Rotabroach™

ELEMENT 50

Magnetic drilling & tapping machine

Model Number Element 50/1T, Element 50/3T

This machine (Serial Number .....) is CE approved.

Rotabroach®

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Thank you for purchasing our Element 50 magnetic drill.
We would really like your feedback on the machine.

Other products by Rotabroach:

Thank you for your purchase of our product.

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P/N	List of Contents with Magnetic Drill Unit
RDC4082	Stationary ring
RDC4083	Safety belt
RD4152	3mm hexagonal spanner
RDC4084	13mm Chuck
CA120	Arbor assembly – 6mm hexagonal spanner included
RDC4086	Drift
RDC4087	Arbor shank
RDA3105	Safety glasses
RDC4088	Spare brush-230V
RDC4089	Spare brush-110V

1) INTENDED USE

The intended use of this magnetic drill is to drill holes in ferrous metals. The magnet is used to hold the drill in place whilst the drill is functioning. It is designed for use in fabrication, construction, railways, petrochemical and any other applications when drilling ferrous metal. Any deviation from its intended use will not be covered by warranty.

2) GENERAL SAFETY RULES

WARNING! When using electric tools basic safety precautions should always be followed to reduce the risk of fire, electric shock and personal injury, including the following. Please read all of these instructions before attempting to operate the machine.

1. Remove the power supply before carrying out any adjustment, servicing or maintenance.1.
2. Keep work area clear - cluttered areas and benches invite injuries.
3. Consider work area environment;
   - Do not expose tools to rain.
   - Do not use tools in damp or wet locations.
   - Keep work area well lit (500 Lux recommended).
   - Do not use tools in the presence of flammable liquids or gases.
   - Ensure there is adequate space to gain access to the plug, mains and motor on/off switches.
4. Guard against electric shock:
   - Avoid body contact with earthed or ground surfaces (e.g. pipes, radiators, cookers and refrigerators). Electric safety can be further improved by using a high-sensitivity (30 m A/0.1s) residual current device (RCD).
5. Keep other persons away. Do not let untrained persons, especially children, touch the tool or the extension cord and keep them away from the work area.
6. Store idle tools when not in use. All tools should be stored in a dry locked-up place, out of reach of children.
7. Do not apply too much force through the machine. It will do a better and safer job at the feeds for which it was designed.
8. Use the right tool;
   - Do not force small tools to do the job of a heavy duty tool.
   - Do not use this tool for purposes not intended: e.g. do not use the magnetic drill to cut tree logs.
9. Dress properly;
   - Do not wear loose clothing or jewellery; they can be caught in moving parts.
   - Non-skid footwear is recommended when working outdoors.
   - Wear a protective hair covering to contain long hair. This will reduce the risk of entanglement.
10. Use protective equipment when using this machine;
    - Use safety glasses to prevent debris from damaging eyes.
    - Use ear defenders or ear plugs for hearing protection.
    - Use face or dust masks if cutting operations create dust.
    - Use protective gloves to prevent swarf or debris cutting the skin.
11. When using the drill, always ensure a safe operating distance from any swarf and do not reach into the cutting area, or near the cutter, when the machine is running.
12. Connect dust extraction and collecting equipment, if devices are provided, ensuring these are properly connected and used.
13. Do not abuse the cord; never pull the cord to disconnect it from the socket. Keep the cord away from heat, oil and sharp edges.
14. Secure work where possible, use clamps or a vice to hold the work. It is safer than using your hand.
15. Do not overreach! Keep proper footing and balance at all times.
16. Maintain tools with care;
    - Keep cutting tools sharp and clean for better and safer performance.
    - Regularly check the machine for any wear or damage.
    - Ensure the machine is clean and free from debris prior to use.

- Remove from the mains prior to any maintenance.
- Follow instructions for lubricating and changing accessories.
- Inspect tool cords periodically and if damaged have it repaired by an authorized Rotabroach service facility.
- Inspect extension cords periodically and replace if damaged.
- Keep handles dry, clean and free from oil and grease.

17. Disconnect tools from the power supply when not in use, before servicing or when changing accessories such as cutters.
18. Form the habit of checking to see that keys and adjusting wrenches are removed from the tool before turning it on.
19. Avoid unintentional starting. Ensure the magnet is off before plugging the machine in.
20. Use extension leads only intended for outdoor use when the tool is used outdoors.
21. The vibration emissions during actual use can differ from the declared total value depending on the ways in which the tool is being used.
22. Watch what you are doing, use common sense and do not operate the tool when you are tired. Do not operate the machine when under the influence of alcohol or any illegal substances.
23. Check for damaged or missing parts before use of the tool; it should be carefully checked to determine that it will operate properly for its intended function.
24. The use of any accessory or attachment, other than ones recommended in this instruction manual, may present a risk of personal injury.
25. Have your machine repaired by a qualified Rotabroach technician. This electric tool complies with the relevant safety rules. Qualified persons using original spare parts should only carry out repairs otherwise this may result in considerable danger to the user.
26. Never operate the machine if parts are missing or damaged.
27. Never direct jets of water or flammable liquids over the drill.
28. Operator must be physically able to handle the weight of the machine.
29. Operator should be trained in the use of the machine.

3) INFORMATION PLATE SYMBOLS

1

2

3

4

1. Refer to the user manual for operational and safety issues with regard to this machine.

2. Dispose of the machine and electrical components correctly.

3. Eye protection must be worn when operating the machine.

4. Ear defenders must be worn when operating the machine.

4) SPECIFICATION

Maximum hole cutting capacity in .2/.3C steel = 50mm dia. x 50mm deep

Arbor bore = MT2

Motor Unit				
Voltages	110V 50-60Hz		230V 50-60Hz	
Normal full load	14.9 A	1500W	6.9 A	1500W
Electro Magnet	0.53 A	56W	0.28 A	61W
Size	200mm long 98mm wide			
Holding Force at 20°C with 25mm minimum plate thickness **The use on any material less than 25mm thick will progressively reduce the magnetic performance. If possible, substitute material should be positioned under the magnet and work piece to equate to a suitable material thickness. If this is not possible, an alternative secure method of restraining the machine must be used.**	13500N			
Total Load (magnet + motor)	1556W		1561W	
Overall Dimensions				
Height - maximum extended	586mm			
Height - minimum	446mm			
Width (including capstan fitting)	195mm			
Length Overall (including guard)	315mm			
Nett Weight	15.5kgs		15.2kgs	
	Element 50/1T		Element 50/3T	
Vibration total values (triax vector sum) in accordance with EN61029-1:	Vibration emission value (a_h):3.562m/s² Uncertainty(K):1.5m/s²		Vibration emission value (a_h):3.527 m/s² Uncertainty(K):1.5m/s²	
Level of sound pressure in accordance with EN61029-1:	*Sound pressure(LpA)*: 87.0 dB(A) *Acoustic power(LwA)*: 100.0 dB(A) Uncertainty(K)：3dB(A)		*Sound pressure(LpA)*: 86.0 dB(A) *Acoustic power(LwA)*: 99.0 dB(A) Uncertainty(K)：3dB(A)	

Ear and eye defenders must be worn when operating this machine. Wear gloves to protect hands when operating the machine.

These tools are UK designed and manufactured with globally sourced components and conform with the requirements of EEC Document HD.400.1 and BS.2769/84

Suitable only for a single phase 50-60Hz A.C. power supply

DO NOT USE ON D.C. SUPPLY

Do not use your magnetic drill on the same structure when arc welding is in progress. D.C. current will earth back through the magnet and cause irreparable damage.

WARNING: THIS APPLIANCE MUST BE EARTHED!

