Rotabroach™

ELEMENT 40

Magnetic drilling machine

Model Number Element40/1, Element40/3

This machine is CE approved.



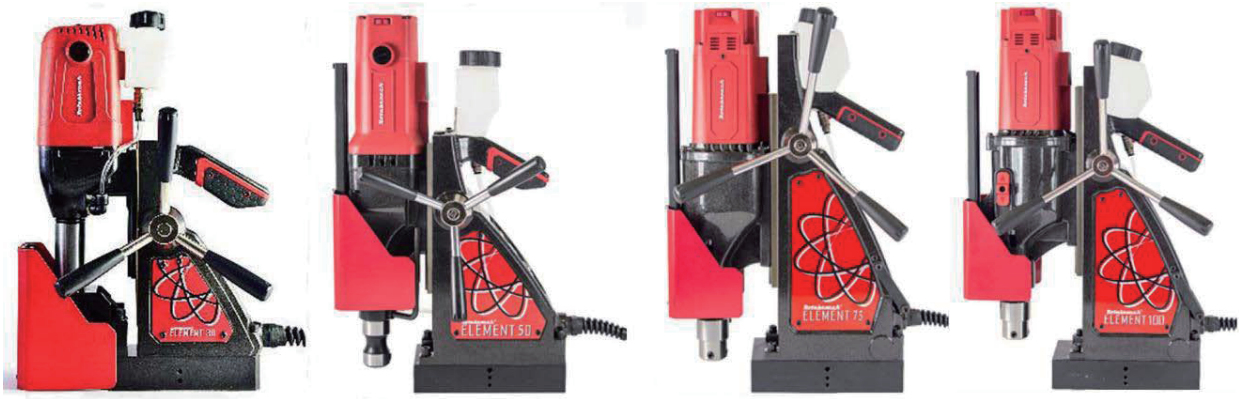
Rotabroach®

Rotabroach Ltd
Burgess Road
Sheffield, South Yorkshire
United Kingdom
S9 3WD

Tel: +44 (0) 114 2212 510 **Fax: +44 (0) 114 2212 563**
Email: info@rotabroach.co.uk **Website: www.rotabroach.co.uk**

Thank you for purchasing our Element 40 magnetic drill.
We would really like your feedback on the machine.

Other Products by Rotabroach:





Thank you for your purchase of our product.

CONTENTS OF THE MANUAL.

		Page
1)	Intended use	4
2)	General safety rules	4
3)	Information plate symbols	5
4)	Specification	6
5)	Operational safety procedures	7
6)	Operating instructions	7
7)	Control panel operation	8
8)	Gear selection	9
9)	Extension cable selection	9
10)	Mounting of cutters	9
11)	Capstan operation	10
12)	Remedies for hole making problems	10
13)	Wiring diagram	12
14)	Exploded view of complete machines	13
15)	Exploded view of gearbox and motor units	16
16)	Control panel and parts list	19
17)	Pipe adapter kit RD2311	20
18)	Fitting the chuck	21
19)	Maintenance checks	21
20)	Trouble shooting	23
21)	Cutter selection, speeds and feeds	24
22)	Warranty	25

P/N	List of Contents with Magnetic Drill Unit
RD4329	Safety Strap
RD43207	4mm A/F Tee Handled Hexagon Key
RD4152	3mm Hexagon Key
RD33153	Drill Chuck Adaptor
RD4230	6mm Hexagon Key
RD43099	Drill Chuck and key
RDA3105	Safety Glasses
RDB3066	Carbon Brush

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.

Read all these instructions before attempting to operate the machine.

Remove the power supply before carrying out any adjustment, servicing or maintenance.

