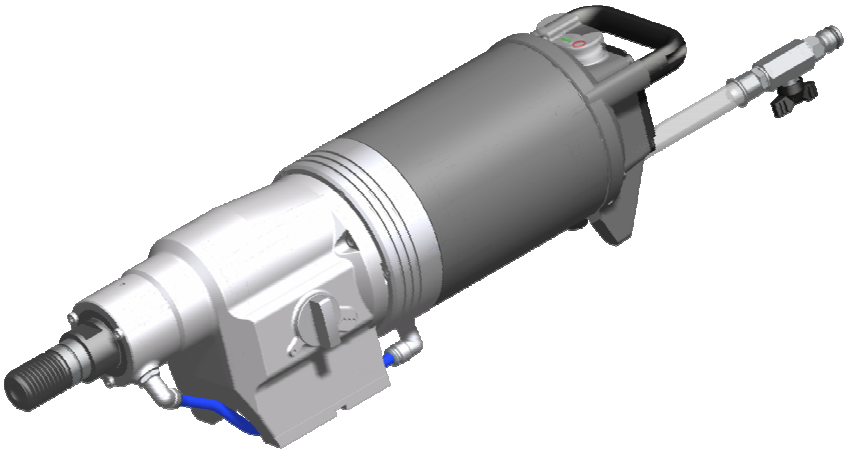
DR. BENDER *GmbH*
Innovative Elektrowerkzeuge

Manual for drilling motor DX 5 L

400 V

Valid from 05.2016 *Art.-Nr. 201055* *Subject to alteration*



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Conformity Declaration

DR.BENDER *GmbH*

Innovative Elektrowerkzeuge

EC declaration of conformity (EG-RL 2006/42/EG)

Hereby the manufacturer

Dr. Bender GmbH
Industriestrasse 22
75382 Althengstett

declares for the product

DX 5L

The named product is conform to the following Council Directives on approximation of laws of the EEC Member States:

- Council Directive for machinery (2006/42/EC)
- Council Directive for Electromagnetic compatibility (EMC) (2004/108/EG)
- Low Voltage Guide Lines (2006/95/EG)

Conformity with the requirements of this Directives is testified by complete adherence to the following standards:

EN 50144-1
EN 50144-2-1
EN 55014-1
EN 61000-3-2
EN 61000-3-3
EN 55014-2
EN 61029-1

The instructions contained in the operating manual for installation and start up the machine have to be followed.

Authorised Person for Documentation:

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Althengstett, 30.07.2018

Min Wei, Managing Director

This Declaration does not include Assurance of Product Properties.
The Safety Instructions of the enclosed Product Documentation have to be respected.

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Warning

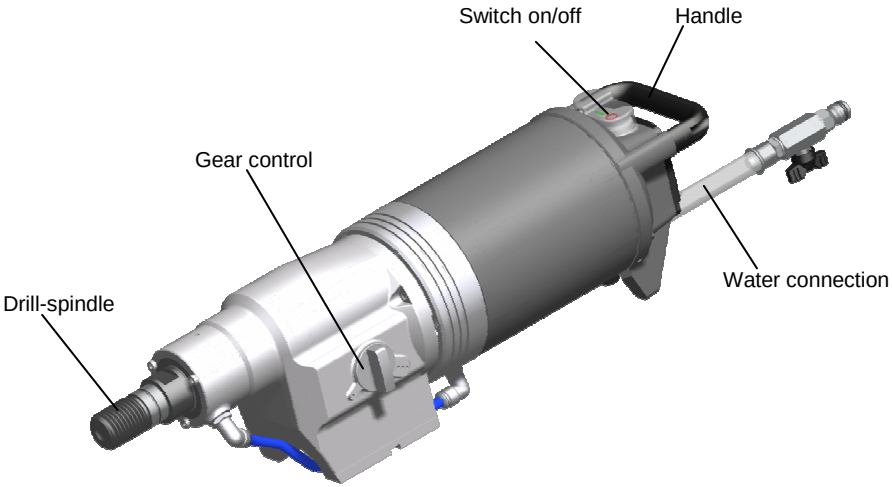
The safety instructions set out in this operating manual must be followed at all costs.

Special designs and versions may differ from the standard models in terms of their technical details. If any points are unclear, we urgently recommend that you contact DR.BENDER GmbH, indicating the machine type and machine number.

1.0 Symbol- and Pictograph description

This sign tells you rules, if you not pay attention for this your health and the function of the machine is in danger. You have no warranty if the machine breaks down because you not looking about this.

