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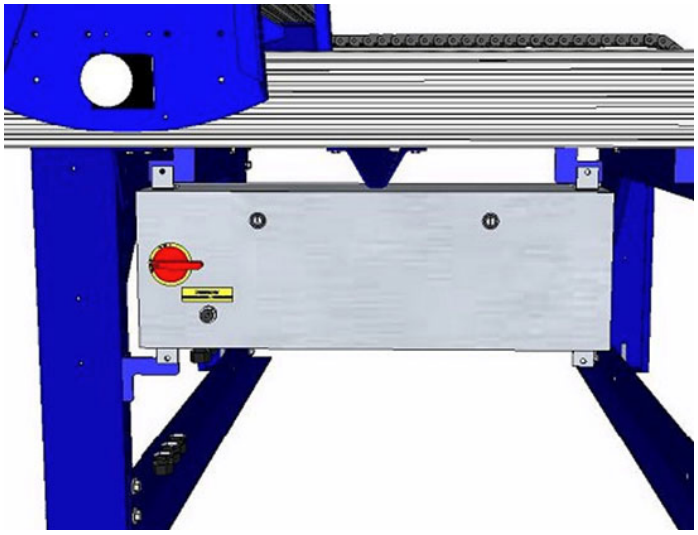
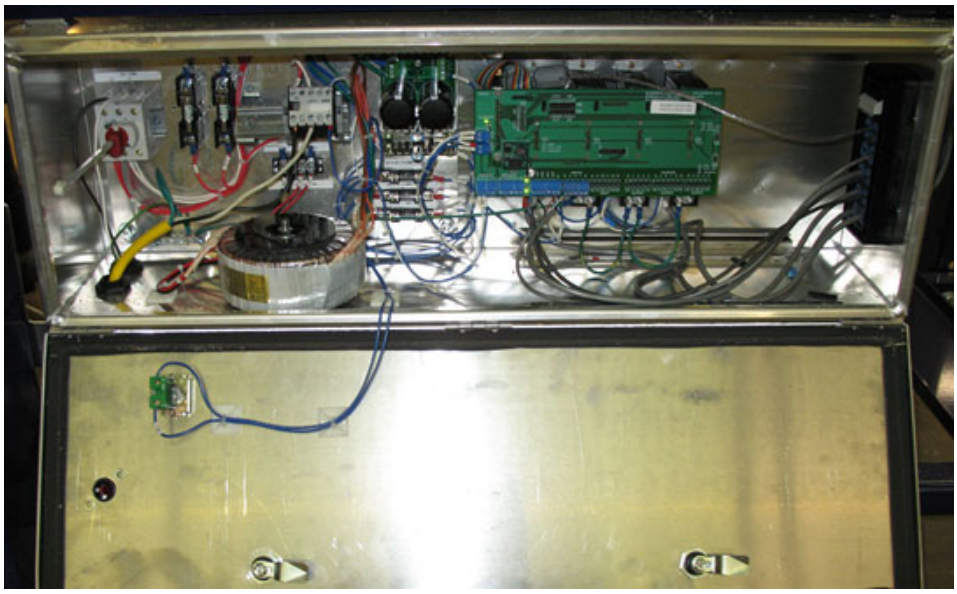
Control Box Wiring

For PRSstandard Tool





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Introduction

The control box is installed on the front left of the machine. This document covers hooking up the motors, proximity switches, spindle, VFD, and remote stop switch.

Installation

Please refer to PRS Assembly Guide included with the tool documentation, and located in the support area of our website in the documentation section.

Powering the PRSstandard Control Box

The power to the PRSstandard control box should be wired into a fused disconnect by a licensed electrician familiar with industrial equipment.

The power requirements for the PRSstandard control box and router/spindle vary according to configuration. A schematic for the power requirements for the specific configuration is inside the door of the PRSstandard control box.

Note: Since the power requirements for a Porter Cable router and for a spindle are different, different components are installed in the PRSstandard control box depending on your configuration. The control box is NOT user configurable; control box specifications are determined at the time these components were ordered. If different power requirements are necessary, please contact customer support.

Exploring the PRSstandard Control Box

WARNING: Disconnect electrical power to the PRSstandard control box prior to this step!

After the electrician has hooked up the PRSstandard control box, open the side of the box with a screwdriver (quarter turn locks). For safety reasons, the door is designed to lock open or closed unless the main power disconnect is turned off.

