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Overview of Power Supply & Placement of ShopBot

International Configurations



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General Safety and Precautions

This safety summary contains general safety warnings that should be understood during operation of this machine. Failure to observe these precautions could result in injury.



Learn and understand safe use of the machine. Do not allow untrained individuals to operate the machine without supervision. Be aware of the location of the Emergency Stop switches at all times.



Eye and ear protection **MUST** be worn by the machine operator as well as any bystanders or observers. Flying sawdust, material chips, and other debris can cause serious eye injury.



Wear closed-toe shoes at all times.



Make sure that your material is properly secured before cutting, and be aware of any small parts that may come loose after being cut. If a small part catches the edge of a spinning bit, it can be thrown forcefully in any direction, causing injury or damage.



Never place your hands on the rails of the ShopBot. Be aware that the machine may move unexpectedly in any direction, which can cause serious injury if your hands are in the path of movement.



Never wear gloves while operating the machine. As with any power tool, a glove can get caught in moving or spinning parts and pull your hand into the machinery.



Never leave a machine running and unattended. Understand that a spinning tool generates friction and heat, creating a risk of fire. This risk is minimized by using correct chip load, using sharp bits, and by always double-checking your files before cutting. Be prepared to pause or stop the cut if something seems incorrect or unsafe.



Keep a working fire extinguisher within reach of the machine, for the reasons listed above.

Overview: Power Supply to the ShopBot (International Customers)

When a ShopBot is ordered, the customer specifies what power the building has available and what equipment is desired so that an appropriate system can be configured. 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 supply ShopBot with the correct information.

NOTE: It is important to verify the power at your intended installation location prior to ordering your tool. Some locations have 220V single phase, and some have 380V three phase. Additionally, the supply can be either 60Hz or 50Hz.

The control box and spindle are set up accordingly at the ShopBot factory.

For a FabLab installation, the usual order is for a PRSalpha (mechanicals and motors) with a single phase 2.2HP or 4HP 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
2. The 220V power source that powers the VFD (Variable Frequency Display), that controls the speed of the spindle.

NOTE: The power cord for the spindle VFD is run to a relay inside the ShopBot control box so that the ShopBot control software can turn the spindle ON/OFF when running a part file and the E-Stop(s) can shut down the spindle in case of an emergency. The power cord to the VFD (or router) should never be wired directly to the wall instead of through the control box.

Prior to the install, a **licensed electrician** should run power to the ShopBot installation location (i.e. the wall). The Power Diagram and Electrical Specs for each order that the electrician will need to reference are sent in advance, and can also be found in the door of the control box when the ShopBot is delivered. The Power Diagram/Electrical Specs can also be downloaded from the ShopBot website at <http://www.shopbottools.com/ShopBotDocs/wiring.htm>.

To determine which specs reflect your individual order, refer to the next section.

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 control box. Remember that there are two feeds that run from the wall to the control box: the line for the box itself, and the relay to the VFD for the spindle. It is the responsibility of the installer [the individual(s) assembling the ShopBot] to run the cables from the motors, sensors, and spindle fan/VFD into the control box during assembly.

Reading a Quote/Order to Determine the Correct Electrical Specs

Look at the quote/order received from ShopBot, and download the specs (power diagram) that refer to that control box. The electrician can determine the wiring that is required from the power diagram. The relevant information on a standard ShopBot quote is in large type and bold below:

EXAMPLE QUOTE: 4HP SPINDLE WITH SINGLE PHASE POWER

PRSGANTRYA - PRS Gantry Tools-Alpha

TOOL SUMMARY

LENGTH 96

WIDTH 60

HEIGHT 6

VOLTAGE = 230V 1Ø International [The first part (230V 1Ø) refers to the power to the spindle. The second part (International) refers to the power to the control box]

DUAL_Z = NO

HP_CUTTER_1 = 4HP

HP_CUTTER_2 = None

DRILL = NONE

PNEUMATIC_ASSIST = NONE

Alpha Gantry Details:

