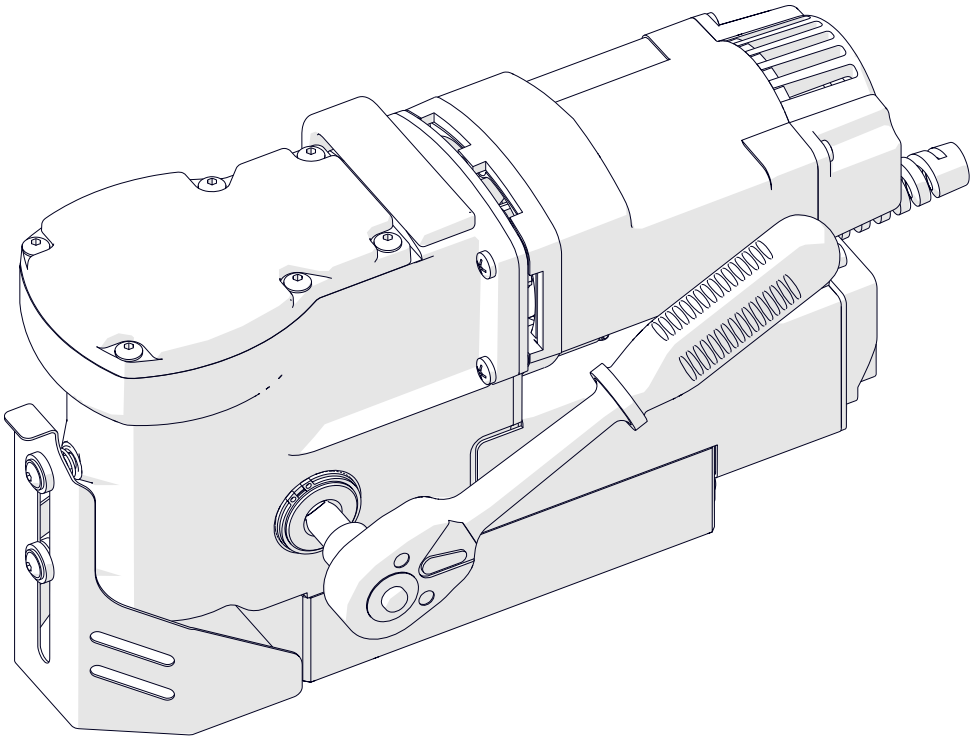
The tools of innovation.

OPERATOR'S MANUAL

SM-D1 LOW PROFILE

DRILLING MACHINE

WITH ELECTROMAGNETIC BASE



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1. GENERAL INFORMATION

1.1. Application

The SM-D1-LP is a drilling machine with electromagnetic base, designed to drill holes with diameters of up to 36 mm (1-7/16'') either to a depth of up to 20 mm (13/16'') by using HSS annular cutters or to a depth of up to 30 mm (1-3/16'') by using TCT annular cutters. When using twist drill bits with a 19 mm (3/4'') Weldon shank you can drill holes with diameters of up to 12 mm (1/2'') to a depth of up to 20 mm (13/16'').

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

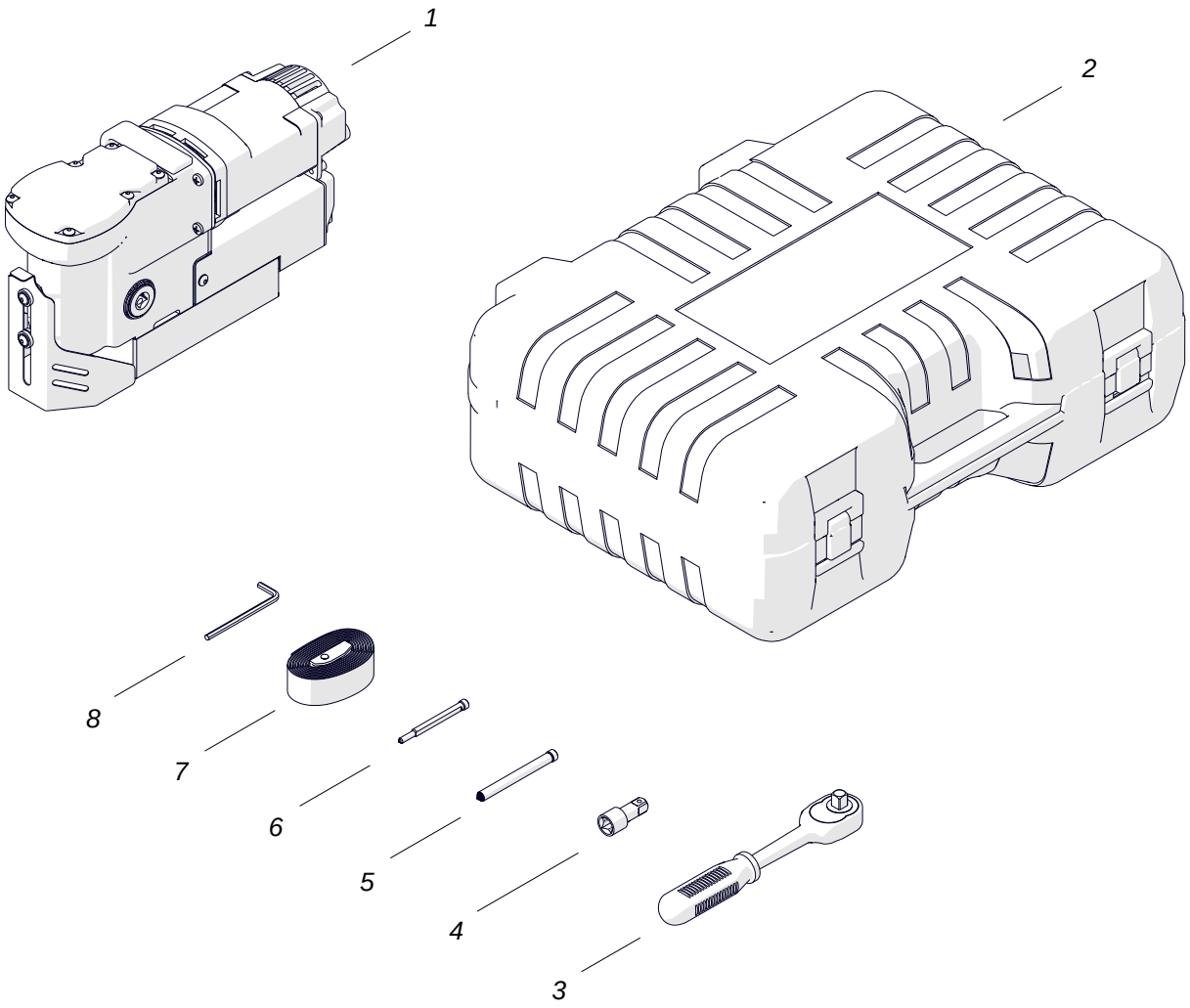
With an optional HSS quill assembly you can drill holes to a depth of up to 25 mm (1'') by using HSS cutters or twist drill bits with a 19 mm Weldon shank.

