

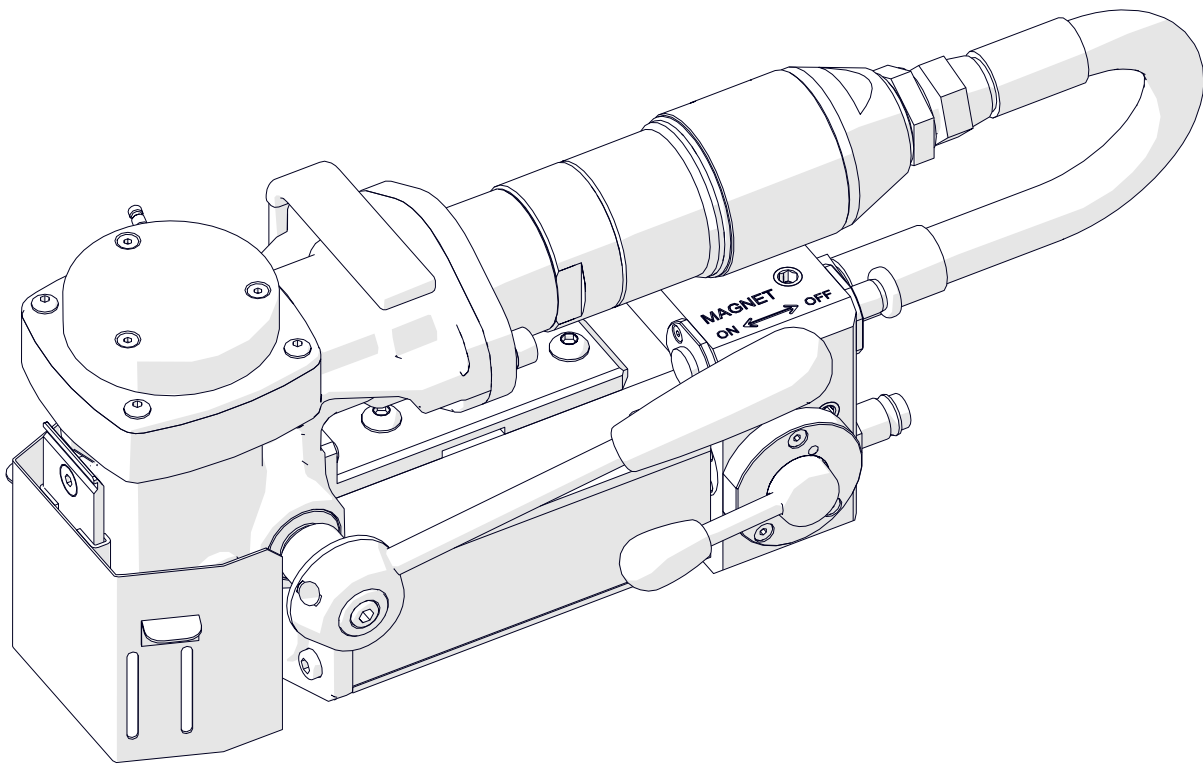


The tools of innovation.

## OPERATOR'S MANUAL

### D1 AIR

### DRILLING MACHINE WITH MAGNETIC BASE



15335 E. Fremont Drive, Centennial, 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 .....	4
1.5. Air preparation unit (optional) .....	4
2. SAFETY PRECAUTIONS.....	5
3. STARTUP AND OPERATION .....	7
3.1. Installing and operating the annular cutter.....	7
3.2. Preparing .....	9
3.3. Drilling.....	11
3.4. Maintaining the air preparation unit .....	12
4. EXPLODED DRAWINGS AND PARTS LIST.....	13
5. DECLARATION OF CONFORMITY .....	17
6. QUALITY CERTIFICATE.....	18
7. WARRANTY CARD.....	19

## 1. GENERAL INFORMATION

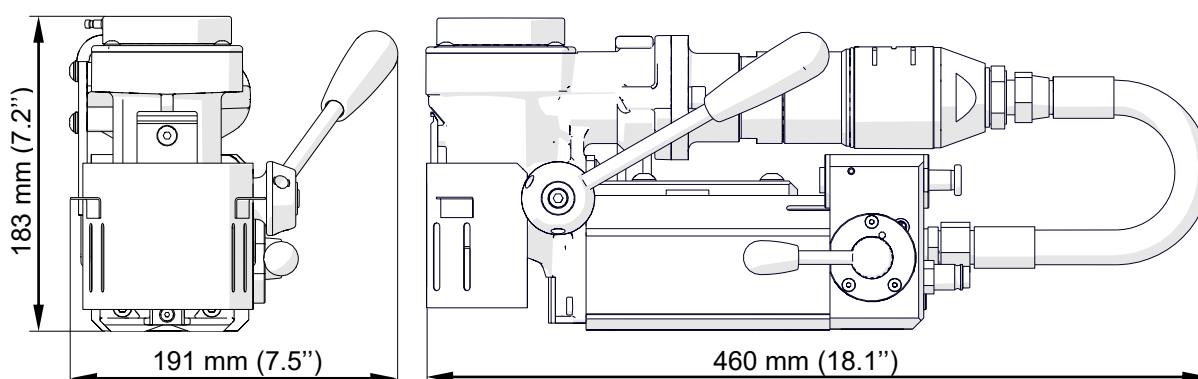
### 1.1. Application

The D1 AIR is an air drilling machine with magnetic base designed to drill holes with diameters of up to 35 mm (1.38") to the maximum depth of 25 mm (0.98") through the use of annular cutters. The machine is ATEX II 2 G/D c IIC T6/T4 certified to allow working in explosive environments.

