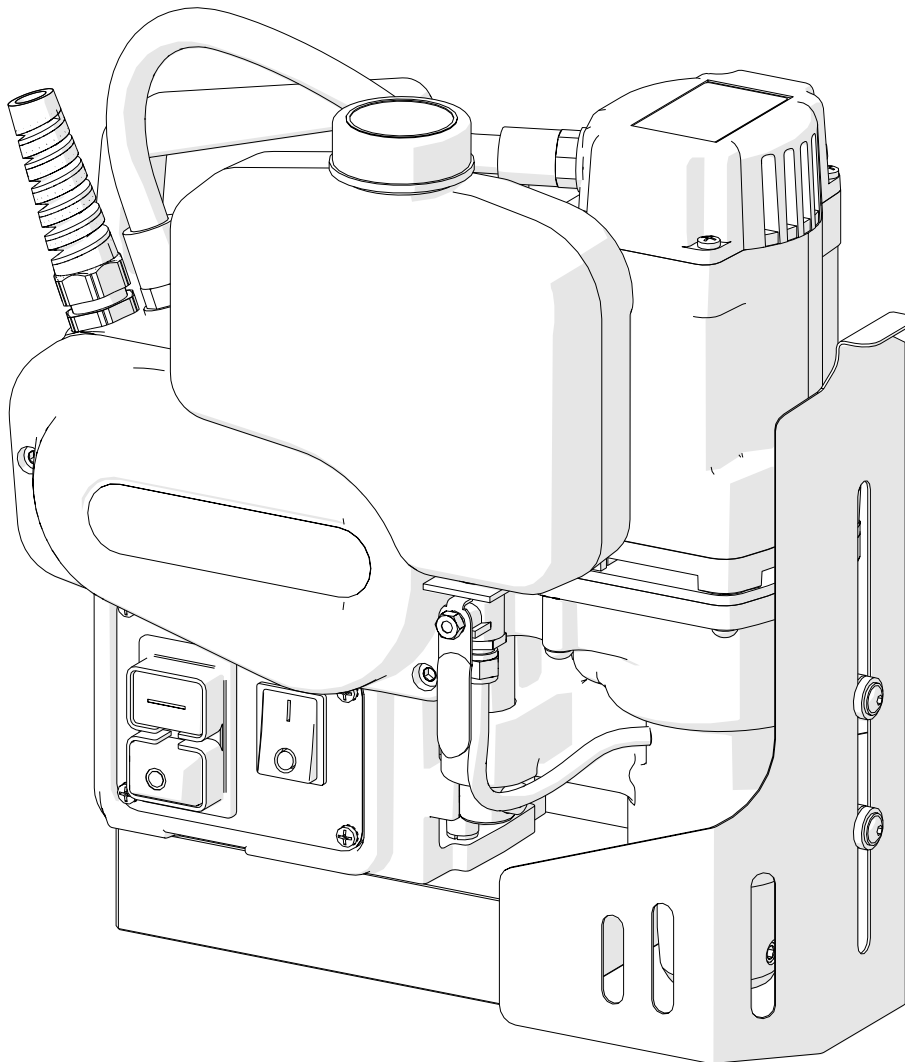




The tools of innovation.

## **OPERATOR'S MANUAL**

### **D1 AUTO DRILLING MACHINE WITH ELECTROMAGNETIC BASE**



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# Contents

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1. GENERAL INFORMATION .....	3
1.1. Application .....	3
1.2. Technical data.....	3
1.3. Design .....	4
1.4. Equipment included .....	5
2. SAFETY PRECAUTIONS.....	6
3. STARTUP AND OPERATION .....	8
3.1. Mounting and operating the annular cutter .....	8
3.2. Mounting and dismounting the cooling system bottle .....	10
3.3. Control system of the electromagnetic base holding force .....	10
3.4. Preparing .....	11
3.5. Drilling.....	13
3.6. Replacing the motor brushes .....	14
4. WIRING DIAGRAM .....	15
5. EXPLODED DRAWINGS AND PARTS LIST.....	16
6. DECLARATION OF CONFORMITY .....	20
7. QUALITY CERTIFICATE.....	21
8. WARRANTY CARD.....	22

## 1. GENERAL INFORMATION

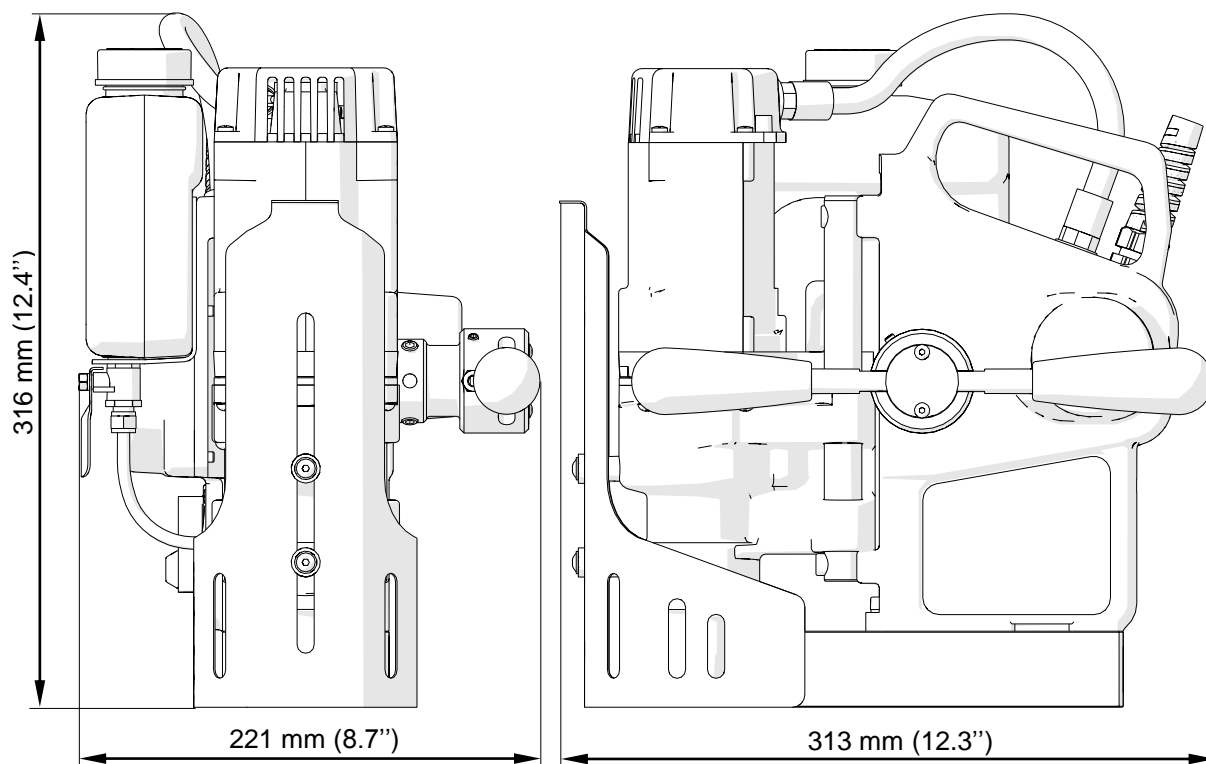
### 1.1. Application

The D1 AUTO is a drilling machine with electromagnetic base designed to drill holes with diameters of 12–36 mm (0.47–1.42") to the maximum depth of 51 mm (2") through the use of annular cutters.

