DR. BENDER *GmbH*
Innovative Power Tools

Operating Manual
Drill accessories
HF III

wet-dry drilling
Machine holders
Planetary gearbox

Issued 09.2014

Art no.: 301730 planetary gear *Subject to change*
Art no.: 301689 drill holder wett
Art no.: 301686 drill holder dry
Art no.: 301564 quick release clamp
Art no.: 301548 machine holder wet
Art no.: 301692 centering device

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DR. BENDER GmbH • D-75382 Althengstett • Tel 07051-9291-0 • Fax 07051-9291-91
We are on the internet at http://www.dr-bender.de • email: info@dr-bender.de

Contents

		Page
	Contents	2
1.0	Symbol and pictogram description	3
1.1	Function description	3
2.0	General instructions	4
2.1	Technical description	4
2.2	Applications	4
3.0	Transport and storage	4
3.1	Transport	4
3.2	Storage	4
4.0	Main dimensions and technical data	5
4.1	Dimensions	5
4.1.1	Dry drilling attachment	5
4.1.2	Wet drilling attachment	5
4.1.3	Drill holder attachment	6
4.1.4	Planetary gearbox attachment	6
4.2	Technical data	7
4.2.1	Dry drilling attachment	7
4.2.2	Wet drilling attachment	7
4.2.3	Drill holder attachment	7
4.2.4	Planetary gearbox attachment i=3.3	7
4.2.5	Planetary gearbox attachment i=5.5	7
5.0	Commissioning	8
5.1	Dry drilling attachment	8
5.1.1	Changing the drill bit	8
5.2	Wet drilling attachment	8
5.2.1	Changing the drill bit	8
5.3	Drill holder attachment	8
5.3.1	Changing the drill bit	8
5.4	Planetary gearbox attachment	8
5.4.1	Change gear	8
5.5	Drill bits	9
5.6	Drilling range for different attachments	9
6.0	Warranty	9
7.0	General Safety Instructions	9
8.0	Spare parts lists	10
8.1	Dry drilling attachment	10
8.2	Wet drilling attachment	11
8.3	Drill holder attachment	12
8.4	Planetary gearbox attachment i=3.3	13
8.5	Planetary gearbox attachment i=5.5	14

Attention

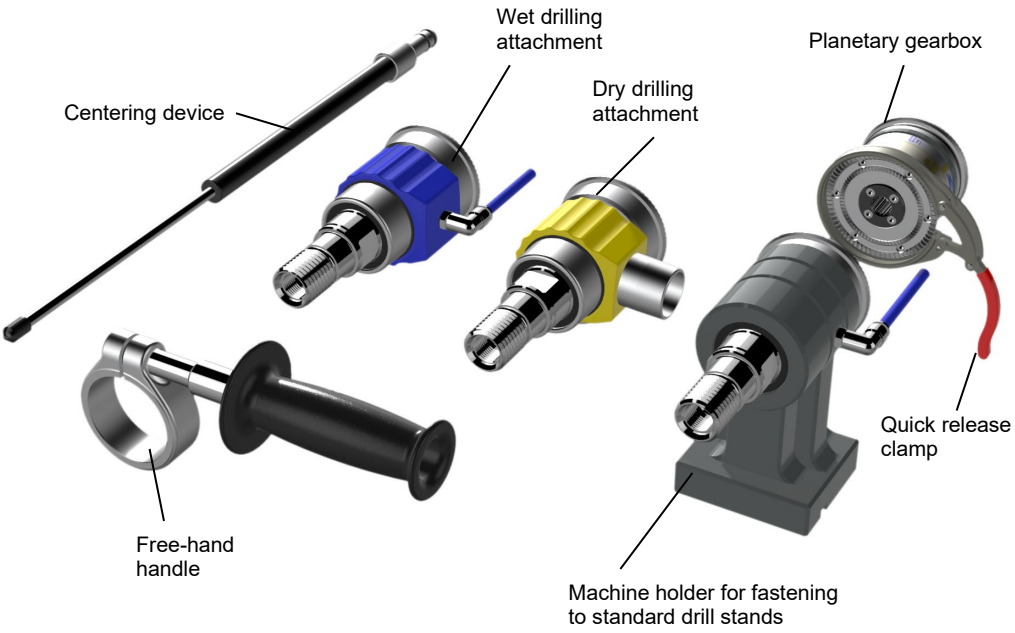
The safety instructions included in this operating manual must be followed!