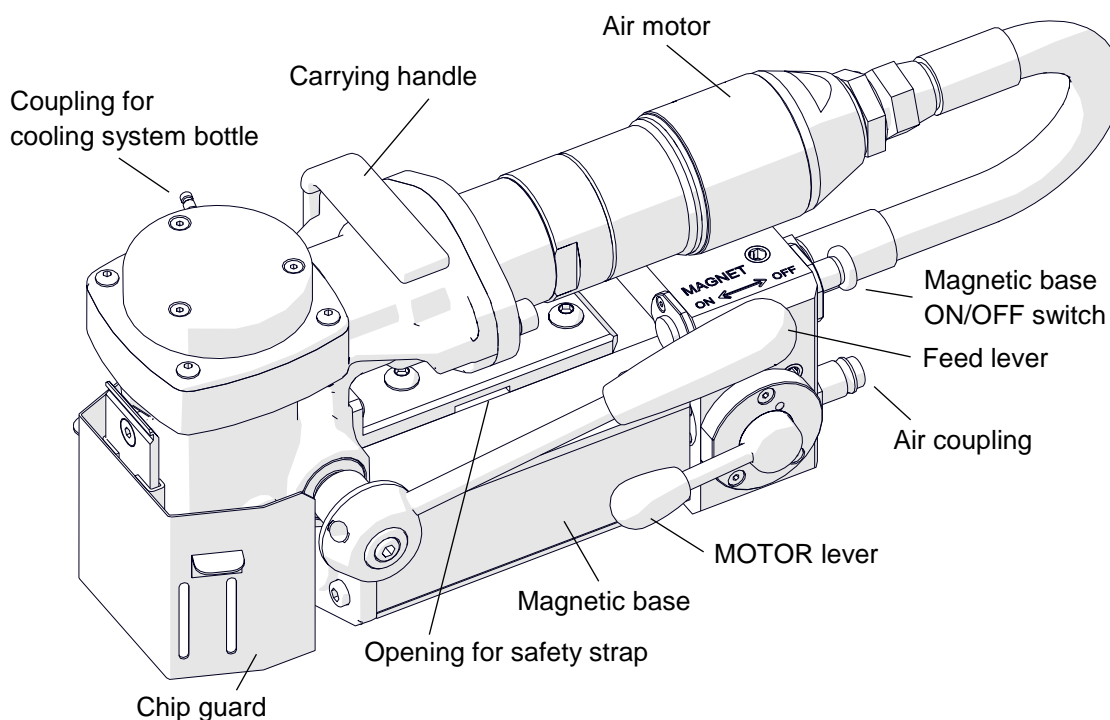
The magnetic base allows the drilling machine to be fixed to ferromagnetic surfaces with a force that ensures user safety and proper machine operation. A safety chain protects the machine from dropping in case of a pressure loss.

### 1.2. Technical data

Pressure	6 bar
Air connection	CEJN 410 DN 10.4 GZ 3/8" BSPT
Power	800 W
Air consumption	1400 l/min (50 CFM)
Cutter holder	19 mm Weldon (0.75")
Maximum drilling diameter	35 mm (1.38")
Maximum drilling depth	25 mm (0.98")
Magnetic base holding force (surface with the thickness of 22 mm and roughness $R_a = 1.25$ )	6 500 N
Magnetic base dimensions	80 mm × 80 mm × 143 mm 3.1" × 3.1" × 5.6"
Spindle stroke	39 mm (1.54")
Rotational speed under load	240 rpm
Minimum workpiece thickness	10 mm (0.39")
Noise level	more than 70 dB
Required ambient temperature	0–40°C (32–104°F)
Weight	17 kg (37 lbs)



## 1.3. Design



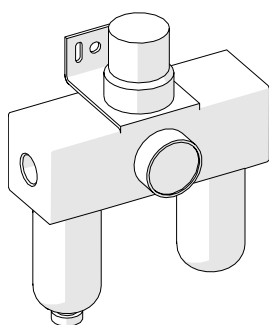
**Fig. 1.** View of the D1 AIR

## 1.4. Equipment included

The D1 AIR drilling machine is supplied including the following elements.

Drilling machine	1 unit
Metal box	1 unit
Feed lever	1 unit
Cooling system bottle 0.5 l	1 unit
Pilot pin	1 unit
Safety strap	1 unit
4 mm hex wrench	1 unit
5 mm hex wrench	1 unit
Operator's Manual	1 unit

## 1.5. Air preparation unit (optional)



Part number (filter, regulator, lubricator):  
ZST-000021

## **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 specifications of the air source must conform to those specified on the rating plate.
5. Supply the machine only with clean and lubricated air. The air source must be equipped with a filter, regulator, and lubricator.
6. Never carry the machine by hoses and never pull the hoses as this may damage them and result in serious injury.
7. Transport and position the machine using the carrying handle and only when the magnet switch is set to the position OFF.
8. Untrained bystanders must not be present near the machine.
9. Before beginning, check the condition of the machine and the air source, including the supply hose, air coupling, 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. Install the annular cutter securely using set screws. Remove adjusting keys and wrenches from the work area before connecting the machine to the air source.
14. Never use cutters that are dull or damaged.
15. Install and remove cutters using protective gloves and only when the machine is unplugged from the air source.
16. Never use annular cutters without the pilot pin except when drilling incomplete through holes.
17. Install only annular cutters with the drilling diameter not more than 35 mm (1.38") and the drilling depth not more than 30 mm (1.18").
18. Using the machine on surfaces that are rusty, covered with a thick paint layer, uneven, or not rigid is prohibited.
19. Use the safety strap in all operating positions. The strap must be tight and fastened to a securely fixed element through the opening in the machine body. Never insert the strap into the buckle from the front.

20. 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.
21. Always use eye and hearing protection and protective clothing during operation. Do not wear loose clothing.
22. The entire surface of the magnetic base bottom must be in full contact with the workpiece. Before every positioning, wipe the workpiece with coarse-grained sandpaper.
23. Do not touch moving parts or chips formed during milling. Prevent objects from being caught in moving parts.
24. After every use, remove metal chips and excess coolant from the machine. Do not remove chips with bare hands.
25. Cover steel parts with a thin anti-corrosion coating to protect the machine from rust when not in use for any extended period.
26. Maintain the machine and install/remove parts and tools only when the machine is unplugged from the air source.
27. Repair only in a service center appointed by the seller.
28. 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.
29. Never leave the machine unattended during operation.
30. 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.

