

**VIRGINIA
ABRASIVES®**

REAL. RUGGED. READY.

DIAMOND CORE DRILL

Model

VA - CD3

Item# 433-20000

OPERATING MANUAL



**VIRGINIA
ABRASIVES®**

REAL. RUGGED. READY.

**2851 Service Road
Petersburg, VA 23805-9347
1.800.446.1805**

Please read these instructions carefully before using.



WARNING To reduce the risk of injury, user must read instruction manual

1. General Power Tool Safety Warnings

WARNING: Read all safety warnings and all instructions. Failure to follow the warnings and instructions may result in electrical shock, fire, and/or serious injury.

Save all instructions for future reference.

1) Work area safety

- a. Keep work area clean and well lit.
- b. Do not operate power tools in the presence of flammable liquids, gases, or dust. Power tools create sparks which may ignite the dust or fumes.
- c. Keep children and bystanders at a safe distance while operating a power tool.

2) Electrical safety

- a. Power tool plugs must match the outlet. Never modify the plug in any way. Do not use any adapter plugs with earthed (grounded) power tools.
- b. Avoid body contact with earthed or grounded surfaces, such as pipes, radiators, ranges, and refrigerators.
- c. Do not expose power tools to rain or wet conditions. Water entering a power tool will increase the risk of electric shock.
- d. Do not abuse the cord. Never use the cord for carrying, pulling, or unplugging the power tool. Keep cord away from heat, oil, sharp edges, or moving parts. Damaged or entangled cords are dangerous and increase the risk of electric shock.
- e. When operating a power tool outdoors, use an extension cord suitable for outdoor use.
- f. Always use the Ground Fault Current Interrupter (GFCI) protected supply to protect against electrical shock.

3) Personal safety

- a. Stay alert, watch what you are doing, and use common sense when operating a power tool. Do not use a power tool while you are tired or under the influence of drugs, alcohol, or medication. A moment of inattention while operating power tools may result in serious personal injury.

CE Declaration of Conformity

We:

Declare that the product detailed below:

Diamond Core Drill

Model: VA – CD3

Satisfies the requirement of the Council Directives:

Machinery Directive 2006/42/EC

Low Voltage Directive 2006/95/EC

Electromagnetic Compatibility Directive 2004/108/EC

And complies with these standards:

EN60745-1/A11: 2010

EN60745-2-1: 2010

EN55014-1/A1: 2009

EN55014-2/A2: 2008

EN61000-3-2/A2: 2009

EN61000-3-11: 2000

Environment Protection

Waste electrical products should not be disposed of with household waste. Please recycle where facilities exist. Check with your local Authority or retailer for recycling advice.

6. Troubleshooting

Problems	Possible Reasons	Solution
Motor doesn't run when connected to power supply	1. Power supply disconnected 2. Breaker is tripped 3. Brush is not contacting the commutator 4. The winding of stator & rotor circuit open	1. Check and connect power supply 2. Check and replace switch 3. Replace electric brushes 4. Check or replace stator & rotor open circuit
Heavy sparks occur during operation of motor	1. Rotor winding has short circuit or open circuit 2. Brush spring positioned improperly or making poor contact 3. Worn commutator	1. Repair or replace rotor 2. Adjust the spring pressure 3. Replace with new commutator or motor
Drill vibrates	1. The core rig base is loose 2. The gap between elevating body and square rack has slipped 3. Elevating body and connecting bolts are loose	1. Reassemble and tighten the frame 2. Adjust the gap 3. Check and tighten bolts
Drilling progress is slow	1. Worn drill bit 2. Chips or aggregate are loose in gap 3. Drill vibrates 4. Adjust the clutch	1. Replace core bit 2. Stop the drill, remove the foreign materials from gap 3. Adjust and tighten connecting bolt 4. Tighten the tensioning nut on the clutch
Motor operates but will not drive a core drill	1. Clutch is out of adjustment	1. Use 19mm socket and torque wrench to adjust clutch (located in the gearbox) to 15 Newton-Meters or 125 inch-pounds

7. Standard Accessories

Electric brush 2 pieces

8. Main Part List and the Breakdown Drawing

The parts list of 433-20000 Virginia Abrasives Core Drill

- Use personal protective equipment. Always wear eye protection. Protective equipment such as dust mask, non-skid safety shoes, hard hat, and hearing protection will reduce the likelihood of personal injuries.
- Ensure that the switch is in the off-position before connecting to the power source to prevent unintentional starting.
- Disconnect the tool from the power source before moving adjusting or carrying the tool.
- Remove any adjusting tools before turning the power tool on.
- Never operate power tools with the guard removed.
- Do not overreach. Keep proper footing and balance at all times. This enables better control of the power tool under varying operating conditions.
- Dress properly. Do not wear loose clothing or jewelry. Keep hair, clothing, and gloves away from moving parts.
- Use of dust collection equipment can reduce dust-related hazards. Use appropriate personal protective equipment designed for the conditions and materials being used.

