maximum Setpoints to the desired values.
- When the cursor is over “Yes” beside “Save” pressing the “Up” or “Down” arrow will **Save the settings on this screen as Default Values**. The text will change between “Yes” to “Ok” for a few seconds.
- When the cursor is over “Yes” beside “Restore Dflt” or “Restore” pressing the “Up” or “Down” arrow will **Restore the Default Settings for the settings on this screen**. The text will change between “Yes” to “Ok” for a few seconds

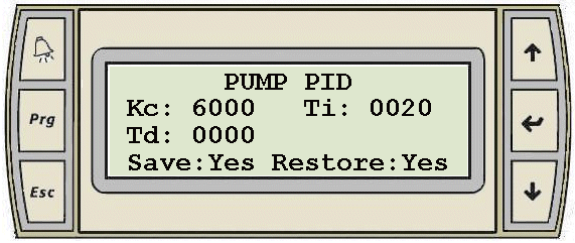
PLC Clock Setup \ Default Display



- When the cursor is at the top left corner of the screen, pressing the “Up” or “Down” arrow will navigate between the active setup screens of the respective Level.
- Pressing the “Enter” key will move the cursor below the Time expressed in Hours (HH), Minutes (MM) and Seconds (SS), “HH:MM:SS”, below the Date expressed in Day (DD), Month (MM) and YEAR (YY), “DD/MM/YY”, over “Yes” beside Save and Restore, and back at the top left corner.
- When the cursor is over the number below “HH:MM:SS”, pressing the “Up” or “Down” keys will set the Hour (HH), the Minute (MM) and the Second (SS) to the desired values.
- When the cursor is over the number below “DD/MM/YY”, pressing the “Up” or “Down” keys will set the Day (DD), the Month (MM) and the Year (YY) to the desired values.
- When the cursor is over “Copy”, pressing the “Up” or “Down” keys will copy the current time and date from the PLC to the display. This will overwrite any values previously entered.
- When the cursor is over “Set”, pressing the “Up” or “Down” keys will set the entered time and date to the PLC.
- When the cursor is over “Yes” beside “Save” pressing the “Up” or “Down” arrow will **Save the settings on this screen as Default Values**. The text will change between “Yes” to “Ok” for a few seconds.
- When the cursor is over “Yes” beside “Restore Dflt” or “Restore” pressing the “Up” or “Down” arrow will **Restore the Default Settings for the settings on this screen**. The text will change between “Yes” to “Ok” for a few seconds.

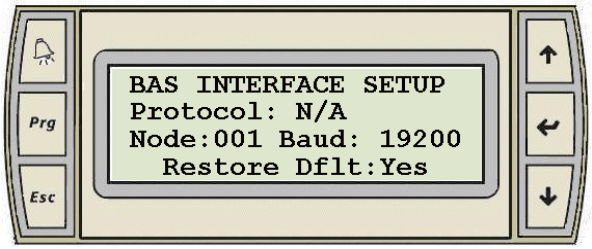
Pump PID Setup \ Default Displays

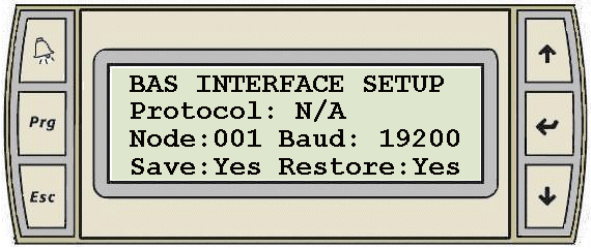




- When the cursor is at the top left corner of the screen, pressing the “Up” or “Down” arrow will navigate between the active setup screens of the respective Level.
- Pressing the “Enter” key will move the cursor over the value beside “Kc”, over the value beside “Ti”, over the value beside “Td”, over “Yes” beside Save and Restore, and back at the top left corner.
- When the cursor is over the value beside “Kc”, pressing the “Up” or “Down” key will set the PID Proportional Constant Kc to the desired value.
- When the cursor is over the value beside “Ti”, pressing the “Up” or “Down” key will set the PID Integral Time Constant Ti to the desired value.
- When the cursor is over the value beside “Td”, pressing the “Up” or “Down” key will set the PID Derivative Time Constant Td to the desired value.
- The actual system pressure is displayed on the screen to help when adjusting the PID constant.
- When the cursor is over “Yes” beside “Save” pressing the “Up” or “Down” arrow will **Save the settings on this screen as Default Values**. The text will change between “Yes” to “Ok” for a few seconds.
- When the cursor is over “Yes” beside “Restore Dflt” or “Restore” pressing the “Up” or “Down” arrow will **Restore the Default Settings for the settings on this screen**. The text will change between “Yes” to “Ok” for a few seconds.

