

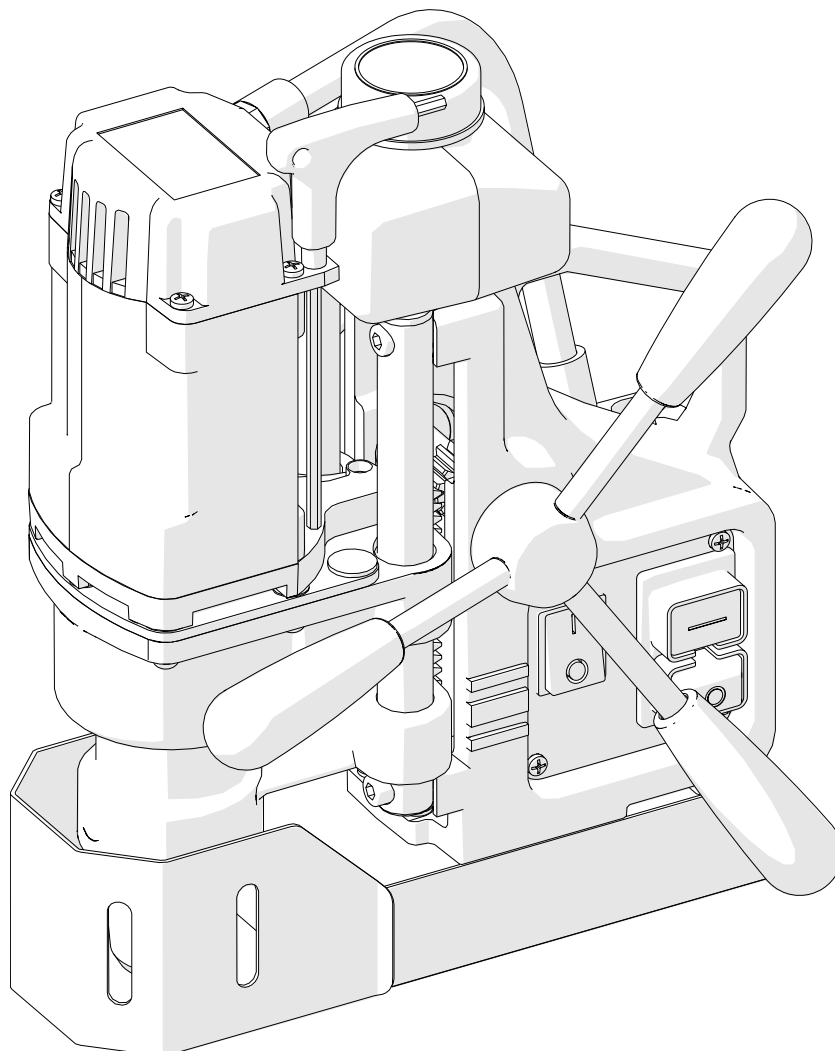


The tools of innovation.

## OPERATOR'S MANUAL

### D1

## DRILLING MACHINE WITH ELECTROMAGNETIC BASE



112 Inverness Circle East Suite F Englewood, CO 80112

1-87STEELMAX, FAX 303-690-9172

[www.steelmax.com](http://www.steelmax.com) sales@steelmax.com

# Contents

---

1. GENERAL INFORMATION .....	3
1.1. Application .....	3
1.2. Technical data.....	3
1.3. Design .....	4
1.4. Equipment included .....	5
1.5. Pressurized cooling system (optional).....	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 .....	10
3.3. Control system of the electromagnetic base holding force .....	11
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

