

ACCU-Series™ Pump Panel for Agricultural Irrigation

Quick Start Guide

460 VAC, 3 Phase Supply



Nidec
All for dreams




10/22/2015

This Quick Start guide allows the user to easily setup the drive for first-time use through minimal setting adjustments. The procedure requires the programming of certain parameters of the drive through the keypad. Instructions for this operation are summarized below. Be sure to complete all procedures before attempting to operate the drive. For additional details and safety information, refer to the AD1000 drive manual, the AD1000 programming manual, and the ACCU-Series™ Pump Panel user manual.

If the keypad has been manually reset to default settings, see the ACCU-Series™ Pump Panel user manual for instructions on how to return to factory settings before continuing with this guide.

General Safety

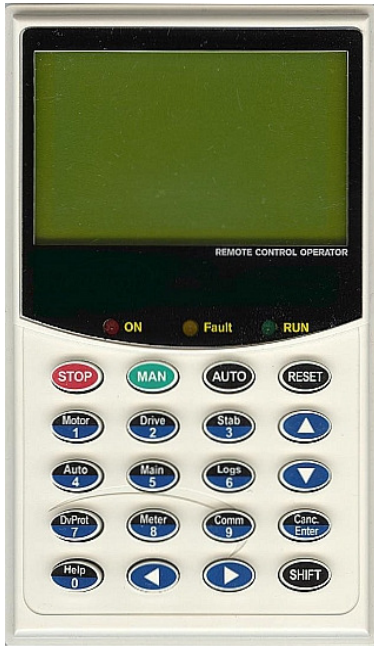
 CAUTION
<p>All standard electrical safety procedures must be followed:</p> <ul style="list-style-type: none"> • Never touch anything within the drive panel until you check that it is not hot and/or live. • Always wear insulated or rubber safety shoes and safety goggles. • Never work alone. • Never connect any grounded meters or oscilloscopes to the system. • Never remove safety shields. <p>Always use extreme caution when handling components or taking measurements inside the enclosure.</p>

 DANGER
<p>Hazard of Electric Shock, Explosion, or Arc Flash</p> <p>This equipment utilizes high voltages and will cause personal injury or loss of life if proper precautions are not taken. Turn off all sources of power (main and remote) and wait at least five minutes before attempting to remove the face of the drive or open the panel for any reason.</p>



1. **Communication Port** – Used to plug the drive keypad into the outside of the panel.
2. **ON LED** – Illuminates to indicate the drive is on and running.
3. **Hand-Off-Auto (HOA) Switch** – Used to select the operation mode of the panel.
 - a. To operate in manual mode, the switch is turned to the HAND position. In this mode, the drive will run and remain on until the user manually turns the HOA switch back to the OFF position.
 - b. To operate in automatic mode, the switch is turned to the AUTO position. In this mode, the drive will automatically turn on and off based on input from an external control source (such as a timer). See the ACCU-Series™ Pump Panel user manual for additional information on wiring in an external control source for this operation mode.
4. **Main Disconnect Switch** – Used to turn the power on and off. While the switch is in the ON position the panel door will be locked and all internal electrical components will be live (provided the external power supply is connected and activated).
5. **Handle Lock** – Used to lock/unlock the panel door. A padlock may be used with this handle for further protection.
6. **Speed Selection Potentiometer** – Used to select the desired speed for the motor to run at.

The drive keypad, located on the face of the AD1000 drive (inside the panel), is equipped with 4 arrow keys, 6 function keys and 10 numeric keys that double as shortcuts to the menus and parameters in conjunction with the SHIFT key. When the keypad is connected for the first time to a drive, the configuration information in the drive is automatically loaded into the keypad. After any settings are entered in the keypad, they are saved in the drive and need not be reentered.



Keypad

NOTICE

If, during operation or setup, a fault occurs (*Fault* LED will flash on keypad and an error message will appear from the main screen), it may be necessary to reset the fault by pressing the RESET key in order to continue. Consult the programming manual for further information on specific faults.