1.1 Function description



2.0 General instructions

2.1 Application

The core drills can be used for the purposes outlined by the data on the model plate. If you are using special machines, the details in the quotation and order confirmation also apply.

The core drills are supplied as standard in protection class I, only this can guarantee the full high quality production of the residual current-operated circuit-breaker or PRCD switch.

If you use suitable core bits, you will be able to drill holes in the most diverse material types:

- Concrete (even if it contains thick reinforcement steel)
- Sandstone and limestone
- All building materials for solid walls
- Asphalt floors

The core drills comply with the regulations issued by the ”Stone and Earth” Professional Association issued in July 1989. They are machines of category II, which means that they must be placed on stands and be stable (pursuant to DIN 57100 or VDE 0100), the stand must be equipped with

- a reversing block, and
- a water suction device.

The machine must be connected to the 230 V mains

- direct using a personal safety switch (residual current-operated circuit-breaker or PRCD), or
- using a coded (1h) plug to a safety box (IP 44) with a residual current-operated circuit-breaker.

2.2 Safety

Warning

Before using the machine for the first time, check that the conformity of the data on the model plate with the mains voltage and frequency. Voltage deviations of ± 5 % and/or voltage deviations of ± 2 % are permissible. Repairs must only be completed by quality persons who have suitable training and qualifications.

The following points are to be given special attention:

- the technical data and details of the permitted use of the machine (commissioning, ambient and operating conditions) which are set out in the catalogue, the operating manual, the model plate data and other product information,
- the relevant accident prevention regulations
- the correct use of tools
- the use of personal safety equipment

3.0 Transport and storage

3.1 Transport

Warning

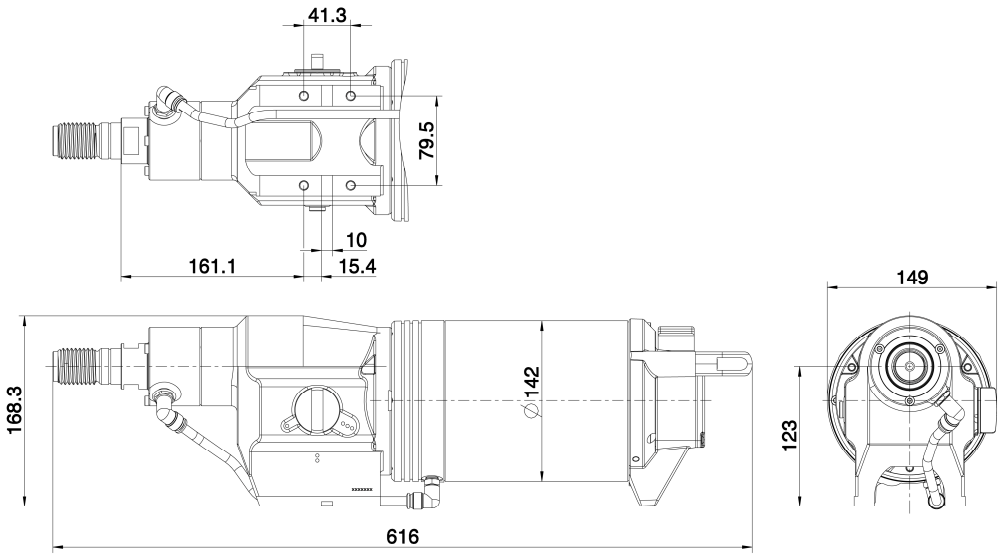
The core drills are to be checked for signs for transport damage on receipt. Any damage must be documented in writing.

3.2 Storage

If possible, the storage site should be dry, clean and have a constant temperature. To ensure that the film of lubricant in the bearings and sealing system is not lost, the motor shaft should be turned through several revolutions by hand after a lengthy period of storage, for example at monthly intervals. The roller bearings in the motors should be replaced (or regreased) if the period between delivery and commissioning is over four years. If the machines are stored in adverse conditions, this period may differ considerably.

4.0 Main dimensions and technical data

4.1 Dimensions



4.2 Technical data

Rated Voltage	400	*V*
Current consumption	9	*A*
Power requirement	5200	*W*
Frequency	50 – 60	*Hz*
Idling speed	120 / 280 / 440	*min^{-1}*
Full speed	120 / 280 / 440	*min^{-1}*
Output rating	3700	*W*
Torque	320 / 165 / 95	*Nm*
Drilling diameter	500 / 250 / 100	*mm*
Degree of protection	IP 56	-
Cooling medium	Water	-
Weight	22,5	*kg*
Core bit connection	UNC 1 ¼	“
Overload coupling torque	320	*Nm*

