Excision EM 50 RL-E

Magnetic Drilling Machine

OPERATING MANUAL

Model: EM 50 RL-E
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Published by Capital Machinery Sales Pty Ltd

WARNING: Do not operate this equipment without reading and understanding this manual.

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Quick Start

This page covers everyday use. Read Section 1 Safety before using the machine for the first time.



Figure 1. Controls: magnet switch (1), motor switch (2), forward and reverse switch (3), speed control (4).

Before you start (every day)

- Check the power cord, plug and any extension cord for damage.
- Make sure the surface under the magnet base (8) is flat, clean and free of rust. Remove paint and filler.
- Fit and fill the coolant unit (10).
- Wear safety goggles, safety footwear, ear protection and gloves. Tie back long hair.

Drill a hole

1. Plug the machine into the mains socket.
2. Position the cutter on the marked centre, then press the magnet switch (1) to ON so the magnet holds the machine.
3. On walls and ceilings, secure the machine with the safety belt.
4. Select the gear with the gear shift (13) and set the speed with the speed control (4). Set the forward and reverse switch (3) to forward (right).
5. Press the motor switch (2) to ON. Feed the cutter with the capstan handles (9). Keep the cutter cooled.
6. When the hole is finished, draw the cutter back with the motor still running. Remove the chips and the core.

Stopping: switch off in reverse order. First switch the motor switch (2) to OFF, then the magnet switch (1) to OFF. The machine has no separate emergency stop.

WARNING: The magnet stops holding if the power fails. When drilling on walls and ceilings, always secure the machine with the supplied safety belt.

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1 Safety

1.1 General safety

Read this manual before using the machine, and keep it with the machine.

- Only trained and authorised people may use, set up or maintain the machine. One operator only.
- Use the machine only for drilling with core (annular) cutters or twist drills on ferromagnetic workpieces, within the limits in Section 2.
- Wear safety gloves and safety boots, plus any other PPE listed in Section 1.2. No loose clothing or jewellery, and tie back long hair.
- Keep the work area clean, dry, well lit and clear of offcuts.
- Never remove, bypass or modify any guard, safety device or safety sign.
- Never clean, oil or adjust the machine while it is running.
- Electrical work must only be done by a licensed electrician.
- In a fire, isolate the power and use a dry powder or CO2 extinguisher. Never use water on electrical equipment.
- Report any damage or fault, and do not use the machine until it is repaired.

1.2 Machine specific hazards

- Improper handling or poor maintenance can destroy the machine and cause serious accidents with considerable injuries.
- **Power failure:** the magnet does not hold if the power is interrupted. When drilling on walls and ceilings, secure the machine with the supplied safety belt.
- **Ejector pin:** the cut core is ejected automatically by the ejector pin. The ejector pin can break if it is used incorrectly.
- **Electric shock:** use only an undamaged power cord and extension cords, and check them regularly for damage.
- The mains supply must match the voltage on the machine nameplate.
- **PPE:** safety goggles, appropriate footwear, ear protection, a hair net for long hair and gloves. Wear an apron and safety helmet where needed.
- The surface for the magnet base must be clean and free of rust. Remove paint (lacquer) and filler.
- Do not do any electric welding on the workpiece the machine is mounted on.
- Fit the coolant unit before all operations.
- **Pacemakers:** people with cardiac pacemakers or other medical devices may only use this machine with their doctor's approval.
- **Rotating parts:** never touch rotating parts. Keep hands and fingers away from the work area while the motor is running, or serious injury can result.
- **Chips:** remove chips with the chip remover. Never touch them with bare hands.
- **Noise:** the machine emits 92 dB(A) at 300 mm from the motor. Wear ear protection.
- The machine may only be used in a dry place, protected from the weather. It can be used horizontally, vertically or overhead.

1.3 Safety devices

- **Magnet switch (1):** switches the magnet on and off. Switch it on before starting the motor and off only after the motor is off.
- **Motor switch (2):** separate ON (I) and OFF (O) buttons. Use OFF to stop the motor. There is no separate emergency stop.
- **Thermal protection:** switches the motor off automatically if it overheats (Section 4.4).
- **Safety belt (supplied):** secures the machine when drilling on walls and ceilings.
- **Chip remover (supplied):** for clearing chips safely.

