

Portable Magnetic Core Drilling System

1 Speed Drilling System

1 Speed Drilling System (N)

Semi Auto Feed Drilling System

Semi Auto Feed Drilling System(N)

2 Speed Drilling System

4 Speed Drilling System

4 Speed Swivel Base Drilling System

4 Speed Variable Motor Speed
Drilling System

ORIGINAL OPERATING INSTRUCTIONS

SAVE THESE INSTRUCTIONS FOR FUTURE REFERENCE.

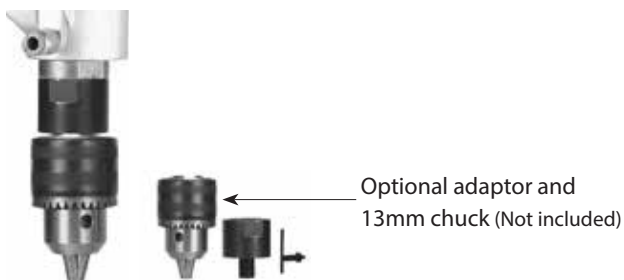
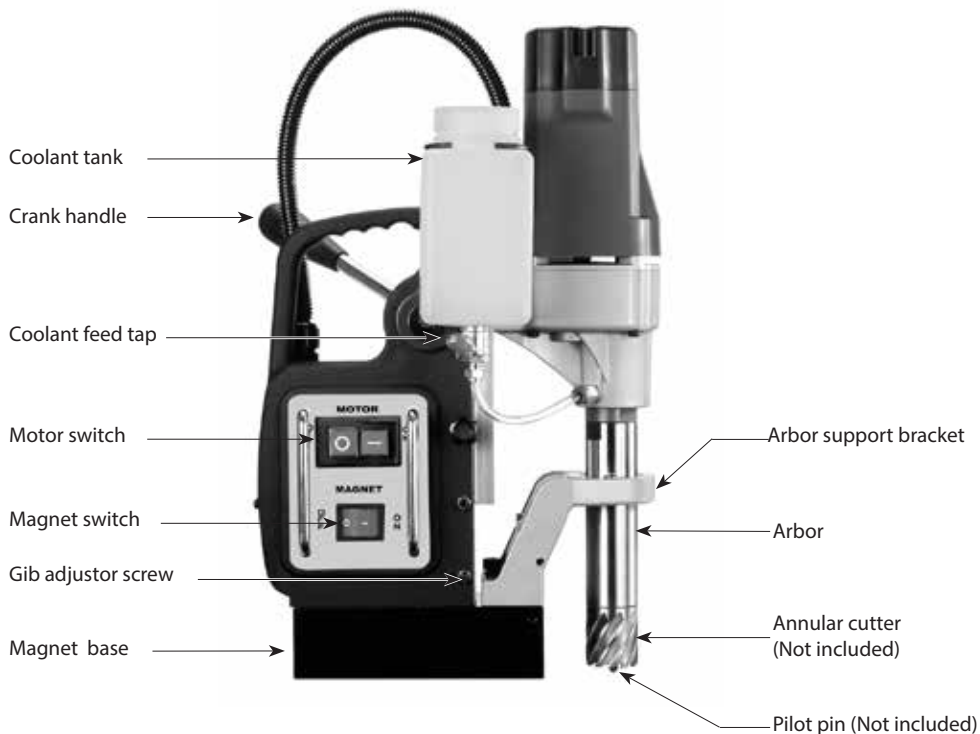


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Warning:

For tools equipped with over load protection, when motor has shut down off due to over load, always run machine with no load for at least 3 minutes to reduce temperature before returning to operation to avoid burn out of the motor.

1 Speed Drilling System & 1 Speed Drilling System (N)



MODEL		1 Speed	1 Speed (N)
POWER INPUT		1100 W	
VOLTAGE		See machine nameplate	
NO / FULL LOAD min ⁻¹		620/350	550/330
CAPACITY	DIA. X DEPTH OF CUT	35MM X 50MM	
	DIA. X DEPTH OF TWIST DRILL BIT	13MM X 110MM	
	DIA. X DEPTH OF TAPS	NA	
MAGNETIC ADHESION		15,000 N	
NET WEIGHT		12.6 kg (27.72 Lbs)	

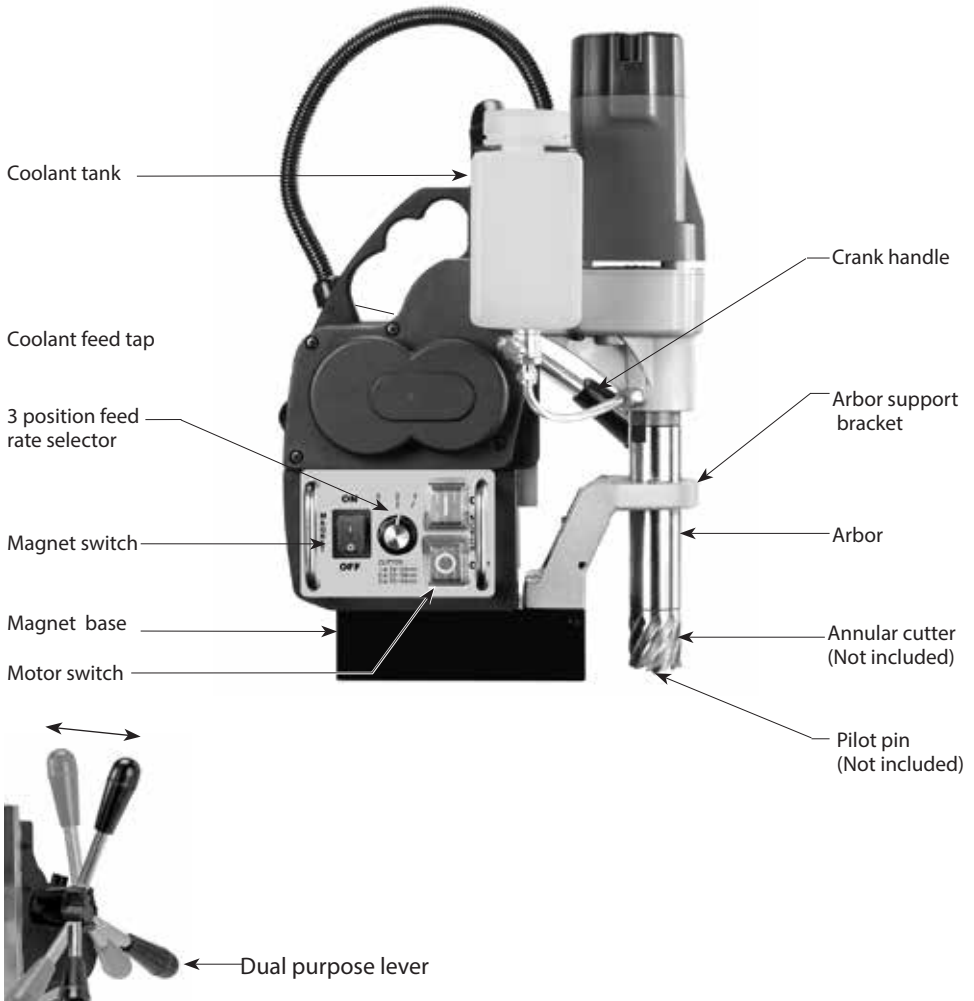
STANDARD ACCESSORIES

- * WRENCH M8
- * HEX. KEY M2.5
- * HEX. KEY M4
- * CHIP GUARD KIT
- * COOLANT TANK KIT
- * SAFETY CHAIN

OPTIONAL ACCESSORY

- * CHUCK ADAPTOR
- * 13MM CHUCK & KEY

Semi Auto Feed Drilling System & Semi Auto Feed Drilling System (N)

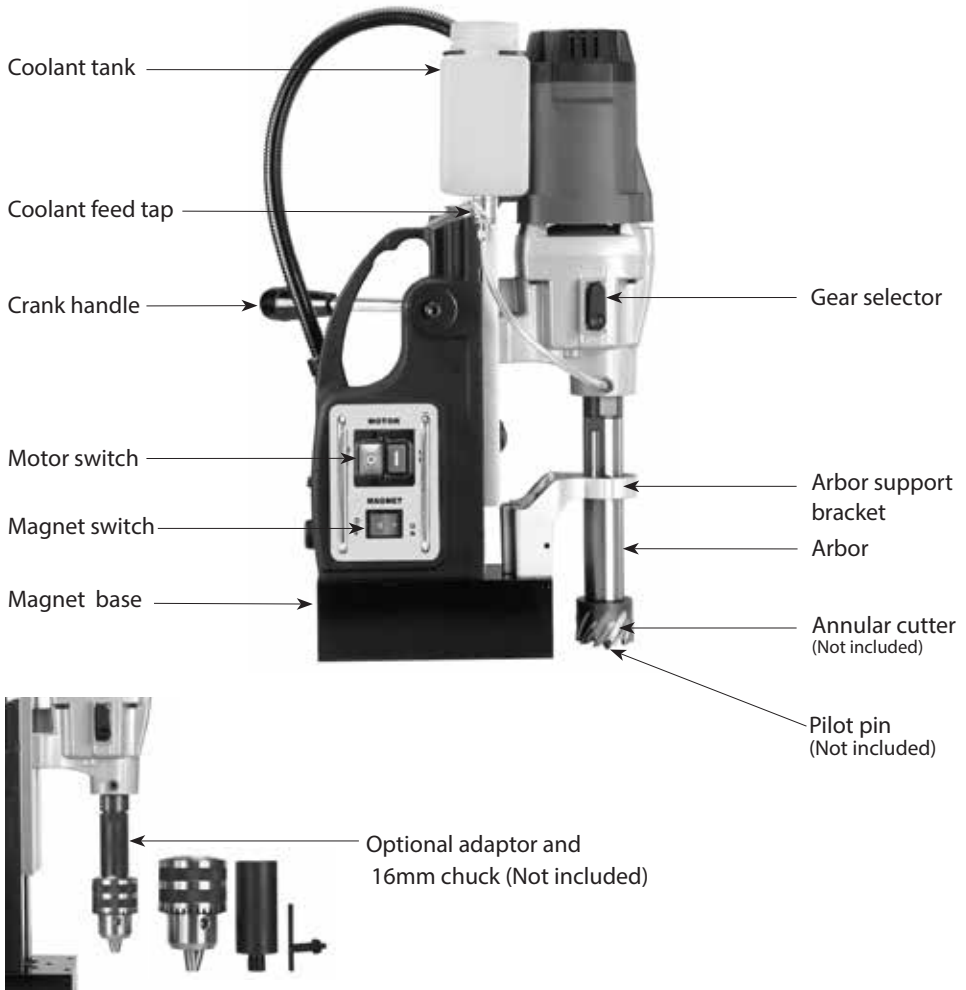


MODEL		Semi Auto Feed	Semi Auto Feed (N)
POWER INPUT		1100 W	
VOLTAGE		See machine nameplate	
NO / FULL LOAD min ⁻¹		620/350	550 / 330
CAPACITY	DIA. X DEPTH OF CUT (HAND FEED)	35MM X 50MM	
	DIA. X DEPTH OF CUT (AUTO FEED)	30MM X 45MM	
	DIA. X DEPTH OF TWIST DRILL BIT (HAND FEED ONLY)	13MM X 110MM	
	DIA. X DEPTH OF TAPS	NA	
MAGNETIC ADHESION		15,000 N	
NET WEIGHT		16.5 kg (36.3 Lbs)	

STANDARD ACCESSORIES

- * WRENCH M8
- * HEX. KEY M2.5
- * HEX. KEY M4
- * CHIP GUARD KIT
- * COOLANT TANK KIT
- * SAFETY CHAIN

2 Speed Drilling System



MODEL		2 Speed
POWER INPUT		1700 W (110V), 2000W (220V)
VOLTAGE		See machine nameplate
NO/FULL LOAD min ⁻¹	SPEED 1	280 / 170
	SPEED 2	500 / 300
CAPACITY:	DIA. X DEPTH OF CUT	65 MM X 75 MM (2"X3")
	DIA. X DEPTH OF TWIST DRILL BIT	16MM X 110 MM (5/8" X 4-5/16")
	DIA. X DEPTH OF TAPS	NA
MAGNETIC ADHESION		32,000 N
NET WEIGHT		22.9 KG (50.38 LBS)

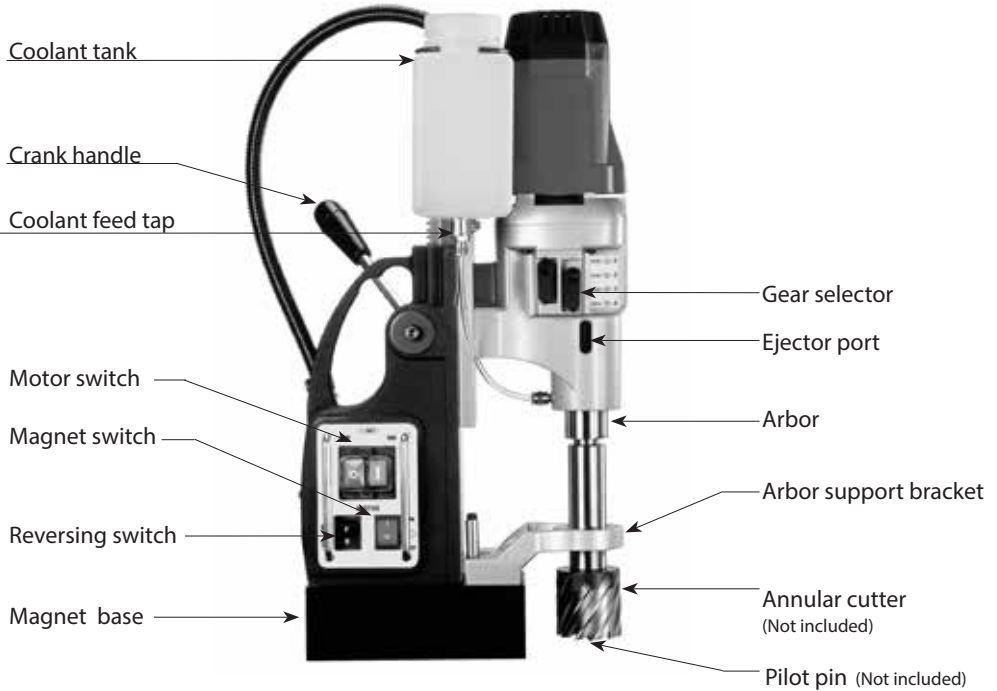
STANDARD ACCESSORIES

- * WRENCH M8
- * HEX. KEY M2.5
- * HEX. KEY M4
- * CHIP GUARD KIT
- * COOLANT TANK KIT
- * SAFETY CHAIN

OPTIONAL ACCESSORY

- * CHUCK ADAPTOR
- * 16MM CHUCK & KEY

4 Speed Drilling System



MT3 Tapping adaptor and Tapping unit (Not included)



MT3 Twist drill bit (Not included)



MT3 Chuck adaptor and Chuck (Not included)

POWER INPUT		1700 W (110V), 2000W (220V)
VOLTAGE		See machine nameplate
NO/FULL LOAD min ⁻¹	SPEED 1	150 / 90
	SPEED 2	200 / 120
	SPEED 3	300 / 180
	SPEED 4	380 / 230
CAPACITY	DIA. X DEPTH OF CUT (HAND FEED)	75MM X 50MM
	DIA. X DEPTH OF MT3 TWIST DRILL BIT	32MM X 150MM
	DIA. X DEPTH OF MT3 CHUCK ADAPTOR WITH TWIST DRILL BIT	16MM X 110MM
	DIA. X DEPTH OF TAPS	25.4MM X 40MM
MAGNETIC ADHESION		32,000N
NET WEIGHT		24.8 kg (54.56 Lbs)

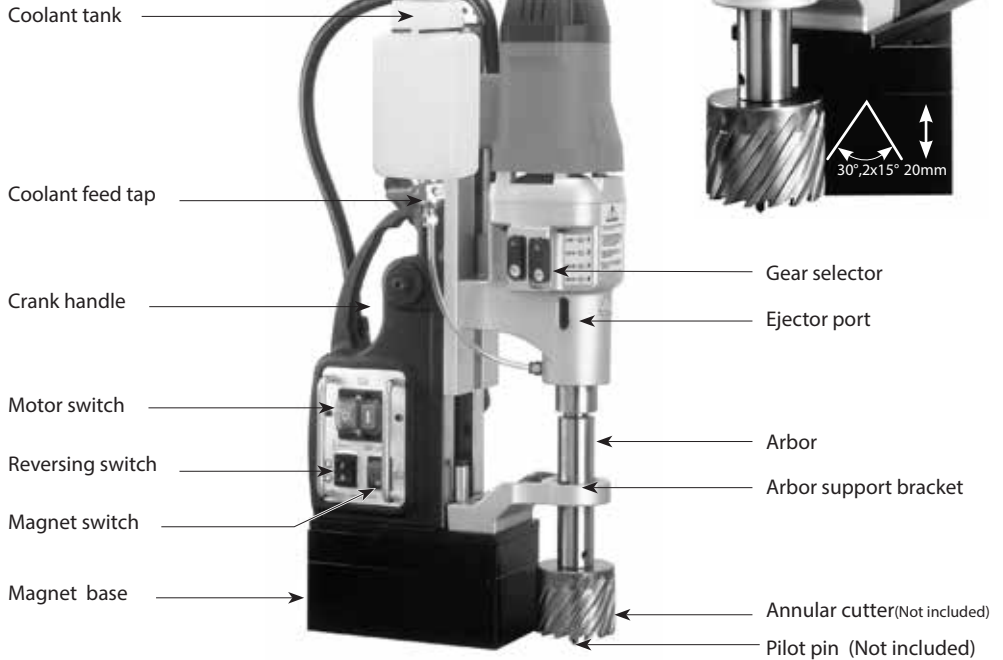
STANDARD ACCESSORIES

- * WRENCH M8
- * HEX. KEY M2.5
- * HEX. KEY M4
- * CHIP GUARD KIT
- * COOLANT TANK KIT
- * SAFETY CHAIN
- * DRIFFT

OPTIONAL ACCESSORY

- * MT3 CHUCK ADAPTOR
- * 16MM CHUCK & KEY
- * MT3 TAPPING ADAPTOR
- * TAPPING ATTACHMENT

4 Speed Swivel Base Drilling System



MT3 Tapping adaptor and Tapping unit (Not included)



MT3 Twist drill bit (Not included)



MT3 Chuck adaptor and Chuck (Not included)