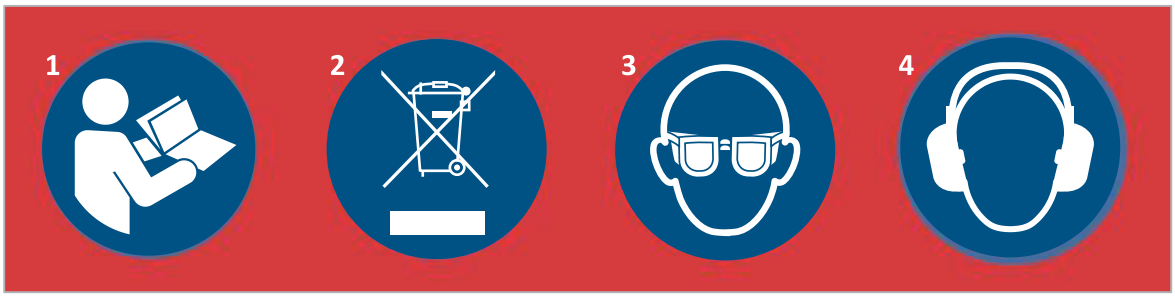
1. Keep work area clear - cluttered areas and benches invite injuries.
2. Consider work area environment;
   - Do not expose tools to rain.
   - Do not use tools in damp or wet locations.
   - Keep work area well lit (500 Lux recommended).
   - Do not use tools in the presence of flammable liquid or gases.
   - Ensure there is adequate space to gain access to the plug, mains and motor on/off switches.
3. 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).
4. 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.
5. Store idle tools when not in use. All tools should be stored in a dry locked-up place, out of reach of children.
6. Do not force the machine. It will do the job better and safer at the rate for which it was intended.
7. 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.
8. 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.
9. 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.
10. 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.
11. Connect dust extraction and collecting equipment, if devices are provided, ensuring these are properly connected and used.
12. 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.
13. Secure work where possible, use clamps or a vice to hold the work. It is safer than using your hand.
14. Do not overreach! Keep proper footing and balance at all times.
15. 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.

16. Disconnect tools when not in use, before servicing and when changing accessories such as cutters, disconnect tools from the power supply.
17. Form the habit of checking to see that keys and adjusting wrenches are removed from the tool before turning it on.
18. Avoid unintentional starting. Ensure the magnet is OFF before plugging the machine in.
19. Use extension leads only intended for outdoor use when the tool is used outdoors.
20. WARNING! The vibration emissions during actual use can differ from the declared total value depending on the ways in which the tool is being used.
21. Stay alert! 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.
22. 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.
23. Warning! The use of any accessory or attachment, other than ones recommended in this instruction manual, may present a risk of personal injury.
24. 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.
25. Never operate the machine if parts are missing or damaged.
26. Never direct jets of water or flammable liquids over the drill.
27. Operator must be physically able to handle the weight of the machine.
28. Operator should be trained in the use of the machine.

3) INFORMATION PLATE SYMBOLS



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 = 40mm dia. x 50mm deep

Arbor bore = 19.05mm (3/4") dia.

Motor Unit				
Voltages	110V 50-60Hz		230V 50-60Hz	
Normal full load	11.5 A	1200 W	5.5 A	1200 W
Electro Magnet	0.54A	57W	0.26A	57W
Size	180mm long 90mm 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.**	10000N			
Total Load (magnet + motor)	1257W		1257W	
Overall Dimensions				
Height - maximum extended	514mm			
Height - minimum	434mm			
Width (including Capstan fitting)	185mm			
Length Overall (including Guard)	285mm			
Nett Weight	13.3kgs			
	Element 40/1		Element 40/3	
Vibration total values (triax vector sum) in accordance with EN61029-1:	Vibration emission value (a_h):2.746m/s² Uncertainty(K):1.5m/s²		Vibration emission value (a_h):2.466 m/s² Uncertainty(K):1.5m/s²	
Level of sound pressure in accordance with EN61029-1:	*Sound pressure(LpA)*: 90.6 dB(A) *Acoustic power(LwA)*: 103.6 dB(A) Uncertainty(K)：3dB(A)		*Sound pressure(LpA)*: 89.6 dB(A) *Acoustic power(LwA)*: 102.6 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

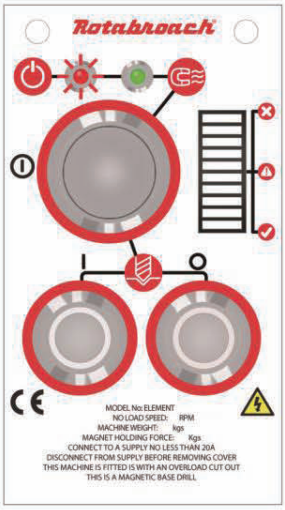
READ BEFORE USING THE MACHINE

- 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 RD4329, or other means) 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 at ALL times 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. DO NOT operate the machine as the ejected slug may cause injury.
- When not in use ALWAYS store the machine in a safe and secure location.
- ALWAYS ensure that approved ROTABROACH™ agents conduct repairs.

