

# ***Rotabroach***<sup>TM</sup>

## **FALCON MAGNETIC DRILLING MACHINE**



**Models CM/405/1 & CM/405/3**

## **OPERATOR'S MANUAL**

This machine (Serial No \_\_\_\_\_) is CE approved.

**Rotabroach Ltd**  
Imperial Works, Sheffield Road  
Sheffield, South Yorkshire  
United Kingdom  
S9 2YL

**Tel: +44 (0) 114 2212 510**

**Fax: +44 (0) 114 2212 563**

**Email: [sales@rotabroach.co.uk](mailto:sales@rotabroach.co.uk)**

**Web site: [www.rotabroach.co.uk](http://www.rotabroach.co.uk)**

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

***Other Products by Rotabroach™:***



**Thank you for your purchase of our product.**

## CONTENTS

	Page
1) General safety	4
2) Machine Specification	5
3) Operational safety procedures	6
4) Machine Operation instructions	6
5) Speed Selection	7
6) Arbor Attachments	7
7) Mounting of cutters	8
8) Remedies for hole making problems	8
9) Trouble shooting	9
10) Exploded diagram of machine	10
11) Exploded diagram of motor	11
12) Maintenance checks	12
13) Cutter selection and speed and feed information	14
14) Warranty	16

# 1) 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 this product

Remove the power supply before carrying out any adjustment, serving 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.
  - Do not use tools in the presence of flammable liquid or gases.
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 mA/0.1s) residual current device (RCD).
4. Do not let people not involved in the work, 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, tools should be stored in a dry locked-up place, out of reach of children.
6. Do not force the tool, 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 tools for purposes not intended: for example do not use circular saws to cut tree limbs or 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 protective hair covering to contain long hair.
9. Use protective equipment when using this machine
  - Use safety glasses.
  - Use ear defenders.
  - Use face or dust masks if cutting operations create dust.
  - Use protective gloves
10. Connect dust extraction and collecting equipment, if devices are provided, and ensure these are properly connected and used.
11. Does not abuse the cord; never pull the cord to disconnect it from socket. Keep the cord away from heat, oil and sharp edges.
12. Secure work where possible by using clamps or a vice to hold the work. It is safer than using your hand.
12. Do not overreach - keep proper footing and balance at all times.
13. Maintain tools with care
  - Keep cutting tools sharp and clean for better and safer performance.
  - Follow instruction for lubricating and changing accessories.
  - Inspect tool cords periodically and if damaged have them repaired by an authorized service facility.
  - Inspect extension cords periodically and replace if damaged.
  - Keep handles dry, clean and free of oil and grease.
15. Disconnect tools from the power supply when not in use, before servicing and when changing accessories such as blades, bits and cutters.
16. Remove adjusting keys and wrenches and form the habit of checking to see that keys and adjusting wrenches are removed from the tool before turning it on.
17. Avoid unintentional starting by ensuring the switch is in the "off" position when plugging in the power supply.
18. Use outdoor extension leads when the tool is used outdoors, but only those intended for outdoor use and so marked.
19. Stay alert and watch what you are doing, use common sense and do not operate the tool when you are tired.
20. Check for damaged parts before using the tool; it should be carefully checked to determine that it will operate properly and for its intended function.
21. Warning! The use of any accessory or attachment other than one recommended in this instruction manual may present a risk of personal injury.
22. Have your tool repaired by a qualified person

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.

## 2) MACHINE SPECIFICATION

Maximum hole cutting capacity in .2/.3C steel = 50mm dia. x 50mm deep  
Arbor bore = 19.05mm (3/4") dia.