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2 Specifications

2.1 Machine data

Item	Excision EM 50 RL-E
Power supply	230 V, 50/60 Hz, single-phase
Power consumption	1200 W
On-load speed	100 to 250 / 180 to 450 rpm
Gearbox	2-speed, forward and reverse (right and left). Gear 1: 100 to 250 rpm. Gear 2: 180 to 450 rpm
Tool holder	MT 2
Stroke	170 mm (6.7 in)
Height adjustment	100 mm
Maximum drilling diameter in steel, core cutter	50 mm (2 in)
Maximum drilling diameter in steel, twist drill	20 mm (0.8 in)
Cutting depth	50 mm (2 in)
Tapping	Up to M20 (M3 to M14 with tapping chuck, M3 to M20 with tapping attachment)
Magnetic base size	92 x 238 mm (3.62 x 9.37 in)
Magnetic holding force	16000 N
Tool force (10 mm)	3800 N
Weight	16 kg (35 lb)
Noise emission	92 dB(A) at 300 mm (12 in) from the motor
Vibration at the handle	AC = 3.5 mm/s² and VC = 3.2 mm/s

2.2 Dimensions and included accessories

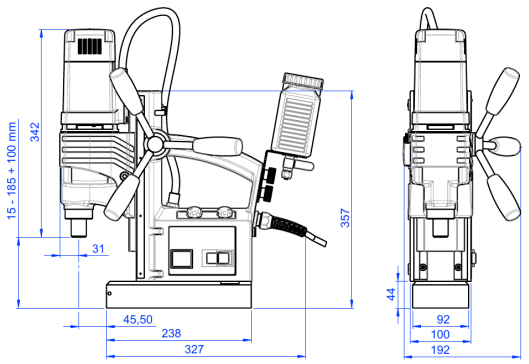


Figure 2. Main dimensions (mm).

Included accessories
Transport case
Coolant unit
Coolant spray
Chip remover
Drill chuck 3 to 16 mm, MT 2
Safety belt
Allen key 2.5 mm
Allen key 6.0 mm
Spare ejector pin, core cutter

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3 Installation

3.1 On delivery



Figure 3. The machine as supplied, fully assembled.

The machine is supplied fully assembled, with this operating manual.

- Check the machine for transport damage as soon as it arrives.
- Check that all the included accessories in Section 2.2 are there.
- If anything is damaged or missing, contact Capital Machinery Sales through capitalmachinery.com.au straight away.

3.2 Work surface

- The magnet base (8) only holds on ferromagnetic material (steel and iron).
- The surface must be flat, clean and free of rust. Remove paint (lacquer) and filler.
- Do not do any electric welding on the workpiece the machine is mounted on.
- For non-magnetic materials, a vacuum base system is needed. Contact Capital Machinery Sales.

3.3 Electrical connection

- Connect to a 230 V, 50/60 Hz mains socket. The supply must match the voltage on the machine nameplate.
- Use only an undamaged power cord and extension cords. Check them regularly for damage.

3.4 Coolant unit

Fit the coolant unit (10) before all operations. Internal cooling through the coolant unit gives the best cooling of the core cutter.