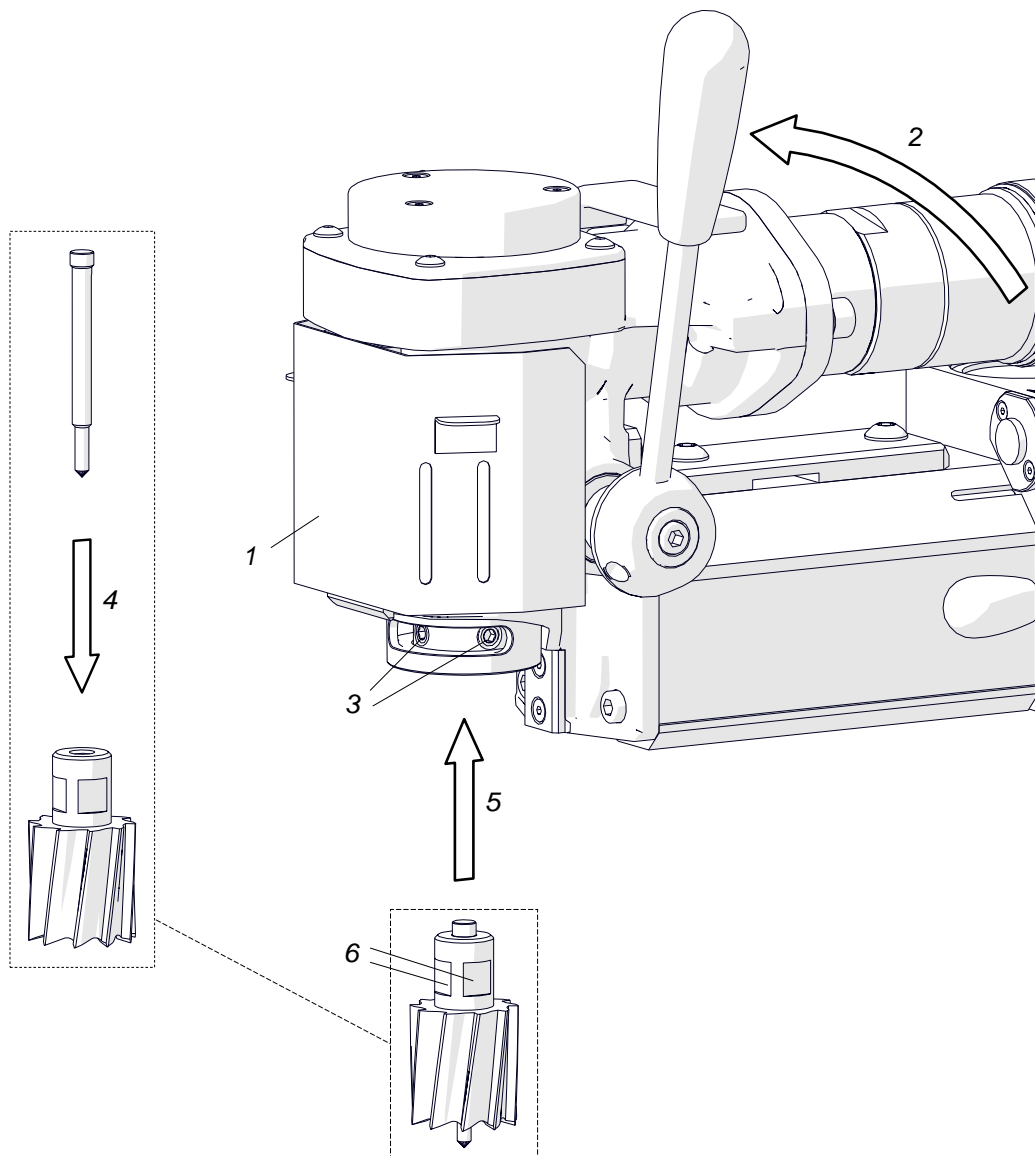
### 3. STARTUP AND OPERATION



**Adhere to all safety precautions.**

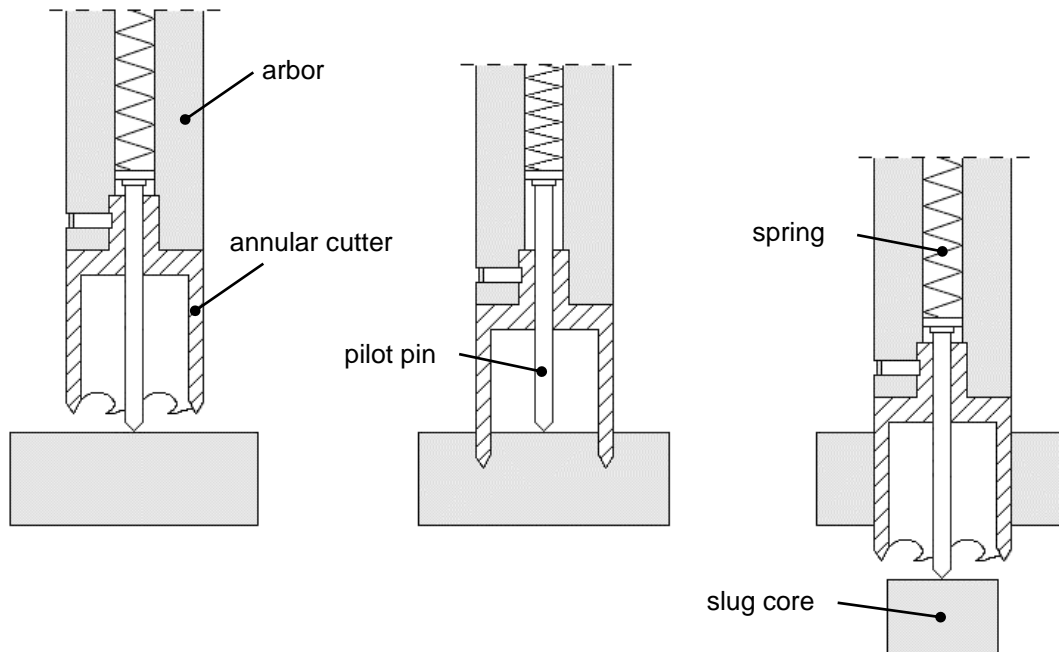
#### 3.1. Installing and operating the annular cutter

Unplug the machine from the air source, raise the chip guard (1, Fig. 2) as far as possible, and rotate the feed lever to the left (2) to access the set screws 3. Next, insert the supplied pilot pin into the annular cutter (4), and then wear protective gloves and place the cutter into the arbor (5) such that to align the flats 6 with the set screws 3. Finally, tighten both set screws with the 4 mm hex wrench. To remove the cutter, proceed in reverse order.