To enter the menu system from the monitor mode press key:	
To scroll the available parameters/submenus (as soon as the menu system has been entered) use keys:	or
To select a parameter/submenu press keys:	or
To return to a previous menu press key:	
After a parameter has been selected, to modify it (to highlight items within choice lists, or to change numeric values) use keys:	or
To modify the underlined active digit within the editing fields, use keys:	or
To change the value of a parameter within the editing fields:	Use numeric keys
To edit a parameter or To confirm modification of a parameter press key:	
To cancel and quit the modification of the selected parameter:	and


Basic Keypad Operations

Combination of keys for quick access	Description	Available families
	Context sensitive guide	
	Main	INDUCTION MOTOR [02.00] MOTOR ID 1 [07.00] INERTIA ID [10.00]
	Drive	Drive [06.00] DC - BUS [12.00] PER – UNIT BASE DATA [13.00] DIGITAL INPUTS [15.00] DIGITAL OUTPUTS [16.00] ANALOG INPUTS [17.00] ANALOG OUTPUTS [18.00]
	Control	SPEED CONTROL [21.00] TORQUE CONTROL [22.00] V/f CONTROL [24.00]
	Auto	SYSTEM CTRL INPUTS [31.00] SPEED REFERENCE [32.00] START/STOP MODE [33.00] AUTORESET [34.00]
	Main	
	Logs	ALARM BUFFER [50.00] FAULT HISTORY [59.00] TIME - RTC TIME [65.00] TRACE SETTINGS [66.00]
	Alarms	MOTOR UNDER/OVERLOAD [35.00] ALARM SETTINGS [36.00]
	Communications	PROFIBUS [81.00] MODBUS [82.00] EXCH AREA 1/2 CONFIG [87.00] ETHERNET – TCP/IP [88.00]
No combination of keys, from the monitor mode press the right key [➡] then scroll with the down [⏴] key	Macro	JOG/FLUSHING [41.00] DIGIT. POTENTIOMETER [42.00] PROCESS PID [45.00]
No combination of keys, from the monitor mode press the right key [➡] then scroll with the down [⏴] key	Utility	INFO [99.00]

Before You Begin

Before beginning, perform the following steps:

1. Be sure to read and understand all safety information presented in this document as well as the ACCU-Series™ Pump Panel user manual.
2. Perform all procedures laid out in the mechanical and electrical installation sections of the ACCU-Series™ Pump Panel user manual.
3. Ensure that the Hand-Off-Auto and Main Disconnect Switch (see page 2) are set to their OFF positions and open the front panel door (you may need to unlock it by rotating the lower handle lock [see page 2]).


DANGER

Hazard of Electric Shock, Explosion, or Arc Flash

Take extreme caution after opening the front panel door. **Never** apply power to the panel or activate the main circuit breaker with the front panel open. Failure to follow these guidelines may result in serious injury or death.

4. Locate and remove the keypad from the face of the AD1000 drive by compressing the latch on top of the keypad and pulling outward. Unplug the keypad from the Ethernet port on the face of the drive.
5. Close the front panel door and lock it in place by rotating the lower handle latch.
6. Plug the keypad's Ethernet cable into the programming port located on the front panel.
7. Turn on the power to the panel from the external power supply.
8. Rotate the main disconnect switch (see below) from the OFF position to the ON position. The keypad screen and LEDs will flash four times during power up. Only the keypad's ON LED will be illuminated and the text "Ready" will appear in the top left corner of the screen to indicate the drive is fully powered on.