Motor Unit	CM/405/1 110V	11.5A, 1150W
	CM/405/3 230V	5.75A, 1150W
Overall Dimensions	Machine	230 x 160 x 420mm
	Magnet Footprint	170mm x 85mm
Net Weight		13.0kgs
No Load Speed	All voltages	280 min-1 max low gear Max 530 min-1 high gear Max
Tractive Force of Magnet at 20° C (25mm min. plate thickness) <b>The use on any material less than 25mm thick will progressively reduce the magnetic performance. If possible additional 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.</b>		1850kgs
Maximum machine stroke		150mm
Twist drill diameter capacity		1-23mm
Tap diameter capacity (DIN376)		M3-M16
Maximum cutter diameter (Annular cutter)		50mm
Maximum cutting depth (Annular cutter)		50mm

It is recommended that ear and eye protectors are worn when operating this machine.

Suitable only for a single phase 25-60 Hz 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**

	List of Contents with Magnetic Drill Unit	Check List
RD40070	Carrying case	YES/NO
RD4329	Safety chain	YES/NO
RD48171	Chuck & key	YES/NO
RD48259	2MT to B16 Chuck attachment	YES/NO
RD40076	M10 Tap collet (DIN376)	YES/NO
RD40077	M12 Tap collet (DIN376)	YES/NO
RD40078	M14 Tap collet (DIN376)	YES/NO
RD40079	M16 Tap collet (DIN376)	YES/NO
RD40072	Hearing protectors	YES/NO
RD40073	Safety glasses	YES/NO
RD40074	Safety gloves	YES/NO
RD40080	2.5mm Hexagon key	YES/NO
RD40081	3mm Hexagon key	YES/NO
RD4088	4mm Hexagon key	YES/NO
RD4153	5mm Hexagonal key	YES/NO
RD40082	Wrench 8	YES/NO
RD48158	Machine Guard	YES/NO

### 3) OPERATIONAL SAFETY PROCEDURES

#### READ BEFORE USING THE MACHINE

All safety measures must be observed at all times when using magnetic core drills.

Improper use and carelessness increase the risk of accidents. Read and carefully follow these recommendations in order to improve your own safety.

This machine is specifically designed for drilling holes in steel, expanded by the possibility of tapping/reaming/countersinking, and must not be adapted and/or used for applications other than those they were designed for, including driving other apparatus.

- When using electrical tools, basic safety precautions should always be followed to reduce the risk of electric shock, fire, and personal injury.
- 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 or gasses. Failure to do so may result in personal injury.
- 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 eye and ear protectors when operating the machine. Failure to do so may result in personal injury.
- Disconnect from power source when changing cutters or working on the machine. Failure to do so may result in personal injury.
- Cutters and swarf are sharp, ALWAYS ensure that hands are adequately protected when changing cutters, or removing swarf.
- Before operating, ALWAYS ensure cutter retaining screws are secured.
- Regularly clear the work area and machine of swarf and dirt, paying particular attention to the underside of the magnet base.
- With a gloved hand, and after switching off the machine, remove any swarf that might have gathered around the cutter and arbor before proceeding with cutting.
- ALWAYS remove your tie, rings, watches and any loose adornments that might entangle with the rotating machinery before operating.
- 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.
- 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 that nuts and screws are tight.
- ALWAYS ensure when using the machine in an inverted position that the machine is securely restrained in the event of power failure. Only use the minimum amount of coolant and ensure that care is taken to prevent coolant entering 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 eject. DO NOT operate the machine if the slug has not ejected, as this may cause injury. If necessary, use barriers to prevent unauthorised access to work area.

### 4) MACHINE OPERATING INSTRUCTIONS

- Keep the inside of the cutter clear of swarf. It restricts the operating depth of the cutter.
- Apply the cutting fluid to the internal reservoir via the inducement holes in the arbor. It is then "metered out" by the pilot during the cutting cycle and is applied directly to the cutting edge. Alternatively, fluid can be applied directly onto the work-piece making certain that it floods into the groove formed by the cutter.
- Occasionally depress the pilot to ensure cutting fluid is being correctly metered.
- To start the machine, first switch on the magnet by depressing the single red button. Ensure that the rotary switch is set to R, then start the motor by depressing the GREEN (I) start button.
- ALWAYS switch off the motor by depressing the RED (O) stop button. DO NOT switch off the motor by switching the magnet off.
- Apply light pressure when commencing to cut a hole into the work surface. Pressure can then be increased sufficiently to load the motor. Excessive pressure is undesirable when using the Rotabroach™ "FALCON" machine. It does not increase the rate of penetration and may result in damage to the machine and cutter.
- 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 only, 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.
- Insecure anchorage, a loosely fitting slide, or a worn bearing in the arbor support bracket usually causes cutter breakage.

