

Overview of Power Supply and Placement of ShopBot (International)

POWER SUPPLY TO THE SHOPBOT (OVERVIEW: INTERNATIONAL)

When the ShopBot is ordered, the customer specifies what power the building has available, and what equipment is desired. **ShopBot can help you with what questions to ask so that you can determine what power supply you have available in your building, but it is your responsibility to give ShopBot the correct information.** *Please verify the power standards in your location. Some locations are 220v single phase, some are 380v three phase. Some are 60Hz and some 50Hz.* The Control Box and Router/Spindle are set up accordingly at the ShopBot Factory.

For a FabLab install, the usual order is a PRSalpha (the mechanicals and motors) with a single phase 2.2HP or 4HP HSD spindle (the cutter head.)

Overall, there are two sources of power (two feeds) that run into the ShopBot Control Box.

- 1) The 220V power source that powers the Control Box itself
- 2) The 220V (208 – 240) power source (single phase) that powers the VFD (Variable Frequency Display) that controls the speed of the spindle.

NOTE: the power cord for the VFD for the spindle is run to a relay inside the ShopBot Control Box so that the ShopBot Control software can turn on and off the spindle when running a part file, and the E-Stops can shut down the spindle in case of emergency. The power cord to the VFD (or router) should never be wired directly to the wall instead of through the ShopBot Control Box.

Prior to the install, a **licensed electrician** should run power to the room/location of the ShopBot (the wall.)

Once the ShopBot is assembled to the point that the Control Box is mounted to the ShopBot table, the **licensed electrician** returns to run the power from the wall into the ShopBot Control Box.

It is the responsibility of the installer (the person building the ShopBot) to run the cables from the motors, sensors and spindle fan/VFD into the Control Box during the assembly process.

Electrical specs for your order are sent in advance, and can also be found in the door of the Control Box when the ShopBot is delivered. If you wish to download the specs from the ShopBot website, see the information below to determine which specs to download.

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TO DOWNLOAD FROM THE ELECTRICAL SPECS FROM THE SHOPBOT WEBSITE:

Look at the quote you have received from ShopBot to determine the type of Control Box you have. The Control Box number is usually the second item on the quote, and may have a dollar value of \$200.00 next to it. The Control Box number is circled in the example below.

<http://www.shopbottools.com/ShopBotDocs/wiring.htm>

CBxARx 1 Spd CE 2.2-5HP,230V 1Ø

10221

002195-00

002198-00

Additional Info:

Box Type:	PRSalph
Cutting Head:	1 Spindle 2.2-5 HP
Cutter Power Source:	230 Volt, Single Phase
Control Power Source:	230 Volt, Single Phase
Certification:	CE