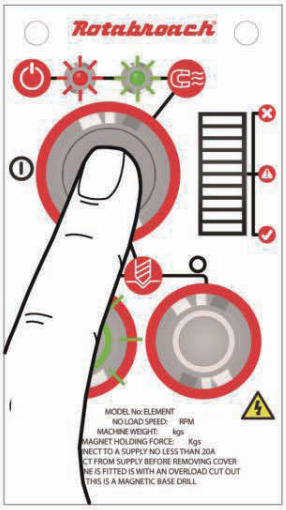
6) OPERATING INSTRUCTIONS

- 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.
- ALWAYS switch off the motor by depressing the RED stop button. 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 and arbor support bearing.
- Cutter breakage is usually caused by insecure anchorage, a loosely fitting slide or a worn bearing in the arbor support. (Refer to routine maintenance instructions).
- Only use approved cutting fluid. Rotabroach cutting fluid has been specially formulated to maximise the cutters performance. It is available in 1 litre (RD208) and 5 litre (RD229).

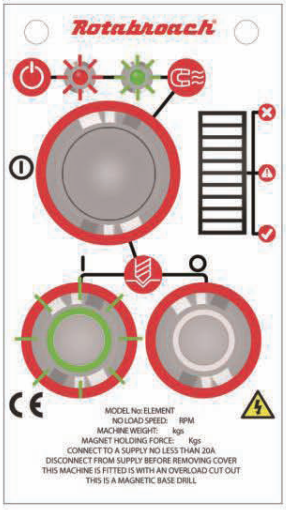
7) CONTROL PANEL OPERATION



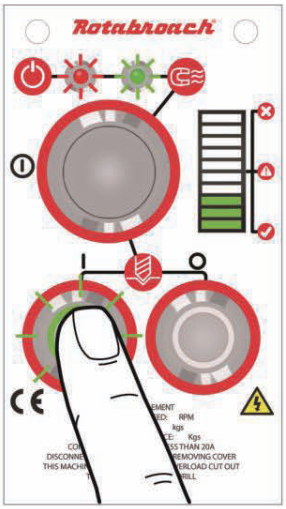
1) Power
When the drill is connected to the power supply, the RED LED will indicate power to the drill.



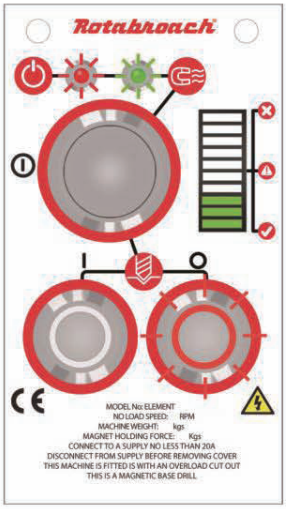
2) Magnet ON
To turn the magnet ON or OFF, depress the large button on the control panel. A GREEN LED will indicate the magnet is ON.



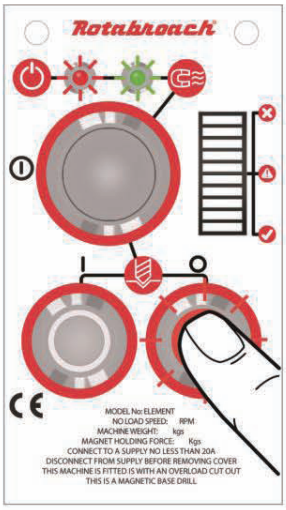
3) Motor switch
When the magnet has power, the GREEN switch will light up to indicate motor start.



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



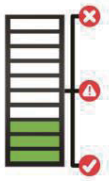
5) Cutting
See below for detailed description of the CutSmart™ visual indicator



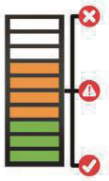
6) Motor OFF
To stop the motor, press the RED switch. The motor will stop, and the magnet will remain on. The GREEN switch will turn on.

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.

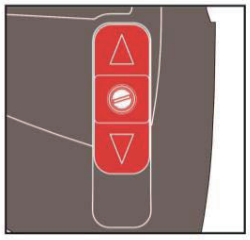
CutSmart™ Technology
Designed for you to get the most out of your machine and your cutters. CutSmart has an easy to read panel that indicates when you are drilling with too much force, which will damage the machine and the cutters.

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

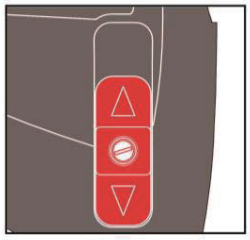
8) GEAR SELECTION

The Element 40 magnetic drill is fitted with a 2 speed gearbox. The gear is used to reduce the output speed when using larger cutters.

Up to 30mm diameter cutters, gear position 1 should be used.
30 – 40mm diameter cutters, gear position 2 should be used



Gear position 1: High speed
Up to 30mm diameter cutters



Gear position 2: Low speed
30 to 40mm diameter cutters

9) 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.