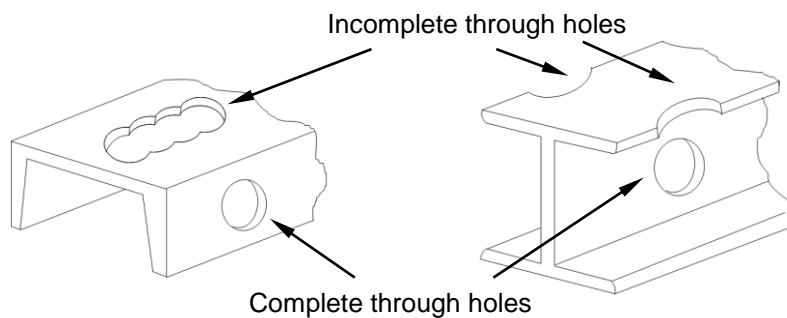
**Fig. 2.** Installing the annular cutter

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 establish only through holes shown in Fig. 4. When drilling incomplete through holes the pilot pin must not be used.



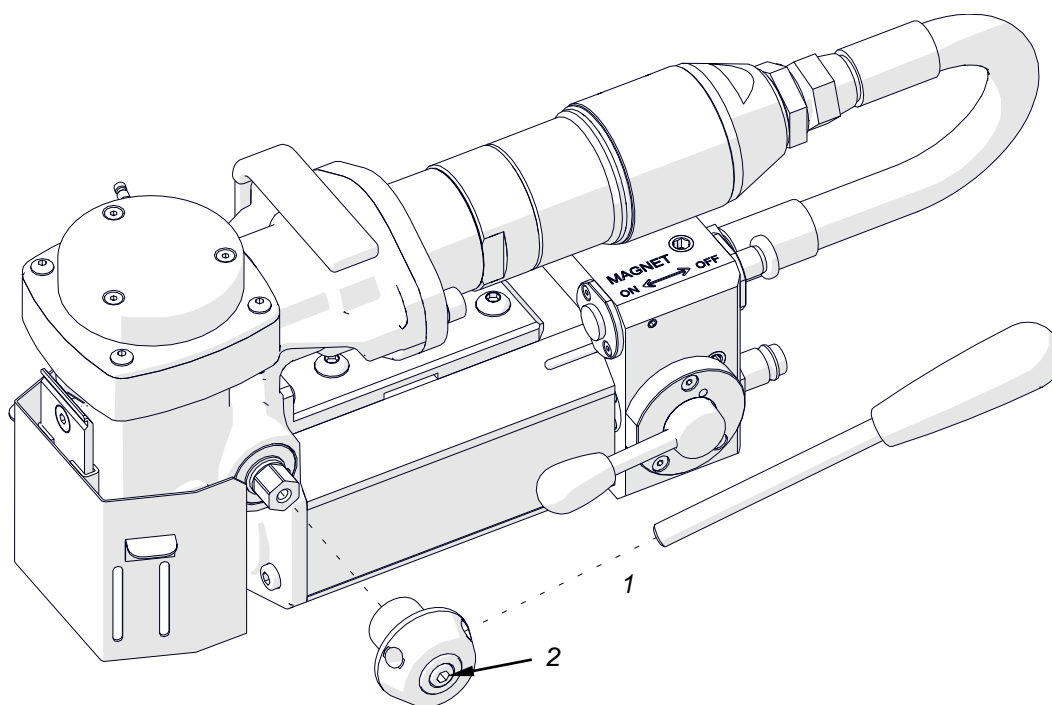
**Fig. 4.** Types of holes to establish with annular cutters



### 3.2. Preparing

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

Next, screw in the feed lever (1, Fig. 5). To install the lever at the opposite side of the machine, use the 5 mm hex wrench to loosen the screw 2 fixing the head, and then reposition the head to the other side and tighten the screw.



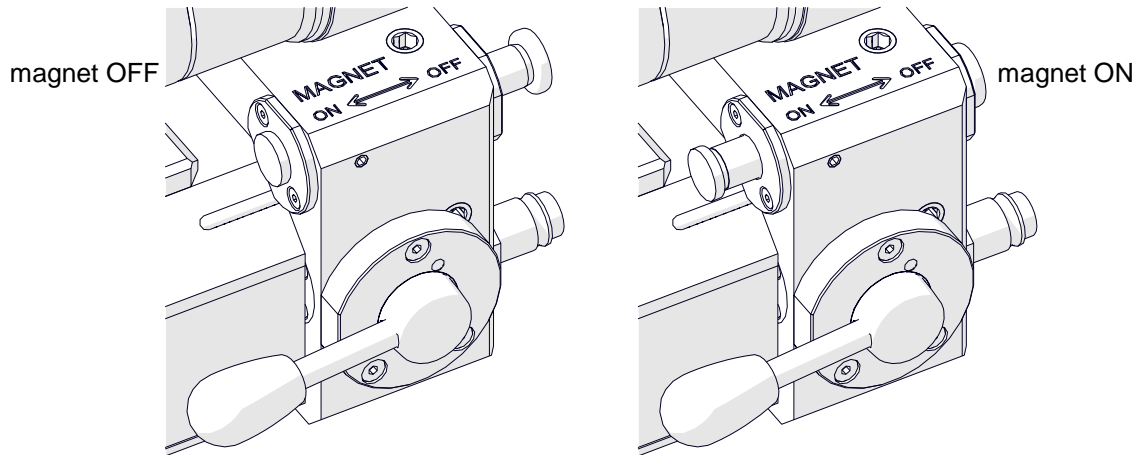
**Fig. 5.** Installing the feed lever

Install the annular cutter into the arbor in the manner described before.

Connect the machine to a correctly prepared air source of sufficient purity using a hose with the internal diameter of at least 10 mm (0.4"). The air source must be equipped with an air preparation unit: a filter, regulator, and lubricator.