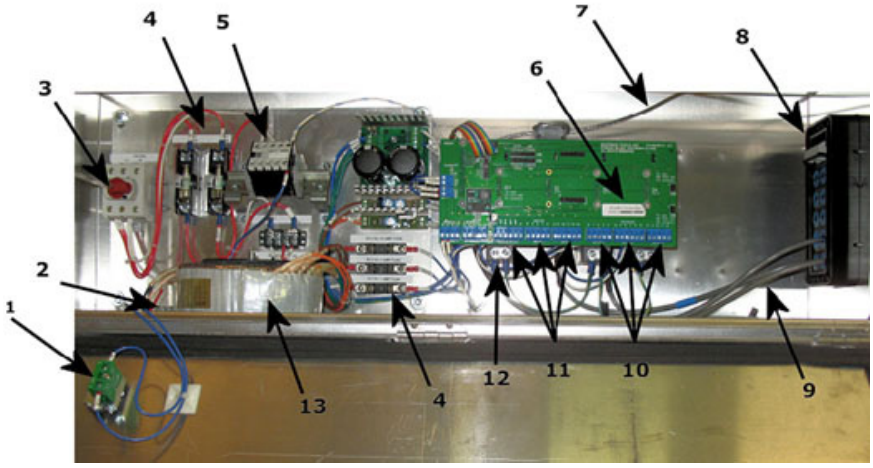
NOTE: The PRSstandard control box has an interlock for the router/spindle. This interlock allows the power to the router/spindle to be disconnected without interrupting power to the machine. This adds additional safety for manual tool changes during a cutting file.

Depending on the model, the control box may not look exactly the same as illustrated in the next pages. If you are unable to follow the steps in this guide, contact the ShopBot support team for help.

Inside the PRSstandard Control Box

NOTE: Not all control boxes will be the same as pictured, depending on specific configurations.

The contactors, located at the top of the PRSstandard control box, are large relays that control power to the cutting head. They are controlled by software and relays on the control board for a router/ spindle. The size of the contactor may vary with the power requirements of the device it is powering.



1. Router/Spindle Interlock Switch
2. Grounding Strip
3. Main Power Disconnect
4. Fuses
5. Contactors
6. Control Board
7. USB Cable
8. Cable Entry
9. Motor Cables
10. Output Terminals
11. Input Terminals
12. Stepper Motor Drivers
13. Toroidal Transformer

The fuses in the PRSstandard control box (US 60Hz power) are dependent upon the setup. For a complete listing of fuses for your control box, refer to the Power Diagram included in the door of the control box.

- All PRSstandard control boxes have glass fuses on the DC power lines used by the controls and stepper motor drivers: 1x10A fuse, 1x2A fuse, and 1x1A fuse
- Porter Cable router (single): 1x15A fuse, 1x10A fuse
- Spindle: 2x5A fuses, no fuses on the power to the VFD (spindle VFDs are protected by fused disconnect before the PRSstandard control box).

Troubleshooting: Although the fused disconnect should protect the PRSstandard control box, if power is lost to any part of the PRSstandard control box, check the fuses and replace them with identical parts if necessary.

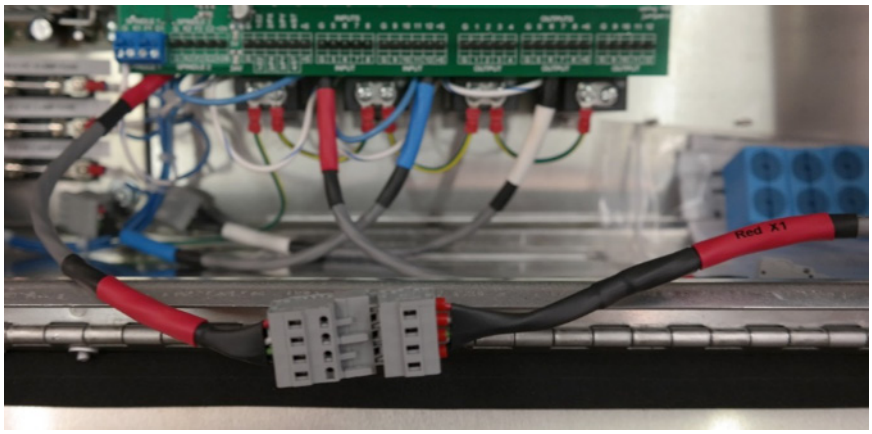
Connecting Wires in the Control Box

Run all of the cables in the bundle of wires from the gantry into the control box through the cable entry on the right end of the control box.

Connect Motor Wires to the Driver Pigtails

Each of the stepper motor drivers in the control box have pigtail cables used to connect them to the motor cables. Connect each of the motor cables to the pigtail with a matching label.

