DR. BENDER *GmbH*
Innovative Power Tools

Operating Manual
Drive unit *Beluga SXD*
HF III

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Declaration of conformity

DR.BENDER *GmbH*
Innovative Power Tools

EC – Declaration of conformity for machines

Herewith, the manufacturer,

Dr. BENDER GmbH
Industriestrasse 22
75382 Althengstett

declares that the machine

Beluga SXD

conforms with the aforementioned Directive and the following Directives

- Machinery Directive of the European Parliament and Council (EC-RL 2006/42/EC)
- Electromagnetic compatibility (EMC) (2004/108/EC)
- Low Voltage Directive (2006/95/EC)

The following harmonised standards have been used for assessment of the appliance:

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

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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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Attention

The safety instructions included in this operating manual must be followed!

Custom models and design variants may deviate from the basic type in technical details. In the event of any discrepancies, we recommend that you contact DR.BENDER GmbH urgently. Always give the machine type and machine number in any correspondence.

1.0 Symbol and pictograph description

Warning

Indicates instructions which may endanger your health or the functionality of the unit if they are not followed. The warranty shall become null and void if you cause defects to the unit by non-compliance with these instructions.

Warning

Warning of dangerous electrical voltage.
Before work is performed in this specially marked section, the installation of the device must be separated completely from current (voltage) and must be secured against unintentional power ON.
Disregard can lead to severe or deadly injuries.

Recycling

Please direct waste to recycling.

Disposal

The customary and regional laws shall be observed for disposal.

Safety signs on the machine

Wear safety shoes

Wear gloves

Wear a safety helmet

Wear protective goggles

Wear ear protection

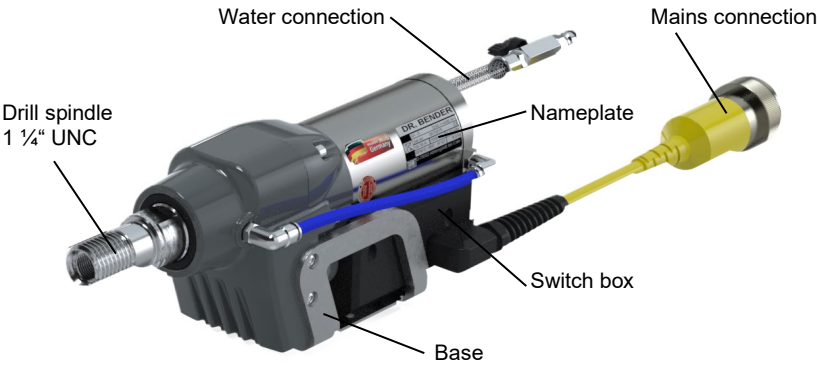
Wear a breathing mask

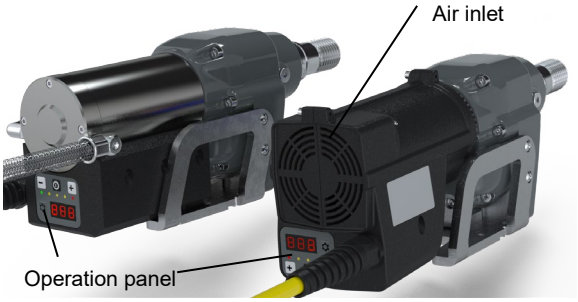
Pull the power plug before work on the device

Read the instructions

1.1 Function description

BELUGA SXD





2.0 General instructions

2.1 Technical description

The BELUGA SXD represent a whole new generation of drive units for stone cutting. The excep-tionally comprehensive modular system offers the flexibility needed today when performing cutting work in concrete and stone. To achieve this, newly developed high-frequency motor parts are used in the motor. The frequency range is controlled by the frequency converter from 0 - 1000 Hz integrated into the Power-box. At 1000 Hz, the rotor reaches a speed of 30.000 min-1. A major benefit lies in the exceptional weight / power ratio (motor power output = 12 kW / weight = 8.2 kg -> 1.4). Using conventional technology e.g. type BBM33extra (motor power output = 2.4 kW / weight = 13.5 kg -> 0.17) It means that the weight of the machine has been reduced sevenfold using the high frequency technology. We have succeeded in running the Powerbox as well as the drive units on a 230V single phase network or on a 400 V three-phase network. This means that only one piece of equipment is needed for use on both voltage sources. Further benefits lie in the stepless speed control. This enables the best speed to be assigned to each tool diameter, in order to attain the best possible cutting speed on the tool. During work, the speed can be steplessly reduced if you come up against steel reinforcements and thus can be optimised according to the progress of the work. Here, you can run the unit at much higher cutting speeds (Attention! depends on the tool) and in doing so, the progress of the job can be speeded up by up to 150%. With conventional machines, the torque drops very sharply at the higher speeds. Therefore, this advantage does not apply to conventional machines.