Main Disconnect Switch

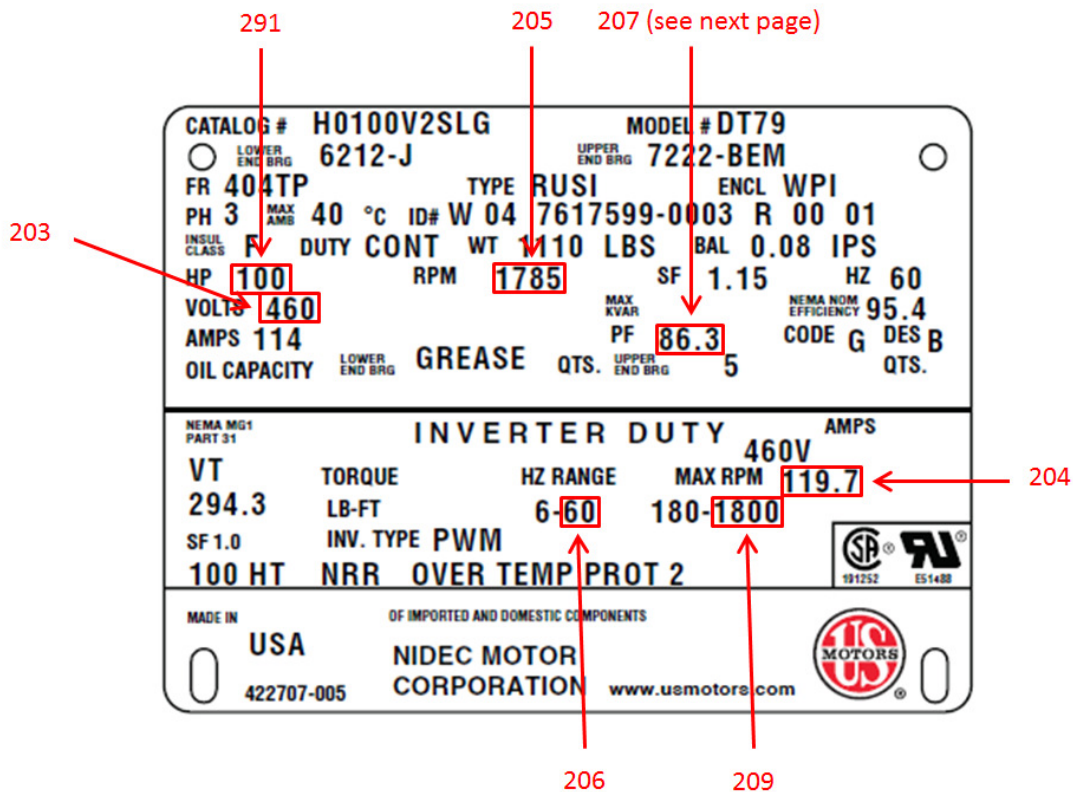
Motor Data

Nameplate motor data must be set up through the keypad:

1. Press the **SHIFT** key following by the **Motor 1** key, navigate to the *INDUCTION MOTOR* submenu using the up and down arrows and then press **Canc Enter** to get to the nameplate data menu. Locate the nameplate on top of the US Motors motor that is wired to the drive. Use the example figure below as well as the notes on the following page to assist in locating the necessary nameplate information and enter it into parameters 202 through 209 and 291 in the open keypad menu (parameters 210 through 290 on the keypad screen may be left as default).

It is recommended that the nameplate data be recorded on the form in the Registration Checklist as they will be required during the online registration process.






Enter the following paramters from the nameplate into the open keypad menu:



EXAMPLE ONLY

US Motor Nameplate Marked by Parameter Field

Example using the **291 (Rated Power)** Parameter and the example nameplate on the previous page:

1. Press the  key following by the  key, navigate to the *INDUCTION MOTOR* submenu using the up and down arrows and then press 
2. Navigate to the **RATED POWER** parameter using the up and down arrows and then press 
3. Using the 0-9 keys, enter the value for the motor horsepower: **00100**
4. When finished entering the value press the  key.
5. Repeat steps 2 through 4 for the motor parameters below.

Using the example nameplate on the previous page as a guide, enter the following Parameters through the keypad:

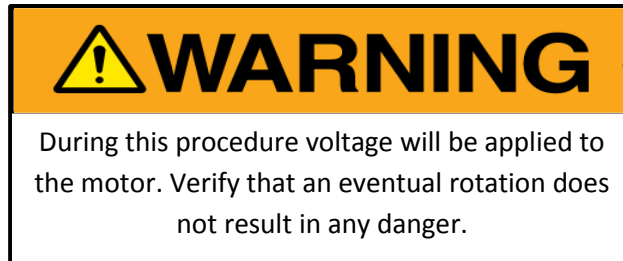
1. **291 (Rated Power)** – Rated input power in Horsepower (HP). Found from the nameplate.
2. **202 (Poles)** – Number of magnetic poles present in the motor. To determine how many poles to enter, consult the following chart (find RPM from parameter 209 below):





Approx. RPM	1200 RPM	1800 RPM	3600 RPM
Poles	2 poles	4 poles	6 poles

3. **203 (Rated Voltage)** – Rated input voltage is Volts (V). Found from the nameplate.
4. **204 (Rated Current)** – Rated input current in Amps (A). Found from the nameplate.
5. **205 (Rated Speed [with slip])** – Rated speed of the motor in rotations per minute (RPM). Found from the nameplate.
6. **206 (Rated Freq)** – Rated input frequency in Hertz (Hz). Found from the nameplate.
7. **207 (Power Factor)** – Power factor (PF) of the motor as a percentage. For example, if the number shown on the nameplate is 86.3, the number 0.86 (round to two decimals) would be entered.
8. **208 (Max Current Limit or FLA)** – Maximum current input in Amps (A). To find the value for this parameter, multiple the value of parameter 204 (Rated Current) by the overload percentage of the pump motor unless the value is indicated on the nameplate as in the example above. So generally the number entered would be $119.7 \times 110\%$ (*131.7 amps*), however the max amps are listed in the inverter duty section of the nameplate as 119.7 amps in the above example.
9. **209 (Max Speed [1 pu])** – Maximum speed of the motor in rotations per minute (RPM). Found from the nameplate.

Motor Rotation Test

Before proceeding, it is necessary to perform a test run of the motor to ensure proper direction of rotation. To carry out the test, perform the following steps:



1. Go back to the main screen by pressing the  button and  button.
2. Ensure the keypad is in Auto mode by pressing the ¹. If not already in Auto mode, the keypad will display the message “Auto Press enter to confirm”. Press the  key to confirm.
3. Verify the speed selection potentiometer is set to 0%.
4. Turn the Hand-Off-Auto switch (see below) from the OFF position to the HAND position.