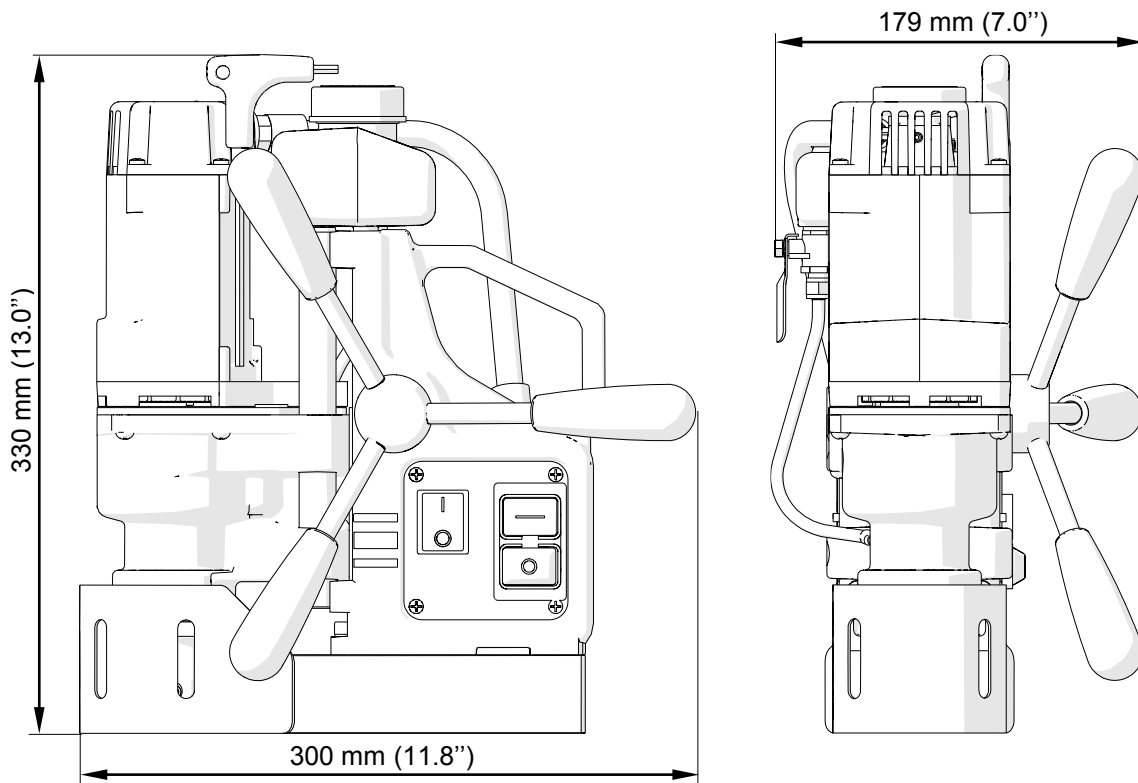
### 1.1. Application

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

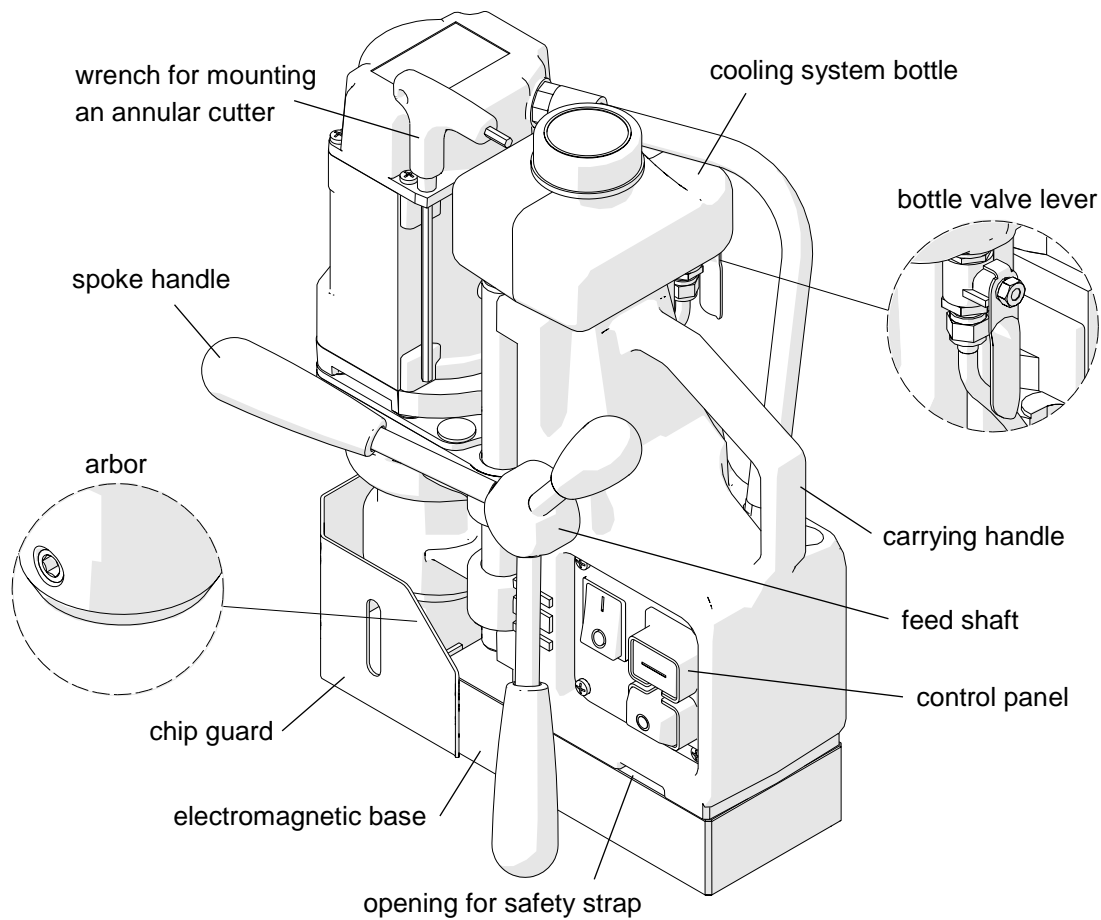
The electromagnetic base allows the drilling machine to be fixed to ferromagnetic surfaces with a force that ensures user safety and proper machine operation. A safety strap protects the machine from dropping in case of a power loss.

### 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
Minimum workpiece thickness	6 mm (0.23")
Protection class	I
Noise level	85 dB
Required ambient temperature	0–40 °C (32–104 °F)
Weight	10 kg (22 lbs)



**1.3. Design**



**Figure 1. D1 design**



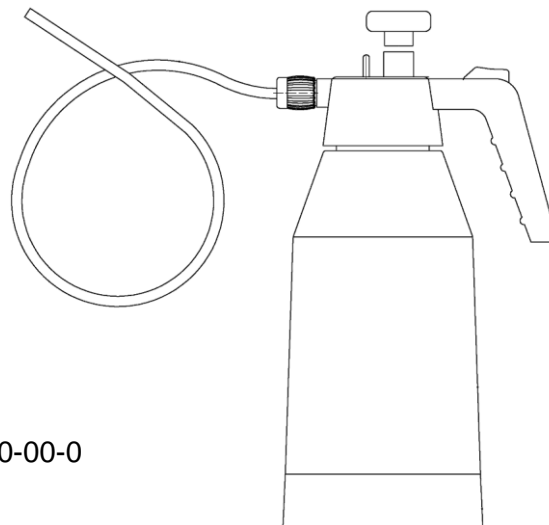
**Figure 2.** Control panel design

### 1.4. Equipment included

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

• Drilling machine	1 unit
• Plastic box	1 unit
• Spoke handle	3 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

### 1.5. Pressurized cooling system (optional)



Part number:  
UKL-0440-16-00-00-0

## 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 in II protection class.
6. Never carry the machine by the cord or pull it to disconnect the plug from the power outlet as this may damage the power cord 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 in the vicinity of 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 for establishing 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 the machine in the vicinity of 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 stiff 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 machining plates with thickness lower than 10 mm (0.4") as the adhesion force depends on material thickness and is significantly lower for thin plates.
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 coolant remainder from the machine. Do not remove chips with bare hands.
27. Maintain the machine and tools with care. Cover steel parts with a thin grease layer to protect them against rust when not in use for any extended period.
28. Perform maintenance only with the machine unplugged from the power outlet.
29. Perform repairs only in a service center appointed by the seller.
30. If the machine falls on a hard surface, from 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 from the arbor.