2.2 Applications

The drill motor BELUGA SXD and the related Powerboxes can be used according to the data attached to the information plate. When you are using custom-built machines, the details on the quotation and the order confirmation also apply.

The drill motors and the Powerboxes are essentially Class I appliances, only this guarantees the full high-quality protection of the residual current circuit breaker.

When suitable saw blades and drill bits are used, a wide range of materials can be cut:

- Concrete (even with strong reinforcement)
- Sandstone and limestone
- All building materials for solid walls
- Asphalt road surfacing

The machines must be connected to the Powerbox RX/SX 12

2.3 Safety

Warning

Before commissioning, check that the mains voltage and frequency match the data given on the information plate. ± 5 % voltage and/or ± 2 % frequency deviation are permitted. Repairs may only be performed by suitably qualified staff based on their training and experience.

Pay particular attention to:

- the technical data and information on the permitted use (commissioning, standard operating conditions), which are included e.g. in the catalogue, the operating manual, the information plate details, and other product information.
- the relevant accident prevention regulations
- the correct use of tools
- the use of personal protective equipment

3.0 Transport and storage

3.1 Transport

Warning

The drive units must be inspected for transport damage after receipt.
Any damage present must be recorded in writing.

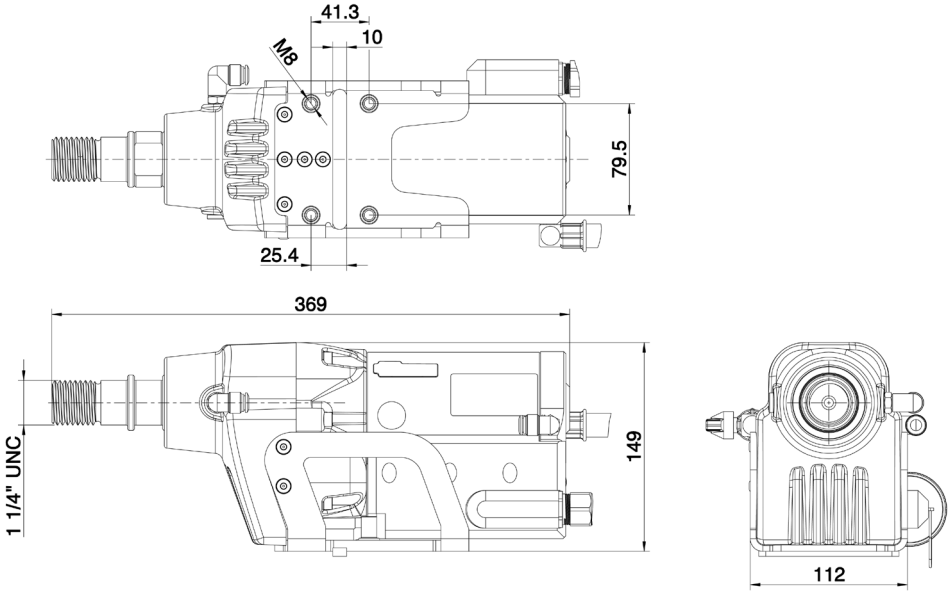
3.2 Storage

The storage location should be dry, clean, and at a constant temperature wherever possible. In order that the lubrication film in the bearings and the seal systems does not separate, the drive shaft should be turned several times manually after a lengthy storage period, e.g. at monthly intervals. The roller bearings of the devices should be replaced (or re-lubricated) if the period between delivery and commissioning is more than 4 years. This period will be significantly reduced if the storage conditions are unsuitable.

