



Manual for  
drilling motor

*DX 6 L DOLPHIN*

**230 V 3~**

Valid from 08.2003

Art.-Nr. 200810

Subject to alterations



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## Conformity Declaration

# DR.BENDER *GmbH & Co. KG*

Innovative Elektrowerkzeuge



## EC Conformity Declaration

for DR.BENDER stone processing machine

### DX 6 L DOLPHIN

DR.BENDER GmbH & Co. KG, as manufacturer, hereby declares that the electrical stone processing machine mentioned above comply with the requirements of the following guidelines:

- Machine guidelines (98/37/EC)
- Electromagnetic compatibility (EMV) (89/336/EEC)
- Low voltage guideline (73/23/EEC)

The following standards were applied for evaluating the machines:

- a) with regard to the machine guidelines:  
VDE 0740 21-22: 1994-1991  
VDE 0701 Part 1: 1993  
VDE 0702 Part 1: 1995  
DIN EN 50144-1: 1999  
DIN EN 50144-2-1: 2000
- b) with regard to electromagnetic compatibility  
Interfering emissions  
DIN EN 55014-1: 2000 + A1: 2001 = VDE 0875 Part 14-1  
DIN EN 61000-3-2: 2000  
DIN EN 61000-3-3: 1995 + Cor.1: 1997 + A1: 2001
- Interference immunity  
DIN EN 55014-2: 1997 + A1: 2001 = VDE 0875 Part 14-2
- c) with regard to the low voltage guideline  
EN 61029-1: 2001

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Althengstett, 08.07.2003

A handwritten signature in black ink, appearing to read 'B. Brehm'.

B. Brehm,  
Geschäftsleitung

This declaration implies no assurance of properties.  
Please observe the safety regulations of the attached product documentation.

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## Warning

The safety instructions contained in this manual must be followed.

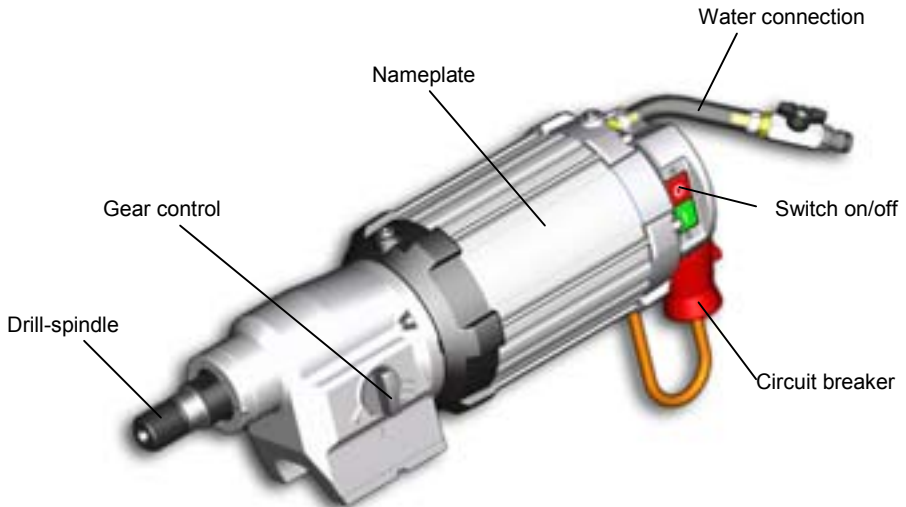
Special designs and versions may differ from the standard models in terms of their technical details. If any points are unclear, we urgently recommend that you contact DR.BENDER GmbH & Co. KG, indicating the machine type and machine number.

### 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

- CEE grounded at one duly electrical outlet (CEE 5pol., 3P +PE 32 amps – 230V) be attached. The zero pus isn't required.
- being operated to ensure the protection of the operation person with a preconnected FI protection.

