

# AGP<sup>®</sup>

## Tile Core Drill

■ High Speed Models

■ Low Speed Models



■ 2 Speed Models



## Instruction Manual

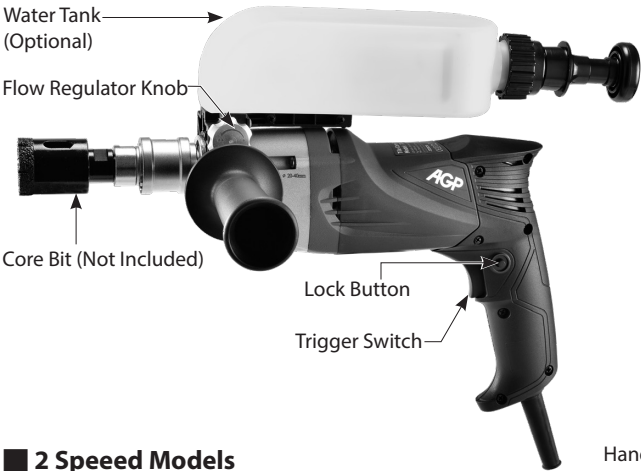
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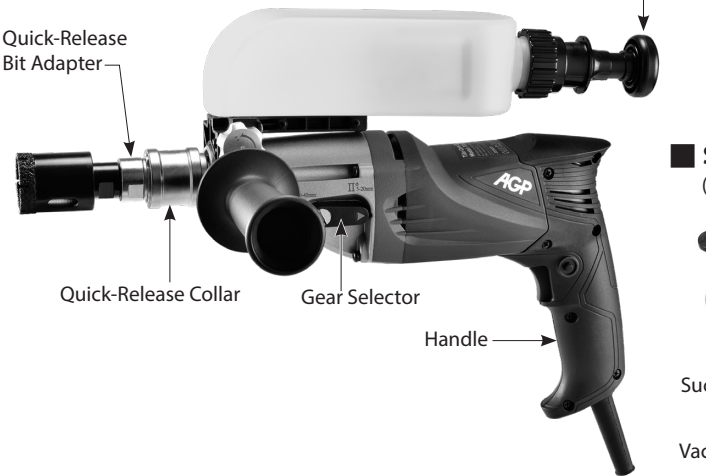
TECHNICAL DATA

Model		High Speeded Models	Low Speeded Models	2 Speeded Models
Power Input		650W		
Voltage		See machine nameplate		
No Load / full Load min <sup>-1</sup>	Speed 1	7500 / 4500	4500 / 2700	4500 / 2700
	Speed 2	N/A	N/A	7500 / 4500
Capacity		20mm (13/16")	40mm (1-9/16")	40mm (1-9/16")
Adapter Thread		G 1/2" (BSPP), M14-2.0 or 5/8-11" (optional)		
Protection Class		Class II with PRCD		
Neck Diameter		43mm		
Dimensions		317mm x 100mm x 300mm		348mm x 100mm x 300mm
Net Weight		2.3kg (5.07 Lbs.)		2.5kg (5.51 Lbs.)

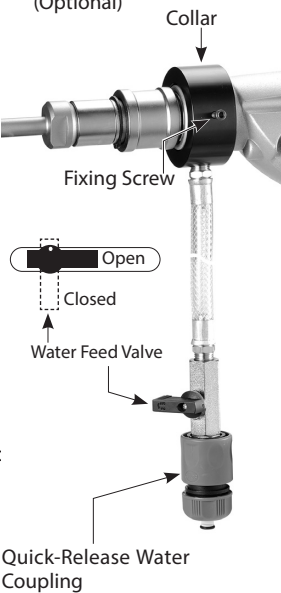
High Speed Models & Low Speed Models



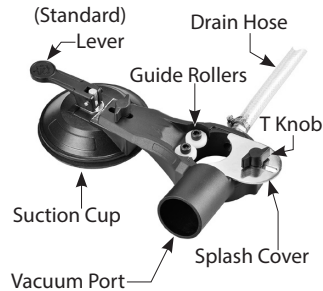
2 Speed Models



Water Supply Kit (Optional)



Suction Centering Guide



## GENERAL SAFETY INSTRUCTIONS



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

Save all warnings and instructions for future reference.

The term "power tool" in the warnings refers to your mains-operated (corded) power tool.

### 1) Work area safety

- a. **Keep work area clean and well lit.** Cluttered or dark areas invite accidents.
- b. **Do not operate power tools in explosive atmospheres, such as 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 away while operating a power tool.** Distractions can cause you to lose control.

### 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.** Unmodified plugs and matching outlets will reduce risk of electric shock.
- b. **Avoid body contact with earthed or grounded surfaces, such as pipes, radiators, ranges and refrigerators.** There is an increased risk of electric shock if your body is earthed or grounded.
- 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 increase the risk of electric shock.
- e. **When operating a power tool outdoors, use an extension cord suitable for outdoor use.** Use of a cord suitable for outdoor use reduces the risk of electric shock.
- f. **If operating a power tool in a damp location is unavoidable, use a residual current device (RCD) protected supply.** Use of an RCD reduces the risk of electric 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.
- b. **Use personal protective equipment. Always wear eye protection.** Protective equipment such as dust mask, non-skid safety shoes, hard hat, or hearing protection used for appropriate conditions will reduce personal injuries.
- c. **Prevent unintentional starting. Ensure the switch is in the off-position before connecting to power source and/or battery pack, picking up or carrying the tool.** Carrying power tools with your finger on the switch or energising power tools that have the switch on invites accidents.
- d. **Remove any adjusting key or wrench before turning the power tool on.** A wrench or a key left attached to a rotating part of the power tool may result in personal injury.
- e. **Do not overreach. Keep proper footing and balance at all times.** This enables better control of the power tool in unexpected situations.