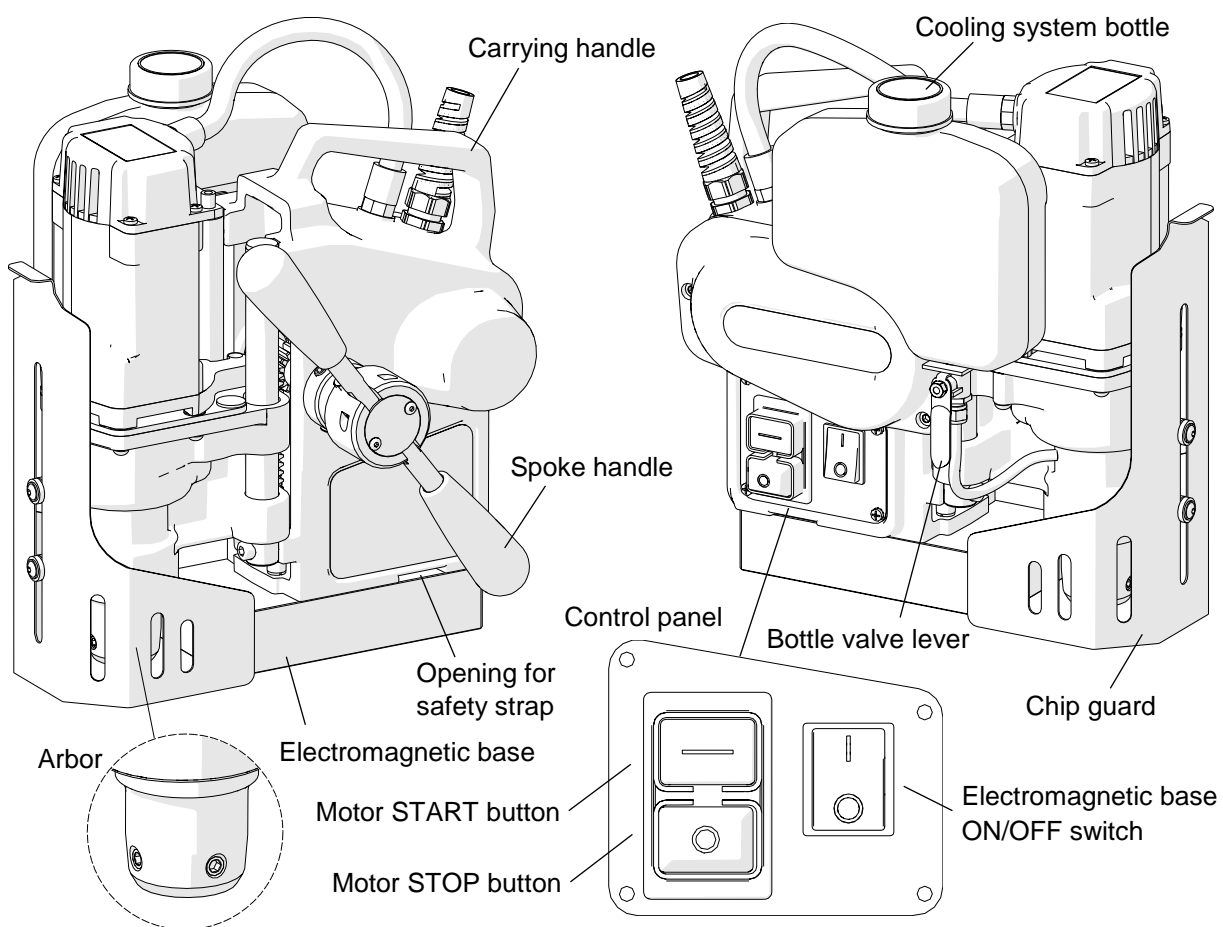
The electromagnetic base allows the drilling machine to be fixed to ferromagnetic surfaces with a force that ensures user safety and proper machine operation. A safety strap protects the machine from dropping in case of a power loss.

### 1.2. Technical data

Voltage	1~ 110–120 V, 50–60 Hz 1~ 220–240 V, 50–60 Hz
Total power	1000 W
Motor power	920 W
Cutter holder	19 mm Weldon (0.75")
Maximum drilling diameter	36 mm (1.42")
Maximum drilling depth	51 mm (2")
Electromagnetic base holding force (surface with the thickness of 22 mm and roughness $R_a = 1.25$ )	9 000 N
Electromagnetic base dimensions	80 mm × 160 mm × 38 mm 3.1" × 6.3" × 1.5"
Slider stroke	70 mm (2.8")
Rotational speed under load	350 rpm
Rotational speed without load	580 rpm
Minimum workpiece thickness	6 mm (0.23")
Protection class	I
Noise level	over 85 dB
Vibration level	under 2.5 m/s <sup>2</sup> (≤ 8.2 ft/s <sup>2</sup> )
Required ambient temperature	0–40°C (32–104°F)
Weight	13.5 kg (30 lbs)



### 1.3. Design



**Fig. 1.** View of the D1 AUTO

D1 AUTO Operator's Manual

### **1.4. Equipment included**

The D1 AUTO is supplied in a metal box with complete standard equipment. The included equipment consists of:

Drilling machine	1 unit
Metal box	1 unit
Spoke handle	2 units
Cooling system bottle	1 unit
Chip guard	1 unit
Safety strap	1 unit
4 mm hex wrench	1 unit
Operator's Manual	1 unit

## **2. SAFETY PRECAUTIONS**

1. Before beginning, read this Operator's Manual and complete proper occupational safety and health training.
2. The machine must be used only in applications specified in this Operator's Manual.
3. The machine must be complete and all parts must be genuine and fully operational.
4. The electrical supply specifications must conform to those specified on the rating plate.
5. The machine must be plugged into a properly grounded (earthed) socket-outlet. The electrical supply must be protected with a 16 A fuse for 230 V or a 32 A fuse for 115 V. When used on building sites, supply the machine through an isolation transformer made with class II protection only.
6. Never carry the machine by the cord and never pull the power cord as this may damage it and result in electric shock.
7. Transport and position the machine using the carrying handle, with the magnet switch set to position 'O'.
8. Untrained bystanders must not be present near the machine.
9. Before beginning, check the condition of the machine and electrical supply, including the power cord, plug, control panel components, and cutters.
10. Keep the machine dry. Exposure to rain, snow, or frost is prohibited.
11. Never stay below the machine placed at heights.
12. Keep the work area well lit, clean, and free of obstacles.
13. Mount the annular cutter securely using the set screws. Remove adjusting keys and wrenches from the work area before connecting the plug to the power outlet.
14. Never use dull or damaged cutters.
15. Mount and dismount cutters using protective gloves and with the power cord unplugged from the power outlet.
16. Never use annular cutters without the pilot pin except when drilling incomplete through holes.
17. Mount only annular cutters with the maximum drilling diameter of 36 mm (1.42") and the maximum drilling depth of 55 mm (2.17").
18. Never use machine near flammable liquids or gases, or in explosive environments.
19. Using the machine on surfaces that are rusty, covered with a thick paint layer, uneven, or not rigid is prohibited.