### 3. STARTUP AND OPERATION



All safety precautions must be closely observed.

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

With the machine unplugged from the supply, proceed as follows. Raise the motor by rotating the spoke handles clockwise (1, Figure 3) and 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 dismount the cutter, proceed in reverse order.

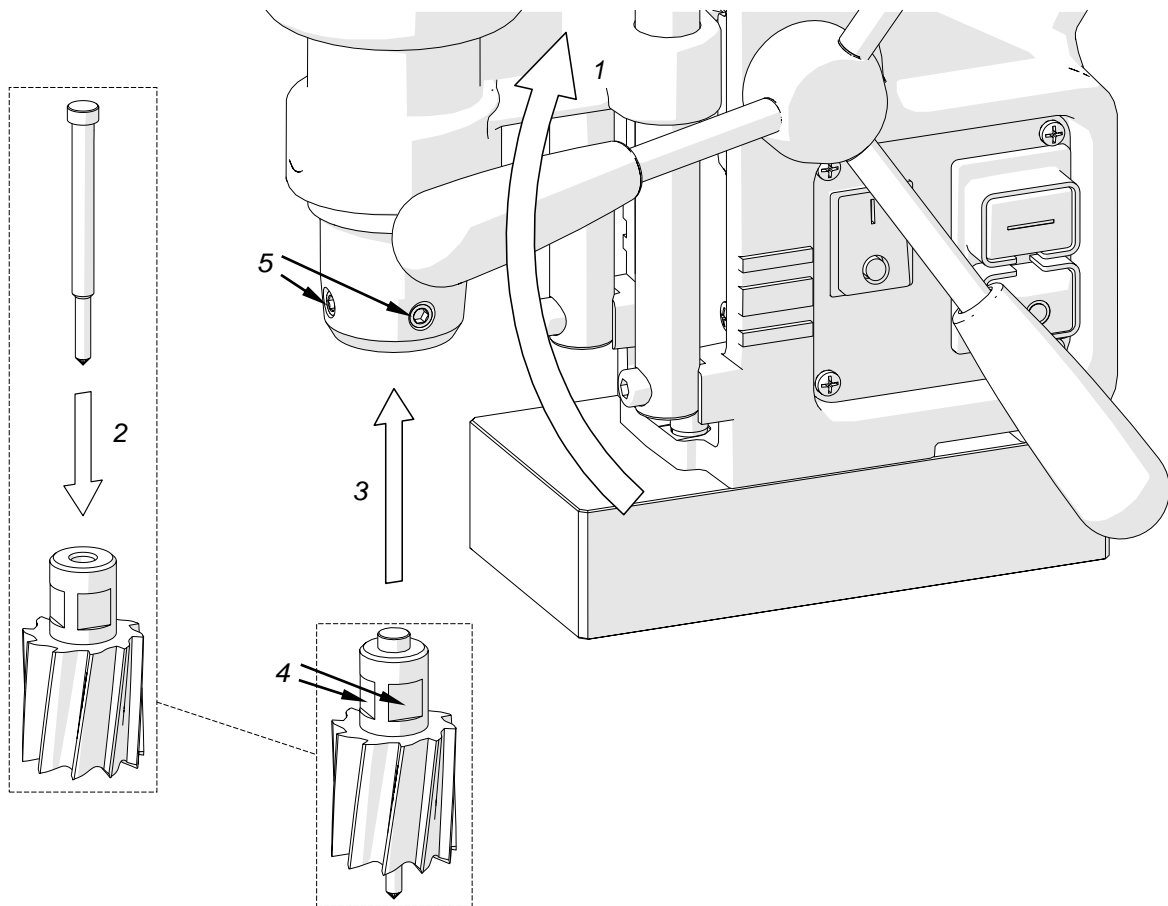
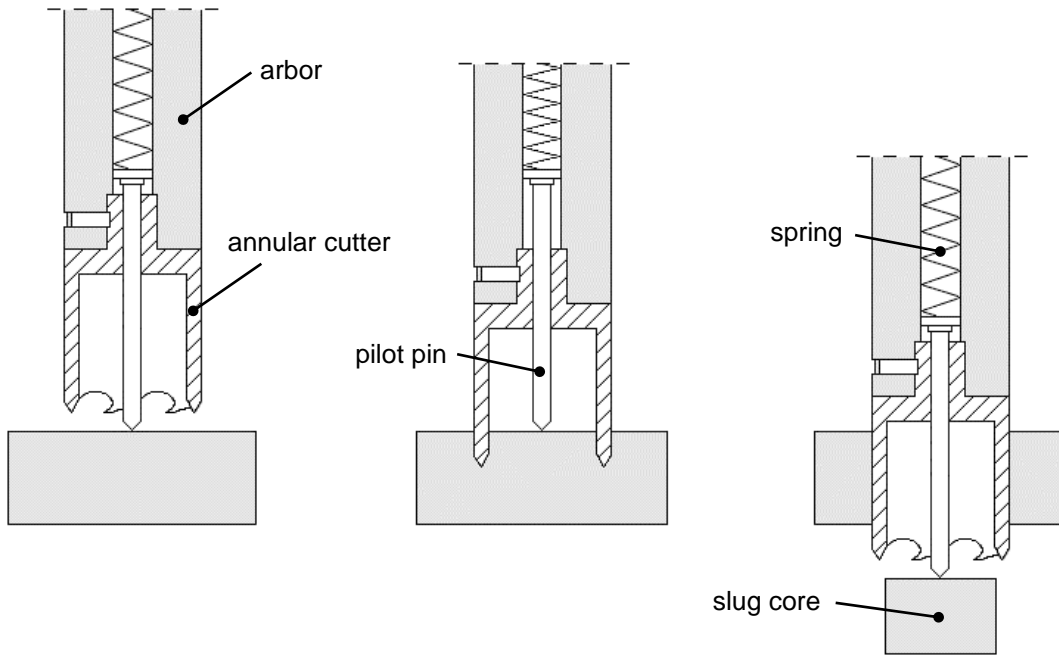