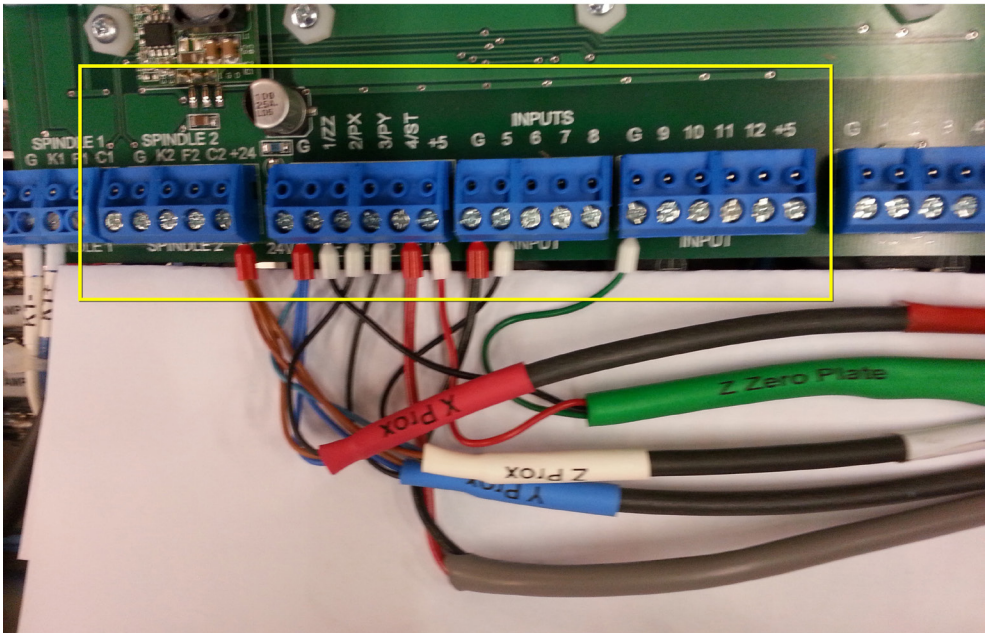
Gantry machines have 4 pigtails & motor cables: X1, X2, Y, and Z.



Connect Proximity Switches, Remote Stop Switch and Z Zero Plate Cables

The proximity switch, remote stop button, and z zero Plate wires are pre-wired onto the gantry at the factory. They are a part of the cable bundle that has been passed through the cable entry and into the control box. Connect the terminal blocks attached to these wires to the input pins on the ShopBot interface board as illustrated below.

Mounting locations for pre-wired blue terminal blocks



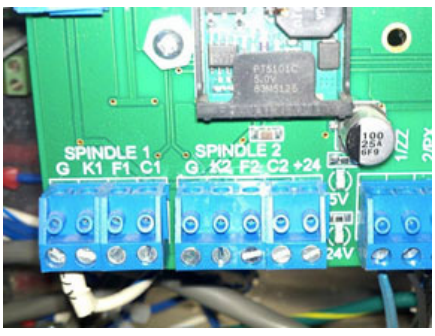
Connecting VFD and Spindle

Connecting the VFD Logic Cable into Control Box

The logic cable is pre-wired into the VFD from the factory, and is the only cable coming out of the VFD without a connector. It contains two wires: one brown, and one white. This cable needs to be installed into the control box.

WARNING: Ensure VFD is powered off before proceeding!

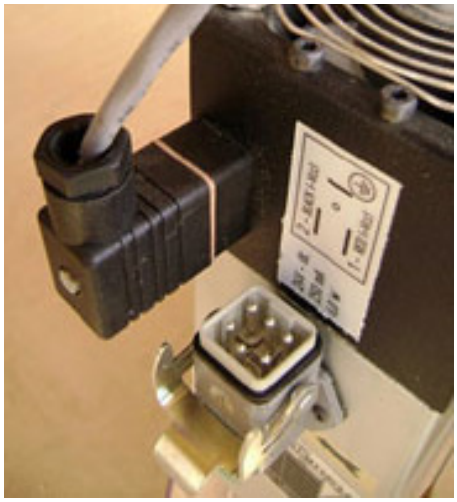
Run the logic cable from the VFD through the cable entry on the right side of the contl box. Use any available cable spaces or double up with an existing small wire.