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4 Operation

4.1 Controls and machine parts

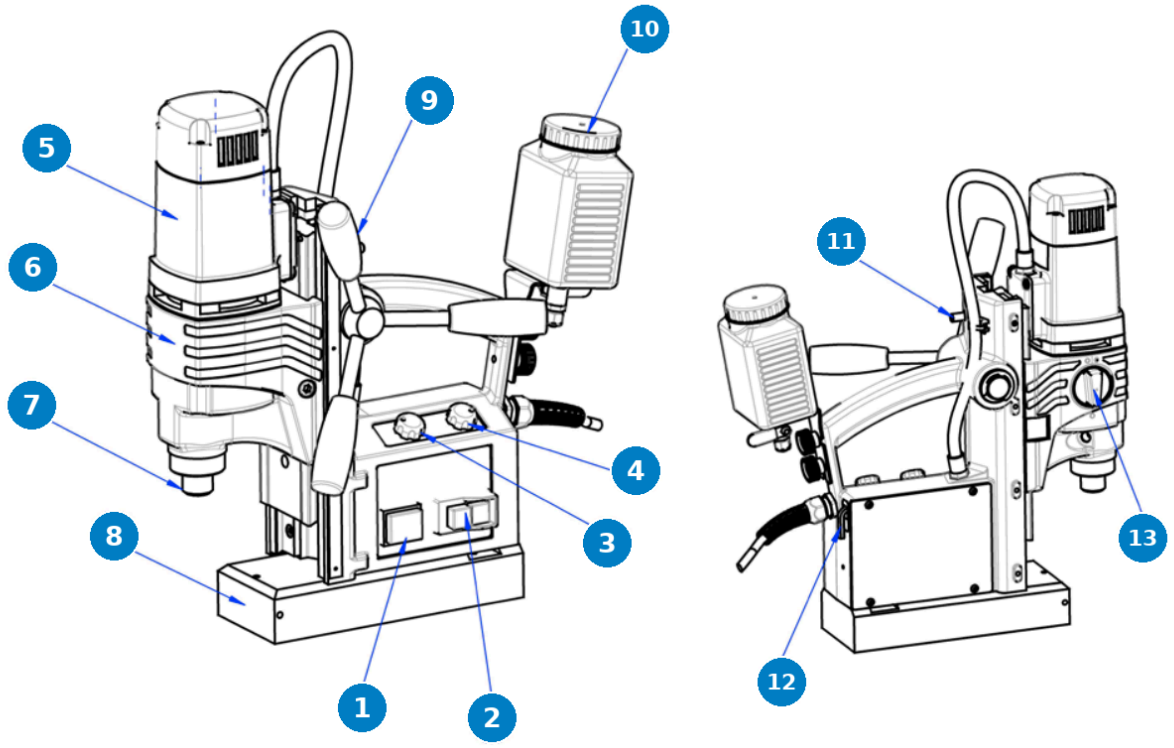


Figure 4. Controls and main parts, items 1 to 13.

Item	Control or part	Function
1	Magnet switch	Switches the electromagnet on and off
2	Motor switch	Starts (I) and stops (O) the drive motor
3	Forward and reverse switch	Sets the direction of rotation (right or left)
4	Speed control	Sets the motor speed electronically
5	Motor	Drive motor
6	Gearbox	2-speed gearbox
7	Tool holder	MT 2 taper
8	Magnet base	Electromagnet that holds the machine on the workpiece
9	Capstan feed handles	Feed the cutter into the work
10	Coolant unit	Coolant tank for cutter cooling
11	Slide lock	Locks the slide and sets the motor stroke range
12	Allen key holder	Holds the Allen key
13	Gear shift	Selects gear 1 or gear 2

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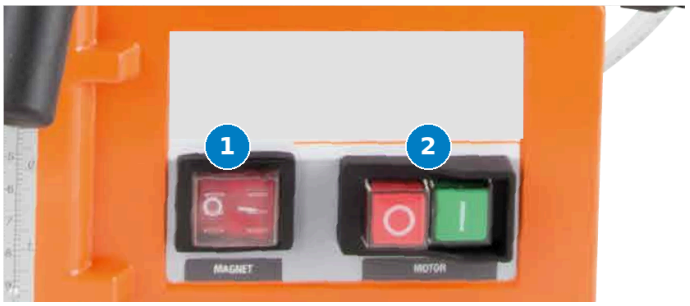


Figure 5. Magnet switch (1) and motor switch (2).

4.2 Starting up

WARNING: Always read this manual before using the machine for the first time.

1. Check the cable and plug for damage, then plug into the mains socket.
2. Press the magnet switch (1) to ON. The magnet now holds the machine.
3. When working on walls and ceilings, secure the machine with the safety belt. For this work, cooling with a cutting spray is recommended.
4. Press the motor switch (2) to ON to start the motor.
5. To switch off, reverse the order: first the motor switch (2) to OFF, then the magnet switch (1) to OFF.

4.3 Setting the speed

The machine has a gearbox with two mechanical gears and full-wave electronic speed control.

1. Select the correct gear first with the gear shift (13).
2. Then set the exact speed with the speed control (4).

Where possible, choose the low gear with a high motor speed. The motor then runs with high torque and is protected against overheating under heavy load.

4.4 Thermal protection

The thermal protection switches the motor off automatically if it overheats. After it trips, let the motor run with no load at high speed for about 2 minutes to cool down.

4.5 Drilling with annular cutters (Weldon shank)

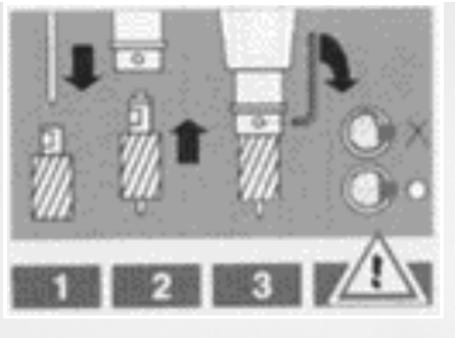


Figure 6. Fitting the annular cutter, steps 1 to 3.