NB: ANY MODIFICATIONS TO THIS MACHINE WILL INVALIDATE THE GUARANTEE

5) OPERATIONAL SAFETY PROCEDURES

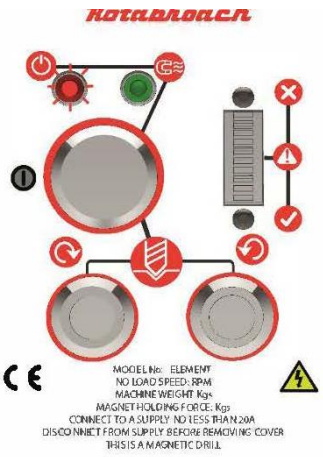
READ BEFORE USING THE MACHINE

- When using electrical tools, basic safety precautions should always be followed to reduce the risk of electric shock, fire and personal injury.
- Ensure the magnet is off before plugging in the machine.
- Do not use in wet or damp conditions. Failure to do so may result in personal injury.
- Do not use in the presence of flammable liquids, gases or in high risk environments. Failure to do so may result in personal injury.
- Before activating the machine, inspect all electrical supply cables (including extension leads) and replace if damaged. Do not use if there are any signs of damage.
- Only use extension cables approved for site conditions.
- Before activating the machine, always check the correct function of all operational systems, switches, magnet etc.
- Before operating, the machine must be securely restrained to a fixed independent feature by using safety strap RDC4083 and stationary rings RDC4082. Affix the stationary rings into the magnet, uppermost side hole to reduce the potential free movement. Should the magnet become detached from the work piece. Failure to do so may result in personal injury.
- Always wear approved eye protectors, ear defenders and recommended PPE when operating the machine.
- Disconnect from power source when changing cutters or working on the machine.
- Cutters and swarf are sharp, always ensure that hands are adequately protected when changing cutters or removing swarf. Use a tool or brush where necessary to remove any swarf or the cutter from the arbor.
- Before operating the machine, always ensure cutter-retaining screws are secured tightly.
- Regularly clear the work area and machine of swarf and dirt, paying particular attention to the underside of the magnet base.
- Always remove tie, rings, watches and any loose adornments that might entangle with the rotating machinery before operating.
- Always ensure that long hair is securely enclosed by an approved restraint before operating the machine.
- Should the cutter become stuck in the work piece, stop the motor immediately to prevent personal injury. Disconnect from power source and turn arbor to and fro. Do not attempt to free the cutter by switching the motor on and off. Wear safety gloves to remove the cutter from the arbor.
- If the machine is accidentally dropped, always thoroughly examine the machine for signs of damage and check that it functions correctly before resuming drilling.
- Regularly inspect the machine and check for any damaged or loose parts.
- Always ensure when using the machine in an inverted position that only the minimum amount of coolant is used and that care is taken to ensure that coolant does not enter the motor unit.
- Cutting tools may shatter, always position the guard over the cutter before activating the machine. Failure to do so may result in personal injury.
- On completion of the cut, a slug will be ejected.
- When not in use always store the machine in a safe and secure location.
- Always ensure that approved ROTABROACH™ agents conduct repairs.

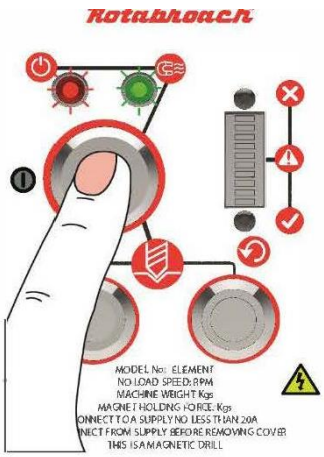
6) OPERATING INSTRUCTIONS

- Keep the inside of the cutter clear of swarf. It restricts the operating depth of the cutter.
- Ensure that the coolant bottle contains sufficient cutting oil to complete the required operating duration. Refill as required.
- Occasionally depress the pilot to ensure cutting fluid is being correctly metered.
- To start the machine, follow the control panel operation instructions. The Element machine is fitted with a dual motor protection system to fully ensure safety and extended life of the motor. The CutSmart protection (found on the control panel) gives a clear and visible indication to the user of torque being applied to the motor, once the prescribed level is reached the motor is protected by automatic cut out. To re-start your machine, the operator will simply press the start button again (blue tapping button should a protection mode occur during tapping). If, however the speed controller protection is activated, this is torque sensor regulated at a pre-determined value above CutSmart (should CutSmart fail to operate) the operator is required to press the start button twice to re-activate the machine.
- Always switch off the motor by depressing the green start/stop button or blue button depending upon operation. Do not switch off the motor by pressing the magnet switch.
- Apply light pressure when commencing the cut of a hole until the cutter is introduced into the work surface. Pressure can then be increased sufficiently to load the motor. Excessive pressure is undesirable, it does not increase the speed of penetration and will cause the safety overload protection device to stop the motor (the motor can be restarted by operating the motor start button) and may cause excessive heat which may result in inconsistent slug ejection
- Always ensure that the slug has been ejected from the previous hole before commencing to cut the next.
- If the slug sticks in the cutter, move the machine to a flat surface, switch on the magnet and gently bring the cutter down to make contact with the surface. This will usually straighten a cocked slug and allow it to eject normally.
- Apply a small amount of light oil lubricant regularly to the slide.
- Cutter breakage is usually caused by insecure anchorage or a loosely fitting slide (Refer to routine maintenance instructions).
- Only use approved cutting fluid. Rotabroach cutting fluid has been specially formulated to maximise the cutters performance.

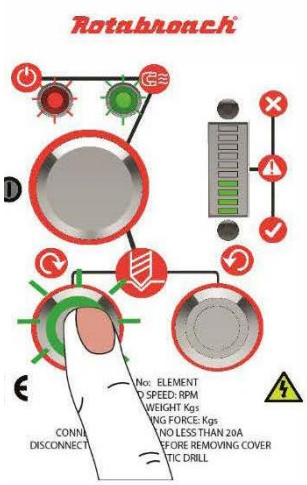
7) CONTROL PANEL OPERATION



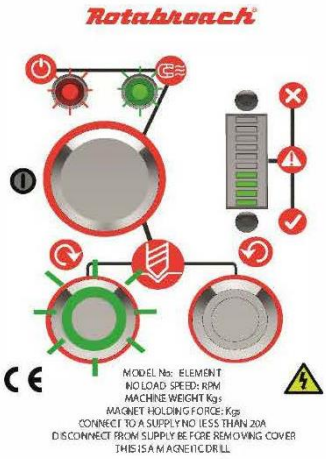
1) Power
When the drill is connected to the power supply, the RED LED will indicate power to the drill.



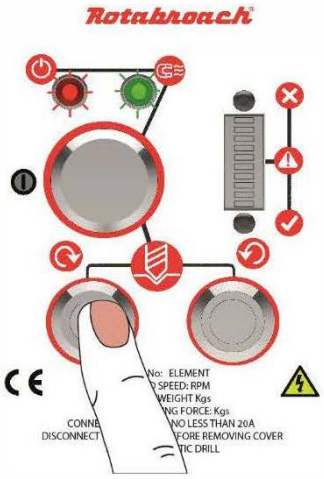
2) Magnet ON
To turn the magnet ON or OFF, press the large button on the control panel. The LED will illuminate either GREEN or RED depending on material thickness.



3) Motor ON
Press the GREEN switch to turn the motor on. Proceed with cutting- following all safety guidelines.



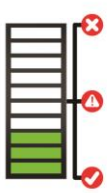
4) Cutting
See below for detailed description of the CutSmart™ visual indicator.



5) Motor OFF
To stop the motor press the GREEN switch. The motor will stop and the magnet will remain on. The GREEN switch will turn off.

Go back to step 3 to start over.

CutSmart™ Technology



Green Zone
Perfect, try to keep in the green zone for the best cut and optimum machine performance.