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 pictogram description

Indicate 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.

1.1 Function description



2.0 General instructions

2.1 Technical description

The BELUGA SXM and the ARRA drill attachments represent a whole new generation of drive units for stone cutting. The exceptionally 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 Powerbox. The Powerbox can be operated on a single-phase 230V mains supply as well as on a 400V mains supply with up to 12 kW. Our motors automatically detect the correct voltage and then work at the allowed power rating for the voltage. 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 = 8 kW / weight = 12.5 kg -> 0.64). Using conventional technology e.g. type BBM33extra (motor power output = 2.4 kW / weight = 13.5 kg -> 0.17) This means that the weight of the machine has been reduced fourfold using the high-frequency technology. 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 200%. With conventional machines, the torque drops very sharply at the higher speeds and therefore, this advantage does not apply here.

2.2 Applications

All attachments can be used with drive units, which are fitted with the DR. BENDER quick release system. If you are using custom-built machines, the details on the quotation and the order confirmation also apply.

If 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

3.0 Transport and storage

3.1 Transport

Warning

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

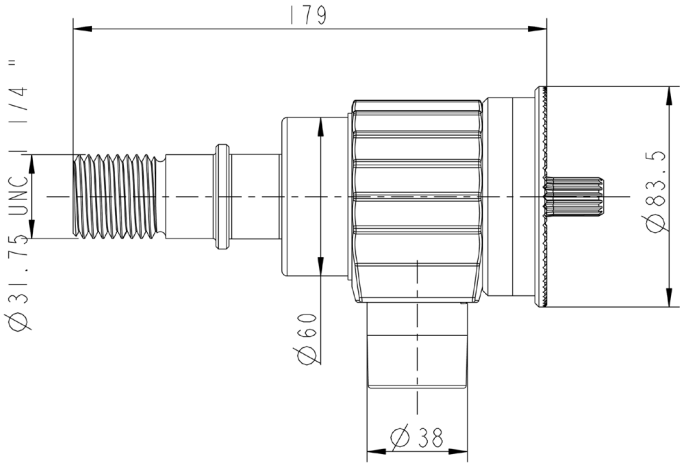
3.2 Storage

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.