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
Tool holder	19 mm (3/4'') Weldon
Maximum drilling diameter with annular cutter	36 mm (1-7/16'')
Maximum drilling diameter with twist drill bit	12 mm (1/2'')
Maximum drilling depth with HSS cutter or drill bit	20 mm (13/16'')*
Maximum drilling depth with TCT cutter	30 mm (1-3/16'')
Electromagnetic base holding force (surface with the thickness of 25 mm and roughness R_a = 1.25)	8 900 N (1950 lbs)
Electromagnetic base dimensions	90 mm × 180 mm × 38.5 mm 3-9/16'' × 7-1/16'' × 1-1/2''
Stroke	39 mm (1-1/2'')
Rotational speed without load	550 rpm (for 115 V) 580 rpm (for 230 V)
Rotational speed under load	350 rpm (for 115 V) 370 rpm (for 230 V)
Minimum workpiece thickness	6 mm (1/4'')
Protection class	I
Noise level	More than 85 dB
Required ambient temperature	0–40°C (32–104°F)
Weight	9.5 kg (21 lbs)

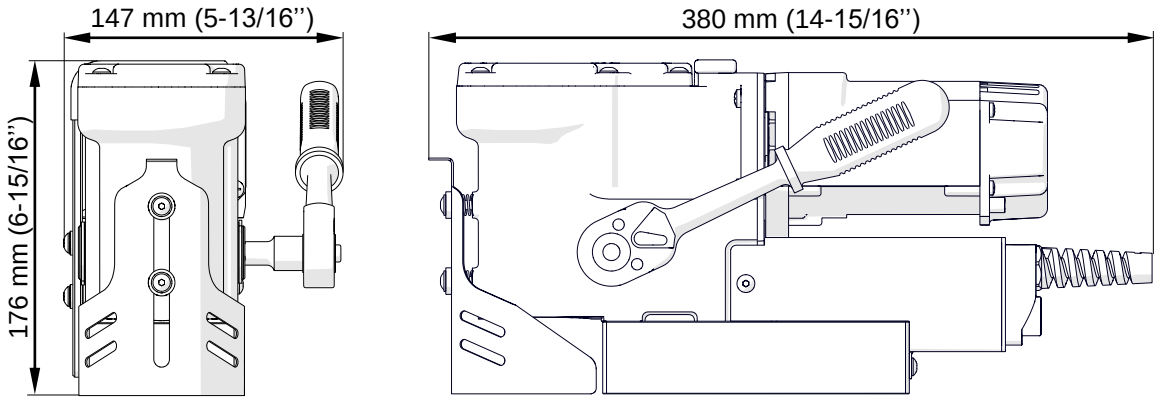
* Up to 25 mm (1'') when used with an optional HSS quill assembly (ZSP-0521-04-00-00-0).

1.3. Equipment included

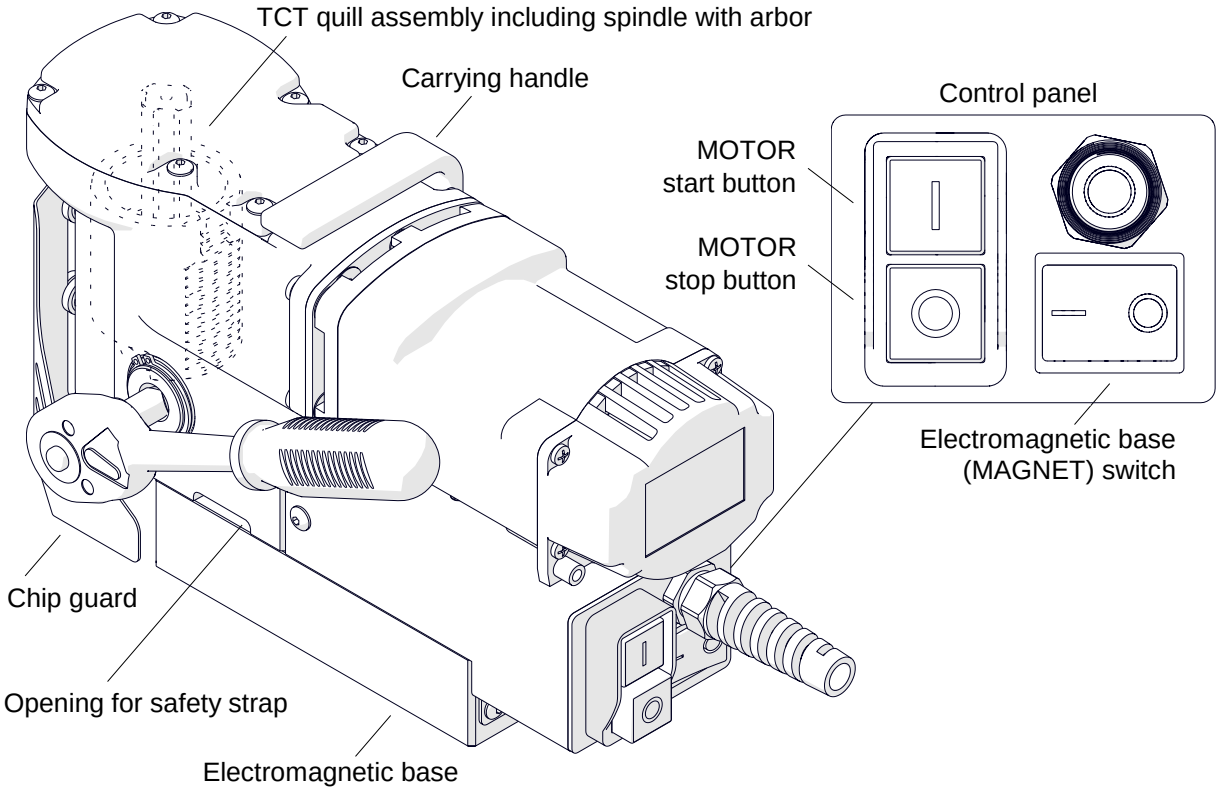


1	Drilling machine	1 unit
2	Plastic box	1 unit
3	Handle	1 unit
4	Handle adapter	1 unit
5	Pilot pin 7.98x85 for TCT cutters	1 unit
6	Pilot pin 6.34x74 for HSS cutters	1 unit
7	Safety strap	1 unit
8	4 mm hex wrench	1 unit
–	Operator's Manual	1 unit

1.4. Dimensions



1.5. Design



2. SAFETY PRECAUTIONS

1. Before starting, read this Operator's Manual and complete proper occupational safety and health training.
2. Use the machine only in applications specified in this Operator's Manual.
3. The machine must be complete and all parts must be genuine and fully functional.
4. The specifications of the power source must conform to those specified on the rating plate.
5. Connect the machine to a properly grounded power source. The power source 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 with class II protection only.
6. Never carry the machine by the power cord and never pull the cord because this may damage it and result in electric shock.
7. Transport and position the machine by using the carrying handle and only when the MAGNET switch is set to 'O'.
8. Untrained bystanders must not be present near the machine.
9. Before starting, ensure the correct condition of the machine, power source, power cord, plug, control panel components, and tools.
10. Keep the machine dry, and do not expose it to rain, snow, or frost.
11. Never stay below the machine placed at heights.
12. Keep the work area well lit, clean, and free of obstacles.
13. Install the tools securely by tightening the set screws. Remove adjusting keys and wrenches from the work area before connecting the machine to the power source.
14. Never use tools that are dull or damaged.
15. Do not make holes whose diameter or depth differ from those specified in the technical data.
16. Install and remove tools by using protective gloves and only when the machine is unplugged from the power source.
17. Never use annular cutters without a pilot pin except when drilling incomplete through holes.
18. Never use near flammable liquids or gases, or in explosive environments.
19. Never use the machine on surfaces that are rusty, covered with a thick paint layer, uneven, or not rigid.

20. Use the safety strap in all work positions by attaching the machine to a fixed structure through the opening in the machine body. 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 work. Do not wear loose clothing.
23. The entire bottom of the electromagnetic base must be in full contact with the workpiece. Before every positioning, wipe the workpiece with coarse-grained sandpaper.
24. Do not touch moving parts or chips formed during milling. Prevent objects from being caught in moving parts.
25. After every use, remove metal chips and excess coolant from the machine. Do not remove chips with bare hands.
26. Cover steel parts with a thin anti-corrosion coating to protect the machine from rust when not in use for any extended period.
27. Maintain the machine and install/remove parts and tools only when the machine is unplugged from the power source.
28. Repair only in a service center appointed by the seller.
29. 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 work and promptly send the machine to the service center for inspection and repair.
30. Never leave the machine unattended during work.
31. Remove from the worksite and store in a secure and dry place when not in use, previously removing the tool from the holder.

3. STARTUP AND OPERATION

3.1. Installing and removing the handle

Install the handle by using the adapter as shown in Fig. 1. The handle can be installed from the opposite side of the machine to allow working in places hard to reach or using the machine by a left-handed person.

To remove the handle, pull it out.