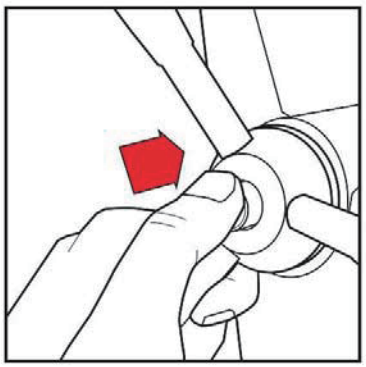
10) MOUNTING OF CUTTERS

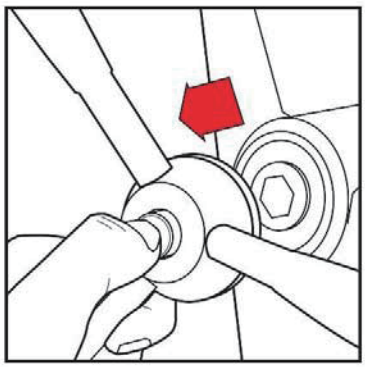
- The machine has been made to accept cutters having 19.05mm (3/4”) dia. Weldon shanks.

The following procedure is to be used when mounting cutters:

- Lay the machine on its side with feed handles uppermost, ensuring arbor is wound down to its lowest point to enable access to socket screws RD4066.
- Take appropriate pilot and place through the hole in cutter shank. Insert shank of cutter into bore of arbor, ensuring alignment of two drive flats with socket screws.
- Tighten both screws using hexagon key.

11) CAPSTAN OPERATION





The quick release capstan is a feature offers 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.

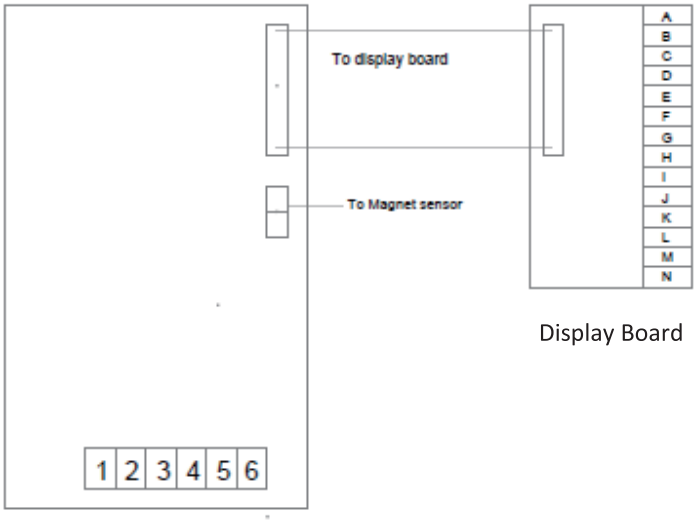
3: Re-insert the hexagonal shaft into the hexagonal slot to attach the capstan.

12) 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	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

	casting or loose gib adjusting set screws.	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. Gibs 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 use 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.