1. Fit the AMK 2 tool holder into the arbor.
2. Push the ejector pin (centre pin) through the head of the annular cutter.
3. Fit the cutter as shown. Position the set screw in the centre of the flat on the Weldon shank, then tighten it firmly.

1. Place the annular cutter with its ejector pin on a marked centre or marking.
2. Spot drill until the whole cutting edge has formed a full circle. The cutter does not need much force.
3. Keep the cutter cooled at all times while drilling. The coolant unit (10) gives the best internal cooling.

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4. Do not stop the motor while drilling. When the hole is finished, draw the cutter back with the motor running.
5. Remove the chips and the core after each hole.

WARNING: Remove chips with the chip remover. Do not touch them with bare hands, or you could be injured.

4.6 Drilling with twist drills



Figure 7.
Twist drill.

1. Use the 3 to 16 mm drill chuck with MT 2 shank only with twist drills.
2. Fit the drill chuck with its adaptor into the arbor.
3. Fit the twist drill in the drill chuck and tighten it with the chuck key.
4. Twist drills with an MT 2 shank can be fitted directly into the arbor.

4.7 Tapping

With the quick-change tapping adaptor, threads from M3 to M20 can be tapped.



Figure 8. Quick change tapping adaptor (14), tap collet (15) and tap (16).

1. Fit the quick-change tapping adaptor (14) into the arbor. Make sure it is a tight fit.
2. Fit the tap (16) into the tap collet (15).
3. Fit the tap collet (15) with the tap (16) into the quick change tapping adaptor (14).
4. Set the motor to the correct cutting speed.
5. Match the tap to the prepared hole in the workpiece (see the tables below). Lower the spindle until the tap touches the surface, then start tapping.

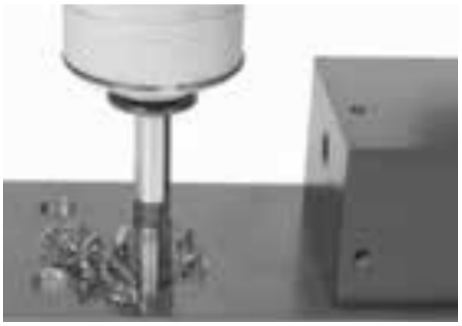


Figure 9. Tap placed on the drilled hole.

NOTE: Make sure the tap is placed on the drilled hole.

When the forward motion is finished:

1. Switch off the motor with the motor switch (2).
2. Set the forward and reverse switch (3) to the left (reverse).
3. Switch on the motor.
4. Lead the tap back out.

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5. Switch off the motor once the tap is completely out.

Metric ISO thread

Size	Pitch	Drill Ø
M3	0.5	2.5
M4	0.7	3.3
M5	0.8	4.2
M6	1	5
M8	1.25	6.8
M10	1.5	8.5
M12	1.75	10.2
M14	2	12
M16	2	14
M18	2.5	15.5
M20	2.5	17.5

Table. Tapping drill sizes, metric ISO thread (mm).

Metric fine thread

Size	Pitch	Drill Ø
M8 x 1	1	7
M10 x 1	1	9
M12 x 1	1	11
M12 x 1.5	1.5	10.5
M14 x 1	1	13
M14 x 1.5	1.5	12.5
M16 x 1	1	15
M16 x 1.5	1.5	14.5
M20 x 1	1	19
M20 x 1.5	1.5	18.5

Table. Tapping drill sizes, metric fine thread (mm).