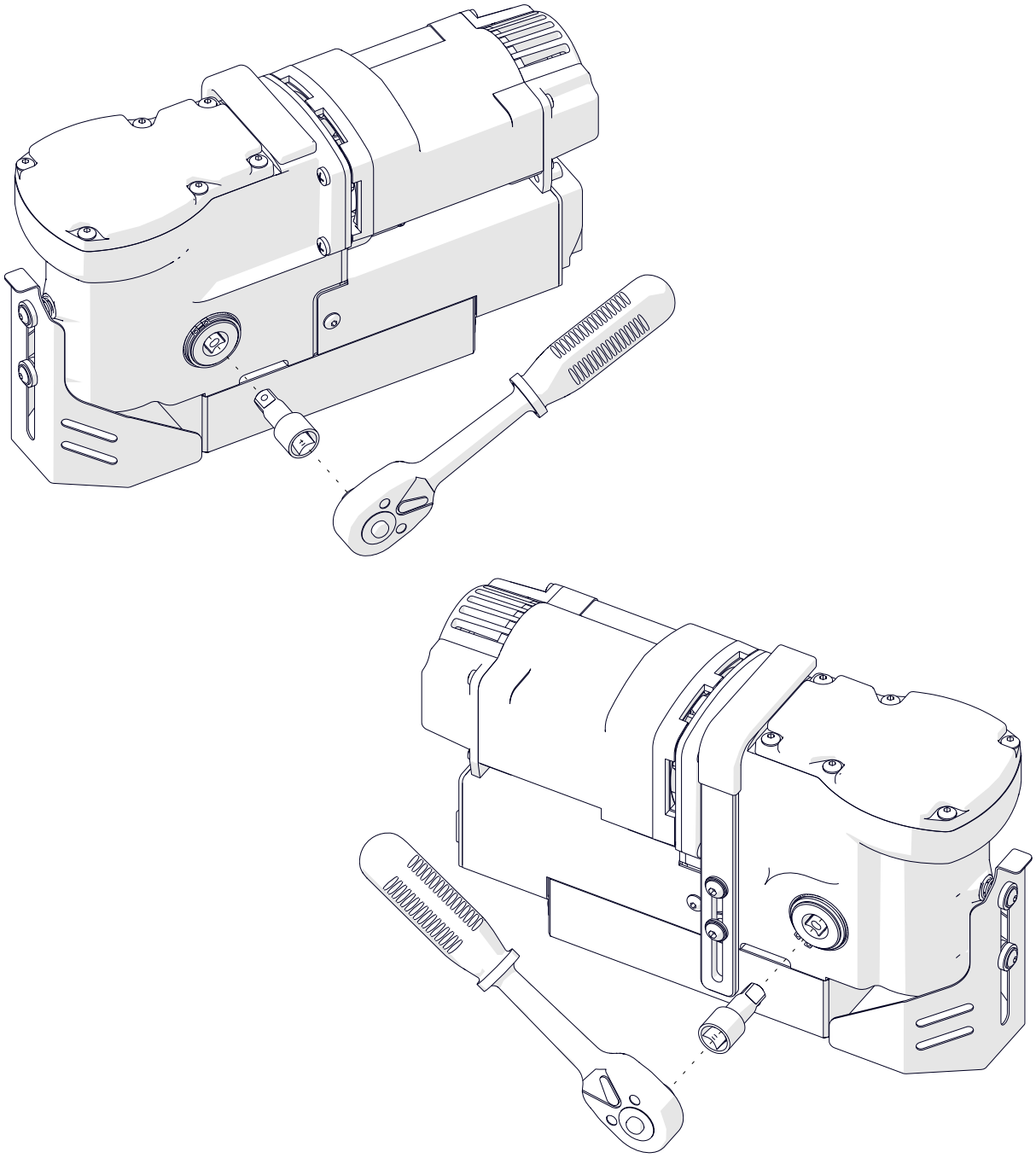


Fig. 1. Installing the handle

3.2. Installing, removing, and operating the annular cutter

Unplug the machine from the power source, raise the chip guard, and then rotate the handle to the left (*1*, Fig. 2) to access the set screws (*2*). Next, wear protective gloves, insert the required pilot pin into the annular cutter (*3*), and then use a clean and dry cloth to wipe the arbor and cutter. Next, place the cutter into the arbor (*4*) so that the flats (*5*) are aligned with the set screws (*2*), and then use the 4 mm hex wrench to tighten both set screws.

To remove the cutter, loosen the screws (*2*) with the 4 mm hex wrench.

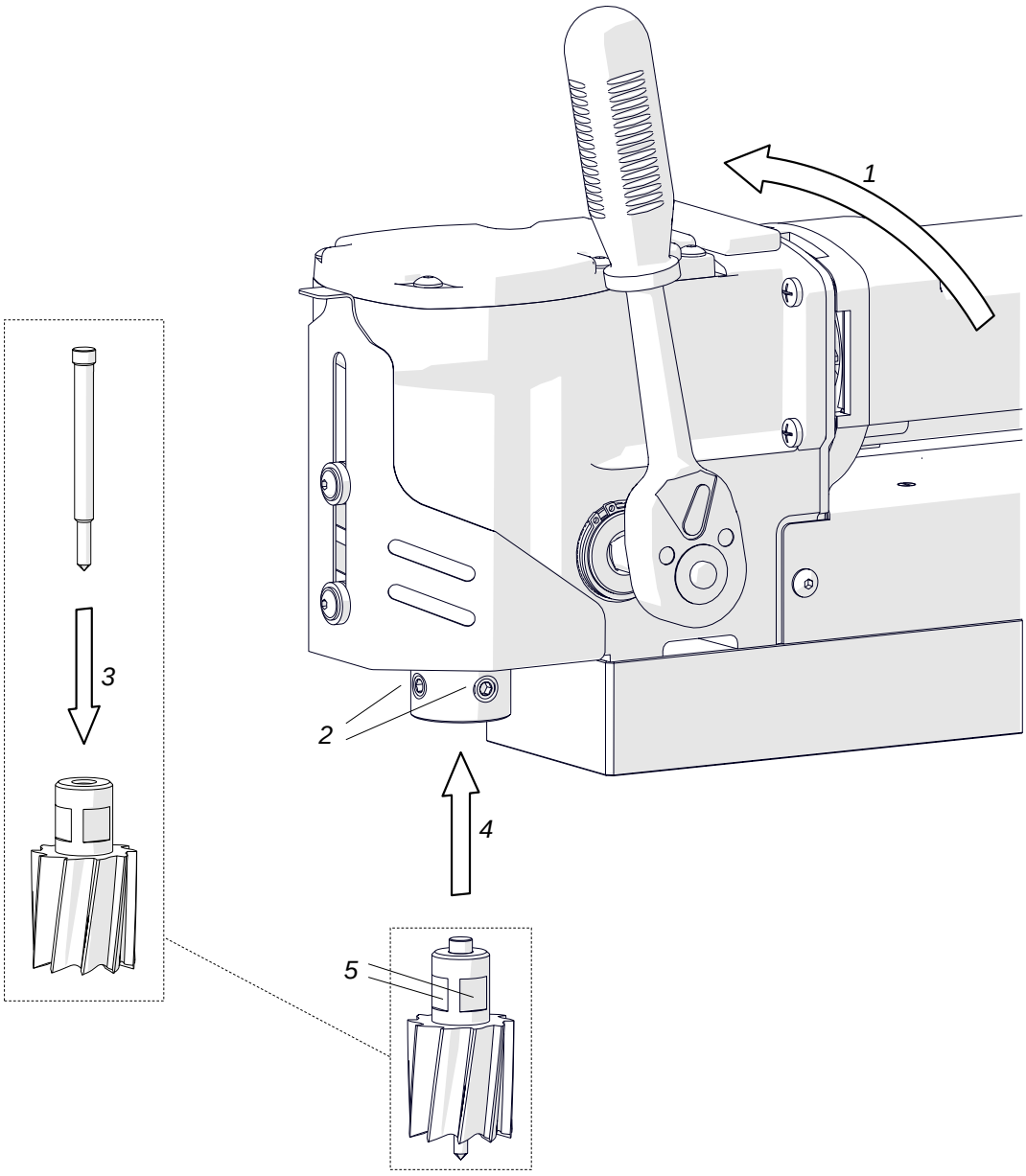


Fig. 2. Installing the annular cutter

Fig. 3 shows how annular cutters work. 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.