13) WIRING DIAGRAM



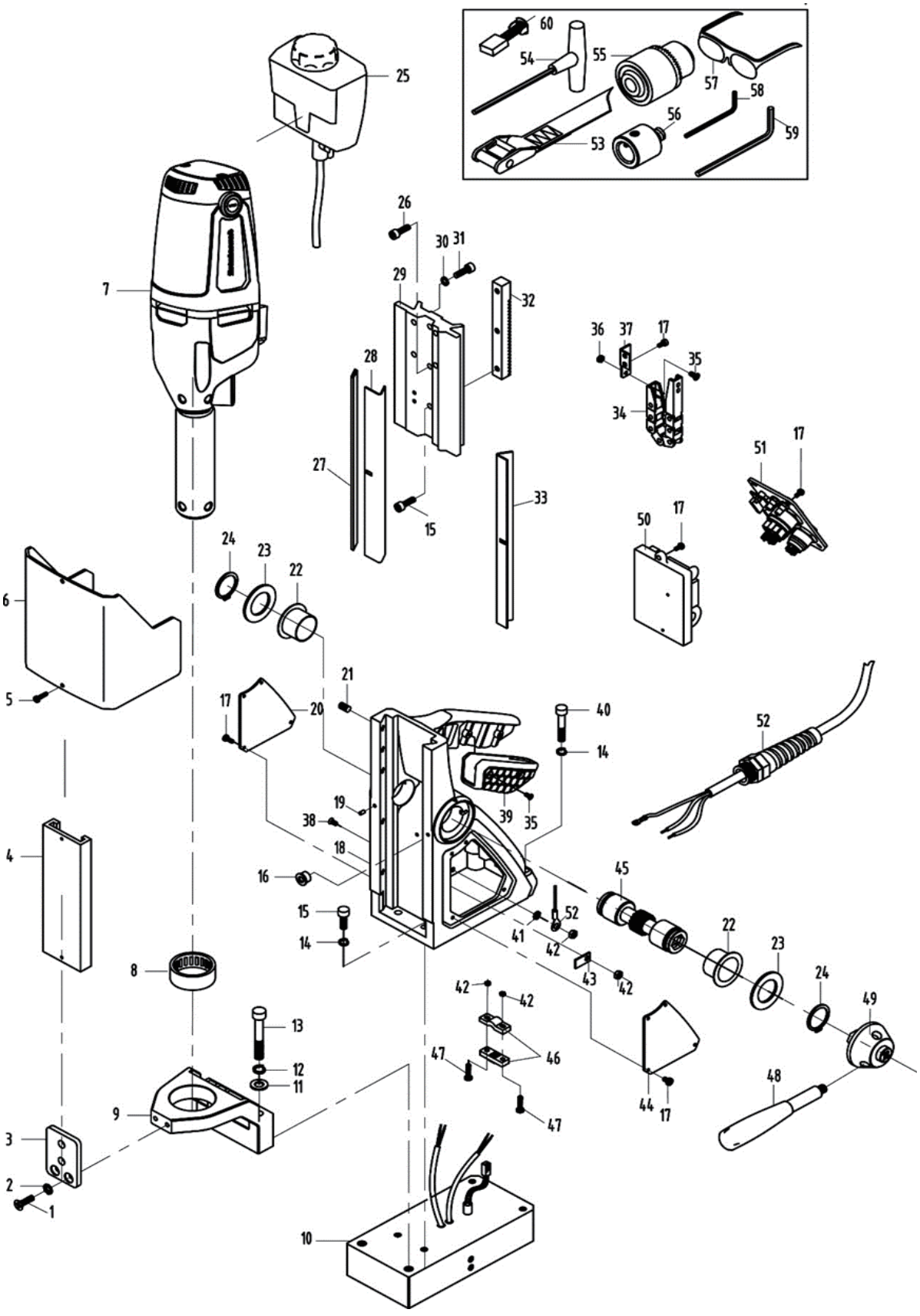
Display Board

Control board

No	Function	Wire Colour
1	Magnet Negative Output	Black
2	Magnet Positive Output	Red
3	Mains Neutral Input	Blue
4	Motor Neutral Output	Black
5	Motor Live Output	Red
6	Mains Live Input	Brown

No	Function	Wire Colour
A	Motor 'Stop' Switch 0V	White
B	Motor 'Stop' Switch +5V	White
C	Motor 'Start' Switch 0V	White
D	Motor 'Start' 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 'Stop' LED 0V (Red)	White
M	Motor 'Stop' LED +12V (Red)	White
N	Motor 'Start' LED 0V (Green)	White
O	Motor 'Start' LED +12V (Green)	White