Hand-Off-Auto (HOA) Switch

5. The indicator light beside the Hand-Off-Auto switch labeled ON should illuminate, the internal fan should begin rotating, the keypad RUN LED will illuminate and the upper left corner of the screen will read “Operation” to indicate the drive is on and running.
6. Rotate the speed selection potentiometer (see below) from 0% to just above 10%. The motor will not rotate until 10% is reached. However, turning the speed up too high at this stage could result in damage to the motor or personal injury.

¹ Note that the AUTO and MAN modes on the keypad are separate from the AUTO and MANUAL modes on the Hand-Off-Auto Switch.





Speed Selection Potentiometer

7. Check to make sure the motor is rotating in the positive direction. Rotate the Hand-Off-Auto switch to OFF when done checking.
8. Turn the main disconnect switch (see page 5) to the "OFF" position. Turn off the external power supply to the panel. Wait at least 5 minutes after removing power for the drive's internal capacitors to discharge before attempting to open the front door.
9. If the motor rotated in the right direction the bump test is complete. Unplug the keypad from the front door port and reinstall on front of drive.
10. If the motor rotated in the wrong direction, the motor leads must be reversed. Locate the U, V and W motor input connections (See ACCU-Series™ Pump Panel User Manual) or the A2, B2 and C2 connections if using the optional output load reactor. Select any two of the three motor leads and reverse them. For example, if motor wires are connected to points U, V and W, you may choose to swap connections U and V. Repeat the bump test if desired.

Operation

After completing **all** previous procedures and carefully reviewing all safety information, follow these steps to operate the drive:

1. Close the front door and lock it. Turn on the external power supply to the panel.
2. Turn the main disconnect switch back to the “ON” position and allow 5 minutes for the drive to fully power on.
3. Ensure the keypad is in Auto mode by pressing the  button. If not already in Auto mode, the keypad will display the message “Auto Press enter to confirm”. Press the  key to confirm.
4. Locate the Hand-Off-Auto switch (see page 8). Turn the switch to the desired operation mode (see page 2 for details).
5. The indicator light beside the Hand-Off-Auto switch labeled ON should illuminate, the internal fan should begin rotating, the keypad RUN LED will illuminate and the upper left corner of the screen will read “Operation” to indicate the drive is on and running.
6. To select the desired motor speed, rotate the speed selection potentiometer (see page 9) to the desired speed. The motor will speed up/slow down to match the selected speed and will automatically adjust power to maintain a constant motor RPM.

Additional Features

All of the listed additional features are inactive by default. Reference the appropriate feature in the programming manual for information on how to activate the desired feature.

- **Soft Fill** – Fill pipes gradually in order to prevent burst pipes and extend pump life. Reference AD1000 programming manual, chapter 9 section 42.
- **Prevent Frost Damage** – If temperatures drop below a set temperature in sleep mode the drive will run at a constant, low speed to prevent damage. Reference AD1000 programming manual, chapter 9 section 33.
- **Anti-Blocking** – Prevents pump blockage during long periods of inactivity by starting the pump periodically. Reference AD1000 programming manual, chapter 9 section 31.
- **Low Inlet Pressure** – Automatically switches to a lower pressure set-point should inlet pressure decline to avoid incurring damage to the pump. Reference AD1000 programming manual, chapter 9 section 45.
- **Process PID** – Control the pump based on water pressure or water flow instead of motor speed using a built-in PID. Reference the External Sensor QuickGuide and annex G examples 1 through 3.
- **Multi-pump Control** – Control multiple auxiliary pumps operating together to meet flow or pressure requirements to save energy and prolong equipment lifetime. Reference AD1000 programming manual, chapter 9 section 43.
- **Motor Pause** – Stop the motor automatically if water level, pressure, flow, or other variables reach a user-defined threshold. Reference AD1000 programming manual, chapter 9 section 43.
- **Well Draw Down Control** – Reduce to a lower, energy-saving flow rate when the ground water level drops below a specified threshold. Reference AD1000 programming manual, chapter 9 section 44.

Product Registration

It is recommended that the ACCU-Series™ Pump Panel be registered with the manufacturer upon receipt of the product. To register your product, go online and visit www.usmotors.com/VFDregistration

Registration of this product with complete data will enable faster service should a problem arise and will provide the user with a Registration Certificate.

For additional product information and technical support please visit:
www.usmotors.com/ACCU-Series/PumpPanel

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Printed in the United States of America