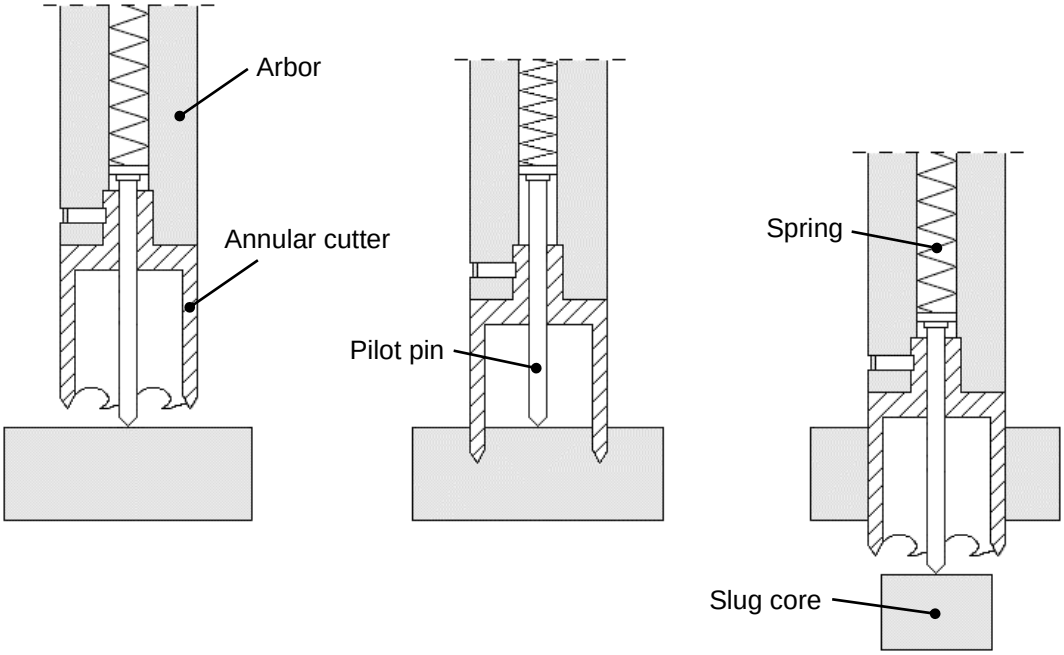


Fig. 3. Annular cutters work

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.

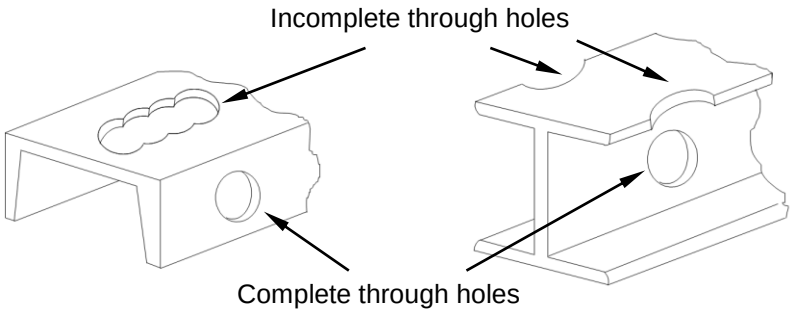


Fig. 4. Types of holes to make with annular cutter

3.3. Preparing

Before starting, clean steel parts, including the arbor, from anti-corrosion coating used to preserve the machine for storage and transport.

Install the handle as described before.

Based on the hole size desired, select the proper annular cutter or drill bit with a 19 mm Weldon shank. Next, use a clean and dry cloth to wipe the arbor and cutter (drill bit), and then install the cutter (drill bit) into the arbor as described before.

Position the machine on a flat ferromagnetic surface with a thickness of at least 6 mm (1/4''). The workpiece must be clean, without rust or paint that decrease the holding force. The force value depends also on the type, thickness, flatness, and roughness of the surface, fluctuations of the supply voltage, and the wear of the electromagnetic base bottom. Some types of steel are non-ferromagnetic (do not conduct magnetic flux) and the machine is not capable to clamp onto them.

Connect the machine to the power source, and set the MAGNET switch to 'I' to turn on the clamping of the electromagnetic base.

Use the safety strap to prevent the machine from falling and avoid possible injury to the operator if the machine loses magnetic clamping in case of a power loss. To protect the machine, insert the strap through the opening in the machine body and attach the machine to a fixed structure. The strap must be tight, not twisted (except standard twist for horizontal drilling from Fig. 5c), 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. 5d).

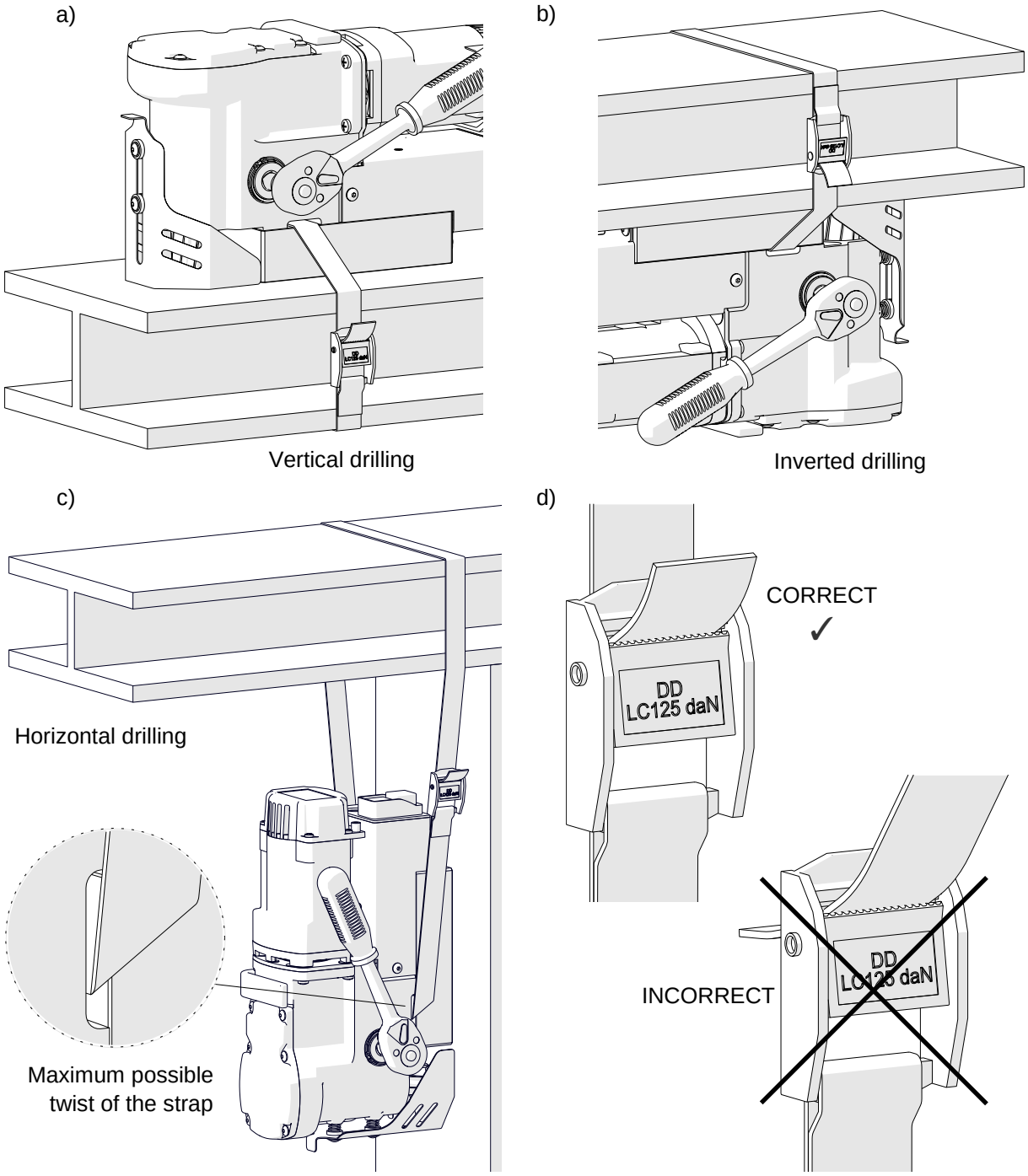


Fig. 5. Protecting the machine from falling by using the safety strap

Rotate the handle to the left to place the pilot pin (drill bit) above the workpiece.