POWER INPUT		1700 W (110V), 2000W (220V)
VOLTAGE		See machine nameplate
NO/FULL LOAD min ⁻¹	SPEED 1	150 / 90
	SPEED 2	200 / 120
	SPEED 3	300 / 180
	SPEED 4	380 / 230
CAPACITY	DIA. X DEPTH OF CUT (HAND FEED)	75MM X 50MM
	DIA. X DEPTH OF MT3 TWIST DRILL BIT	32MM X 150MM
	DIA. X DEPTH OF MT3 CHUCK ADAPTOR WITH TWIST DRILL BIT	16MM X 110MM
	DIA. X DEPTH OF TAPS	25.4MM X 40MM
MAGNETIC ADHESION		32,000N
NET WEIGHT		27 kg (59.4 Lbs)

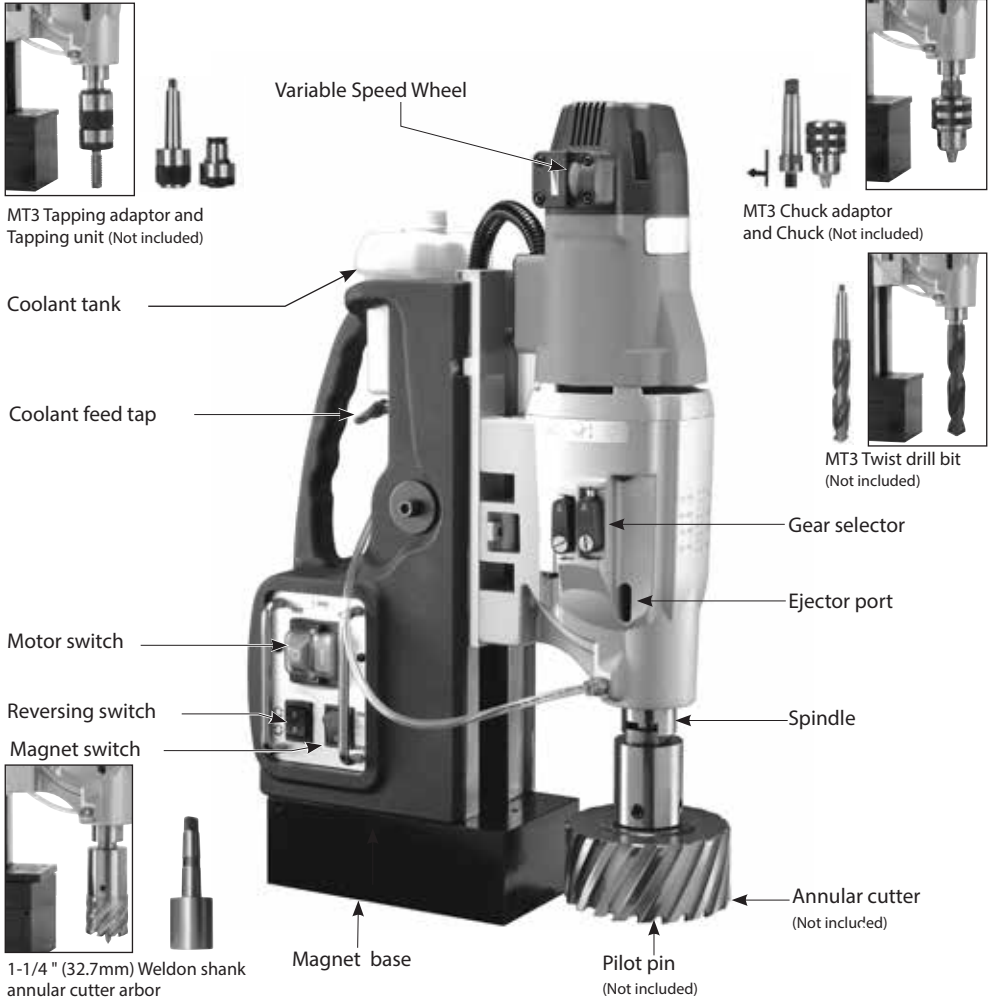
STANDARD ACCESSORIES

- * WRENCH M8
- * HEX. KEY M2.5
- * HEX. KEY M4
- * CHIP GUARD KIT
- * COOLANT TANK KIT
- * SAFETY CHAIN
- * DRIFFT

OPTIONAL ACCESSORY

- * MT3 CHUCK ADAPTOR
- * 16MM CHUCK & KEY
- * MT3 TAPPING ADAPTOR
- * TAPPING ATTACHMENT

4 Speed Variable Motor Speed Drilling System



POWER INPUT		1700 W (110V), 2000W (220V)
VOLTAGE		See machine nameplate
NO/FULL LOAD min ⁻¹	SPEED 1	35 - 120
	SPEED 2	70 - 220
	SPEED 3	80 - 250
	SPEED 4	140 - 450
CAPACITY	Dia. X Depth of cut with Annular Cutters	120mm x 50mm (4-3/4" x 2")
	Dia. X Depth of MT3 Twist Drill Bit	32mm x 150mm (1-1/4" x 6")
	Dia. X Depth of MT3 Chuck adaptor with Twist Drill bit	16mm x 110mm (5/8" x 4-5/16")
	Dia. X Depth of Taps	25.4mm x 40mm (1" x 1-9/16")
MAGNETIC ADHESION		32,000N
Overload Protection		Standard
NET WEIGHT		27 kg (59.4 Lbs)

Standard Accessories

- * WRENCH M8
- * HEX. KEY M2.5 & M5
- * CHIP GUARD KIT
- * COOLANT TANK KIT
- * SAFETY CHAIN
- * DRIFT

* Max. Dia. x Depth of cut with Annular Cutters with 19mm Weldon or Quick-Release Arbor: 60mm x 50mm (2-3/8" x 2")



WARNING! Read and understand all instruction before operating any drilling system. Failure to follow all instructions listed below may result in electrical shock, damage to drilling system and even personal injury.

GENERAL SAFETY INSTRUCTIONS

Work area

1. **Keep your working area clean and well lighted.** Cluttered benches and working stations causes accidents as well as dark spaces. Always ensure working stations are clean and well lit.
2. **Do not operate power tools in explosive atmosphere, such as in the presence of flammable liquids, gases or extreme dust.** Power tools create sparks that may ignite gases as well as flammable liquids. Dust may enter the ventilation system causing clogging and causing overheating.
3. **Keep bystanders, children and visitors away from moving parts of the power tool.** Any distractions can cause you to loose control of the power tool and an injury could take place.

Electrical Safety

1. **Grounded tools must be plugged into an outlet properly installed and grounded in accordance with all codes and ordinances. Never remove the ground prong or modify the dance plug in any way. Do not use any adaptor plugs. Check with a qualified electrician if you are in doubt as to whether the outlet is properly grounded.** If tools should electrically malfunction or break down, grounding provides a low resistance path to carry electricity away from the user.
2. **Never carry a tool by the cord or hose and “yanking” the cord or the hose to disconnect it from the receptacle.** Always carry the power tools properly and store in dry and dust free place.
3. **Keep cords and hoses away from heat, oil and sharp edges.** Damaged cords increase the risk of electric shock.
4. **Don't expose power tools to rain or wet conditions.** Water entering a power tool will increase the risk of electric shock. **When operating a power tool outside, use an outdoor extension cord marked . W-A. or. W..** These cords are rated for outdoor use and reduce the risk of electric shock.

Personal Safety

1. **Stay alert, watch what you are doing and use common sense when operating a power tool. Do not use tool while tired or under the influence of drugs, alcohol, or medication.** A moment of inattention while operating power tools may result in serious personal injury.
2. **Dress properly. Do not wear loose clothing or jewelry. Contain long hair. Keep your hair, clothing, and gloves away from moving parts.** Loose clothes, jewelry, or long hair can be caught in moving parts.
3. **Avoid accidental starting. Be sure switch is off before plugging in.** Carrying tools with your finger on the switch or plugging in tools that have the switch on invites accidents.
4. **Remove adjusting keys or switches before turning the tool on.** A wrench or a key that is left attached

to a rotating part of the tool may result in personal injury.

5. **Do not overreach. Keep a proper footing and balance at all times.** Proper footing and balance enables better control of the tool in unexpected situations.
6. **Use safety equipment. Always wear eye protection.** Dust mask, non-skid safety shoes, hardhat, or hearing protection must be used for appropriate conditions.

Tool use and care

1. **Use clamps or other practical way to secure and support the work piece to a stable platform.** Holding the work by hand or against your body is unstable and may lead to loss of control.
2. **Do not force tool. Use the correct tool for your application.** The correct tool will do the job better and safer at the rate for which it is designed.
3. **Do not use tool if switch does not turn it on or off.** Any tool that cannot be controlled with the switch is dangerous and must be repaired.
4. **Disconnect the plug from the power source before making any adjustments, changing accessories, or storing the tool.** Such preventive safety measures reduce the risk of starting the tool accidentally. **Store idle ling tools out of reach of children and other untrained persons.** Tools are dangerous in the hands of untrained users.
5. **Maintain tools with care. Keep cutting tools sharp and clean.** Properly maintained tools, with sharp cutting edges are less likely to bind and are easier to control.
6. **Check for misalignment or binding of moving parts, breakage of parts, and any other condition that may affect the tools operation.** If damaged, have the tool serviced before using. Poorly maintained tools cause many accidents.
7. **Use only accessories that are recommended by the manufacturer for your model.** Accessories that may be suitable for one tool may become hazardous when used on another tool.



Service

Only qualified repair personnel must perform tool service. Service or maintenance performed by unqualified personnel could result in a risk of injury.

When servicing tool, use only identical replacement parts. Follow instructions in the Maintenance section of this manual. Use of unauthorized parts or failure to follow Maintenance Instructions may create a risk of electric shock or injury.

Symbols used in this manual

IMPORTANT: Some of the following symbols may be used on your tool. Please study them and learn their meaning. Proper interpretation of these symbols will allow you to operate the tool better and safer.

Symbol	Name	Designation/Explanation
V	Volt	Voltage (potential)
A	Amperes	Current
Hz	Hertz	Frequency (cycles per second)
W	Watt	Power
kg	Kilograms	Weight
min	Minutes	Time
s	Seconds	Time
	Diameter	Size of drill bits
n_0	No load speed	Rotational speed, at no load
min^{-1}	Revolutions per minute	Revolutions, strokes, surface speed per minute.
0	Off position	Zero speed, zero torque...
1, 2, 3, ...	Selector settings	Speed setting, higher number means greater speed
~	Alternating current	Type or a characteristic or current
	Class I construction	With electrical earth
	Warning symbol	Alerts user to warning messages

Terminology used in the manual

- Warning:** This term means that there is a risk of physical harm or death to the operator or people nearby.
- Caution:** This term means that there is a risk of damage to the machine, cutting tool or other equipment.
- Note:** These terms offer useful information relating to the operation of the machine or its maintenance.

SPECIFIC SAFETY RULES AND REGULATIONS

- Always use safety chain.** Mounting can release.
- The magnet's adhesion depends on the thickness of the work piece.** Always ensure that the work piece is a minimum of 12mm (7/16 in.) thick. If it is not, then use a piece of steel plate at least 12mm thick and larger than the magnet below the work piece to supplement the magnetic adhesion.
- Metal chips and other debris will seriously hamper magnetic adhesion.** Always ensure that the magnet is clean and free of rust and scale.
- Other units used on the same receptacle will cause uneven voltage that could lead to the magnet releasing.** Always use the tool alone on the receptacle.
- It is hazardous to use the drill upside-down.** Do not exceed 90 degrees from horizontal.
- Avoid the magnet releasing.** Ensure that the magnet has properly adhered to the work piece before beginning drilling.
- Avoid operating annular cutters without coolant fluid.** Always check coolant level before operating.
- Do not operate with dull or damaged cutting tools.** This may overload the motor.
- Protect the motor.** Never allow cutting fluid, water, or other contaminants to enter the motor.
- Metal chips are often very sharp and hot.** Never touch them with bare hands. Clean up with a magnetic chip collector and a chip hook or other appropriate tool.

CAUTION: NEVER position machine on a work piece between the electrode and the ground of any arc type welder. Damage to the machine will result, as the welder will ground through the machine's ground cable. When drilling stacked work materials, always stop to clear the slug after the first layer is drilled.

WARNING: Do not operate the machine on a workpiece which is being welded on at the same time. This may lead to damage to the machine and possible injury.

WARNING: NEVER attempt to use machine with incorrect current or abnormally low voltage. Check machine nameplate to ensure that correct voltage and Hz are used. When drilling non-ferrous (non-magnetic) work materials, only use a manufacturer- approved fixture such as a vacuum base adapte.

Magnet Base Duty Cycle

Do not leave the magnet base activated continuously for more than 60 minutes. If the magnet base is overheated, allow it to cool for 30 minutes before continuing.

This machine is not intended for production-line type use.

CAUTION: Turn the magnet base off when not in use. Leaving the magnet base on continuously will damage it.

ASSEMBLY

Coolant tank assembly required. First attach clear tube to the bottom of the coolant tank. To do this, first loosen the nut and slide nut onto the tube. Then slide tube onto the nipple. Then tighten the nut. Slide tank hanger over the screw on the upper right hand side of slide and tighten. Finally insert the other end of the tube into the quick-release connector in the gearbox. Just directly push in to install. **(To remove, first firmly push the red collar of the connector and pull the tube out.)** Cutting coolant fluid is always required when using annular cutters. Open tank cover and fill. Check coolant fluid level often. Keep coolant tap closed when not in use.

Chip guard must be used. To attach the chip guard, use the supplied butterfly bolts to bolt to the magnet. It is not necessary to remove guard to clean chips. Simply raise guard to its upper position.

Safety chain must be used. Loop chain around the work piece and feed through the machine's handle and clip in place.

MOUNTING ANNULAR CUTTERS

CAUTION: Never use a cutting tool that is larger than the maximum rated capacity of the machine.

1. To insert an annular cutter, first insert the pilot pin into the cutter. Then slide the cutter into the arbor, align the proper flat with the locking screw(s) and tighten securely with the supplied hex wrench.



CAUTION: Ensure that the locking screw is on a flat of the cutter and not just against the rounded shank.

- 2. Ensure that the oil feed tap is on and coolant feeds properly by pushing the pilot pin. If it feeds too quickly or slowly, adjust the tap accordingly. Keep the tap closed when not in use.

2-SPEED MODELS

GEAR SELECTION

On 2-speed models, before drilling select desired gear range by first pushing in on spring-loaded gear selector slider switch and then sliding selector up for high speed or down for low speed. (It may be necessary to turn the arbor slightly in order for the gears to mesh properly). Follow the recommended speed ranges on the cutting speed chart to set the proper speed and gear range.



2 SPEED GEAR CHART

GEAR	NO LOAD min ⁻¹	FULL LOAD min ⁻¹	CUTTER SIZE
1	380	230	40~50mm (1~9/16 to 2 in.)
2	500	300	40mm (1~9/16 in.) or less.

NOTE: These speeds are general recommendations only. Actual speeds should be determined by the material and the cutting speed recommended by the cutting tool manufacturer. See the section below "RECOMMENDED SURFACE SPEEDS" and use the formula to calculate the best RPM.

CAUTION: Ensure that that gears engage fully.

CAUTION: ALWAYS ensure that the machine is fully stopped before attempting to change gears! NEVER change gears on a running machine!

OPERATION-GENERAL

WARNING: Always ensure that the magnet is adhered properly to the work piece before beginning drilling.

NOTE: If mounting to a curved surface beam, mount the machine parallel to the curve in the work piece.

WARNING: Avoid operating at more than 90 degrees from horizontal. When drilling at such an angle take precautions to prevent cutting coolant from entering the motor. Paste-type coolant should be used.

1. First fit tool into arbor and line up with intended center of cut. Then switch magnet on.
2. Press green motor on button to start motor. Use the crank handle to feed to work. Always use very light pressure when beginning the cut and just as the tool is breaking through. The crank handle offers tremendous leverage; so do not use too much force. Allow the cutting tool to determine the pace. With experience, the operator will be able to determine the best pace to feed to the work. There should be some degree of audible slowing of the motor but not bogging in the cut. Correct cutting speed with a properly sharp annular cutter will produce long unbroken chips, which produce a "bird's" nest-shaped bundle of chips around the cut.



NOTE: Always ensure that the cutting tool is sharp. A dull cutter typically will have finer and/or choppy shavings.

WARNING: ALWAYS clear chips when there is too much build-up. Excessive chip build-up could result in a jammed cutter or other hazardous situation.

WARNING: the slug ejects at end of cut and is very hot. Always provide a method of catching the slug, where the ejected slug may cause injury to people below.

Note: Lock the slide lock on the side of the machine in the fully raised position when at rest to prevent the slide from accidentally slamming down - remember to unlock it again before commencing drilling.

CAUTION: Never attempt to cut half-circles or to stitch drill (drill overlapping holes) with a TCT cutter. This may destroy the cutter.

CAUTION: Never attempt to re enter a half-finished cut if the magnet has been turned off and the machine shifted in the interim. This may destroy the cutter.

TWIST DRILLING

If twist drilling is desired, the arbor support bracket must be removed by removing the three socket-head bolts. Then an optional chuck adaptor arbor and chuck must be fitted. Follow the special instructions below to replace the arbor support bracket. (For 1 speed & 2 speed model only).

Arbor support bracket replacement

1. Replace arbor support bracket and screw in the 3 hex head bolts finger tight only (ensure that the needle bearing is clean and adequately greased.)
2. Replace the annular cutter arbor.



WARNING: use extreme care to avoid contacting the rotating arbor shaft!

3. Double check to ensure that there is no binding anywhere throughout the stroke.

SPECIAL INSTRUCTIONS FOR AUTO-FEED MODELS

WARNING: NEVER attempt to use machine in auto feed mode when using twist drills. THIS WILL RESULT IN MAGNET LIFTING.

WARNING: NEVER use poor quality, incorrect sized or dull cutters in auto feed mode. THIS MAY RESULT IN MAGNET LIFTING.

The Auto-Feed Feature

A lever incorporated into the feed handle engages or disengages the feed drive gears. If the auto-feed mode is not engaged, the machine may be used in the same fashion as the manual machine as described above. Below are the additional instructions needed to operate in auto-mode.

IMPORTANT: When in manual mode, the three lever handles will be pointing outward slightly (out). When in auto-feed mode, the lever handles will be parallel with the side of the machine (in).

NOTE: Do not operate the auto machine banked to one side in the plane of the lever as this may allow the machine to slip into or out of auto-feed mode unexpectedly.

WARNING: Do not attempt to drill a work piece which is thicker than the maximum cutting depth of the cutter being used. Never exceed 30mm diameter cutters when using auto-feed mode.

THE FEED RANGE SELECTOR

There is a 3-position range selector switch on the switch panel which allows ideal feed rate for various sized cutters. Select the feed range which corresponds to the cutter diameter being used.