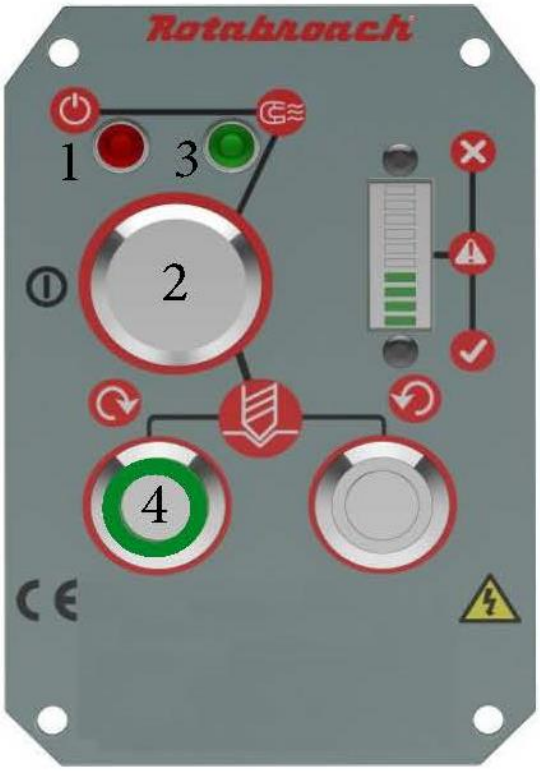
Yellow Zone
A little too much pressure on the drill ease off to get back to the green zone.

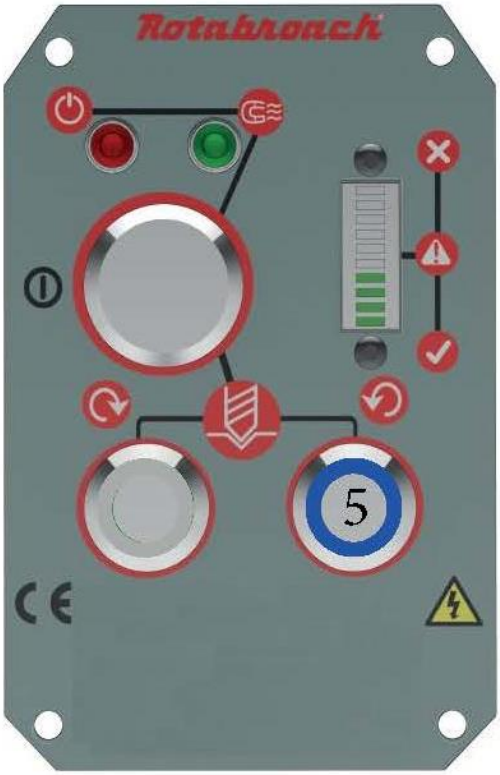
Red Zone
Overload: Back off immediately as too much force will cause the motor to cut off if you continue.

CutSmart™ Technology
Designed for you to get the most out of your machine and your cutters. CutSmart has an easy to read panel that indicates when you are drilling with too much force, which will damage the machine and the cutters.

Allow the cutter to do the work and you will find that a much smoother hole and faster drilling time is achieved.

8) TAPPING FUNCTION



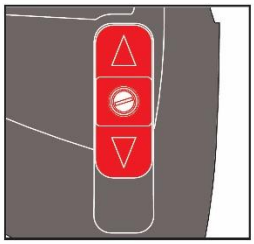


1. Ensure power to the machine, red LED will illuminate (1).
2. Press the magnet switch on (2) to engage the magnet. The LED will light up in either green or red (3). Depending on the material thickness and magnetic adhesion. Green magnet LED indicates optimum adhesion achieved. Drilling operation is available.
Warning if red magnet LED is illuminated this indicates optimum adhesion not achieved. Drilling operation is still available.
3. Use the speed controller on the top cap housing to dictate the speed, always use speeds that are recommended for the drill size being used.
4. Turn the motor on in the forward direction (4).
5. Drill the hole to the recommended tapping size for the thread to be cut.
6. Without disengaging the magnet replace the drill with the tap.
7. Set the spindle speed to the required tapping speed required.
8. Start the drill spindle in the forward direction (4) and feed the tap into the hole until it begins to cut. Once cutting the tap will feed itself through, only gentle pressure on the feed handles should be necessary.
9. Once the tap has threaded the hole the drill should be stopped immediately (4).
10. The drill spindle should then be switched to reverse (5) and the tap can be fed back out of the hole. Allowing the tap to be safely extracted from the hole at a reduced RPM.

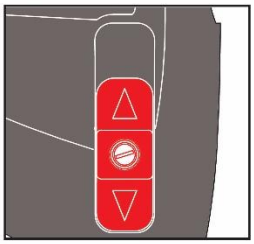
9) GEAR SELECTION

The Element 50 magnetic drill is fitted with a 2 speed gearbox. The gear is used to reduce the output speed when using larger cutters.

Slide Selector Position	Speed Controller Setting	
	Level 1	Level 6
/\	200/min	500/min
\/	100/min	265/min



Slide Selector Positon Up

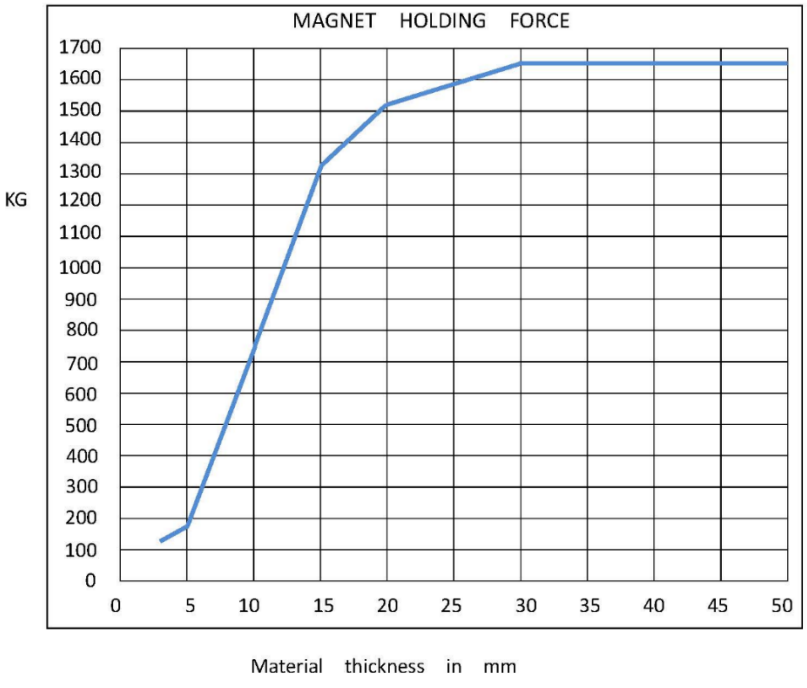


Slide Selector Positon Down

10) MAGNET DETECTION

It is advised that when working on thin material a packing piece should be used to increase the material thickness under the magnet. Working on thin material without a packing piece will reduce the magnet holding force.

It is advised that the drill is to be operated on ferrous material 12mm thick and above. Damage to the magnet base, such as pitting, will affect the strength of the magnet holding force.



11) EXTENSION CABLE SELECTION

The machines are factory fitted with a 3 metre length of cable having three conductors 1.5mm² LIVE, NEUTRAL and EARTH. If it becomes necessary to fit an extension cable from the power source, care must be taken in using a cable of adequate capacity. Failure to do so will result in a loss of traction by the magnet and a reduction of power from the motor.