10633 - Table 96-60-6

002735 - Gantry 60

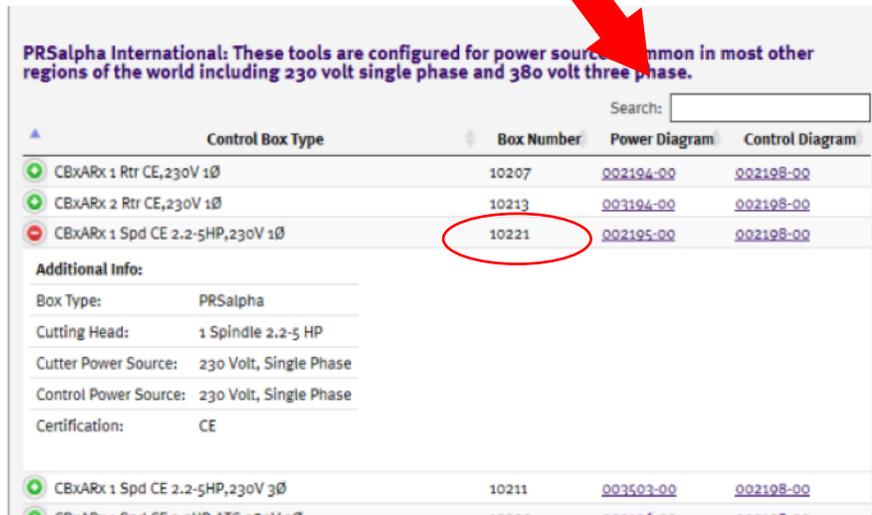
002742 - YZ Car 8" Z

12571 - HSD 4HP 220V 1PH PRS (The spindle ordered)

40221 - CSxARx 4 Mtr 1 Spd CE 2.2-5HP, 230V 1 (ShopBot's internal number of the control box. Note the last 3 digits in red; these are the digits needed to find the correct power diagram/specs)

Downloading Your Electrical Specs

Now that you have the information for your specific tool, you can find your power diagram/electrical specs at <http://www.shopbottools.com/ShopBotDocs/wiring.htm>. Scroll down to the section “International Tools” and find your control box by typing in the last 3 digits in the search box, or scroll down the list (ignoring the first 2 digits). For the electrician: see end of document on how to read the power diagram.



PRSalpha International: These tools are configured for power sources common in most other regions of the world including 230 volt single phase and 380 volt three phase.

Search:

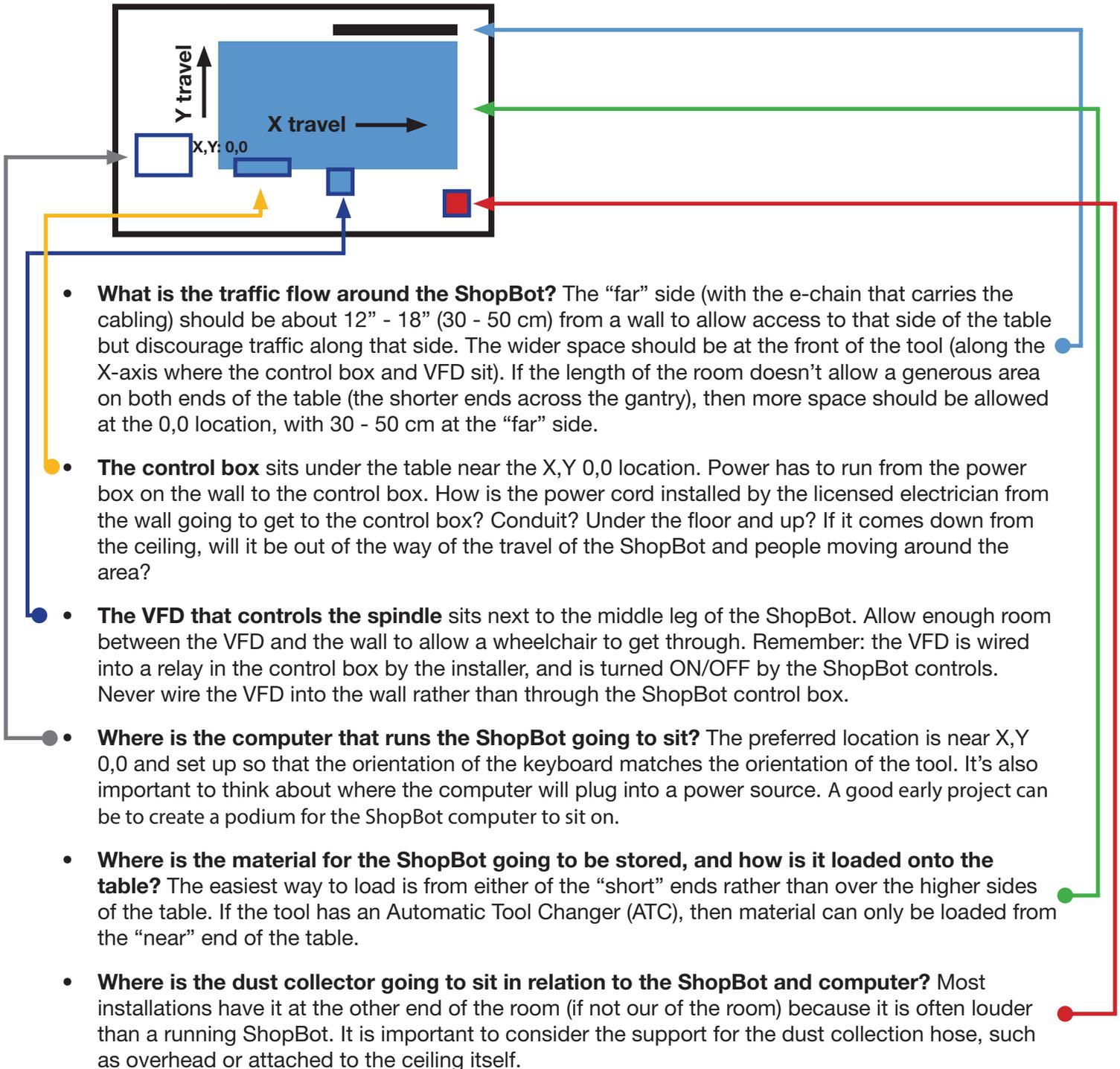
Control Box Type	Box Number	Power Diagram	Control Diagram
CBxARx 1 Rtr CE,230V 1Ø	10207	002194-00	002198-00
CBxARx 2 Rtr CE,230V 1Ø	10213	003194-00	002198-00
CBxARx 1 Spd CE 2.2-5HP,230V 1Ø	10221	002195-00	002198-00
Additional Info:			
Box Type:	PRSalpha		
Cutting Head:	1 Spindle 2.2-5 HP		
Cutter Power Source:	230 Volt, Single Phase		
Control Power Source:	230 Volt, Single Phase		
Certification:	CE		
CBxARx 1 Spd CE 2.2-5HP,230V 3Ø	10211	003503-00	002198-00
CBxARx 1 Spd CE 2.2-5HP,380V 3Ø	10222	003506-00	002198-00

Other Power Needs in the ShopBot Room/Location

- Dust Collection or Vacuum:** Please check the system ordered and wire accordingly. Some larger systems may require a 20A circuit and plug, or even 220V. The ShopFox dust collector (no relation to ShopBot) in the 220V version comes with a power cord but no plug. It is up to the licensed electrician to provide the plug and matching receptacle.
- Outlets for Computers, Chargers, and Other Devices:** Accessories and additional tools such as cordless drill chargers, scroll or band saws, and shop vacs may require different power needs. If ordering equipment from the U.S., it may be necessary to also purchase the appropriate converter for 110v or 220v devices, as well as appropriate plug adapters.
- Vacuum Hold Down:** If a vacuum hold down has been ordered with the ShopBot, please check with ShopBot to determine what the power requirements are, and be sure to talk over where the vacuum pump should be located. For a quick reference and links to different blower options available from ShopBot, visit <http://www.shopbottools.com/mProducts/vacuumholddown.htm>.
- Laser:** If you are ordering a laser for the space, check the power needs for the exhaust system’s blower. It may also need the services of a licensed electrician.

Deciding Where to Place the ShopBot

The footprint for a ShopBot that will hold a 4' x 8' piece of plywood (PRSalph 96-48) is roughly 6' x 10' (183cm x 305cm). 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 ShopBot Tools website at <http://www.shopbottools.com/PriceList.pdf>.



An Elegant Dust Collection Hose Management System

The dust collection hose must be hung so that it does not get in the way of the travel of the ShopBot. One option is to hang the hose from the ceiling. Each space has a different ceiling configuration, and so it is up to the customer to determine how it is going to handle the dust collection hose.