20. Use the safety strap in all operating positions. The strap must be tight and fastened to a securely fixed element either through the opening in the machine body or by catching the strap on the carrying handle. Never insert the strap into the buckle from the front.
21. Before every use, inspect the machine to ensure it is not damaged. Check whether any part is cracked or improperly fitted. Make sure to maintain proper conditions that may affect the operation of the machine.
22. Always use eye and hearing protection and protective clothing during operation. Do not wear loose clothing.
23. Proceed with caution when drilling plate with a thickness less than 10 mm (0.4") as the adhesion force depends on material thickness and is significantly lower for thin plate.
24. The entire surface of the electromagnetic base bottom must be in full contact with the workpiece. Before every positioning, wipe the workpiece with coarse-grained sandpaper.
25. Do not touch moving parts or chips formed during milling. Prevent objects from being caught in moving parts.
26. After every use, remove metal chips and excess coolant from the machine. Do not remove chips with bare hands.
27. Cover steel parts with a thin anti-corrosion coating to protect the machine from rust when not in use for any extended period.
28. Maintain the machine and mount/dismount parts and tools only with the machine unplugged from the power outlet.
29. Repair only in a service center appointed by the seller.
30. If the machine falls from any height, is wet, or has any other damage that could affect the technical state of the machine, stop the operation and immediately send the machine to the service center for inspection and repair.
31. Never leave the machine unattended during operation.
32. Remove from the worksite and store in a secure and dry location when not in use, previously removing the cutter and pilot pin from the arbor.

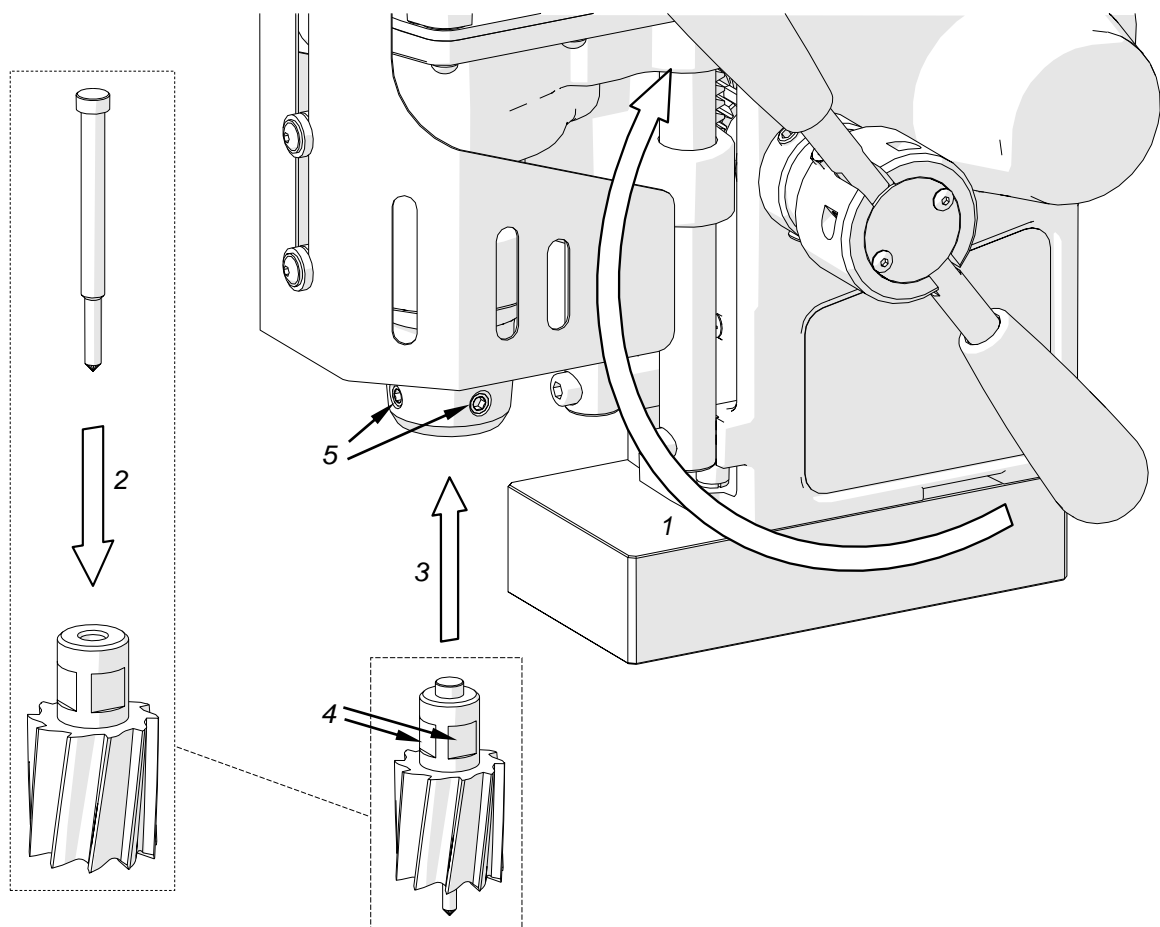
### 3. STARTUP AND OPERATION



**Adhere to all safety precautions.**

#### 3.1. Mounting and operating the annular cutter

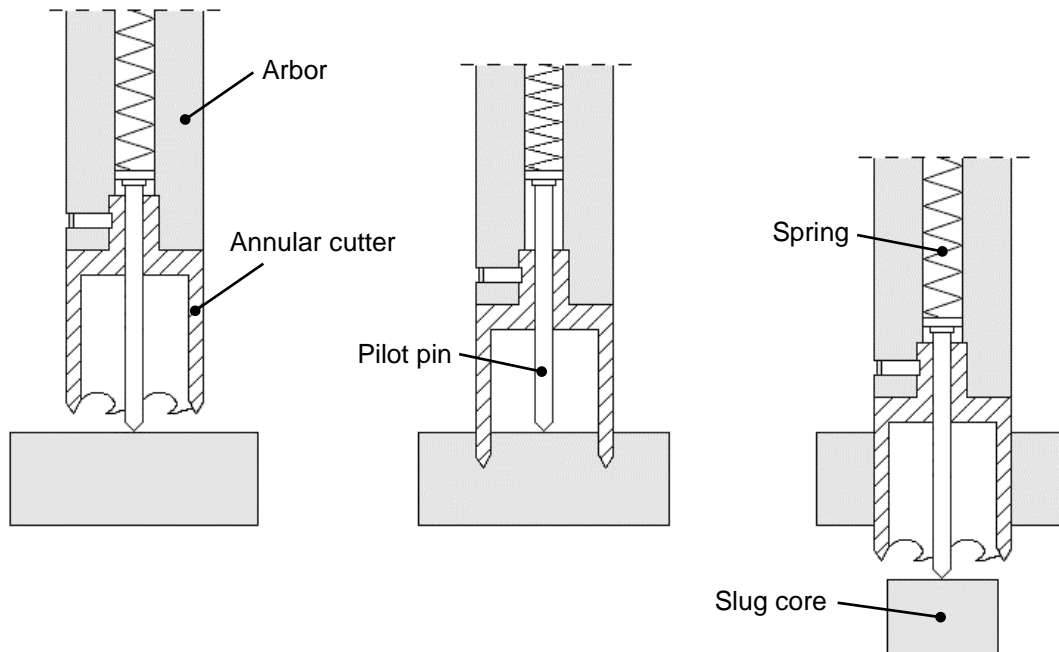
Unplug the power cord from the power outlet and raise the motor by rotating the spoke handles clockwise (1, Fig. 2). Insert the proper pilot pin into the annular cutter (2), then wear protective gloves and place the cutter into the arbor (3) in such a way to align the flats 4 with the set screws 5. Finally, tighten both set screws with the supplied 4 mm hex wrench. To remove the cutter, proceed in reverse order.



