

Pressure Sensitive Z Zero Plate





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Introduction

This document is for setting up and using the Pressure Sensitive Z-zero plate, replacing the standard Z-zero plate which comes with the tool. The Pressure Sensitive Z-zero plate functions identically to the standard Z-zero plate, using the same Wago connection and C2 command; however the Pressure Sensitive Z-zero plate does not require an alligator clip, and can be used to zero rigid non-conductive cutters.



Users can expect repeatability under 0.001" when bit contact occurs at identical points. For example, if designated XY coordinates for the C2 command corresponds to a fixed location, or if using an ATC. Between points 1 and 2 (above) users can expect variance in measured plate thickness up to 0.001". For this reason, if the plate is being placed by hand, it is worthwhile to ensure that bit contact is occurring as close as possible to the center of the plate for high tolerance applications. This is due to the compressible nature of the O-ring which is isolating the plate from the base, as shown in the section view above.

NOTE: Always handle the z-zero plate by the plate, and not by the cord.

Z Zero Plate Setup

The suggested default plate thickness value for the Pressure Sensitive Z-Zero Plate is 0.570". To update the plate thickness value:.

Command Console [F]ie [M]ove [J]og [C]uts [Z]ero [S]ettings [V]alue([T]ools R]ecording] ShopBgc cnc	Open ShopBot3 software. Make sure tool is not in EASY mode.
•	Click Tools, then Shopbot Setup.
Comparison of the second	ShopBot Setup (Tool Settings) Image: Control software. Intested Shopbots control software. Image: Control software. Accroding to the settings file you inverse. Image: Control software. What units will you be using for your measurements in nohes during this setup program? This doent have to be the inverse in mm Image: Control software. What at you'' usualy work in, but just the units that if it is at you'' usualy work in, but just the units that if it is at you'' usualy work in, but just the units that if it is at you'' usualy work in, but just the units that if it is at you''' usualy work in, but just the units that if it is at you''' usualy work in, but just the units that if it is at you''' usualy work in, but just the units that if it is a provide using NOW Click "Next", then "Next" again. What's the size of your ShopBot table top, and the Zavis movement? These numbers is a soft is a provide and want to setup the Z_zero routhe is a provide and want to setup the Z_zero routhe is have prox switches and want to setup the Z_zero routhe is have Z prox Switch is have Z routers or the ShopBot tril head is have Z routers or the ShopBot tril head is have an Automatic Tool Changer (ATC) Image: Step Image:
Now let's get down to the real work. The first step is to set up a Z-axis zeroing program. It's done by connecting a flat metal plate to one of the input switch connections in your control box, and then running the C2 custom cut to run a z-zeroing routine. First, though, you'll need togive us some values. First, though, you'll need togive us some values. The ACTUAL thickness of the contact plate that you'll be using. Measure carefullyyour zeroing will only be as accurate as this measurement. The input switch number that your zeroing plate is connected to Most people connect it to input #1, but if you have some other accessory that's connected to input 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Enter desired thickness of Z-zero plate, and click "Next".





Z Zero Plate Thickness Measurements

For very high tolerance machining applications, there are two suggested methods for calibrating the thickness of the z zero plate. The first and most accurate is to use a measuring device such as a micrometer or caliber and carefully compress the z zero plate until input 1 is triggered.

Using a micrometer is simplest, but the method shown below uses calipers to measure a spacer of arbitrary thickness (in this case, a 0.350" thick nut). The spacer (nut) is installed on the Z-Zero plate, and the calipers are closed to compress the z zero plate to the point of triggering Input 1 (in this case, the trigger point is 0.920"). The difference between the spacer and total measurement (in this case 0.57") will give the final thickness of the z zero plate when Input 1 is triggered.



If calipers or a micrometer are not available, the tool itself can be used to find a rough estimate of plate thickness by using the following steps.

Surface spoil board.



Plug in Wago connector.

Open ShopBot3 software.

Click Tools, then Shopbot Setup.

Comma	and Conso	le					\frown			
[F]ile	[M]ove	[J]og	[C]uts	[Z]ero	[S]ettings	[V]alues	[T]ools	R]ecording	[U]tilities	[H]elp
11	ihop)B(<u>p</u> t °	CNC						
Stat	us	1.1/1		00 0 00	•	00 M	00 0 00 0	00 0 00 0 00	0.00	



Click "Next", then "Next" again.





Run "C2" command to zero the bit to the surface of the plate ~0.57" from table surface.

Open keypad and click "Fixed" button.

Perform paper test:

- Place a piece of paper onto spoil board. Paper is generally considered to have a thickness of 0.004".
- Lower bit until paper is barely held by bit.
- Check the position screen and note Z number.