Connect the brown and white wires from the logic cable into the VFD terminals on the control board labeled “SPINDLE 1” (for a second spindle, use the terminals labeled “SPINDLE 2”). For Spindle #1, connect the brown wire to the “F1” terminal and the white wire to the “C1” terminal. For a second spindle, use the terminal connections” F2” and “C2”.

Attaching Fan Connection Plug to HSD Spindle

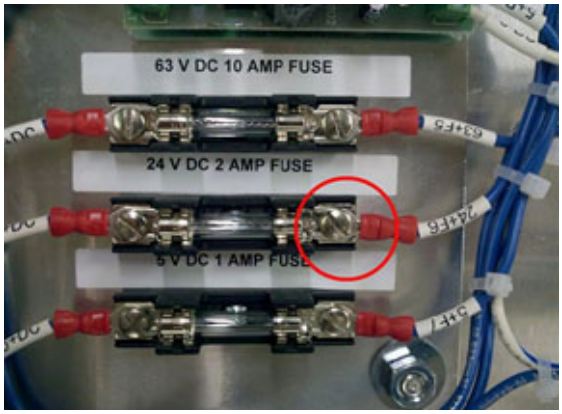
WARNING: Ensure VFD is powered off before proceeding!



Attach the fan connection plug to the front face of the HSD spindle. Tighten the screw inside the fan connection plug.

Attaching Fan Cable to 24V Power Supply

The PRSstandard comes with a 24V power supply already installed in the control box.



Strip back approx. 1/4” of insulation from both the red and black wires at the loose end of the cable from the fan connection plug. Route the cable into the control box.

Connect the red wire to the right side of the fuse marked “24 V DC 2 AMP FUSE” (circled in picture to left). Connect the black wire to any empty ground (G) connection in the blue terminals on the board.

Connecting Power Cable from VFD to Spindle

Plug the electrical connector into the HSD spindle power plug and depress the metal retainer clip until it snaps into place.

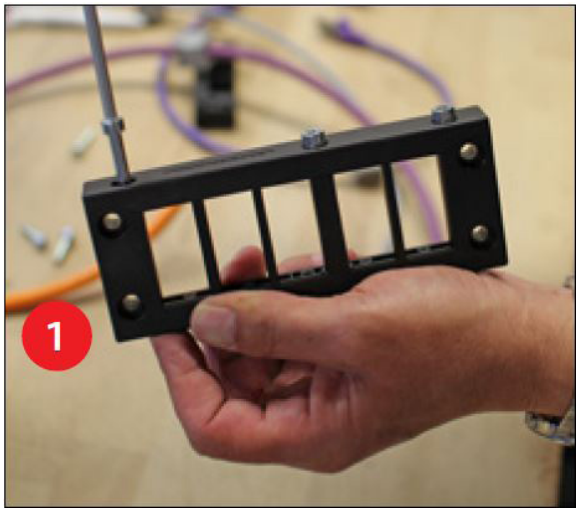
Re-connect and turn on the control box. Verify that the fan powers up and starts turning when the control box is powered.

WARNING: Ensure power is turned OFF before proceeding!

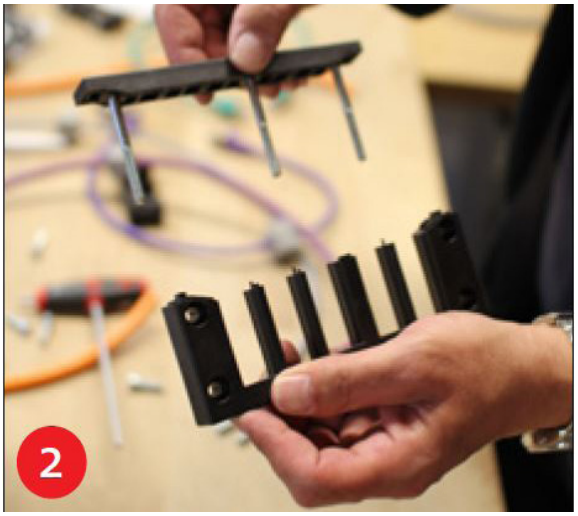
Using the Cable Entry

Once all of the cables have been attached inside the control box, run the cables through the modules and tighten the fixture to keep dust out of the control box. Do not tighten the cable entry modules completely (step 7) until all cables and wires are routed inside and out of the control box.

The cable entry gives all wires a tight strain relief and will seal the control box against dust and debris. Below is the manufacturer's suggested installation procedure.