#### EXTENSION CABLE SELECTION

- The machines are factory fitted with a 3 metre length of cable having three, 1.5mm<sup>2</sup> conductors, 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:

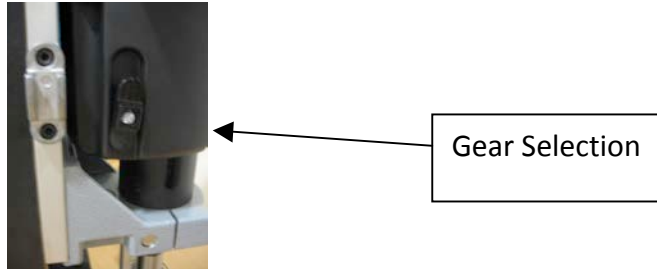
**For 110v supply: 3.5metres of 3 core x 1.5mm<sup>2</sup>**

**For 230v supply: 26 metres of 3 core x 1.5mm<sup>2</sup>**

## 5) SPEED SELECTION

The machine is equipped with gear ranges which can produce speeds up to 450rpm. Do not change the gear while the motor is in motion.



The speed range for this gear is changed by the rotary change switch located on the gearbox side.



The speed controller is adjusted by rotating the blue disk located on the control panel of the motor.

Before cutting holes in the work piece ensure that you are using the correct speed and gear for your material and cutter. Site conditions, e.g. diameter and condition of cutter, material condition, material thickness, etc must also be taken into account when determining the suitable cutting speed. The speed and feed rate must continuously be monitored and adjusted to ensure optimum cutting conditions prevail.

In general the faster output speeds would be used for smaller cutters and the slower more torque gears for larger cutters.

- Gear selector in**  **Position for small cutters**
- Gear selector in**  **Position for large cutters**

## 6) ARBOR ATTACHMENTS

The CM/405 has been design so that a number of 2 morse taper attachments can be used with this machine.

### **Arbors for cutters**

Currently available from Rotabroach™ are a number of various Arbors for fitting our range of cutters that are available with the standard 19.05mm Weldon shank attachment and also are available with a 32mm Weldon shank.

### **Twist drills**

It is possible to also use twist drills with this machine. These can either be 2MT twist drills or a using a suitable drill chuck. Please contact our sale department for further details. Max size twist drill that can be used with this machine is 23mm.

### **Tap and Tap holders**

Again as with the Twist drills this machine can also allow you to tap through holes. Using a suitable tap or tap holder they can be connected to the 2MT output shaft.

The machine is suitable for tapping up to M20. Please contact our sales department for further details and our available products.

## 7) MOUNTING OF CUTTERS

The machine has been made to accept cutters having 19.05mm (3/4") dia. 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.
- Take appropriate pilot and place through hole in shank of cutter. Insert shank of cutter into 3/8" dia. bore of arbor, ensuring alignment of two drive flats with socket screws
- Tighten both screws using hexagon key RD4088.

ALWAYS DISCONNECT MACHINE FROM POWER SOURCE.