Fill the coolant bottle (not included) 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.

When drilling in vertical positions (Fig. 5a), apply the coolant manually into the drilling area. When drilling in inverted or horizontal positions (Fig. 5b, 5c) use coolants under pressure or in the form of spray or paste.

3.4. Drilling

Start the motor with the green MOTOR button, and slowly rotate the handle to the left to lower the tool to the workpiece, and start drilling.

When using annular cutter, drill holes in one pass.

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

When using drill bits, drill holes with diameters of 8–12 mm (5/16'' – 1/2'') in two passes. Drill a first hole by using a drill bit with the 70% diameter of the hole size desired, and then drill again by using a bit with the diameter equal to the hole size desired.

After the hole is made, retract the tool from the workpiece and press the red MOTOR button to stop the motor. Before moving the machine to another drilling spot, set the MAGNET switch to 'O' to turn off the electromagnetic base.

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

Before inserting the machine into the box, remove the handle, and then wear gloves to remove the tool from the holder.

3.5. Replacing the motor brushes

Check the condition of the carbon brushes every 100 work hours. To do this, unplug the machine from the power source, and unscrew the cover (*1*, Fig. 6). Next, unscrew the pressing plate (*2*), and then remove the brush holder (*3*) and the brush (*4*). If the length of the brush is less than 5 mm (3/16''), replace both brushes with new ones.

To install brushes, proceed in reverse order. After the replacement, run the motor without load for 20 minutes.

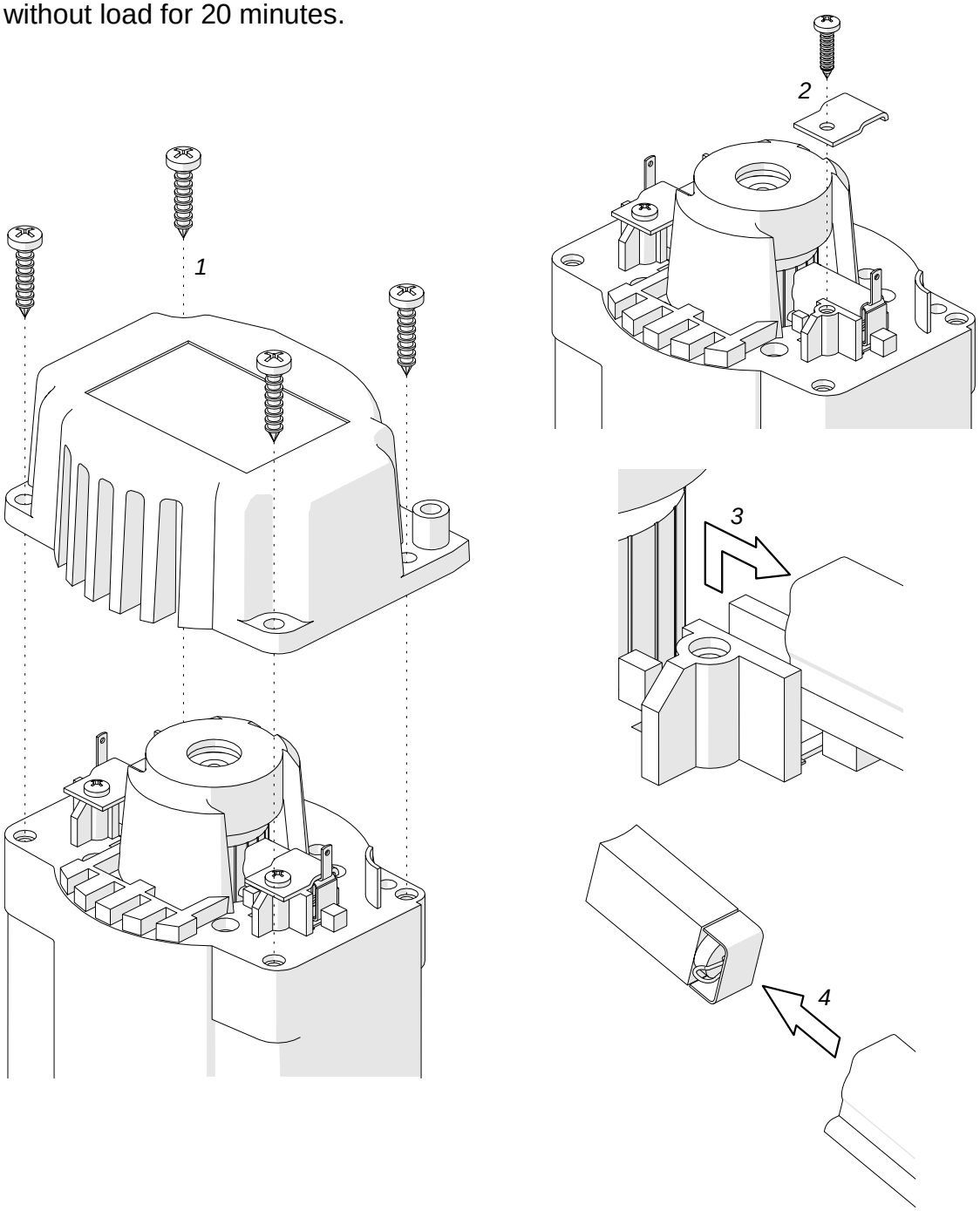


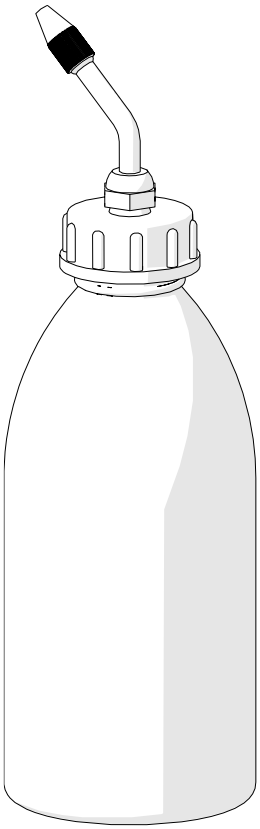
Fig. 6. Replacing the brushes

4. ACCESSORIES

4.1. Coolant bottle with nozzle

Capacity of 250 ml (8 oz).

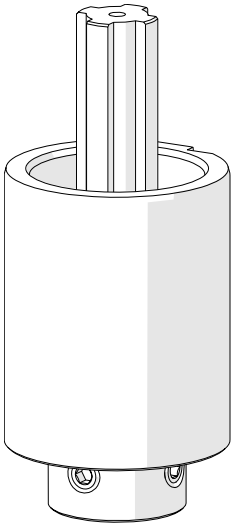
Part number:
PJM-000003



4.2. HSS quill assembly

Allows you to drill holes to a depth of up to 25 mm (1'') by using HSS annular cutters or twist drill bits with a 19 mm (3/4'') Weldon shank.

Part number:
ZSP-0521-04-00-00-0



To install the assembly, unplug the machine from the power source, raise the cover, and then rotate the handle to the left (*1*, Fig. 7) to lower the standard TCT quill assembly as much as possible. Next, remove the handle, use pliers to remove the retaining rings (*2*), and then push out the shaft (*3*) by 16 mm (10/16''), which will expel the TCT quill assembly (*4*). Insert the HSS quill assembly (*5*), push in the shaft (*6*), and then place the retaining rings back in place (*7*).