Assuming a normal AC supply of the correct voltage, it is recommended that the following extension lengths shall not be exceeded:

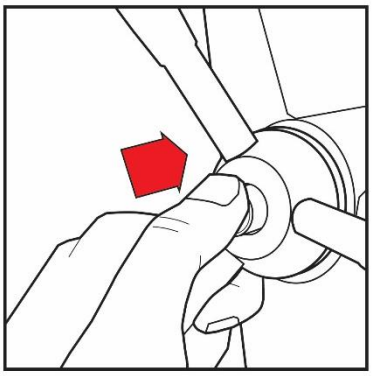
For 110v supply: 3.5metres of 3 core x 1.5mm²
For 230v supply: 26metres of 3 core x 1.5mm²

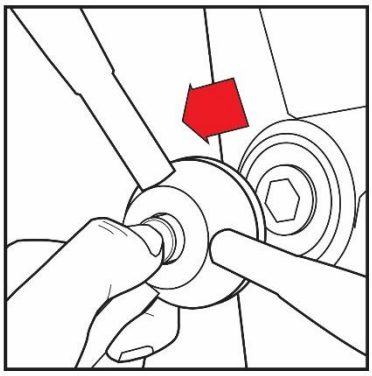
ALWAYS DISCONNECT THE MACHINE FROM THE POWER SOURCE BEFORE CHANGING CUTTERS.

12) MOUNTING OF CUTTERS

- The machine has been made to accept cutters having 19.05mm (3/4”) dia. Weldon shanks. The following procedure is to be used when mounting cutters:
- With the machine in the upright position, ensure the Arbor Assembly (CA120) is fully inserted into Arbor Spindle (RDC4009).
- Take appropriate pilot and place through the hole in cutter shank. Insert shank of cutter into bore of Arbor Assembly, ensuring alignment of two drive flats with socket screws.
- Tighten both screws using hexagon key.

13) CAPSTAN OPERATION





The quick release capstan is a feature that offers the user simple dual side operation.

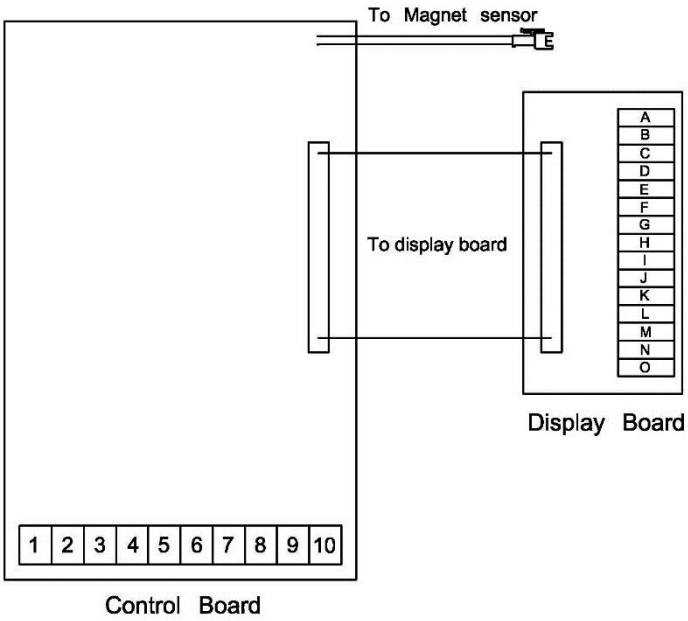
To remove the capstan, simply do the following;

1: Press in the central button on the capstan hub, holding onto the capstan arms.
2: With the button pressed in, pull the capstan away from the main body, holding on to the capstan arms.
3: Re-insert the hexagonal shaft into the hexagonal slot to attach the capstan.

14) REMEDIES FOR HOLE MAKING PROBLEMS

Problem	*Cause*	*Remedy*
1) Magnetic base won't hold effectively	Material being cut may be too thin for efficient holding. Swarf or dirt under magnet. Irregularity on magnet contact or work-piece. Insufficient current going to magnet during drilling cycles.	Attach an additional piece of metal under the magnet, or mechanically clamp magnetic base to work-piece. Clean magnet. Use extreme care; file any imperfections flush to surface. Confirm power supply and output from control unit, check supply cable.
2) Cutter skips out of centre-punch mark at initiation of cut	Magnetic base is not holding effectively. Worn arbor bushing and/or ejector collar. Too much feed pressure at start of cut. Cutter is dull, worn, chipped or incorrectly sharpened. Poor centre-punch mark; weak pilot spring; pilot not centred in centre-punch mark. Worn or bent pilot, worn pilot hole. Loose bolts on motor bushing support bracket, main casting or loose gib adjusting set screws.	See causes and remedies above. New arbor bushing is needed. Light pressure only is needed until a groove is cut. The groove then serves as a stabilizer. Replace or re-sharpen. Sharpening service is available. Improve centre-punch and/or replace worn parts Replace part or parts Adjust where necessary
3) Excessive drilling pressure required	Incorrectly re-sharpened, worn or chipped cutter. Coming down on swarf lying on surface of work-piece. Gib strips out of adjustment or lack of lubrication. Swarf accumulated (packed) inside cutter.	Re-sharpen or replace. Take care not to start a cut on swarf. Adjust setscrews and lubricate. Clear cutter.
4) Excessive cutter breakage	Steel swarf or dirt under cutter. Incorrectly re-sharpened or worn cutter. Cutter skipping. Slide needs adjustment. Cutter not attached tightly to arbor. Insufficient use of cutting oil or unsuitable type of oil. Incorrect speed	Remove cutter, clean part thoroughly and replace. Always have a new cutter on hand to refer to for correct tooth geometry, together with instruction sheet. See causes and remedies (2). Tighten grub screws supporting the slide. Retighten. Inject oil of light viscosity into the coolant-inducing ring and check that oil is being metered into cutter when pilot is depressed. If not, check pilot groove and arbor internally for dirt or apply oil externally. (Even a small amount of oil is very effective). Ensure correct gear is used for the cutter.
5) Excessive cutter wear	See cause and remedy above Incorrectly re-sharpened cutter. Insufficient or spasmodic cutting pressure.	Refer to instructions and a new cutter for proper tooth geometry. Use sufficient steady pressure to slow the drill down. This will result in optimum cutting speed and chip load.