14) EXPLODED VIEW OF MACHINE

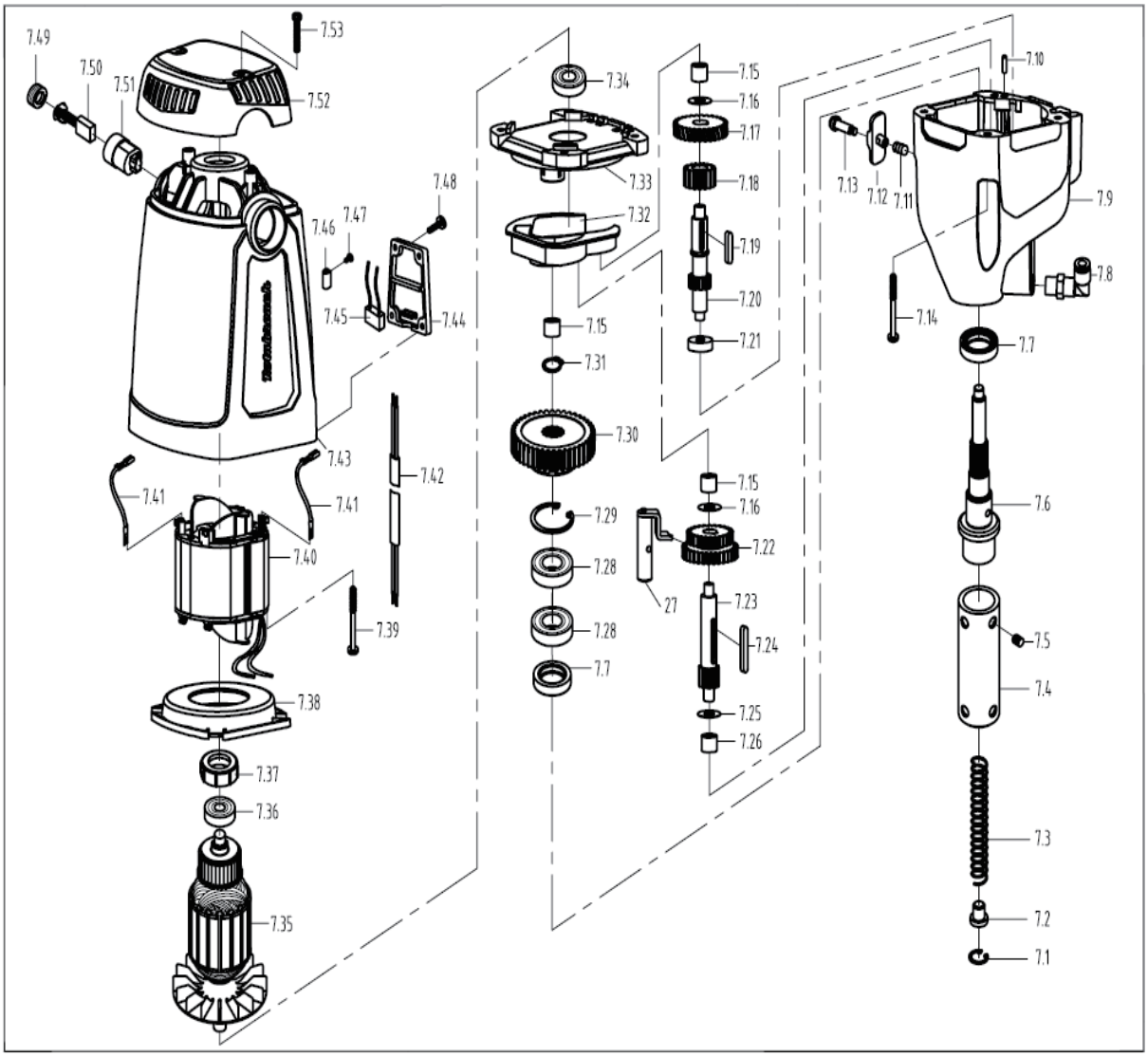


PARTS LIST

Item#	Rotabroach P/N	Description	Qty/pcs
1	RD43131	Screw M5×16 CSK HD	2
2	RD45607	M5 CSK Washer	2
3	RDB3032	Guard support	1
4	RDB3105	Slide channel	1
5	RDA4201	Screw M4×14 BTTN HD	2
6	RDB3037	Element E40 Guard	1
7	RDB2002/1(110V) RDB2002/3(230V)	Motor assembly	1
8	RD45624	Needle bearing HK3516	1
9	RDB3013	Bearing bracket	1
10	RDA3121(110V) RDA3122(230V)	Magnet	1
11	RD4078	Washer	2
12	RD4079	spring washer	2
13	RD4277	Screw M8×50 CAP HD	2
14	RD4207	Spring washer	4
15	RD4098	Screw M6×20 CAP HD	2
16	RDA4005	Cable bush	1
17	RDA4021	Screw M4×8 BTTN HD	17
18	RDA3001	Main housing	1
19	RD45622	Straight pin	2
20	RDB3026	Right side panel	1
21	RD4312	Grub Screw M6×12	5
22	RDA3092	Bush	2
23	RDA4006	Capstan Washer	2
24	RDA4004	Circlip	2
25	RDA4068	Coolant bottle assembly	1
26	RDA4029	Screw M6×16 CAP HD	1
27	RDA3123	Gib support strip	1
28	RDA3038	Gib strip	1
29	RDB3035	Slide	1
30	RD4092	M5 Shake proof washer	4
31	RD4091	Screw M5×22 CAP HD	4
32	RDB3027	Rack	1
33	RDA3037	Adjustable gib strip	1
34	RDB2013	Chain	1
35	RDA4204	Screw M3×8 CSK HD	8
36	RDA4205	M3 Nut	4
37	RDB3045	Cable chain attachment	2
38	RDC4068	Screw M4×16 CSK HD	2
39	RDA5008	Handle insert	1
40	RD4206	Screw M6×38 CAP HD	2