4.3 Noise emissions and vibrations *[EN 50144]*

Noise level	Noise level	Vibration
dB(A)	dB	m/s^2
73	85	< 2,5

5.0 Commisioning

Check that the mains voltage is identical to the voltage specified on the model plate.
Secure the core drill and the water collector to the drilling stand with its reverse block. The drilling stand should be as rigid as possible and have precise, low-play guides. Ensure that the core drill axis is parallel to the axis of the drilling stand.
Insert the core bit and set the speed. The setting instructions are on page 12.
Connect the water supply. Important: Do not exceed the maximum water pressure of 3 bar.
Connect the core drill to the mains using a residual current-operated circuit-breaker box and 6 h coded CEE plug. Only use three-core extension cables with a protective conductor and an adequate cross-section. If the cross-section is too low, you may lose excessive power and result in the motor and cable overheating. An extension cable must have an overload cut-out switch. Recommended cable cross-sections:

Rated current = 9 A							
Cable length	m	7,5	15	25	30	45	60
Cable cross-section	mm^2	2,5	2,5	2,5	2,5	2,5	4

The drilling motor is water-cooled. Look after sufficient cooling water when drilling therefore. The drilling motor must be operated during the full load with at least 1 liters of water per minute. Use only pure tapwater, no dirt or sewage, otherwise the drilling motor will damaged. Adjust the feed speed to the core bit diameter and the drive rating of the core drill so that the rated current is not exceeded.

5.1 Changing gear

Warning

Never change gear using force and only do so when the machine is slowing down or at a standstill.

To change into the next higher or lower gear, move the gear-change lever through an angle of approx. 50°. If necessary (if the gear is difficult to engage), turn the drive spindle briefly by hand until the gear engages easily. Do not use any tools (pliers, hammer, etc.) to change gear since otherwise gear damage is a natural con-sequence.

5.2 Safety coupling

The values set out in the table are theoretical values and may be used to provide a rough guide for gear changing. Since a whole range of other parameters also plays a major role in adjusting the speed, we cannot offer any guarantee if the tool is damaged when using the values in the table. Drilling work for which the speeds are outside the range of the core drill (values printed in italics), should only be completed with extreme care and by trained personnel.

5.3 Core bits

All core bits with a connection thread of UNC 1 ¼ " can be used.
Adapters can be supplied to allow core bits with other connection systems to be used.
Only use core bits that are suitable for the type of stone.
You will keep the core drill in good condition if you only use core bits that are concentric and not deformed ones.
Ensure that the diamond segments have an adequate undercut against the core bit body.

Warning

To use wrong tools or accessories is danger for your life.

5.4 To change a core bit

The drill spindle has a right-handed thread.
Always use a 32 mm open-ended spanner to hold against the drill spindle.
Never release the core bit with (hammer) blows since this will damage the core drill.
The core bit can be removed more easily if you apply a little waterproof grease to the drill spindle thread.

6.0 Safety instructions

Important

Only use the core drill under supervision. Disconnect the mains plug and check that the switch has been turned off,

- If you intend to leave the core drill unsupervised,
- For attachment and disconnection work,
- If the voltage drops (below 340 V),
- At uneven mains voltage (phase asymetrical) or interruption of a phase (phase failure),
- For adjustments or for fitting an accessory,

Switch off the machine if it stops for any reason. This will prevent its starting suddenly when it is not under supervision.

Do not use the tool if

- Part of the casing is missing or defective,
- If water drips out of the overflow hole, stop work and have the core drill inspected by an authorised service contractor.
- After a fault do not switch on the machine again until the core bit can be turned easily.
- Check the area you wish to drill with a line detector to prevent drilling through electric cables, water or gas lines, etc.
- The switch, lead or plug connector has suffered damage (conduct a visual inspection every day).
- Cooling water must not be allowed to ingress into the motor or the electrical components when operating the core drill in any position.

Do not expose the tool to rain and use not in humidity or wet environment. Use a good lightning. Do not use the tool near flammable fluids or gase air mixes.

7.0 Servicing and care

Warning

Before starting any servicing or repair work always disconnect the mains plug. After all repairs you must have the core drilling machine inspected by an electrician (statutory regulation pursuant to VBG4 since 1.1.1990).

7.1 Daily care

Ensure that no water is emitted from the overflow hole. This will cause gear damage and may adversely affect the electrical safety of the core drill. If water is emitted, see assistance from an authorised service outlet.
Visual inspection for damage to the switch, connection lead or plug connector.
After completing the drilling work clean the core drill. Grease the core bit mounting thread. The ventilation slits must always be clean and open. Ensure that during the cleaning process, no water gets into the core drill.
Empty the cooling water in the drilling motor after the use. Open to this the ball cock completely and let the cooling water go off. This is particulary very important because of freezing education in the winter months.
To maintain the seal, oil the drilling spindle as follows

- Disconnect the core drill from the water supply. Open the water connector shut-off cock, add several drops of oil, close the shut-off cock, add several drops of oil to the overflow hole and turn the machine briefly by hand.