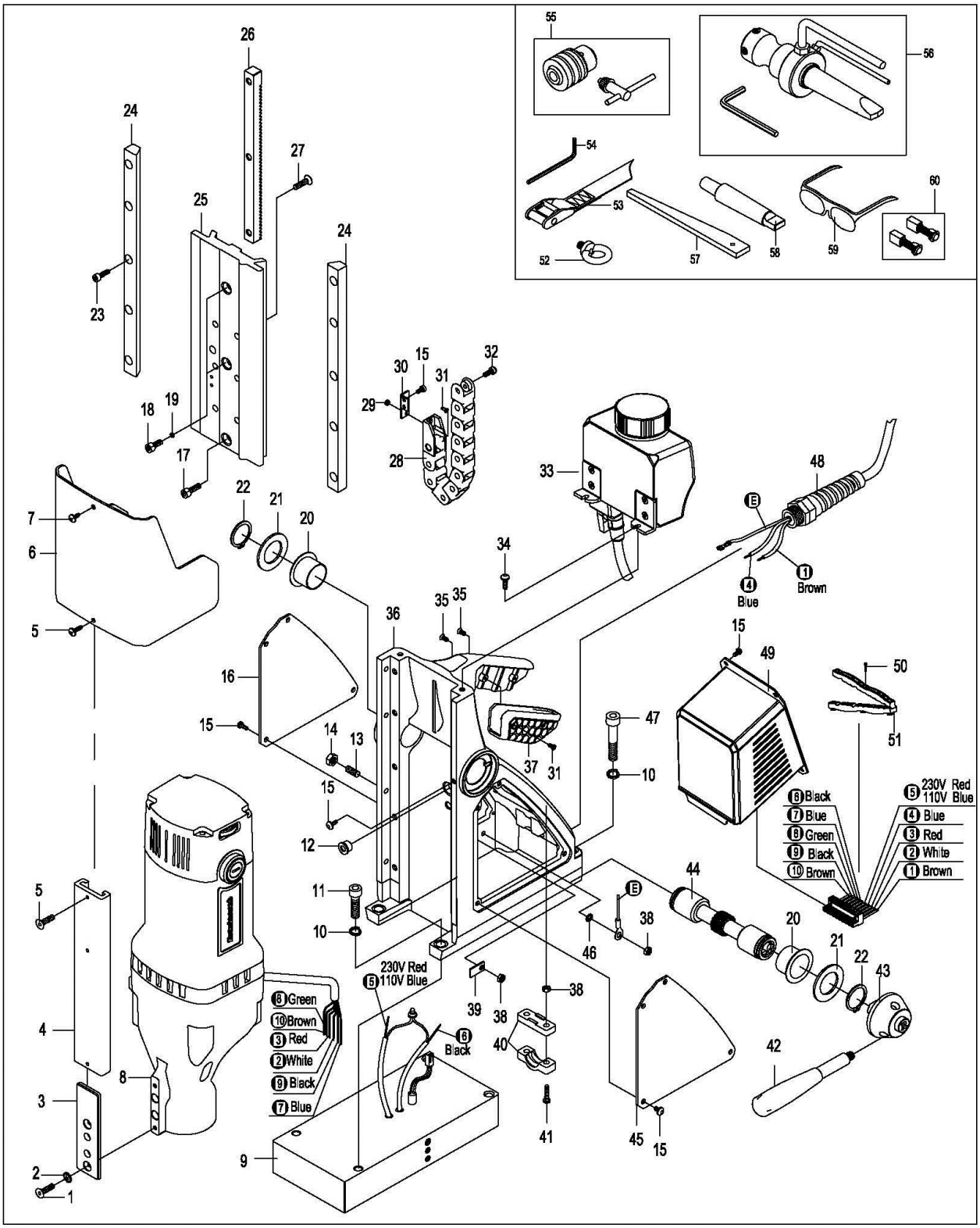
15) WIRING DIAGRAM



No	Function	Wire Colour
1	Mains Live Input	Brown
2	Speed controller module Lead wire	White
3	Speed controller module Lead wire	Red
4	Mains Neutral Input	Blue
5	Magnet Positive Output	230V Red, 110V Blue
6	Magnet Negative Output	Black
7	Field coil Lead wire	Blue
8	Field coil Lead wire	Green
9	Carbon brush Lead wire	Black
10	Carbon brush Lead wire	Brown

No	Function	Wire Colour
A	Motor 'Reverse' Switch 0V	White
B	Motor 'Reverse' Switch +5V	White
C	Motor 'Forward' Switch 0V	White
D	Motor 'Forward' Switch +5V	White
E	Magnet Switch 0V	White
F	Magnet Switch +5V	White
G	Magnet 'ON' LED +5V	White + Green
H	Magnet 'ON' LED +5V	White + Red
I	Magnet 'ON' LED 0V	White + Brown
J	Power 'ON' LED 0V	White + Black
K	Power 'ON' LED +5V	White + Brown
L	Motor 'Reverse' LED OV (BLUE)	White
M	Motor 'Reverse' LED +12V (BLUE)	White
N	Motor 'Forward' LED 0V (Green)	White
O	Motor 'Forward' LED +12V (Green)	White

16) EXPLODED VIEW OF MACHINE

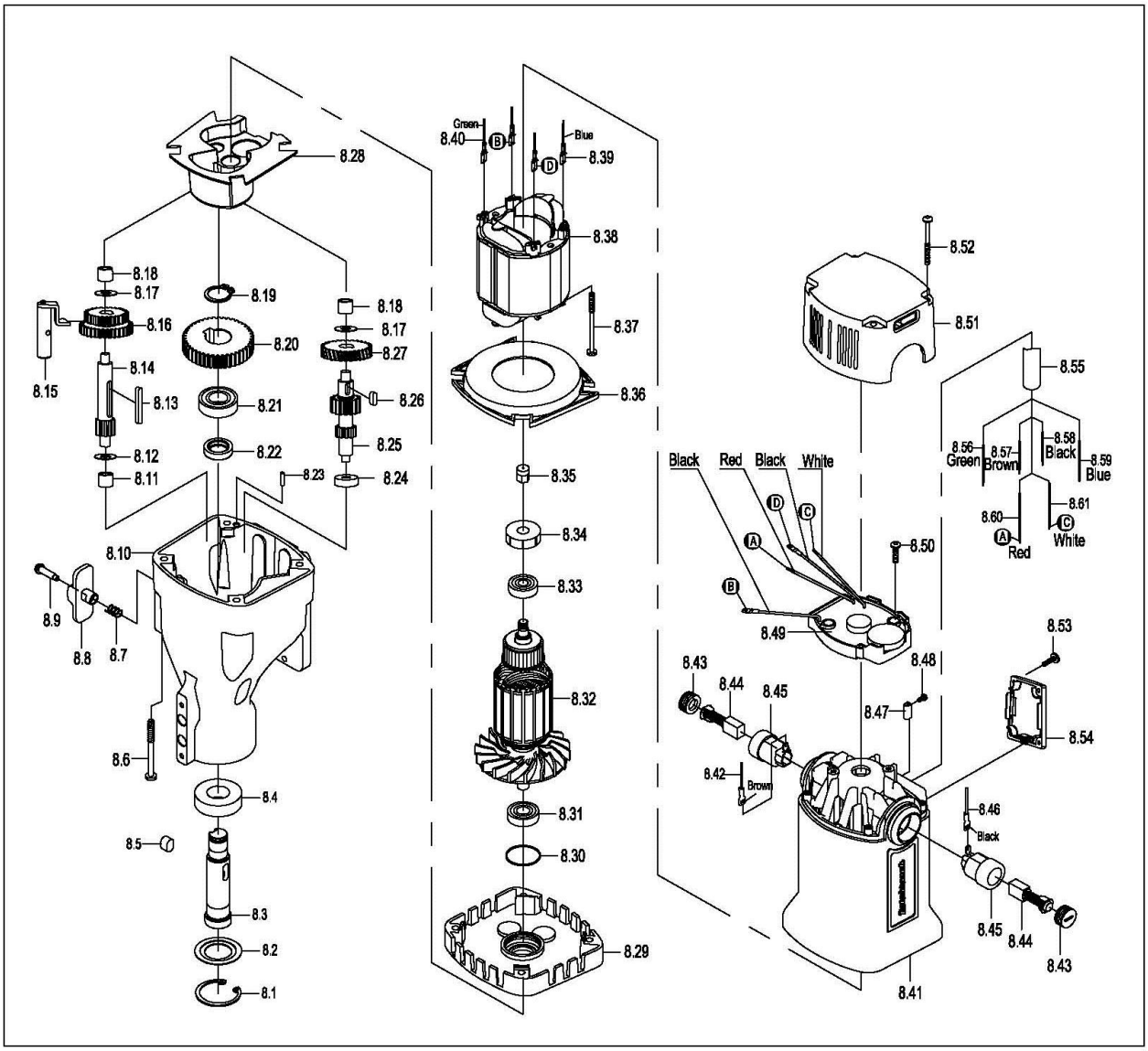


PARTS LIST

Item#	Rotabroach P/N	Description	Qty/pcs
1	RDC4001	Screw	2
2	RD45607	M5 CSK Washer	2
3	RDC4002	Guard support	1
4	RDC4003	Slide channel	1
5	RDA4201	Screw M4×14 Button Head	2
6	RDB3037	Element E40 Guard	1
7	RDC4004	Screw M4×8 Button Head	1
9	RDC4053	Magnet-230V	1
	RDC4054	Magnet-110V	1
10	RD4079	Spring washer	4
11	RDC4055	Screw	2
12	RDA4005	Cable bush	1
13	RDC4056	Screw	4
14	RDC4057	Nut	4
15	RDA4021	Screw M4×8 Button Head	13
16	RDC4058	Right side plate	1
17	RD4098	Screw M6×20 CAP HD	1
18	RDA4029	Screw M6×16 CAP HD	2
19	RDC4104	Spring washer	2
20	RDA3092	Bush	2
21	RDA4006	Capstan Washer	2
22	RDA4004	Circlip	2
23	RDC4059	Screw	10
24	RDC4060	Guide bar	2
25	RDC4061	Slide	1
26	RDC4062	Rack	1
27	RDC4063	Screw	6
28	RDC4064	Chain	1
29	RDA4205	M3 Nut	2
30	RDC4065	Chain	1
31	RDA4204	Screw M3×8 CSK HD	14
32	RDC4066	Screw	1
33	RDC4067	Coolant bottle assembly	1

