SP100

Step 1 – SP100 Model Number and Mounting

Step 2 – Connect Line and Motor Power

Step 3 – Apply Power and Verify Motor Direction

Introduction

This quick start reference is meant to be a supplement to the User Manual included in the VFD packaging. This reference informs the installer of the proper steps for mounting, wiring, and basic programming/operation of the SP100 Bypass. The SP100 Bypass package is a 3-contactor bypass arrangement with an H100 VFD. The H100 consists of special software for interfacing with the bypass.

⚠️ **CAUTION!** ⚠️
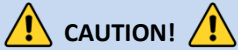
*Improper wiring and operation may result in serious personal injury or death.*

Follow the recommended wiring practices suggested in this document as well as the User Manual. The minimum size of the protective earth (ground) conductor shall comply with local safety regulations and applicable codes.

Please review all H100 and SP100 related documents included with the product before proceeding with any installation and wiring.

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Verify that you have ordered and received the correct Bypass by checking the nameplate information on the enclosure. Utilize the example name plate below to assist you with this.
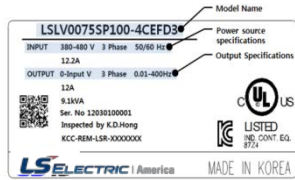

Important!

🔹 Verify that the input voltage rating matches the voltage source which will be applied to the bypass input terminal block.

🔹 Confirm that the output power of the VFD is equal to or greater than the rating of the motor which will be connected.

Mounting
In order to maximize the lifespan of your SP100 package, follow the proper installation and environment recommendations. The User Manual contains further details on the exact dimensions and weights of each capacity SP100.

Cover Removal
After mounting, and in order to move onto the wiring step, turn the disconnect switch to OFF. Next, remove the two screws to gain access to the inside of the panel. Locate the terminal strip with R, S, T, U, V, and W for the next step

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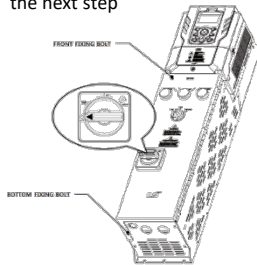
Utilize the below wiring diagrams to properly wire the main power connections to the bypass. **This step should be done with power OFF!** Refer to the User Manual for proper wire gauge recommendations. Be sure to follow good wiring and grounding practices. Follow applicable local codes if needed.

⚠️ **Danger!** ⚠️

Lethal voltages are present. Be sure that all power is turned OFF while performing the recommended power wiring. Reinstall all protective covers on the SP100 before reapplying power

Below is the wiring instructions. Note that all power and motor connections should be wired to the terminal strip in the bypass panel. Factory wiring between the bypass and the VFD should not be moved or modified.

- **R, S, T is the 3-Phase** **Input for the supply line**
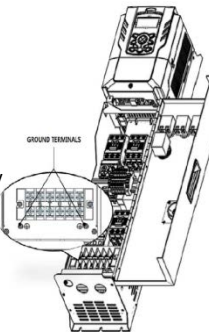- **U, V, W is the 3-Phase** **Output to the motor**

Grounding
Chassis ground terminals can be found near the bottom of the enclosure

Motor Protection
Locate the EMPR and verify it is adjusted to match the applied **motor amperage**.

This step explains how to apply power and check motor direction by running the motor at a low speed via the keypad in **HAND mode**. Verify that the power and motor wiring matches the previous step and covers are installed before applying power.

Turn ON the SP100's disconnect. Next, turn the VFD/OFF/Bypass selector switch to VFD. The H100 should now power up. If using the EZ Start, i**t is not recommended to select an application macro. Leave this setting at "Basic".** After the EZ Start, the display will look like below. "0.0 Hz" represents the default HAND frequency reference.

Setting a HAND Speed

| Press LEFT arrow 3 times so that the cursor is flashing to the left of "0.00". | Press UP arrow so that 10.00 is displayed. | Press the (HAND) key to run the motor in the forward direction. |

Checking Direction
Use the above mentioned steps to run the motor in the forward direction in HAND mode. The display will briefly show the output frequency of the VFD until it reaches 10Hz.

Look at the motor shaft to verify rotation is correct. Press the (OFF) key to STOP.

If motor direction is **incorrect,** stop the motor with the (OFF) key, and power down the VFD.

⚠️ Wait at least **5 minutes** to let the VFD capacitors discharge.

Swap any two **output** leads between the VFD and the motor. This will change motor direction. Verify correct rotation via the previous steps.

This is also a good time to check bypass mode rotation. Bypass mode is independent of VFD mode as far as power and motor rotation. **Verify it is safe to run in bypass mode before testing.**

Turn the VFD/OFF/Bypass switch to Bypass. You can do this for a quick second, just long enough to see the motor rotate. If rotation is incorrect, swap any two **input** leads on the input terminal block mentioned on step 2.

Step 4 – Keypad Navigation and Parameter Changes

Navigate and select different parameters by using the directional arrows on the keypad while in the PAR Mode (⊗).

From the main screen, the MODE key will change the keypad to display the Parameter (PAR) mode. The PAR mode contains all parameters and monitors. These parameters and monitors are divided into intuitive groups. Pressing the LEFT or RIGHT arrows will move through the different parameter groups. While the UP and DOWN arrows will navigate through the different parameter code #'s in the selected group.

Shortened group name on LCD keypad...