**Fig. 2. Mounting the annular cutter**

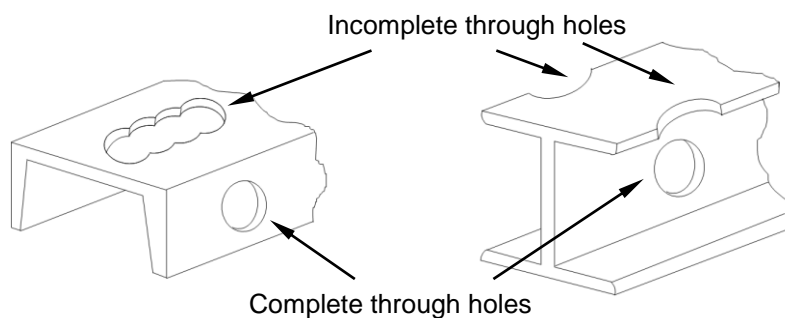


Fig. 3 shows how annular cutters operate. As the cutter penetrates the workpiece, the pilot pin recesses into the arbor and tightens the spring. As a result, after the cutter goes through the entire thickness, the slug core is expelled from the cutter. The pilot pin also allows application of coolant to the inner surface of the annular cutter as it is depressed.



**Fig. 3.** Annular cutters operation

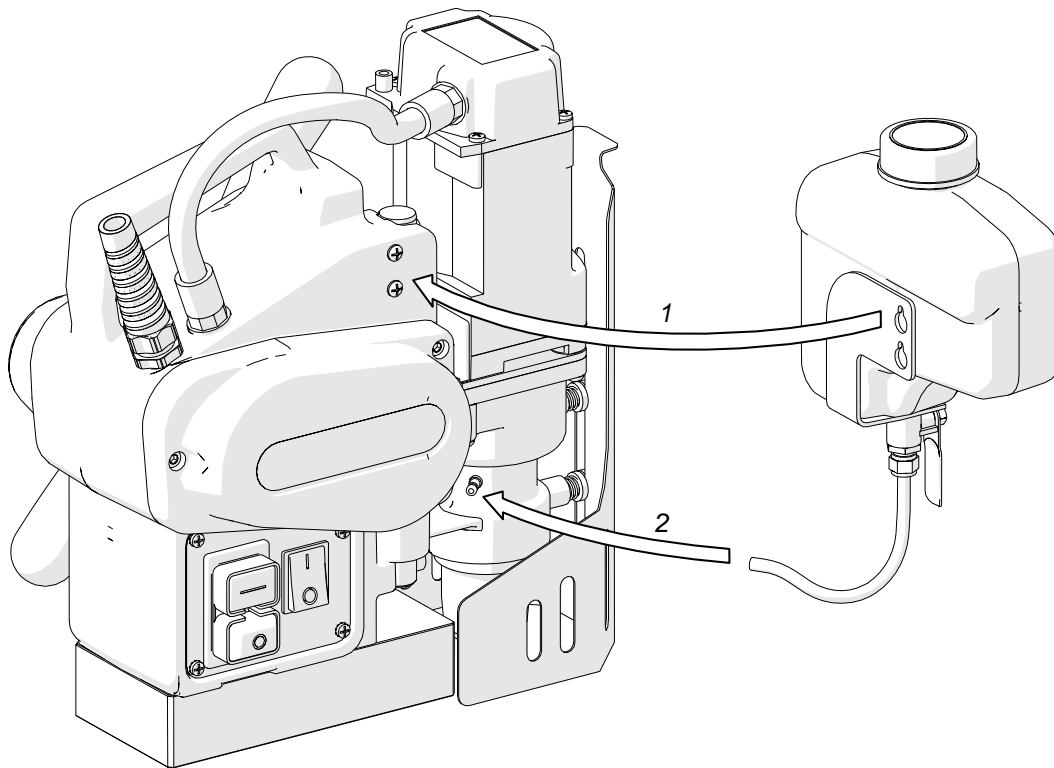
Annular cutters are designed to make only through holes shown in Fig. 4. When drilling incomplete through holes the pilot pin must not be used.



**Fig. 4.** Types of holes to make with annular cutters

### 3.2. Mounting and dismounting the cooling system bottle

Hang the cooling system bottle on the screws (1, Fig. 5) and attach the bottle hose to the coupling (2). Dismount in reverse order.



**Fig. 5.** Mounting the cooling system bottle

### 3.3. Control system of the electromagnetic base holding force

The D1 AUTO drilling machine incorporates a holding force control system to monitor the adhesion force of the electromagnetic base to the surface. The force value depends on several factors, such as type, thickness, flatness, and roughness of the surface, presence of paint, rust or other contaminants, supply voltage fluctuations, and the wear of the electromagnetic base bottom.

If the holding force falls below a safe operating value, the control system will not allow the machine to operate. Additionally, the system will prevent the startup of the motor if the machine is placed on a surface thinner than 5 mm (0.2") as such thickness does not provide sufficient holding force. In such a case, the adhesion force will be only about 25% of the force attained on a standard 22 mm (0.87") flat plate.

If the motor does not continue operation after the green MOTOR button is pushed and released, it means that the control circuit is operating properly and preventing further drilling because of too low adhesion force.

### 3.4. Preparing

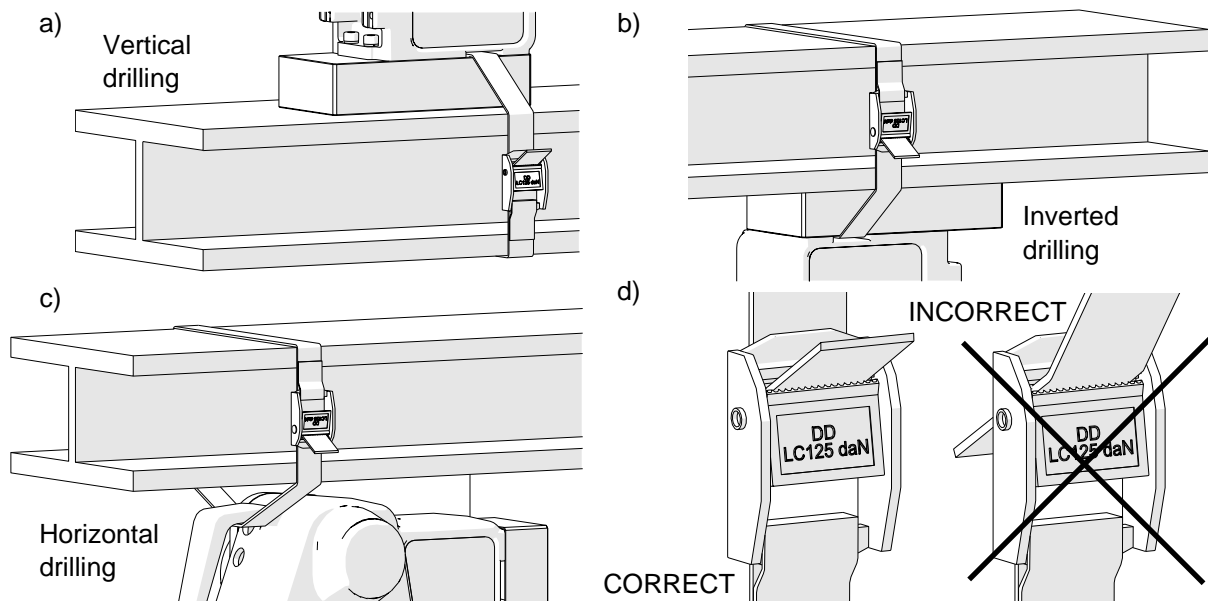
Before beginning, clean steel parts, especially the Weldon shank, from anti-corrosion coating used to preserve the machine for storage and transport.