Figure 3. Mounting the annular cutter

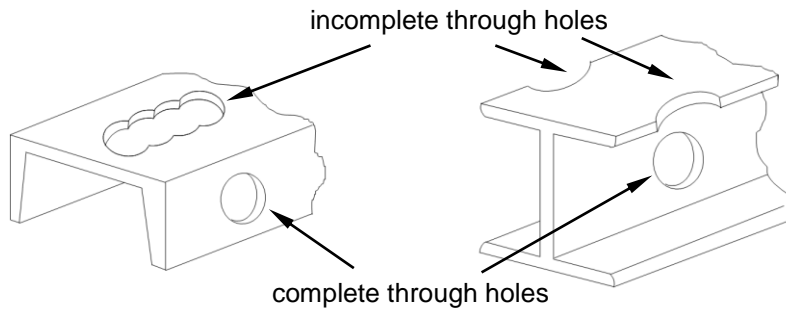


Figure 4 shows how annular cutters operate. As the cutter penetrates the workpiece, the pilot pin recesses into the arbor and tightens the spring. As a result, after the cutter goes through the entire thickness, the slug core is expelled from the cutter.



**Figure 4.** Annular cutters operation

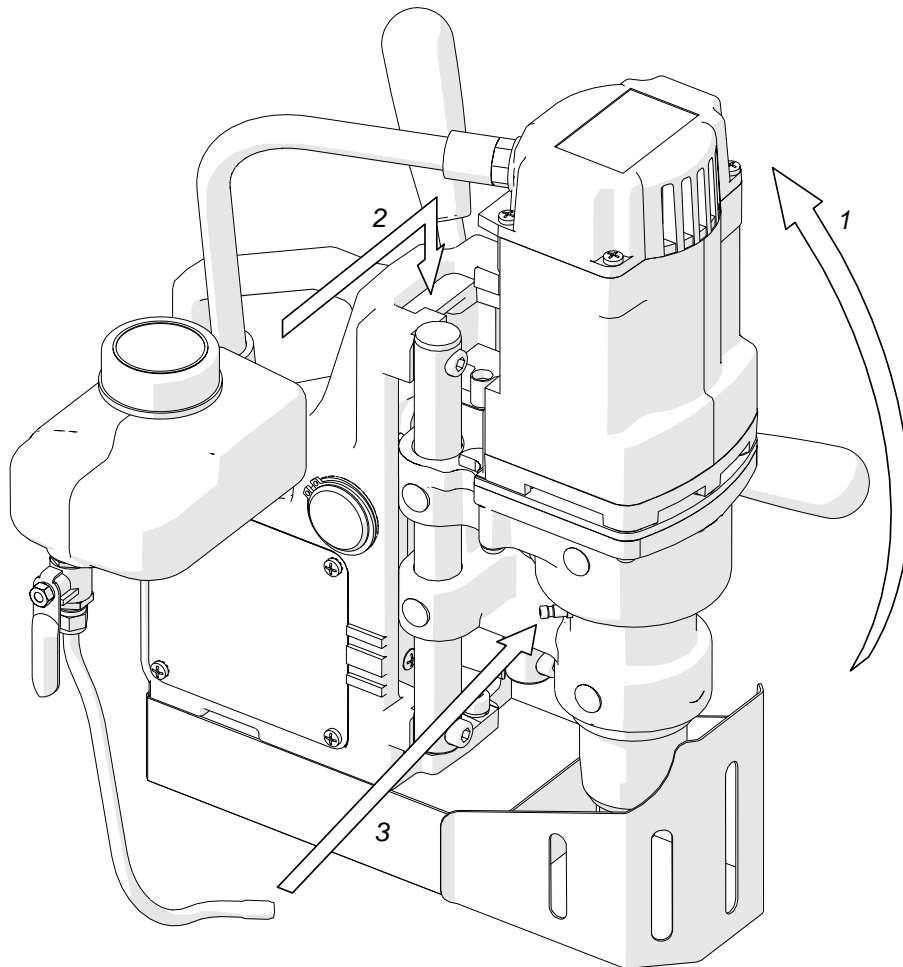
Annular cutters are designed to establish only through holes shown in Figure 5. During establishing incomplete through holes the pilot pin must not be used.



**Figure 5.** Types of holes to establish with annular cutters

### 3.2. Mounting and dismounting the cooling system

Raise the motor by rotating the spoke handles (1, Figure 6) and place the cooling system bottle on the machine (2). Then, attach the bottle hose to the coupling (3). Dismount in reverse order.



**Figure 6.** Mounting the cooling system bottle

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

The D1 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 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. Drilling on thin plates is possible, but in such cases the green MOTOR button must be continuously held.