- f. **Dress properly. Do not wear loose clothing or jewellery. Keep your hair, clothing and gloves away from moving parts.** Loose clothes, jewellery or long hair can be caught in moving parts.
- g. **If devices are provided for the connection of dust extraction and collection facilities, ensure these are connected and properly used.** Use of dust collection can reduce dust-related hazards.

#### 4) Power tool use and care

- a. **Do not force the power tool. Use the correct power tool for your application.** The correct power tool will do the job better and safer at the rate for which it was designed.
- b. **Do not use the power tool if the switch does not turn it on and off.** Any power tool that cannot be controlled with the switch is dangerous and must be repaired.
- c. **Disconnect the plug from the power source and/or the battery pack from the power tool before making any adjustments, changing accessories, or storing power tools.** Such preventive safety measures reduce the risk of starting the power tool accidentally.
- d. **Store idle power tools out of the reach of children and 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.
- e. **Maintain power tools. Check for misalignment or binding of moving parts, breakage of parts and any other condition that may affect the power tool's operation. If damaged, have the power tool repaired before use.** Many accidents are caused by poorly maintained power tools.
- f. **Keep cutting tools sharp and clean.** Properly maintained cutting tools with sharp cutting edges are less likely to bind and are easier to control.
- g. **Use the power tool, accessories and tool bits etc. in accordance with these instructions, taking into account the working conditions and the work to be performed.** Use of the power tool for operations different from those intended could result in a hazardous situation.

#### 5) Service

**Have your power tool serviced by a qualified repair person using only identical replacement parts.** This will ensure that the safety of the power tool is maintained.

#### Symbols used in this manual

V.....volts

A.....amperes

Hz.....hertz

W.....watt

~.....alternating current

$n_0$ .....no load speed

$\text{min}^{-1}$ .....revolutions or reciprocation  
per minute



.....warning of general danger



....class II tool



.....read these instructions



.....always wear eye protection



.....always wear a dust mask.



.....always wear hearing protection



.....wear safety-approved hard hat



do not dispose of electric tools,  
accessories and packaging together  
with household waste material

## DRILL SAFETY WARNINGS

1. **Hold power tool by insulated gripping surfaces, when performing an operation where the cutting accessory may contact hidden wiring or its own cord.** Cutting accessory contacting a "live" wire may make exposed metal parts of the power tool "live" and could give the operator an electric shock.
2. **The locking screw for the ground/earth cable may never be loosened, otherwise there is acute danger to life!**
3. **Check the ground (earth) connection of the electrical plug.**
4. **Take care not to damage gas, water, power and other conduits in the area of the drilling operation.** Drain or shut off these conduits as required.
5. **Block off the working area and place warning signs on both sides of the wall when drilling through from one side to the other.**
6. **When drilling hollow components, check the flow route of the cooling water in order to prevent damage.**
7. **Always hold the machine tightly.** Diamond core drilling bits can become stuck at any time during core drilling, there is a danger of the machine jumping out of control.
8. **WARNING: Pull the plug out of the socket before making device settings or changing accessories.** Many accidents are caused by accidental starting of power tools.

## SPECIAL SAFETY WARNINGS FOR WET DRILLING

1. **Never use the machine without the PRCD fault-current safety switch supplied.**
2. **Always check the PRCD fault-current safety switch for correct functioning before starting a drilling operation.**
3. **Ensure that no water is allowed to get into the motor unit during operation.**
4. **If you detect a leak in any part of the water supply system, shut the machine down immediately and repair the fault. Water pressure should not exceed 70 psi (4 bar).**

## INTRODUCTION

The machine is designed for either wet or dry core drilling in stone, concrete, masonry, ceramic, and similar materials.

All other uses which are not for the intended purpose are prohibited.

Some models are equipped with a suction centering guide for precise hole placement which also acts as a slurry or dust collector.

For wet drilling, some models have an autonomous hand-pumped water tank with water regulator valve. Some models have a conventional water supply kit with valve.

There are quick-release adaptors which hold the core bits and make it easy to clear the cores from the bits between holes.

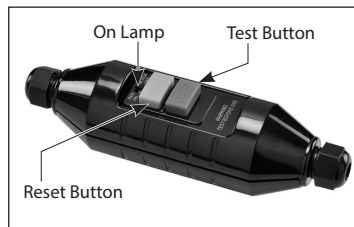
Some models are equipped with a two speed gearbox.

## ELECTRICAL CONNECTION

The network voltage must conform to the voltage indicated on the tool name plate.

Under no circumstances should the tool be used when the power supply cable is damaged. A damaged cable must be replaced immediately by an authorized Customer Service Center. Do not try to repair the damaged cable yourself. The use of damaged power cables can lead to an electric shock.

**WARNING: This machine is equipped with a Portable Residual Current Device (PRCD) also known as a Ground Fault Circuit Interrupter (GFCI). Always use this device whenever using the machine to reduce the risk of shock hazards. Always position the device PRCD as close as possible to the power source. Test and reset the PRCD device before each use. Press the "Test" button to test. Press the "Reset" button to energize the circuit to the machine.**



**WARNING: Always connect the plug into the wall socket with a drip loop. If the cable leads downward directly into the wall socket, any water on the cable could run into the socket, causing a hazard.**

## ASSEMBLY

Mount the bit to the quick-release bit adapter. (See instructions below: "Mounting the core bit"). If applicable, mount water tank or water supply kit. (See Instructions below: "USING THE WATER TANK" or "USING THE WATER SUPPLY KIT").