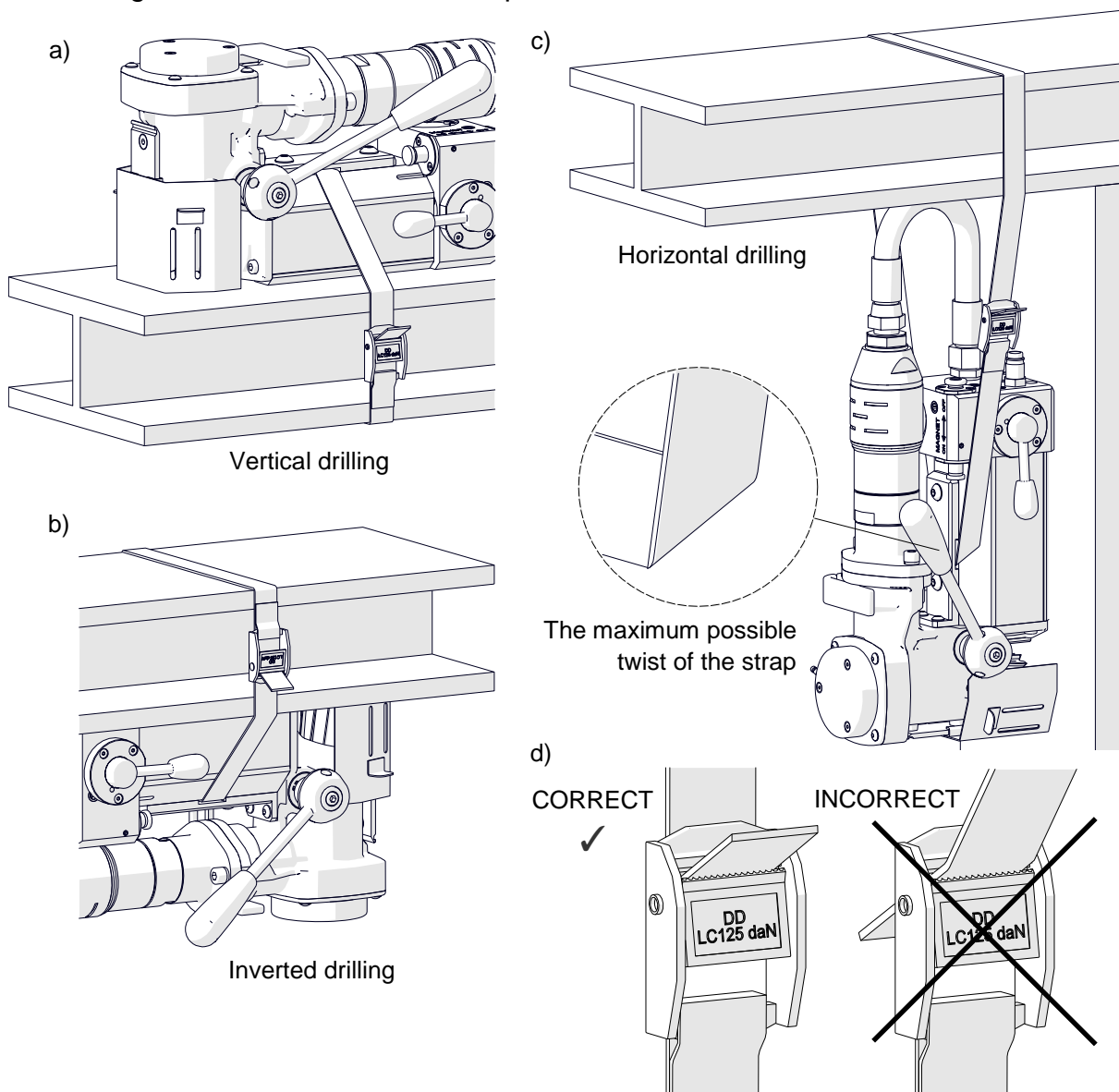
Position the machine on a flat ferromagnetic surface (some types of stainless and acid-proof steel do not conduct magnetic flux) with the thickness of at least 10 mm (0.4"). The workpiece must be clean, without rust or paint that decrease the holding force of the magnetic base.

With the MOTOR lever set to the position from Fig. 6, turn on the magnetic base by setting the MAGNET switch to the position ON.



**Fig. 6.** Enabling the magnetic base

Protect the machine using the safety strap to prevent possible injury if the machine loses magnetic adhesion in case of a pressure loss.



**Fig. 7.** Protecting the machine using the safety strap

To do this, fasten the strap through the opening in the machine body (Fig. 7). The strap must be tight, not twisted (except horizontal drilling; the maximum possible twist is shown in Fig. 7c), 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. 7d).

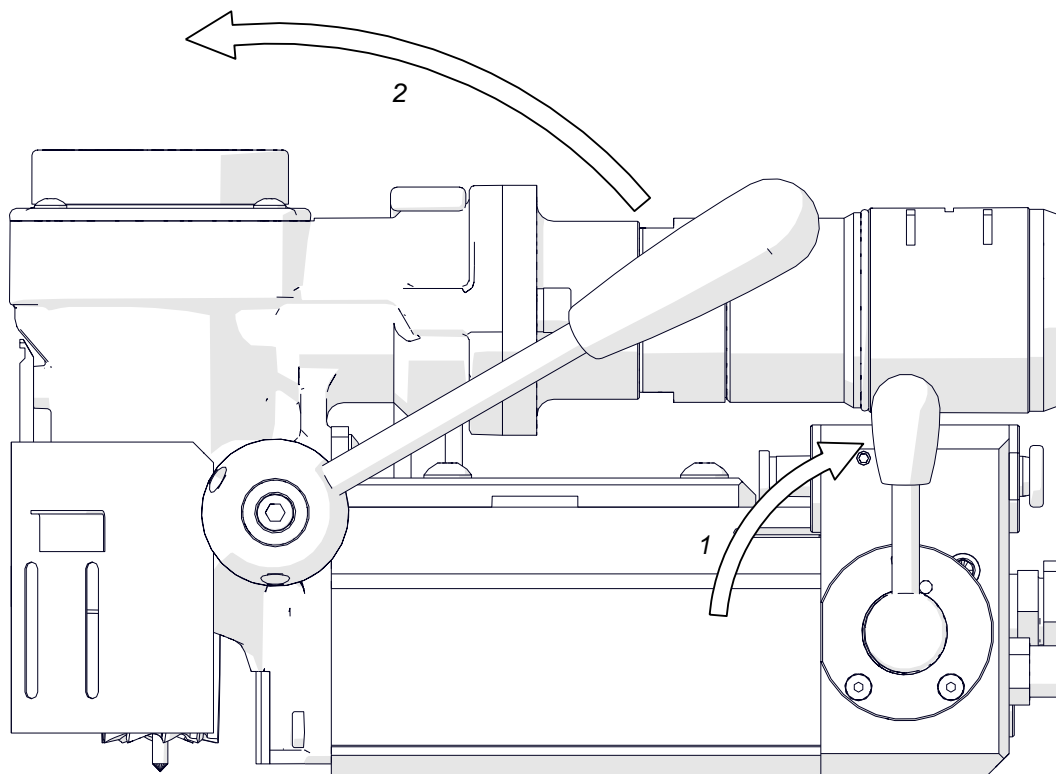
When working in the position from Fig. 7a or 7c, fill the cooling system bottle with a cutting fluid and attach the bottle hose to the coupling (Fig. 1). Do not use pure water as the cutting fluid. However, using emulsions formed from mixing water and drilling oil is satisfactory. Next, press the lever of the bottle several times, and then rotate the feed lever to initially apply pressure on the pilot pin. The fluid will fill the system and begin flowing from the inside of the cutter.



