RELIANCE ELECTRIC

Using the SP120 AC Drive Demo Unit

M/N D1SP1201

Instruction Manual D2-3471

Rockwell Automation

The information in this manual is subject to change without notice.

Throughout this manual, the following notes are used to alert you to safety considerations:

ATTENTION: Identifies information about practices or circumstances that can lead to personal injury or death, property damage, or economic loss.

Important: Identifies information that is critical for successful application and understanding of the product.

ATTENTION: Only qualified personnel familiar with the construction and operation of this equipment and the hazards involved should install, adjust, operate, and/or service this equipment. Read and understand this document in its entirety before proceeding. Failure to observe this precaution could result in severe bodily injury or loss of life.

ATTENTION: After disconnecting input power, wait two minutes to insure that DC bus capacitors are discharged. Failure to observe this precaution could result in severe bodily injury or loss of life.

ATTENTION: The user is responsible for conforming with all applicable local and national codes. Failure to observe this precaution could result in severe bodily injury or loss of life.

ATTENTION: Checking the direction of motor rotation requires rotating parts and/or electrical circuits to be exposed. Stay clear if the motor must be running. Disconnect, lockout, and tag the power source if contact must be made. Failure to observe this precaution could result in severe bodily injury or loss of life.

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CHAPTER 1

Introduction

This manual describes how to use the SP120 demo unit.

For complete product information, refer to the SP120 AC Drive Installation and Operation Manual (D2-3456).

1.1 What Is a Variable-Speed Drive?

A variable-speed drive is an electronic device that controls the speed, torque, horsepower, and direction of an AC or DC motor.

Variable-speed drives offer:

- Improved process control by enabling you to control virtually any process variable and to control your process remotely with electrical interfaces.
- Reduced operating costs by enabling you to match the motor speed to the load requirements.
- Reduced maintenance by providing a "soft-start" capability that limits inrush current to reduce stress on mechanical parts.

1.2 About the SP120 Drive

The SP120 drive is best suited for applications with these requirements:

- A three-phase 1/4 to 5 HP AC induction motor is used
- 115 V, 230 V, or 460 V input is available
- On-board operator controls are desired

The SP120 drive comes standard with four control selections to meet specific application requirements:

- Speed potentiometer
- Single-channel analog input
- Preset speeds (up to 15)
- PID

CHAPTER 2

Setting Up the Demo Unit

Before running the demo, take a moment to become familiar with the demo unit components and how the unit is wired.

2.1 Demo Unit Components and Wiring

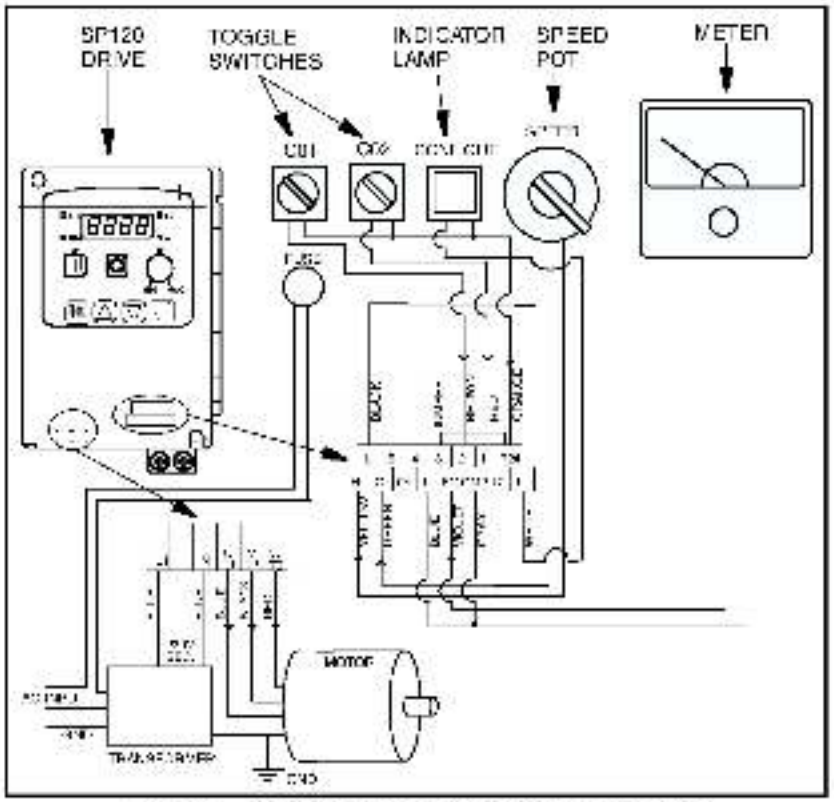

Figure 2.1 – SP120 AC Drive Demo Components and Wiring

2.2 Connecting Power to the Demo Unit

The SP120 AC drive demo unit is powered by a grounded 115 VAC input. Follow these steps to connect the power cord to the demo unit.

Step 1. Stand the demo unit on a flat surface with the handle and cover latches facing you.

Step 2. Open both latches and lift the cover. Then slide the cover to the right to remove.