Next, mount the annular cutter into the arbor in the manner described before.

Position the machine on a flat ferromagnetic surface (some types of stainless and acid-proof steel do not conduct magnetic flux) with the thickness of at least 6 mm (0.23"). The workpiece must be clean, without rust or paint that decrease the holding force of the electromagnetic base.

Then, connect the drilling machine to the power outlet and enable the holding force of the electromagnetic base by toggling the MAGNET switch to position 'I'.

Protect the machine using the safety strap to prevent possible injury if the machine loses magnetic adhesion in case of a power loss. To do this, either mount the strap through the opening in the machine body (Fig. 6a, 6b) or catch the strap on the carrying handle when working in horizontal position (Fig. 6c). The strap must be tight, not twisted, and must be replaced every single time the machine hangs on the strap as a result of coming loose from steel. Never insert the strap into the buckle from the front (Fig. 6d).



**Fig. 6.** Securing the drilling machine using the safety strap

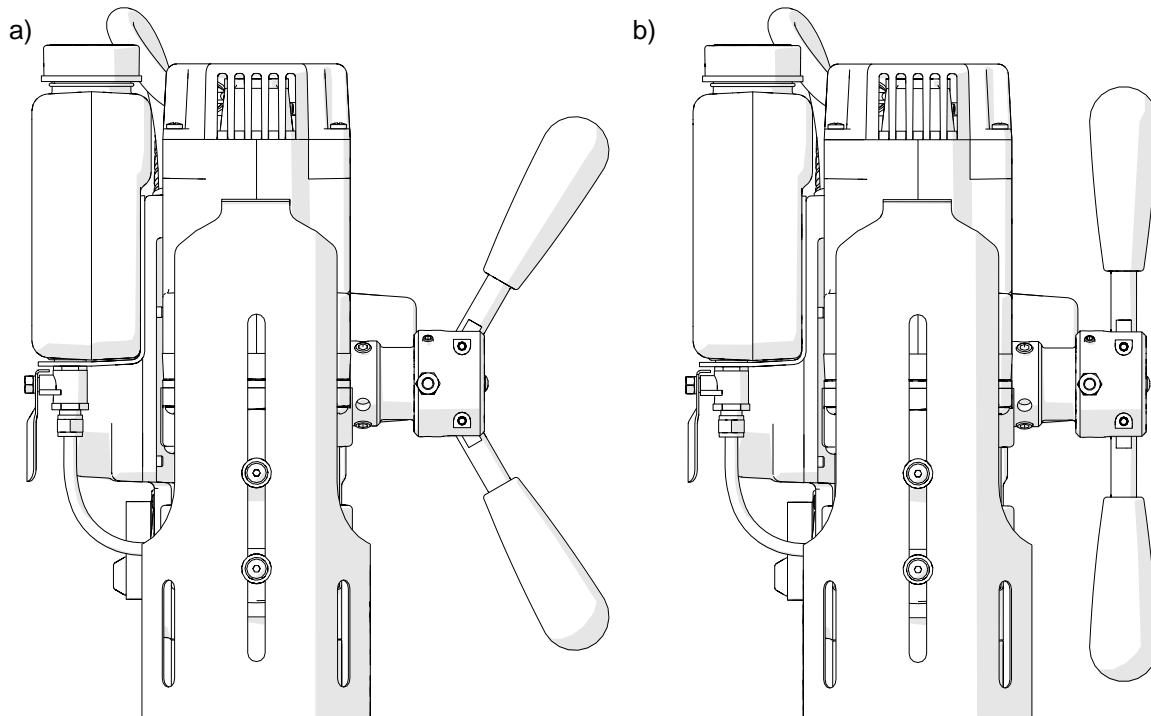
When working in the position from Fig. 6a, mount the cooling system bottle as described before and fill it with a cutting fluid. Do not use pure water as the cutting fluid. However, using emulsions formed from mixing water and drilling oil is satisfactory. To check the operation of the cooling system, slightly loosen the bottle cap, open the

valve using the lever, and initially apply pressure on the pilot pin by rotating the spoke handles counterclockwise. The fluid should fill the system and begin flowing from the inside of the cutter.



**The cooling system works by means of gravitation, therefore use a cooling paste when working in horizontal or inverted positions.**

Enter into manual feed mode by positioning the spoke handles as shown in Fig. 7a, and rotate them counterclockwise to place the tip of the pilot pin above the drilling point.



**Fig. 7.** Configuration of the spoke handles: manual feed (a), automatic feed (b)

### 3.5. Drilling

Start the motor by pressing the green MOTOR button. Slowly rotate the spoke handles counterclockwise to bring the cutter close to the workpiece. Then, gently begin drilling and enter into the automatic feed mode by setting the spoke handles in the position shown in Fig. 7b. The drilling machine will automatically detect the end of the drilling, which will stop the feed after the hole is made, however, the motor will still be rotating.



**When the cutter goes through the material, the slug core is expelled from the tool with a significant force.**

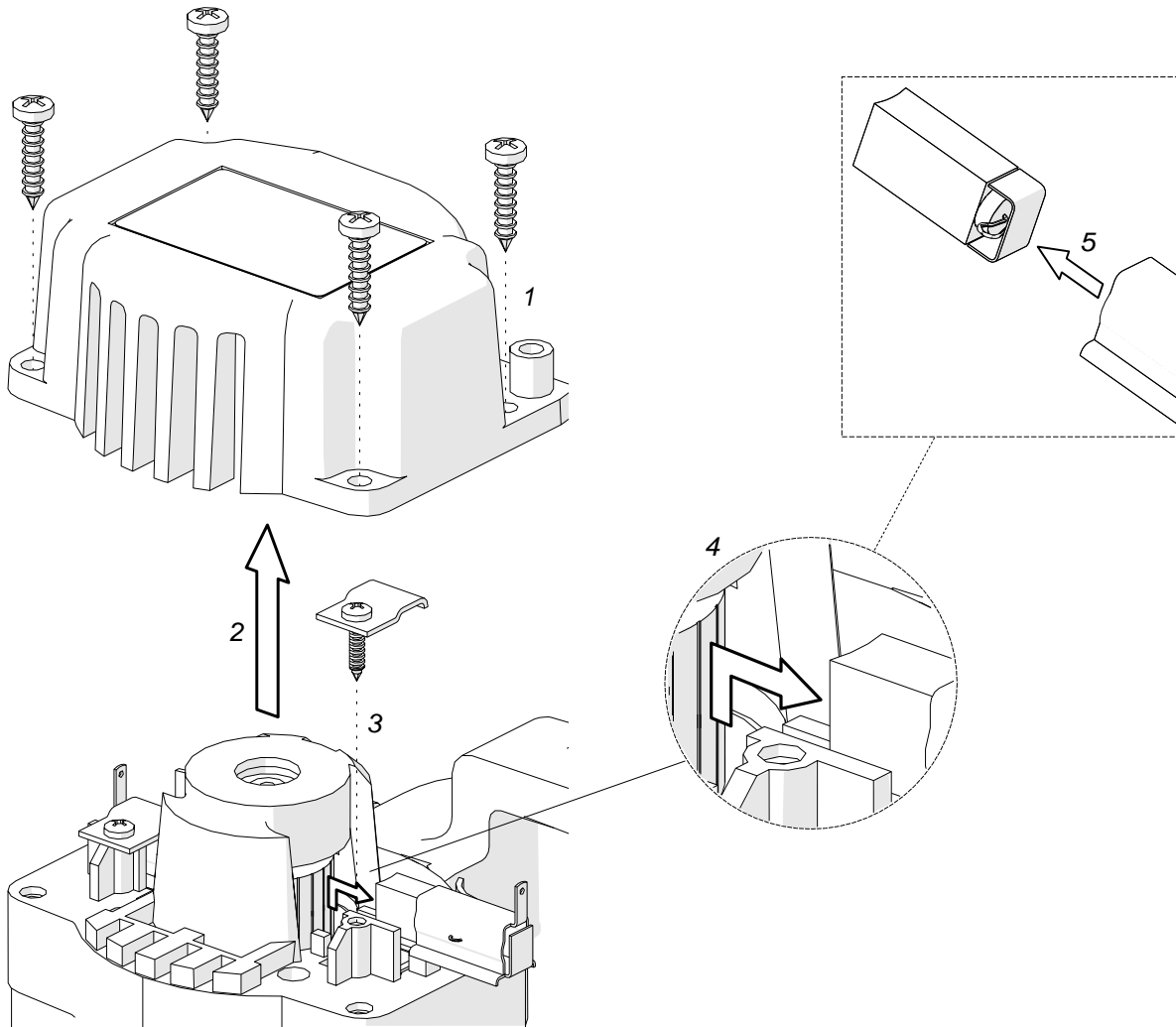
After the hole is made, toggle the spoke handles into the manual feed mode (Fig. 7a). Then, retract the cutter from the workpiece and stop the motor using the red MOTOR button. To move the machine to another drilling spot, first disable the electromagnetic base by toggling the MAGNET switch to position 'O'.