## LIST OF CONTENTS

1. Diamond core drilling machine.
2. Quick-Release Bit Adapter (2)
3. M22 Wrench
4. M27 Wrench
5. Water Tank (optional)
6. Water Supply Kit (optional)
7. Suction Centering Guide Set (optional)

## OPERATING INSTRUCTIONS

### Mounting the core bit

**CAUTION: Ensure that the threads of the quick-release adapter and the core bit match. Attempting to mount mismatched threads will result in damage to both threads.**

Mount the core bit to the correct sized quick-release adapter using two correct-sized wrenches. Only use correct sized wrenches to avoid damage to the adapter or bit.

Use some grease or anti-seize compound on the threads and remove the bit from the adaptor when not in use to avoid seizing. Ensure that both the core bit and the adapter threads are clean. Any debris could cause excessive run-out of the mounted core bit. Excessive run-out can cause premature failure of the core bit and/or a safety hazard.

To mount to the machine, pull back on the quick-release collar and snap the adapter into position. Turn until the collar snaps closed. To remove, pull back on the collar and pull the adapter straight out.



**CAUTION: Keep the surfaces of the Quick-Release Bit Adapter and the inside of the Quick-Release Collar assembly clean. Accumulated dust and slurry could cause them to become jammed together.**

## Choosing the correct core bit for the job:

Ensure that the bit you are using is suitable for the material you are drilling. There are two main types of diamond core bit:

**Wet/dry type-electroplated (surface set) diamond core bits and wet type-sintered (impregnated) diamond core bits.**

### Dry drilling may only use Dry type bits:

Electroplated bits, also known as wet/dry type, are only suitable for less hard materials. The diamonds are sharp and coarse and are only set on the surface. They have a much shorter service life than sintered bits and cannot be dressed (resharpened). Once they become dull, they must be replaced. They tend to work well with softer, abrasive materials like brick.

### Wet type bits must always be used with water:

Sintered bits, also known as wet type, are much longer lasting but require operator knowledge for best results. Water is absolutely always required with sintered bits. The bit is impregnated with many layers of diamond in its metal matrix. As the matrix (bond) wears, new diamonds are exposed. If the bit becomes glazed, it can be resharpener by dressing with an appropriate alumina oxide or silicon carbide dressing stick. There are many variables with sintered diamond core bits, such as diamond grade and type, diamond grit size, bond type, bond hardness, and bit wall thickness. Consult with your diamond core bit supplier for the best bit for your application. Work materials vary widely in hardness.

## INSTRUCTIONS FOR WET DRILLING

Water is a basic requirement for wet diamond core drilling. The water serves as a coolant to avoid the working surface at the tip of the bit from overheating. When the diamond bit becomes overheated, both the bond matrix and even the diamonds break down. The most frequent cause of diamond core bit damage is caused by

drilling without enough coolant water.

Water should always be used to cool and lubricate the bit and to flush out abrasive particles formed while drilling.

## **USING THE WATER SUPPLY KIT**

Mount the water supply collar onto the gearbox neck and secure with the screw.

To connect to the water supply, attach the quick-release water coupling to a water hose and then snap the coupling into position. Use the valve to regulate the water flow. (See p2.)

## **USING THE WATER TANK**

Make sure the flow regulator knob is closed and fill the tank with clean water. Mount the tank's collar onto the gearbox neck and tighten the screw to fix in place.

With the flow regulator knob in the closed position, pump the hand pump to create pressure in the tank.

When ready to drill, open the flow regulator knob and adjust the water flow to the desired amount. Close the flow regulator knob when the hole is finished. (See p2.)

**WARNING: Remove the tank from the motor when refilling. Never allow water to enter the motor.**

**CAUTION: Always empty the water tank whenever storing in case or transporting.**

**CAUTION: Never allow the water to freeze in the water tank.**

**WARNING: Never allow water to enter the motor. It could lead to an electric shock.**

**WARNING: Check all connections of the water feed system to ensure there are no leaks. Inspect hoses and other critical parts which could deteriorate.**

**WARNING: The maximum water pressure should not exceed 70 psi (4 bar).**

Use a water collector with a wet vacuum to collect cooling water if nearby objects could be damaged by water.

**WARNING: Never allow water to enter the motor. A perfectly functioning water collector set up must be used for any drilling performed at an upward angle.**

## **SPECIAL INSTRUCTIONS FOR DRY DRILLING**

Dry drilling is a different process from wet drilling. With wet drilling, it is more of a grinding process and you need a lot of downforce to grind away the material. But with dry drilling, it is more of a cutting process and you must use a much lighter touch.

When dry drilling, you must not push too hard. Allow the tool to work at its own pace.



Dry drilling is normally done in softer materials. Note that in very hard materials it may not be possible to drill dry. Always use a vacuum cleaner to control the dust from dry drilling.

### SELECTING SPEEDS (2 speed models only)

There are 2 speed ranges to suit the bit size and work piece hardness. Choose the slowest speed for large diameter bits and hard materials. If when cutting the bit stalls repeatedly, then you must change to a lower gear. If you are already in the lowest gear and the bit stalls repeatedly, then you are using the machine over its maximum capacity.

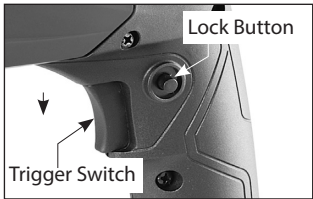
**CAUTION: Never attempt to change gears on a running machine! Only adjust when the machine is at rest.**



Pop the Gear Selector Tab out of the detent then slide the selector back for low or forward for high to change the gear. It may be necessary to turn the spindle slightly in order for the gear to be engaged. Once engaged, pop the tab into its detent.