## 8) REMEDIES FOR HOLE MAKING PROBLEMS

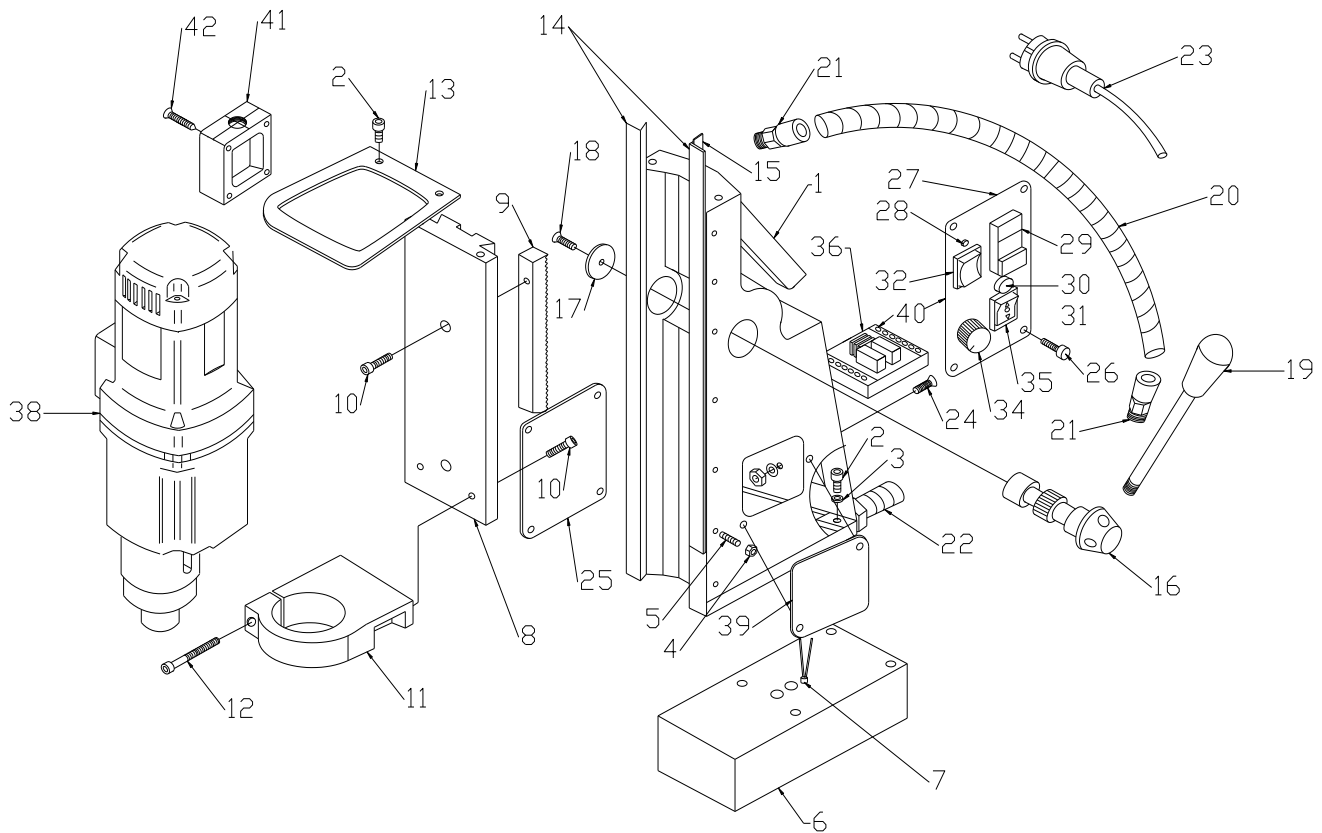
<i>Problem</i>	<i>Cause</i>	<i>Remedy</i>
1) Magnetic base won't hold effectively	Material being cut may be too thin for efficient holding.  Swarf or dirt under magnet.  Irregularity on magnet contact or work-piece.  Insufficient current going to magnet during drilling cycles.	Attach an additional piece of metal under work-piece where magnet will be located, 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.  Replace! Only a few thousandths wear permissible. 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.  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-ways need adjustment.  Cutter not attached tightly to arbor.  Insufficient use of cutting oil or unsuitable type of oil.	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 sideways.  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).
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.