4.0 Main dimensions and technical data

4.1 Dimensions

4.1.1 Beluga SXD



4.2 Technical data

4.2.1 Beluga SXD

Rated voltage	480 / 400 ~3 / 230V ~1	*V*
Current rating	18 / 16	*A*
Power consumption	10.000 / 3.200	*W*
Frequency	50 - 60	*Hz*
Idle – full load speed continuously variable	0 – 850	min^{-1}
Power output	9.400 / 3.000	*W*
Torque	220 / 120	*Nm*
Drilling diameter	40 - 450	*mm*
Weight	8,2	*kg*
Core bit connection	1 ¼“ UNC	-
Cooling medium	water	-

4.3 Noise emission and vibration *[EN 50144]*

Sound pressure level	Sound power level	Vibration
db(A)	dB	m/s^2
83	96	< 2.5

4.4 Operating temperatures

If the system is sufficiently cooled, the Beluga SXD attains to the cooling water temperature.

5.0 Commissioning

5.1 Mains connection

Attention

Check whether the mains voltage matches the voltage given on the information plate. Check whether the mains voltage matches the voltage given on the information plate.

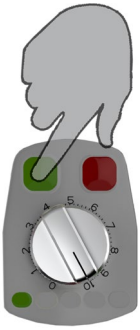
Remove the protective covers on the plug sockets. These protective covers are designed to protect the socket against the ingress of water when the plug is not connected. This significantly increases the service life of the high-quality cable sockets.
Connect the electrical power lead of the Beluga drive unit to the round socket located on the front of the Powerbox. Lock the bayonet sleeve of the plug socket until you hear it click, in order to maintain the required IP 67 protection.

5.2 Water connection

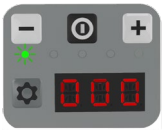
The water must first flow through the Powerbox, then through the drive unit, and only then to the saw blade or the drill bit. Therefore, connect the water supply to the water line (with tap) provided on the Powerbox.
Attention: If possible, do not exceed a maximum water pressure of 3 bar.
The Beluga SXD drive units are water-cooled. During operation, always supply sufficient cold cooling water (cooling water should not exceed 30 °C). The machine must be operated during full load operation with at least 1/2 litre of water per minute. Only use clean tap water, no contaminated or waste water, since otherwise the heat transfer to the cooling surfaces is no longer guaranteed and the motor may suffer irreparable damage.
The Powerbox PB RX/SX 12 is normally air-cooled and therefore does not require the water connection. Water supply fittings (part no. 102122) are available as custom accessories. Please take the necessary information from the Powerbox PB RX/SX 12 operating manual.

5.3 Service Beluga SXD

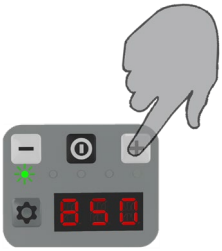
If the Powerbox will be connected to the net, the green LED flashes. This means that the power box is in standby mode.



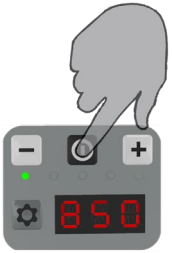
When you turn on the green pushbutton, the power box is switched on. The green LED changes from blinking to a steady light. With the speed control the speed from 0 to 100% can be selected. In the operation with the drilling motors, this value should always be set to 100% to obtain the maximum speed of the drill spindle.



The panel of Beluga SXD now showing
Speed 000 min-1 and the green LED is flashing.



By pressing the Plus + or minus - button you can change the speed from 0 rpm up to 850 rpm.



By pressing the On-Off switch of the drill motor Beluga SXD will now be accelerated to the preset speed.
During the drilling operation can be adjusted at any time-the rotational speed.

The power display is mirrored by the Powerbox on the control panel. This is described in detail in the operating instructions of the Powerbox.

5.4 Drill bits

You can use any drill bit with a connection thread of 1 ¼“ UNC or with a four-hole flange. Only use drill bits that are suitable for the stone type. Using only concentric drill bits that are not deformed prolongs the service life of the drive unit. Ensure that the diamond segments have an adequate undercut in relation to the drill bits.

6.0 Safety instructions

Attention

The units must be attended when in use. Disconnect the mains plug and check that the switch is disabled,

- when the units remain unattended
- during assembly and disassembly
- during voltage drop (rated voltage 400 V 3~ under 340 V), (rated voltage 230 V 1~ under 200 V),
- if the mains voltage fluctuates (phase imbalance) or during interruption of a phase (phase failure),
- when adjusting or fitting an accessory.