POSITION	RANGE
1	14~20mm
2	21~24mm
3	25~30mm



AUTO-FEED OPERATION

1. Always begin drilling manually (with the handles pointing out) as described above in "OPERATION-GENERAL".

2. Only after the cutter has begun cutting for a few seconds and has raised a chip should the auto feed be engaged.

NOTE: Do not cut manually for more than 10 seconds before shifting into auto feed. If manual cutting continues for more than 10 seconds, as soon as auto feed is engaged, rather than cutting, it will directly stop.

3. To engage auto-feed, push any of the lever handles in. The gears may not always line up perfectly. If the handle will not push in, simply raise the feed upward slightly and the lever will engage.
4. As a precaution, always keep one hand near to the motor shut off switch in order to shut off quickly in the event of any problem.
5. Once the hole is drilled, the machine will continue to feed for 3 seconds (to fully finish hole) and then will automatically shut off.



NOTE: This machine is equipped with safety override systems which will automatically engage: If the load exceeds maximum for 2 seconds or more, the motor and feed will stop and stay in that position. Only the magnet will stay on. This will alert the operator of an overload problem. If this happens repeatedly, stop operation and find the cause of the excessive load. It could be a bad cutter or other problem.

WARNING: WHENEVER THE MACHINE STOPS DUE TO OVERLOAD IN THIS WAY, RAISE THE CUTTER CLEAR OF THE WORKPIECE BEFORE RESTARTING

NOTE: when drilling very deep holes with long reach cutters, there is considerable build up of chips. This may interfere with operation and even cause the machine to stop from overload. In this situation, we recommend stopping to clear the chips after the first 25mm (1 inch) or so, then continuing to finish the cut.

45mm IS THE MAXIMUM DEPTH OF CUTTING WITH AUTO FEED.

NOTE: the maximum rated thickness of material with the auto feed function is 45mm. For drilling thickness up to 50mm, finish by hand feed.

WARNING: PAY ATTENTION TO THE CONDITION OF THE CUTTER. This is particularly important with an auto feed machine. A dull or damaged cutter may cause a dangerous situation.

WARNING: NEVER ATTEMPT TO DRILL MATERIAL THICKER THAN THE DEPTH CAPACITY OF THE CUTTER. If the cutter is allowed to “bottom out” the feed system may cause the magnet to lift (usually it will overload first).NOTE: In very light load conditions, such as when using very small cutters or drilling a very thin work piece, often the load drop will not be enough to signal the machine’s electronic control board to automatically stop. If this occurs, it does not indicate a malfunction.

SPECIAL INSTRUCTIONS FOR SWIVEL BASE EQUIPPED MODELS

The swivel base allows the drill to be precisely positioned under difficult circumstances.

To use: first position the magnet base in the desired position and turn magnet on.

Loosen the Locking Lug, then swivel the machine body into the desired position. Finally lock the Locking Lug.



SPECIAL INSTRUCTIONS FOR 4-SPEED MT3 EQUIPPED MODELS

CHANGING TOOLS & ADAPTORS WITH MT3 SHANK

To insert a tool, turn the tool until the tang lines up and firmly push into place. It is helpful to tap with a soft-faced mallet to fully engage the taper. If it is properly in position, one will not be able to pull it back apart by hand. To remove, line up the ejector slot of the arbor with the ejector port in the gear case, slide the ejector drift into the slot and tap with a hammer to eject the tool.

CAUTION: When removing, take care that the cutting tool does not crash down and get damaged or injure anyone below.



MT3 ANNULAR CUTTER ADAPTOR

This machine is equipped with a unique annular cutter adaptor system with built-in coolant directly to the gearbox. No stop bar is needed.

1. To install the annular cutter adaptor, first insert the taper end of the adaptor into the arbor of the machine as described above.
2. Attach the coolant tank to the slide and ensure that the tube is attached properly.
3. To insert an annular cutter, first insert the pilot pin. Then slide the cutter into the adaptor, align the proper flat with the locking screw(s) and tighten securely with the supplied hex wrench.
4. Ensure that the oil feed tap is on and coolant feeds properly by pushing the pilot pin. If it feeds too quickly or slowly, adjust the tap accordingly. Keep the tap closed when not in use.

OPERATION

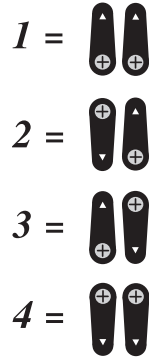
The operation instructions under "OPERATION-GENERAL" also apply to this machine. Please see the additional

instructions specific to the 4-speed Morse taper model below:

WARNING: NEVER operate 60mm (2-3/8 in.) or larger cutters unless the plate thickness is minimum 20mm (13/16 in.) MAGNET LIFTING MAY RESULT. If the plate thickness is not enough, supplement the magnetic adhesion by adding a 10mm or thicker plate directly the magnet's position under the work piece.

CAUTION: Machine is equipped with a reversing switch. Always ensure that direction of rotation is correct before operating. Operating in the wrong direction could result in damage to the cutter.

Select desired gear range by first popping the tab out of its detent and then sliding selectors up or down in the proper combination. Refer to the chart to achieve the correct combination for the desired speed. (It may be necessary to turn the arbor slightly in order for the gears to mesh properly). Follow the recommended speed ranges on the cutting speed chart to set the proper speed and gear range.



4 SPEED GEAR CHART (FIXED MOTOR SPEED MODELS)

GEAR	NO LOAD min ⁻¹	FULL LOAD min ⁻¹	CUTTERS	TAPS
1	150	90	60~75mm (2-3/8 to 3 in.)	15~25.4mm or less (9/16 to 1 in.)
2	200	120	45~60mm (1-3/4 to 2-3/8 in.)	N/A
3	300	180	35~45mm (1-3/8 to 1-3/4 in.)	N/A
4	380	230	35mm or less (1-3/8 in.)	N/A

4 SPEED GEAR CHART (VARIABLE MOTOR SPEED MODELS)

GEAR	MAX. SPEED min ⁻¹	MIN. SPEED min ⁻¹	CUTTERS	TAPS
1	120	35	Up to 120mm (4-3/4")	25mm or less (1 in.)
2	220	70	55mm-70mm (2-1/8 to 2-3/4 in.)	N/A
3	250	80	35~55mm (1-3/8 to 2-1/8 in.)	N/A
4	450	140	35mm or less (1-3/8 in.)	N/A

NOTE: These speeds are general recommendations only. The material should determine actual speeds and the cutting speed recommended by the cutting tool manufacturer. See the section below "RECOMMENDED SURFACE SPEEDS" and use the formula to calculate the best RPM.

NOTE: the left and right side gear selectors have a different engagement design:

For The LEFT HAND SLIDER must ALWAYS ensure that the machine is FULLY STOPPED before attempting to change gears! NEVER change the Left hand slider gears on a running machine!

For the RIGHT HAND SLIDER the gears select by engagement dogs, similar to a motorcycle transmission design. These MUST BE SELECTED BY TURNING THE ARBOR to allow the dogs to engage.

CAUTION: Ensure that that gears engage fully.

VARIABLE MOTOR SPEED MODELS ONLY

The electronic variable motor speed control allows the motor speed to be lowered for further flexibility for adjusting the cutting speed to suit the size of cutter and type of material. Simply turn the thumb wheel to raise or lower the motor speed electronically.

NOTE: whenever possible, it is always preferable to lower the speed by changing the gear rather than lowering the motor speed. A slower motor speed will have less cooling and somewhat less torque so always try to keep the motor going as fast as possible. Only lower the motor speed if you have no other option.

(For example: If you need the RPM at about 100/min, it is much better to use 1st gear at full motor speed than to use 3rd gear at minimum motor speed.)



Avoid overheating the motor:

When using the machine at or near maximum capacity with a slow motor speed the motor will be at maximum stress and very hot. After each cut is finished, **ALWAYS** cool the motor by running at no load at the maximum motor speed for a few minutes.

CUTTING SPEEDS

The type of material to be drilled, its hardness and thickness will all greatly affect the recommended cutting speed. See the chart below for general guidelines for cutting speeds. Use the formula to determine the recommended RPM for the diameter of annular cutter being used:

RECOMMENDED SURFACE SPEEDS

Note: work materials which have been flame cut will be heat treated in the affected area. These areas will require much slower cutting speeds.

Work Material	Surface Speed MPM (m/min)
Aluminum	60-90
Brass	40-50
Soft Cast Iron	30-50
Hard Cast Iron	15-21
Mild Steel	24-30
High Tensile Steel	6~13
Stainless Steel	3~5

RPM = 318.5 x MPM / cutter diameter (in mm)

For example: if you are drilling mild steel with a 50mm cutter, the recommended MPM would be about 30 m/min, so the ideal RPM would be:

$$318.5 \times 30 / 50 = 191 / \text{min}$$

But if you were drilling high tensile steel, the MPM would be about 6 m/min, so the ideal RPM would be: $318.5 \times 6 / 50 = 38 / \text{min}$

REVERSING SWITCH

Select desired direction of rotation. This switch has 3 positions: up is forward, middle is neutral, and down is reverse rotation.

WARNING: If the motor is switched on with the direction switch in the neutral position, the machine will not turn but will be “live”, as soon as either forward or reverse is selected, the arbor will begin turning! Take due care to



SAFETY CLUTCH

The 4 speed variable motor speed models are equipped with a safety clutch which is designed to slip when the maximum torque value is exceeded. This clutch is not a tapping clutch and bottoming taps in blind hole is to be avoided.

TWIST DRILLING

If twist drilling is desired, the arbor support bracket must be removed by removing the three socket-head bolts. Then an MT3 twist drill or an optional chuck adaptor arbor and chuck may be fitted. Follow the special instructions below to replace the arbor support bracket.



ARBOR SUPPORT BRACKET REPLACEMENT

1. Replace arbor support bracket and screw in the 3 hex head bolts finger tight only (ensure that the needle bearing is clean and adequately greased.)
2. Replace the annular cutter arbor and carefully tighten the bolts evenly to ensure proper alignment.

WARNING: use extreme care to avoid contacting the rotating arbor shaft!

3. Double check to ensure that there is no binding anywhere throughout the stroke.

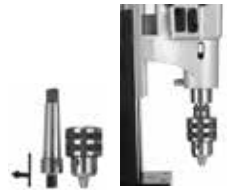
NOTE: A pilot hole may be necessary when drilling with larger twist drills. If a MT3 twist drill is used, it may not be necessary to remove the arbor support bracket.

CHUCK

If a MT3 chuck adaptor & chuck are used, then the bracket must be removed.

To replace, see the instructions above under

“ARBOR SUPPORT BRACKET REPLACEMENT”.



TAPPING

CAUTION: To avoid damage to the tap, always very carefully line the tap up with the hole and ensure that the size of the hole is correct for the tap to be used.

CAUTION: To avoid damage to the tap or machine, be very careful to stop the machine in time to NOT allow the tap bottom out. The motor continues to coast for a while after being shut off, so plan for this and anticipate. This machine does NOT have a tapping clutch.

CAUTION: To avoid damage to the machine, ALWAYS allow the machine to come to a full stop before reversing rotation.

1. Select the proper speed according to the chart for the size of tap used.
2. Begin with forward direction of rotation with standard right hand threads. (Opposite with left-hand threads)
3. Allow the tap to determine the feed rate. A light touch on the feed handle is all that is needed once it is started in the hole.
4. When the desired thread is tapped, hit the red motor stop switch. Allow the machine to come to a full stop. Then reverse direction and restart machine by pressing the green motor switch to remove tap. Guide the tap back out with the feed handle. Proper order of operations for normal tapping is as follows: magnet: on. direction: forward. motor: on. motor: off. THEN: direction: reverse. motor: on. motor: off - magnet: off.



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.)

1. Keep the machine clean and free of chips.
2. Check for loose fittings and tighten as needed.
3. Ensure that the ventilation slots are clear so that motor can be cooled normally. Blow low-pressure compressed air through the ventilation slots with the motor running to keep motor clean.

THE ARBOR SHAFT

Keep the arbor shaft free of dirt and lightly grease as needed. If the arbor support bearing is noisy, it may be dirty or have a chip lodged in it. Remove the arbor shaft to clean and re-grease the arbor support bearing.

THE GIBS (DOVETAIL SLIDES)

The gibes require adjustment if too loose. To adjust, loosen the lock nuts and adjust the adjustor screws evenly while moving the handle up and down. Adjust so that there is no free play, yet any binding anywhere in its range of travel. Then retighten the lock nuts. Periodically check, lubricate, and adjust as needed.



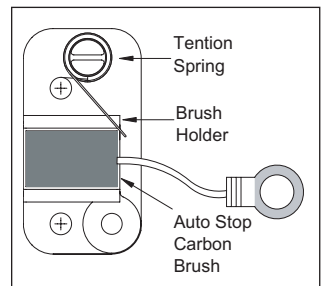
THE CARBON BRUSHES

The carbon brushes are a normal wearing part and must be replaced when they reach their wear limit.

Caution: Always replace the brushes as a pair.

To replace:

1. Remove the 4 screws and remove the motor tail cover.
2. Using pliers rotate the brush spring out of the way and slide the old carbon brush out of the brush holder.
3. Unscrew the screw to remove the brush lead. The old carbon brush may now be lifted away.
4. Install a new brush. Installation is the reverse of removal.
5. Replace the motor tail cover.



AUTO STOP CARBON BRUSH

Due to the new auto stop carbon brush if the machine comes to a stop without any reason, the brushes have to be checked. The auto feature

stops the machine before the carbon brushes are finished and protects the motor.

MAGNET TROUBLESHOOTING

Full magnet performance is absolutely essential for magnetic drill operation.

If the magnet works, but does not hold well, it is likely that one of the coils has failed. If the magnet does not work at all, it is likely to be a failed rectifier. (It is highly unlikely that both magnet coils would fail at the same time)

NOTE: A faulty magnet coil can also damage the rectifier, so whenever there is a magnet problem, BOTH the magnet coils and rectifier must be checked.

WARNING: Never attempt to operate a magnetic drill with a faulty magnet!

CHECKING THE MAGNET (qualified technicians only)

If the magnet is not working well, it must be checked. Separate the wires of each individual coil and test the resistance of each coil separately. (note that 110V models are wired in parallel and 230V models are wired in series) The resistance of the coils of different sizes of magnets varies, but it should be in the region of hundreds of ohms. Most importantly, both coils must have very nearly the same resistance. If one of the coils has zero resistance, it means that it is shorted. If one of the coils has infinite resistance, it means that the circuit is broken. If either coil has a problem, the magnet must be replaced. A faulty magnet may also cause damage to the rectifier. Also check the rectifier when replacing a faulty magnet. (see below)

CHECKING THE RECTIFIER (Qualified technicians only)

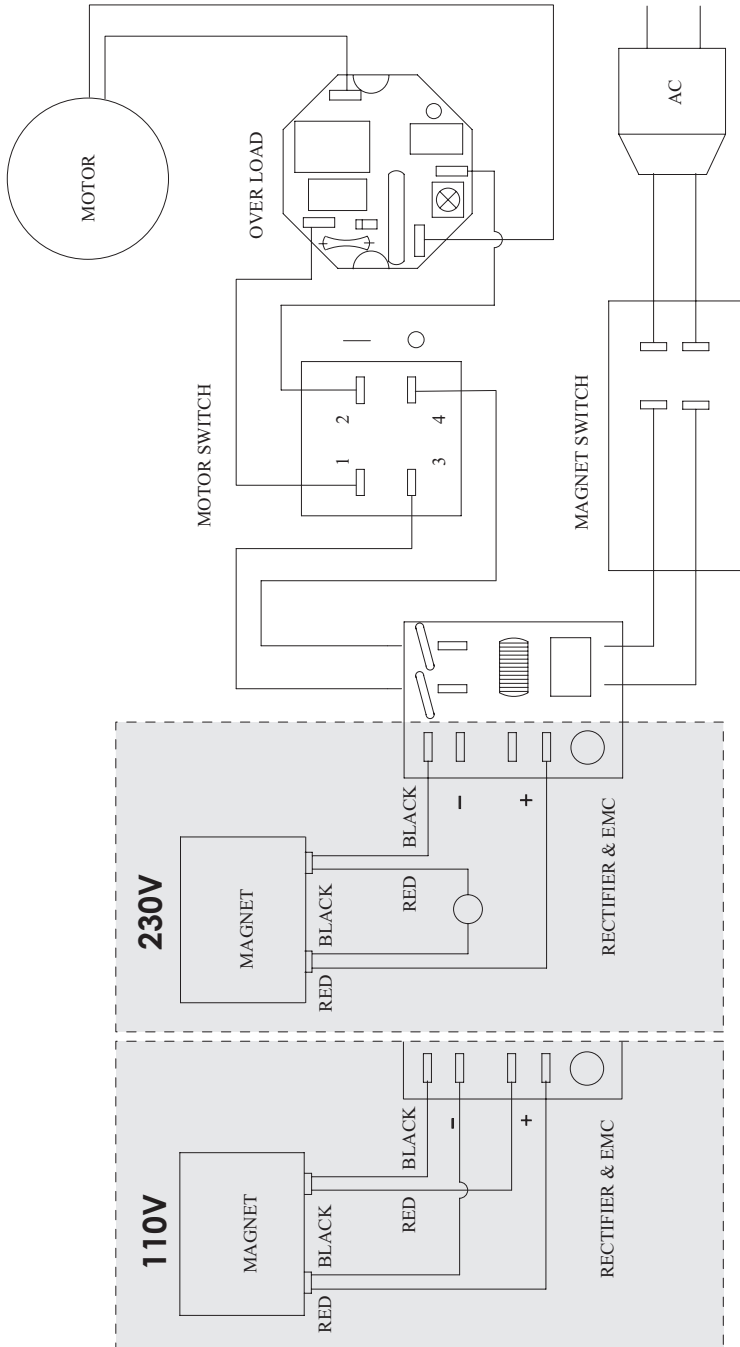
The rectifier takes the AC household current and converts it to DC to power the magnet. If it fails, the magnet coils will not receive power.

Disconnect the rectifier and test the resistance of both circuits of the rectifier between the AC and the DC sides. Note that polarity matters, so you can only take a reading if test probes are oriented correctly. Each side will be the opposite of the other. Both circuits should have very nearly the same resistance reading. If one of the circuits has zero resistance, it means that it is shorted. If one of the circuits has infinite resistance, it means that the circuit is broken.