After the work is finished, unplug the machine from the power outlet, clean chips and excess coolant from the machine and cutter, and remove the machine from the worksite.

Tighten the cap of the cooling system bottle, close the valve, and press the pilot pin to expel the coolant remaining within the system. Before inserting the drilling machine into the toolbox, disassemble the cooling system bottle and remove the cutter and pilot pin from the arbor using protective gloves.

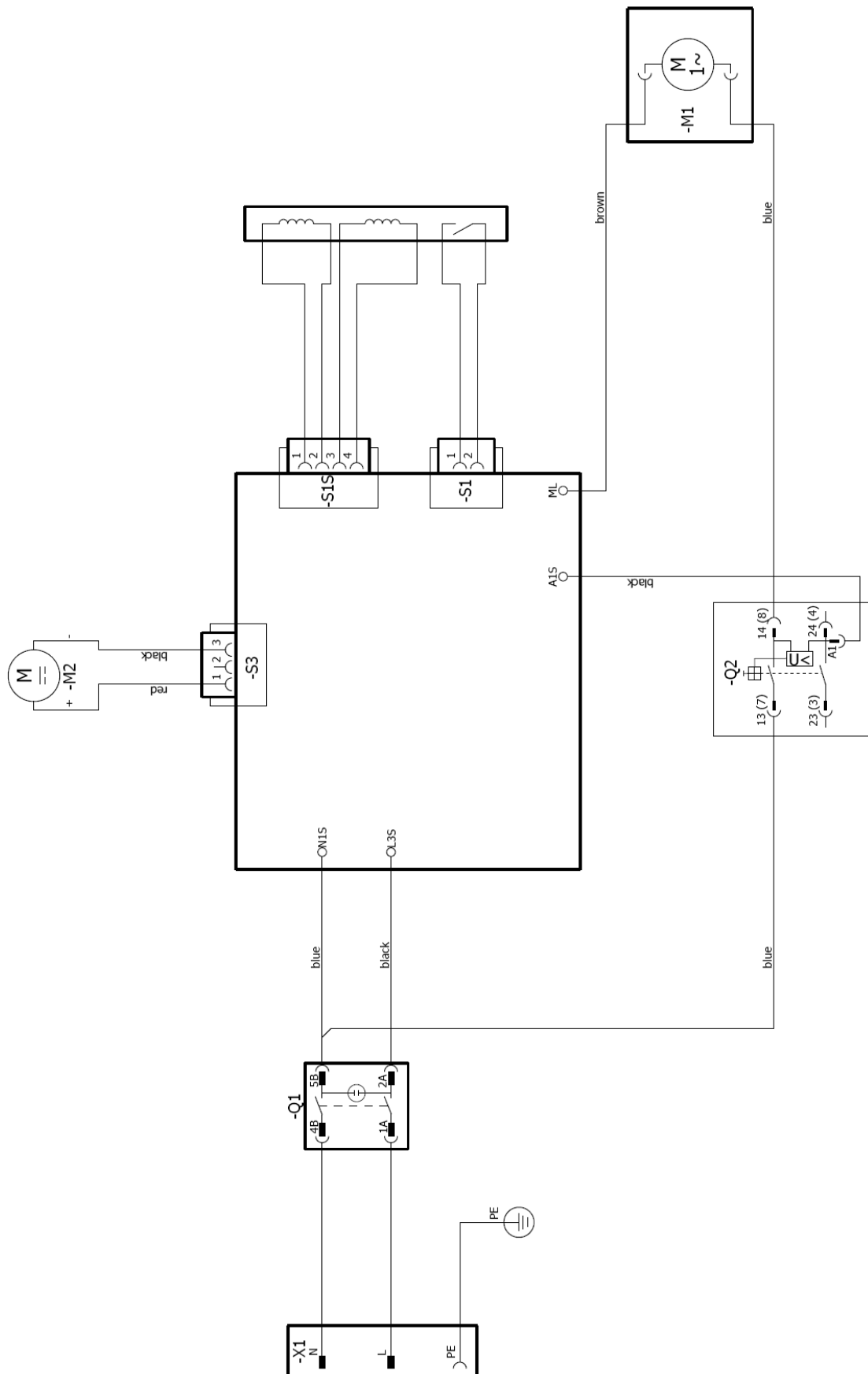
### 3.6. Replacing the motor brushes

Check the condition of the carbon brushes every 100 operational hours. To do this, unplug the power cord from the power outlet, and unscrew four mounting screws (1, Fig. 8) to remove the motor cover (2). Next, unscrew the pressing plate 3, then remove the brush holder (4) and the brush (5). If the length of the brush is less than 5 mm (0.2"), replace both brushes with new ones. To mount brushes, proceed in reverse order. After the replacement, run the motor without load for 20 minutes.