Item#	Rotabroach P/N	Description	Qty/pcs
34	RDD4118	Screw M4×12 Button Head	2
35	RDC4068	Screw	2
36	RDC4069	Housing	1
37	RDA5008	Handle insert	1
38	RD4068	M4 nut	4
39	RD45604	Earth label	1
40	RDA4070	Cable clamp	1
41	RDA4071	Screw M4×18CAP HD	2
42	RDD4104	Capstan arm	3
43	RDA3015	Capstan Hub	1
44	RDC4070	Capstan spindle	1
45	RDC4071	Left side panel	1
46	RD4069	Washer	1
47	RDC4073	Screw	2
48	RDC4074	Cable plug assembly-230V	1
	RDC4075	Cable plug assembly-110V	1
49	RDC4076	Control panel assembly-E50/3T	1
	RDC4077	Control panel assembly-E50/1T	1
50	RDC4080	Tapping screw ST2.9×12(using 110V)	3
51	RDC4081	Clamp (using 110V)	1
52	RDC4082	Stationary ring	2
53	RDC4083	Safety belt	1
54	RD4152	3mm hexagonal spanner	1
55	RDC4084	13mm Chuck	1
56	CA120	Arbor assembly	1
57	RDC4086	Drift	1
58	RDC4087	Arbor shank	1
59	RDA3105	Safety Glasses	1
60	RDC4088	Spare brush-230V	1pair
	RDC4089	Spare brush-110V	1pair

17) EXPLODED VIEW OF MOTOR AND GEARBOX

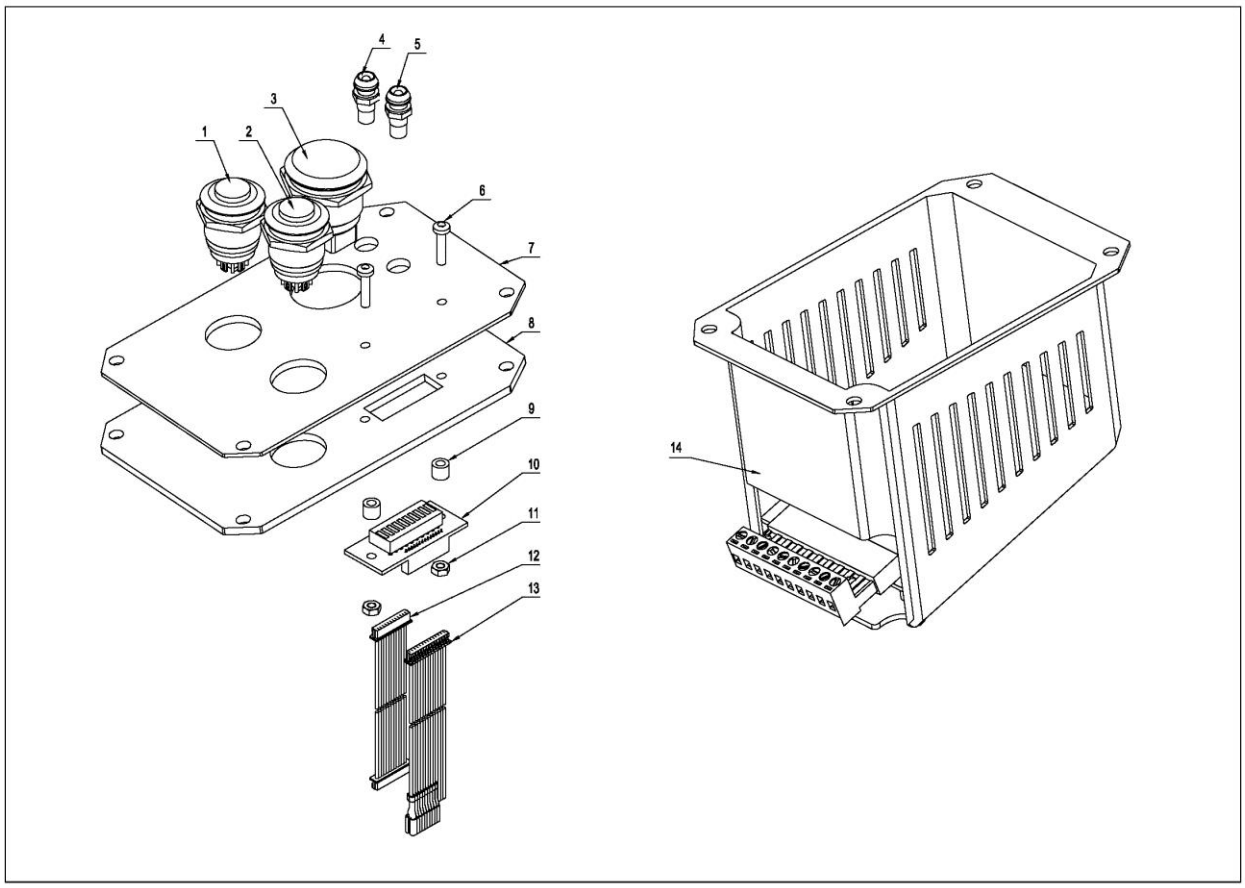


PARTS LIST

Item#	Rotabroach P/N	Description	Qty/pcs
8	RDC4005	Motor assembly-230V	1
	RDC4006	Motor assembly-110V	1
8.1	RDC4007	Circlip	1
8.2	RDC4008	Oil seal washer	1
8.3	RDC4009	Arbor spindle	1
8.4	RDC4010	Roll Bearing	1
8.5	RDC4011	Flat Key	1
8.6	RDC4012	Tapping Screw	4
8.7	RDB4008	Spring	1
8.8	RDB3030	Gear lever	1
8.9	RDC4013	screw	1
8.1	RDC4014	Gear box	1
8.11	RDC4015	Needle bearing	1
8.12	RDB4004	Gear shaft washer 10mm ID	1
8.13	RDB3048	Key steel	1
8.14	RDB3046	Gear axel	1
8.15	RDB2010	Gear lever shaft	1
8.16	RDB2022	Dual gear	1
8.17	RDB4002	Washer	2
8.18	RDC4016	Needle bearing	2
8.19	RDC4017	Circlip	1
8.2	RDC4018	Big gear	1
8.21	RDC4019	Roll Bearing	1
8.22	RDC4020	Oil seal	1
8.23	RD45614	Straight Pin	1
8.24	RM17134	Rolling bearing 608	1
8.25	RDC4021	Shaft gear	1
8.26	RDC4022	Flat Key	1
8.27	RDC4023	Gear	1
8.28	RDC4024	Oil baffle plate	1
8.29	RDC4025	Inner gear plate	1
8.3	RDC4026	Seal washer	1
8.31	RD45522	Rolling bearing 6001	1
8.32	RDC4027	Armature-230V	1
	RDC4028	Armature-110V	1
8.33	RD43603	Rolling bearing 629	1
8.34	RDB3069	Bearing Sleeve	1
8.35	RDC4029	Inductor	1