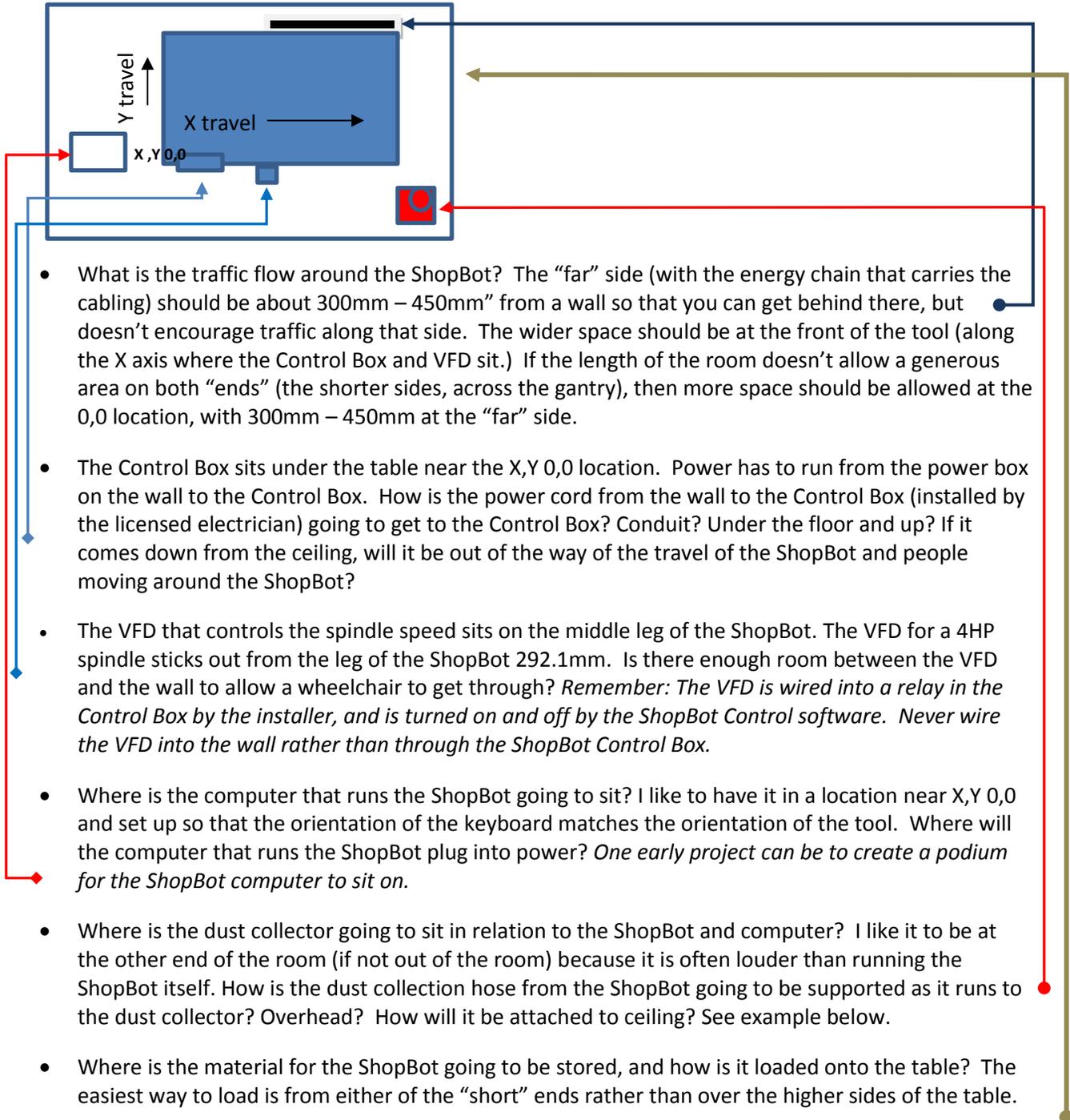
Other power needs in the ShopBot room/location

- Dust collection vacuum? Please check the system ordered, and wire accordingly. If ordering equipment from the US, check the manual for internal wiring, plug adapters and, if necessary, power converters.
- Outlets for computers and other devices such as chargers for cordless drills and shop vacs, or other equipment such as the scroll saw and/or band saw. If ordering equipment from the US, have you considered the appropriate converter 110v to 220v, and having the appropriate plug adapters?
- If a vacuum hold down system has been ordered with the ShopBot, please check with ShopBot to determine what the power requirements are, and to talk over where the vacuum pump should be located.
- NOTE: Check the power needs for the blower for the laser cutting exhaust system. It may also need the services of a licensed electrician.

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THINGS TO THINK ABOUT WHEN DECIDING WHERE TO PLACE THE SHOPBOT

The footprint for a ShopBot that will hold a 4' x 8' (~1200mm x 2400mm) piece of plywood (PRSalph 9648) is roughly 6' x 10' (~1830 mm x 3051 mm.) The exact dimensions and specs for each size ShopBot can be found on the first page of the ShopBot price list, which can be downloaded from the website <http://www.shopbottools.com/PriceList.pdf>.