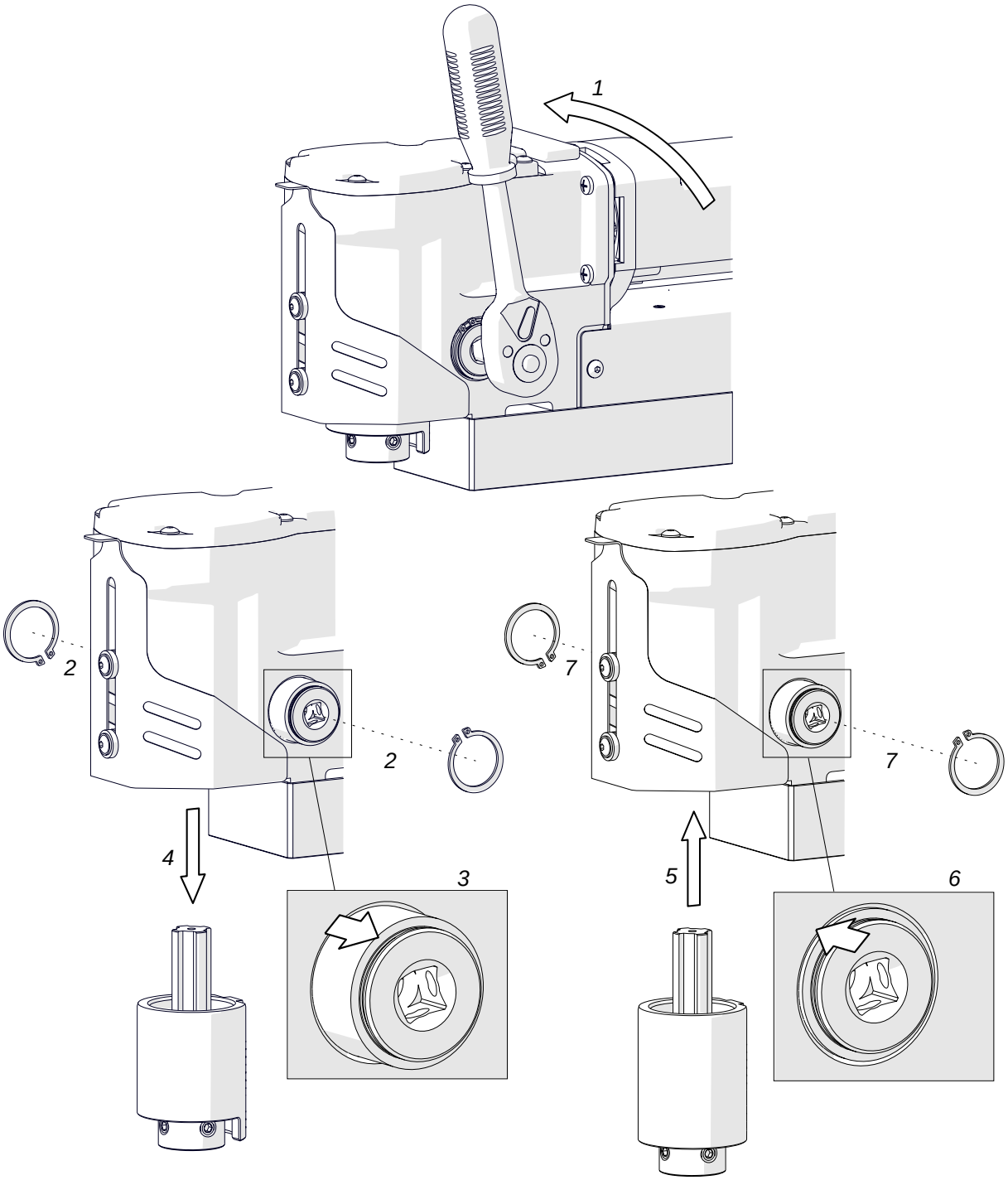
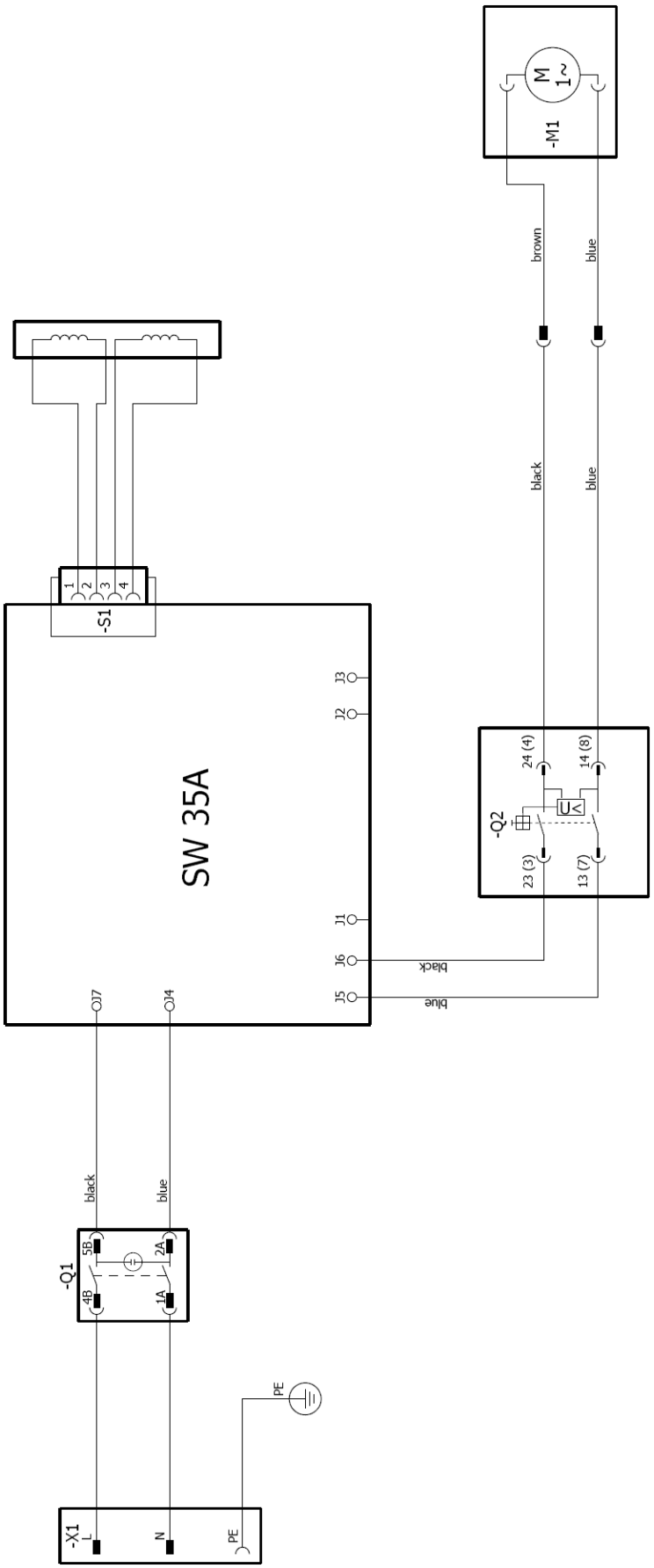
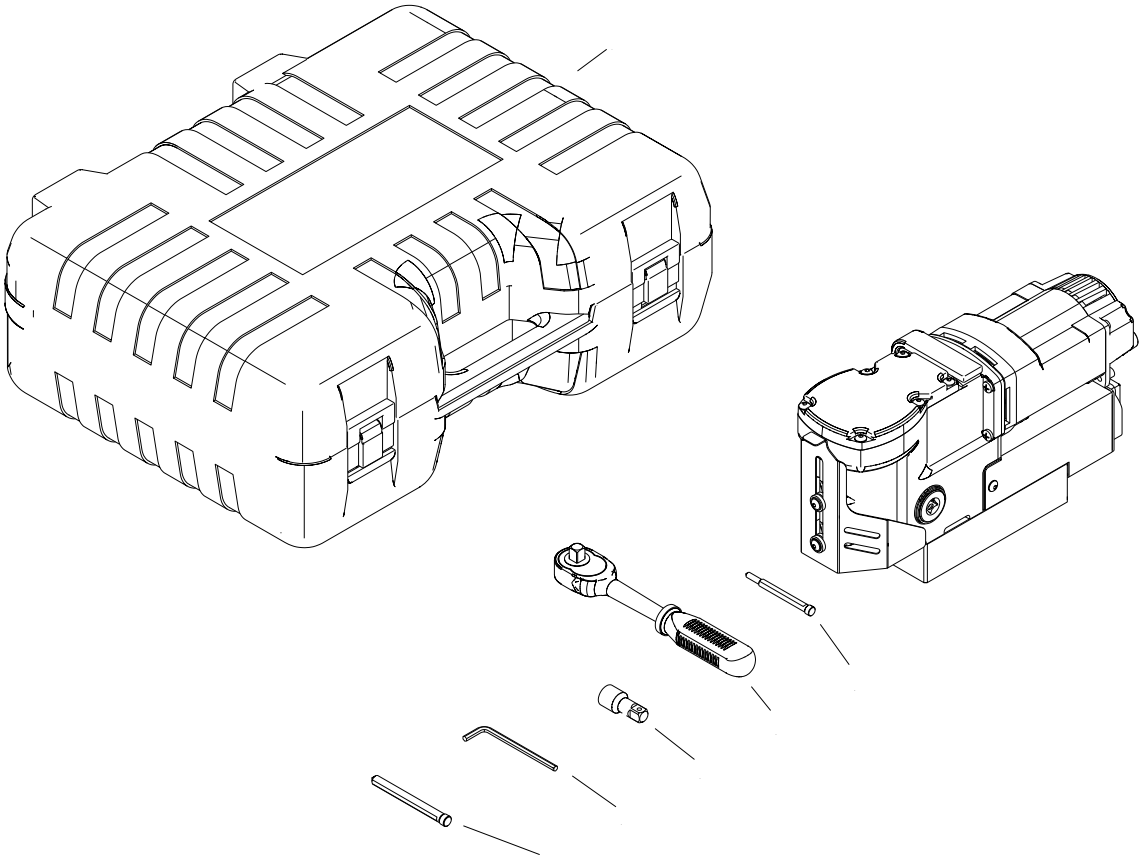