Building Automation System (BAS) Interface Setup \ Default Displays.





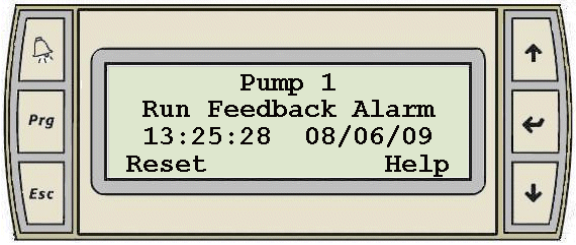
- When the cursor is at the top left corner of the screen, pressing the “Up” or “Down” arrow will navigate between the active setup screens of the respective Level.
- Pressing the “Enter” key will move the cursor over the text beside “Protocol”, the value beside “Node”, the value beside “Baud”, over “Yes” beside Save and Restore, and back at the top left corner.
- When the cursor is over the value beside “Protocol”, pressing the “Up” or “Down” key will set the Protocol to the desired type. The choices are: Modbus, BACnet and Lonworks.
- When the cursor is over the value beside “Node”, pressing the “Up” or “Down” key will set the Node address to the desired value.
- When the cursor is over the value beside “Baud”, pressing the “Up” or “Down” key will set the Baud rate to the desired value.
- When the cursor is over “Yes” beside “Save” pressing the “Up” or “Down” arrow will **Save the settings on this screen as Default Values**. The text will change between “Yes” to “Ok” for a few seconds.
- When the cursor is over “Yes” beside “Restore Dflt” or “Restore” pressing the “Up” or “Down” arrow will **Restore the Default Settings for the settings on this screen**. The text will change between “Yes” to “Ok” for a few seconds.

ALARM MANAGEMENT DISPLAYS

Alarm Displays

- Pressing the “Alarm” button  at any time will call up the alarm display.
- If there is no active alarm the following “No More Alarms” display will appear:

- This display will also appear when navigating through a number of Active Alarm displays to indicate when you reach the end of the list of active alarm.
- If there is one or more active alarms an alarm display similar to the one below will appear:



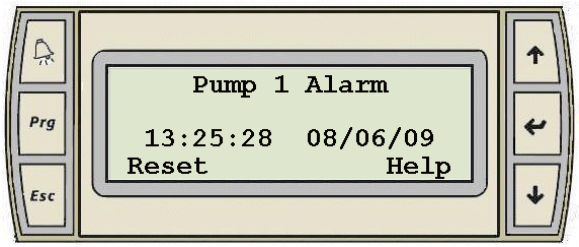
- When the cursor is at the top left corner of the screen pressing the “Up” or “Down” arrow will navigate between the active alarm displays.

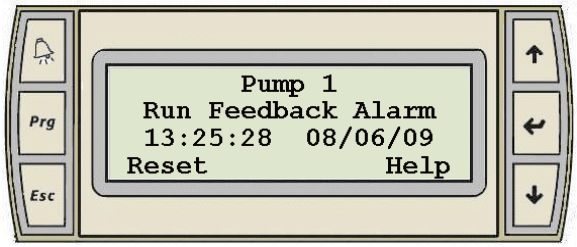
- When you reach the end of the alarm list the “No More Alarms” display will appear.
- All alarm displays are setup as the one above.
- The top two lines give a brief alarm description.
- The third line shows the time and date (HH:MM:SS DD:MM:YY) when the alarm occurred.
- When the cursor is above “Reset”, pressing the “Up” or “Down” arrow will reset all non active alarm. It will also silence the alarm horn and stop the “Alarm” button from flashing red. If there are no more active alarms the “Alarm” button will turn white