**Use a cooling paste when working in inverted positions (Fig. 7b).**

### 3.3. Drilling

Start the motor by positioning the MOTOR lever vertically (1, Fig. 8). Rotate the feed lever to the left (2) to bring the cutter close to the workpiece. Then, gently begin drilling, maintaining constant pressure on the lever. Accomplish the hole in one pass.



**Fig. 8.** Starting the motor



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

After the hole is made, retract the cutter from the workpiece and stop the motor by rotating the MOTOR lever to the left to position it horizontally. To move the machine to another drilling spot, first disable the magnetic base by positioning the MAGNET switch to the position OFF.

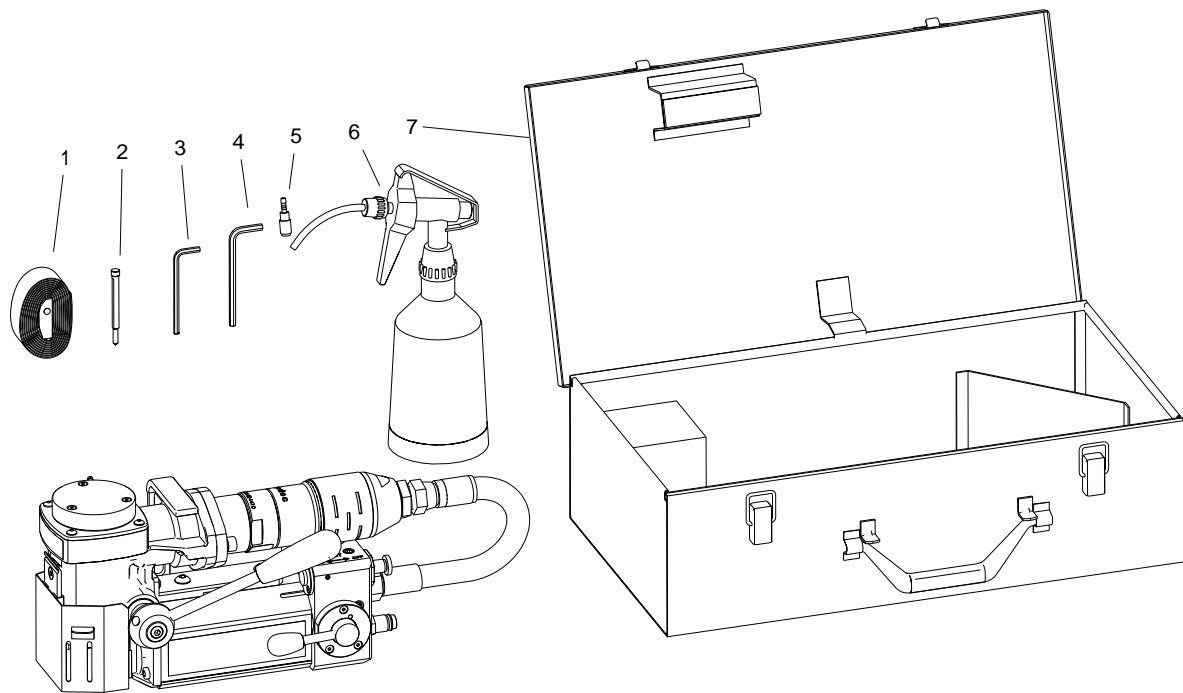
After the work is finished, unplug the machine from the air source, clean chips and excess coolant from the machine and the cutter, and then remove the machine from the worksite.

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 then wear protective gloves to remove the cutter from the arbor.