## 9) TROUBLE SHOOTING

Magnet and motor do not function	<ul style="list-style-type: none"> <li>- The magnet switch is not connected to the power supply</li> <li>- Damaged or defective wiring</li> <li>- Defective fuse</li> <li>- Defective magnet switch</li> <li>- Defective Control Unit</li> <li>- Motor forward/reverse switch set to O</li> </ul>
Magnet does function, the motor does not	<ul style="list-style-type: none"> <li>- Damaged or defective wiring</li> <li>- Carbon brushes are stuck or worn out</li> <li>- Defective magnet switch</li> <li>- Defective On / off switch</li> <li>- Defective Control Unit</li> <li>- Defective anchor and/or field</li> </ul>
Magnet does not function, the motor does	<ul style="list-style-type: none"> <li>- Defective magnet</li> <li>- Defective Control Unit</li> </ul>
Hole cutters break quickly, holes are bigger than the hole cutter	<ul style="list-style-type: none"> <li>- Play in the guide</li> <li>- Bent spindle</li> <li>- Shaft extending from the motor is bent</li> </ul>
Motor running roughly and/or seizing up	<ul style="list-style-type: none"> <li>- Bent spindle</li> <li>- Shaft extending from the motor is bent</li> <li>- Triangular guide not mounted straight</li> <li>- Dirt between spindle and triangular guide</li> </ul>
Motor making a rattling sound	<ul style="list-style-type: none"> <li>- Gear ring (bottom of the anchor) worn out</li> <li>- Gear(s) worn out</li> <li>- No grease in gear box</li> </ul>
Motor humming, big sparks and motor has no force	<ul style="list-style-type: none"> <li>- Anchor burned</li> <li>- Field burned</li> <li>- Carbon brushes worn out</li> </ul>
Motor does not start or fails.	<ul style="list-style-type: none"> <li>- Damaged or defective wiring</li> <li>- Dirt in sensor Speed Control Unit</li> <li>- Defective Speed Control Unit</li> <li>- Defective speed control or its wiring</li> <li>- Defective or loose magnet on top of anchor</li> </ul>
Guiding takes a great deal of effort	<ul style="list-style-type: none"> <li>- Guide is set too tight</li> <li>- Guide is dry</li> <li>- Guide/gear- rack/rotation system dirty or damaged</li> </ul>
Insufficient magnetic force	<ul style="list-style-type: none"> <li>- Damaged or defective wiring</li> <li>- Bottom of magnet not clean and dry</li> <li>- Bottom of magnet not flat</li> <li>- Work piece is not bare metal</li> <li>- Defective Control Unit</li> <li>- Defective magnet</li> </ul>
Motor only runs at maximum rpm	<ul style="list-style-type: none"> <li>- Defective speed switch</li> <li>- Damaged / defective wiring</li> <li>- Defective Control Unit</li> </ul>
Frame under voltage	<ul style="list-style-type: none"> <li>- Damaged / defective wiring</li> <li>- Defective magnet</li> <li>- Motor seriously dirty</li> </ul>
Fuse blows when magnet switch is turned on	<ul style="list-style-type: none"> <li>- Damaged or defective wiring</li> <li>- Wrong value fuse</li> <li>- Defective magnet switch</li> <li>- Defective Control Unit</li> <li>- Defective magnet</li> </ul>
Fuse blows when motor is started up	<ul style="list-style-type: none"> <li>- Damaged or defective wiring</li> <li>- Wrong value fuse</li> <li>- Motor running roughly</li> <li>- Defective Anchor and / or Field</li> <li>- Carbon brushes worn out</li> <li>- Defective Control Unit</li> </ul>
Rotation system free stroke too long	<ul style="list-style-type: none"> <li>- Loose or defective gear-rack</li> <li>- Defective rotation system</li> </ul>