4) Power tool use and care

- Do not force the power tool. Use the correct power tool for your application.
- Do not use the power tool if the switch malfunctions. Any power tool that cannot be controlled with the switch is dangerous and must be repaired.
- Disconnect the plug from the power source before making any adjustments, changing accessories, or storing power tools.
- Store idle power tools out of the reach of children. Do not allow persons unfamiliar with the power tool or these instructions to operate the power tool. Power tools are dangerous in the hands of untrained users.
- Properly maintain your power tools. Check for misalignment or binding of moving parts, broken or damaged parts, and any other condition that may affect the power tool's operation. If damaged, have the power tool repaired before use.
- Keep cutting tools sharp and clean. Properly maintained cutting tools with sharp cutting edges are less likely to bind and are easier to control. Never use a damaged blade. Discard damaged blades immediately.
- Always use power tools and accessories in accordance with manufacturer's instructions. Take into account working conditions and the proper application. Use of power tools for unapproved applications could result in injury or property damage.

5) Service

- a. Have your power tool serviced by a qualified repair person using only identical replacement parts. This will ensure the continued safe operation of the power tool.

2. Diamond Core Drill Safety Warnings

- 1) Use auxiliary handles supplied with the tool. Auxiliary handles allow for good control and support safe operation.
- 2) Consider work area environment: Do not use the diamond core drill in damp or wet locations. Do not expose diamond core drill to rain. Operate only in a well-lit area. Do not use in the presence of flammable vapors or liquids. Electrical motors produce sparks during normal operation.
- 3) Grounding of Class I tools is necessary while in use to protect the operator from electrical shock. Class I tools are equipped with an approved three-conductor cord and three-prong grounding-type plug.
- 4) **⚠Warning!** The power outlet must be fitted with proper grounding. Do Not insert Class I tools into the socket without grounding. Never use a Class I tool with a damaged or missing ground plug.
- 5) Use a 12-gauge extension cord when tool is used outdoors or indoors. Use only three-conductor cord with approved grounding.
- 6) Be aware of your surroundings when working at elevation. Hard hat and fall protection may be indicated. Secure the area under and around the work location.
- 7) Use a garden hose and quick change adapter to supply water to the core bit. The water valve on the core drill can be used to adjust the water flow.
- 8) To protect the user and the core drill, ensure that there are no water leaks.
- 9) Inspect the hoses and other critical parts of the tool for wear. If water leaks from the testing hole of the gear box, the seal must be repaired immediately to avoid damage to the machine and possible hazard to the operator.
- 10) The maximum permitted pressure of water supply is 17 psi.
- 11) **⚠Warning!** Never use the tool without the GFCI provided.
- 12) Test the correct operation of the GFCI before starting work. The red light will be "ON" after pressing the "RESET" button. The light will be "OFF" after pressing the "TEST" button. Only operate the tool when the GFCI works properly.
- 13) Replacement of the plug or the power cord shall always be carried out by the tool manufacturer or authorized service center.
- 14) To ensure the safety of the operator and others, make certain that water is diverted away from the motor and other electrical equipment. Use a water containment system where appropriate and when working at elevation.

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Main Technical Parameters

Type	433-20000
Style	Portable
Max. Drilling Diameter	5 inches
Rated voltage	120V
Rated frequency	60Hz
Rated input power	1500 W
No load speed	3450/1800/950 min
Weight	22 lbs.
External Dimension	410x100x375 mm
Noise pressure level / K=3dB(A)	dB(A)
Noise power level / K=3dB(A)	dB(A)
Vibration / K=1.5m/s ²	A _{h,DD} =m/s ²

5. Maintenance

- 1) Contact an authorized service center for service and repair. Do not use unapproved replacement parts.
- 2) Check the electric brushes and commutator periodically. When the brushes are worn to about 3/16" they must be changed. Use only original equipment replacement parts to ensure proper operation and commutator damage. Both brushes must be changed at the same time. If you find heavy sparking during operation or the commutator is worn or burned, repair or replace the commutator.
- 3) The drill should be checked and repaired periodically after use. Check the condition of the power cord and plug. Verify proper grounding. Replace seals as needed and check lubricating oil.
- 4) Replace the rubber seals as required. Stop using the drill immediately if water is flowing from the top of the drill, check and replace the sealing washer immediately. The gears in the gear case use 175ml (6 oz) of 110# industrial gear lubricating oil. If you find lubricating oil penetrating the mid-cover air port, replace the rubber oil ring seal on the rotor spindle. Keep the drill clean and dry. When not in use, store the drill in a clean dry place. Remove the core bit when storing the drill. Apply a small amount of grease to the threads prior to storage.