### THE SWITCH

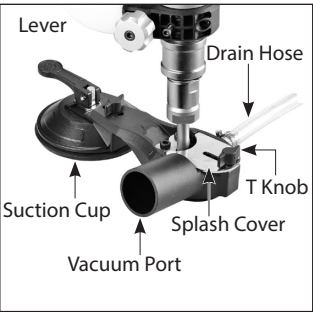
The machine has a lockable trigger switch. Squeeze the trigger to start the machine. To lock the switch on, press the lock button while holding the trigger switch on. To release, squeeze the trigger and release.



### THE SUCTION CENTERING GUIDE

The optional suction centering guide is a very useful multi-purpose device which can be used as a drilling guide, a slurry collector ring, and a dust collector ring. There is an adjustable splash cover to help control splattering of slurry. The guide firmly attaches to the workpiece with a suction cup.

To use, align the guide with the location of the intended hole then flip down the lever of the suction cup to secure in position. The shank of the core bit will rest against the two guide rollers to keep it from wandering when the cut begins. Adjust the splash cover to minimize splatter. One may either attach a vacuum cleaner or simply route the drain hose to catch the slurry as needed.



## DIAMOND CORE DRILLING

**WARNING: When coring through a floor, the core will fall down. Take precautions to avoid injury or damage below.**

**NOTE: When drilling with a new bit for the first time, use less than normal feed pressure for a time until it breaks-in.**

1. Squeeze the trigger switch to turn the machine on. (press the "Reset" button on the PRCD interrupter device to energize the circuit to the machine before starting.)

**WARNING: Hold the machine tightly with both hands to counteract the torque reaction force when the bit begins to turn.**

2. Very gently begin the cut. Use the optional suction centering guide to guide the bit and keep it from wandering. Or, if holding free hand, start the cut by approaching at an angle of about 30 degrees to the cutting surface. Once about a third of the arc is cut, straighten the bit to the correct perpendicular angle while keeping enough feed pressure on the bit to prevent it from wandering.  
Once the cut is finished, if the core does not drop out of the bit on its own, remove the bit and push out the core with an appropriate tool.

**NOTE: When using larger bits, it is sometimes helpful to use a slight rotating motion to help the cutting action and allow debris to escape the kerf.**

## FOR WET DRILLING

1. Make adjustments to the water feed as needed. The water leaving the cut should be a solid colored slurry with about the consistency of milk. If the exiting water is clear, then you may reduce the water flow. If the exiting water is thick and muddy, then increase the water. It's very important that the water has enough pressure to flush cutting debris out of the cut.
2. Once in the cut, use steady feed pressure.
3. When the cut is almost finished and the bit is about to break through, the bit will be very liable to get stuck. Take extra care gripping the machine tightly and reduce feed pressure at this point.

**WARNING: Always keep your face away from the machine.**

## ADDITIONAL SPECIAL INSTRUCTIONS FOR WET DRILLING

The diamond impregnated segments in a wet type (sintered) diamond core bit operate on a principle of controlled erosion. The bond matrix holding the diamonds is continually worn away by abrasion with the work piece, exposing the harder diamonds to stand proud from the bond matrix. A bit with good diamond exposure is a sharp bit.

This erosion process causes heat and particles, which require water to cool and rinse free. Without

adequate water, the bit would overheat and be destroyed.

With too much water and not enough feed pressure, there would not be adequate erosion of the bond matrix (the diamonds not exposed) and the bit becomes dull (diamond segments polish smooth). This is called glazing and luckily the bit can be de-glazed (sharpened). If the bit seems to refuse to cut anymore, you know that it is glazed. **See below: "SHARPENING A GLAZED BIT"**

Never use a sharp motion or the bit will be damaged. Conversely, don't feed too gently or the diamond segments will become glazed. Keep the bit steadily working, but don't be abusive or give the bit shock impacts into the work surface.

Take great care to keep the bit aligned to the hole. If the bit is crooked, it will easily bind.

If the cut is very deep, the core plug may be obstructing the flow of cooling water. In this case, stop drilling, and chisel out the core plug before continuing.

**CAUTION: If the bit gets stuck, do not try to rock it loose by turning the switch on and off. That is hazardous and could damage the motor. Rather, unplug the machine and use a wrench on the bit mounting to work it loose.**

If embedded steel such as rebar is encountered take special care. When the steel is encountered, the water will generally go clear and vibration will begin. Change to a lower gear if available. Reduce the feed pressure by about 1/3 and let the bit go at its own pace, if there is too much vibration the bit will be destroyed.

Once the steel is passed, continue normally. A properly sharp bit with good diamond exposure should be able to cut through rebar if handled well.

When the cut is finished keep the motor running until the bit is removed from the cut to avoid it getting stuck.

**CAUTION: Drilling operations are very stressful to the motor and at the end of the cut, the motor temperature will be very hot, always run the motor at no load for a few minutes until the temperature returns to a normal range before shutting off.**

Then turn off the switch and allow the coasting bit to stop before setting it down.

## **RESHARPENING A GLAZED BIT (Wet bits only)**

If the bit becomes glazed, the ideal way to sharpen and true it up is by dressing with an appropriate alumina oxide or silicon carbide dressing stone. Simply drill into the stick as many times as necessary to restore its cutting performance.

If it is only slightly dull, while cutting, you may first reduce the water flow by about half until the water exiting the kerf is really muddy.

Another method is to stop and add about 6mm (1/4") of coarse silica sand in the kerf and drill for a few minutes, then turn up the water to rinse the sand free. Repeat as needed.

Another method is to drill into a cinder block. Repeat as needed.

If that still does not work the only choice is to use a dressing stone.

## VIBRATION TROUBLESHOOTING

If vibration occurs and it is not caused by embedded steel, stop drilling to find the cause and remedy.