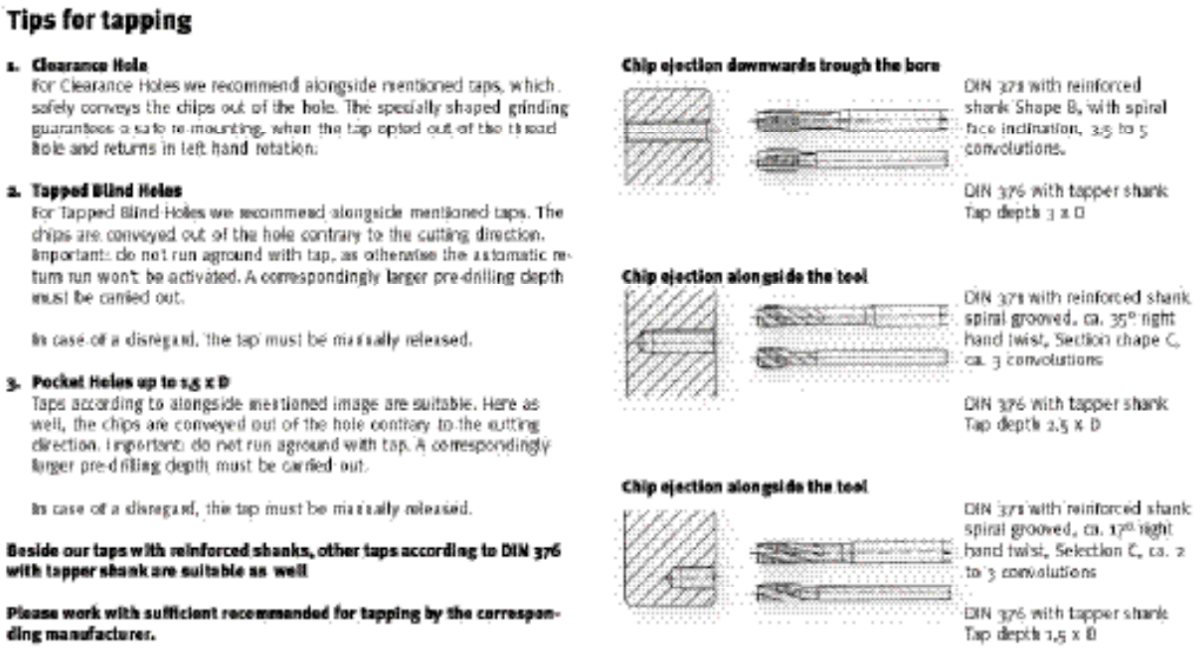


Figure 10. Tips for tapping: recommended taps for through holes, blind holes and pocket holes.

4.8 Switching off

1. Switch the motor switch (2) to OFF.
2. Switch the magnet switch (1) to OFF. On walls and ceilings, hold the machine and keep the safety belt in place until the machine is taken down.
3. Unplug the machine and store it in the transport case, lying down.

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5 Maintenance and Troubleshooting

WARNING: Before any cleaning, maintenance or repair, switch off and unplug the machine and lock it out, so it cannot be switched on by accident. Refit all guards and check the safety devices before use.

5.1 Maintenance schedule

When	Task
After each hole	Remove the chips and the core.
Regularly	Clean the outside of the motor with dry compressed air. Check the power cord and connecting cables for damage. Clean and grease all sliding surfaces.
If the slide has side play	Wear on the dovetail guide can cause side play. Take it up by adjusting the set screws (K) on the side of the slide.
After work	Store the machine in the transport case, lying down.
About every 250 running hours	Replace the carbon brushes. Have the machine serviced by an authorised workshop, including changing the gear oil (Lubcon Turmogearoil PE 150, 300 ml) and the carbon brushes.

CAUTION: Have the machine serviced at about 250 running hours. Damage caused by skipped servicing (carbon brushes and gear oil) is not covered by warranty (Section 6).

Maintenance, checks and repairs must only be done by a licensed electrician, following the regulations that apply in Australia. Use only genuine spare parts.

5.2 Troubleshooting

Problem	Cause	Fix
Motor stops during drilling	Motor overheated, thermal protection tripped	Let the motor run with no load at high speed for about 2 minutes to cool. Use low gear with high motor speed (Section 4.3).
Machine does not hold firmly	Surface not flat or clean, or covered in rust, paint or filler	Clean the surface and remove paint and filler (Section 3.2).
	Non-magnetic material	A vacuum base system is needed. Contact Capital Machinery Sales.
Core not ejected, or ejector pin broken	Ejector pin used incorrectly	Fit the spare ejector pin supplied.
Side play in the slide	Wear on the dovetail guide	Adjust the set screws (K) on the side of the slide.
Tap will not come out after tapping	Motor still set to forward	Switch off, set the forward and reverse switch (3) to the left, switch on and lead the tap back out (Section 4.7).
Any problem that continues		Contact Capital Machinery Sales through capitalmachinery.com.au.

5.3 Storage, disposal and parts

Storage: store the machine in the transport case, lying down, in a dry place. **Disposal:** dispose of the machine and packaging according to local rules.

To order parts, contact Capital Machinery Sales with the machine model, serial number and part description. A photo of the part helps. Common wear parts are the carbon brushes, ejector pins, cutters and the gear oil.