### 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  $\pm 5\%$  and/or voltage deviations of  $\pm 2\%$  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

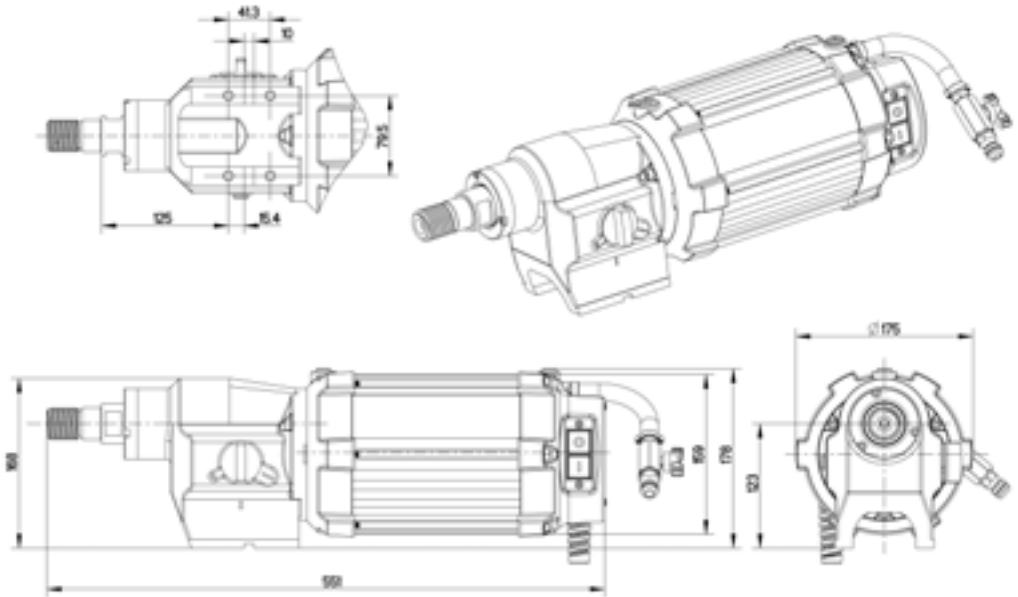
**The core drills are to be checked for signs for transport damage on receipt. Any damage must be documented in writing.**

### 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	230	V
Current consumption	17	A
Power requirement	6000	W
Frequency	50 – 60	Hz
Idling speed	120 / 280 / 440	$min^{-1}$
Full speed	120 / 280 / 440	$min^{-1}$
Output rating	4200	W
Torque	380 / 190 / 110	Nm
Drilling diameter	150 – 500	mm
Weight	24,5	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 <sup>2</sup>
73	85	< 2,5

### 5.0 Commissioning

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 = 17 A							
Cable length	m	7,5	15	25	30	45	60
Cable cross section	mm <sup>2</sup>	2,5	2,5	2,5	4	4	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 be 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 consequence.

## 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 1 ¼" UNC 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 180 V),
- at uneven mains voltage (phase asymmetrical) 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

**Disconnect the mains plug before commencing any servicing or repair work. You must have the core drill checked by an electrician after every repair (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 particularly 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	120	1st gear
<b>Bit capacity <math>\varnothing</math></b>		<b>concrete</b>	<b>concrete</b>	<b>rock</b>		
<b>[mm]</b>		<b>reinforced</b>				

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 six 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.