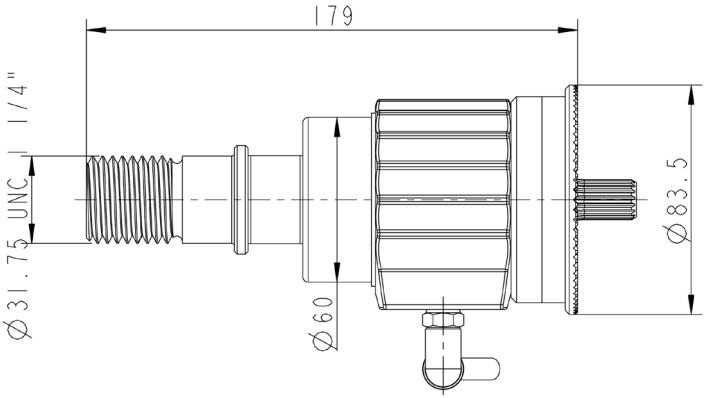
4.0 Main dimensions and technical data

4.1 Dimensions

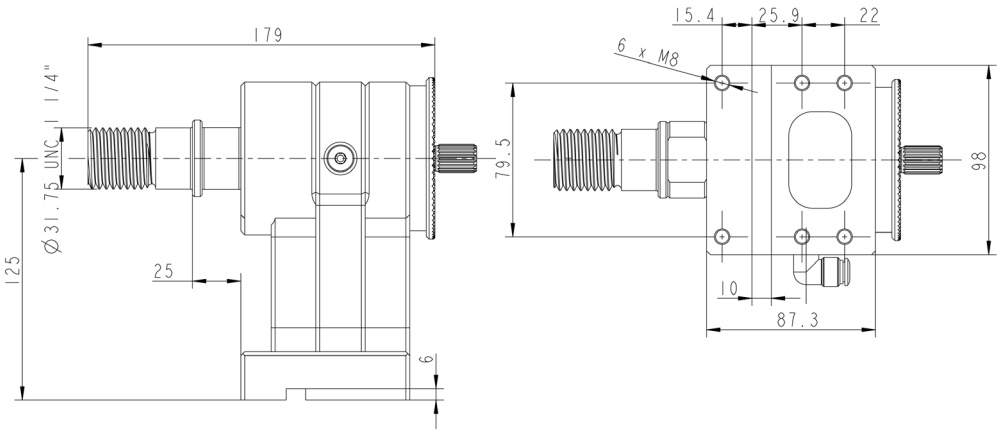
4.1 Dry drilling attachment



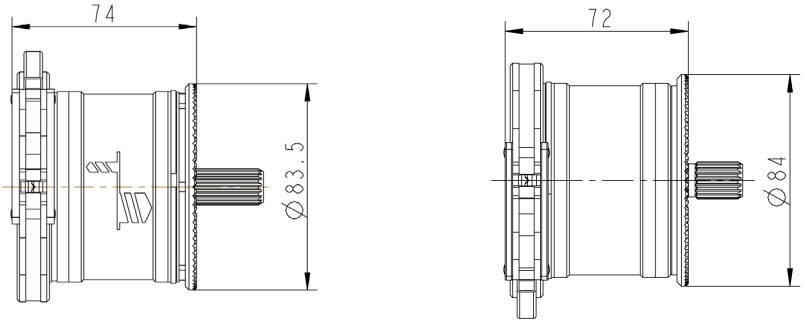
4.1.2 Wet drilling attachment



4.1.3 Drill holder attachment



4.1.4 Planetary gearbox attachment



4.2 Technical data

4.2.1 Dry drilling attachment

Max. drill bit diameter	250	*mm*
Cooling medium	Air	-
Spindle bearing	UNC 1 ¼	*“*
Weight	1,2	*kg*

4.2.2 Wet drilling attachment

Max. drill bit diameter	250	*mm*
Cooling medium	Water	-
Spindle bearing	UNC 1 ¼	*“*
Weight	1,2	*kg*

4.2.3 Drill holder attachment

Max. drill bit diameter	600	*mm*
Cooling medium	Water	-
Spindle bearing	UNC 1 ¼	*“*
Weight	2,3	*kg*

4.2.4 Planetary gearbox attachment i = 3.3

Overdrive gear	3,3 / 1	-
Reduction gear	1 / 3,3	-
Weight	1,2	*kg*

4.2.5 Planetary gearbox attachment i = 5.5

Reduction gear	1 / 3,3	-
Weight	1,2	*kg*

5.0 Commissioning

5.1 Dry drilling attachment

5.1.1 Changing the drill bits

Screw a drill bit with R½ “ thread into the threaded bore of the drill spindle, a drill bit with UNC 1 ¼ “ onto the external thread of the drill spindle. Lubricate the thread adapter well. Use the chuck key to easily release the drill bit. For centering, use the supplied centering device (only possible with drill bits with UNC 1 ¼ “) and insert this into the drill spindle adapter provided. Always lubricate the centering device adapter well. When the drill bit is inserted approx. 2 - 3 mm into the material and is securely guided in, put down the drilling machine and switch it off. Disconnect from the mains. Now remove the centering device by simply pulling it out of the drill spindle. Connect the suction hose to the fittings which can be turned through 360°.

5.2 Wet drilling attachment

5.2.1 Changing the drill bits

Proceed as described above in 5.1.1, but attaching a water line instead of a suction hose.

5.3 Drill holder attachment

5.3.1 Changing the drill bits

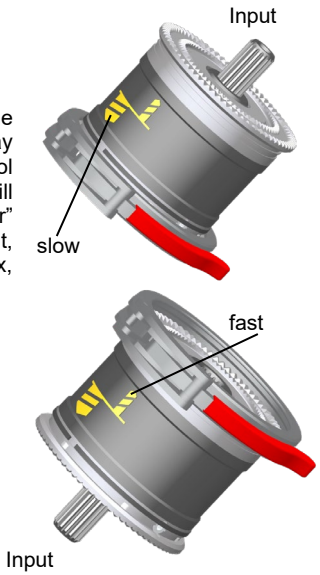
Proceed as described above in 5.1.1, but attaching a water line instead of a suction hose.