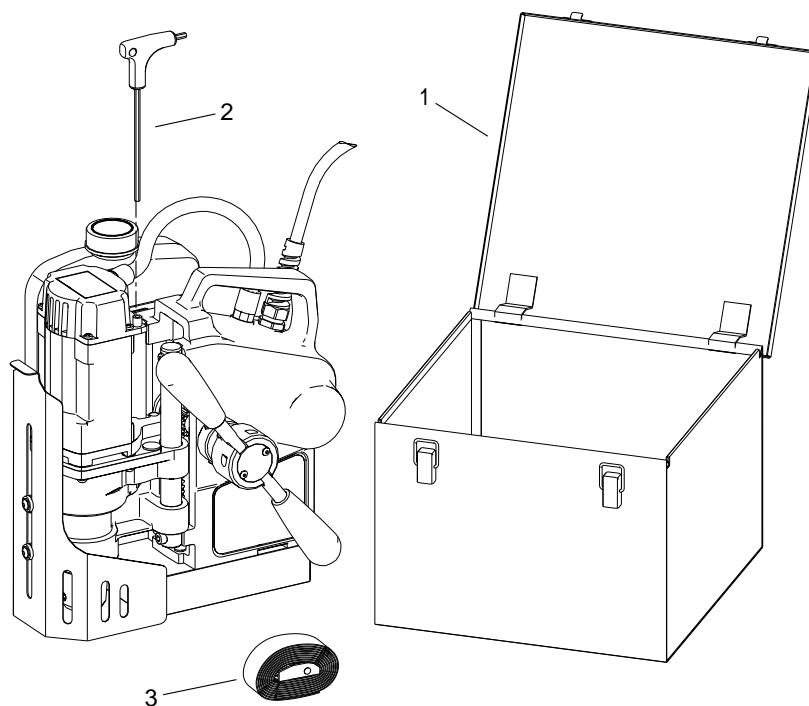


**Fig. 8.** Replacing the brushes

### 4. WIRING DIAGRAM

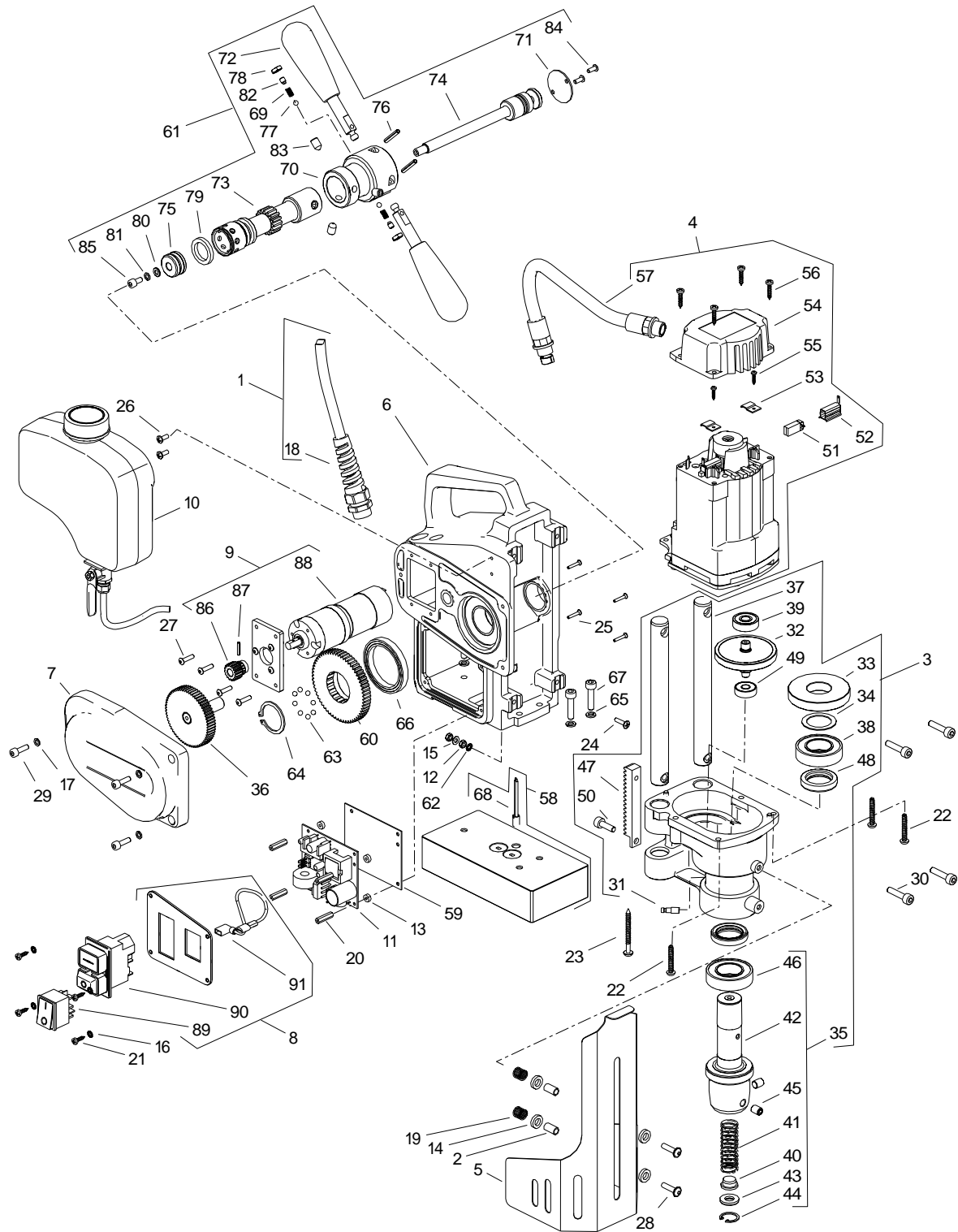


## 5. EXPLODED DRAWINGS AND PARTS LIST



ITEM	PART NUMBER	DESCRIPTION	Q-TY
1	SKR-0502-17-00-00-0	METAL BOX	1
2	KLC-000036	4 MM HEX WRENCH WITH HANDLE	1
3	PAS-000007	SAFETY STRAP 250	1