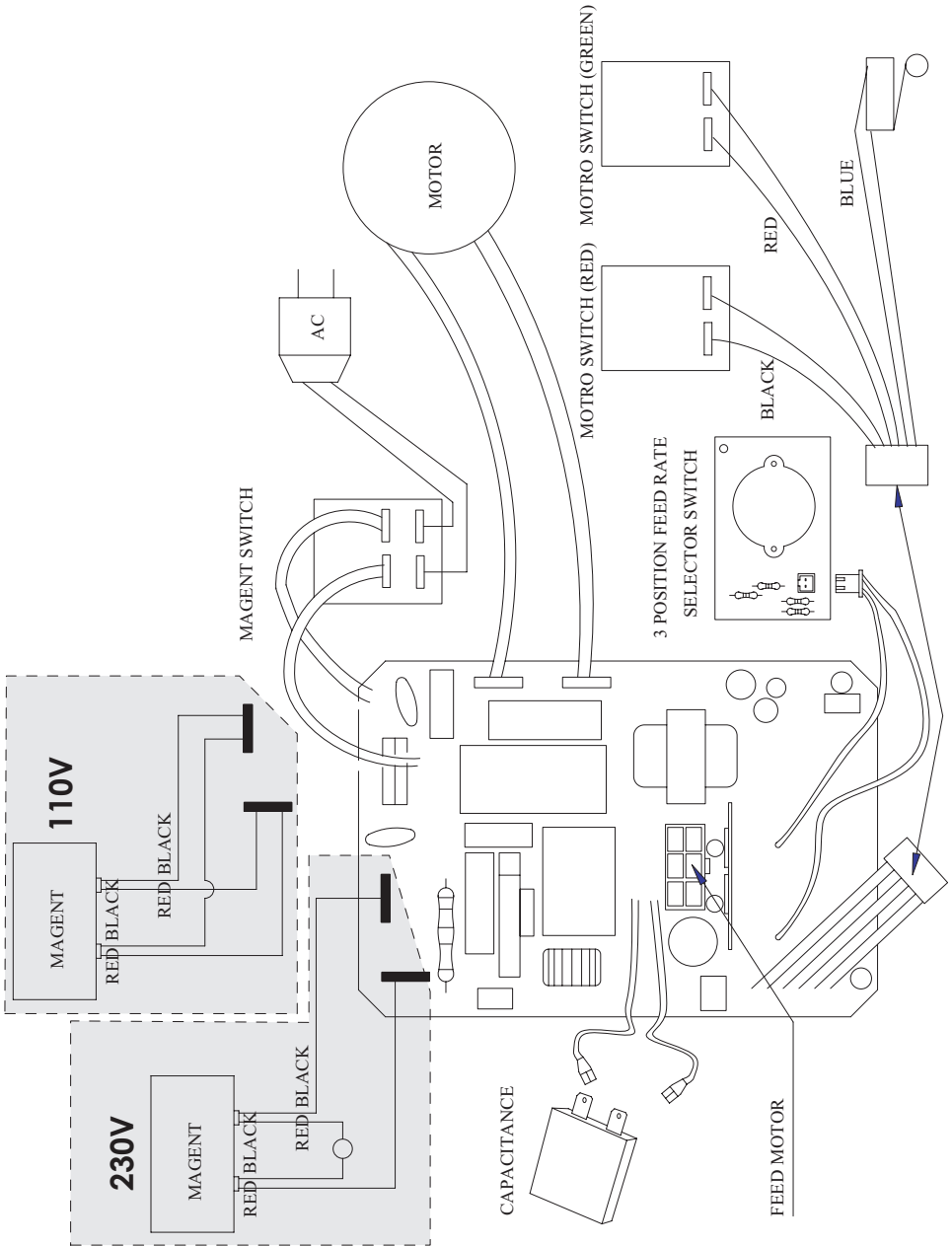
If the replacement of the power supply cord is necessary, this has to be done by the manufacturer or their agent in order to avoid a safety hazard.

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

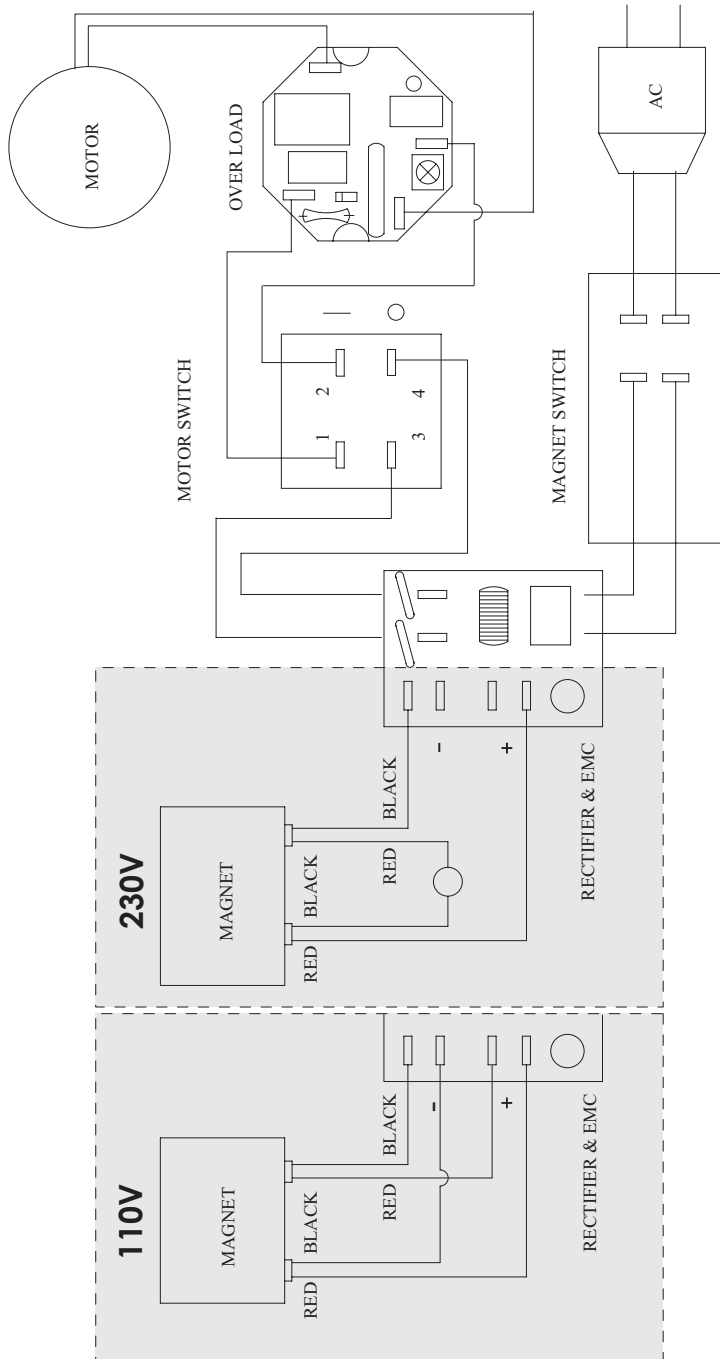
1 Speed Drilling System & 1 Speed Drilling System(N) (Wiring)



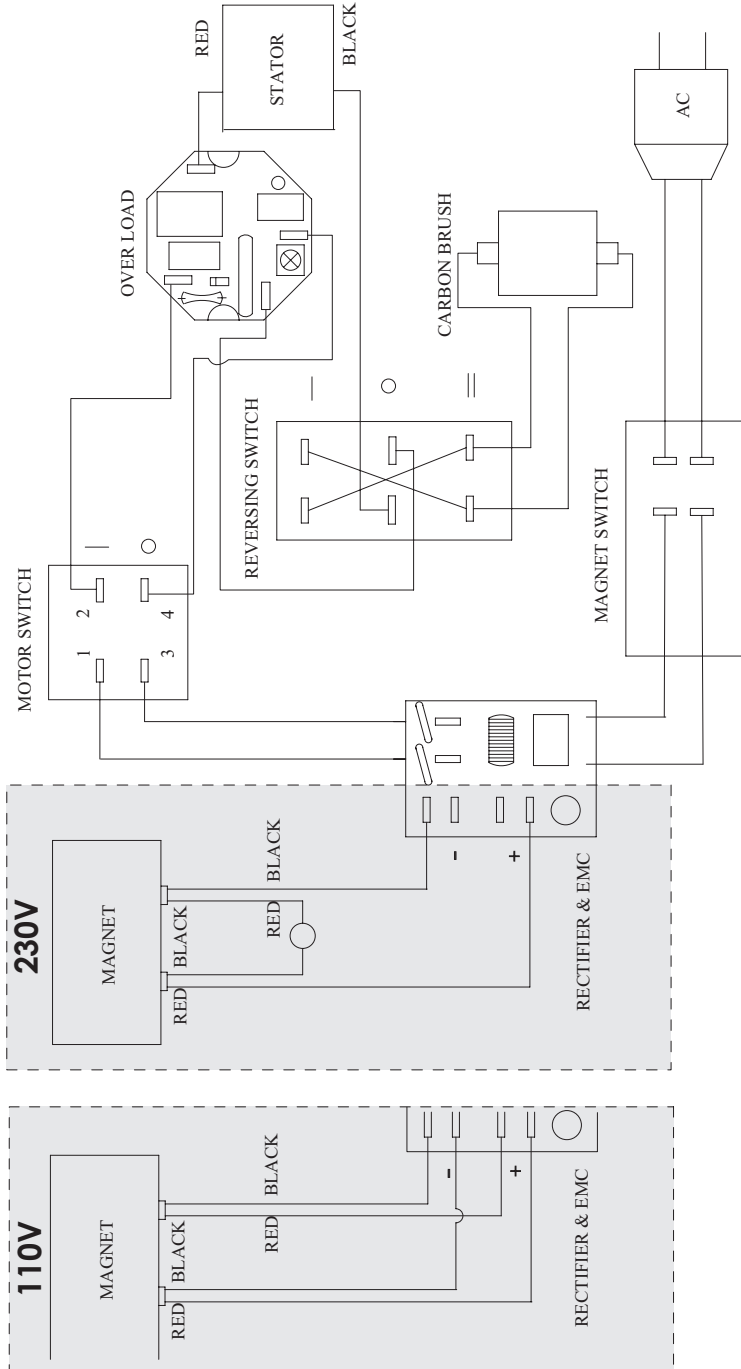
Semi Auto Feed Drilling System & Semi Auto Feed Drilling System (N) (Wiring)



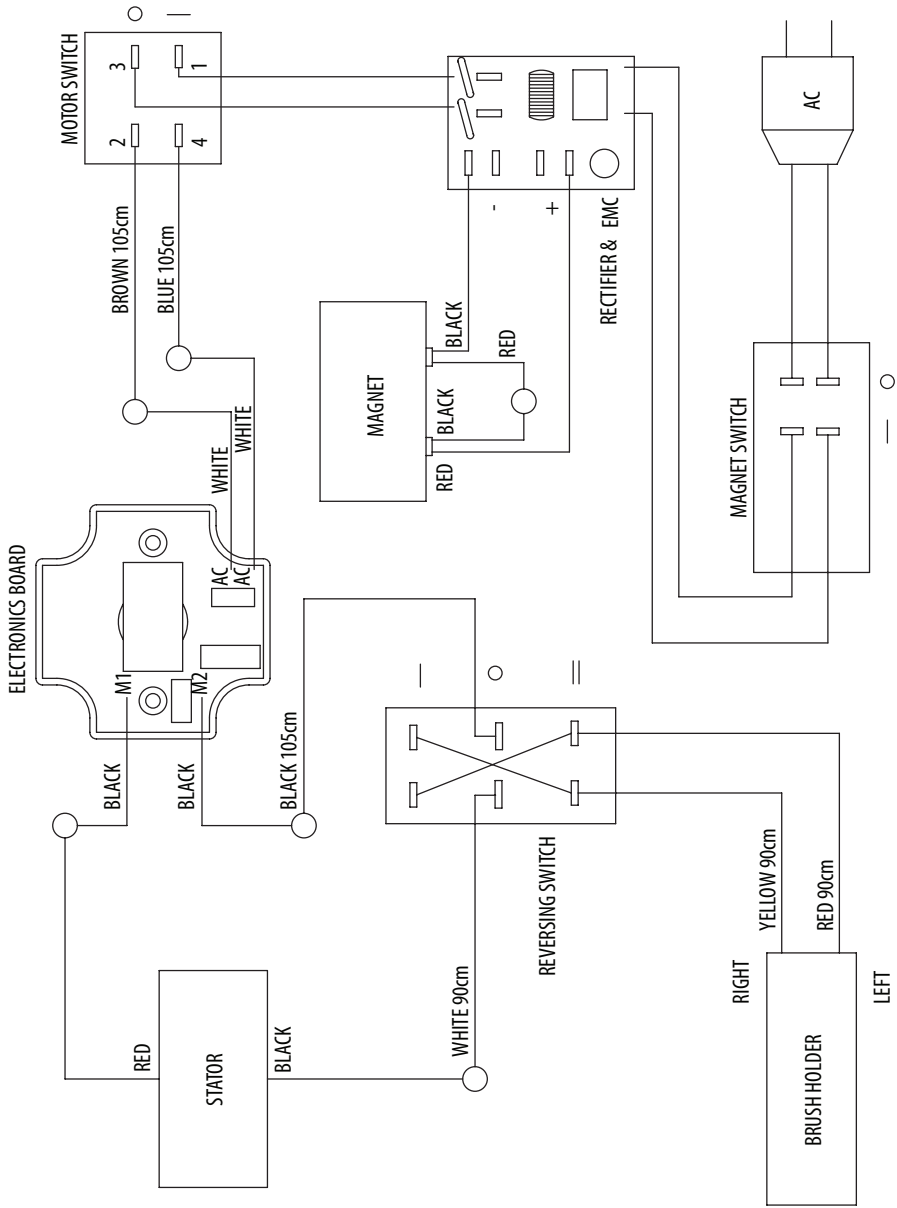
2 Speed Drilling System (Wiring)



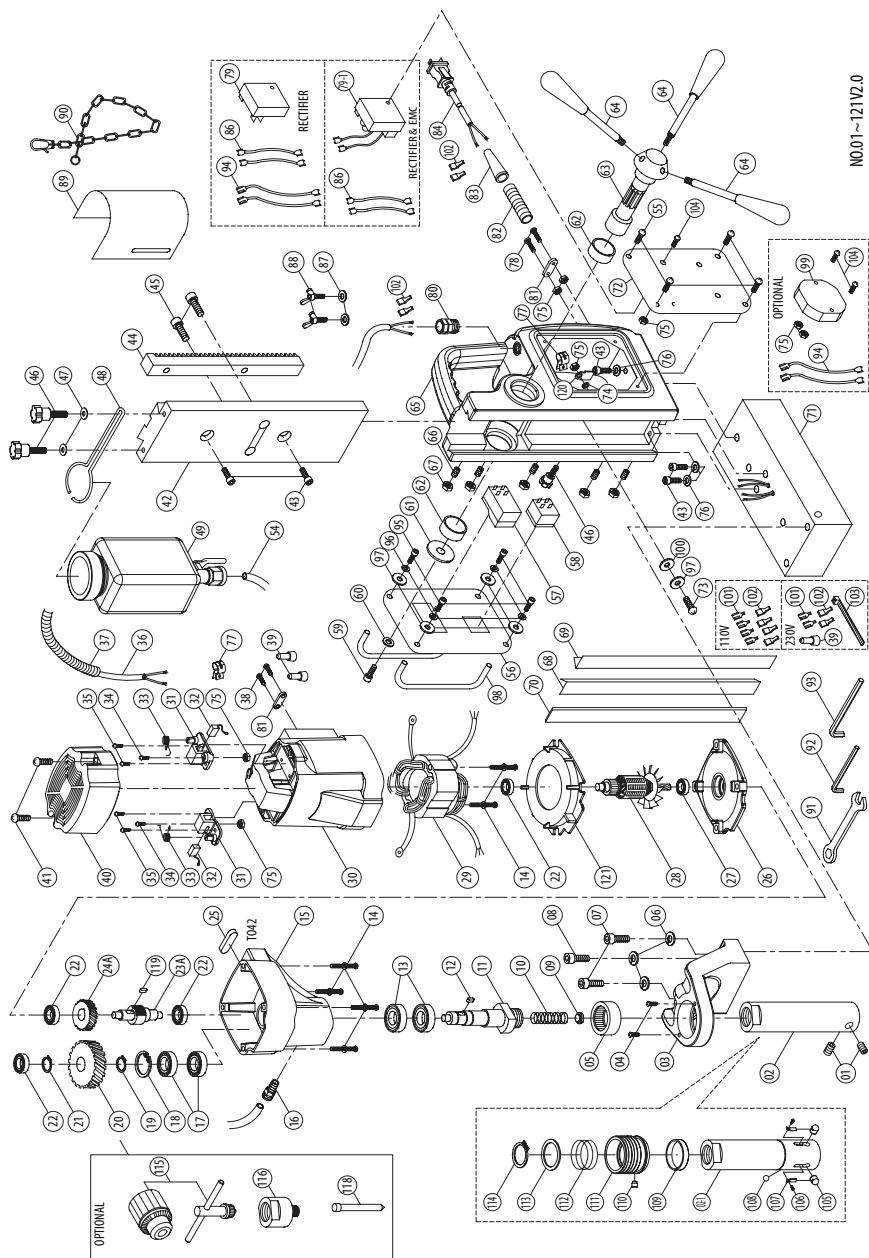
4 Speed Drilling System & 4 Speed Swivel Base Drilling System (Wiring)



4 Speed Variable Motor Speed Drilling System (Wiring)



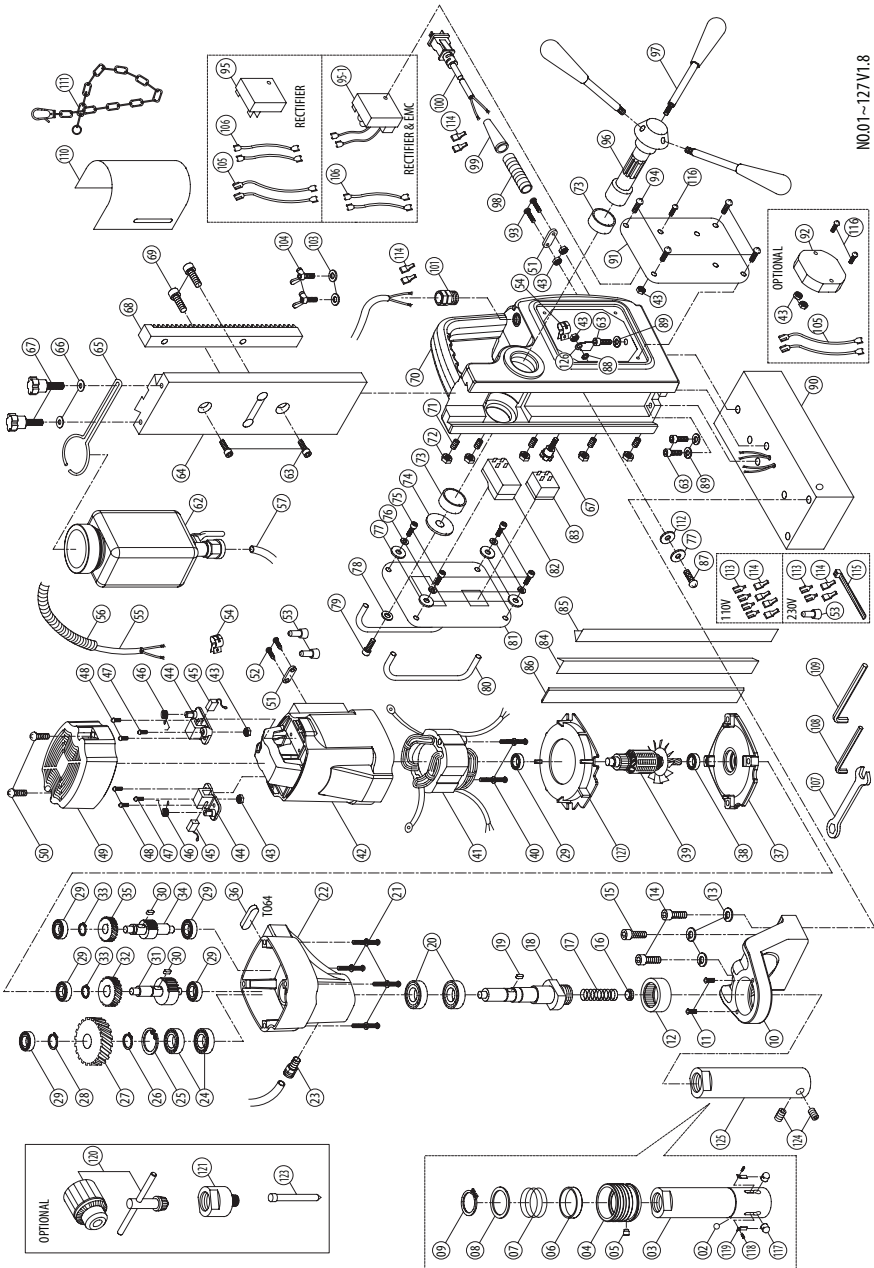
1 Speed Drilling System Exploded View & Parts list