The example in the photos below allows the dust collection hose to extend over the full surface of the ShopBot table, while not dropping down into the travel of the tool while in the center of the table. Note that the hose is attached to the hanger at two points, forming a loop. The strut and hardware shown below was purchased at a tractor supply store and may be available at big box DIY stores. It is traditionally used for sliding barn doors. Any length of material and attachment that allows the hose to slide along the length is appropriate.



Spindle at 0,0 position (near corner)



Spindle at 2440,1220mm (far corner)

Supplies Needed in Advance for Successful ShopBot Install

Cabinet-grade plywood, 0.75" (19mm) thick, for support and sacrificial board: 2 sheets

(The assembly manual suggests MDF for the sacrificial board, but in a location with changing humidity levels, plywood is recommended)

NOTE: If installing a vacuum hold down system with plenum and bleeder board, see ShopBot website for instructions. In this case, cabinet-grade plywood should be used for the support board, but the plenum and bleeder board should be MDF as per instructions.

Outside deck screws, star drive T20 or T25, 1¼" long. 1 box. Available at Home Depot or Lowe's. These screws will be used to attach the sacrificial board to the support board (instead of gluing) and will be used for hold down in regular ShopBot projects. A box of T20 or T25 star drive heads is also a good idea in the event that the one that comes with the screws becomes misplaced or stripped.

Plywood for projects. The podium project requires 2 pieces of cabinet-grade plywood. Either half-inch (12mm) or three-quarter-inch (18mm) is fine.

Tools: The list of tools required for building a ShopBot can be found in the assembly manual. A simple tool kit is included with the ShopBot. Having a 6' (2m) level on hand makes leveling and squaring the table much easier.

ShopBot Software

Computer Setup for International Customers

The PC that runs the ShopBot must be set to US English in order to correctly run the ShopBot Control System software. A document with instructions on how to set up the computer correctly can be found at <http://www.shopbottools.com/files/InternationalComputerConfiguration.pdf>

Prior to installing ShopBot software: If the PC is managed by an IT group, it is strongly recommended that the computer gets a clean install of Windows using English (US) as default language without any entity managing the software or settings. The user will ultimately need to be an administrator. Check with ShopBot support for additional instructions.

ShopBot Control Software is pre-loaded onto a thumb drive found in the white ShopBot binder that comes with your machine. It is important to load the software and drivers before plugging the ShopBot into the computer. It is always a good idea to check the ShopBot website and download the most recent version of the software prior to running the tool. The latest version of the ShopBot Control Software is available at no cost, and can be found at <http://www.shopbottools.com/mSupport/controlsoftware.htm>.

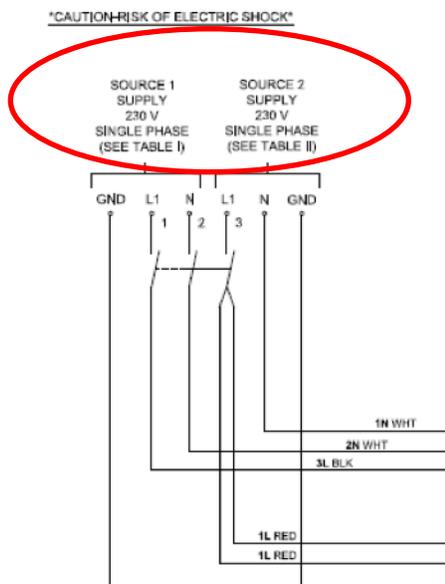
VCave Pro design and toolpathing (CAD/CAM) software included with the purchase of a ShopBot is available for download from an email sent from ShopBot to the main contact person on the purchase order. The name of the customer and the license code is also printed in the front of the white ShopBot binder that comes with your tool. If you are unable to locate the email with the correct download and customer information, you can contact support@shopbottools.com for a copy of the information.

For the Electrician/Contractor



WARNING: Be sure to read the Power Diagrams for advanced wiring and during the actual installation.

EXAMPLE: Control Box 0221



The only part that the electrician needs to wire into the control box is in the upper left of the power diagram.

NOTE: Use two power supplies. **DO NOT** wire a single power supply circuit for both the control box and the spindle.

The remaining diagram might help with technical support but is not needed for installation.

Tables with additional information for the electrician (example: wire gauge and circuit size) are also found in the power diagram.