Item#	Rotabroach P/N	Description	Qty/pcs
8.36	RDC4030	Baffle plate	1
8.37	RDC4031	Tapping Screw	2
8.38	RDC4032	Field coil-230V	1
	RDC4033	Field coil-110V	1
8.39	RDC4034	Lead wire	1
8.4	RDC4035	Lead wire	1
8.41	RDC4036	Motor casing	1
8.42	RDC4037	Lead wire	1
8.43	RD33616	Brush cap	2
8.44	RDC4038	Carbon brush-230V	2
	RDC4039	Carbon brush-110V	2
8.45	RD33614	Brush holder	2
8.46	RDC4040	Lead wire	1
8.47	RD35617	Terminal	6
8.48	RD45613	Screw M3×6 Button Head	12
8.49	RDC4041	Speed controller module-230V	1
	RDC4042	Speed controller module-110V	1
8.5	RDA4035	Tapping Screw	2
8.51	RDC4043	Top Cap	1
8.52	RDC4044	Tapping Screw	4
8.53	RDA4034	Tapping Screw ST2.9×8	4
8.54	RDC4045	Outlet clamp	1
8.55	RDC4046	Plastic tube	1
8.56	RDC4047	Lead wire(green)	1
8.57	RDC4048	Lead wire(brown)	1
8.58	RDC4049	Lead wire(black)	1
8.59	RDC4050	Lead wire(blue)	1
8.6	RDC4051	Lead wire(red)	1
8.61	RDC4052	Lead wire(white)	1

18) CONTROL PANEL AND PARTS LIST



Item#	Rotabroach P/N	Description	Qty/pcs
1	RDA4051	Green Motor Switch	1
2	RDC4090	Blue Motor Switch-Tapping	1
3	RDC4091	Magnet Switch	1
4	RDC4092	Red LED	1
5	RDC4093	Green LED	1
6	RDA4036	Screw M3×12 BTTN HD	2
7	RDD4005	Control Panel Cover	1
8	RDD4006	Control Plate-230V Tapping	1
	RDD4007	Control Plate-110V Tapping	1
9	RDA4019	Nylon Spacer	2
10	RDC4099	Array Board	1
11	RDA4205	M3 Nut	2
12	RDC4100	Connection line	1
13	RDC4101	Connection line	1
14	RDD4314/3	E75PCBA-230V	1
	RDD4314/1	E75PCBA-110V	1

19) PIPE ADAPTOR KIT RD2311

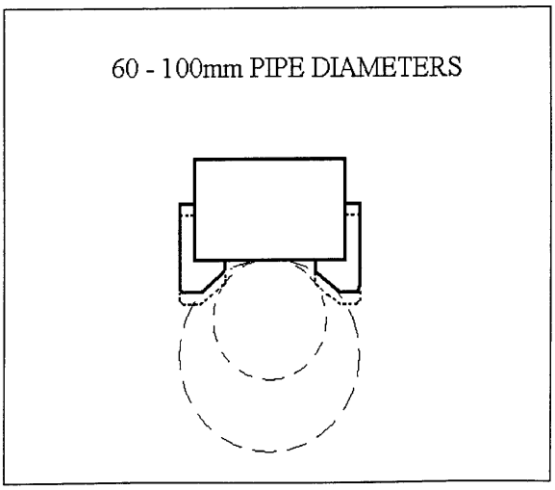
FITTING INSTRUCTIONS

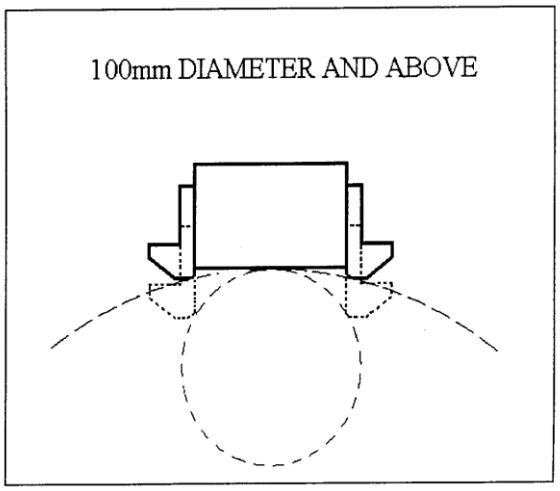
- Dependent upon the size of the pipe to be cut (see illustrations) attach adjustable angle plates RD3328 with cap screws RD4325 and washers RD4205 (4 off each) to the magnet sides. Do not tighten.

- Locate the machine on the centreline of the pipe taking care that the magnet is in line with the longitudinal axis of the pipe.

- Switch on the magnet and move the sliding plates down to the outside diameter of the pipe. Tighten the screws on both sides by hand then check once again that the full length of the moving plates is touching the pipe at the front and back, fasten the plate securely. Feed the safety strap through the lugs at the front of the housing, around the pipe and pull tight.

- When cutting the hole DO NOT use excessive pressure but rather let the cutter ease into the cutting surface.





20) FITTING THE CHUCK

- The machine comes supplied with an RDC4087 (Arbor Shank) & RDC4084 (13mm Chuck).
- Insert RDC4087 into RDC4009 (Arbor Spindle), ensure a good and tight fit is achieved.
- Insert RD4084 into RDC4087, ensure a good and tight fit is achieved.
- Replacing the chuck is the reverse sequence, by utilising RDC4086 (Drift).

21) MAINTENANCE

In order to 'get the best life' out of your Rotabroach machine always keep it in good working order.
A number of items must always be checked on Rotabroach machines.
Always before starting any job make sure the machine is in good working order and that there are no damaged or loose parts. Any loose parts must be tightened.
Before proceeding with any maintenance work be certain that the power supply is disconnected.

Description	Every operation	1 week	1 Month
Visual check of machine for damage	X		
Operation of machine	X		
Check brush wear		X	
Check magnetic base	X		
Check alignment of the machine			X
Check grease			X
Check armature			X

Visually check the machine for damage.
The machine must be checked before operation for any signs of damage that will affect the operation of the machine. Particular notice must be taken to the mains cable, if the machine appears to be damaged it should not be used, failure to do so may cause injury or death.

Check operation of the machine.
The machines operation must be checked to ensure that all components are working correctly.

Machine Brushes
Should be checked to make sure there is no abnormal wear present (this should be checked at least once a week if used frequently). If the brush has worn more than 2/3 of the original length, the brushes should be changed. Failure to do so may cause damage to the machine.

Magnetic base

Before every operation the magnetic base should be checked to make sure that the base is flat and there is no damage present. An uneven magnet base will cause the magnet not to hold as efficiently and may cause injury to the operator.

Adjustment of slide and bearing bracket alignment.

An essential requirement of the machine is that the slide can move in a smooth and controlled manner, free of lateral movement and vibration.
This situation can be maintained by periodic adjustment of the slide and is accomplished in the following manner:

1. Place the machine in an upright position and, by means of the capstan, raise the slide to its highest position. Clean the brass gib strips and apply a small amount of light machine oil to the wear surfaces.
2. Now lower the slide back to its lowest position. Bring the slide into the center of the dovetail slide housing and loosen screws thus allowing free movement of the arbor support bracket.
3. Commencing with the middle screws, gently feed in all the screws until slight resistance is encountered.
4. Operate the slide up and down a few times to test the movement and make any further necessary adjustments. Try to ensure that all the screws are exerting a uniform pressure on the slide from top to bottom. A perfectly adjusted slide will operate freely up and down without any sideways movement.
5. Now raise the slide to its highest position. Slightly undo the arbor bearing bracket and, using fingers only, tighten the screws.
6. Place the machine on a steel plate, connect to power supply and switch on the magnet. Start up the motor. If the arbor is incorrectly aligned, the arbor support bracket will be seen to oscillate. Make any necessary further adjustments to the bracket to ensure correct alignment of the spindle and finally tighten the screws using a spanner. Lastly tighten the arbor bearing bracket.