41	RD4069	M4 Washer	1
42	RD4068	M4 nut	4
43	RD45604	Earth label	1
44	RDB3025	left side panel	1
45	RDA3012	Intermediate gear shaft	1
46	RDA4070	Cable clamp	1
47	RDA4071	Screw M4×18CAP HD	2
48	RDA2008	Capstan arm	3
49	RDA3015	Capstan Hub	1
50	RDB2029/1(110V) RDB2029/3(230V)	PCB	1
51	RDB2030/1(110V) RDB2030/3(230V)	Control panel assembly	1
52	RDA3071(110V) RDA3072(230V)	Power chord	1
53	RD4329	Safety belt	1
54	RD43207	4mm hexagonal spanner	1
55	RD43099	Chuck	1
56	RD33153	Adapter	1
57	RDA3105	Safety glass	1
58	RD4152	3mm hexagonal spanner	1
59	RD4230	6mm hexagonal spanner	1
60	RDB3066	Carbon Brush	2

15) EXPLODED VIEW OF MOTOR AND GEARBOX

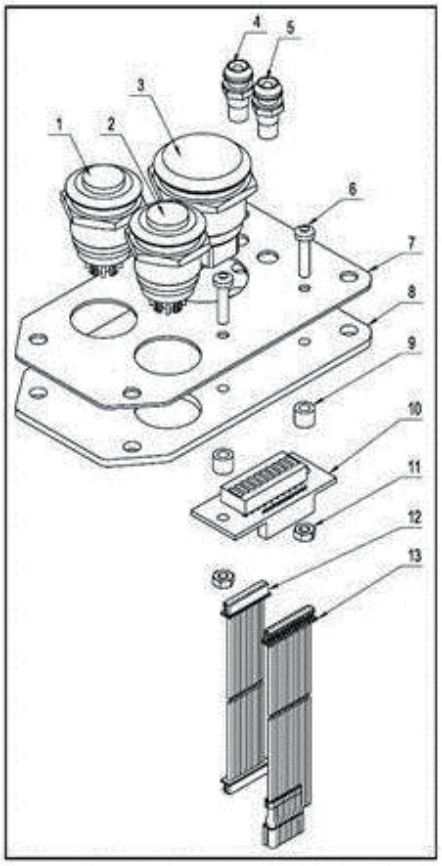


PARTS LIST

Item#	Rotabroach P/N	Description	Qty/pcs
7.1	RD4056	Circlip	1
7.2	RA354	Button	1
7.3	RA3118	Spring	1
7.4	RD33155	Arbor	1
7.5	RD4066	Grub Screw M8×8	6
7.6	RDB3020	Arbor spindle	1
7.7	RD43304	Oil seal	2
7.8	RDA4037	Fluid lever	1
7.9	RDB3005	Gear box	1
7.10	RDA3150	Straight Pin	1
7.11	RAB4008	Spring	1
7.12	RDB3030	Gear lever	1
7.13	RDB4006	Gear lever M4 shoulder bolt	1
7.14	RDB4003	Tapping Screw ST4.8×45	4
7.15	RDB4001	Needle bearing HK0810	3
7.16	RDB4002	Washer	2
7.17	RDB3049	Helical gear 31T 1.25M 15HA 30PA	1
7.18	RDB3043	17 tooth gear	1
7.19	RDB3050	Key steel 4×4×16	1
7.20	RDB3047	Gear axel	1
7.21	RM17134	Rolling bearing 608	1
7.22	RDB2022	Dual gear	1
7.23	RDB3046	Gear axel	1
7.24	RDB3048	Key steel	1
7.25	RDB4004	Gear shaft washer 10mm ID	1
7.26	RDB4005	Needle bearing HK1010	1
7.27	RDB2010	Gear lever shaft	1
7.28	RD43305	Rolling bearing 6003 RS	2
7.29	RD43306	Circlip	1
7.30	RDB2018	Drive gear assembly	1
7.31	RD43310	Circlip	1
7.32	RDB3031	Oil baffle plate	1
7.33	RDB3006	Gear plate	1
7.34	RD45522	Rolling bearing 6001 RS	1
7.35	RDB3060/1(110V) RDB3060/3(230V)	Armature	1
7.36	RD43603	Rolling bearing 629 RS	1
7.37	RDB3069	Bearing Sleeve	1
7.38	RDB5004	Baffle plate	1
7.39	RD43206	Tapping screw ST4.2×65	2

7.40	RDB3061/1(110V) RDB3061/3(230V)	Field coil	1
7.41	RDB3065	Lead wire	2
7.42	RDB3068	Motor wire	1
7.43	RDB5002	Motor housing	1
7.44	RDA5018	Wire box cover	1
7.45	RDA3069	capacitor	1
7.46	RD35617	Terminal	2
7.47	RD45613	Screw M3×6 BTTN HD	4
7.48	RDA4034	Tapping Screw ST2.9×8	4
7.49	RD33616	Brush cap	2
7.50	RDB3066	Brush	2
7.51	RD33614	Brush hold	2
7.52	RDB5003	Top Cap	1
7.53	RDA4035	Tapping Screw	2