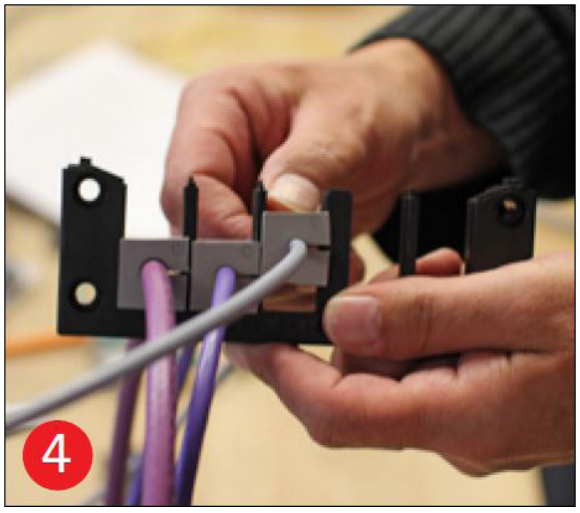


Loosen the screws of the frame.

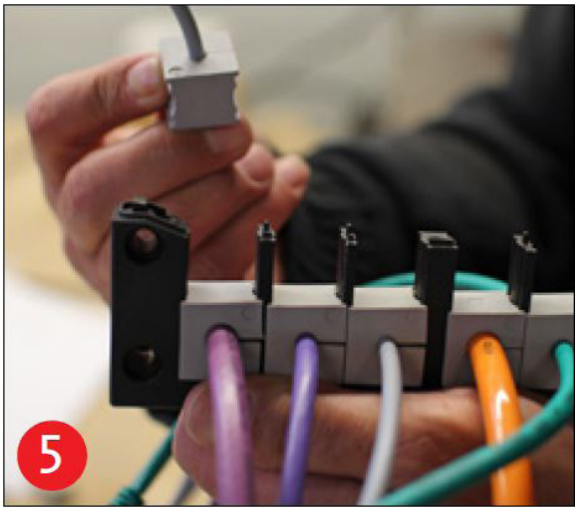


Remove the cover strip.

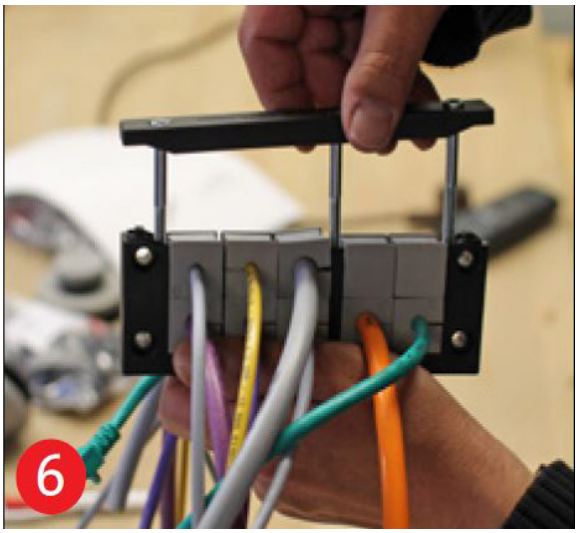
Equip the corresponding KT grommet with the cable.



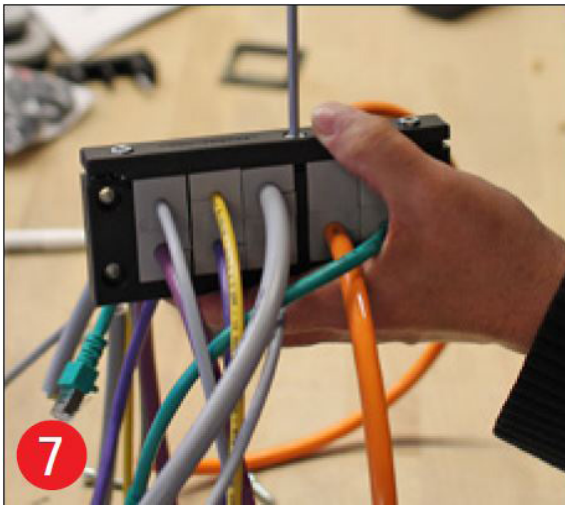
Slide the inserts into the frame. It must be ensured that the flat side of the grommets in the lower row are pointing to the open side of the frame half (flat sides pointing upwards)



The flat side of the grommets in the upper row have to point downwards so that all flat sides rest on each other.



After completing the grommet placement set the cover strip on the frame again.



Now screw frame and cover strip together.

Remove the foil off the on-sided self-adhesive gasket that is included in the delivery.

Tape the gasket around the wall cut-out

Route the cables through the cut-out...

...and screw the cable entry frame to the control box.