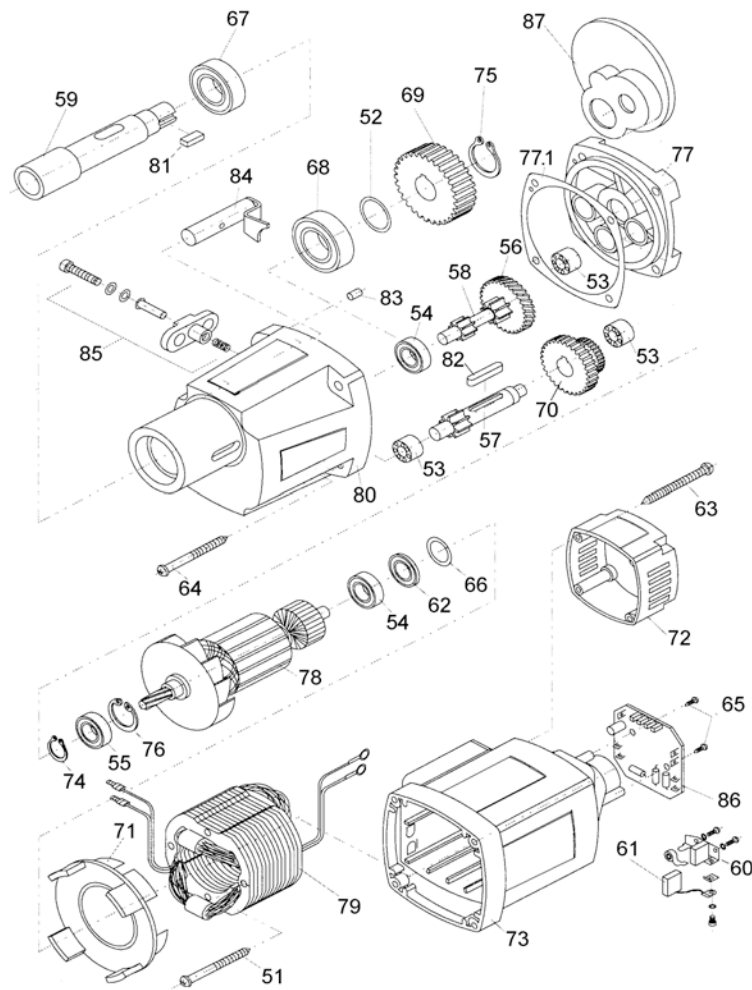
## 10) EXPLODED DIAGRAM OF MACHINE



Component identification for CM/405/1-3 FALCON

Item No	Part No	Description.	Item No	Part No	Description.
1	RD48153	Frame	24	RD48196	Screw+washer+nut
2	RD48174	Screw SSM6x16	25	RD38001	Info Plate
3	RD48175	Washer M6	26	RD48198	Panel screw M4x8 (rearplate)
4	RD48176	Setting Nut		RD48199	Panel screw long M4x20 (frontplate)
5	RD48177	Setting Screw	27	RD38010	Front plate 110V
6	RD48178	Magnet Hi/Lo	27	RD38011	Front Plate 230V
7	RD48179	Sensor	28	RD48201	Sensor LED+cable
8	RD48180	Slide	29	RD48202	On/Off switch
9	RD48181	Rack	30	RD48203	Fuse holder
10	RD48182	Screw SSM6x20	31	RD48204	Fuse F2A
11	RD48183	Motorholder	32	RD4643	Magnet switch
12	RD48184	Screw SSM6x25	34	RD48206	Potentiometer
13	RD48185	Top fixing plate 110mm	35	RD48207	L/R switch
14	RD48186	Brass rail set (stick)	36	RD48208	Control Unit Hi/Lo 220v
15	RD48187	Pressing Strip 4 holes	36	RD48209	Control Unit Hi/Lo 110v
16	RD48188	Capstan hub assembly	37	RD48210	Cable clamp
17	RD48189	End plate	38	RD48211	Motorunit 220v
18	RD48190	End screw	38	RD48212	Motorunit 110v
19	RD48191	Arm for Capstan	39	RD38009	Name plate
20	RD48192	Motorcable	40	RD48256	Complete control unit
21	RD48193	Coupling nut for motorcable	41	RD48213	Cable housing
22	RD48194	Coupling nut for maincable	42	RD48214	Screw 8 x 35
23	RD48195	Main Cable			