7.2 After approx. 150 hours of use

After the first 150 hours of use, the gearbox oil must be changed.

7.3 Quarterly

Have the cable, switch and plug connectors inspected by a specialist (regulation pursuant to VBG4) and document this inspection. Changing the gearbox oil will produce a considerably increase in the service life of the gear.

8.0 Speed adjustment dependent on the cutting speed

	3	4	5	6	7	[m/s]
100	573	764	955	1146	1337	3rd gear
110	521	694	868	1042	1215	3rd gear
120	477	637	796	955	1114	3rd gear
130	440	588	735	881	1028	3rd gear
140	409	546	682	819	955	3rd gear
150	382	509	637	764	891	3rd gear
160	358	477	597	716	836	3rd gear
170	337	440	562	674	786	3rd gear
180	318	424	531	637	743	3rd gear
190	302	402	503	603	704	3rd gear
200	286	382	477	573	668	3rd gear
210	280	364	440	546	637	3rd gear
220	260	347	434	521	608	3rd gear
230	249	332	415	498	581	3rd gear
240	239	318	398	477	557	3rd gear
250	229	306	382	458	535	3rd gear
260	220	294	367	440	514	3rd gear
270	212	280	354	424	495	3rd gear
280	205	273	341	409	477	3rd gear
290	198	263	329	395	461	3rd gear
300	191	255	318	382	440	3rd gear
320	179	239	298	358	418	2 or 3
340	169	225	280	337	393	2 or 3
360	159	212	265	318	371	2 or 3
380	151	201	251	302	352	2 or 3
400	143	191	239	280	334	2 or 3
420	160	182	227	273	318	2 or 3
440	130	174	217	260	304	2 or 3
460	125	166	208	249	291	2 or 3
480	120	159	199	239	280	2nd gear
500	115	153	191	229	267	1 or 2
520	110	147	184	220	257	1 or 2
540	106	141	177	212	248	1 or 2
560	102	136	171	205	239	1 or 2
580	99	132	165	198	231	1st gear
600	95	120	159	191	223	1st gear
700	82	109	136	164	191	1st gear
800	72	95	120	143	167	1st gear
900	64	85	106	120	150	1st gear
Bit capacifityø		concrete	concrete	rock		
[mm]		reinforced				

The values set out in the table are theoretical values and may be used to provide a rough guide for gear changing. Since a whole range of other parameters also plays a major role in adjusting the speed, we cannot offer any guarantee if the tool is damaged when using the values in the table. Drilling work for which the speeds are outside the range of the core drill (values printed in italics), should only be completed with extreme care and by trained personnel.

9.0 Warranty

In keeping with our terms of sale, we offer a warranty for twelve months from the date of sale. This refers to the free repair of material and workmanship defects, which were verifiably caused before the sale.

An original purchase document must always be submitted in case of a warranty claim. It has to contain the full address of the dealer, the date of purchase and the type designation of the product. The operating instructions of the particular product and the safety instructions must have been followed.

Damages resulting from operational faults cannot be acknowledged as warranty cases.

The products of the manufacturer have been developed and produced for specific applications. No warranty claim is accepted in case of non-compliance with the due employment according to the operating instructions, in case of the employment for other purposes than originally intended or the employment of inadequate accessories.

The periodical maintenance and cleaning of the products according to the directions of the operating instructions is absolutely necessary. The intervention of third persons (opening the machine) renders any warranty claim void.

Maintenance and cleaning operations cannot be claimed on the basis of warranty.