**CAUTION: Do not operate with vibration or there will be serious hazard and the diamond core bit will surely be destroyed.**

### Vibration is usually caused by:

1. A bit with too much runout  
**SOLUTION:** Replace bit.
2. A bit with diamond segments broken off  
**SOLUTION:** Repair or replace bit.

## KEEP TOOL CLEAN

Wipe down the machine at the end of each work day with a damp cloth.

NEVER use solvents to clean plastic parts. They could possibly dissolve or otherwise damage the material. Periodically blow low-pressure compressed air through the ventilation slots with the motor running to keep the motor clean so that motor can be cooled normally.

Wear safety glasses while using compressed air.

**CAUTION: When drilling in a position with the motor near to the floor, take measures to prevent dust, debris and slurry from being sucked into the motor's cooling slots**

## MAINTENANCE

Every 50 hours of operation blow compressed air through the motor while running at no load to clean out accumulated dust. (If operating in especially dusty conditions, perform this operation more often.)

To keep your diamond coring machine in top condition, periodic maintenance must be performed. In addition always check for a damaged power supply cable, check for loose fasteners and always keep alert for unusual noises and vibration when operating.

**WARNING: Never operate a damaged machine. Always tag a damaged machine and take it out of service until repairs can be made.**

Maintenance which should be performed by an authorized service center, include the following:

- Replace water seals as needed.
- Replace the carbon brushes as needed
- Change the gearbox grease about every 100 hours of operation

Each year perform a full mechanical inspection, cleaning and re-lubrication.

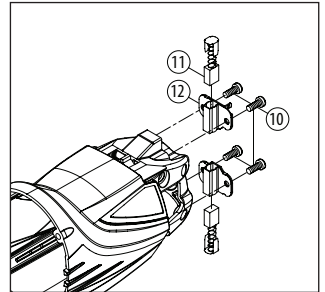
## THE CARBON BRUSHES

The carbon brushes are a normal wearing part and must be replaced when they reach their wear limit. Replace both carbon brushes when either has less than 1/4" length of carbon remaining.

**Caution: Always replace the brushes as a pair.**

### To replace brushes:

1. Remove the 5 long screws and 2 short screws to remove the left handle housing. (The two screws closest to the motor are the short screws).
2. Remove the 2 short screws to remove the right handle housing. There will be wires which will remain attached. Take care not to strain the wires.
3. Unplug the female spade terminal from the brush.
4. Unscrew the 2 screws to remove the brush holder. The brush will come away together with the holder.
5. Install the new brush into the brush holder with the male spade end pointing toward the rear of the motor then screw the brush holder in place.
6. Reconnect the female spade terminal to the brush. Then repeat for the other brush.
7. Replace the right handle housing, then carefully place the switch in the correct position and arrange the wires so that they will not be pinched.
8. Replace the left handle housing, taking care to avoid pinching any wires and tighten the screws.



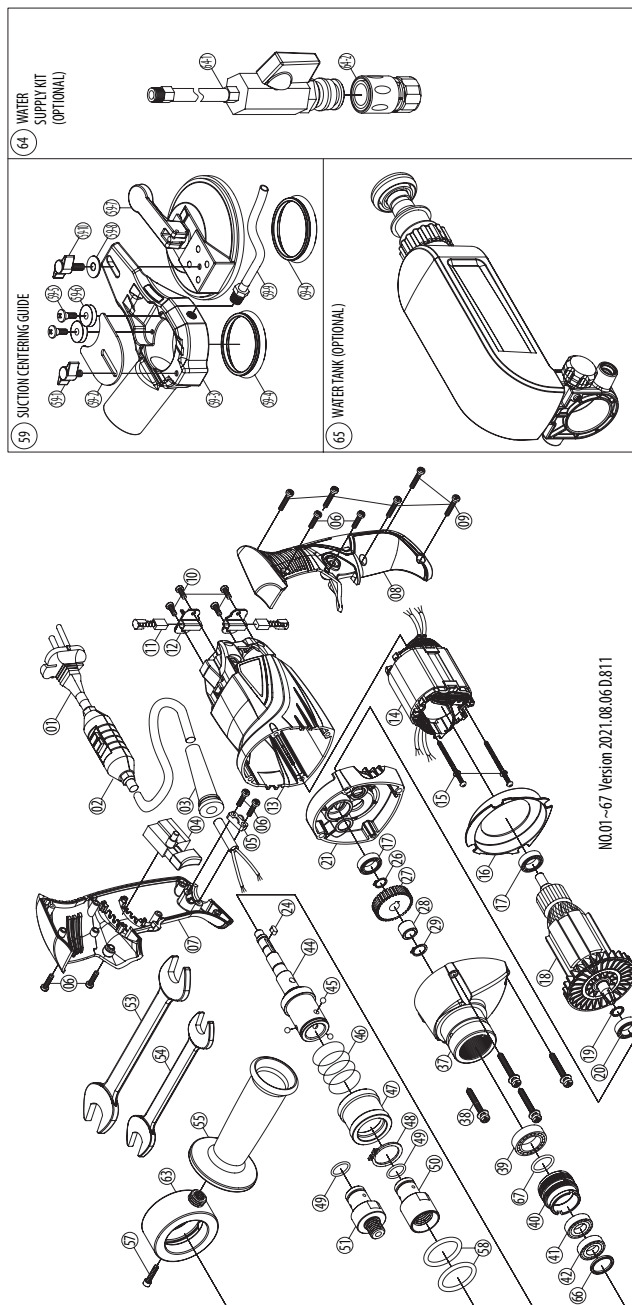
**If the replacement of the power supply cord is necessary, this has to be done by the manufacturer or their agent in order to avoid a safety hazard.**

**WARNING: All repairs must be entrusted to an authorized service center.** Incorrectly performed repairs could lead to injury or death.