## 11) EXPLODED DIAGRAM OF MOTOR



Component identification for CM/405/1-3 FALCON

Item No	Part No	Description.	Item No	Part No	Description.
51	RD48215	Screw 3,9x60	72	RD48236	End cover
52	RD48216	Adaptor ring 22x0,2	73	RD48237	Housing
53	RD48217	Needle bearing	74	RD48238	Circlip 471/10
54	RD48218	Bearing 8x22x7	75	RD48239	Circlip 471/15
55	RD48219	Bearing 12x28x8	76	RD48240	Circlip 472/28
56	RD48220	First gear	77	RD48241	Inner gear plate
57	RD48221	Axle	77.1	RD48242	Gasket for gearcasing
58	RD48222	Gear shaft	78	RD48243	Armature 220v
59	RD48223	Spindle drive shaft		RD48244	Armature 110v
60	RD48224	Carbon brush holder	79	RD48245	Field 220v
61	RD48225	Carbon brush set		RD48246	Field 110v
62	RD48226	Ringmagnet	80	RD48247	Gear casing
63	RD48227	Screw 4,8x45	81	RD48248	Key for spindle
64	RD48228	Screw 4,8x50	82	RD48249	Key
65	RD48229	Screw 2,8x12	83	RD48250	Casing pin
66	RD48230	Adaptor ring rubber 22x2,5	84	RD48251	Clutch shaft
67	RD48231	Bearing 20x37x9	85	RD48252	Gear switch
68	RD48232	Bearing 17x40x12	86	RD48253	Speed Control Unit 220v
69	RD48233	Spindle gear		RD48254	Speed Control Unit 110v
70	RD48234	Gear 34/40	87	RD48255	Plate for gear casing
71	RD48235	Baffle	88	RD38009	Name Plate

## 12) MAINTENANCE CHECKS

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.

Machine must be checked before operation for any signs of damage that will affect the operation of the machine. Particular notice must be taken of 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.
6. Place the machine on a steel plate, connect to supply and switch on 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.

**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 the machine.

**Check Armature of the machine.**

This should be checked at least 1 per month to check that there are 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 this is normal as this is the part that comes in contact with the brushes but any signs of abnormal damage and the part should be replaced.

### 13) CUTTER SELECTION AND SPEEDS

Material	Material Hardness	Cutter
Mild and free cutting steels	<700N/mm <sup>2</sup>	RAP or RAPL
Mild and free cutting steels	<850N/mm <sup>2</sup>	SRCV or SRCVL
Steel angle and joists	<700N/mm <sup>2</sup>	RAP or RAPL
Steel angle and joists	<850N/mm <sup>2</sup>	SRCV or SRCVL
Plate and sheet steel	<700N/mm <sup>2</sup>	RAP or RAPL
Plate and sheet steel	<850N/mm <sup>2</sup>	SRCV or SRCVL
Aluminium	<750N/mm <sup>2</sup>	RAP or RAPL
Aluminium	<850N/mm <sup>2</sup>	SRCV or SRCVL
Brass	<700N/mm <sup>2</sup>	RAP or RAPL
Brass	<850N/mm <sup>2</sup>	SRCV or SRCVL
Cast iron	<700N/mm <sup>2</sup>	RAP or RAPL
Cast iron	<850N/mm <sup>2</sup>	SRCV or SRCVL
Stainless steel	<700N/mm <sup>2</sup>	RAP or RAPL
Stainless steel	<850N/mm <sup>2</sup>	SRCV or SRCVL
Stainless steel	>850N/mm <sup>2</sup>	CWC to CWCX
Rail track	>850N/mm <sup>2</sup>	SCRWC or SCRWCL
Tool steel	>850N/mm <sup>2</sup>	CWC to CWCX
Die Steel	>850N/mm <sup>2</sup>	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 <sup>®</sup>	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.

## NOTES



## 14) WARRANTY STATEMENT

Rotabroach™ warrants its machines to be free from faulty materials, or workmanship under normal use for a period of 12 months from initial date of purchase and 90 days for all other parts (excluding cutters), 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 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 on [www.rotabroach.co.uk](http://www.rotabroach.co.uk)

The warranty claim must be lodged 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](http://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 MECHANICALITY 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**