Switch the machine off when you stop operation for any reason. This prevents the unit from suddenly starting while unattended.

Do not use the unit if,

- a part of the housing is missing or defective,
- There is damage to switches, lines, or plug connections (daily inspection!)
- when operating the units, cooling water must not penetrate the electrical components in whichever location the units are used.
- If water is dripping from the unit, stop work and take the unit to an authorised service centre.
- After a break in operation, only switch on again if the saw blade or drill bit can rotate freely.
- Check the work area with a pipe detector in order to avoid cutting into electrical cables, water pipes or gas pipes etc.

7.0 Repair and maintenance

Warning

Always disconnect from the mains before starting repair or maintenance work. After any repair, the unit must be checked by a qualified electrician (legal requirement pursuant to VBG4 since 1.1.1990).

7.1 Daily maintenance

Check that no water is leaking out of the unit. This may impair the electrical safety of the unit and lead to damage to the gearbox. In this case, please contact an authorised service centre.

Visual inspection for damage to the switches, the lines, or the plug sockets.
Clean the units after completion of the work.
Check that no water gets into the units during cleaning.
Drain the cooling water after using the machine. (Open the tap and blow out the water using compressed air). This is particularly important in case of frost formation in winter.

7.2 Service after 120 operating hours

A service is due after 120 operating hours. The machine counts the operating hours itself and tells you when 120 operating hours are reached by a blue LED on the handle. All worn parts are replaced during this service. The next service is carried out at further intervals of 120 operating hours. The service interval may be extended by max. 10 %, so you can complete your work with the machine at your own convenience.
If the maximun service interval of 120 + 12 operating hours is exceeded, the warranty becomes null and void.

7.3 Quarterly

Have the cables, switches, plugs checked by a qualified specialist (provision pursuant to VBG4) and record this. Replacing the gearbox oil significantly increases the service life of the gearbox.

8.0 Speed setting depending on cutting speed

The drive units of the Beluga series allow stepless speed adjustment. You can thus set the best cutting speed for your saw blade or drill bit. This also provides a perfect, quick cut and the service life of the tool is also significantly extended.

9.0 Warranty

Pursuant to our Terms & Conditions of Sale, we offer a warranty of 12 months from the date of purchase. This covers the free repair of material and production defects which are shown to have been caused prior to sale.

An original sales receipt must always be produced when asserting a warranty claim. It must include the full address of the dealer, purchase date, and type code of the product. The user manual for the relevant product as well as the safety instructions must have been followed.
Damage caused by operating errors is not covered by the warranty.
The manufacturer's products are developed and built for specific applications. If the product is used for purposes other than the intended purpose based on the user manual, or in the event of misuse, or if unapproved accessories are used, the warranty shall become null and void.

The products must be regularly maintained and cleaned according to the instructions in the user manual. The warranty shall become null and void in the event of an intervention by third parties (opening the machine).
The warranty does not cover maintenance and cleaning work.
You must ensure that only original spare parts and accessories are used. The products must be purchased from an authorised dealer. If non-original parts are used, this may result in consequential damage and increased risk of accidents. The manufacturer is not liable for such damage. Disassembled, partially disassembled units, and units repaired with third party parts are not covered by the warranty.

