



Single Phase Vacuum Hold Down Solutions for CNC Routers

**Operation Manual
Storm Vacuum System**



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Part Number: BBV-SVP-2
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Limited Warranty Statement

Black Box Vacuum Solutions warrants each new Black Box Vacuum Solutions product to be free from defects in material and workmanship. This warranty is applicable only for the normal service life expectancy of the product or components, not to exceed 12 consecutive months from the date of purchase.

Genuine Black Box Vacuum Solutions replacement parts and components will be warranted for 90 days from the date of purchase, or the remainder of the original equipment warranty period, whichever is longer.

Our obligation under this warranty shall be limited to repairing or replacing, free of charge to the original purchaser, any part that, in our judgment, shall show evidence of such defect, provided further that such part, if so requested shall be returned within thirty (30) days from date of failure to Black Box Vacuum Solutions. Under no circumstances will it cover any merchandise or components thereof, which, in the opinion of the company, has been subject to misuse, unauthorized modification, alteration, and accident or if repairs have been made with parts other than those obtained through Black Box Vacuum Solutions. Black Box Vacuum Solutions in no way warrants vacuum motors outside this warranty since these items are warranted separately by their respective manufacturer. All shipping charges for returned items shall be paid by the user. This warranty shall not interpret to render Black Box Vacuum Solutions or dealer liable for injury or damages of any kind or nature to person or property. This warranty does not extend to the loss of material, loss because of delay in job, or any expense or loss incurred for labor, substitute machinery, rental or for any other reason. Except as set forth above, Black Box Vacuum Solutions shall have no obligation or liability of any kind on account of any of its equipment and shall not be liable for special or consequential damages.

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Safety Information

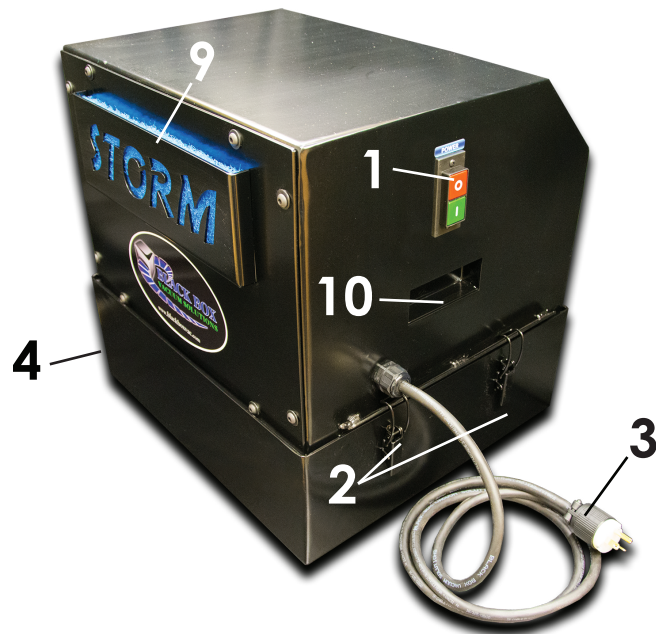


1. **Read** entire manual before installation and operation of the Storm Vacuum System.
2. This vacuum system is designed for CNC hold down use only, no other use is authorized.
3. Use common safety procedures when using this equipment.
4. Always perform all maintenance as required.
5. **DANGER! Shock hazard!** Always disconnect power before performing any maintenance tasks.
6. **DANGER!** Always be sure to connect power to a properly grounded circuit.
7. **DANGER!** If debris is allowed to bypass the spoilboard and canister filter, it may damage motors and be ejected from the exhaust port.
8. **DANGER!** If plumbing the exhaust port, never use plastic piping, always use heat tolerant metal piping. Plastic piping may melt and cause a fire. Plastic piping is acceptable for plumbing the intake port only.
9. **DANGER!** Never place hands or objects into the vacuum system.
10. **DANGER!** Surface may become hot from use. Allow equipment to cool before coming into contact with the surface.
11. **WARNING!** Use proper lifting techniques when moving this equipment.
12. **WARNING!** Always wear hearing protection when operating this equipment.
13. **WARNING!** Always wear eye protection when operating this equipment.
14. **WARNING!** Always clean out all pipes and plumbing before connecting this vacuum system to a CNC router table.
15. **WARNING!** Always use a spoilboard to provide filtration. An optional canister filter can be purchased for added protection (Recommended).
16. **WARNING!** Ensure area around equipment is kept clean and dry.
17. **WARNING!** This equipment should be operated by qualified personnel. Do not allow children to play around or operate this equipment.