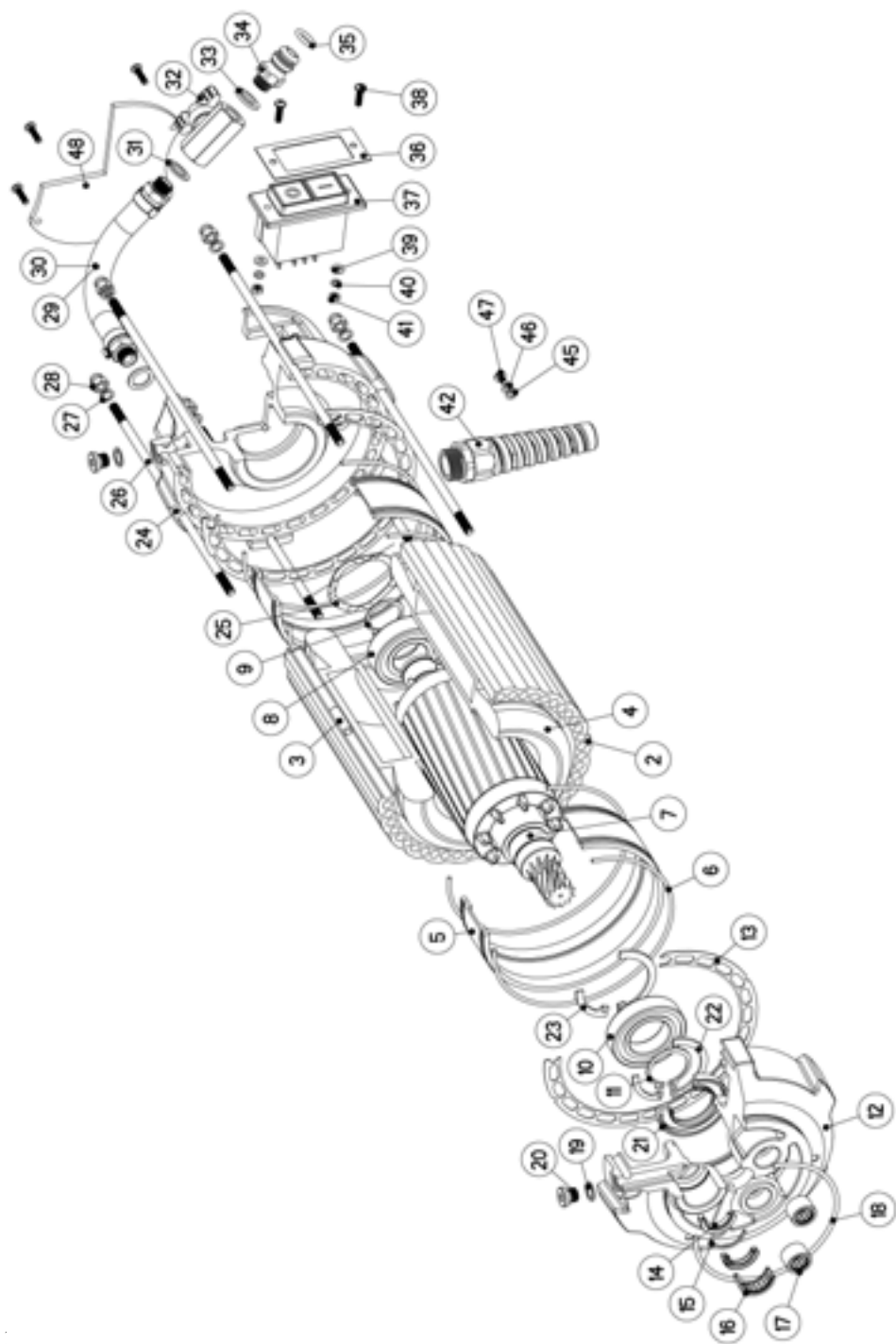
## 10.0 General safety instructions

1. Read and follow these instructions before you use the tool. Keep these safety instructions in a safe place.
2. Keep your workplace tidy. Untidiness in the workplace can cause accidents.
3. Protect yourself from electric shocks. Refer to the applicable regulations. Avoid physical contact with earthed parts, such as pipes, heaters, furnaces and refrigerators.
4. Keep children away. Do not allow other people to touch the tool or cable, keep them away from where you are working.
5. Keep your tools in a safe place. Unused tools should be kept in a dry, locked room out of the reach of children.
6. Do not overload your tool. It will work better and more safely in the specified capacity range.
7. Use the correct tool. Do not use tools that are too weak or mounted tools for heavy work. Do not use tools for purposes and work for which they have not been designed.
8. Wear suitable clothing. Do not wear excessively baggy clothing or jewellery, which may be caught by moving parts. For working outdoors, we recommend the use of rubber gloves and sturdy shoes. Wear a hairnet if you have long hair.
9. Use goggles. Use a breathing mask for work that generates dust.
10. Do not use the cable for any purpose other than that for which it is designed. Do not carry the tool by the cable and do not use it to pull the plug out of the socket. Protect the cable from heat, oil and sharp edges.
11. Check the connection lead and plug every time before you use the tool for signs of damage. If they are damaged, have them replaced by a specialist. Always keep the connection lead away from the working area of the machine.
12. Secure the workpiece. Use clamps or a vice to hold the workpiece. This will make it more secure that if you hold it in your hand and will allow you to use both hands to control the machine.
13. Do not overstretch yourself. Avoid abnormal body positions. Ensure that you have a stable area on which to stand and keep your balance at all times.
14. Look after your materials with care. Keep your tools sharp and clean so that they produce good safe results. Check the plug and cable at regular intervals and have them replaced by a specialist if they suffer any damage. Check the extension cable at regular intervals and replace damaged cables. Keep the handles free of oil and grease.
15. Disconnect the mains plug from the supply when the tool is not in use and when changing the tool.
15. Do not leave a tool spanner on the tool. Before switching on the tool check that the wrench and setting tools have been removed.
16. Avoid the machine starting when you do not intend it to. Do not carry a tool that is connected to the mains supply with your finger on the switch. Ensure that the switch is turned off when you connect the tool to the mains supply.