ITEM	PART NUMBER	DESCRIPTION	Q-TY
1	SZN-0212-10-02-00-2	POWER CORD 230V	1
1	SZN-0075-00-51-00-5	POWER CORD 120V	1
2	TLJ-0399-06-00-00-0	BOTTOM SLEEVE	2
3	RDK-0440-02-00-00-1	GEARBOX ASSY	1
4	SLN-0440-03-00-00-5	MOTOR ASSY 230V	1
4	SLN-0440-03-00-00-3	MOTOR ASSY 120V	1
5	OSL-0440-04-00-00-0	SWARF SHIELD ASSY	1
6	KRP-0502-01-01-00-0	MAIN BODY ASSY	1
7	PKR-0502-02-00-00-1	BODY COVER	1
8	MSK-0502-03-00-00-0	CONTROL PANEL ASSY 220V	1
8	MSK-0502-03-00-00-1	CONTROL PANEL ASSY 120V	1
9	ZSP-0502-04-00-00-0	MOTOREDUCER ASSY	1
10	ZSP-0502-06-00-00-1	COOLANT BOTTLE ASSY	1
11	MDL-0502-07-00-00-0	ELECTRONIC CONTROLLER 220V	1
11	MDL-0502-07-00-00-1	ELECTRONIC CONTROLLER 120V	1
12	NKR-000013	HEX NUT M4	2
13	PDK-000002	DISTANCE WASHER	4
14	PDK-000151	NYLON WASHER SR1940	4
15	PDK-000016	ROUND WASHER 4.3	1
16	PDK-000161	EXTERNAL TOOTH LOCK WASHER 3.7	4
17	PDK-000045	SPRING WASHER 5.1	3
18	DLW-000007	CABLE GLAND WITH STRAIN RELIEF PG11	1
19	SPR-000030	PUSH SPRING	2
20	TLJ-000042	SLEEVE M3x20	4
21	WKR-000415	CROSS RECESSED PAN HEAD SELF-TAPPING SCREW 3.5x13	4
22	WKR-000302	SELF-TAPPING SCREW 5x30	3
23	WKR-000237	SELF-TAPPING SCREW 5x50	1
24	WKR-000113	CROSS RECESSED OVAL COUNTERSUNK HEAD SCREW M4x16	1
25	WKR-000158	COUNTERSUNK HEAD SCREW M3x16	4
26	WKR-000183	CROSS RECESSED PAN HEAD SCREW M4x10	2
27	WKR-000095	HEX SOCKET BUTTON HEAD SCREW M4x16	4
28	WKR-000395	HEX SOCKET ROUND HEAD SCREW WITH FLANGE M5x20	2
29	SRB-000083	HEX SOCKET HEAD CAP SCREW M5x16	3
30	SRB-000115	HEX SOCKET HEAD CAP SCREW M6x25	4
31	KNC-0234-00-10-00-0	COOLANT COUPLING	1
32	WLK-0271-02-03-00-1	PINION ASSY	1
33*	KOL-0271-02-05-00-1	GEAR 52	1
34*	PRS-0271-02-06-00-0	DISTANCE RING	1
35*	WRZ-0272-02-02-00-0	SPINDLE ASSY	1
36	WLK-0502-10-00-00-0	IDLE GEAR	1
37	PRT-0440-02-02-00-1	GUIDE	2
38*	LOZ-000047	BALL BEARING 25x47x12	1
39	LOZ-000072	BALL BEARING 9x26x8	1
40	WYP-0139-00-02-00-1	PLUNGER	1
41	SPR-0271-02-02-03-0	SPRING	1
42	KRP-0272-02-02-01-0	SPINDLE BODY	1
43	USZ-0279-02-01-06-0	SEAL	1
44	PRS-000009	INTERNAL RETAINING RING 19w	1
45	WKR-000059	HEX SOCKET SET SCREW WITH FLAT POINT M8x10	2
46*	LOZ-000048	BALL BEARING 25x47x12	1
47	LST-0271-02-01-02-1	GEAR RACK	1

ITEM	PART NUMBER	DESCRIPTION	Q-TY
48*	PRS-000070	SEAL 25x37x7	2
49	LOZ-000053	BALL BEARING 8x22x7	1
50	SRB-000111	HEX SOCKET HEAD CAP SCREW M6x18	1
51	SCZ-000008	MOTOR BRUSH 6x9x17	2
52	SCT-0271-03-06-00-0	BRUSH HOLDER	2
53	PLY-0271-03-07-00-0	BRUSH HOLDER PRESSURE PLATE	2
54	PKR-0440-03-02-00-1	MOTOR COVER	1
55	WKR-000326	CROSS RECESSED COUNTERSUNK HEAD SHEET METAL SCREW 2.9x13	2
56	WKR-000241	SELF-TAPPING SCREW 4x20	4
57	PWD-0440-03-01-00-0	MOTOR CORD	1
58	PDS-0440-06-00-00-0	ELECTROMAGNETIC BASE	1
59	PLY-0277-00-02-00-1	INSULATION PLATE	1
60	KOL-0502-01-02-00-0	GEAR z=60	1
61	ZSP-0502-05-00-00-0	LEVERS ASSY	1
62	PDK-000166	EXTERNAL TOOTH LOCK WASHER 4.3	1
63	KUL-000003	BEARING BALL 5	8
64	PRS-000021	EXTERNAL RETAINING RING 30z	1
65	PDK-000046	SPRING WASHER 6.1	3
66	LOZ-000080	BALL BEARING 45x58x7	1
67	SRB-000115	HEX SOCKET HEAD CAP SCREW M6x25	3
68	WZK-0242-04-00-00-0	REED WIRES SET	1
69	SPR-0203-03-09-00-0	LATCH SPRING	2
70	KRP-0502-05-01-00-1	LEVER BODY	1
71	PKR-0502-05-02-00-0	COVER	1
72	DZW-0502-05-03-00-0	SPOKE HANDLE INCLUDING KNOB (ASSY)	2
73	WLK-0502-05-04-00-0	DRIVEN SHAFT	1
74	WLK-0502-05-05-00-1	SWITCHING SHAFT	1
75	TLJ-0502-05-06-00-0	CLUTCH SLEEVE	1
76	KLK-000015	SPRING DOWEL PIN 4x26	2
77	KUL-000003	BEARING BALL 5	2
78	NKR-000035	SHORT NUT M6	2
79	PRS-000259	SEAL	1
80	PDK-000017	ROUND WASHER 5.3	1
81	PDK-000045	SPRING WASHER 5.1	1
82	WKR-000019	HEX SOCKET SET SCREW WITH DOG POINT M5x6	2
83	WKR-000069	HEX SOCKET SET SCREW WITH CONE POINT M8x12	3
84	WKR-000092	HEX SOCKET BUTTON HEAD SCREW M4x10	2
85	SRB-000075	HEX SOCKET HEAD CAP SCREW M5x10	1
86	KOL-0502-04-02-00-0	GEAR z=16	1
87	KLK-000005	SPRING DOWEL PIN 3x14	1
88	SLN-000056	MOTOREDUCER 12V	1
89	PNK-000013	MAGNET SWITCH	1
90	WLC-000007	SWITCH START-STOP 230V	1
90	WLC-000005	SWITCH START-STOP 115V	1
91	PWD-0277-09-04-00-0	PANEL PLATE WIRE	1
—	SMR-000001	GREASE	0.055 kg

\* before you order read the service manual

## **6. DECLARATION OF CONFORMITY**

### ***EC Declaration of Conformity***

We

***PROMOTECH sp. z o.o.  
Elewatorska 23/1  
15-620 Białystok  
Poland***

declare with full responsibility that product:

### **D1 AUTO Drilling Machine with Electromagnetic Base**

which the declaration applies to is in accordance with the following standards:

- EN 60745-1
- EN 55014
- EN ISO 12100-1
- EN ISO 12100-2

and satisfies safety regulations of the guidelines: 2004/108/EC, 2006/95/EC, 2006/42/EC.

Białystok, 6 September 2013



---

Marek Siergiej  
Chairman

## 7. QUALITY CERTIFICATE

### Machine control card

### D1 AUTO Drilling Machine with Electromagnetic Base

Serial number .....

Spindle radial runout.....

Slider to base travel perpendicularity.....

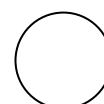
Spindle axis to base perpendicularity .....

Base holding force.....  
(surface with the minimum thickness of 22 mm and roughness  $R_a \leq 1.25$ )

#### Electric test

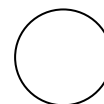
Type of test	Result	Name of tester
Test with sinusoidal voltage (voltage 1000 V, frequency 50 Hz)		..... Date
Resistance of the protective circuit	..... $\Omega$	..... Signature

Quality control .....



#### Adjustments, inspections

Quality control .....



## **8. WARRANTY CARD**

**WARRANTY CARD No.....**

..... in the name of Manufacturer warrants the D1 AUTO Drilling Machine with Electromagnetic Base to be free of defects in material and workmanship under normal use for a period of 12 months from date of sale.

This warranty does not cover cutters, damage or wear that arise from misuse, accident, tempering or any other causes not related to defects in workmanship or material.

Date of production .....

Serial number .....

Date of sale .....

Signature of seller.....

**1.05 / 19 December 2014**

***WE RESERVE THE RIGHT TO MAKE CHANGES IN THIS MANUAL WITHOUT NOTICE***