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5.4 Parts drawings

Use these drawings and lists to describe a part when ordering.

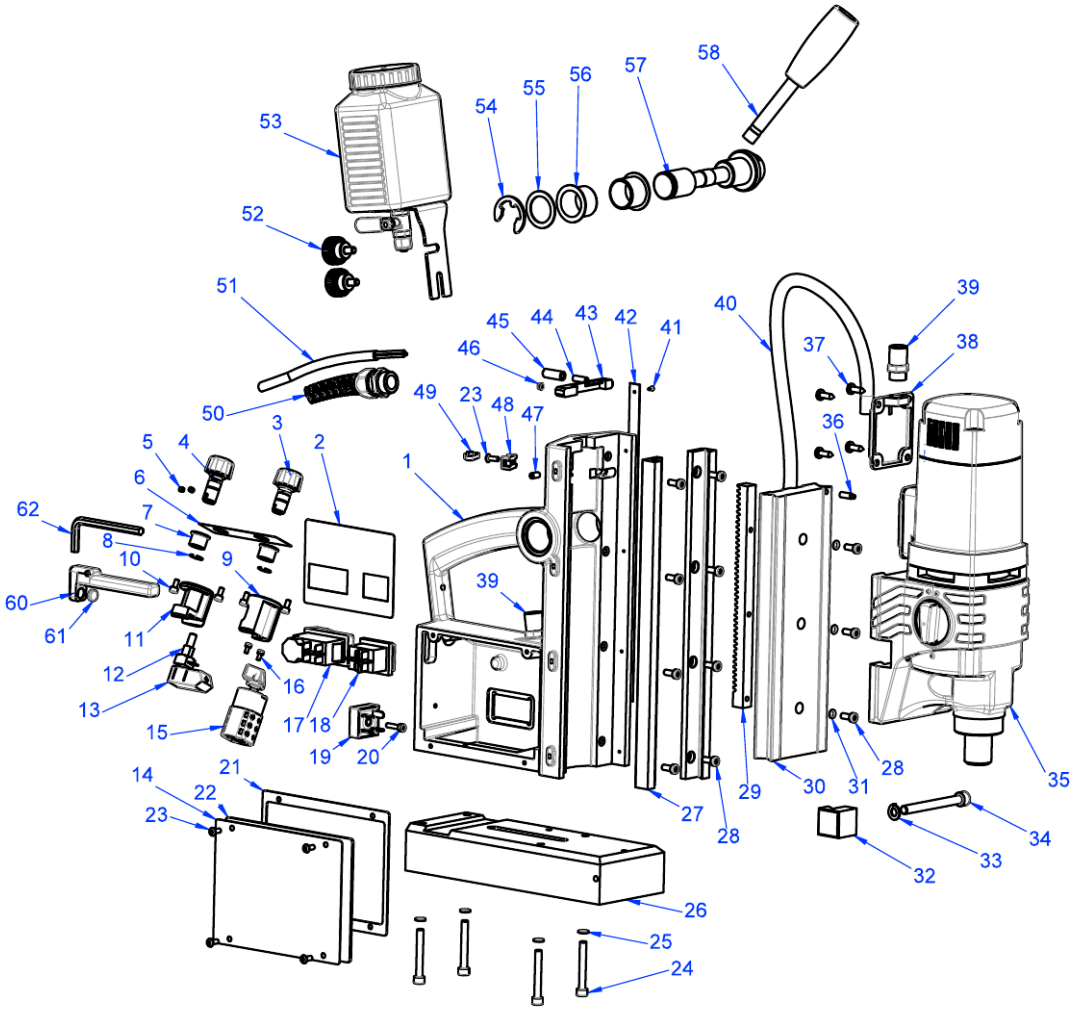


Figure 11. Machine parts, positions 1 to 62.