Do not throw electric power tools into the household waste!

In accordance with the European Directive 2002/96/EG on Waste Electrical and Electronic Equipment and transposition into national law, used electric power tools must be collected separately and recycled in an environmentally friendly manner.

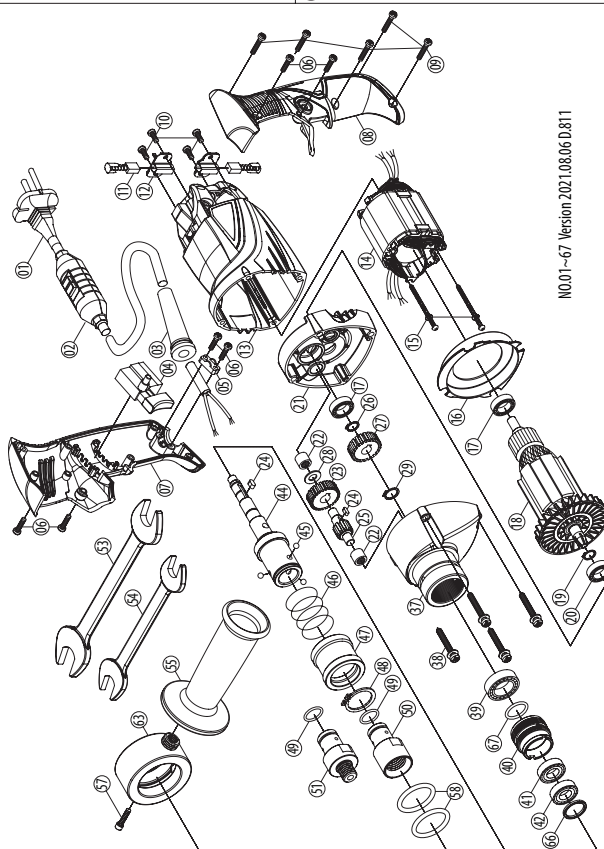
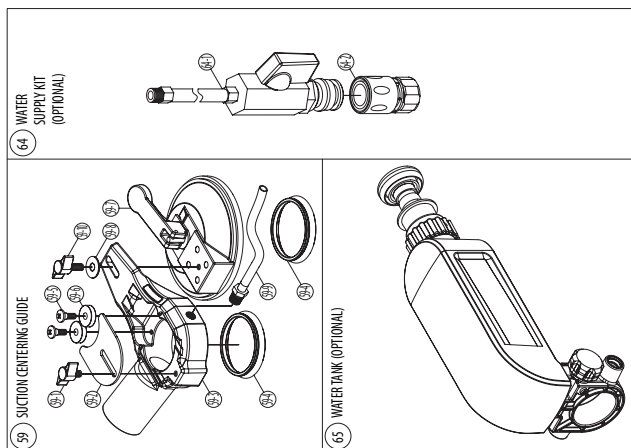
# High Speed Models Exploded View



## High Speed Models Parts List

NO.	Parts Name	Q'TY	NO.	Parts Name	Q'TY
1	POWER SUPPLY CABLE (VDE-1.0x2Cx3M-H07RNF)	1	44	SPINDLE (Ø19-129.5MM)	1
2	PRCD INTERRUPTER PROTECTION (110V/220V)	1	45	CHECK BALL (Ø5)	3
3	CORD ARMOR	1	46	SPRING (Ø1.8xØ28.2xØ31.8x4Tx46L-SUS304)	1
4	TRIGGER SWITCH	1	47	QUICK-RELEASE COLLAR	1
5	CABLE CLIP	1	48	EXTERNAL CIRCLIP (S-28)	1
6	PANHEAD TAPPING SCREW (M4x14)	6	49	O-RING (Ø13x2)	2
7	HANDLE HALF-RIGHT	1	50	QUICK-RELEASE BIT ADAPTER (1/2"BSP)	1
8	HANDLE HALF-LEFT	1	51	QUICK-RELEASE BIT ADAPTER (M14xP2.0)	1
9	PANHEAD TAPPING SCREW (M4x16)	5	53	WRENCH (M24/M27)	1
10	PANHEAD TAPPING SCREW (M4x8)	4	54	WRENCH (M19/M22)	1
11	CARBON BRUSH (7x8x12)	2	55	FRONT HANDLE (M12xP1.75)	1
12	CARBON BRUSH HOLDER (7x8)	2	57	SOCKET CAP SCREW (M4x14xP0.7)	1
13	MOTOR HOUSING	1	58	O-RING (Ø38x2)	2
14	STATOR (110V/220V-62x36.5x50)	1	59	SUCTION CENTERING GUIDE	1
15	PANHEAD TAPPING SCREW (M4x60)	2	59-1	THUMB SCREW (M6x12xP1.0)	1
16	FAN SHROUD	1	59-2	SPLASH COVER	1
17	BALL BEARING (608)	2	59-3	CENTERING GUIDE BODY	1
18	ARMATURE(110V/220V-62x36.5x50)	1	59-4	SEAL	2
19	EXTERNAL CIRCLIP (S-15)	1	59-5	TRUSS HEAD SHOULDER SCREW (M5x15xP0.8)	2
20	BALL BEARING (6002)	1	59-6	ROLLER (Ø6.2xØ20x5)	2
21	GEAR PLATE	1	59-7	SUCTION CUP	1
24	PARALLEL KEY (4x4x8)	1	59-8	FLAT WASHER (Ø6xØ25x1)	1
26	EXTERNAL CIRCLIP (S10)	1	59-9	DRAIN HOSE	1
27	OUTPUT GEAR (M1.0x33T)	1	59-10	THUMB SCREW (M6x16xP1.0)	1
28	SHAFT RACE (Ø10xØ14.8x11)	1	63	WATER FEED COLLAR	1
29	EXTERNAL CIRCLIP (S-12)	1	64	WATER FEED CONNECTOR KIT (1/2")/(3/4")	1
37	GEAR HOUSING	1	64-1	WATER FEED CONNECTOR KIT	1
38	PANHEAD TAPPING SCREW (M5x45)	4	64-2	WATER COUPLING (1/2")/(3/4")	1
39	BALL BEARING (6201)	1	65	WATER TANK	1
40	SEAL HOLDER (M34 x P1.5)	1	66	OIL SEAL (Ø15xØ24x5)	1
41	OIL SEAL (Ø15xØ24x5)	1	67	O-RING (Ø30x1.5)	1
42	OIL SEAL (Ø15xØ25x5)	1			