DRV
BAS
ADV
CON
IN
OUT
COM
PID
...
AP1
AP2
AP3
PRT
M2
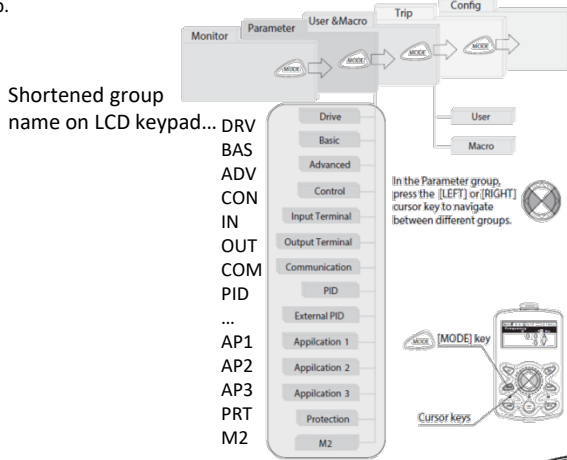
Any of the above parameters settings can be changed by pressing the [PROG ENT] key, selecting the new setting with the arrows, and pressing [PROG ENT] again to save.

Changing Acceleration Time Example

1. Press the [MODE] key from the main display to access PAR Mode.
2. In the DRV group, press down to select DRV 03 (Acc Time).
3. Press the [PROG ENT] key access the current setting.
4. Use the UP and DOWN arrows to increase and decrease the value.
5. Use the LEFT or RIGHT arrows to move the cursor over to select different digits.
6. Press the [PROG ENT] key once the desired value is set. This saves the change.
7. DRV 03 will be displayed again indicating the parameter change has taken effect with the new value displayed.

Parameter Mode, DRV parameter group

Parameter Code and Name

Default parameter setting

Parameter setting adjustment

Parameter setting range

Current parameter setting

Step 5 – Control Wiring

This step shows common wiring examples for both the run command and frequency reference when operating in **AUTO Mode**. This wiring differs slightly from a standalone H100. **Do NOT move or remove any of the factory control terminal wiring.**
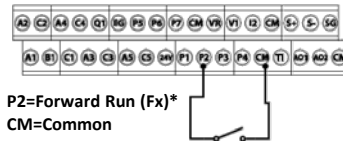
Be sure to put the VFD in AUTO Mode by pressing the [AUTO] key to test or operate in AUTO.

AUTO Mode Run Command Wiring

2-Wire Control
2-wire control consists of **maintained** run signals. This can be accomplished via toggle switches, relays, jumpers, etc. Default parameters support this operation*

P2=Forward Run (Fx)*
CM=Common

*Older firmware versions of the SP100 will require manually setting IN.66=Fx

AUTO Mode Frequency Reference Wiring

Speed POT Wiring (0-10VDC)
Controlling the VFD with an external speed POT can be accomplished by setting DRV7=2 V1 and wiring like below. For 0-10VDC signals from a BAS or Controller simply wire to V1 and CM.

VR = 10VDC
VI = Wiper
CM = Common

BAS or Controller Wiring (4-20mA)
For speed control over a 4-20mA signal set DRV7=5 I2.

Important: Verify that SW4 dip switch on the terminal board to 'I2' (LEFT) for 4-20mA signal.

I2 = + Signal
CM = - Common
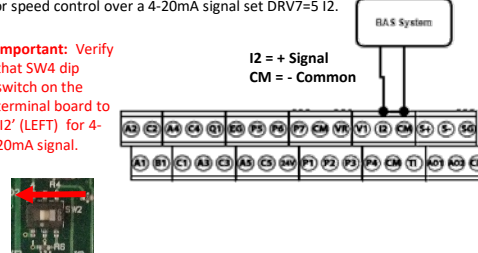
Step 6 – Basic Setup Parameters

The basic drive and motor parameters are shown on the below table. Set the parameters according to your specific application.

Required Motor Parameters
Set the below motor parameters based on the motor nameplate.

Group	No	Description	Default	Set Options
DRV	14	Motor Capacity	Depends on drive	Depends on drive
BAS	11	Poles	4	2 - 12
BAS	13	Motor Rated Current	Depends on drive	Depends on drive
BAS	15	Motor Voltage	Depends on drive	Depends on drive

Motor RPM to Poles chart

RPM	3600	1800	1200
Poles	2	4	6

Example:
If actual motor RPM is 3450.
Set Motor Poles = 2. *This is due to motor slip. In this example The motor has 150 RPM of slip. (Slip=Synchronous speed-Rated Speed)*

Commonly Set Parameters

Group	No	Description	Default	Set Options
DRV	1	Command Freq	0.00	0 - Max Freq
DRV	3	Acc Time	20	0 - 6000
DRV	4	Decel Time	30	1 - 6000
DRV	6	Run Command	1	Fx/Rx-1	0: Keypad 1: Fx/Rx-1 2: Fx/Rx-2 3: Comm RS485 4: Field Bus
DRV	7	Freq Command	0	Keypad-1	0: Keypad-1 1: Keypad-2 2: V1 4: V2 5: I2 6: Comm RS485 8: Field Bus 12: Pulse
BAS	19	Input Voltage	220/380	170 - 480V

Optional Parameters
- To automatically start after a power loss, set **ADV 10=Yes.**
- Enable phase loss protection by setting the dipswitches in **PRT 05** both up.

- Enable auto restart after a fault trip by setting the below...
  - **PRT 08= Both Switches Up**
  - **PRT 09= # of retry attempts**