Specifications and Features



Single Phase 220v-230v @20 Amps
~200 CFM
~9.5 inHg Sealed Vacuum
2 Long Life High Performance
Vacuum Motors - 50/60 Hz
Solid Steel Powder-Coated Housing
Internal Relief Valve System
Cooling Air Filter
Circuit Breaking Power Switch



Storm Vacuum System

1. Power Switch
2. Base Latches
3. Power Cord
4. Sound Dampening Base
5. inHg Vacuum Pressure Gauge
6. Threaded Intake Port
7. Exhaust Port
8. Cooling Air Exhaust Fan
9. Cooling Air Intake Filter
10. Side Handles (2)

Canister Filter (Optional)

11. Canister Filter Housing
12. Canister Filter Element
13. Threaded Fittings

Installation Instructions

Materials Required: Sufficient 2" PVC piping and fittings for intake plumbing, 2" threaded male adapter for intake port, PVC glue and PVC primer, thread sealant for all PVC fittings, tools for cutting piping, measuring tape, and a damp rag for cleaning.

Note: Please reference the Installation Diagram on page 7 before and after installation to verify that the system has been installed properly. Failure to install the system properly can result in system failure and will void the warranty.

Note: Place vacuum system with base as close to CNC as possible to minimize the amount of bends in the piping. Doing so will ensure optimal airflow.

Note: 2" piping is desired for use between CNC to Canister Filter*, and between Canister Filter* to Vacuum System.

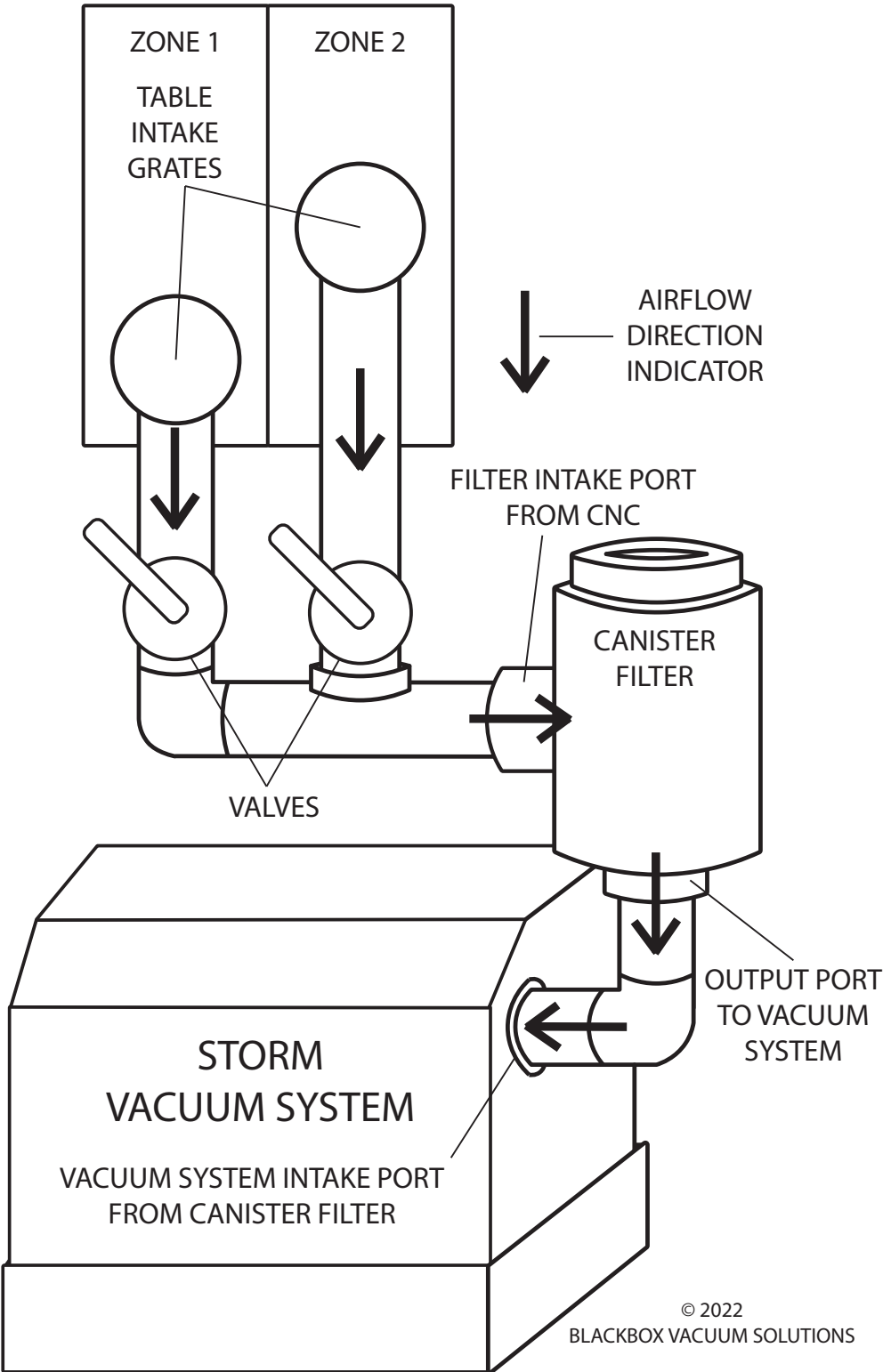
Steps:

1. Apply thread sealant to the 2" male adapter (not included) and install into the threaded Intake Port (#6) of the vacuum system. Do not over-tighten.
2. Apply thread sealant to the included adapters for the Canister Filter (Optional*) install them and tighten.
3. Measure, cut, and test fit all piping and fittings according to your setup. Do not glue at this time.
4. Install Canister Filter (Optional*) in line between CNC table and vacuum system. Ensure that the Canister Filter is properly oriented according to the labels. ("From CNC" and "To Vac") Placing canister filter closer to vacuum system is optimal.
5. Ensure that the Canister Filter* (#12) is installed into Canister Filter Housing* (#11) properly.
6. **Important:** Thoroughly clean all piping and fittings before gluing! Be sure inside of pipes are free of any shavings or debris. These items may be sucked into vacuum system on startup and damage the system.
7. After cleaning the piping, prime and glue fittings as you determine necessary.
8. Connect Power Plug (#3) to a properly grounded 20 amp 220v circuit.

* The Canister Filter is available for purchase from store.BlackBoxVac.com and is a recommended addition for added protection from debris.

Installation Diagram

SAMPLE DIAGRAM
FOR PLUMBING
A 2 ZONE CNC TABLE



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Operating Instructions

- Note:** Ensure that system is properly installed and cleaned according to the installation instructions and installation diagram.
- Note:** Ensure that CNC table top is equipped with a proper vacuum grid.
- Note:** Ensure proper spoilboard is installed on top of gridded table top.
(Black Box Vacuum Solutions recommends use of LDF also known as MDF Lite as spoilboard. Both sides need to be surfaced to remove hard resinous layer to optimize hold-down.)
- Note:** When cutting smaller parts it may be necessary to employ other hold-down methods such as leaving tabs or onion skin.

Steps:

1. Clean spoilboard of all dust and debris.
2. Load CNC table with the material to be cut.
3. Open desired zones on CNC table top (If equipped).
4. Power on the vacuum system by pushing the Power Button (#1).
5. Once the cut job is completed, turn off the vacuum system to allow the system to cool and to maximize motor life. A cooling cycle of 15-20 min should be factored into your process every 60-90 min or less.
6. Remove the materials from CNC table and clean before next use.

Maintenance

Warning! Disconnect unit from power before performing any maintenance tasks.

1. Remove and clean out cooling air intake (#9) and exhaust (#8) filters weekly. Return filters to proper places after cleaning. If filters are damaged or soiled badly order new filters.
2. Ensure area around vacuum system is kept clean.
3. Ensure area around vacuum system is kept dry.
4. If equipped with a canister filter:
Remove Canister Filter (#12) from Canister Filter Housing (#11) and clean monthly. If filter is damaged or soiled badly replacement filters can be ordered from Black Box Vacuum Solutions. Be careful not to introduce debris into Canister Filter Housing during cleaning. Wipe clean the Canister Filter Housing inside and out before reinstalling the Canister Filter.
5. Clean out inside of unit yearly. First, remove the allen bolts on the back of the unit to remove the back cover. Then remove the internal vent cover. Blow out the dust from inside the unit and clean with damp rag if necessary. Replace gasket material if it is damaged. Allow system to dry before operating.
6. Vacuum motors used in the Storm Vacuum System are a brush type motor. Brushes will wear and the motors will periodically need to be replaced. Please contact Black Box Vacuum Solutions for more information on replacement motors.

Contact

For More Information or Replacement Parts Please Contact
Us By Phone: 678-880-8490
By Email: Info@BlackBoxVac.com
Our Website: BlackBoxVac.com
Or Our Webstore: Store.BlackBoxVac.com

After getting your Black Box Vacuum set up, please e-mail us
pictures of what you have been creating!