# Low Speed Models Exploded View

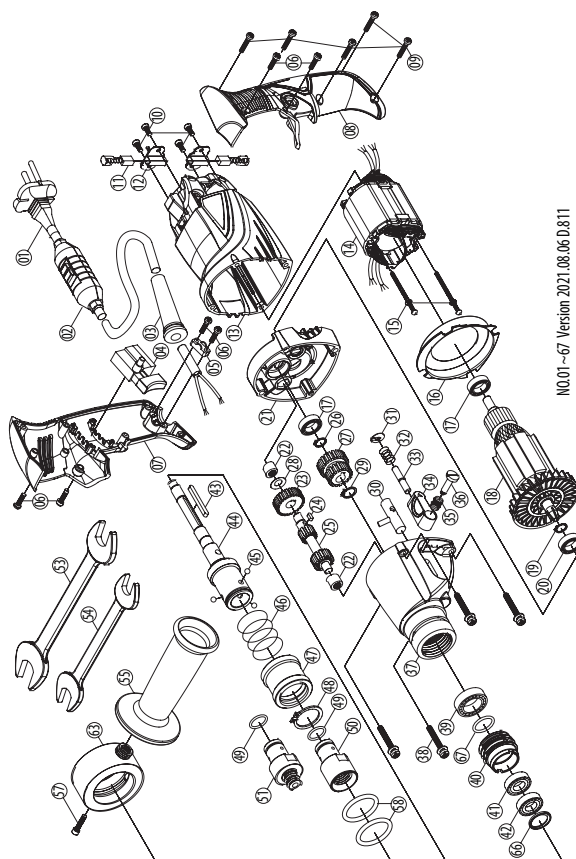
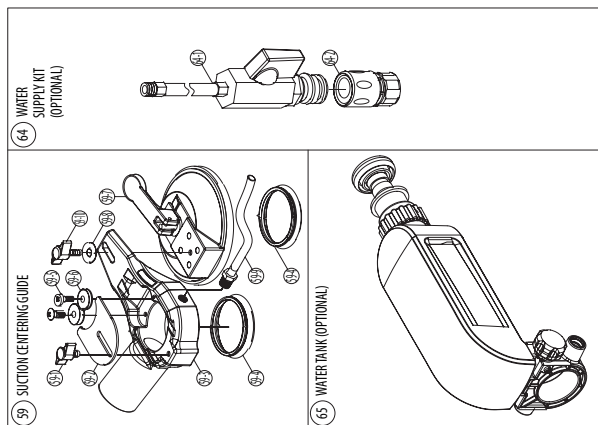




## Low Speed Models Parts List

NO.	Parts Name	Q'TY	NO.	Parts Name	Q'TY
1	POWER SUPPLY CABLE (VDE-1.0x2Cx3M-H07RNF)	1	41	OIL SEAL (Ø15xØ24x5)	1
2	PRCD INTERRUPTER PROTECTION (110V/220V)	1	42	OIL SEAL (Ø15xØ25x5)	1
3	CORD ARMOR	1	44	SPINDLE (Ø19-129.5MM)	1
4	TRIGGER SWITCH	1	45	CHECK BALL (Ø5)	3
5	CABLE CLIP	1	46	SPRING (Ø1.8xØ28.2xØ31.8x4Tx46L )	1
6	PANHEAD TAPPING SCREW (M4x14)	6	47	QUICK-RELEASE COLLAR	1
7	HANDLE HALF-RIGHT	1	48	EXTERNAL CIRCLIP (S-28)	1
8	HANDLE HALF-LEFT	1	49	O-RING (Ø13x2)	2
9	PANHEAD TAPPING SCREW (M4x16)	5	50	QUICK-RELEASE BIT ADAPTER (1/2"BSP)	1
10	PANHEAD TAPPING SCREW (M4x8)	4	51	QUICK-RELEASE BIT ADAPTER (M14xP2.0)	1
11	CARBON BRUSH (7x8x12)	2	53	WRENCH (M24/M27)	1
12	CARBON BRUSH HOLDER (7x8)	2	54	WRENCH (M19/M22)	1
13	MOTOR HOUSING	1	55	FRONT HANDLE (M12xP1.75)	1
14	STATOR (110V/220V-62x36.5x50)	1	57	SOCKET CAP SCREW (M4x14xP0.7)	1
15	PANHEAD TAPPING SCREW (M4x60)	2	58	O-RING (Ø38x2)	2
16	FAN SHROUD	1	59	SUCTION CENTERING GUIDE	1
17	BALL BEARING (608)	2	59-1	THUMB SCREW (M6x12xP1.0)	1
18	ARMATURE (110V/220V-62x36.5x50)	1	59-2	SPLASH COVER	1
19	EXTERNAL CIRCLIP (S-15)	1	59-3	CENTERING GUIDE BODY	1
20	BALL BEARING (6002)	1	59-4	SEAL	2
21	GEAR PLATE	1	59-5	TRUSS HEAD SHOULDER SCREW (M5x15xP0.8)	2
22	NEEDLE BEARING (HK 0810)	2	59-6	ROLLER (Ø6.2xØ20x5)	2
23	INPUT GEAR (M1.0x26T)	1	59-7	SUCTION CUP	1
24	PARALLEL KEY (4x4x8)	2	59-8	FLAT WASHER (Ø6xØ25x1)	1
25	INPUT SHAFT (M1.25x10T)	1	59-9	DRAIN HOSE	1
26	EXTERNAL CIRCLIP (S10)	1	59-10	THUMB SCREW (M6x16xP1.0)	1
27	OUTPUT GEAR (M1.25x22T)	1	63	WATER FEED COLLAR	1
28	THRUST RING (Ø816)	1	64	WATER FEED CONNECTOR KIT (1/2")/(3/4")	1
29	EXTERNAL CIRCLIP (S-12)	1	64-1	WATER FEED CONNECTOR KIT	1
37	GEAR HOUSING	1	64-2	WATER COUPLING (1/2')/(3/4')	1
38	PANHEAD TAPPING SCREW (M5x45)	4	65	WATER TANK	1
39	BALL BEARING (6201)	1	66	OIL SEAL (Ø15xØ24x5)	1
40	SEAL HOLDER (M34 x P1.5)	1	67	O-RING (Ø30x1.5)	1