Pos.	Description	Qty
1	Housing B40/60RL-E	1
2	Front label	1
3	Rotary knob	1
4	Potentiometer knob	1
5	Set screw	2
6	Rotary switch label	1
7	Sintered bronze collar bushing	2
8	Retaining ring	2
9	Rotary switch adaptor	1
10	Socket cap screw	4
11	Potentiometer adaptor	1
12	Rotary potentiometer	1
13	Potentiometer cover	1
14	Type plate	1
15	Left and right switch	1
16	Socket cap screw	2
17	Motor switch KJD17F/240V/110V	1
18	Magnet switch HY12	1

Pos.	Description	Qty
32	Motor fixing part	1
33	Lock washer	1
34	Socket cap screw	1
35	Motor AHB 32/4-RL-E	1
36	Set screw	1
37	Screw	4
38	Flange piece	1
39	Corrugated pipe screw connection	2
40	Flexible cable guide	1
41	Half-round notch nail, galvanised	1
42	Scale	1
43	Slide	1
44	Set screw	1
45	Knurled nut	1
46	Resilient thrust piece	1
47	Set screw, Tuflok	4
48	Cable fixture	1
49	Lacing cord 180 x 4.5 mm	1

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19	Bridge rectifier (400 V)	1
20	Cylinder screw, galvanised	1
21	Frame seal	1
22	Type plate	1
23	Mushroom head screw	5
24	Socket cap screw	4
25	Lock washer	4
26	Magnet base	1
27	Brass guide rail	2
28	Socket cap screw	11
29	Rack, 210 mm	1
30	Slide	1
31	Lock washer	3

50	Protection sleeve	1
51	Connector (plug) type	1
52	Knurled screw	2
53	Coolant unit, complete	1
54	Lock washer	1
55	Washer	1
56	Plain bearing	2
57	Pinion shaft	1
58	Spoke (capstan handle)	3
60	Insert for hexagon offset screwdriver	1
61	Round magnet D 9 mm	1
62	Hexagon wrench key	1