1. Output Shaft
2. Assistant Handle
3. Cooling Water Tube
4. Adjustable Speed Knob
5. Reducer Casing
6. Single Phase Series Motor
7. Switch
8. Rear Cover
9. Bubble Level

FIGURE 3



3. Handling Instructions

1) Core bit installation:

Thread the core bit (by hand) onto the threaded drive of the drill. Use a wrench to secure the core bit.

2) Check the voltage:

Make sure the voltage of the power source is the same as required on the nameplate of the tool. The voltage should be kept at $\pm 5\%$.

3) Cutting bit installation:

Install the diamond core bit carefully. The end thread shall match with the end output shaft. Apply a small amount of grease to the output shaft prior to installation of the core bit. Install the bit by hand and tighten securely using a wrench. After tightening the core bit, allow the drill run under no-load for one minute prior to using.

4) Ensure proper water supply:

A reliable water supply is required for proper core bit performance. The water flushes slurry created during the cutting process from the cutting area and cools the core bit.

Drilling a core:

Open the water valve. Start the drill under no-load conditions. When water begins to flow, you may begin the drilling process. When drilling with a portable drill, angle the drill to a slightly inclined angle (See fig. 1). Drill a crescent-shape notch on the surface of the concrete. Continue drilling while adjusting the drill to the desired drilling angle. Increase pressure when the drill bit is into the work piece about $\frac{1}{4}$ " depth. Drill slowly and uniformly. Do not use excessive force. Apply moderate pressure and allow the tool to do the work. During drilling, if the speed of motor is reduced significantly, this indicates an excessive load. Reduce the pressure accordingly to maintain normal operating speed. If the motor overheats, shut off the drill immediately. Allow the motor to cool down.

Drilling through rebar:

When encountering rebar in the slab, the clutch on the output shaft may slip and the GFCI may trip if the drill is forced into the steel reinforcement bar. It is normal for the cutting progress to slow when drilling through rebar. Forcing the drill will damage the drill and the core bit. Allow extra time for drilling through rebar.



Figure 1

7) Various Materials:

If vibration or clutch slip occurs when drilling reinforced concrete, the drilling pressure should be reduced. If broken concrete or gravel falls into the bore, rebar may catch on gaps in the core bit segments resulting in overheating of the motor. Remove the drill bit from the hole and clean the gap. Let the drill cool down before continuing to drill. When drilling thick asphalt, the load on the drill will be increased, take care to drill slowly, uniformly, and monitor the motor speed. If the clutch slips continuously, reduce the cutting pressure.

8) Remove drill core:

When the drill bit nearly drills through the slab or wall, take care to reduce the cutting pressure to avoid a sudden breakthrough. Remove the core bit from the work piece by joggling the drill motor. Shut off and unplug the drill from the power source and remove the drill bit. Gently tap the core bit with non-metallic material and/or a rubber hammer to remove the cored material from inside of the bit. Be careful removing the cored material and avoid damaging the drill bit. Re-install the core drill and continue operation.

9) Keep the motor ventilated and allow the motor to cool down periodically:

During operation, take care to avoid blocking the ventilation openings. Make sure that the ventilation fins are kept open and are not clogged with dirt or debris to avoid overheating and damage to the motor.

10) Wet operation recommended:

When operating, there should be plenty of water flow onto the surface of the drill bit to clean and cool the bit.

11) Keep the motor dry:

Keep the enclosure of the motor away from water to avoid electrical shock. Control the water flow away from the operator and drill by drilling in a horizontal or vertical downward orientation only.

When changing gears, the machine must be stopped. Unplug the machine. Turn the adjustment knob by hand while gently turning the core bit by hand. This will allow the gears to un-mesh and mesh in the newly selected speed. Never adjust the gears while the motor is running. Doing so will damage the gears and void the warranty. Be sure to have the gears fully meshed before operating. Improperly meshed gears will damage the drill and void the warranty.

4. Structure, Feature, and Usage

This tool is a portable diamond core drill, it is designed for three-gear speeds.

High gear (gear III) is suitable for core bits up to 2".

Medium gear (gear II) is for core bits up to 3".

When drilling holes greater than 3" a core rig must be used.

Low gear (gear I) is suitable for holes from 3" to 6" diameter.

The core drill is equipped with safety friction clutch which protects the user and the motor. See fig. 3 for an expanded diagram of parts.