NO.01~121V2.0

NO.	Parts Name	QTY	63	CRANK SPINDLE	1
1	SET SCREW M8 x 7	2	64	CRANK LEVER	3
2	ARBOR	1	65	STAND BODY	1
2-1	QUICK RELEASE ARBOR SHAFT	1	66	GIB SET SCREW M5 x 20	5
3	ARBOR SUPPORT BRACKET	1	67	GIB LOCK NUT M5	5
4	TRUSS HEAD SCREW M5 x 8	2	68	GIB WEAR STRIP - LEFT	1
5	BEARING HK3516	1	69	GIB WEAR STRIP - RIGHT	1
6	SPRING WASHER M8	3	70	GIB TENSIONER 260 x 11 x 2.3	1
7	SOCKET CAP BOLT M8 x 55	2	71	ELECTROMAGNET 164 x 80 x 48	1
8	SOCKET CAP BOLT M8 x 30	1	72	SIDE PANEL	1
9	COOLANT SEAL	1	73	SCREW M4 x 16	1
10	SPRING	1	74	STAR WASHER M5	1
11	SPINDLE	1	75	NUT M4 x 8	8
12	PARALLEL KEY 5 x 5 x 10	1	76	SPRING WASHER M6	3
13	OIL SEAL Ø28 x Ø40 x 7	2	77	CABLE CLAMP	2
14	SCREW M5 x 60	6	78	SCREW M4 x 30	2
15	GEAR CASE	1	79	RECTIFIER	1
16	PUSH LOCK FITTING	1	79-1	RECTIFIER & EMC	1
17	BEARING 6003 zz	2	80	CABLE GLAND	1
18	INTERNAL CIRCLIP R-35	1	81	CABLE CLIP	2
19	EXTERNAL CIRCLIP S-17	1	82	STRAIN RELIEF 7cm	1
20	OUTPUT GEAR 52T	1	83	CORD ARMOR	1
21	EXTERNAL CIRCLIP S-15	1	84	POWER SUPPLY CABLE	1
22	BEARING 608 zz	4	85	N/A	-
23A.)	INPUT PINION 8T	1	86	LEAD WIRE	2
24A.)	INPUT GEAR 50T	1	87	FLAT WASHER Ø6 x Ø13 x 1	2
25	PARALLEL KEY 4 x 4 x 30	1	88	BUTTERFLY SCREW M6 x 10	2
26	GEAR PLATE	1	89	CHIP GUARD	1
27	BEARING 609-2RS EZO	1	90	SAFETY CHAIN	1
28	ARMATURE 7T	1	91	COMBINATION WRENCH-M8 M8	1
29	STATOR	1	92	L-HEX KEY-M2.5 M2.5	1
30	MOTOR HOUSING	1	93	L-HEX KEY-M4 M4	1
31	BRUSH HOLDER	2	94	LEAD WIRE	4
32	CARBON BRUSH 7 x 11 x 17	2	95	SOCKET CAP SCREW M4 x 16	4
33	BRUSH SPRING	2	96	SPRING WASHER M4	4
34	SCREW M4 x 10	2	97	FLAT WASHER Ø4 x Ø10 x 1	5
35	SCREW M4 x 12	4	98	SWITCH GUARD BAR	2
36	MOTOR CABLE 1.25 x 2C x 65CM	1	99	OVER LOAD PROTECTION (OPTIONAL)	1
37	CABLE PROTECTOR 40CM	1	100	RUBBER WASHER Ø4 x Ø11 x 1	1
38	SCREW M4 x 14	2	101	SPADE TERMINAL FDV1-250	4
39	END SPLICE TERMINAL C4	3	102	TERMINAL COVER	8
40	MOTOR TAIL COVER	1	103	ZIP TIE	1
41	SCREW M4 x 25	2	104	SCREW M4 x 25	3
42	SLIDE PLATE 230cm	1	105	LOCK PIN	2
43	SOCKET CAP BOLT M6 x 20	5	106	SCREW M3 x 4	2
44	GEAR RACK	1	107	LOCKING PIN SPRING	2
45	SOCKET CAP BOLT M8 x 16	2	108	CHECK BALL Ø8	1
46	THUMB SCREW M5 x 16	3	109	RUBBER RING	1
47	FLAT WASHER Ø5 x Ø12 x 1	2	110	COLLAR PIN	1
48	COOLANT TANK BRACKET	1	111	QUICK-RELEASE COLLAR	1
49	COOLANT TANK ASSEMBLY	1	112	SPRING Ø39 x Ø43 x 3T x 30L	1
50-53	N/A	-	113	SPRING SEAT RING Ø35.1 x Ø44.5 x 2	1
54	COOLANT TUBE 15cm	1	114	EXTERNAL CIRCLIP S-35	1
55	SCREW M4 x 8	4	115	CHUCK (OPTIONAL) 1/2"	1
56	SWITCH PANEL	1	116	CHUCK ADAPTOR (OPTIONAL)	1
57	MOTOR SWITCH	1	117	N/A	-
58	MAGNET SWITCH	1	118	PILOT PIN (OPTIONAL) TCTx91LxØ8	1
59	SOCKET CAP BOLT M6 x 16	1	119	PARALLEL KEY 4 x 4 x 8	1
60	FLAT WASHER Ø6 x Ø25 x 1	1	120	EARTHING MARKING	1
61	FLAT WASHER Ø6 x Ø40 x 2.5	1	121	FAN BAFFLE	1
62	BUSHING Ø28 x Ø32 x 12	2			

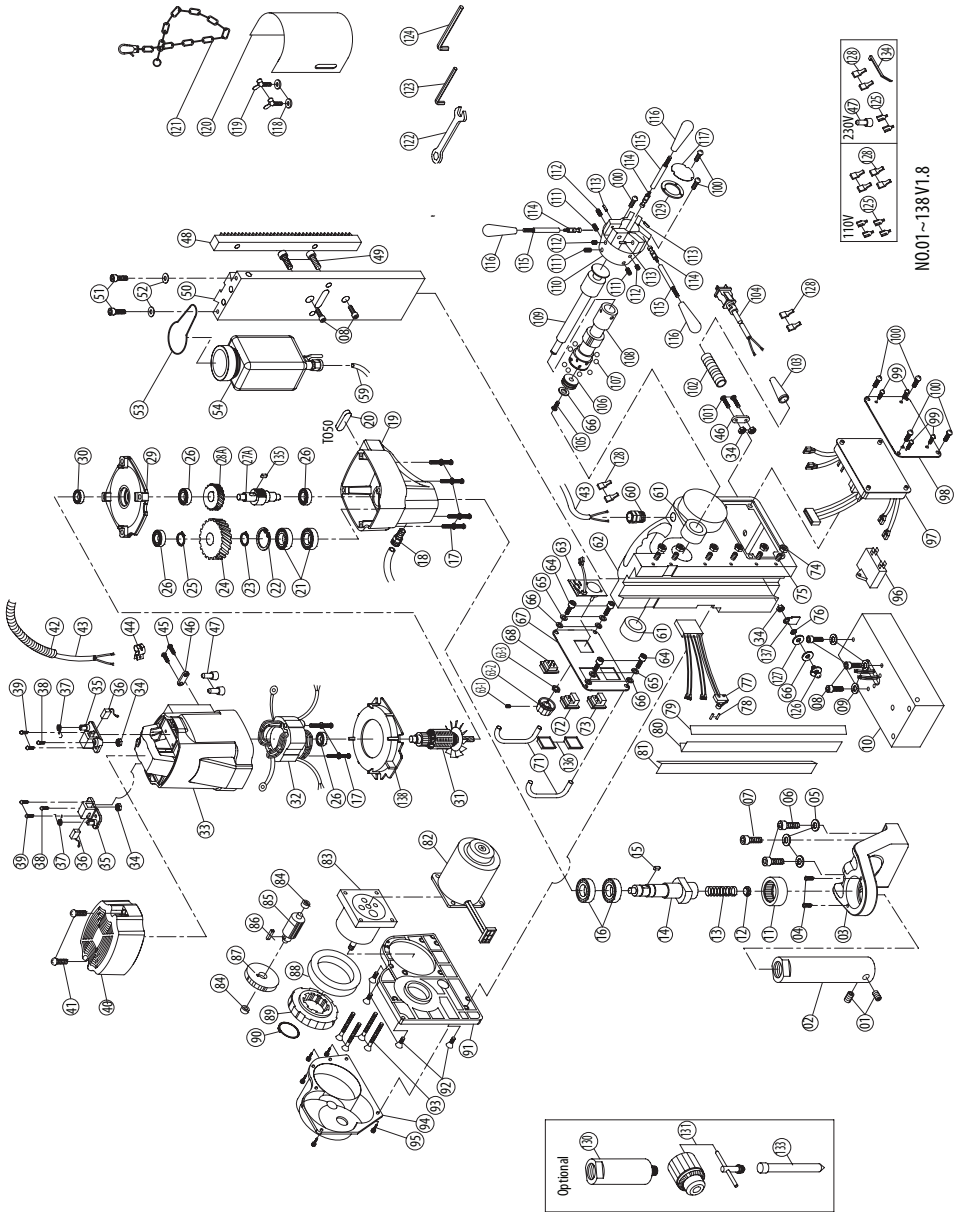
1 Speed Drilling System Exploded View & Parts list (N)



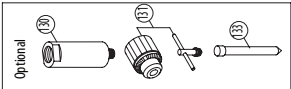
NO.01-127V1.8

NO.	Parts Name	Q'TY	66	FLAT WASHER 05 x 012 x 1	2
1	N/A	-	67	THUMB SCREW M5 x 16	3
2	CHECK BALL Ø8	1	68	GEAR RACK	1
3	QUICK RELEASE ARBOR SHAFT	1	69	SOCKET CAP BOLT M8 x 16	2
4	QUICK-RELEASE COLLAR	1	70	STAND BODY	1
5	COLLAR PIN	1	71	GIB SET SCREW M5 x 20	5
6	RUBBER RING Ø40 x Ø44 x 9	1	72	GIB LOCK NUT M5	5
7	SPRING Ø2 x Ø39 x Ø43 x 30L x 3T	1	73	BUSHING Ø28 x Ø32 x 12	2
8	STEEL RING Ø35.1 x Ø44.5 x 2	1	74	FLAT WASHER Ø6 x Ø40 x 2.5	1
9	EXTERNAL CIRCLIP S-35	1	75	SOCKET CAP SCREW M4 x 16	4
10	ARBOR SUPPORT BRACKET	1	76	SPRING WASHER M4	4
11	TRUSS HEAD SCREW M5 x 8	2	77	FLAT WASHER Ø4 x Ø10 x 1	5
12	BEARING HK3516	1	78	FLAT WASHER Ø6 x Ø25 x 1	1
13	SPRING WASHER M8	3	79	SOCKET CAP BOLT M6 x 16	1
14	SOCKET CAP BOLT M8 x 55	2	80	SWITCH GUARD BAR	2
15	SOCKET CAP BOLT M8 x 30	1	81	SWITCH PANEL	1
16	COOLANT SEAL	1	82	MOTOR SWITCH	1
17	SPRING	1	83	MAGNET SWITCH	1
18	SPINDLE	1	84	GIB WEAR STRIP - LEFT	1
19	PARALLEL KEY 5 x 5 x 10	1	85	GIB WEAR STRIP - RIGHT	1
20	OIL SEAL Ø28 x Ø40 x 7	2	86	GIB TENSIONER 260 x 11 x 2.3	1
21	SCREW M5 x 70	4	87	SCREW M4 x 16	1
22	GEAR CASE	1	88	STAR WASHER M5	1
23	PUSH LOCK FITTING	1	89	SPRING WASHER M6	3
24	BEARING 6003 zz	2	90	ELECTROMAGNET 164 x 80 x 48	1
25	INTERNAL CIRCLIP R-35	1	91	SIDE PANEL	1
26	EXTERNAL CIRCLIP S-17	1	92	OVER LOAD PROTECTION (OPTIONAL)	1
27	OUTPUT GEAR 37T	1	93	SCREW M4 x 30	2
28	EXTERNAL CIRCLIP S-15	1	94	SCREW M4 x 8	4
29	BEARING 608 zz	6	95	RECTIFIER & EMC	1
30	PARALLEL KEY 4 x 4 x 8	2	95-1	RECTIFIER & EMC	1
31	INTERMEDIATE GEAR PINION 12T	1	96	CRANK SPINDLE	1
32	INTERMEDIATE GEAR 34T	1	97	CRANK LEVER	3
33	EXTERNAL CIRCLIP S-10	2	98	STRAIN RELIEF 7cm	1
34	INPUT PINION 9T	1	99	CORD ARMOR	1
35	INPUT GEAR 30T	1	100	POWER SUPPLY CABLE	1
36	PARALLEL KEY 4 x 4 x 30	1	101	CABLE GLAND	1
37	GEAR PLATE	1	102	N/A	-
38	BEARING 6001-LLU	1	103	FLAT WASHER Ø6 x Ø13 x 1	2
39	ARMATURE 7T	1	104	BUTTERFLY SCREW M6 x 10	2
40	SCREW M5 x 60	2	105	LEAD WIRE	4
41	STATOR	1	106	LEAD WIRE	2
42	MOTOR HOUSING	1	107	M8 COMBINATION WRENCH M8	1
43	NUT M4 x 8	8	108	M2.5 L-HEX WRENCH M2.5	1
44	BRUSH HOLDER	2	109	M4 L-HEX WRENCH M4	1
45	CARBON BRUSH 7 x 11 x 17	2	110	CHIP GUARD	1
46	BRUSH SPRING	2	111	SAFETY CHAIN	1
47	SCREW M4 x 10	2	112	RUBBER WASHER M4	1
48	SCREW M4 x 12	4	113	SPADE TERMINAL FDV1-250	4
49	MOTOR TAIL COVER	1	114	TERMINAL COVER	8
50	SCREW M4 x 25	2	115	ZIP TIE	1
51	CABLE CLIP	2	116	SCREW M4 x 25	3
52	SCREW M4 x 14	2	117	LOCK PIN	2
53	END SPLICE TERMINAL C4	3	118	SCREW M3 x 4	2
54	CABLE CLAMP	2	119	LOCKING PIN SPRING	2
55	MOTOR CABLE 1.25 x 2C x 65CM	1	120	CHUCK (OPTIONAL) 1/2"	1
56	CABLE PROTECTOR 40cm	1	121	CHUCK ADAPTOR (OPTIONAL)	1
57	COOLANT TUBE 15cm	1	122	N/A	-
58-61	N/A	-	123	PILOT PIN (OPTIONAL) TCTx91LxØ8	1
62	COOLANT TANK ASSEMBLY	1	124	SET SCREW M8 x 7	2
63	SOCKET CAP BOLT M6 x 20	5	125	ARBOR	1
64	SLIDE PLATE 238cm	1	126	EARTHING MARKING	1
65	COOLANT TANK BRACKET	1	127	FAN SHROUD	1