18. Electric tools outdoors and in wet areas: Mobile tools which are used outdoors should be connected to the mains supply using a residual-current circuit breaker or the like for added safety. This is particularly important when working with freehand tools. If there is a water supply, you should use an isolation transformer and a voltage supply of 115 V; please specify in your order.
19. For outdoors work, only use extension cables, which are approved for this purpose and marked accordingly.
20. Be vigilant at all times. Watch your work. Proceed sensibly. Do not use the tool if you are not concentrating fully on what you are doing.
21. Important:  
Safety equipment (such as overcurrent protection devices, undervoltage trips, safety couplings etc.) are tools but do not offer guaranteed safety. As a responsible manufacturer we tailor these tools to each other so that they offer the best possible protection. But without the care and caution of the use, these tools may even cause damage if they are not used properly. Have the slip couplings, in particular, checked during the quarterly inspection to ensure that it is correctly adjusted and functions properly. This inspection should be conducted by the manufacturer or an authorised service outlet and documented.

22. Check the machine every day for signs of damage, conduct a visual inspection:  
Before reusing the tool, carefully check the safety equipment or slightly damaged parts to ensure that they offer perfect and proper function. Check that all moving parts function correctly, that they do not jam and that none of the parts are damaged. All parts must be correctly fitted and satisfy all the conditions to ensure the perfect operation of the tool. Damaged safety equipment and parts must be repaired or replaced properly by a specialist service contractor. Do not use any tools, which cannot be switched on and off using the switch. Pay particular attention to ensuring electrical safety: Cables? Plugs? Switches? Do all the components satisfy safety regulations?
23. Repairs may only be completed by trained personnel. Before being used for the first time and after all repair work, the safety of electric tools must be checked by an electrician pursuant to VBG 4, § 5. This inspection must also be conducted and documented at regular intervals – at least once per year.
24. Please note that as the operator you are responsible for complying with any additional regulations. For example if electric tools are used in a wet and/or damp environment, the regulations of the "Stone and Earth" Professional Association must be satisfied.
25. Electrical safety and fire safety: We now also recommend the additional safety and fire safety for all out tools, as set out in the new version of VDE 0100 which can be achieved by using low cost residual current-operated circuit-breakers or DI/PRCD switches.