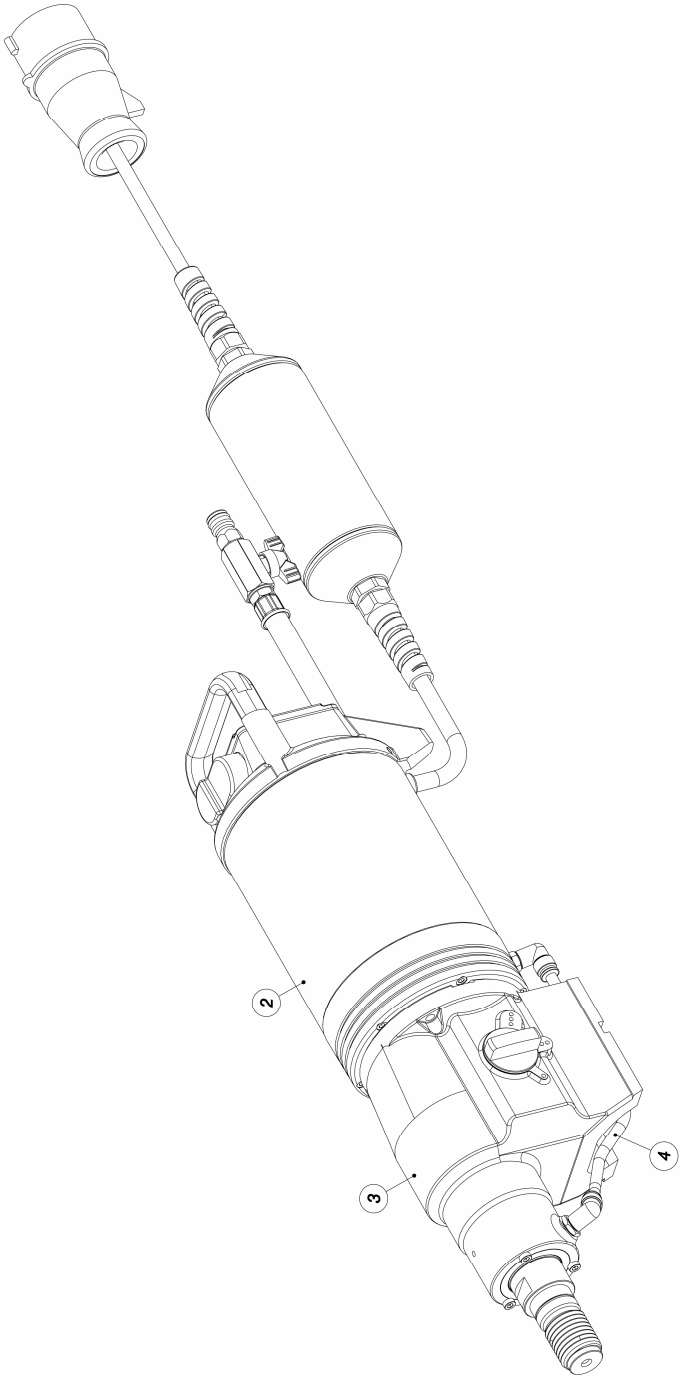
Make sure only original spare parts and original accessories are used. They are available at the authorized specialized product dealer. If non-original parts are used, consequential damages and increased hazard cannot be ruled out. The producer is not liable for such damages. Disassembled or partially disassembled hand saws and those repaired with non-original parts are excluded from the warranty.

Certain components, such as carbon brushes, ball bearings, switches, power-supply lines, gaskets, etc., are exposed to usage dependent or to normal wear. These wearing parts are not object of this warranty. Wearing parts are marked on the spare parts lists.