### 3.4. Preparing

Before beginning, clean steel parts, especially the Weldon shank, from grease used to preserve the machine for storage and transport. The feed shaft can be mounted at the opposite side of the drilling machine to allow working in places hard to reach or using the machine by a left-handed person.

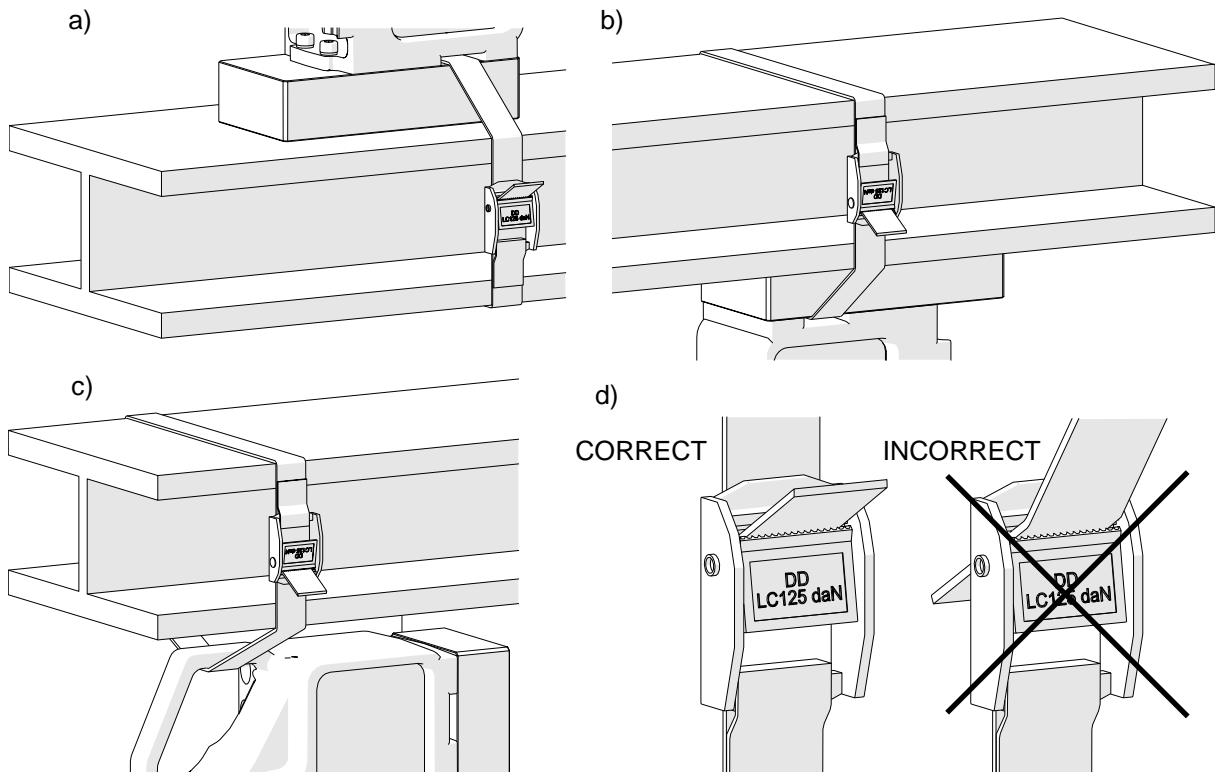
Next, mount the annular cutter into the arbor in the manner described before.

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. In order to do this, either mount the strap through the opening in the machine body (Figure 7a, 7b) or catch the strap on the carrying handle when working in horizontal position (Figure 7c). 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 (Figure 7d). When working in the position from Figure 7a, attach the chip guard to protect yourself from swarf.



**Figure 7.** Securing the drilling machine using the safety strap

Rotate the spoke handles to place the tip of the pilot pin above the drilling point.

Fill the cooling system bottle with a cutting fluid. Do not use pure water as the cutting fluid, however, using emulsions formed from mixing water and drilling oil is also 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 should 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 and inverted positions.**

### 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 and gently begin drilling. Accomplish the hole in one pass.



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

If the operation results in an overload caused by insufficient cooling, using dull cutter, or too fast feed in comparison to the cutter diameter, the machine will automatically stop. In such case, to restart the machine, press the red MOTOR button, retract the cutter from the workpiece, and press the green MOTOR button (the electromagnetic base must remain powered).