- What is the traffic flow around the ShopBot? The “far” side (with the energy chain that carries the cabling) should be about 300mm – 450mm” from a wall so that you can get behind there, but doesn’t encourage traffic along that side. The wider space should be at the front of the tool (along the X axis where the Control Box and VFD sit.) If the length of the room doesn’t allow a generous area on both “ends” (the shorter sides, across the gantry), then more space should be allowed at the 0,0 location, with 300mm – 450mm at the “far” side.
- The Control Box sits under the table near the X,Y 0,0 location. Power has to run from the power box on the wall to the Control Box. How is the power cord from the wall to the Control Box (installed by the licensed electrician) going to get to the Control Box? Conduit? Under the floor and up? If it comes down from the ceiling, will it be out of the way of the travel of the ShopBot and people moving around the ShopBot?
- The VFD that controls the spindle speed sits on the middle leg of the ShopBot. The VFD for a 4HP spindle sticks out from the leg of the ShopBot 292.1mm. Is there enough room between the VFD and the wall to allow a wheelchair to get through? *Remember: The VFD is wired into a relay in the Control Box by the installer, and is turned on and off by the ShopBot Control software. Never wire the VFD into the wall rather than through the ShopBot Control Box.*
- Where is the computer that runs the ShopBot going to sit? I like to have it in a location near X,Y 0,0 and set up so that the orientation of the keyboard matches the orientation of the tool. Where will the computer that runs the ShopBot plug into power? *One early project can be to create a podium for the ShopBot computer to sit on.*
- Where is the dust collector going to sit in relation to the ShopBot and computer? I like it to be at the other end of the room (if not out of the room) because it is often louder than running the ShopBot itself. How is the dust collection hose from the ShopBot going to be supported as it runs to the dust collector? Overhead? How will it be attached to ceiling? See example below.
- Where is the material for the ShopBot going to be stored, and how is it loaded onto the table? The easiest way to load is from either of the “short” ends rather than over the higher sides of the table.

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Dust Collection Hose management system:

The dust collection hose must be able to extend over the full surface of the ShopBot table and yet not drop down into the travel of the tool while in the center of the table. One solution is to attach a bar to the ceiling (parallel to the X axis), and attach the hose to the bar in two places. The hose can then slide along the bar as needed. Be creative. The strut (bar) and hardware shown below is usually used for sliding barn doors. However, a bamboo cane or metal conduit and bungee cords can also serve the purpose.



Spindle at 0,0 position (near corner)
Dust collection hose forms loop to not fall into
travel of ShopBot



Spindle at 2400mm x 1200mm position (far corner)
Dust collection hose extended across ShopBot table
and into dust collection vacuum

SUPPLIES NEEDED IN ADVANCE FOR SUCCESSFUL SHOPBOT INSTALL

Cabinet grade plywood, 18mm thick, for support board and sacrificial board: 2 sheets
(I know the assembly manual suggests MDF for the sacrificial board, but I am partial to the plywood, especially in a location with changing humidity levels.)

Outside Deck screws, star drive T20 or T25, 1 ¼" long (or the international equivalent.) 1 box. Available at Home Depot or Lowe's (or the international hardware store.) These screws can be used to attach the sacrificial board to the support board (instead of gluing) and are useful for hold down in regular ShopBot projects. A box of T20 or T25 star drive heads is also a good idea because the one that comes with the screws gets lost or stripped easily.

Plywood for projects. The podium project requires 2 pieces of cabinet grade plywood. Either 12mm or 18mm is fine.

TOOLS:

The ShopBot uses English (inch) hardware. Ratchet wrenches or socket wrenches in the following sizes will help with the ShopBot assembly: 5/8", ½" (two, preferably), 3/8". An adjustable wrench can serve multiple purposes. A set of hex or allen wrenches in inches is can complement the 4 allen wrenches included with the ShopBot assembly packet . The complete list of tools required for assembling a ShopBot can be found in the assembly manual: <http://shopbottools.com/ShopBotDocs/gantry.htm>

Having a 6' (2m) level on hand makes leveling and squaring the table much easier.

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SHOPBOT SOFTWARE:

FOR INTERNATIONAL CUSTOMERS:

The PC computer that runs the ShopBot must be set to US English in order to run the ShopBot Control system software correctly. A document with instructions on how to set up the computer correctly can be found here:

<http://shopbottools.com/ShopBotDocs/files/SBG%2000198%20International%20Computer%20Configuration%202015%2001%2019.pdf>

ShopBot Control software will be loaded on a thumb drive found in the white ShopBot binder. It is always a good idea to check the ShopBot website and download the most recent version of the ShopBot Control software. The Control software is always available for no charge.

<http://www.shopbottools.com/mSupport/controlsoftware.htm>

VCARVE Pro, the Design and Toolpathing (CAD/CAM) Software included with the purchase of a ShopBot, is also found on the ShopBot thumb drive. The registered name of the customer and the long license code is printed in the white ShopBot binder. VCarve Pro is also available for download from an email sent from ShopBot to the main contact person. If you cannot find the email with the correct download and customer information, you can email ShopBot for a copy of the information.

support@shopbottools.com. VCarve Pro can only be installed on a limited number of computers.