## 11.0 Spare parts list

### 11.1 Motor complete

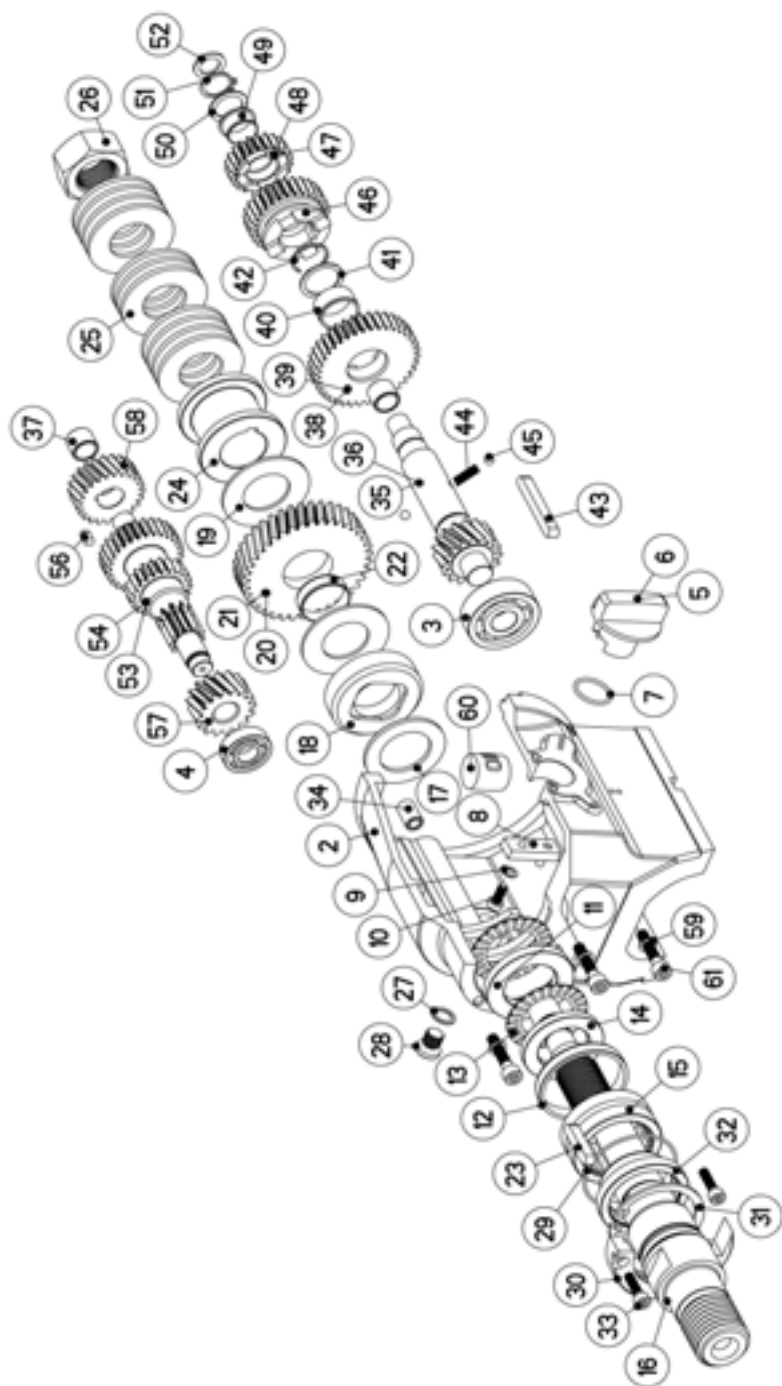




Item	Art. No.	Description	No.
1	301206	Motor compl.	1
2	200675	Motor casing	1
3	401201	Stoppers	1
4	801471	Stator	1
5	401200	Thick hull	2
6	801384	O Ring	4 **
7	300996	Rotor compl.	1
8	800757	Grooved ball bearings	1 **
9	900202	Spring washer	1 **
10	900679	Grooved ball bearings	1 **
11	900199	Spring washer	1 **
12	200676	Intermediate cover	1
13	300958	Flat sealing	2 **
14	900715	Shaft sealing ring	2 **
15	900716	Spring ring	1 **
16	900156	Needle sleeve	1 **
17	900680	Needle sleeve	2 **
18	800083	O ring	1 **
19	800027	Sealing ring	2 **
20	800026	Sealing screw	2
21	900682	Shaft sealing ring	1 **
22	800760	Spring washer	1 **
23	900678	Spring washer	1 **
24	200677	Bearing cap	1
25	800764	Ball bearing compensating disc	1
26	401199	Threaded rod	6
27	800077	Spring washer	6
28	900779	Hexagon domed cap nut	6
29	300074	Water connection compl..	1 **
30	800733	Hose compl.	1
31	800028	Sealing ring	2
32	800023	Ball cock compl.	1
33	800299	Sealing ring	1
34	800020	Nipple	1
35	800040	O ring	1
36	801385	Flat sealing	1 **
37	801472	Toggle switch	1
38	801232	Button head socket screw	2
39	900231	Washer	2
40	800076	Spring washer	2
41	900251	Hexagon nut	2
42	801383	Cable grommet	1
45	900229	Washer	1
46	900181	Spring washer	1
47	900412	Slotted pan head screw	1
48	300997	Plate	1