Repeat Z-zero plate setup as above, but enter thickness of Z-zero plate as determined above.

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Setting a Fixed Z Zero Plate Location

Run the TS (Tool Setup) routine. Check the box below and fill in the fields for the desired fixed Z Zero location using the overtravel of the tool (not necessary for ATC users).

For Gantry/ATC Tool Users

To position the Pressure Sensitive Z Zero Plate in a fixed location with the overtravel of the tool to automate the C2 Routine, it will be necessary to install a wire harness from the control box to the designated location through the following steps.

- Locate the wire harness that came with the plate and remove the zip tie holding it.
- Shut off power to the tool and open the control box.
- Feed the ferrule end of the cable through one of the Roxtec cable entries on the side of the control box.
- Use a flathead driver to wire the Red wire to Input 1 marked as 1ZZ on the control board such that it is sharing the terminal block with the existing Z Zero Plate wire.
- Wire the black wire to any ground terminal on the control board marked Gnd.
- Retighten the Roxtec cable entries and run the wire underneath the tool to the designated location
 of the fixed z zero plate routine. Remove the paper cover from the strip of VHB tape on the back of
 the Wago end, and stick the Wago securely to the chassis where it will not interfere with tool travel
 or be vulnerable to material being loaded on or off the tool.













For ATC Users

Use a 4mm allen wrench to unscrew the four bolts on the underside of the phenolic block holding the ATC's fixed Z Zero Plate.

Ensure the phenolic block is free from debris and place the Pressure Sensitive Z Zero Plate securely in the hexagonal pocket. Plug the plate into the Wago connector run.

Use the two 10-32 bolts provided to fasten the Pressure Sensitive Z Zero Plate to the phenolic block through the underside of the phenolic block.

Re-center the fixed Z Zero plate location by loading the file "ATC_FixZ_Plate.sbp" located in "C:\Sb-Parts\Custom\ATC\ ATC_FixZ_Plate.sbp".

Reset the tool's plate offset by running a CN73 command.





Users retrofitting an ATC purchased before 07/01/16 will need to install a replacement phenolic block (Part number 003547) in order to mount the Plate directly to the tool rack.

Contact ShopBot Sales at (919) 680-46800 to purchase directly.



Z Zero Plate Troubleshooting

Problem	Potential Cause	Resolution	
Input 1 is always on.	Plate is stuck.	Press on plate to see if it comes	
		loose. Loosen bolts slightly.	
	Chips or dust under cap caus-	Remove six 1/8" hex bolts and	
	ing sticking.	cap. Clean under cap with cloth	
		and rubbing alcohol to eliminate	
		contaminants. Install cap and	
		secure with hex bolts.	
	Wire or Spring may have come	Remove six 1/8" hex bolts and	
	loose.	cap. Remove plate and ensure	
		wire is firmly connected to ring	
		terminal and spring is secure.	
		If wire is loose, or has discon-	
		nected from plate, reattach wire	
		with electrical tape or crimpers if	
		available. Install plate, cap, and	
		six 1/8" hex bolts.	
	Wires may be frayed.	Remove six 1/8" hex bolts and	
		cap. Remove plate and ensure	
		wire is firmly connected to ring	
		terminal and spring is secure.	
		Loosen wires from under wash-	
		er. If wire is loose, reattach wire.	
		If wire is frayed, isolate each	
		wire with electrical tape. Install	
		plate, cap, and six 1/8" hex	
		bolts.	
Input 1 does not turn on.	Wago connector may not be	Make sure Wago connector is	
	plugged in.	plugged in and both wires are	
		firmly installed.	
	Chips or dust under cap caus-	Loosen six 1/8" hex bolts. Blow	
	ing sticking.	air under cap to eliminate con-	
		taminants. Re-tighten hex bolts.	

Problem	Potential Cause	Resolution
	Positive wire may be loose.	Remove six 1/8" hex bolts and
		cap. Remove plate and ensure
		wire is firmly connected to ring
		terminal and spring is secure. If
		wire is loose, or has disconnect-
		ed from ring terminal, re-attach
		with electrical tape or crimpers if
		available. Install plate, cap, and
		six 1/8" hex bolts.
During Z Zeroing, bit missed	The plate is stuck in compres-	First loosen and the remove six
plate and contacts the blue	sion from the blue HDPE cap.	1/8" hex bolts and cap. Examine
HDPE cap.		the cap's inner race for damage
		or denting and try to flatten the
		inner race. Reinstall plate, cap,
		and six 1/8" hex bolts.



If these troubleshooting steps do not fix the problem, please contact ShopBot technical support at the contact information located on the first page of this document.