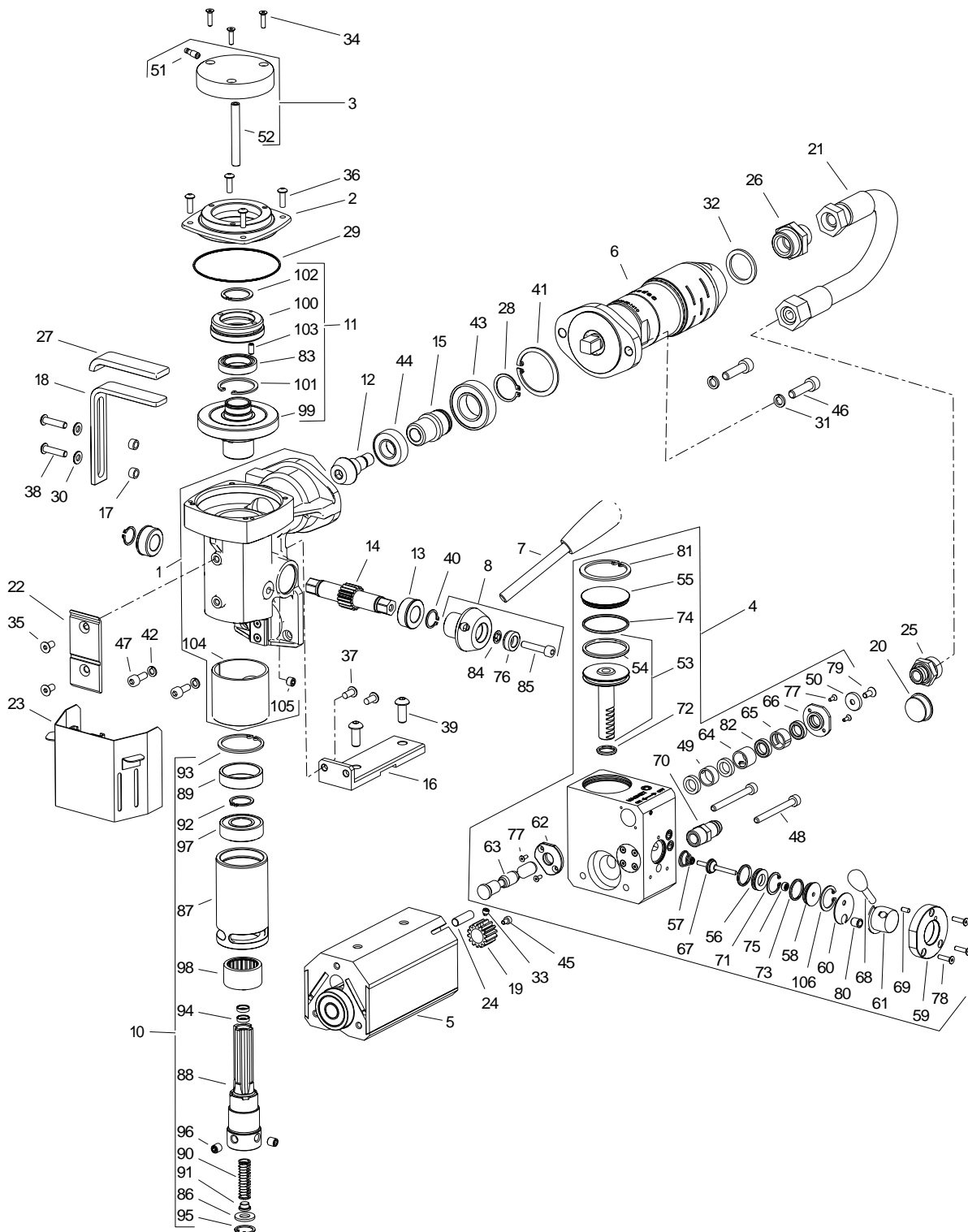
### **3.4. Maintaining the air preparation unit**

Maintain the air preparation unit as required to keep the water trap drained, filter cleaned, and the lubricator oil reservoir filled so that there is a drop of oil every 2–5 seconds. Use only oil whose ignition temperature is more than 260°C (500°F). If the machine is to be left idle for at least 24 hours, increase the delivery of oil and run the motor for 2–3 seconds, which will prevent rusting and degrading of the rotor vanes.

## 4. EXPLODED DRAWINGS AND PARTS LIST



ITEM	PART NUMBER	DESCRIPTION	Q-TY
1	PAS-000007	SAFETY STRAP 250	1
2	PLT-0378-15-00-00-0	PILOT PIN	1
3	KLC-000007	4 MM HEX WRENCH	1
4	KLC-000008	5 MM HEX WRENCH	1
5	SZB-000003	QUICK COUPLING	1
6	PJM-000007	PRESSURE BOTTLE	1
7	SKR-0418-27-00-00-0	METAL BOX	1



ITEM	PART NUMBER	DESCRIPTION	Q-TY
1	KRP-0520-01-00-00-0	MAIN BODY ASSY	1
2	OBS-0520-05-00-00-1	BEARING NUT HOLDER	1
3	PKR-0520-06-00-00-0	GEARBOX COVER ASSY	1
4	ZSP-0520-04-00-00-0	VALVE ASSY	1
5	BLO-0520-02-00-00-0	MAGNET BASE	1
6	SLN-000182	AIR MOTOR	1
7	DZW-0140-04-00-00-0	SPOKE HANDLE WITH KNOB ASSY	1
8	GLW-0231-36-00-00-1	HEAD ASSY	1
10	ZSP-0378-03-00-00-0	QUILL ASSY	1
11	ZSP-0378-04-00-00-0	BEVEL GEAR T=39 ASSY	1
12	WLK-0378-17-00-00-0	PINION T=11	1
13	TLJ-0418-02-00-00-0	SLIDE BUSHING	2
14	WLK-0418-03-00-00-0	PINION	1
15	ZBI-0418-04-00-00-0	DRIVER	1
16	WSP-0418-05-00-00-0	MAIN BODY BRACKET	1
17	TLJ-0418-08-00-00-0	HANDLE SLEEVE	2
18	UCW-0418-09-00-00-0	HANDLE	1
19	ZBT-0418-11-00-00-0	TURN ON/OFF GEAR	1
20	ZLP-0418-12-00-00-0	GEAR PLUG	1
21	PWD-0418-14-00-00-0	MOTOR HOSE ASSY	1
22	PRW-0418-15-00-00-0	GUARD SLIDE	1
23	OSL-0418-16-00-00-0	GUARD	1
24	WLK-0418-17-00-00-0	SHAFT	1
25	ZLC-0418-18-00-00-0	COUPLING 1/2" – 3/8"	1
26	ZLC-0418-19-00-00-0	COUPLING 3/4" – 3/8"	1
27	NSD-000009	HANDLE COVERING	1
28	PRS-000017	EXTERNAL RETAINING RING 25z	1
29	PRS-000224	SEAL RING 80x1.3	1
30	PDK-000021	ROUND WASHER 6.4	2
31	PDK-000051	SPRING WASHER 8.2	2
32	USZ-000017	SEAL 3/4"	1
33	WKR-000396	HEX SOCKET SET SCREW WITH DOG POINT M6x6	1
34	WKR-000132	HEX SOCKET COUNTERSUNK HEAD SCREW M4x16	3
35	WKR-000141	HEX SOCKET COUNTERSUNK HEAD SCREW M6x12	2
36	WKR-000098	HEX SOCKET BUTTON HEAD SCREW M5x16	4
37	WKR-000290	HEX SOCKET BUTTON HEAD SCREW M6x12	2
38	WKR-000103	HEX SOCKET BUTTON HEAD SCREW M6x25	2
39	WKR-000437	HEX SOCKET BUTTON HEAD SCREW M8x20	2
40	PRS-000238	EXTERNAL RETAINING RING 16z	2
41	PRS-000030	INTERNAL RETAINING RING 47w	1
42	PDK-000046	SPRING WASHER 6.1	2
43	LOZ-000048	BALL BEARING 25x47x12	1
44	LOZ-000043	BALL BEARING 17x35x10	1
45	SRB-000071	HEX SOCKET HEAD CAP SCREW M4x6	1
46	SRB-000155	HEX SOCKET HEAD CAP SCREW M8x30	2
47	SRB-000106	HEX SOCKET HEAD CAP SCREW M6x16	2
48	SRB-000132	HEX SOCKET HEAD CAP SCREW M6x60	2
49	TLJ-0215-00-29-00-0	SLEEVE I	1
50	PRS-0215-00-32-00-0	SHAFT RING	1
51	KNC-0234-00-10-00-0	COOLANT COUPLING	1
52	RRA-0378-05-02-00-0	JUMPER	1
53	TLK-0418-10-02-00-0	PISTON ASSY	1
54	PRS-000194	O-RING 39.2x3	1
55	ZLP-0418-10-03-00-0	PISTON PLUG	1
56	PRS-0418-10-06-00-0	LOCKING RING	1
57	SPR-0418-10-07-00-0	SPRING	1
58	PRS-0418-10-09-00-0	EXTERNAL RING	1