Semi Auto Feed Drilling System Exploded View & Parts list

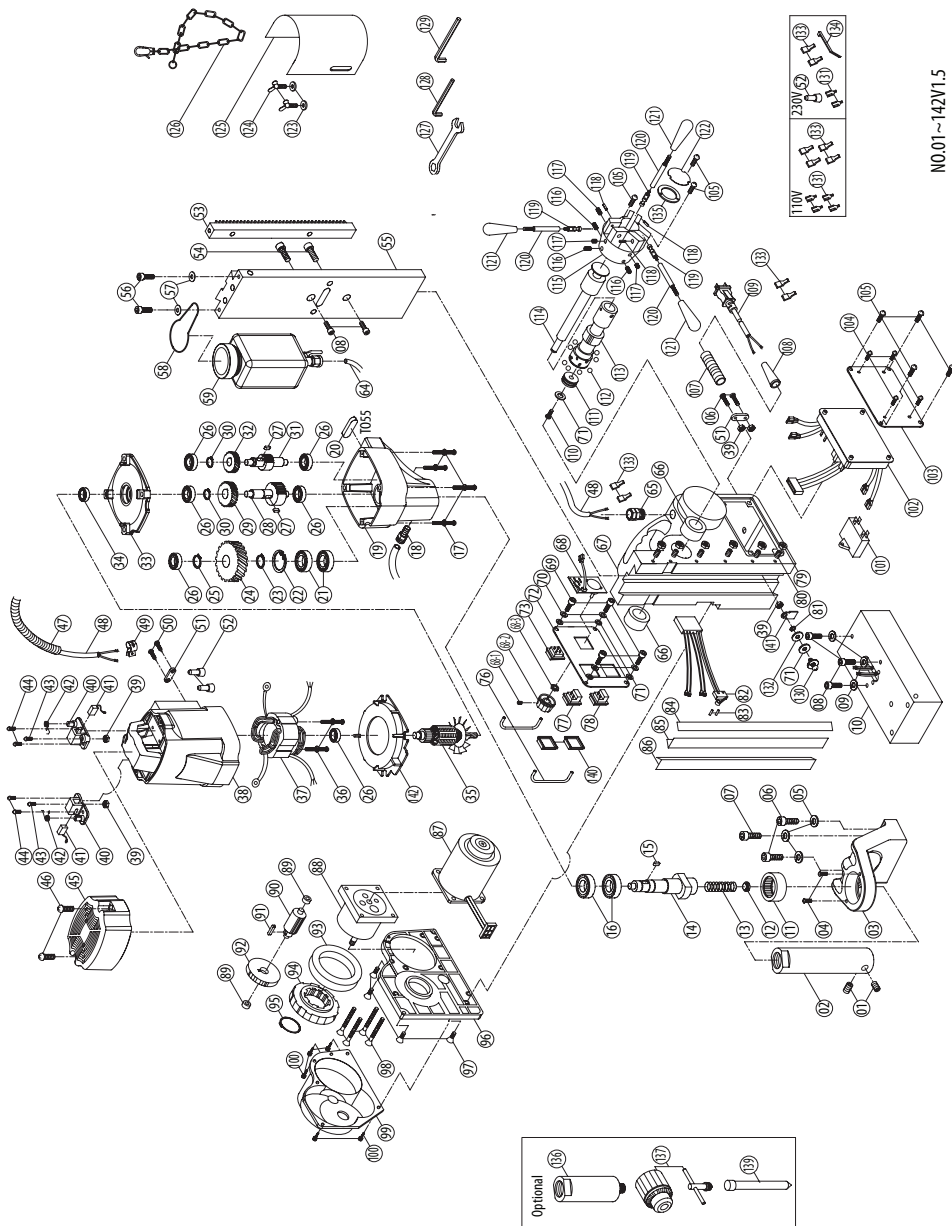


NO.01~138V1.8



NO.	Parts Name	QTY	69~70	N/A	-
1	SET SCREW M8 x 7	2	71	SWITCH GUARD	2
2	ARBOR	1	72	MOTOR ON SWITCH (GREEN)	1
3	ARBOR SUPPORT BRACKET	1	73	MOTOR OFF SWITCH (RED)	1
4	TRUSS HEAD SCREW M5 x 8	2	74	NUT M5	6
5	SPRING WASHER M8	3	75	SET SCREW M5 x 20	6
6	SOCKET CAP BOLT M8 x 55	2	76	STAR WASHER M5	1
7	SOCKET CAP BOLT M8 x 30	1	77	LIMIT SWITCH	1
8	SOCKET CAP BOLT M6 x 20	5	78	PIN Ø2.2 x 10	2
9	SPRING WASHER M6	3	79	GIB TENSIONER 260 x 11 x 2.3	1
10	ELECTROMAGNET 164 x 80 x 48	1	80	GIB STRIP - RIGHT 260L	1
11	BEARING HK 3516	1	81	GIB STRIP - LEFT 260L	1
12	COOLANT SEAL	1	82	FEED MOTOR	1
13	SPRING	1	83	FEED MOTOR GEAR BOX	1
14	SPINDLE	1	84	BUSHING Ø8 x Ø12 x 6	2
15	PARALLEL KEY 5 x 5 x 10	1	85	FEED INTERMEDIATE GEAR 10T	1
16	OIL SEAL Ø28 x Ø40 x 7	2	86	PARALLEL KEY 4 x 4 x 10	1
17	SCREW M5 x 60	6	87	FEED OUTPUT GEAR 80T	1
18	PUSH LOCK FITTING	1	88	BEARING 6809 zz	1
19	GEAR CASE	1	89	ENGAGEMENT GEAR 63T	1
20	PARALLEL KEY 4 x 4 x 30	1	90	EXTERNAL CIRCLIP 5-29	1
21	BEARING 6003 zz	2	91	FEED SUPPORT BASE	1
22	INTERNAL CIRCLIP R-35	1	92	FLAT HEAD SCREW M5 x 15	4
23	EXTERNAL CIRCLIP 5-17	1	93	FLAT HEAD SCREW M5 x 30	4
24	OUTPUT GEAR 52T	1	94	AUTO FEED COVER	1
25	EXTERNAL CIRCLIP 5-15	1	95	SCREW M5 x 20	5
26	BEARING 608 zz	4	96	CAPACITOR	1
27A	INPUT PINION 8T	1	97	ELECTRONICS BOARD	1
28A	INPUT GEAR 50T	1	98	SIDE PLATE	1
29	GEAR PLATE	1	99	SCREW M3.5 x 6	4
30	BEARING 609 zz	1	100	SCREW M4 x 8	7
31	ARMATURE 7T	1	101	SCREW M4 x 30	2
32	STATOR	1	102	CABLE PROTECTOR 7CM	1
33	MOTOR HOUSING	1	103	CORD ARMOR	1
34	NUT M4 x 8	5	104	POWER SUPPLY CABLE	1
35	BRUSH HOLDER 7 x 11	2	105	SCREW M4 x 10	1
36	CARBON BRUSH 7 x 11 x 17	2	106	SELECTOR CAM	1
37	SPRING	2	107	BALL Ø5	8
38	SCREW M4 x 10	2	108	CRANK SPINDLE	1
39	SCREW M4 x 12	4	109	SELECTOR ROD	1
40	MOTOR TAIL COVER	1	110	CRANK HUB	1
41	SCREW M4 x 25	2	111	SET SCREW M8 x 10	3
42	CABLE PROTECTOR 40CM	1	112	DETEN UNIT M6 x 13	3
43	MOTOR CABLE 1.25 x 2C x 80CM	1	113	SPRING PIN Ø4.2 x 25	3
44	CABLE CLAMP	1	114	CRANK LEVER TIP	3
45	SCREW M4 x 14	2	115	CRANK LEVER	3
46	CORD CLIP	2	116	CRANK GRIP	3
47	END SPLICE TERMINAL C-4	3	117	HUB COVER	1
48	GEAR RACK	1	118	FLAT WASHER Ø6 x Ø13 x 1	2
49	SOCKET CAP BOLT M8 x 16	2	119	BUTTERFLY SCREW M6 x 10	2
50	SLIDE PLATE	1	120	CHIP GUARD	1
51	SOCKET CAP SCREW M5 x 16	2	121	SAFETY CHAIN	1
52	FLAT WASHER Ø5 x Ø12 x 1	2	122	COMBINATION WRENCH-M8 M8	1
53	COOLANT TANK BRACKET	1	123	L-HEX KEY-M2.5 M2.5	1
54	COOLANT TANK ASSEMBLY	1	124	L-HEX KEY-M4 M4	1
55~58	N/A	-	125	SPADE TERMINAL	4
59	COOLANT TUBE 15CM	1	126	SCREW M4 x 16	1
60	CABLE GLAND	1	127	WASHER 4 x 11 x 1	1
61	BUSHING Ø28 x Ø32 x 12	2	128	TERMINAL COVER	8
62	STAND BODY	1	129	HUB PLATE	1
63	SPEED CONTROL BOARD	1	130	CHUCK ADAPTOR (OPTIONAL)	1
63-1	SCREW	1	131	CHUCK (OPTIONAL) 1/2"	1
63-2	SELECTOR SWITCH	1	132	N/A	-
63-3	NUT	1	133	PILOT PIN (OPTIONAL) Tctx91LxØ8	1
64	SOCKET CAP SCREW M4 x 16	4	134	ZIP TIE	1
65	SPRING WASHER M4	4	135	PARALLEL KEY 4 x 4 x 8	1
66	FLAT WASHER Ø4 x Ø10 x 1	6	136	SWITCH COVER	2
67	SWITCH PLATE	1	137	EARTHING MARKING	1
68	MAGNET SWITCH	1	138	FAN BAFFLE	1

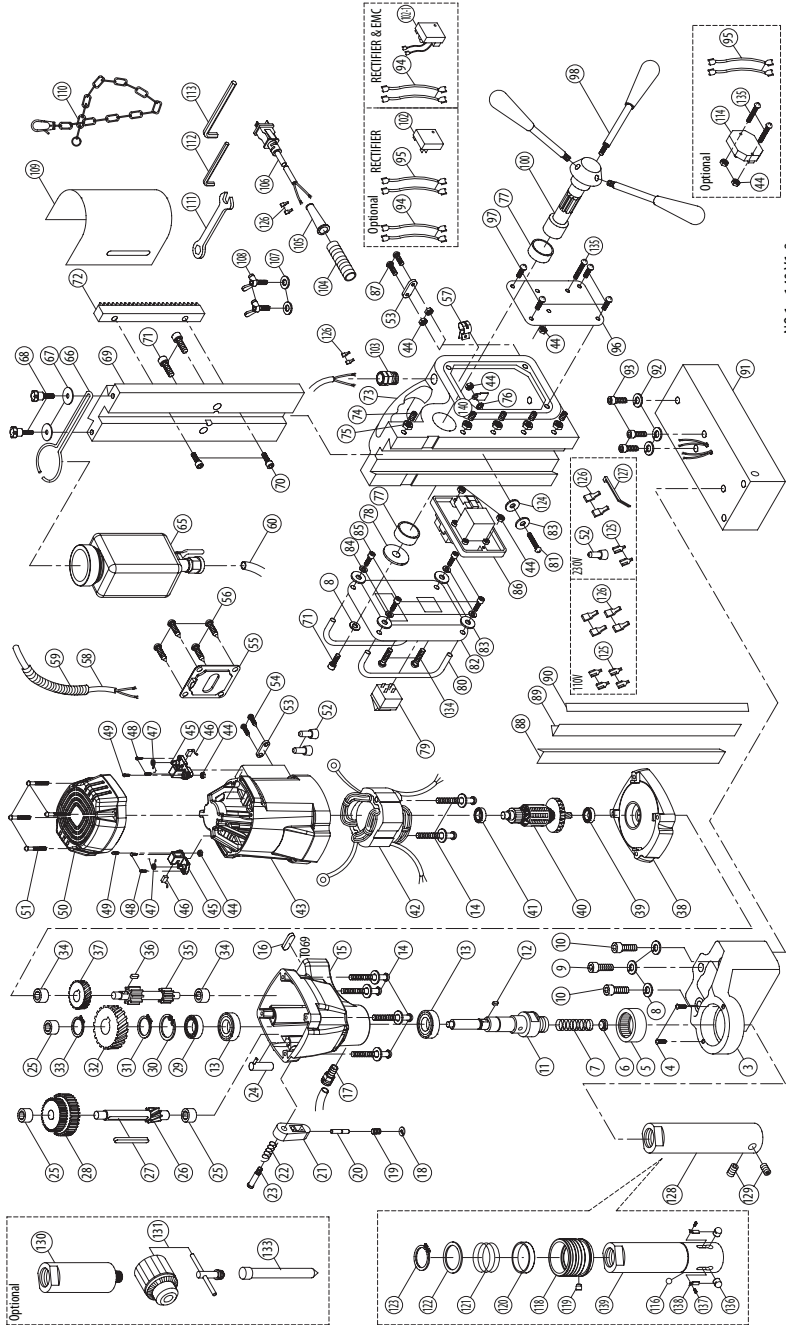
Semi Auto Feed Drilling System Exploded View & Parts list (N)



NO.01~142V1.5

NO.	Parts Name	QTY	71	FLAT WASHER 04x010x1	6
1	SET SCREW M8 x7	2	72	SWITCH PLATE	1
2	ARBOR	1	73	MAGNET SWITCH	1
3	ARBOR SUPPORT BRACKET	1	74-75	N/A	-
4	TRUSS HEAD SCREW M5 x 8	2	76	SWITCH GUARD	2
5	SPRING WASHER M8	3	77	MOTOR ON SWITCH (GREEN)	1
6	CAP BOLT M8 x 55	2	78	MOTOR OFF SWITCH (RED)	1
7	CAP BOLT M8 x 30	1	79	NUT M5	6
8	CAP BOLT M6 x 20	5	80	SET SCREW M5 x 20	6
9	SPRING WASHER M6	3	81	STAR WASHER M5	1
10	MAGNET	1	82	LIMIT SWITCH	1
11	BEARING HK 3516	1	83	PIN 02.2 x 10	2
12	COOLANT SEAL	1	84	GIB TENSIONER 260 x 11 x 2.3	1
13	SPRING	1	85	GIB STRIP - RIGHT	1
14	SPINDLE	1	86	GIB STRIP - LEFT 260L	1
15	WOODRUFF KEY 5x5x10	1	87	FEED MOTOR	1
16	OIL SEAL 028 x 040 x 7	2	88	FEED MOTOR GEAR BOX	1
17	SCREW M5 x 70	4	89	BUSHING 08 x 012 x 6	2
18	PUSH LOCK FITTING	1	90	FEED INTERMEDIATE GEAR 10T	1
19	GEAR CASE	1	91	PARALLEL KEY 4 x 4 x 10	1
20	PARALLEL KEY 4 x 4 x 30	1	92	FEED OUTPUT GEAR 80T	1
21	BEARING 6003 zz	2	93	BEARING 6809 zz	1
22	INTERNAL CIRCLIP R-35	1	94	ENGAGEMENT GEAR 63T	1
23	EXTERNAL CIRCLIP S-17	1	95	EXTERNAL CIRCLIP S-29	1
24	OUTPUT GEAR 37T	1	96	FEED SUPPORT BASE	1
25	EXTERNAL CIR CLIP S-15	1	97	FLAT HEAD SCREW M5 x 15	4
26	BEARING 608 zz	6	98	FLAT HEAD SCREW M5 x 30	4
27	PARALLEL KEY 4 x 4 x 8	2	99	AUTO FEED COVER	1
28	INTERMEDIATE GEAR PINION 12T	1	100	SCREW M5 x 20	5
29	INTERMEDIATE GEAR 34T	1	101	CAPACITOR	1
30	EXTERNAL CIRCLIP S-10	2	102	ELECTRONICS BOARD	1
31	INPUT PINION 9T	1	103	SIDE PLATE	1
32	INPUT GEAR 30T	1	104	SCREW M3.5 x 6	4
33	GEAR PLATE	1	105	SCREW M4 x 8	7
34	BEARING 6001-LLU	1	106	SCREW M4 x 30	2
35	ARMATURE 7T	1	107	CABLE PROTECTOR 7CM	1
36	SCREW M5 x 60	2	108	CORD ARMOR	1
37	STATOR	1	109	POWER SUPPLY CABLE	1
38	MOTOR HOUSING	1	110	SCREW M4 x 10	1
39	NUT M4 x 8	5	111	SELECTOR CAM	1
40	BRUSH HOLDER 7 x 11	2	112	BALL 05	8
41	CARBON BRUSH 7 x 11 x 17	2	113	CRANK SPINDLE	1
42	SPRING	2	114	SELECTOR ROD	1
43	SCREW M4 x 10	2	115	CRANK HUB	1
44	SCREW M4 x 12	4	116	SET SCREW M8 x 10	3
45	MOTOR TAIL COVER	1	117	DETENT UNIT M6 x 13	3
46	SCREW M4 x 25	2	118	SPRING PIN 04.2 x 25	3
47	CABLE PROTECTOR 40CM	1	119	CRANK LEVER TIP	3
48	MOTOR CABLE 1.25 x 2C x 80CM	1	120	CRANK LEVER	3
49	CABLE CLAMP	1	121	CRANK GRIP	3
50	SCREW M4 x 14	2	122	HUB COVER	1
51	CORD CLIP	2	123	FLAT WASHER 06 x 013 x 1	2
52	WIRE CONNECTOR C-4	3	124	BUTTERFLY SCREW M6 x 10	2
53	GEAR RACK	1	125	CHIP GUARD	1
54	SCREW M8 x 16	2	126	SAFETY CHAIN	1
55	SLIDE PLATE	1	127	M8 COMBINATION WRENCH M8	1
56	SOCKET CAP BOLT M5 x 16	2	128	M2.5 L-HEX WRENCH M2.5	1
57	FLAT WASHER 05 x 012 x 1	2	129	M4 L-HEX WRENCH M4	1
58	COOLANT TANK BRACKET	1	130	SCREW M4 x 16	1
59	COOLANT TANK ASSEMBLY	1	131	SPADE TERMINAL	4
60-63	N/A	-	132	RUBBER WASHER 04 x 011 x 1	1
64	COOLANT TUBE 15CM	1	133	TERMINAL COVER	8
65	CABLE GLAND	1	134	ZIP TIE	1
66	BUSHING 028 x 032 x 12	2	135	HUB PLATE	1
67	STAND BODY	1	136	CHUCK ADAPTOR(OPTIONAL)	1
68	SPEED CONTROL BOARD	1	137	CHUCK(OPTIONAL)	1
68-1	SCREW	1	138	N/A	1
68-2	SELECTOR SWITCH	1	139	PILOT PIN(OPTIONAL) TCTx91Lxp8	1
68-3	NUT	1	140	SWITCH PROTECTIVE COVER	2
69	SOCKET CAP SCREW M4 x 16	4	141	EARTHING MARKING	1
70	SPRING WASHER M4	4	142	FAN SHROUD	1

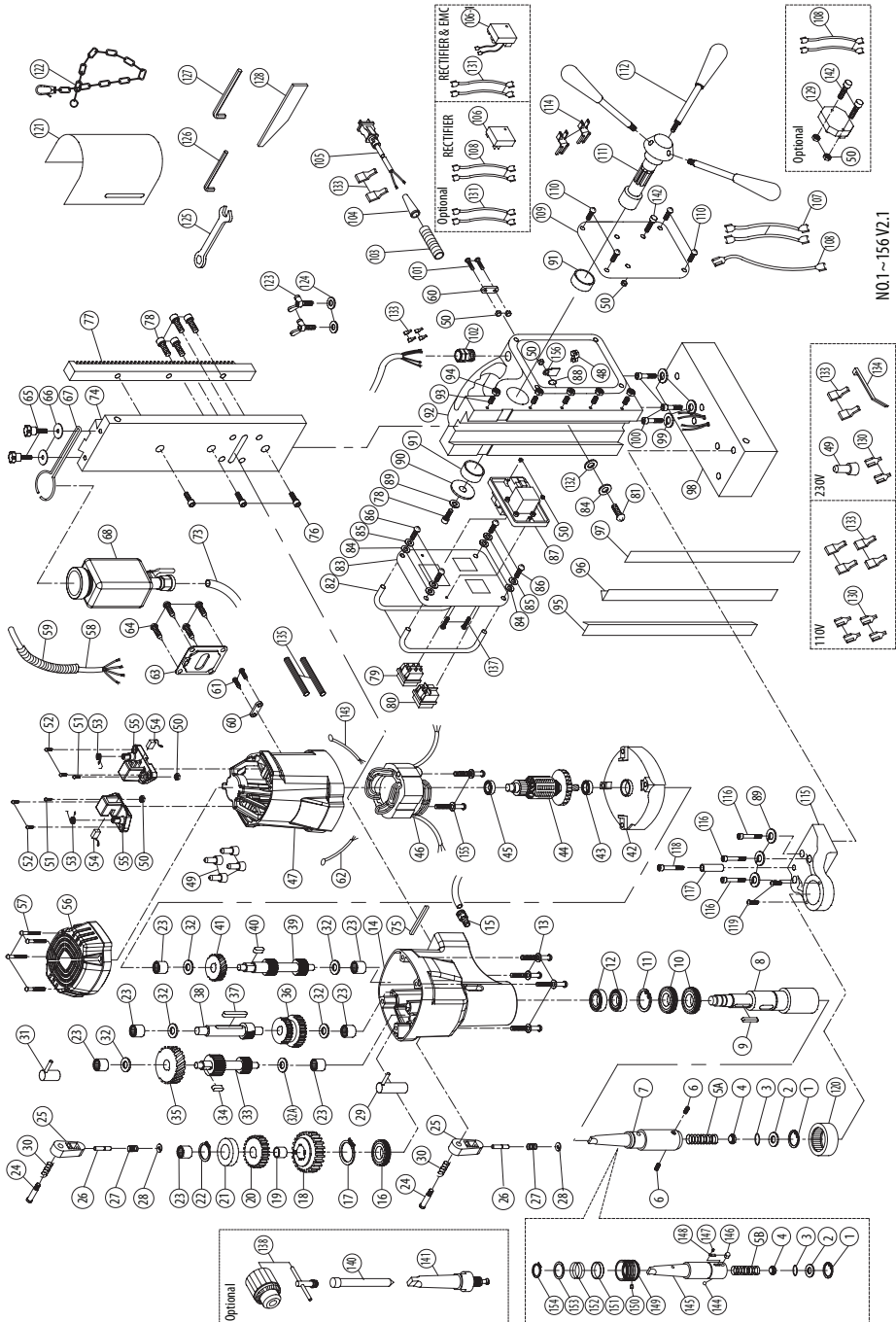
2 Speed Drilling System Exploded View & Parts list