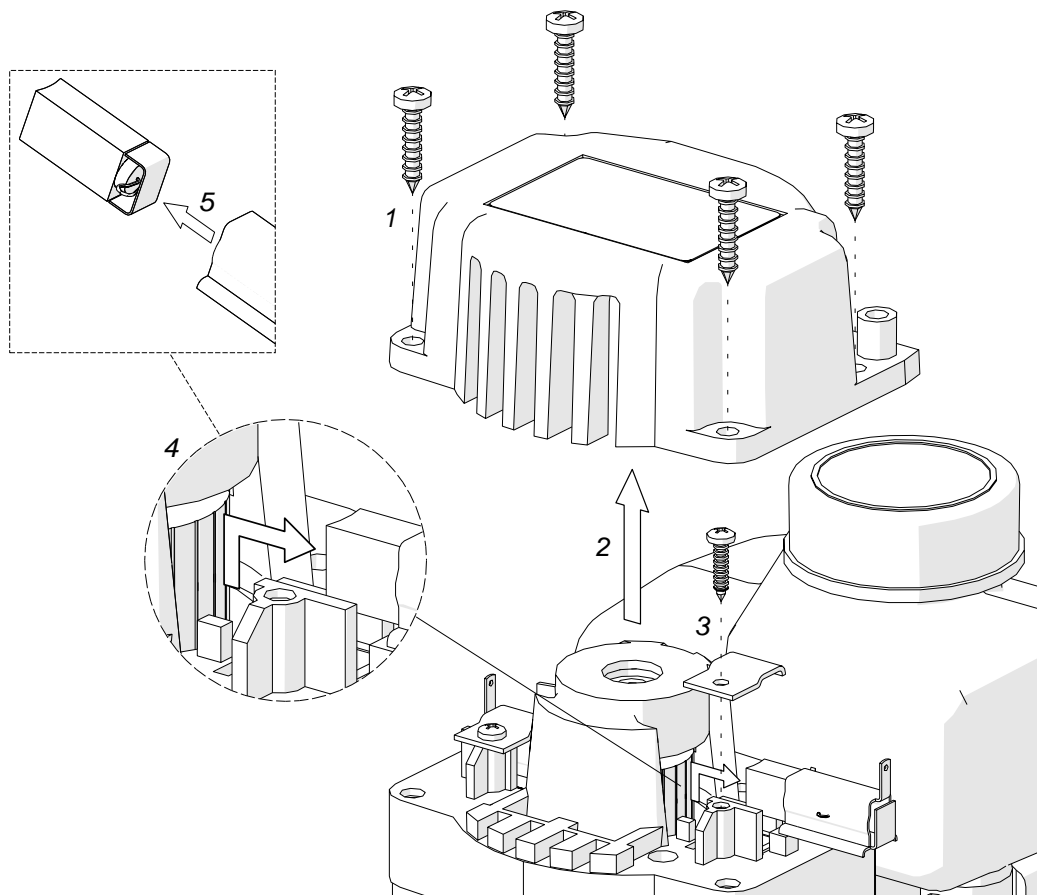
Once the hole is accomplished, retract the cutter from the workpiece and stop the motor using the red MOTOR button. To move the machine to another drilling spot, first disable the electromagnetic base by toggling the MAGNET switch to position 'O'.

Once the work is finished, unplug the machine from the power outlet, clean chips and coolant remainder 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 from the arbor using protective gloves. Always insert the drilling machine into the toolbox with all the spoke handles installed.