Step 3. The power cord is stored in the cover of the demo unit. Press down on the spring-loaded fasteners inside the cover to access the power cord.

Step 4. Turn the demo unit around and stand it on its feet so that it faces you.

Step 5. Plug the power cord into the receptacle on the left side of the demo unit.

Step 6. Plug the power cord into a grounded 115 VAC outlet.

Step 7. Use the on/off switch located next to the power cord to apply power to the unit.

CHAPTER 3

Programming Basics

To program the drive for a specific application, you display the appropriate parameter and adjust it as required. The parameters are used to define characteristics of the drive.

3.1 Parameter Menu Structure

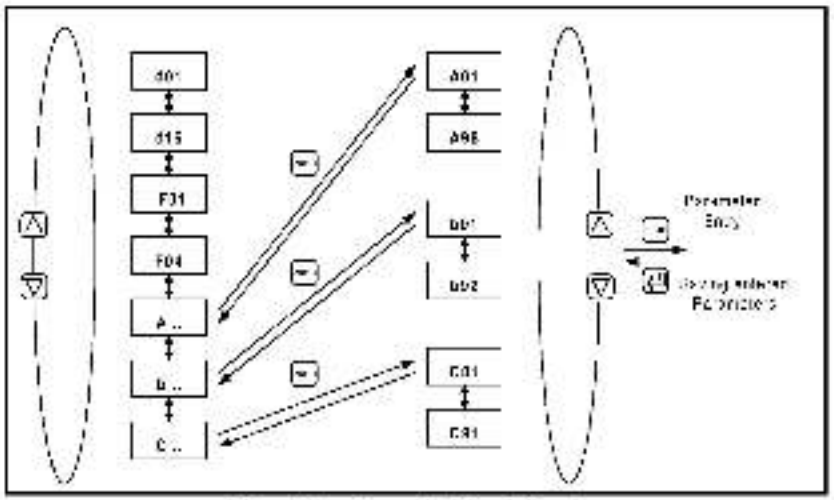

Figure 3-1 Parameter Menu Structure

Note that the **d** and **F** group parameters are displayed in sequence, but the **A**, **b**, and **C** parameters are grouped. You must select the group before you can view the parameters within that group.

Parameter Group	Description
d	Display and Diagnostic Parameters (Read Only)
F	Basic Function Parameters
A	Advanced Function Parameters
b	Advanced Control and Protection Parameters
C	Intelligent I/O and Communication Parameters

3.2 Parameter Types

There are three types of parameters:

- **Tunable** parameters can be adjusted or changed while the drive is running or stopped.
- **Configurable** parameters can be adjusted or changed only while the drive is stopped.
- **Read-only** parameters cannot be adjusted.

3.3 How To Display and Adjust Parameter Values Using the Keypad

The keypad is located on the front panel of the drive. You must open the cover to access the programming keys.

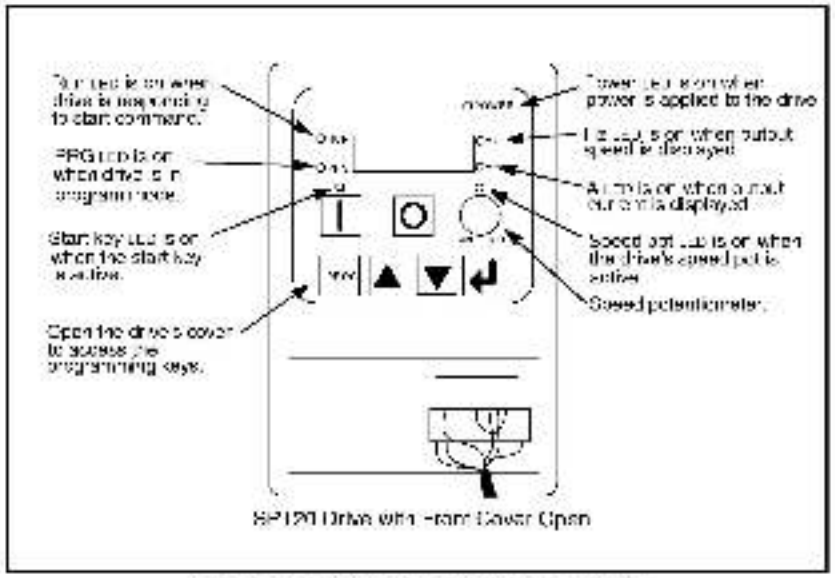

Figure 3.1 – SP120 Keypad with LEDs Identified

Table 3.1 – Key Descriptions

Key	Description
PROG	• Toggles between parameter number and parameter value. • Selects the parameter group or individual parameter.
▲ ▼	• Scrolls through parameters or parameter groups. • Increases or decreases parameter values.
↵	Enters the displayed value into memory.
I	When the Start key is active, starts the motor in the direction of rotation defined in F04 [START KEY DIRECTION].
O	• Stops the motor. • Clears drive faults.

Note the following when using the keypad:

- If you were viewing a display (**d**) parameter when power was last removed from the drive, the same display parameter value will reappear when the drive is re-powered.

  If you were viewing any other parameter value (**A**, **b**, or **C**) when power was removed, the parameter group or parameter number will appear when the drive is re-powered.