10.0 General safety instructions

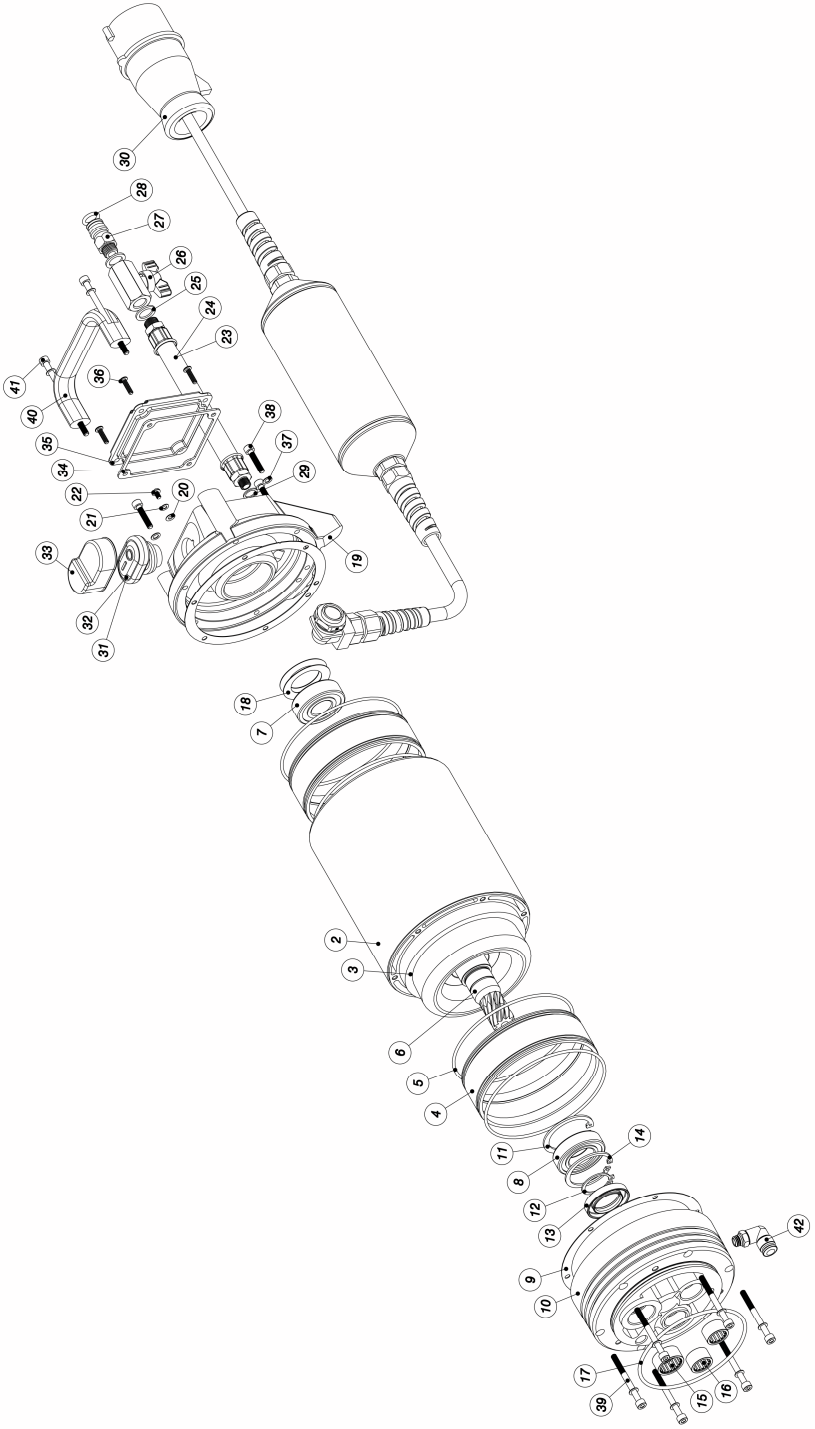
The general safety instructions can be found in the supplied safety instruction booklet.

11.0 Spare parts list
11.1 Stone drilling machine complete



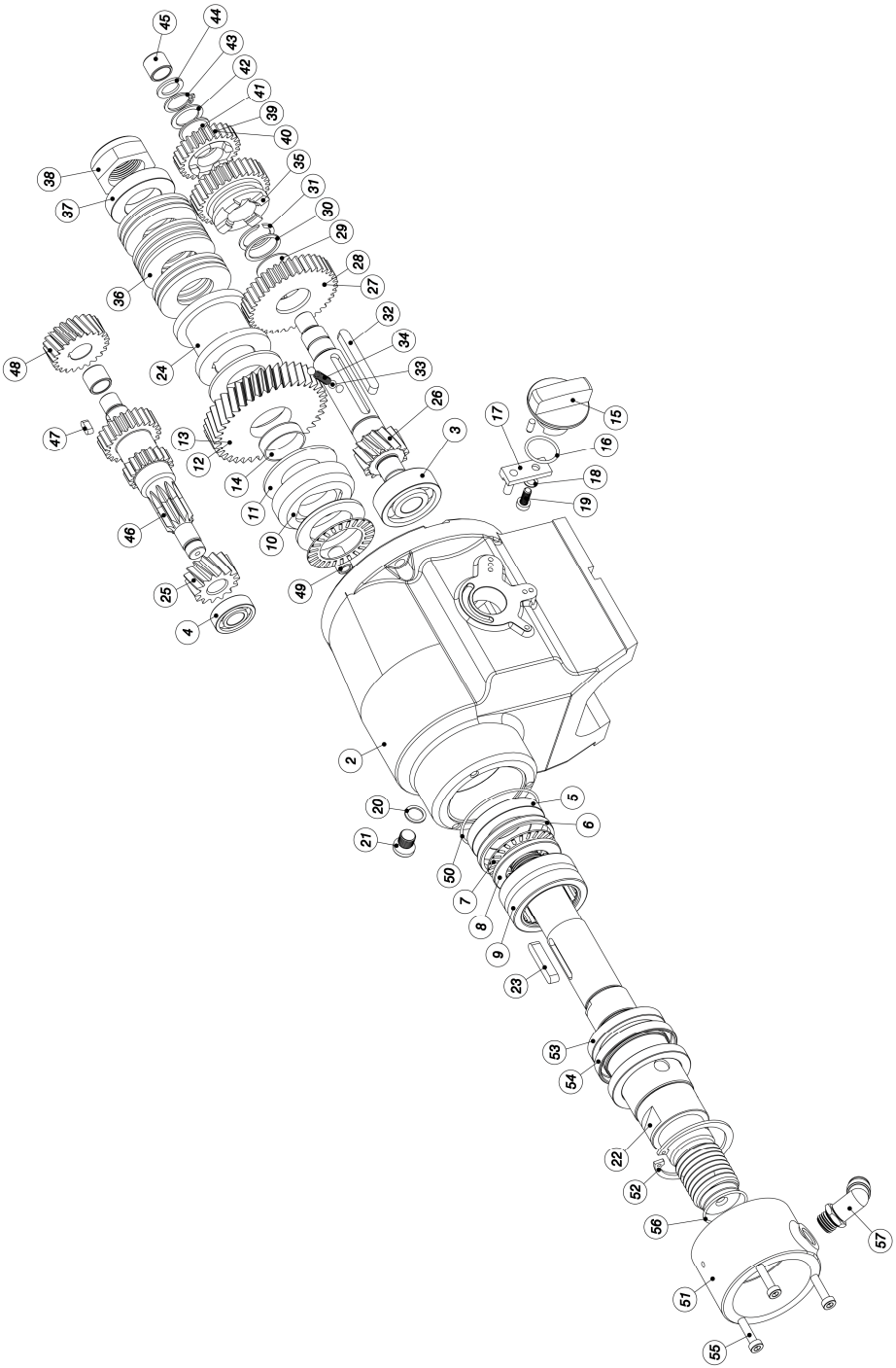
Item	Art. No.	Description	No.
1	201055	Stone drilling machine complete	1
2	301766	Motor complete	1
3	301764	Gear complete	1
4	802399	Water hose	1 **
			Wearing parts**