Wearing parts \*\*

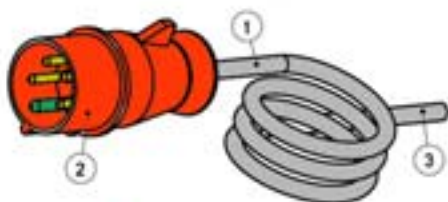
## 11.2 Gear complete



Item	Art. No.	Description	No.
1	200733	Gear, complete	1
2	100080	Gear casing	1
3	900051	Grooved ball bearings	1 **
4	900495	Grooved ball bearings	1 **
5	400528	Gear change, complete	1
6	400048	Gear change shaft, complete	1
7	800097	O ring	1 **
8	400096	Gear change lever, complete	1
9	800075	Locking disc	1
10	900354	Allen bolt	1
11	401342	Interim washer	1
12	401343	Sleeve	1
13	900669	Axial needle rim	2 **
14	401345	Interim washer	1
15	900671	Needle bearing	1 **
16	300998	Drill spindle, complete	1
17	900672	Rotor disc	1
18	300670	Support disc	1
19	400011	Brake disc	2 **
20	401308	Floor wheel, complete	1
21	301051	Floor wheel	1
22	400798	Bearing sleeve	1 **
23	900110	Adjusting spring	1
24	400796	Bridge sleeve	1
25	900663	Disc spring	9
26	900662	Hexagonal nut	1
27	900500	Sealing ring	1 **
28	900498	Sealing screw	1
29	801059	O ring	1 **
30	401202	Connection ring	1
31	800760	Locking ring	1 **
32	900673	Shaft seal	1 **
33	900332	Allen bolt	3
34	900674	Bush	1
35	401349	Pinion shaft, complete	1
36	301052	Pinion shaft	1
37	900681	Bush	1
38	401310	Loose wheel 1, complete	1
39	301053	Loose wheel 1	1
40	400082	Bearing sleeve 1	1 **
41	400129	Adjusting washer	1
42	800080	Spring ring	1 **
43	900504	Adjusting spring	1
44	800165	Bridge spring	1
45	900014	Ball	2
46	301054	Gear change wheel	1
47	401311	Loose wheel 2, complete	1
48	301055	Loose wheel 2	1
49	400083	Bearing sleeve 2	1 **
50	900163	Adjusting washer	1
51	900209	Locking ring	1 **
52	900503	Adjusting washer	1
53	401228	Reduction gear shaft, complete	1
54	300872	Reduction gear shaft	1
(37)	900681	Bush	1
56	900127	Adjusting spring	1
57	300427	Pump wheel	1
58	300995	Reduction gear wheel	1
59	800077	Locking washer	3
61	900320	Allen bolt	3
60	800413	Gear lubricant oil 0,3 l	1 **

Wearing parts \*\*

### 11.3 Connection cables and accessories



<b>Item</b>	<b>Article number</b>	<b>Description</b>	<b>No.</b>
<i>Plugs</i>			<i>phase reversal 6h</i>
<b>15</b>	<b>801466</b>	<b>Connection cable compl.</b>	<b>1</b>
<b>16</b>	<b>901008</b>	<b>Plug, 6h, phase reversal, 32 A</b>	<b>1</b>
<b>17</b>	<b>801467</b>	<b>Connection cable, finished</b>	<b>1</b>
<i>Plugs</i>			<i>6h</i>
<b>18</b>	<b>801163</b>	<b>Connection cable compl.</b>	<b>1</b>
<b>19</b>	<b>900744</b>	<b>Plug, 6h, 32 A</b>	<b>1</b>
<b>20</b>	<b>801467</b>	<b>Connection cable, finished</b>	<b>1</b>