Motor Replacement Instructions for Black Box Vacuum Solutions Vacuum Pumps

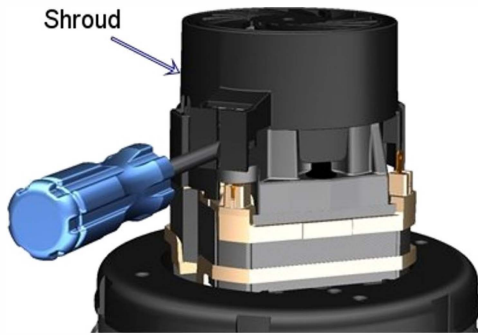
Check out our motor replacement video on our Facebook or YouTube page

- 1) Unplug the vacuum system from power source
- 2) Remove the rear cover of unit. Set aside the bolts
- 3) Remove the inner motor cover plate
- 4) Use compressed air to clean out the motor section (Wear eye protection)
- 5) Unplug the power leads of the motor to be replaced and remove the motor fan housing gasket. Set aside the gasket for use with the new motor
- 6) Loosen clamp holding exhaust boot and slide boot down from the motor
- 7) Loosen and remove the 3 nuts and washers holding the motor in and move the ground wires out of the way
- 8) Slide the motor off of the mounting studs being careful to not allow any parts or debris to enter the vacuum chamber
- 9) Check the vacuum chamber for any debris
- 10) Slide the new motor onto mounting studs
- 11) Install the ground wires onto mounting studs after motor is installed
- 12) Install washers and nuts and tighten the nuts to secure motor in place. Do not overtighten
- 13) Slide exhaust boot onto motor and re-tighten clamp
- 14) Connect power leads to motor. The white wire connects to the lead on the exhaust side
- 15) Insure all motors have a motor fan housing gasket and replace the inner motor cover (Do not overtighten nuts—seat to motor fan housing only)
- 16) Replace rear cover and tighten bolts. Do not overtighten bolts

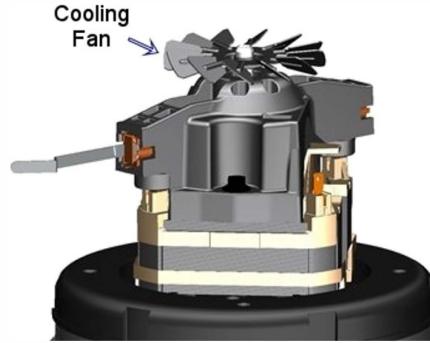


Brush Replacement Instructions

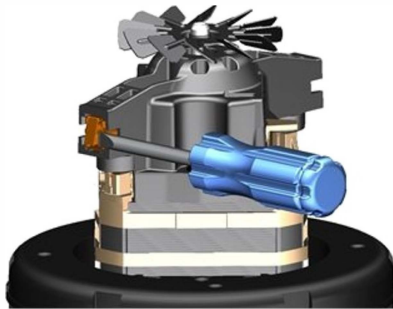
Please carefully read all instructions prior to attempting to replace brushes!
Check out our brush replacement video on our Facebook or YouTube page!



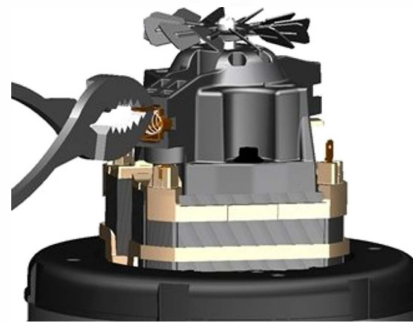
1. Using a small flat-head screwdriver or using finger tips, **carefully** spread plastic tabs and lift to remove shroud.



2. Insert the long end of replacement tool **inside** spring until it stops. If the scribe line on the tool goes inside the brush tube the brushes should be replaced.

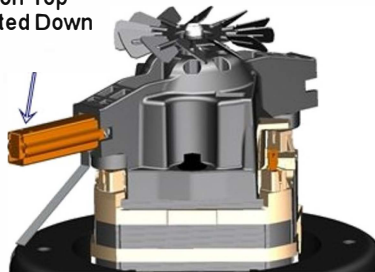


3. Using the screwdriver, bend the metal tab on the brush outward.



4. Using pliers, grasp the tab and pull the brush from the bracket. Be careful not to bend the fan blades.

Bumps on Top
Tabs Pointed Down



5. Insert short end of the the installation tool into the slot on top of the brush contact spring.

6. While holding the spring down with the replacement tool, slide the new brush over top of the tool and push by hand into the bracket.

7. After new brush is beyond the contact spring, pull the replacement tool out.

Note: Be sure the brush housing does not catch on contact spring during insertion.



8. Use a rubber mallet to gently tap the carbon brush until it is flush with the end of the bracket for short brushes or until it reaches the tabs on long brushes.

9. Repeat steps 3-8 for the second brush.
Always replace both brushes.

10. Carefully replace cooling fan shroud.

11. If the brushes are not in far enough the fan shroud will not slide over the end of the brushes easily; repeat step 8 if needed.



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