NO.1~140 V1.9

NO.	Parts Name	Q'TY	73	STAND BODY	1
1~2	N/A	-	74	SET SCREW M5 x 25	5
3	ARBOR SUPPORT BRACKET	1	75	NUT M5	5
4	TRUSS HEAD SCREW M4 x 6	2	76	STAR WASHER M5	1
5	BEARING HK 3516	1	77	BUSHING Ø32 x Ø38 x 12	2
6	COOLANT SEAL	1	78	FLAT WASHER Ø8 x Ø40 x 2.5	1
7	SPRING	1	79	MAGNET SWITCH	1
8	SPRING WASHER M8	4	80	GUARD BAR	2
9	SOCKET CAP BOLT M8 x 60	1	81	SCREW M4 x 16	1
10	SOCKET CAP BOLT M8 x 70	2	82	SWITCH PANEL	1
11	SPINDLE	1	83	FLAT WASHER Ø4 x Ø10 x 1	5
12	PARALLEL KEY 5 x 5 x 12	1	84	SPRING WASHER M4	4
13	OIL SEAL Ø22 x Ø37 x 7	2	85	SOCKET CAP SCREW M4 x 16	4
14	SCREW M5 x 60	6	86	MOTOR SWITCH	1
15	GEAR CASE	1	87	SCREW M4 x 30	2
16	PARALLEL KEY 4 x 4 x 30	1	88	GIB STRIP-LEFT	1
17	PUSH LOCK FITTING	1	89	GIB STRIP-RIGHT	1
18	E-CLIP E-3	1	90	GIB TENSIONER	1
19	SPRING	1	91	MAGNET BASE	1
20	DETENT PIN	1	92	SPRING WASHER M6	3
21	SELECTOR TAB	1	93	SOCKET CAP BOLT M6 x 20	3
22	SPRING	1	94	LEAD WIRE	2
23	SHOULDER SCREW	1	95	LEAD WIRE	4
24	SELECTOR FORK	1	96	SIDE PLATE	1
25	BEARING HK 1010	3	97	SCREW M4 x 8	4
26	INTERMEDIATE GEAR PINION 10T	1	98	CRANK HANDLE 140mm	3
27	PARALLEL KEY 5 x 5 x 50	1	99	N/A	-
28	INTERMEDIATE GEAR 30T x 33T	1	100	CRANK SPINDLE	1
29	BEARING 6204 zz	1	101	N/A	-
30	INTERNAL CIRCLIP R-47	1	102	RECTIFIER	1
31	EXTERNAL CIRCLIP S-20	1	102-1	RECTIFIER & EMC	1
32	OUTPUT GEAR 39T	1	103	CABLE GLAND	1
33	EXTERNAL CIRCLIP S-15	1	104	STRAIN RELIEF 7CM	1
34	BEARING HK Ø810	2	105	CORD ARMOR	1
35	INPUT PINION 10T x 13T	1	106	POWER SUPPLY CABLE	1
36	PARALLEL KEY 5 x 5 x 8	1	107	FLAT WASHER Ø6 x Ø13 x 1	2
37	INPUT GEAR 29T	1	108	BUTTERFLY SCREW M6 x 10	2
38	GEAR PLATE	1	109	CHIP GUARD	1
39	BEARING 6202-2RS	1	110	SAFETY CHAIN	1
40	ARMATURE	1	111	M8 COMBINATION WRENCH M8	1
41	BEARING 6200-LLU	1	112	M2.5 L-HEX KEY M2.5	1
42	STATOR	1	113	M4 L-HEX KEY M4	1
43	MOTOR HOUSING	1	114	OVER LOAD PROTECTION (OPTIONAL)	1
44	NUT M4 x 8	10	115	N/A	-
45	BRUSH HOLDER 7 x 17 x 17	2	116	CHECK BALL Ø8	1
46	CARBON BRUSH 7 x 17 x 17	2	117	N/A	-
47	BRUSH SPRING	2	118	COLLAR	1
48	SCREW M4 x 12	4	119	COLLAR PIN	1
49	SCREW M4 x 10	2	120	RUBBER RING	1
50	MOTOR TAIL COVER	1	121	SPRING Ø2 x Ø39 x Ø43 x 3T x 30L	1
51	SCREW M4 x 20	4	122	STEEL RING Ø35.1 x Ø44.5 x 2	1
52	END SPLICE TERMINAL C-4	3	123	EXTERNAL CIRCLIP S-35	1
53	CORD CLIP	2	124	RUBBER WASHER Ø4 x Ø11 x 1	1
54	SCREW M4 x 16	2	125	SPADE TERMINAL	4
55	MOTOR COVER PLATE (PLASTIC)	1	126	TERMINAL COVER	8
56	FLAT HEAD SCREW M5 x 12	4	127	ZIP TIE	1
57	CABLE CLAMP	1	128	ARBOR SHAFT	1
58	MOTOR CABLE 2.0 x 2C x 90CM	1	129	SET SCREW M8 x 7	2
59	CABLE PROTECTOR 50CM	1	130	CHUCK ADAPTOR (OPTIONAL) M27x3 -5/8" x 16	1
60	COOLANT TUBE 18CM	1	131	CHUCK (OPTIONAL) 5/8"	1
61~64	N/A	-	132	N/A	-
65	COOLANT TANK ASSEMBLY 400cc	1	133	PILOT PIN (OPTIONAL) TCTx112LxØ8	1
66	COOLANT TANK BRACKET	1	134	SCREW M4 x 20	2
67	FLAT WASHER Ø5 x Ø12 x 1	2	135	SCREW M4 x 25	3
68	THUMB SCREW	2	136	LOCK PIN 11.7mm	2
69	SLIDE PLATE	1	137	SCREW M3 x 4	2
70	SOCKET CAP BOLT M8 x 20	2	138	LOCKING PIN SPRING	2
71	SOCKET CAP BOLT M8 x 16	3	139	QUICK RELEASE ARBOR SHAFT	1
72	GEAR RACK	1	140	EARTHING MARKING	1

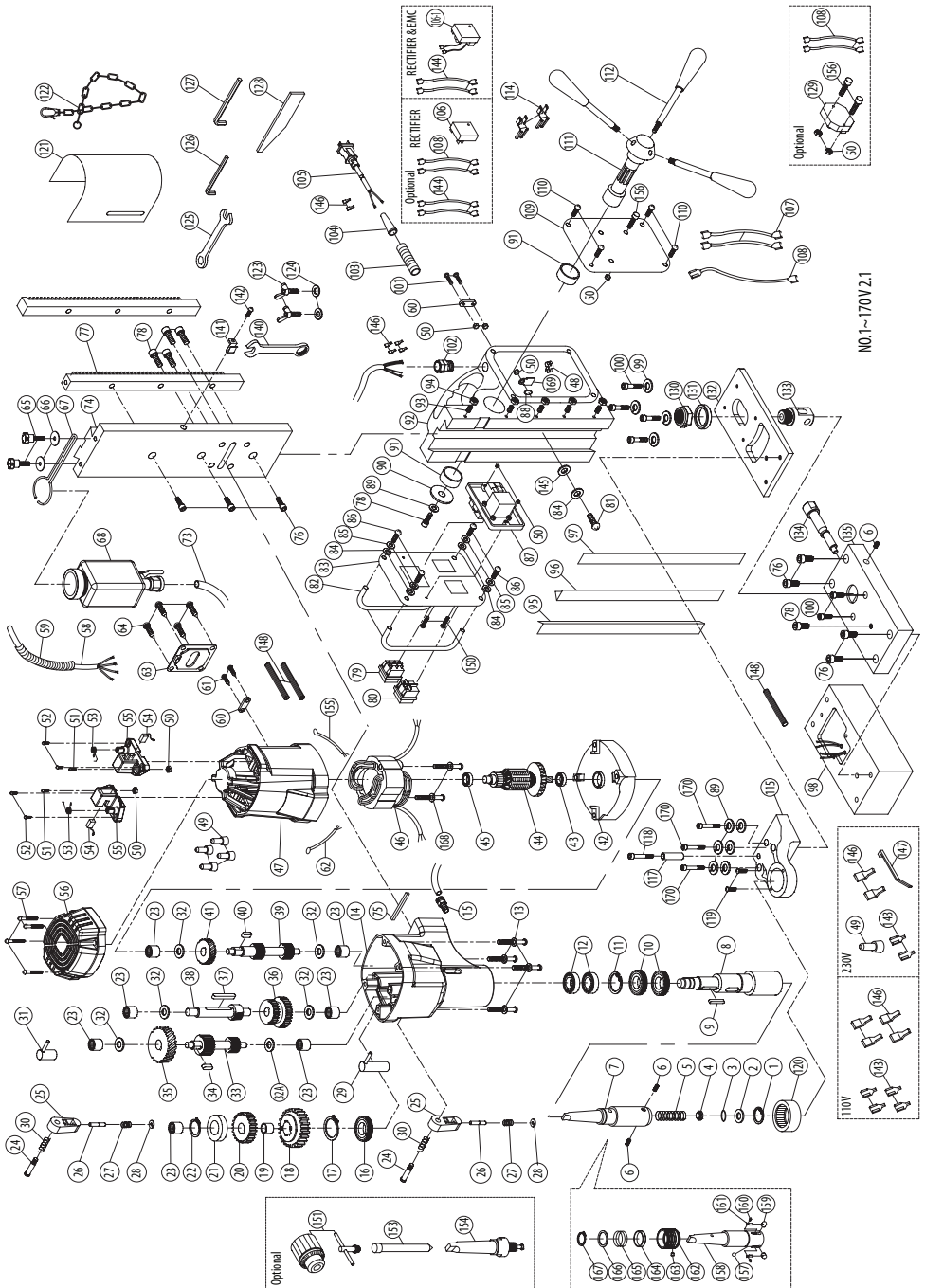
4 Speed Drilling System Exploded View & Parts list



NO.1~156V2.1

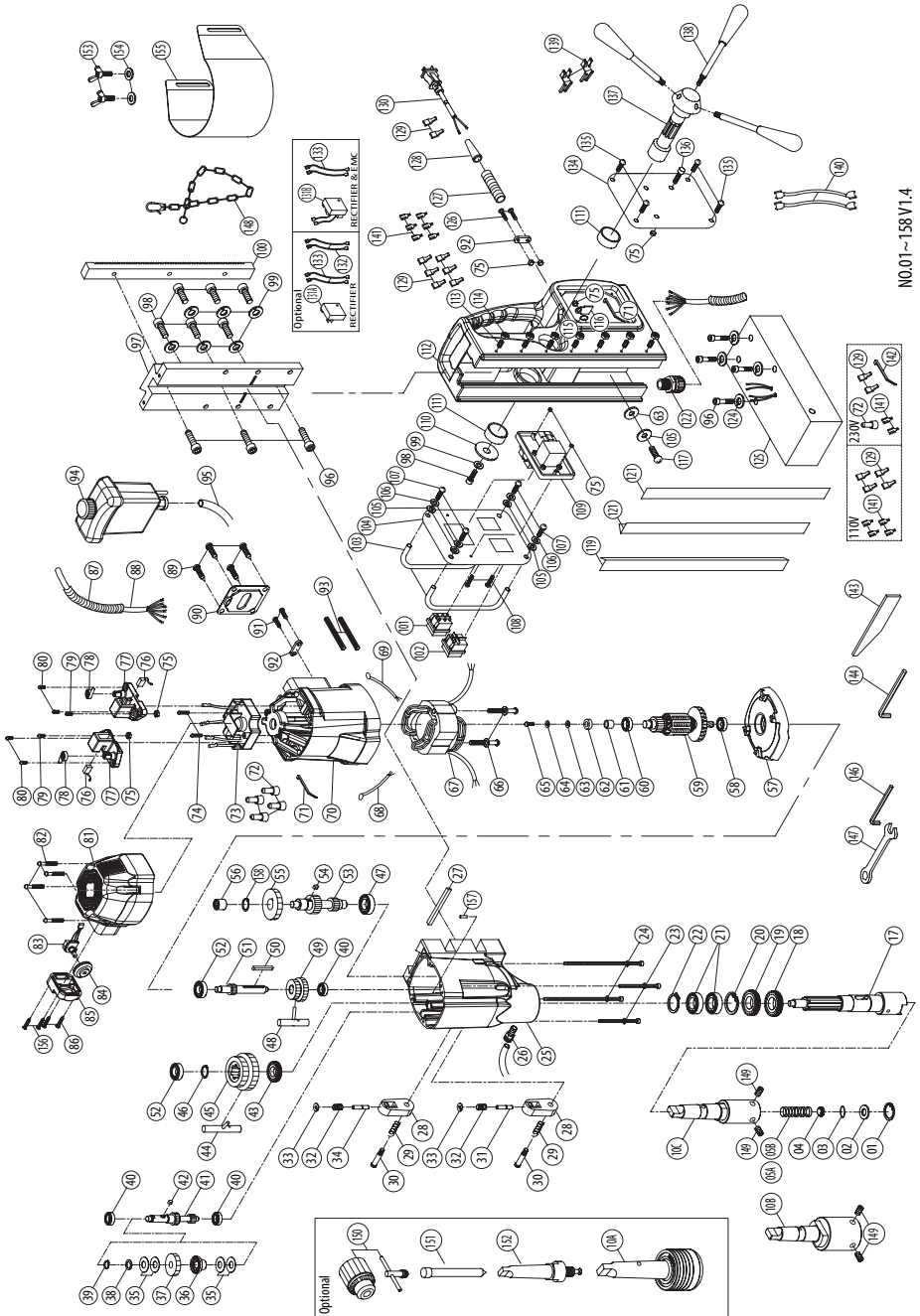
NO.	Parts Name	Q'TY	80	MAGNET SWITCH	1
1	INTERNAL CIRCLIP R-19	1	81	SCREW M4 x 16	1
2	ARBOR WASHER Ø10 x Ø18.5 x 0.8	1	82	GUARD BAR	2
3	O-RING Ø12 x 4	1	83	SWITCH PANEL	1
4	COOLANT SEAL Ø12 x Ø10.2 x 15	1	84	FLAT WASHER Ø4 x Ø10 x 1	5
5A	SPRING Ø1.2 x Ø10 x Ø12.4 x 24T x 140L	1	85	SPRING WASHER M4	4
5B	SPRING Ø1.2 x Ø10 x Ø12.4 x 15T x 100L	1	86	SOCKET CAP SCREW M4 x 16	4
6	SET SCREW M8 x 7	2	87	MOTOR SWITCH	1
7	MT3 ARBOR	1	88	STAR WASHER M5	1
8	SPINDLE	1	89	SPRING WASHER M8	4
9	PARALLEL KEY 5 x 5 x 40	1	90	FLAT WASHER Ø8 x Ø40 x 2.5	1
10	OIL SEAL Ø40 x Ø55 x 7	2	91	BUSHING Ø32 x Ø38 x 12	2
11	INTERNAL CIRCLIP R-55	1	92	STAND BODY	1
12	BEARING 6006 LLB	2	93	SET SCREW M5 x 25	5
13	SCREW M5 x 65	4	94	NUT M5	5
14	GEAR CASE 75/KG	1	95	GIB STRIP-LEFT 308mm	1
15	PUSH LOCK FITTING	1	96	GIB STRIP-RIGHT 308mm	1
16	OIL SEAL Ø30 x Ø45 x 5	1	97	GIB STRIP TENSIONER 308 x 1.5 x 2.3	1
17	EXTERNAL CIRCLIP S-30	1	98	MAGNET BASE	1
18	LOW SPINDLE GEAR 21T	1	99	SPRING WASHER M6	3
19	BUSHING Ø18 x Ø20 x 11.5	1	100	SOCKET CAP BOLT M6 x 20	3
20	HIGH SPINDLE GEAR 25T	1	101	SCREW M4 x 30	2
21	SPACER	1	102	CABLE GLAND	1
22	INTERNAL CIRCLIP S-14	1	103	STRAIN RELIEF 7CM	1
23	BEARING HK 1010	7	104	CORD ARMOR	1
24	SHOULDER SCREW	2	105	POWER SUPPLY CABLE	1
25	SELECTOR TAB	2	106	RECTIFIER & EMC(OPTIONAL)	1
26	DETENT PIN	2	106-1.)	RECTIFIER & EMC(OPTIONAL)	1
27	SPRING Ø0.6 x Ø5.3 x Ø6.5 x 5T x 17L	2	107	WIRE LEADS	2
28	E-CLIP E-3	2	108	WIRE LEADS	5
29	FIRST SELECTOR FORK	1	109	SIDE COVER	1
30	SPRING Ø1 x Ø9 x Ø11 x 4T	2	110	SCREW M4 x 8	4
31	SECOND SELECTOR FORK	1	111	CRANK SPINDLE	1
32	FLAT WASHER 1024	5	112	CRANK HANDLE 140mm	3
32A	THRUST WASHER Ø13 x Ø24 x 1	1	113	N/A	-
33	IDLER PINION 16T x 7T	1	114	THREE WAY CONNECTOR	2
34	PARALLEL KEY 5 x 5 x 10	1	115	ARBOR SUPPORT BRACKET	1
35	IDLER GEAR 36T	1	116	SOCKET CAP BOLT M8 x 25	3
36	INTERMEDIATE GEAR 28T x 30T	1	117	TRAVEL STOP	1
37	PARALLEL KEY 5 x 5 x 50	1	118	SOCKET CAP BOLT M6 x 45	1
38	COUNTERSHAFT PINION 12T	1	119	TRUSS HEAD SCREW M4 x 8	2
39	INPUT PINION 10T x 12T	1	120	BEARING HK 3516	1
40	PARALLEL KEY 5 x 5 x 8	1	121	CHIP GUARD	1
41	INPUT GEAR 29T	1	122	SAFETY CHAIN	1
42	GEAR PLATE	1	123	BUTTERFLY SCREW M6 x 10	2
43	BEARING 6202-2RS	1	124	FLAT WASHER Ø6 x Ø13 x 1	2
44	ARMATURE	1	125	M8 COMBINATION WRENCH M8	1
45	BEARING 6200-LLU	1	126	M2.5 L-HEX KEY M2.5	1
46	STATOR	1	127	M4 L-HEX KEY M4	1
47	MOTOR HOUSING	1	128	DRIFT	1
48	CABLE CLAMP	1	129	OVERLOAD(OPTIONAL)	1
49	END SPlice TERMINAL C4	5	130	SPADE TERMINAL	4
50	NUT M4 x 8	10	131	WIRE LEADS(OPTIONAL)	2
51	SCREW M4 x 10	2	132	RUBBER WASHER Ø4 x Ø11 x 1	1
52	SCREW M4 x 12	4	133	TERMINAL COVER	10
53	BRUSH SPRING	2	134	ZIP TIE	1
54	CARBON BRUSH 7 x 17 x 17	2	135	SILICON TUBE M4 x 12CM	2
55	BRUSH HOLDER 7 x 17 x 17	2	136	N/A	-
56	MOTOR TAIL COVER	1	137	SCREW M4 x 20	2
57	SCREW M4 x 20	4	138	CHUCK(OPTIONAL) 5/8"	1
58	MOTOR CABLE 2.0 x 4C x 86cm	1	139	N/A	-
59	CABLE PROTECTOR 50cm	1	140	PILOT PIN(OPTIONAL) TCTx112LxØ8	1
60	CORD CLIP	2	141	MT3 CHUCK ADAPTOR(OPTIONAL)	1
61	SCREW M4 x 16	2	142	SCREW M4 x 25	3
62	WIRE LEADS	1	143	WIRE LEADS	1
63	MOTOR COVER PLATE (PLASTIC)	1	144	CHECK BALL Ø8	1
64	SCREW M5 x 12	4	145	QUICK-RELEASE ARBOR	1
65	THUMB SCREW M5 x 16	2	146	LOCK PIN	1
66	FLAT WASHER Ø5 x Ø12 x 1	2	147	SCREW M3 x 4	1
67	COOLANT TANK BRACKET	1	148	LOCK PIN SPRING	1
68	COOLANT TANK ASSEMBLY	1	149	QUICK-RELEASE COLLAR	1
69-72	N/A	-	150	COLLAR PIN	1
73	COOLANT TUBE 18cm	1	151	RUBBER RING	1
74	SLIDE PLATE 348mm	1	152	SPRING Ø2 x Ø39 x Ø43 x 30L x 3T	1
75	PARALLEL KEY M4 x 4 x 30	1	153	STEEL RING Ø35.1 x Ø44.5 x 2	1
76	SOCKET CAP BOLT M8 x 20	3	154	EXTERNAL CIRCLIP S-35	1
77	GEAR RACK 270cm	1	155	SCREW M5 x 60	2
78	SOCKET CAP BOLT M8 x 16	5	156	EARTHING MARKING	1
79	REVERSING SWITCH	1			