## From our product spectrum



		EBM 23	EBM 25	EBM 33	EBM 35	EBM 43	EBM 45	EBL 33
Rated Voltage	V	115	115	115	115	115	115	115
Current consumption	A	16	16	16	16	16	16	20
Power requirement	W	1.800	1800	1.800	1.800	1.800	1.800	2.300
Frequency	Hz	50-60	50-60	50-60	50-60	50-60	50-60	50-60
Idling speed <sup>1</sup>	<sup>1</sup> min <sup>-1</sup>	830	1750	830	1750	950	1710	720
	<sup>2</sup> min <sup>-1</sup>	2200	4080	2200	4080	1650	2380	1890
	<sup>3</sup> min <sup>-1</sup>	-	-	4600	8500	2450	3850	3960
	<sup>4</sup> min <sup>-1</sup>	-	-	-	-	3450	4800	-
Full speed <sup>1</sup>	<sup>1</sup> min <sup>-1</sup>	520	1100	520	1100	500	900	450
	<sup>2</sup> min <sup>-1</sup>	1400	2600	1400	2600	900	1300	1200
	<sup>3</sup> min <sup>-1</sup>	-	-	2900	5500	1400	2200	2500
	<sup>4</sup> min <sup>-1</sup>	-	-	-	-	2290	3200	-
Output rating	W	1.300	1.300	1.300	1.300	1.300	1.300	1.650
Torque <sup>1</sup>	<sup>1</sup> Nm	27	15	27	15	28	20	36
	<sup>2</sup> Nm	12	6,5	12	6,5	20	13	19
	<sup>3</sup> Nm	-	-	6	3	12	7	10
	<sup>4</sup> Nm	-	-	-	-	7	5	-
Drilling diameter <sup>1</sup>	<sup>1</sup> mm	25	20	15	8	20	10	20
	<sup>2</sup> mm	150	80	80	40	60	30	120
	<sup>3</sup> mm	-	-	150	80	100	70	220
	<sup>4</sup> mm	-	-	-	-	150	90	-
Weight (freehand)	kg	4,9	4,9	5,2	5,2	6,2	6,2	-
	(drill stand) kg	4,2	4,2	4,5	4,5	5,4	5,4	6,5
Core bit connection	"	1/2	1/2	1/2	1/2	1/2	1/2	1 1/4
Torque	Nm	13	8	13	8	35	30	18
Overload coupling	Nm	-	-	-	-	12	10	-
Safety class	IP	13	13	13	13	13	13	13
Cooling medium	-	Air	Air	Air	Air	Air	Air	Air



BBM 33	BBM 33L	BBM 33 extra	BBM 33L extra	DM 33	DM 33 extra	DX 6 Dolphin	DX 6L Dolphin	WX 10 Circa
115	115	115	115	230	230	230	230	230
22	22	30	30	11	16	17	17	38
2400	2.400	3.300	3.300	3.150	4.250	6.000	6.000	16.000
50-60	50-60	50-60	50-60	50-60	50-60	50-60	50-60	50-60
480	380	480	360	120	120	160	120	Vario speed
1230	840	1200	820	320	320	430	280	0-250
1960	1290	1960	1240	550	550	750	440	0-550
-	-	-	-	-	-	-	-	-
275	210	240	180	120	120	160	120	Vario speed
720	480	620	430	320	320	430	280	0-250
1250	760	1100	750	550	550	750	440	0-550
-	-	-	-	-	-	-	-	-
1.710	1.710	2.400	2.400	2.200	2.900	4.200	4.200	11.000
65	95	100	125	160	200	280	380	750
26	42	36	59	85	95	120	190	350
16	28	21	33	40	55	65	110	-
-	-	-	-	-	-	-	-	-
25	40	30	45	80	80	100	150	100
150	180	200	250	220	270	280	320	600
290	320	400	450	400	450	450	500	-
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-
13,2	13,2	13,2	13,2	21,5	26	24,5	24,5	21,5
1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4
180	220	220	260	220	260	320	320	-
-	-	-	-	-	-	-	-	-
13	13	13	13	56	56	56	56	56
Air	Air	Air	Air	Air	Air	Water	Water	Water