11.2 Motor complete



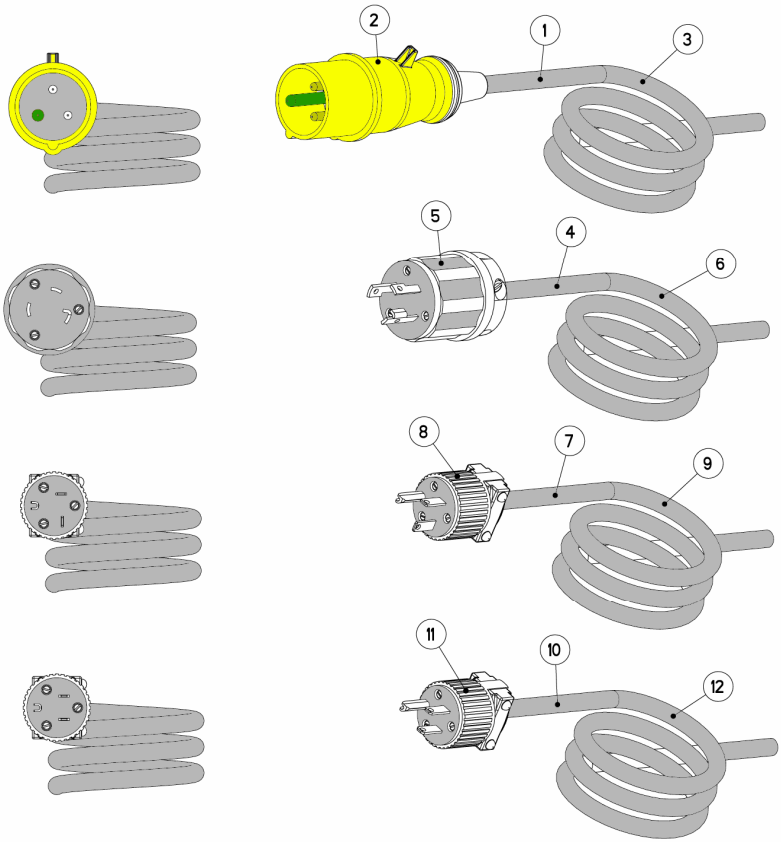
Item	Art. No.	Description	No.
1	301766	Motor complete	1
2	201222	Motor casing	1
3	802570	Stator	1
4	401462	Sealing sleeve	2
5	802104	O ring	4 **
6	301768	Rotor complete	1
7	900052	Grooved ball bearings	1 **
8	900601	Grooved ball bearings	1 **
9	301769	Flat sealing	2 **
10	201059	Intermediate cover	1
11	801368	Locking ring	1 **
12	900202	Locking ring	1 **
13	901031	Shaft seal	1 **
14	801345	Locking ring	1 **
15	900156	Needle sleeve	1 **
16	900680	Needle sleeve	2 **
17	800083	O ring	1 **
18	802106	Disc spring	2 **
19	201060	Stored cap	1
20	900231	Washer	1
21	900181	Wave spring washer	1
22	900412	Slotted pan head screw	1
23	802980	Water connection complete	1 **
24	802981	Hose complete	1
25	800028	Sealing ring	2
26	800023	Ball valve complete	1
27	800020	Nipple	1
28	800040	O ring	1
29	800027	Sealing ring	1
30	802673	Connection cable	1 **
31	802574	Switch complete	1
32	802572	Double push button	1
33	802573	Key protection	1
34	800149	Switch box literature	1 **
35	800167	Switch box cover	1
36	801386	Button head socket screw	4
37	800075	Locking washer	12
38	900331	Hexagon socket head cap screw	4
39	900327	Hexagon socket head cap screw	6
40	803074	Handle	1
41	901399	Hexagon socket head cap screw	2
42	802402	Thread nipple	1 **
			Wearing parts**