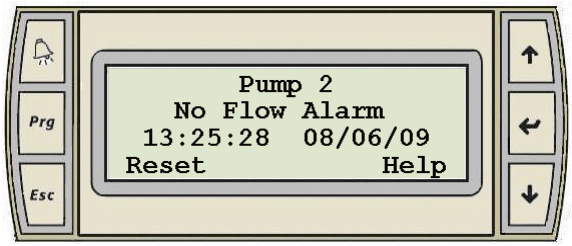
Alarm Displays

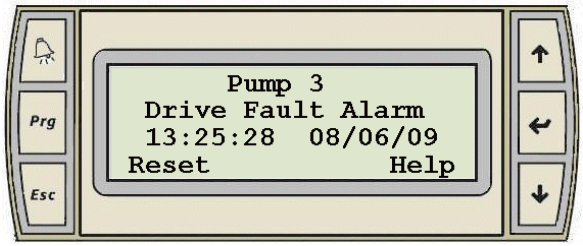
- These are all the different Alarm Display in order they will appear when navigating through the active alarms. Only the displays associated with an active alarm will appear.

1. Variable Speed Pump Alarms (Similar for pump 1 to 3 for IPS3001 (or) 1 to 4 for IPS3002)

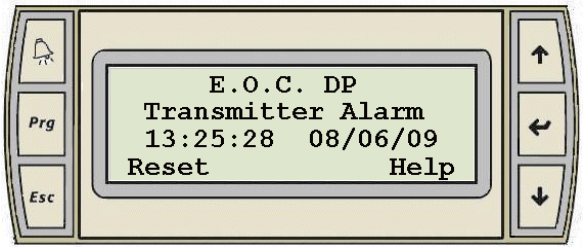


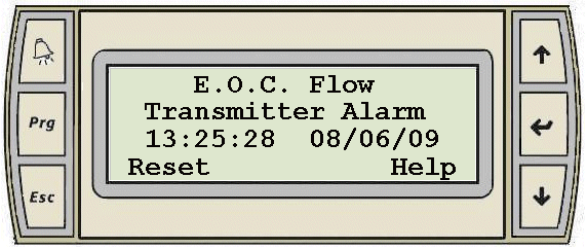




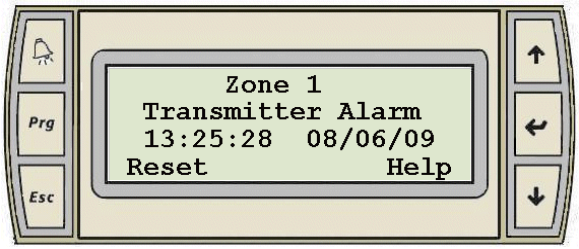


2. End of Curve Differential Pressure and Flow Transmitter Alarms





3. Zone Transmitter Alarm (Similar for Zones 1 to 5)



ARMSTRONG

Alarm Help Displays

The following is a list of all alarm help screens:

Pump Alarm: Check for: Run Fbk (feedback), Drive Flt (fault), No Flow, or for High Temperature

Pump Run Fbk Alarm: Check for: Proper connection, Loose or broken wire, PLC bad Digital In, Drv (drive) bad digital Out, Drive parameters, or for 24 VDC shorted

Pump No Flow Alarm: Check for: Proper connection, Loose or broken wire, Impeller frozen, loose, or blocked, DP switch failed or not set properly, 24 VDC shorted, or for PLC bad Digital In

Drive Fault Alarm: Check drive local display for fault code number, Use drive manual for fault cause, and remedy description

Pump High Temp Alarm: Check for: wear or bad bearings and for locked rotor

EOC Flow Xmtr (Transmitter) Alarm: Check for: Proper connection, Loose or broken wire, PLC bad Analog In, Failed Transmitter, 24 VDC shorted and for jammed water turbines

EOC DP Xmtr (Transmitter) Alarm: Check for: Proper connection, Loose or broken wire, PLC bad Analog In, Failed Transmitter, 24 VDC shorted and for plugged water sensing lines

Zone DP Xmtr (Transmitter) Alarm: Check for: Proper connection, Loose or broken wire, PLC bad Analog In, Failed Transmitter, 24 VDC shorted and for plugged water sensing lines

All Zones Xmtr (Transmitter) Alarm: Check for: Proper connection, Loose or broken wire, PLC bad Analog In, Failed Transmitter, 24 VDC shorted and for plugged water sensing lines

Motor Temp Xmtr (Transmitter) Alarm: Check for: Proper connection, Loose or broken wire, PLC bad Analog In, or for Failed temperature element

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