Fig. 7. Installing the HSS quill assembly

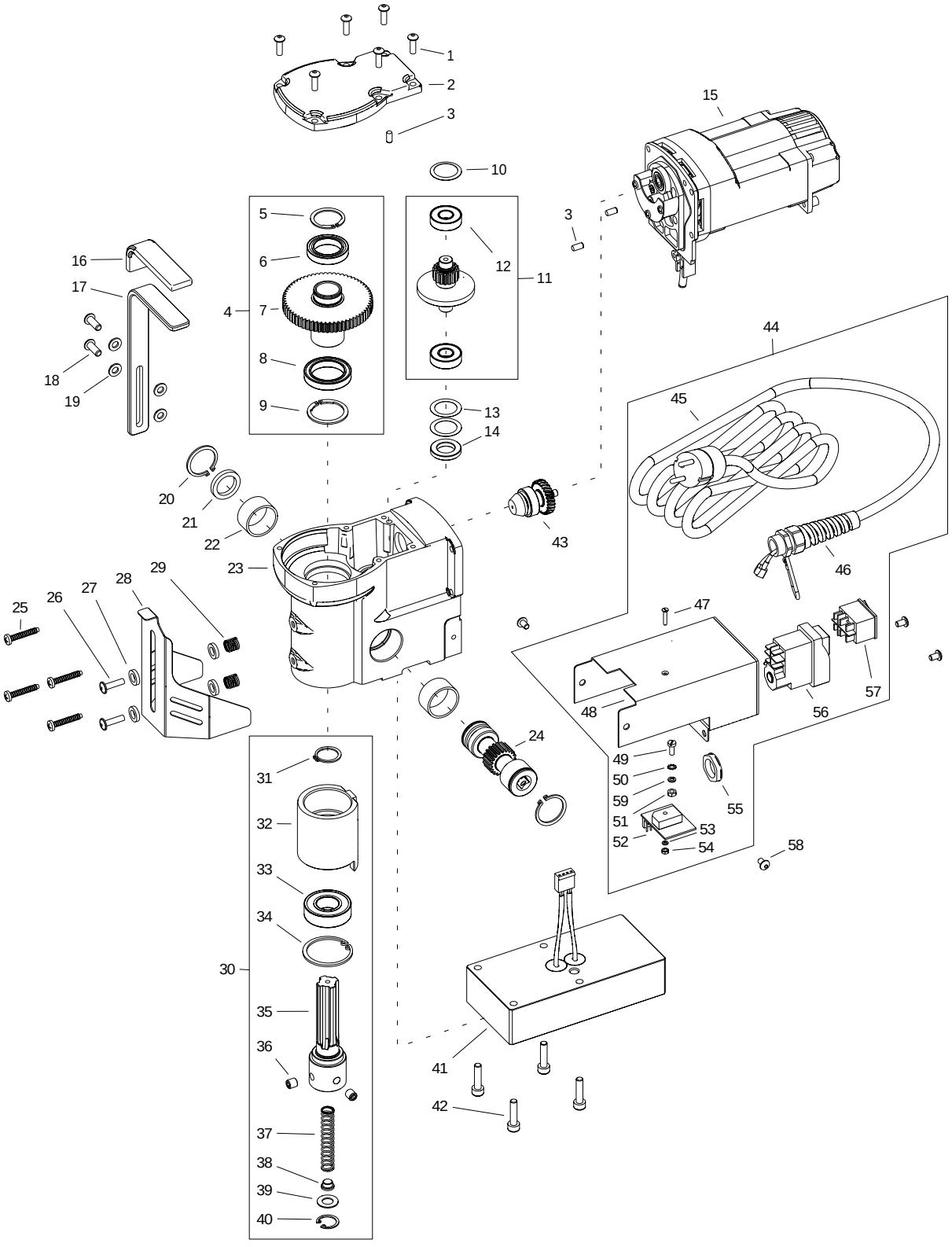
5. WIRING DIAGRAM



6. EXPLODED DRAWINGS AND PARTS LIST



ITEM	PART NUMBER	DESCRIPTION	Q-TY
1	SKR-000012	PLASTIC BOX	1
2	PLT-0521-11-00-00-0	PILOT PIN 7.98x85	1
3	KLC-000007	4 MM HEX WRENCH	1
4	PRD-000002	TORQUE STICK	1
5	KLC-000048	RATCHET WRENCH 3-8	1
6	PLT-0378-15-00-00-0	PILOT PIN 6.34x74	1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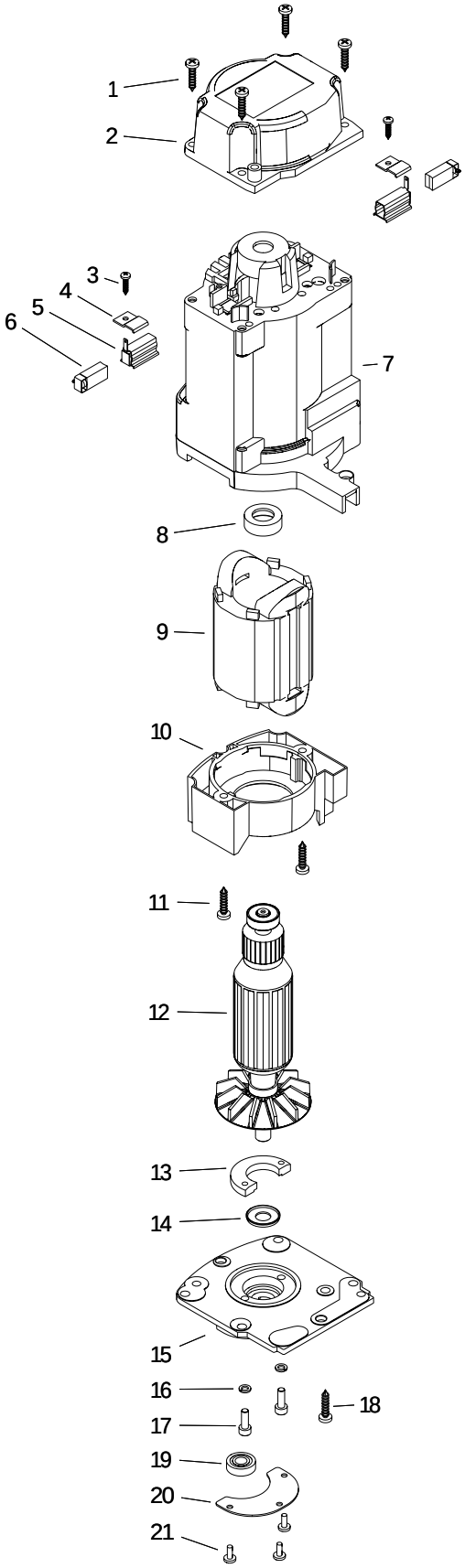
ITEM	PART NUMBER	DESCRIPTION	Q-TY
1	WKR-000098	HEX SOCKET BUTTON HEAD SCREW M5x16	6
2	PKR-0521-02-00-00-1	GEARBOX COVER	1
3	KLK-000044	DOWEL PIN 5n6x10	3
4	KOL-0521-08-00-00-0	GEAR z63 ASSY	1
5	PRS-000223	EXTERNAL RETAINING RING 25z TYPE A	1
6	LOZ-000169	BALL BEARING 25x42x9	1
7	KOL-0521-08-01-00-0	GEAR z63	1
8	LOZ-000100	BALL BEARING 30x42x7	1
9	PRS-000021	EXTERNAL RETAINING RING 30z TYPE A	1
10	SPR-000063	DISC SPRING fi27.99xfi21.74x0.3	1
11	WLK-0521-07-00-00-0	PINION SHAFT z16 z32 ASSY	1
12	LOZ-000038	BALL BEARING 12x28x8	2
13	PDK-000221	WASHER 20x28x0.1	2
14	PDK-0521-13-00-00-0	SETTING WASHER	1
15	SLN-0521-03-00-00-1	MOTOR ASSY – 120V	1
15	SLN-0521-03-00-00-3	MOTOR ASSY – 230V	1
16	NSD-000009	HANDLE COVER	1
17	UCW-0521-12-00-00-0	HANDLE	1
18	WKR-000101	HEX SOCKET BUTTON HEAD SCREW M6x16	2
19	PDK-000021	ROUND WASHER 6.4	4
20	PRS-000019	EXTERNAL RETAINING RING 28z	2
21	PRS-000259	SEAL 20x28x4	1
22	TLJ-000010	SELF-LUBRICATING SLEEVE 28.05x32x1	2
23	KRP-0521-01-01-00-1	BODY	1
24	WLK-0521-10-00-00-0	FEED SHAFT z20	1
25	WKR-000302	SELF-TAPPING SCREW 5x30	4
26	WKR-000395	HEX SOCKET ROUND HEAD SCREW WITH FLANGE M5x20	2
27	PDK-000151	NYLON WASHER 8.1x14x3	4
28	OSL-0521-09-01-00-0	CHIP GUARD	1
29	SPR-000030	SPRING 1x10x17.5	2
30	ZSP-0521-30-00-00-0	QUILL ASSY TCT	1
31	PRS-000011	EXTERNAL RETAINING RING 20z	1
32	TLJ-0521-30-01-00-0	QUILL CARRIER TCT	1
33	LOZ-000045	BALL BEARING 20x42x12	1
34	PRS-000026	INTERNAL RETAINING RING 42w	1
35	WRZ-0378-03-02-00-0	SPINDLE	1
36	WKR-000063	HEX SOCKET SET SCREW WITH FLAT POINT M8x8	2
37	SPR-0378-03-04-00-0	SPRING	1
38	WYP-0378-03-05-00-0	PLUNGER	1
39	PDK-0139-00-04-00-0	WASHER 18.8x10x1	1
40	PRS-000009	INTERNAL RETAINING RING 19w	1
41	PDS-0521-14-00-00-0	ELECTROMAGNETIC BASE ASSY	1
42	SRB-000117	HEX SOCKET HEAD CAP SCREW M6x25	4
43	WLK-0521-06-00-00-0	PINION SHAFT z11 z26 ASSY	1
44	STR-0521-05-00-00-0	ELECTRONIC CONTROLLER ASSY – 120V	1
44	STR-0521-05-00-01-0	ELECTRONIC CONTROLLER ASSY – 230V (CEE)	1
44	STR-0521-05-00-02-0	ELECTRONIC CONTROLLER ASSY – 230V (AU)	1
44	STR-0521-05-00-03-0	ELECTRONIC CONTROLLER ASSY – 230V (INDIA)	1
45	SZN-0075-00-51-00-5	POWER CORD 120V 3x2.08 WITH STRAIN RELIEF ASSY (US)	1
45	SZN-0212-10-02-00-2	POWER CORD 230V 3x1.5 WITH STRAIN RELIEF ASSY (CEE)	1
45	SZN-0212-10-02-00-1	POWER CORD 230V 3x1 WITH STRAIN RELIEF ASSY (AU)	1

ITEM	PART NUMBER	DESCRIPTION	Q-TY
45	PWD-0212-10-02-00-6	POWER CORD 230V 3x1.5 WITH STRAIN RELIEF ASSY (INDIA)	1