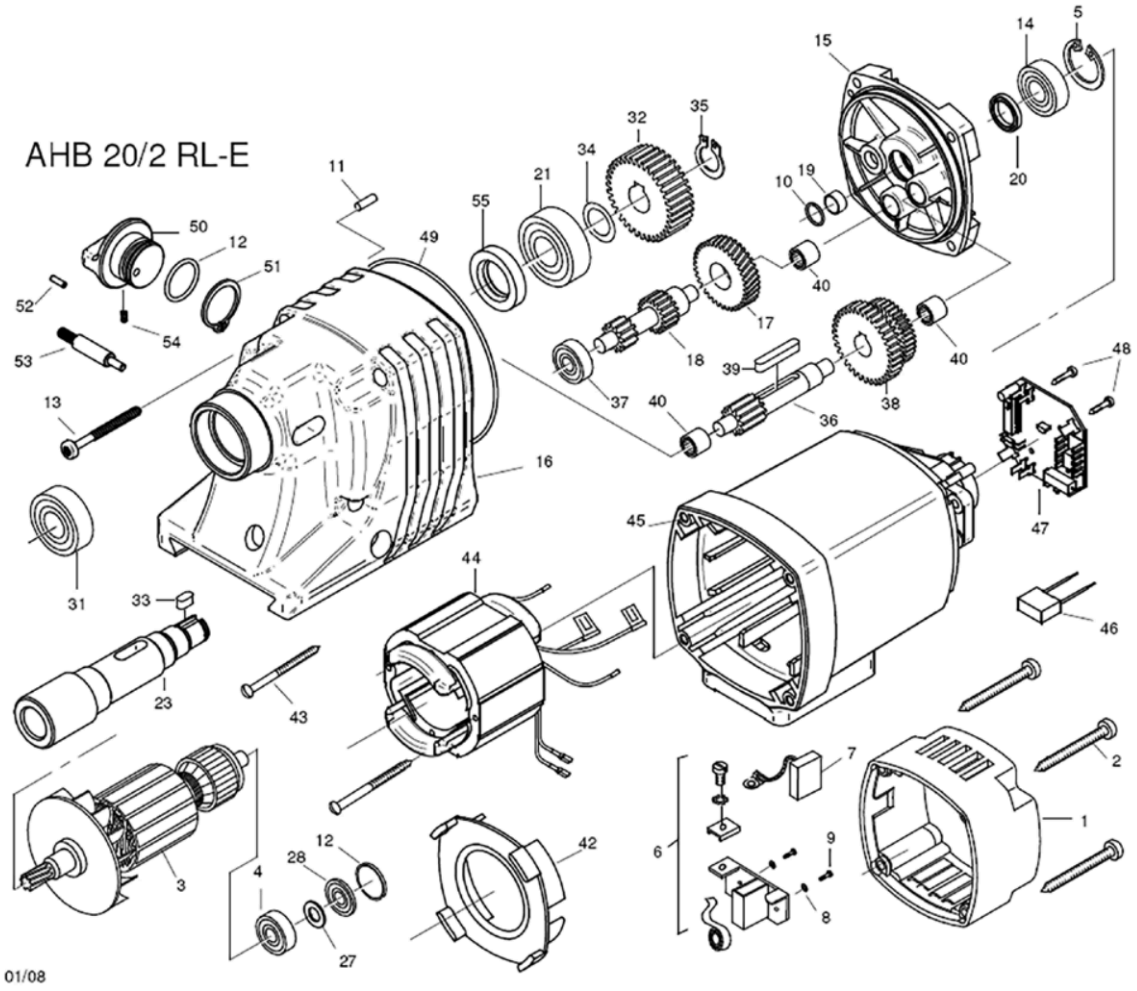


Figure 12. Motor parts (motor AHB 20/2 RL-E).

Pos.	Description	Qty
1	Motor housing cap	1
2	Sheet metal screw HC 4.8 x 45	4
3	Armature, complete, 110 V	1
3	Armature, complete, 230 V	1

Pos.	Description	Qty
32	Spindle gear 45 T	1
33	Feather key A5 x 5 x 12	1
34	Washer 15/22 x 0.2	1
35	Retaining ring 15/1	1

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4	Deep groove ball bearing 608 2Z	1
5	Retaining ring 28/1.2	1
6	Carbon brush holder	2
7	Carbon brush	2
8	Spring disc B4, corrugated	4
9	Thread forming screw CM4 x 12	4
10	Circlip SW 10	1
11	Dowel pin 4 x 12	1
12	O-ring 22 x 2.5	2
13	Sheet metal screw HC 4.8 x 60	4
14	Deep groove ball bearing 6001 2RS	1
15	Gearbox flange	1
16	Gearbox housing	1
17	Intermediate gear 44 T	1
18	Shaft with two gears 11/17	1
19	Bushing	1
20	Rotary shaft seal KEIV 15 x 21 x 3	1
21	Deep groove ball bearing 6203 2RS	1
23	Motor spindle	1
27	Disc	1
28	Magnet ring	1
31	Deep groove ball bearing 6904 2RS	1

36	Shaft for gear block 13 T	1
37	Deep groove ball bearing 608	1
38	Gear block 34/40 T	1
39	Feather key A5 x 5 x 28	1
40	Needle bearing HK0810	3
42	Fan shroud	1
43	Screw 3.9 x 60	2
44	Field, complete, 110 V	1
44	Field, complete, 230 V	1
45	Motor housing, complete	1
46	Anti-interference capacitor	1
47	Printed circuit board, 110 V	1
47	Printed circuit board, 230 V	1
48	Sheet metal screw HC 2.9 x 13	2
49	O-ring 85 x 1.78	1
50	Gear shift knob	1
51	Retaining ring 26/1.2	1
52	Cylinder pin 3m6 x 10	1
53	Control pin	1
54	Locking pin	1
55	Rotary shaft seal WAS 20 x 35 x 7	1

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6 Warranty and Support

6.1 Warranty

- Standard 12-month warranty, unless a different period is shown on the product page or your invoice.
- Covers replacement of any part or material found to be defective under normal working conditions. Misuse and damage are not covered.
- This warranty is in addition to your rights under the Australian Consumer Law. Full terms are at capitalmachinery.com.au.

Not covered by warranty

- Using non-genuine parts, or parts not supplied or approved by Capital Machinery Sales, including consumables such as annular cutters, twist drills, taps, ejector pins and carbon brushes. Any damage this causes is not covered.
- Tampering with, opening or modifying the machine or its sealed components.
- Incorrect power, air or gas connection.
- An unsuitable operating environment, poor maintenance, work by unauthorised people, excessive use or not following this manual.
- Damage caused by not having the machine serviced at about 250 running hours (carbon brushes and gear oil, Section 5.1).

6.2 Making a warranty claim

Lodge your claim online at capitalmachinery.com.au/warranty-claim. Have your invoice number and date of purchase ready, and describe the problem. Photos or a short video help us resolve it faster. Our team will reply by email with the next steps.

6.3 Service and parts

For service, spare parts and support, visit capitalmachinery.com.au.

6.4 Revision history

Revision	Date	Description
Rev 0	06/11/2026	First issue, created from the manufacturer's manual

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Capital Machinery Sales has supplied, serviced and supported workshop machinery across Australia for over 20 years, backed by more than 30 years of hands-on industry experience.

Sales, service and spare parts

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Warranty claims: capitalmachinery.com.au/warranty-claim

Hallam, Victoria