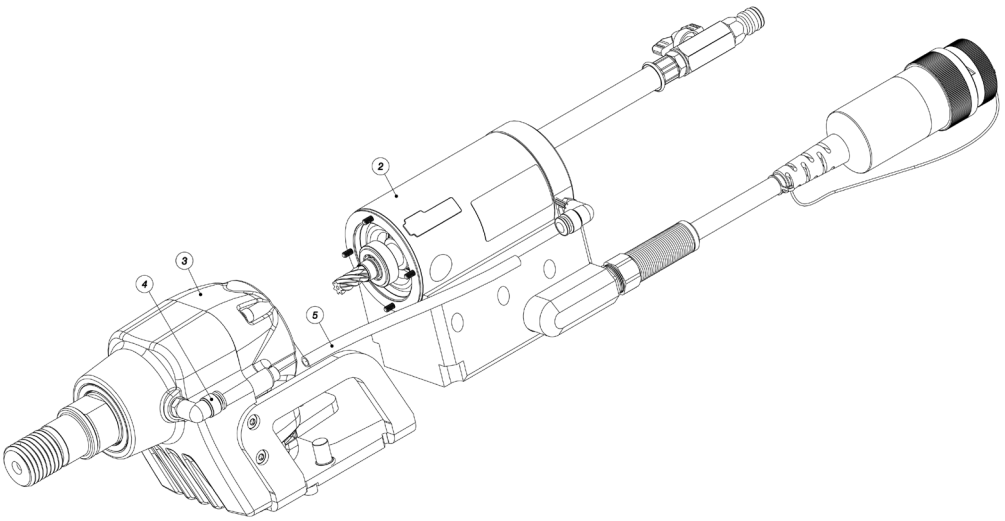
Certain parts are subject to normal wear and tear depending on use. These parts include e.g. carbon brushes, ball bearings, switches, mains cables, seals, etc. These consumable parts are not covered by the warranty. Consumable parts are highlighted in the spare parts lists.