46	DLW-000007	CABLE GLAND WITH STRAIN RELIEF PG11	1
47	WKR-000420	COUNTERSUNK HEAD SCREW M3x16	1
48	OBD-0521-05-01-00-0	ELECTRONIC CONTROLLER HOUSING	1
49	WKR-000208	PAN HEAD SCREW M4x10	1
50	PDK-000060	EXTERNAL TOOTH LOCK WASHER 4.3	1
51	NKR-000013	HEX NUT M4	1
52	MDL-0378-14-04-00-4	ELECTRONIC MODULE SW=35A – 230V	1
52	MDL-0378-14-04-00-3	ELECTRONIC MODULE SW=35A – 120V	1
53	PDK-000041	SPRING WASHER 3.1	1
54	NKR-000009	HEX NUT M3	1
55	NKR-000040	STRAIN RELIEF NUT	1
56	WLC-000006	START-STOP SWITCH – 120V	1
56	WLC-000008	START-STOP SWITCH – 230V	1
57	PNK-000013	POWER SWITCH	1
58	WKR-000289	HEX SOCKET BUTTON HEAD SCREW M5x8	4
59	PDK-000043	SPRING WASHER 4.1	1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ITEM	PART NUMBER	DESCRIPTION	Q-TY
1	WKR-000241	SELF-TAPPING SCREW 4x20	4
2	PKR-0440-03-02-00-0	MOTOR COVER	1
3	WKR-000359	SCREW 3x13	2
4	PLY-0271-03-07-00-0	BRUSH HOLDER PRESSURE PLATE	2
5	SCT-0271-03-06-00-0	BRUSH HOLDER	2
6	SCZ-000008	MOTOR BRUSH 6x9x17	2
7	OBD-0272-03-01-01-1	STATOR HOUSING	1
8	WKL-000001	BEARING INSERT 19x7.5	1
9	STN-000002	STATOR – 120V	1
9	STN-000004	STATOR – 220V	1
10	OSL-0271-03-01-02-0	FAN GUARD	1
11	WKR-000241	SELF-TAPPING SCREW 4x20	2
12	WRN-000016	ROTOR – 120V	1
12	WRN-000017	ROTOR – 230V	1
13	PRS-0271-03-02-02-1	GEARBOX COVER RING	1
14	USZ-000055	SEAL	1
15	PKR-0521-03-01-01-1	MOTOR COVER	1
16	PDK-000042	SPRING WASHER 4.1	2
17	SRB-000062	HEX SOCKET HEAD CAP SCREW M4x12	2
18	WKR-000236	SELF-TAPPING SCREW 5x16	1
19	LOZ-000061	BALL BEARING 7x17x5	1
20	OSL-0521-03-02-00-0	GEAR COVER	1
21	WKR-000182	CROSS RECESSED PAN HEAD SCREW M3x8	3

7. 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:

SM-D1-LP Drilling Machine with Electromagnetic Base

is manufactured in accordance with the following standards:

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

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

Person authorized to compile the technical file:
Marek Siergiej, ul. Elewatorska 23/1, 15-620 Białystok

Białystok, 19 July 2016

_____

Marek Siergiej
CEO

8. QUALITY CERTIFICATE

Machine control card

SM-D1-LP Drilling Machine with Electromagnetic Base

Serial number .....

Spindle radial runout.....

Spindle to base travel perpendicularity.....

Spindle axis to base perpendicularity .....

Base holding force.....
(surface with the thickness of 25 mm and roughness $R_a \leq 1.25$)

Electric test

Type of test	Result	Name of tester
Insulation electrical strength test (1000 V, 50 Hz)		..... Date
Continuity test of the protective earth system	..... Ω	..... Signature

Quality control .....

Adjustments, inspections

Quality control .....

9. WARRANTY CARD

WARRANTY CARD No.....

..... in the name of Manufacturer warrants the SM-D1-LP Drilling Machine with Electromagnetic 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 tools 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 / 23 February 2017

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