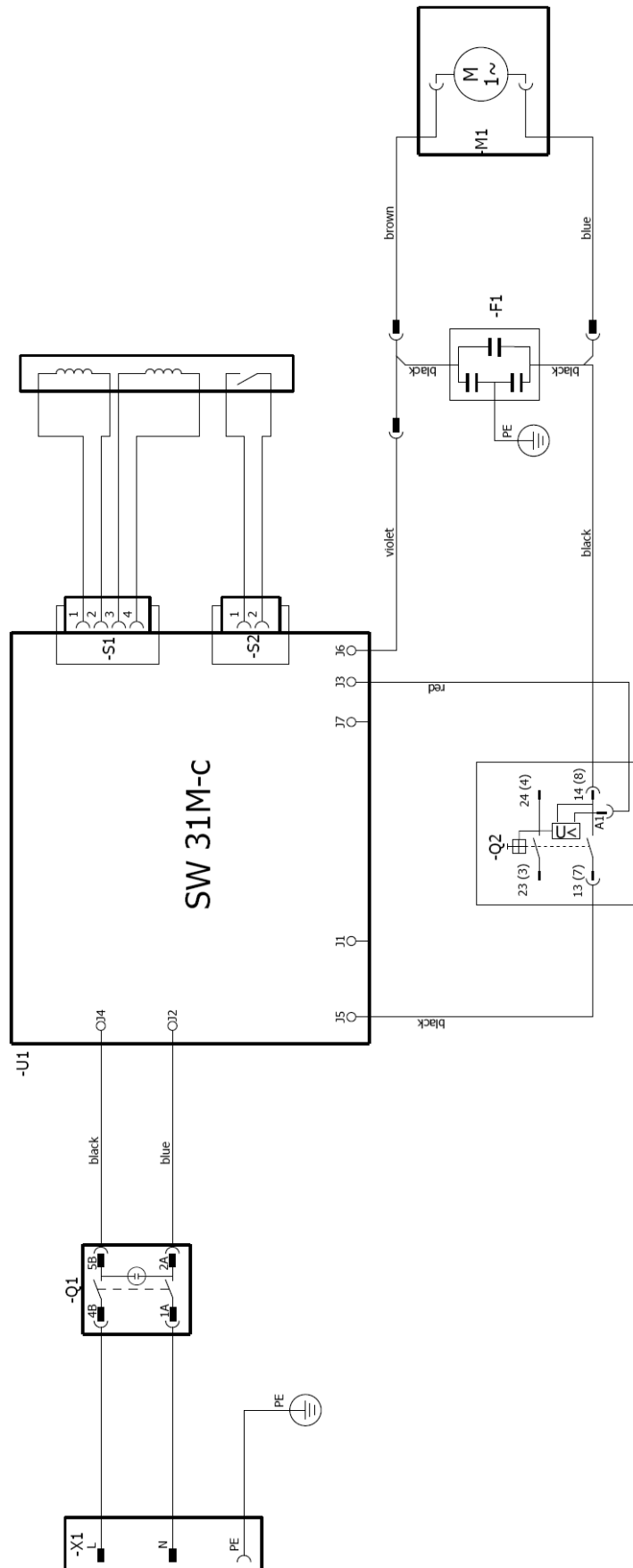
### 3.6. Replacing the motor brushes

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

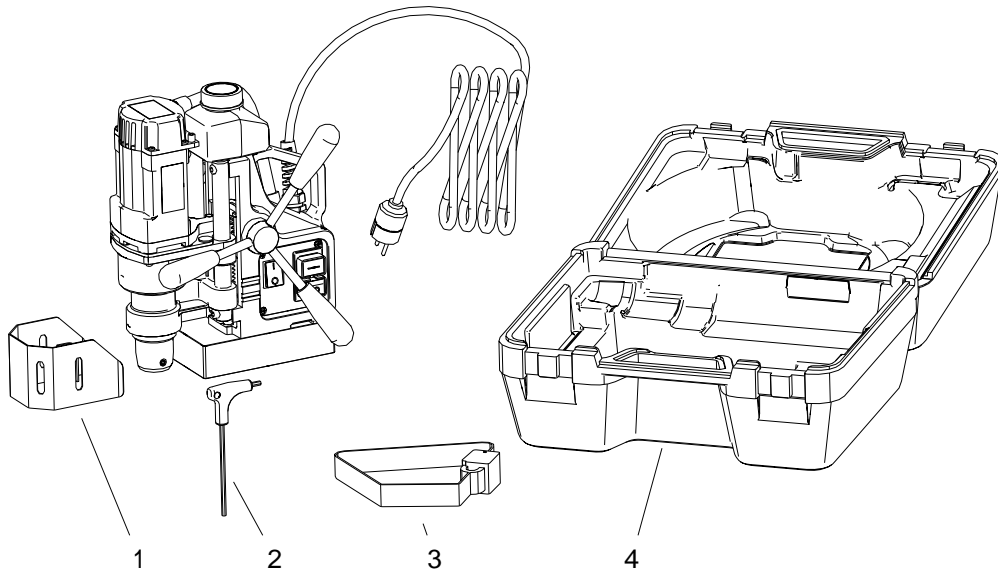


**Figure 8.** Replacing the brushes

### 4. WIRING DIAGRAM

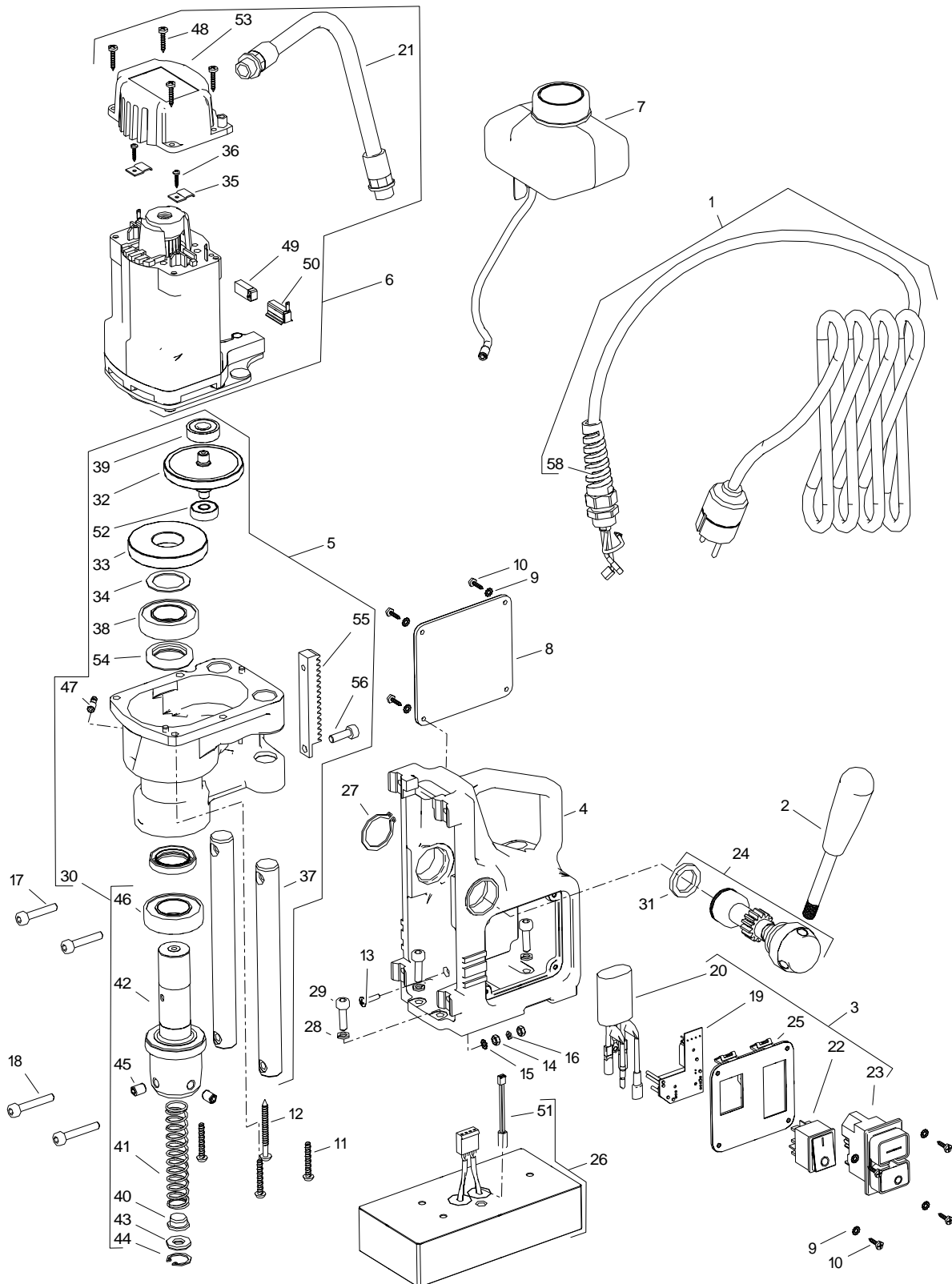


**5. EXPLODED DRAWINGS AND PARTS LIST**



ITEM	PART NUMBER	DESCRIPTION	Q-TY
1	OSL-0440-04-00-00-1	SWARF SHIELD ASSY	1
2	KLC-000036	4 MM HEX WRENCH WITH HANDLE	1
3	PAS-000007	SAFETY STRAP 250	1
4	SKR-000007	PLASTIC BOX	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	DZW-0212-12-00-00-0	SPOKE HANDLE INCLUDING KNOB (ASSY)	3
3	PNL-0300-04-00-08-1	CONTROL PANEL ASSY 230V	1
3	PNL-0300-04-00-08-0	CONTROL PANEL ASSY 120V	1
4	KRP-0440-01-01-00-3	MAIN BODY ASSY	1
5	RDK-0440-02-00-00-4	GEARBOX ASSEMBLY	1
6	SLN-0440-03-00-00-5	MOTOR ASSY 230V	1
6	SLN-0440-03-00-00-3	MOTOR ASSY 120V	1
7	UKL-0440-05-00-00-1	COOLANT BOTTLE ASSY	1
8	SCN-0440-07-00-00-0	BODY COVER	1
9	PDK-000161	EXTERNAL TOOTH LOCK WASHER 3.7	8
10	WKR-000415	CROSS RECESSED PAN HEAD SELF-TAPPING SCREW 3.5x13	8
11	WKR-000302	SELF-TAPPING SCREW 5x30	3
12	WKR-000237	SELF-TAPPING SCREW 5x50	1
13	WKR-000112	CROSS RECESSED OVAL COUNTERSUNK HEAD SCREW M4x16	1
14	NKR-000013	HEX NUT M4	2
15	PDK-000166	EXTERNAL TOOTH LOCK WASHER 4.3	1
16	PDK-000042	SPRING WASHER 4.1	1
17	SRB-000118	HEX SOCKET BOLT M6x30	2
18	SRB-000123	HEX SOCKET BOLT M6x35	2
19	STR-0257-04-10-00-5	ELECTRONIC CONTROLLER SW 31M-C 230V	1
19	STR-0257-04-10-00-4	ELECTRONIC CONTROLLER SW 31M-C 120V	1
20	FLT-0257-04-12-00-1	INTERFERENCE ELIMINATOR 230V	1
20	FLT-0257-04-12-00-0	INTERFERENCE ELIMINATOR 120V	1
21	PWD-0440-03-01-00-0	MOTOR CORD	1
22	PNK-000013	MAGNET SWITCH	1
23	WLC-000007	SWITCH START-STOP 230V	1
23	WLC-000005	SWITCH START-STOP 115V	1
24	WLK-0271-01-02-00-1	PINION SHAFT ASSY	1
25	MSK-0300-04-01-00-1	PANEL PLATE ASSY	1
26	PDS-0440-06-00-00-0	ELECTROMAGNETIC BASE	1
27	PRS-000019	EXTERNAL RETAINING RING 28z	1
28	PDK-000046	SPRING WASHER 6.1	3
29	SRB-000114	HEX SOCKET BOLT M6x20	3
30	WRZ-0272-02-02-00-0	MOTOR SPINDLE ASSEMBLY	1