16)CONTROL PANEL AND PARTS LIST

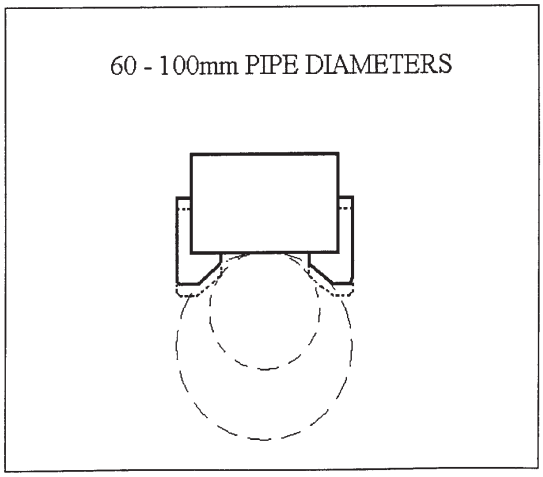


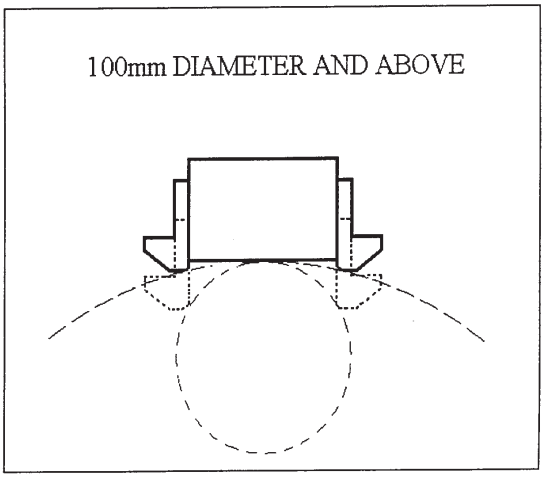
1	RDA4051	Green Motor Switch	1
2	RDA4052	Red Motor Switch	1
3	RDC4091	Magnet Switch	1
4	RDC4092	Red LED	1
5	RDC4093	Green LED	1
6	RDA4036	Screw M3 X 12 BTTN HD	2
7	RDA3118	Control Panel Cover	1
8	RDB3100 (110V) / RDB3101 (230V)	Control Plate	1
9	RDA4019	Nylon Spacer	2
10	RDC4099	Array Board	1
11	RDA4205	M3 Nut	2
12	RDA4083	Connection line	1
13	RDA4084	Connection line	1

17)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.





18) FITTING THE CHUCK

- To remove the arbor lay the machine on its side.
- Unscrew the two grub screws at the top of the arbor.
- When the arbor has become detached from the spindle this can then be removed.
- Remove the arbor support bracket and guard with the arbor retained.
- Mount the chuck using the chuck adaptor RD33153.
- Replacing the chuck is the reverse sequence.

19) 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 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.

20) 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

21) CUTTER SELECTION AND SPEEDS

Material	Material Hardness	Cutter
Mild and free cutting steels	<700N/mm²	RAP or RAPL
Mild and free cutting steels	<850N/mm²	SRCV or SRCVL
Steel angle and joists	<700N/mm²	RAP or RAPL
Steel angle and joists	<850N/mm²	SRCV or SRCVL
Plate and sheet steel	<700N/mm²	RAP or RAPL
Plate and sheet steel	<850N/mm²	SRCV or SRCVL
Aluminium	<750Nmm²	RAP or RAPL
Aluminium	<850N/mm²	SRCV or SRCVL
Brass	<700N/mm²	RAP or RAPL
Brass	<850N/mm²	SRCV or SRCVL
Cast iron	<700N/mm²	RAP or RAPL
Cast iron	<850N/mm²	SRCV or SRCVL
Stainless steel	<700N/mm²	RAP or RAPL
Stainless steel	<850N/mm²	SRCV or SRCVL
Stainless steel	>850N/mm²	CWC to CWCX
Rail track	>850N/mm²	SCRWC or SCRWCL
Tool steel	>850N/mm²	CWC to CWCX
Die Steel	>850N/mm²	CWC to CWCX

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	Cutting surface speed Meters/min	Cutter diameter/Material/RPM relationship													
		13		14		18		22		30		50		65	
Material to be cut	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.

22) WARRANTY STATEMENT

Rotabroach™ warrants its machines to be free from faulty materials, 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 not in accordance with the operators 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 atwww.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

Known and Trusted Worldwide for Quality, Performance and Reliability