ITEM	PART NUMBER	DESCRIPTION	Q-TY
59	OBS-0418-10-10-00-0	HANDLE HOLDER	1
60	PDK-0418-10-11-00-0	WASHER	1
61	WLK-0418-10-12-00-0	HANDLE SHAFT	1
62	PKR-0418-10-14-00-0	COVER I	1
63	WLK-0418-10-15-00-1	DIVIDING SHAFT	1
64	TLJ-0418-10-16-00-0	CENTER SLEEVE	1
65	TLJ-0418-10-17-00-0	SLEEVE II	1
66	PKR-0418-10-18-00-0	COVER II	1
67	DCS-0418-10-20-00-0	STOP PLUG ASSY	1
68	DZW-0520-04-02-00-0	HANDLE ASSY	1
69	KLK-000043	DOWEL PIN 4n6x8	1
70	KRC-000005	MALE PLUG, G3/8" 10 mm	1
71	PRS-000012	INTERNAL RETAINING RING 21	1
72	PRS-000233	O-RING 15.3x2.4	1
73	PRS-000241	O-RING 18x2	2
74	PRS-000242	O-RING 42x2	1
75	PRS-000243	SEAL 4x8.2x4	1
76	TLJ-0231-36-02-00-0	HEAD SLEEVE	1
77	WKR-000398	HEX SOCKET COUNTERSUNK HEAD SCREW M3x8	4
78	WKR-000132	HEX SOCKET COUNTERSUNK HEAD SCREW M4x16	3
79	WKR-000134	HEX SOCKET COUNTERSUNK HEAD SCREW M5x12	1
80	ZTR-000001	BALL LOCK GN 614-8-NI	1
81	PRS-000030	INTERNAL RETAINING RING 47w	1
82	PRS-000125	SEAL 12x18.4	4
83	LOZ-000089	BALL BEARING 25x37x7	1
84	ZBZ-000001	PROTECTIVE RING 6	1
85	SRB-000118	HEX SOCKET HEAD CAP SCREW M6x30	1
86	USZ-0279-02-01-06-0	SEAL	1
87	TLJ-0378-03-01-00-0	QUILL CARRIER	1
88	WRZ-0378-03-02-00-0	SPINDLE	1
89	TLJ-0378-03-03-00-0	DISTANCE SLEEVE	1
90	SPR-0378-03-04-00-0	SPRING	1
91	WYP-0378-03-05-00-0	PLUNGER	1
92	PRS-000011	EXTERNAL RETAINING RING 20z	1
93	PRS-000026	INTERNAL RETAINING RING 42w	1
94	PRS-000222	SEAL RING 8/12x3	2
95	PRS-000009	INTERNAL RETAINING RING 19w	1
96	WKR-000063	HEX SOCKET SET SCREW WITH FLAT POINT M8x8	2
97	LOZ-000045	BALL BEARING 20x42x12	1
98	LOZ-000099	NEEDLE BEARING 30x37x20	1
99	KOL-0378-04-01-00-0	BEVEL GEAR T=39 WITH SLEEVE ASSY	1
100	TLJ-0378-04-02-00-0	BEARING SLEEVE	1
101	PRS-000025	INTERNAL RETAINING RING 37w	1
102	PRS-000223	EXTERNAL RETAINING RING 25z TYPE A	1
103	WKR-000043	HEX SOCKET SET SCREW WITH FLAT POINT M5x10	1
104	TLJ-0378-01-05-00-0	SLIDE BUSHING 50/55x60	1
105	WKR-000031	HEX SOCKET SET SCREW WITH FLAT POINT M8x6	1
106	PRS-000016	INTERNAL RETAINING RING 24	1



## 5. DECLARATION OF CONFORMITY

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

We

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

declare with full responsibility that:

### **D1 AIR DRILLING MACHINE WITH MAGNETIC BASE ATEX group II category 2 G/D**

is manufactured in accordance with the following standards:

- EN ISO 12100
- EN 1127-1
- EN 1127-2+A1
- EN 13463-1
- EN 13463-5

and satisfies safety regulations of the guidelines: 2006/42/EC, 94/9/EC.

Białystok, 27 September 2013



---

Marek Siergiej  
Chair

## 6. QUALITY CERTIFICATE

### Machine control card

### D1 AIR Drilling Machine with Magnetic Base

Serial number .....

Spindle radial runout.....

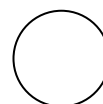
Spindle to base travel perpendicularity .....

Spindle axis to base perpendicularity .....

Base holding force .....

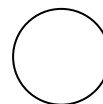
(surface with the minimum thickness of 22 mm and roughness  $R_a \leq 1.25$ )

Quality control .....



### Adjustments, inspections

Quality control .....



## **7. WARRANTY CARD**

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

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

This warranty does not cover cutters as well as 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.....

**1.04 / 4 September 2015**

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