10.0 General Safety instructions

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

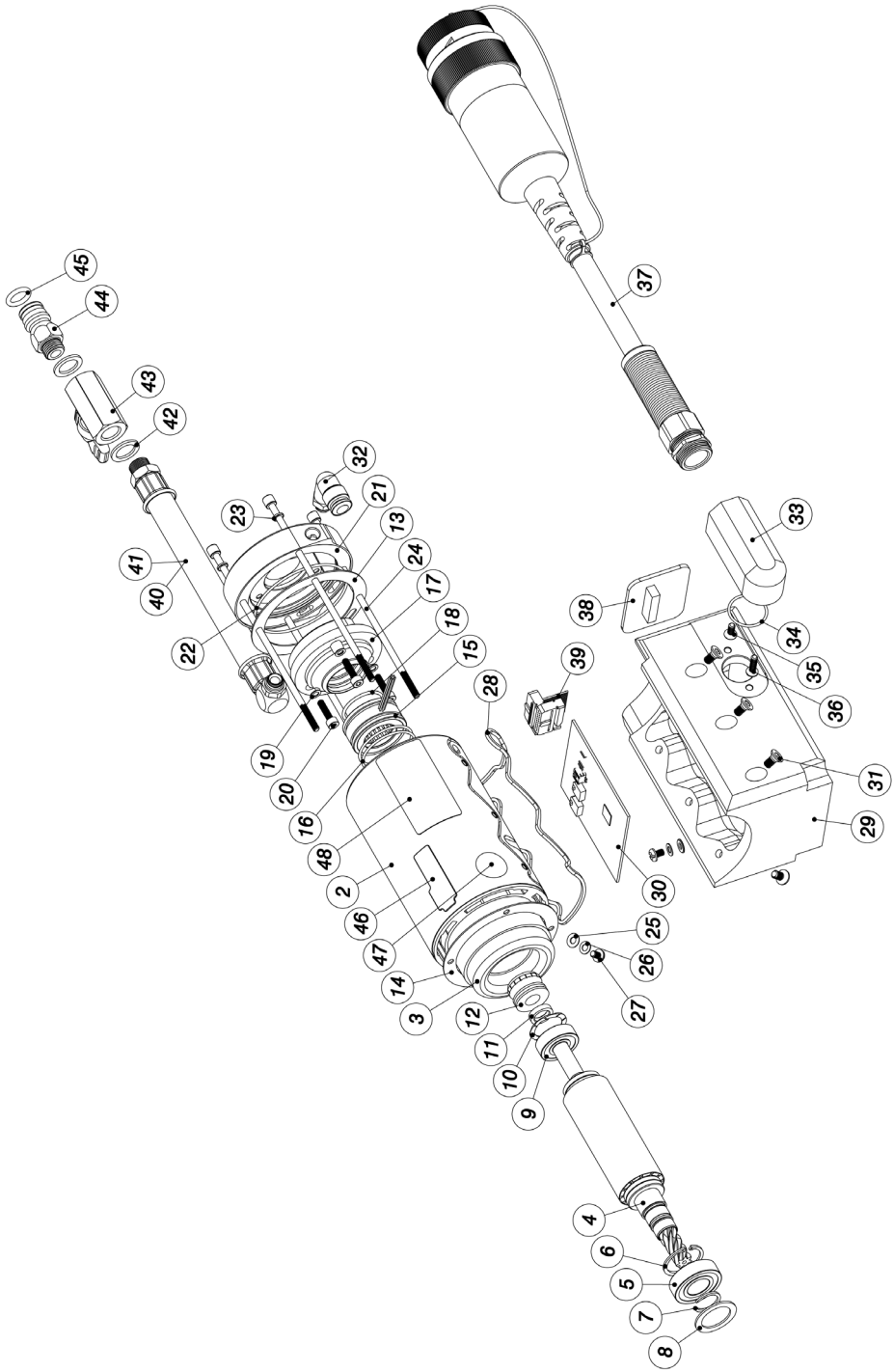
11.0 Spare parts lists

11.1 Driving machine SXD



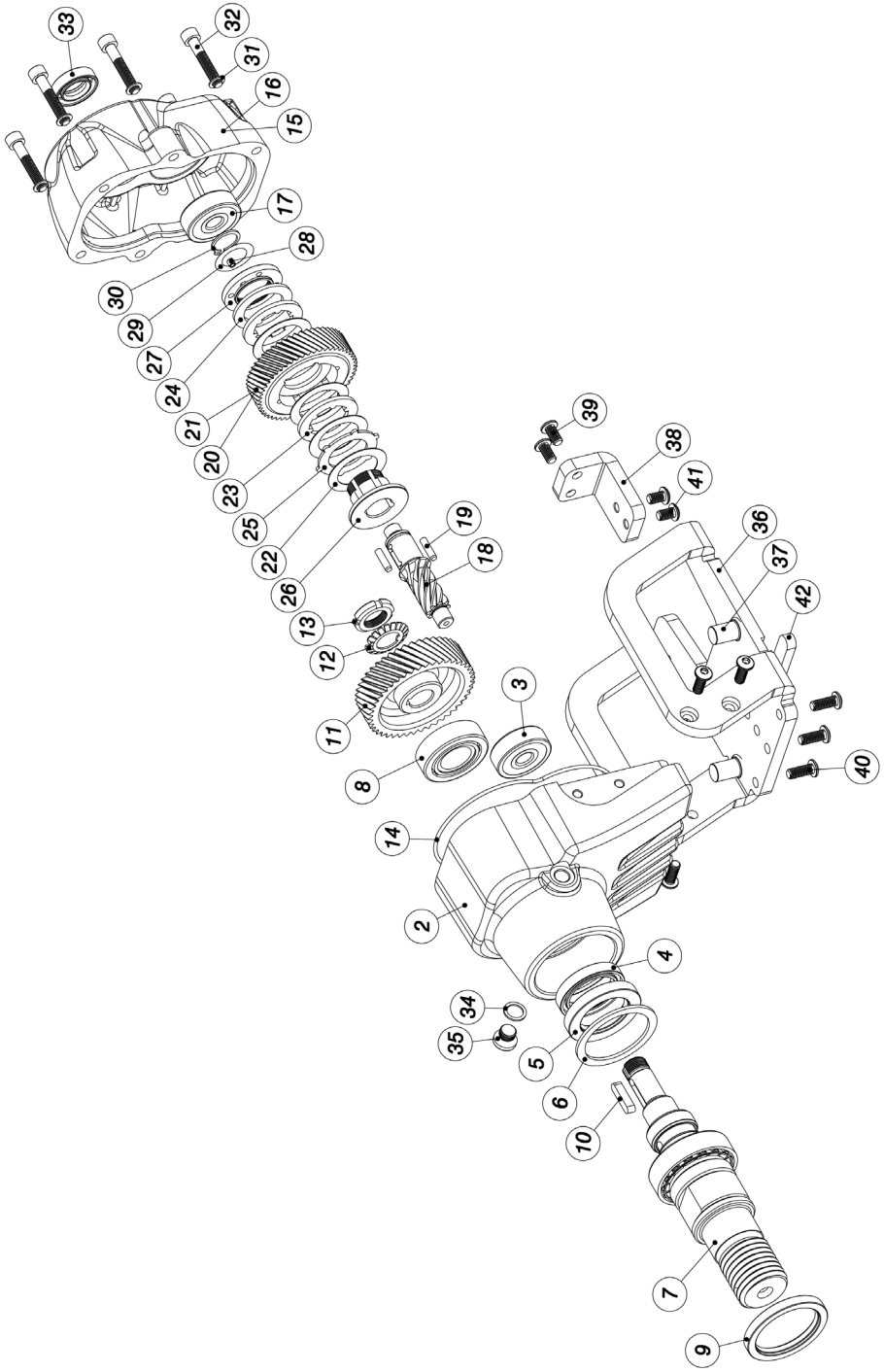
Item	Part no.	Description	No.
1	302221	Driving machine SXD	1
2	302222	Motor complete	1
3	302186	Gear complete	1
4	802402	Nipple	1
5	802464	Hose	1 **
			Wearing parts **