4 Speed Swivel Base Drilling System Exploded View & Parts list



NO.	Parts Name	Q'TY	86	SOCKET CAP SCREW M4x16	4
1	INTERNAL CIRCLIP R-19	1	87	MOTOR SWITCH	1
2	ARBOR WASHER Ø10 x Ø18.5 x 0.8	1	88	STAR WASHER M5	1
3	O-RING 12 x 4	1	89	SPRING WASHER M8	7
4	COOLANT SEAL Ø10.2 x Ø12 x 15	1	90	FLAT WASHER Ø8 x Ø40 x 2.5	1
5	SPRING Ø1.2 x Ø10 x Ø12.4 x 24T x 140L	1	91	BUSHING Ø32 x Ø38 x 12	2
6	SET SCREW M8 x 7	3	92	STAND BODY	1
7	MT3 ARBOR	1	93	SET SCREW M5 x 25	5
8	SPINDLE	1	94	NUT M5	5
9	PARALLEL KEY 5 x 5 x 40	1	95	GIB STRIP-LEFT 308mm	1
10	OIL SEAL Ø40 x Ø55 x 7	2	96	GIB STRIP-RIGHT 308mm	1
11	INTERNAL CIRCLIP R-55	1	97	GIB STRIP TENSIONER 308 x 1.5 x 2.3	1
12	BEARING 6006-2LLB	2	98	MAGNET	1
13	SCREW M5 x 65	4	99	SPRING WASHER M6	4
14	GEAR CASE	1	100	SOCKET CAP BOLT M6 x 20	6
15	PUSH LOCK FITTING	1	101	SCREW M4 x 30	2
16	OIL SEAL Ø30 x Ø45 x 5	1	102	CABLE GLAND	1
17	EXTERNAL CIRCLIP S-30	1	103	STRAIN RELIEF 7CM	1
18	LOW SPINDLE GEAR 21T	1	104	CORD ARMOR	1
19	BUSHING Ø18 x Ø20 x 11.5	1	105	POWER SUPPLY CABLE	1
20	HIGH SPINDLE GEAR 25T	1	106	RECTIFIER & EMC(OPTIONAL)	1
21	SPACER	1	106-1	RECTIFIER & EMC(OPTIONAL)	1
22	INTERNAL CIRCLIP S-14	1	107	WIRE LEADS	2
23	BEARING HK 1010	7	108	WIRE LEADS	5
24	SHOULDER SCREW	2	109	SIDE COVER	1
25	SELECTOR TAB	2	110	SCREW M4 x 8	4
26	DETENT PIN	2	111	CRANK SPINDLE	1
27	SPRING Ø0.6 x Ø5.3 x Ø6.5 x 5T x 17L	2	112	CRANK HANDLE 140mm	3
28	E-CLIP E-3	2	113	N/A	-
29	FIRST SELECTOR FORK	1	114	THREE WAY CONNECTOR	2
30	SPRING Ø1.0 x Ø9 x Ø11 x 4T	2	115	ARBOR SUPPORT BRACKET	1
31	SECOND SELECTOR FORK	1	116	N/A	-
32	THRUST WASHER 1024	5	117	TRAVEL STOP	1
32A	THRUST WASHER Ø13xØ24x1	1	118	SOCKET CAP BOLT M6 x 45	1
33	IDLER PINION 16T x 7T	1	119	TRUSS HEAD SCREW M4 x 8	2
34	PARALLEL KEY 5 x 5 x 10	1	120	BEARING HK 3516	1
35	IDLER GEAR 36T	1	121	CHIP GUARD	1
36	INTERMEDIATE GEAR 28T x 30T	1	122	SAFETY CHAIN	1
37	PARALLEL KEY 5 x 5 x 50	1	123	BUTTERFLY SCREW M6 x 10	2
38	COUNTERSHAFT PINION 12T	1	124	FLAT WASHER Ø6 x Ø13 x 1	2
39	INPUT PINION 10T x 12T	1	125	M8 COMBINATION WRENCH M8	1
40	PARALLEL KEY 5 x 5 x 8	1	126	M2.5 L-HEX KEY M2.5	1
41	INPUT GEAR 29T	1	127	M4 L-HEX KEY M4	1
42	GEAR PLATE	1	128	DRIFT	1
43	BEARING 6202-2NSE	1	129	OVERLOAD	1
44	ARMATURE	1	130	NYLOCK NUT M22	1
45	BEARING 6200-LLU	1	131	WASHER Ø30.1 x Ø40 x 5	1
46	STATOR	1	132	SWIVEL PLATE	1
47	MOTOR HOUSING	1	133	LOCKING POST	1
48	CABLE CLAMP	1	134	LOCKING LUG	1
49	END SPLICE TERMINAL C4	5	135	MOUNTING PLATE	1
50	NUT M4 x 8	10	136	SOCKET SET SCREW M8 x 7	1
51	SCREW M4 x 10	2	137~139	N/A	-
52	SCREW M4 x 12	4	140	M17 OPEN-END WRENCH M17	1
53	BRUSH SPRING	2	141	CLIP	1
54	CARBON BRUSH 7 x 17 x 17	2	142	SCREW M5 x 8	4
55	BRUSH HOLDER 7 x 17 x 17	2	143	SPADE TERMINAL	1
56	MOTOR TAIL COVER	1	144	WIRE LEADS	2
57	SCREW M4 x 20	4	145	RUBBER WASHER Ø4 x Ø11 x 1	1
58	MOTOR CABLE 2.0 x 4C x 86cm	1	146	TERMINAL COVER	10
59	CABLE PROTECTOR 50cm	1	147	ZIP TIE	1/1000
60	CORD CLIP	2	148	SILICON TUBE M4 x 12CM 3	6/100
61	SCREW M4 x 16	2	149	N/A	-
62	WIRE LEADS	1	150	SCREW M4 x 20	2
63	MOTOR COVER PLATE (PLASTIC)	1	151	CHUCK(OPTIONAL) 5/8"	1
64	SCREW M5 x 12	4	152	N/A	-
65	THUMB SCREW	2	153	PILOT PIN(OPTIONAL) 112L	1
66	FLAT WASHER Ø5 x Ø12 x 1	2	154	MT3 CHUCK ADAPTOR(OPTIONAL)	1
67	COOLANT TANK BRACKET	1	155	WIRE LEADS	1
68	COOLANT TANK ASSEMBLY	1	156	SCREW M4 x 25	3
69~72	N/A	-	157	CHECK BALL Ø8	1
73	COOLANT TUBE 18cm	1	158	QUICK-RELEASE ARBOR	1
74	SLIDE PLATE 348mm	1	159	LOCK PIN	2
75	PARALLEL KEY 4 x 4 x 30	1	160	SCREW M3 x 4	2
76	SOCKET CAP BOLT M8 x 20	7	161	LOCKING PIN SPRING	2
77	GEAR RACK 270cm	1	162	QUICK-RELEASE COLLAR	1
78	SOCKET CAP BOLT M8 x 20	6	163	COLLAR PIN	1
79	REVERSING SWITCH	1	164	RUBBER RING Ø40 x Ø44 x 9	1
80	MAGNET SWITCH	1	165	SPRING Ø2 x Ø39 x Ø43 x 30L x 3T	1
81	SCREW M4 x 16	1	166	STEEL RING Ø35.1 x Ø44.5 x 2	1
82	GUARD BAR	2	167	EXTERNAL CIRCLIP S-35	1
83	SWITCH PANEL	1	168	SCREW M5 x 60	2
84	FLAT WASHER Ø4 x Ø10 x 1	5	169	EARTHING MARKING	1
85	SPRING WASHER M4	4	170	SOCKET CAP BOLT M8 x 25	3

4 Speed Variable Motor Speed Drilling System Exploded View & Parts List



NO.01~158 V1.4

NO.	Parts Name	Q'TY	NO.	Parts Name	Q'TY
1	INTERNAL CIRCLIP R-19	1	83	RHEOSTAT	1
2	ARBOR WASHER 010 x 018.5 x 0.8	1	84	THUMB WHEEL	1
3	O-RING 12 x 4	1	85	SPEED ADJUSTOR COVER	1
4	COOLANT SEAL 012 x 010.2 x 15	1	86	FLAT HEAD SCREW M4 x 16	2
5A	SPRING-for 10B.) 01.2 x 010.1 x 012.5 x 15T x 100L	1	87	CABLE PROTECTOR 65cm	1
5B	SPRING-for 10C.) 01.2 x 010 x 012.4 x 24T x 140L	1	88	MOTOR CABLE 90cm	1
6-9	N/A	-	89	SCREW M5 x 10	4
10A	3/4" QUICK-RELEASE ARBOR-MT3 (LOCKING PIN 12.3mm,11.7mm)	1	90	COVER PLATE	1
10B	1-1/4" CUTTER ARBOR-MT3 31.7mm	1	91	SCREW M4 x 16	2
10C	3/4" CUTTER ARBOR-MT3 19MM	1	92	CORD CLIP	2
11-15	N/A	-	93	CABLE SHEATH M4 x 12CM	2
16	EXTERNAL CIRCLIP S-35	1	94	COOLANT TANK ASSEMBLY	1
17	SPINDLE	1	95	COOLANT TUBE 40cm	1
18	OIL SEAL 040 x 058 x 8	1	96	SOCKET CAP BOLT M8 x 20	7
19	OIL SEAL 040 x 055 x 7	1	97	SLIDE	1
20	INTERNAL CIRCLIP R-55	1	98	SOCKET CAP BOLT M8 x 16	7
21	BALL BEARING 6006-LLB	2	99	SPRING WASHER M8	7
22	EXTERNAL CIRCLIP S-30	1	100	GEAR RACK 270cm	1
23	SCREW M5 x 80	2	101	REVERSING SWITCH	1
24	SCREW M5 x 150	2	102	MAGNET SWITCH	1
25	GEAR CASE	1	103	GUARD BAR	2
26	PUSH LOCK FITTING	1	104	SWITCH PANEL	1
27	MOUNTING TENON M4 x 4 x 60	1	105	FLAT WASHER 04 x 010 x 1	5
28	SELECTORTAB	2	106	SPRING WASHER M4	4
29	SPRING 01 x 09 x 011 x 4T	2	107	SOCKET CAP BOLT M4 x 16	4
30	SHOULDER SCREW	2	108	SCREW M4 x 20	2
31	DETENT PIN	1	109	MOTOR SWITCH	1
32	SPRING 00.6 x 05.3 x 06.5 x 5T x 17L	2	110	FLAT WASHER 08 x 040 x 2.5	1
33	E-CLIP E-3	2	111	CRANK BUSHING 032 x 038 x 12	2
34	DETENT PIN	1	112	STAND BODY	1
35	DISC SPRING 012.4 x 027.9	4	113	SET SCREW M5 x 35	7
36	TOOTH CLUTCH	1	114	NUT M5	7
37	CLUTCH GEAR	1	115	STAR WASHER M5	1
38	THRUST WASHER 012.1 x 018 x 1.6	1	116	EARTHING MARKING	1
39	EXTERNAL CIRCLIP E-10	1	117	SCREW M4 x 16	1
40	BALL BEARING 608 zz	3	118	N/A	-
41	INPUT PINION M1.25 x 15T & 10T	1	119	GIB STRIP-LEFT 394mm	1
42	PARALLEL KEY M5 x 5 x 10	1	120	GIB STRIP-RIGHT 394mm	1
43	OIL SEAL 028 x 038 x 7	1	121	GIB STRIP TENSIONER 394 x 15 x 1.2	1
44	FIRST SELECTOR FORK	1	122	CABLE GLAND	1
45	SPINDLE GEAR M1.75 x 27T M2.0 x 29T	1	123	N/A	-
46	INTERNAL CIRCLIP S-25	1	124	SPRING WASHER M6	4
47	BALL BEARING 6202 zz ZZ	1	125	MAGNET BASE	1
48	SECOND SELECTOR FORK	1	126	SCREW M4 x 30	2
49	INTERMEDIATE GEAR M1.25 x 27T & 32T	1	127	STRAIN RELIEF 7CM	1
50	PARALLEL KEY 5 x 5 x 45	1	128	CORD ARMOR	1
51	COUNTERSHAFT PINION 12T	1	129	TERMINAL COVER	12
52	BALL BEARING 6200 zz ZZ	2	130	POWER SUPPLY CABLE	1
53	IDLER PINION M1.75 x 17T M2.0 x 9T	1	131A	RECTIFIER & EMC(OPTIONAL)	1
54	PARALLEL KEY M5 x 5 x 8	1	131B	RECTIFIER & EMC(OPTIONAL)	1
55	IDLER GEAR M1.25 x 43T	1	131B	RECTIFIER & EMC(OPTIONAL)	1
56	NEEDLE BEARING TLA 1212	1	132	WIRE LEADS	2
57	GEAR PLATE	1	133	WIRE LEADS(OPTIONAL) 1015-16#18CM	2
58	BALL BEARING 6202-2NSE	1	134	SIDE COVER	1
59	ARMATURE	1	135	SCREW M4 x 8	4
60	BALL BEARING 6200-LLU	1	136	SCREW M4 x 25	1
61	SPACER 08 x 012 x 10.5	1	137	CRANK PINION	1
62	PICKUP MAGNET 08 x 015 x 5	1	138	CRANK HANDLE	3
63	PLASTIC WASHER 04 x 011 x 1	2	139	3 WAY CONNECTOR	2
64	FLAT WASHER 04 x 010 x 1	1	140	WIRE LEADS	2
65	SCREW M4 x 10	1	141	SPADE TERMINAL	10
66	SCREW M5 x 60	2	142	ZIP TIE	1
67	STATOR	1	143	DRIFT	1
68	WIRE LEADS	1	144	L HEX KEY (OPTIONAL) 5mm M5	1
69	WIRE LEADS	1	145	N/A	-
70	MOTOR HOUSING	1	146	L HEX KEY 2.5mm M2.5	1
71	ZIP TIE 2.5mmX160mm	2	147	M8 COMBINATION WRENCH M8	1
72	END SPLICE CONNECTOR C4	5	148	SAFETY CHAIN	1
73	ELECTRONICS UNIT(110V,220V)	1	149	SOCKET SET SCREW M10 x 10	2
74	SCREW M4 x 25	2	150	CHUCK(OPTIONAL) 5/8"	1
75	NUT M4 x 8	8	151	PILOT PIN(OPTIONAL) TCTx112Lx08	1
76	CARBON BRUSH 7 x 17 x 17	2	152	MT3 CHUCK ADAPTOR(OPTIONAL)	1
77	BRUSH HOLDER 7 x 17 x 17	2	153	BUTTERFLY BOLT M6 x 10	2
78	BRUSH SPRING	2	154	FLAT WASHER 06 x 013 x 1	2
79	SCREW M4 x 10	2	155	CHIP GUARD	1
80	SCREW M4 x 12	4	156	FLAT HEAD SCREW M4 x 20	2
81	MOTOR TAIL COVER	1	157	PIN 05 x 10	1
82	SCREW M4 x 30	4	158	INTERNAL CIRCLIP S-20	1