## 2 Speed Models Exploded View



NO.01-67 Version 2021.08.06 D.8.11

## 2 Speed Models Parts List

NO.	Parts Name	Q'TY	NO.	Parts Name	Q'TY
1	POWER SUPPLY CABLE (VDE-1.0x2Cx3M-H07RNF)	1	38	PANHEAD TAPPING SCREW (M5x45)	4
2	PRCD INTERRUPTER PROTECTION (110V/220V)	1	39	BALL BEARING (6201)	1
3	CORD ARMOR	1	40	SEAL HOLDER (M34 x P1.5)	1
4	TRIGGER SWITCH	1	41	OIL SEAL (Ø15xØ24x5)	1
5	CABLE CLIP	1	42	OIL SEAL (Ø15xØ25x5)	1
6	PANHEAD TAPPING SCREW (M4x14)	6	43	PARALLEL KEY (4x4x30)	1
7	HANDLE HALF-RIGHT	1	44	SPINDLE (Ø19-161.5MM)	1
8	HANDLE HALF-LEFT	1	45	CHECK BALL (Ø5)	3
9	PANHEAD TAPPING SCREW (M4x16)	5	46	SPRING (Ø1.8xØ28.2xØ31.8x4Tx46L)	1
10	PANHEAD TAPPING SCREW (M4x8)	4	47	QUICK-RELEASE COLLAR	1
11	CARBON BRUSH (7x8x12)	2	48	EXTERNAL CIRCLIP (S-28)	1
12	CARBON BRUSH HOLDER (7x8)	2	49	O-RING (Ø13x2)	2
13	MOTOR HOUSING	1	50	QUICK-RELEASE BIT ADAPTER (1/2" BSP)	1
14	STATOR (110V/220V-62x36.5x50)	1	51	QUICK-RELEASE BIT ADAPTER (M14xP2.0)	1
15	PANHEAD TAPPING SCREW (M4x60)	2	53	WRENCH (M24/M27)	1
16	FAN SHROUD	1	54	WRENCH (M19/M22)	1
17	BALL BEARING (608)	2	55	FRONT HANDLE (M12xP1.75)	1
18	ARMATURE (110V/220V-62x36.5x50)	1	57	SOCKET CAP SCREW (M4x14xP0.7)	1
19	EXTERNAL CIRCLIP (S-15)	1	58	O-RING (Ø38x2)	2
20	BALL BEARING (6002)	1	59	SUCTION CENTERING GUIDE	1
21	GEAR PLATE	1	59-1	THUMB SCREW (M6x12xP1.0)	1
22	NEEDLE BEARING (HK 0810)	2	59-2	SPLASH COVER	1
23	INPUT GEAR (M1.0x26T)	1	59-3	CENTERING GUIDE BODY	1
24	PARALLEL KEY (4x4x8)	1	59-4	SEAL	2
25	INPUT SHAFT (M1.25x10TxM1.25x14T)	1	59-5	TRUSS HEAD SHOULDER SCREW (M5x15xP0.8)	2
26	EXTERNAL CIRCLIP (S10)	1	59-6	ROLLER (Ø6.2xØ20x5)	2
27	SPINDLE GEAR (M1.25x22Tx18T)	1	59-7	SUCTION CUP	1
28	THRUST RING (Ø816)	1	59-8	FLAT WASHER (Ø6xØ25x1)	1
29	EXTERNAL CIRCLIP (S-12)	1	59-9	DRAIN HOSE	1
30	SELECTOR FORK (Ø10x47.5 / Ø4.8x19)	1	59-10	THUMB SCREW (M6x16xP1.0)	1
31	E-CLIP (E-3)	1	63	WATER FEED COLLAR	1
32	SPRING (Ø0.6xØ5.3xØ6.5x17Lx5T)	1	64	WATER FEED CONNECTOR KIT (1/2")/(3/4")	1
33	DETENT PIN (Ø5x22)	1	64-1	WATER FEED CONNECTOR KIT	1
34	SELECTOR TAB	1	64-2	WATER COUPLING (1/2")/(3/4")	1
35	SPRING (Ø1xØ9xØ11x11Lx4T)	1	65	WATER TANK	1
36	SHOULDER SCREW	1	66	OIL SEAL (Ø15xØ24x5)	1
37	GEAR HOUSING	1	67	O-RING (Ø30x1.5)	1

WIRING