Check machines grease.

The gearbox grease should be checked once a month to ensure all moving components are covered to prevent wear. The grease should be changed at least once a year to ensure you gain the best from your machine.

Check Armature of the machine.

This should be checked at least once a month to check that there are no visual signs of damage to the body or to the commutator. Some signs of wear will be seen on the commutator over a period of time but this is normal (this is the part that comes into contact with the brushes) however, if there are any signs of abnormal damage the part should be replaced.

22) TROUBLE SHOOTING

Magnet and motor do not function	- The magnet switch is not connected to the power supply - Damaged or defective wiring - Defective fuse - Defective magnet switch - Defective control unit - Defective power supply
Magnet does function, the motor does not	- Damaged or defective wiring - Carbon brushes are stuck or worn out - Defective magnet switch - Defective on / off switch - Defective control unit - Defective armature and/or field - Defective protective reed switch
Magnet does not function, the motor does	- Defective magnet - Defective fuse - Defective control unit
Hole cutters break quickly, holes are bigger than the hole cutter	- Play in the guide - Bent spindle - Shaft extending from the motor is bent - Pilot bent
Motor running roughly and/or seizing up	- Bent spindle - Shaft extending from the motor is bent - Triangular guide not mounted straight - Dirt between spindle and triangular guide
Motor making a rattling sound	- Gear ring (bottom of the armature) worn out - Gear(s) worn out - No grease in gear box
Motor humming, big sparks and motor has no force	- Armature damaged - Field burned - Carbon brushes worn out
Motor does not start or fails.	- Damaged or defective wiring - Damage to armature or field coil - Damaged or defective brushes
Guiding takes a great deal of effort	- Guide is set too tight - Guide is dry - Guide/gear- rack/rotation system is dirty or damaged
Insufficient magnetic force	- Damaged or defective wiring - Bottom of magnet not clean and dry - Bottom of magnet not flat - Work piece is not bare metal - Work piece is not flat - Work piece is too thin less than 10mm - Defective control unit - Defective magnet
Frame under voltage	- Damaged / defective wiring - Defective magnet - Motor seriously dirty
Fuse blows when magnet switch is turned on	- Damaged or defective wiring - Wrong value fuse - Defective magnet switch - Defective control unit - Defective magnet
Fuse blows when motor is started up	- Damaged or defective wiring - Wrong value fuse - Motor running roughly - Defective armature and / or field - Carbon brushes worn out - Defective control unit
Rotation system free stroke too long	- Loose or defective gear-rack - Defective rotation system

23) CUTTER SELECTION AND SPEEDS

Material	Material Hardness	Cutter
Mild and free cutting steels	<900N/mm²	RAP or RAPL
Mild and free cutting steels	<900N/mm²	SRCV or SRCVL
Steel angle and joists	<900N/mm²	RAP or RAPL
Steel angle and joists	<900N/mm²	SRCV or SRCVL
Plate and sheet steel	<900N/mm²	RAP or RAPL
Plate and sheet steel	<900N/mm²	SRCV or SRCVL
Aluminium	<900Nmm²	RAP or RAPL
Aluminium	<900N/mm²	SRCV or SRCVL
Brass	<900N/mm²	RAP or RAPL
Brass	<900N/mm²	SRCV or SRCVL
Cast iron	<900N/mm²	RAP or RAPL
Cast iron	<900N/mm²	SRCV or SRCVL
Stainless steel	<900N/mm²	RAP or RAPL
Stainless steel	<900N/mm²	SRCV or SRCVL
Stainless steel	>1400N/mm²	CWC to CWCX
Rail track	>1400N/mm²	SCRWC or SCRWCL
Tool steel	>1400N/mm²	CWC to CWCX
Die Steel	>1400N/mm²	CWC to CWCX
Cast Iron	>1800N/mm²	CTCT
Inox	>1800N/mm²	CTCT
Inconel	>1800N/mm²	CTCT
Fine Grain Steel	>1800N/mm²	CTCT
Hardox	>1800N/mm²	CTCT

The data listed below is for reference purposes only, and indicate potential starting conditions. It is the responsibility of the site operation manager to determine correct application requirements.

Rotabroach Material to be cut	Cutting surface speed Meters/min	Cutter diameter/Material/RPM relationship													
		13		14		18		22		30		50		65	
	Lower - Upper	L	U	L	U	L	U	L	U	L	U	L	U	L	U
Aluminium	60 - 90	1469	2203	1364	2046	1061	1591	868	1302	637	955	382	573	294	441
Brass & Bronze	40 - 50	979	1224	909	1137	707	884	579	723	424	530	255	318	196	245
Iron: cast(soft)	30 - 50	734	1224	682	1137	530	884	434	723	318	530	191	318	147	245
cast(hard)	15 - 21	367	514	341	477	265	371	217	304	159	223	95	134	73	103
cast(malleable)	15 - 30	367	734	341	682	265	530	217	434	159	318	95	191	73	147
Steel: mild	24 - 30	588	734	546	682	424	530	347	434	255	318	153	191	118	147
high tensile	3 - 5	73	122	68	114	53	88	43	72	32	53	19	32	15	24
stainless (free cutting)	15 - 18	367	441	341	409	265	318	217	260	159	191	95	115	73	88
stainless (heat resisting)	6 - 13	26	318	136	296	106	230	87	188	64	138	38	83	29	64

These are only starting points. They will vary with application and work piece condition.

Material or Application Type	Feed Per Tooth (mm)
Thin Walled Workpieces Oblique Entry / Curved Surfaces Semi-Circles / Fragile Setups	.0254 / .0508 (.0762 FPT with Work Hardening Materials)
Soft / Gummy Materials	.1016 / .127
Typical / Average Applications	.0762 / .1016
Deep Holes	.1016 / .127

Difficult-to-machine materials will require reduced feed rates.

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24) WARRANTY STATEMENT

Rotabroach™ warrants its machines to be free from faulty parts, under normal usage of machines, for a period of 12 months from initial date of purchase. All other parts (excluding cutters) are under warranty for 90 days, provided that the warranty registration card (or online registration) has been completed and returned to Rotabroach™ or its designated distributor within a period of (30) days from the purchase date. Failure to do so will void the warranty. If the stated is adhered to, Rotabroach™ will repair or replace (at its option) without charge any faulty items returned.

This Warranty does not cover:

1. Components that are subject to natural wear and tear caused by the use is not in accordance with the operator's instructions
2. Defects in the tool caused by non-compliance with the operating instructions, improper use, abnormal environment conditions, inappropriate operating conditions overload or insufficient servicing or maintenance.
3. Defects caused by using accessories, components or spare parts other than original Rotabroach™ parts.
4. Tools to which changes or additions have been made.
5. Electrical components are subject to manufacturer's warranty.

Your online registration can be submitted at www.rotabroach.co.uk

The warranty claim must be logged within the warranty period. This requires the submission or sending of the **complete** tool in question with the original sales receipt which must indicate the purchase date of the product. A complaint form must also be submitted prior to the return.
This can be found online at www.rotabroach.co.uk. Failure to complete this form will result in the delay of your claim.
All goods returned defective must be returned pre-paid to Rotabroach™, in no event shall Rotabroach™ be liable for subsequent direct, or indirect loss or damage.

THIS WARRANTY IS IN LIEU OF ANY OTHER WARRANTY, (EXPRESSED OR IMPLIED) INCLUDING ANY WARRANTY OF MERCHANTABLITY OR FITNESS FOR A PARTICULAR PURPOSE. ROTABROACH™ RESERVE THE RIGHT TO MAKE IMPROVEMENTS AND MODIFICATIONS TO DESIGN WITHOUT PRIOR NOTICE

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