- When viewing parameters within the **A**, **b**, and **C** groups, the parameters will wrap from A01 through C91 by pressing ▲ or ▼. To view parameters within the **d** and **F** groups, press PROGram until the display shows **A**- -, **b**- - or **C**- -. Once the group letter is displayed, use ▲ or ▼ to scroll to the **d** and **F** parameters.

CHAPTER 4

Running the Demo Unit

The demo consists of three step-by-step labs to acquaint you with the basic operation of the drive.

Purpose of the labs:

Lab A	Learn the steps required to reset the drive to factory defaults. This lab sets the drive up for the next two labs. Run Lab A first.
Lab B	Learn how to set up and run the drive in local (keypad) operation.
Lab C	Learn how to set up and run the drive in remote (switches and speed pot) operation.

4.1 The Labs

Lab A: Reset the drive to factory defaults using the following procedure.

Tools required: None

Step 1. Turn on the demo unit using the power switch.

Step 2. If a parameter number is not displayed, press the PROGram key.

Step 3. Press ▲ or ▼ until b - - is displayed.

Step 4. Press PROGram to select the b parameter group.

Step 5. Press ▲ or ▼ until parameter b84 is displayed.

Step 6. Press PROGram to display the value of b84.

Step 7. Press ▲ or ▼ until 00 is displayed.

Step 8. Press ↵ to save the displayed value. b84 is displayed again.

Step 9. Press and hold PROGram, ▲, ▼, and ○ for 3 seconds.

Step 10. Release ○ only. Hold the other keys down until the display starts to blink, then release the remaining keys.

d01 will be displayed when the defaults have been successfully restored.

Lab B: Set up the drive for local (keypad) operation using the following procedure:

Tools required: None

Step 1. Use the PROGram and ▲ ▼ keys to select the F parameter group.

Step 2. Set F02 [ACCEL TIME] to 3.0 sec.

Step 3. Set F03 [DECEL TIME] to 3.0 sec.

Step 4. Set A01 [FREQUENCY COMMAND SELECT] to 00. This selects the drive's speed pot as the frequency source.

Step 5. Set A02 [START COMMAND SELECT] to 02. This selects the input from the Start key (I) on the drive keypad.

Step 6. Verify that A03 [BASE FREQUENCY] and A04 [MAXIMUM FREQUENCY] are set to 60Hz.

Step 7. Set A82 [BASE VOLTAGE] to 230V.

Step 8. Set b12 [MOTOR OVERLOAD CURRENT] to 0.60 amp.

Step 9. After you have set the above parameters, press I. You should now be able to vary the speed of the motor using the speed pot on the drive.

The CONF OUT indicator lamp turns on when the requested frequency is reached.

Notice that the RUN LED is on to indicate the drive is responding to the start command.

The LEDs above I and the speed pot are on to indicate they are active.

Step 10. Press ○ to stop the drive.

Lab C: Set up the drive for remote operation (based on 2-wire start stop).

Tools required: None

Step 1. Set parameter A01 [FREQUENCY COMMAND SELECT] to equal 01. This changes the source of the drive's speed reference to an analog reference.

Step 2. Start the drive by pressing |▶|. Notice that the RUN LED and the LED above |▶| are on.

a. Turn the speed pot located on the drive. Notice there is no effect. Start/Stop is still from the drive.

b. Turn the remote speed pot. Notice that now you can vary the speed. Notice also that the LED above the drive's speed pot is not on, indicating that the drive's speed pot is not the active speed reference source.

Step 3. Press [O] to stop the drive

Step 4. Set parameter A02 [START COMMAND SELECT] to 01. This changes the source of the Start/Stop control to the control terminal block.

Step 5. Set parameter C01 [DIGITAL INPUT 1] to equal 00 (forward).

Step 6. Set parameter C02 [DIGITAL INPUT 2] to equal 01 (reverse).

Step 7. Verify that switches C01 and C02 are both turned to the left.

Step 8. Turn switch C01 to the right. Notice that the motor rotates (cw). Then turn the remote speed pot to vary the speed.

Notice that the RUN LED is on, but the LEDs above [I] and the pot are not on.

Step 9. Turn switch C01 back to the left. The motor should stop.

Step 10. Turn switch C02 to the right. Note that the motor starts to rotate (in the opposite direction (ccw)). By turning the remote speed pot, you can vary the speed.

Step 11. Turn switch C02 back to the left, and the motor will stop.

CHAPTER 5

Troubleshooting the Demo Unit

Use table 5.1 to troubleshoot any problems you may have with the demo unit.

For technical assistance, call 1-800-726-8112.

Table 5.1 – Troubleshooting Table

Problem	Corrective Action
Display or LEDs are not on.	• Check power source. • Check power cord connection. • Check on/off switch. • Check fuse.
Demo unit does not react as described in labs.	• Verify that parameter defaults were restored. • Verify that parameters were set correctly.
Cannot change parameter value.	• If the drive is running, verify that the parameter is a tunable parameter.
Fault or alarm code is displayed.	• Refer to the troubleshooting section in the SP120 AC Drive Installation and Operation Manual (D2-3450)

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