11.2 Motor complete SXD



Item	Part no.	Description	No.
1	302222	Motor complete SXD	1
2	201015	Motor casing	1
3	802022	Stator	1
4	302266	Rotor complete	1
5	901370	Groove ball bearing	1 **
6	900801	Locking ring	1 **
7	800380	Spring ring	1
8	901337	Shim ring	1
9	901208	Groove ball bearing	1 **
10	801574	Cup spring	1
11	401768	Distance bush	1
12	802354	Resolver rotor	1
13	401892	Flat sealing	1 **
14	401421	Flat sealing	1 **
15	802353	Resolver stator	1
16	800092	O ring	2 **
17	102009	Sleeve	1
18	800100	O ring	1 **
19	800076	Locking washer	3
20	902026	Hexagon socket head cap screw with centre hole	3
21	102010	Stored cap	1
22	802028	O ring	1 **
23	800391	Sealing ring	4 **
24	802197	Hexagon socket head cap screw with centre hole	4
25	900231	Washer	1
26	900181	Wave spring washer	1
27	900412	Slotted pan head screw	1
28	802481	O ring	1 **
29	201237	Switch box	1
30	102384	Platine complete	1
31	150549	Hexagon socket countersunk head screw	6
32	802402	Nipple	1
33	302423	Cap	1
34	800095	O ring	1 **
35	900552	Hexagon socket countersunk head screw	1
36	900789	Hexagon socket countersunk head screw	1
37	803017	Connection cable conf.	1
38	802713	Keypad	1
39	802947	Power supply complete	1
40	800359	Water connection complete	1 **
41	800415	Hose complete	1
42	800028	Sealing ring	2 **
43	800023	Ball valve complete	1
44	800020	Nipple	1
45	800040	O ring	1 **
46	802898	Sticker	1
47	802479	Sticker	1
48		Name plate	1
			Wearing parts **

11.3 Gear complete



Item	Part no.	Description	No.
1	302186	Gear complete	1
2	201164	Gear casing	1
3	901139	Groove ball bearing	1 **
4	803021	Shaft seal	1 **
5	900687	Shaft seal	1 **
6	901354	Shim ring	1
7	302293	Drill spindle complete	1
8	901355	Tapper roller bearing	1 **
9	901202	Shaft seal	1 **
10	901247	Parallel key	1
11	301597	Counter gear	1
12	901356	Locking plate	1
13	901357	Slotted round nut for hook spanner	1
14	401684	O ring	1 **
15	302188	Gear V complete	1
16	201189	Casing	1
17	901139	Groove ball bearing	1 **
18	301385	Pinion shaft 2	1
19	901071	Parallel pin	2
20	302267	Gear 2 slip coupling	1
21	302249	Hub	1
22	401563	Brake disc	4
23	401562	Support washer I	2
24	401339	Plat spring	1
25	401561	Support washer A	1
26	301252	Hub	1
27	401566	Nut	1
28	101866	Pin	1
29	800107	Distance washer	1
30	900209	Locking ring	1
31	800077	Locking washer	6
32	900312	Hexagon socket head cap screw with centre hole	6
33	900708	Shaft seal	1 **
34	800027	Sealing ring	1 **
35	800026	Crew plug	1
36	201165	Base	1
37	803039	Pop rivet nut	4
38	402135	Angle support	1
39	901159	Hexagon socket head cap screw with centre hole	2
40	801379	Button head socket screw	7
41	801736	Button head socket screw	2
42	901427	Parallel key	1
43	803131	Gear lubricant oil	1 **
			Wearing parts **