11.3 Gear complete



Item	Art. No.	Description	No.
1	301764	Gear complete	1
2	100080	Gear casing	1
3	900051	Grooved ball bearings	1 **
4	900495	Grooved ball bearings	1 **
5	900670	Interim washer	1
6	400795	Sleeve	1
7	900669	Axial needle rim	2 **
8	900672	Axial-thrust bearing disk	2
9	900671	Needle roller bearing	1 **
10	300670	Supporting disk	1
11	400011	Brake disk	2 **
12	401308	Floor wheel complete	1
13	301051	Floor wheel	1
14	400798	Bearing bush	1 **
15	400048	Gear change shaft complete	1
16	800097	O ring	1 **
17	400096	Switch handle complete	1
18	800075	Locking washer	1
19	900354	Hexagon socket head cap screw	1
20	900500	Sealing ring	1 **
21	900498	Screw plug	1
22	301934	Drill spindle complete	1
23	900110	Parallel key	1
24	400796	Pressure sleeve	1
25	300427	Pump wheel	1
26	301052	Pinion shaft	1
27	401310	Loose wheel 1 complete	1
28	301053	Loose wheel 1	1
29	400082	Bearing bush	1 **
30	400129	Shim ring	1
31	800080	Spring ring	1 **
32	900504	Parallel key	1
33	900014	Ball	2
34	800165	Pressure spring	1
35	301054	Change gear	1
36	900663	Disc spring	9
37	401965	Compensation slice	1
38	402009	Hexagonal nut	1
39	401311	Loose wheel 2 complete	1
40	301055	Loose wheel 2	1
41	400083	Bearing bush 2	1 **
42	900163	Shim ring	1
43	900209	Locking ring	1 **
44	900503	Shim ring	1
45	900681	Inside ring	2
46	300872	Reduction gear shaft	1
47	900127	Parallel key	1
48	300995	Counter gear	1
49	900674	Bush	1
50	801059	O ring	1 **
51	400797	Connection ring	1
52	800760	Locking ring	1 **
53	900673	Shaft seal	1 **
54	900027	Shaft seal	2 **
55	900675	Hexagon socket head cap screw	3
56	800092	O ring	1 **
57	802404	Thread nipple	1 **
58	801019	Gear lubricant oil 0,3l	1 **
			Wearing parts**

11.4 Connection cables and accessories



Item	Article number	Description	No.
Plugs for UK and standards for type EBM			
1	801462	Connection cable compl. 4h	1
2	900159	Plug, 4h	1
3	801328	Connection cable, finished	1
Plugs for UK and standards for type BBM			
1	801460	Connection cable compl. 4h	1
2	900159	Plug, 4h	1
3	801459	Connection cable, finished	1
Plugs for USA and Japan up to 30 amps for type BBM			
4	801321	Connection cable compl.	1
5	801317	Plug, 30A	1
6	801320	Connection cable, finished	1
Plugs for USA and Japan up to 20 amps for type EBM			
7	801461	Connection cable compl.	1
8	800200	Plug, 15A	1
9	801328	Connection cable, finished	1
Plugs for USA and Japan up to 20 amps for type EBL			
7	803182	Connection cable compl.	1
8	800168	Plug, 20A	1
9	801328	Connection cable, finished	
Plugs for Australia			
10	802839	Connection cable compl.	1
11	801809	Plug, 15A	1