31	PRS-000259	SEAL	1
32	WLK-0271-02-03-00-1	PINION SHAFT ASSEMBLY	1
33	KOL-0271-02-05-00-1	GEAR 52	1
34	PRS-0271-02-06-00-0	DISTANCE RING	1
35	PLY-0271-03-07-00-0	BRUSH HOLDER PRESSURE PLATE	2
36	WKR-000326	CROSS RECESSED COUNTERSUNK HEAD SHEET METAL SCREW 2.9x13	2
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	MOTOR SPINDLE	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

ITEM	PART NUMBER	DESCRIPTION	Q-TY
46	LOZ-000048	BALL BEARING 25x47x12	1
47	KNC-0234-00-10-00-0	COOLANT COUPLING	1
48	WKR-000241	SELF-TAPPING SCREW 4x20	4
49	SCZ-000008	MOTOR BRUSH 6x9x17	2
50	SCT-0271-03-06-00-0	BRUSH HOLDER	2
51	WZK-0242-04-00-00-0	REED WIRES SET	1
52	LOZ-000053	BALL BEARING 8x22x7	1
53	PKR-0440-03-02-00-1	MOTOR COVER	1
54	PRS-000070	SEAL 25x37x7	1
55	LST-0271-02-01-02-1	GEAR RACK	1
56	SRB-000111	HEX SOCKET BOLT M6x18	1
58	DLW-000007	CABLE GLAND WITH STRAIN RELIEF PG11	1
-	SMR-000001	GREASE	0.055 kg

## 6. DECLARATION OF CONFORMITY

### *EC Declaration of Conformity*

We

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

declare with full responsibility that product:

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

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

- EN 50144-1
- EN 55014

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

Bialystok, 22 February 2013



---

Marek Siergiej  
Chairman

**7. QUALITY CERTIFICATE**

**Machine control card**

**D1 Drilling Machine with Electromagnetic Base**

Serial number .....

Spindle radial runout.....

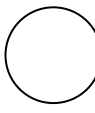
Slider to base travel perpendicularity.....

Spindle axis to base perpendicularity .....

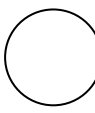
Base holding force.....  
(surface with the minimum thickness of 22 mm and roughness  $R_a \leq 1.25$ )

**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 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.....

1.03 / 5 May 2014

***WE RESERVE THE RIGHT TO MAKE CORRECTIONS  
AND MODIFICATIONS IN THIS MANUAL WITHOUT PRIOR NOTICE***