433-20000 DIAMOND CORE DRILL SPARE PART LIST

NO	SYMBOL	NAME	NO	SYMBOL	NAME	NO	SYMBOL	NAME	NO	SYMBOL	NAME	NO	SYMBOL	NAME
1	02-80/0-46	Sealing ring 78x2 O	24	02-80/0-28	Coil spring	47	ST4.2x19	Crossed slot tapping bolt	70	φ 17	Unmark uncork shield ring for shaft	93	02-80/0-40	16x10x1 washer
2	05-80/0-03	Mid-cover	25	02-80/0-56	Brush base assembly	48		Capacitance	71	06-80/0-05	6 # gear	94	02-80/0-44	Assistant handle cover
3	FB12x24x4.5	Bracket rubber sealing ring	26	M4	Hexagonal nut	49	02-80/0-67	Inductance	72	06-80/0-06	4# gear copper cover	95	02-80/0-45	Assistant handle
4	02-80/0-53	Oil sealing shim (32x18x0.8)	27	02-80/0-24	Rear cover jacket	50		Switch	73	06-80/0-04	4 # gear	96	M14x45	Hexagonal bolt
5	NSK6201	Deep groove ball bearing	28	02-80/0-16	Rear cover	51	ST2.9x16	Crossed slot tapping bolt	74	06-80/0-13	19x14x0.8 washer	97	M6x35	Butterfly shape bolt
6	05-80/1-01	Armature assembly	29	06-80/0-12	Rear cover	52	ST2.9x9.5	Crossed slot tapping bolt	75	05-80/0-26	13x1 Uncork shield ring for shaft	98	02-80/0-60	Spacer for water switch 18x13.3x1.5
7	02-80/0-52	Armature rear insulating cover	30	06-80/0-11	multifunctional level	53	M4x6	Crossed slot tapping bolt	76	HK1010	Stamping Outer needleroller bearings	99	02-80/0-62	Connector of water faucet
8	NSK6200	Deep groove ball bearing	31	M15x40	Inner hexagonal round head bolt	54	06-80/0-22	Scutcheon	77	06-80/0-02	Gear shell	100	02-80/0-61	Tighten bolt
9	φ 30x2.5	O-shape sealing ring	32	φ 5	Inner hexagonal bolt	55	06-80/0-01	Output shaft	78	φ 5x16	Bearing steel column	101	02-80/0-65	Tight ring
10	02-80/0-35	Shield board	33	φ 5	Spring Washer	56	02-80/0-50	Small spring	79	φ 3x12	Cylindrical pin	102		Inner φ8x350 mesh tube
11	M4x105	Pan head screws with cross recess	34	02-80/0-51	washer	57	φ 4	Steel ball	80	M5x12	Inner hexagonal round head bolt	103	02-80/0-63	Output connector of water faucet
12	φ 4	Spring washer	35	02-80/0-39	level	58	φ 47	Spring shield ring for holes	81	02-80/0-12	Adjustable speed block	104	02-80/0-43	1/4" mini ball valve
13	φ 4	Flat washer	36	02-80/0-21R	Post head DG8H-0	59	KS-NSK6005	Deep groove ball bearing	82	φ 20x3	O-shape sealing ring	105	02-80/0-64	Connector of water switch
14	02-80/2-01	Stator assembly	37		Handle bracket	60	φ 25	Spring shield ring for holes	83	02-80/0-13	Adjustable speed knob	106	11.2x2.65x16.5	O-shape sealing ring
15	02-80/0-22	Stator insulating cover	38	02-80/0-68	Handle lining	61	02-80/0-41	Shim cover	84	A5x40	Flat key			
16	02-80/0-23	Insulation mat	39	M15x35	Rear cover jacket	62	FB24x40x7	Bracket rubber sealing ring	85	KS-NSK629	Deep groove ball bearing			
17	2x4	Scutcheon rivet	40	06-80/0-19	Right handle	63	06-80/0-09	locating cover	86	06-80/0-03	3# gear axle			
18	06-80/0-21	name plate	41	02-80/0-31	jacket	64	M15x85	Inner hexagonal round head bolt	87	05-80/0-09	17x14x5 copper cover			
19	02-80/0-15	Shell of drill	42		PRCD	65	M15x55	Inner hexagonal round head bolt	88	05-80/0-04	2# gear			
20	3x6	Mushroom head rivets	43		CABLE&PLUG	66	FB22x35x7	Bracket rubber sealing ring	89	02-80/0-08	friction disk			
21	02-80/0-25	Brush holder base plate	44	02-80/0-29	Pressure Line board	67	02-80/0-58	Oil sealing base shim 2(24x18x0.8)	90	02-80/0-10	Press circle 28x14x12x2			
22	02-80/0-47	Brush assembly	45	ST4.2x16	Crossed slot tapping bolt	68	06-80/0-08	8# gear	91	05-80/0-24	Dish spring			
23	M13x6	Pan head screws with cross recess	46	06-80/0-20	left handle	69	06-80/0-07	9# gear copper cover	92	M12x1.25	Hexagonal nut			

433-20000 THREE SPEED BREAKDOWN DRAWING