5.4 Planetary gearbox attachment

5.4.1 Change gear ratio

The planetary gearbox can be inserted on both sides. On the one side, the planetary gearbox reduces the ratio by 3.3 x, if inserted the other way round it increases the ratio by 3.3 x. If the “smaller drill bit diameter” symbol shown on the gearbox housing points in the direction of the drill bit, the drill bit will rotate at a 3.3 times higher speed. If the “larger drill bit diameter” symbol shown on the gearbox housing points in the direction of the drill bit, the drill bit will rotate at a 3.3 times lower speed. To insert the gearbox, insert the drive shaft into the required position, always lubricate it well when changing sides. The red safety clip can be detached from the gearbox housing by gently expanding it and can be fitted to the opposite side by again gently expanding it.

The planetary gearbox can only be operated at a ratio of i = 3.3 in both directions. The planetary gearbox with a gear ratio i = 5.5 can only be inserted on one side with a gear ratio i = 5.5 reduction.



5.5 Drill bits

You can use any drill bit with a connection bore of R ½ " or UNC 1 ¼ ". Only use drill bits which are suitable for the stone type. Using only concentric drill bits which 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 bit.

5.6 Drilling range for different attachments

Attachment	Speed	Drill bit diameter
Planetary gearbox i=3.3 step-up	4.750 – 9.500 min^{-1}	9 – 20 mm
Beluga SXM without planetary gearbox	1.500 – 2.900 min^{-1}	20 – 70 mm
Planetary gearbox i=3.3 reduction	450 – 900 min^{-1}	70 – 200 mm
Planetary gearbox i=5.5 reduction	260 – 525 min^{-1}	120 – 350 mm
Planetary gearbox i=5.5 + i=3.3 reduction	80 – 160 min^{-1}	350 – 600 mm

6.0 Warranty

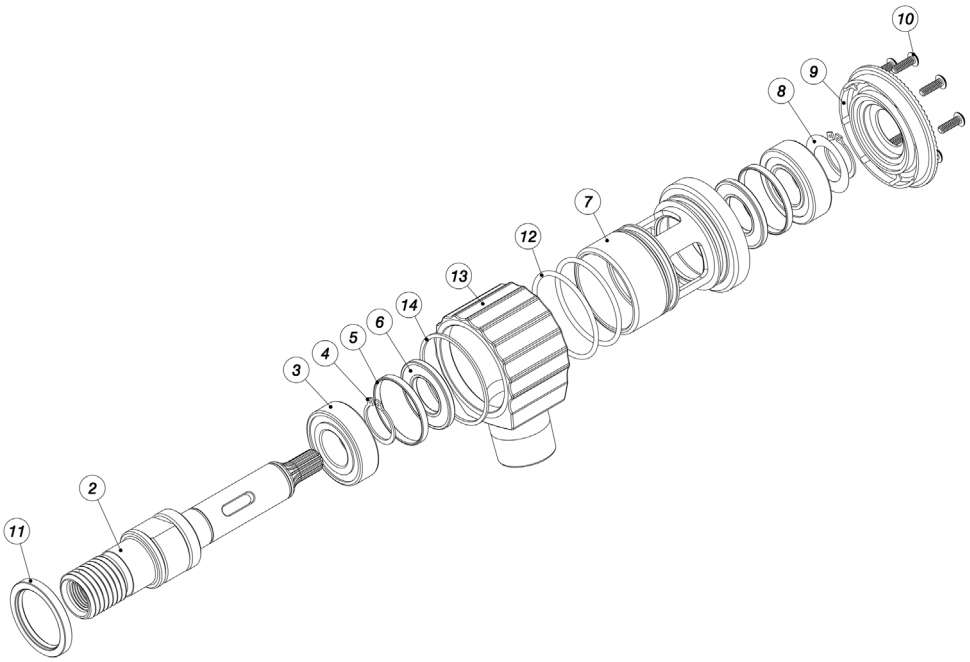
Pursuant to our Terms & Conditions of Sale, we offer a warranty of 12 months from the date of purchase. This covers the free repair of material and production defects which are shown to have been caused prior to sale.
An original sales receipt must always be produced when asserting a warranty claim. 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.

7.0 General Safety Instructions

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

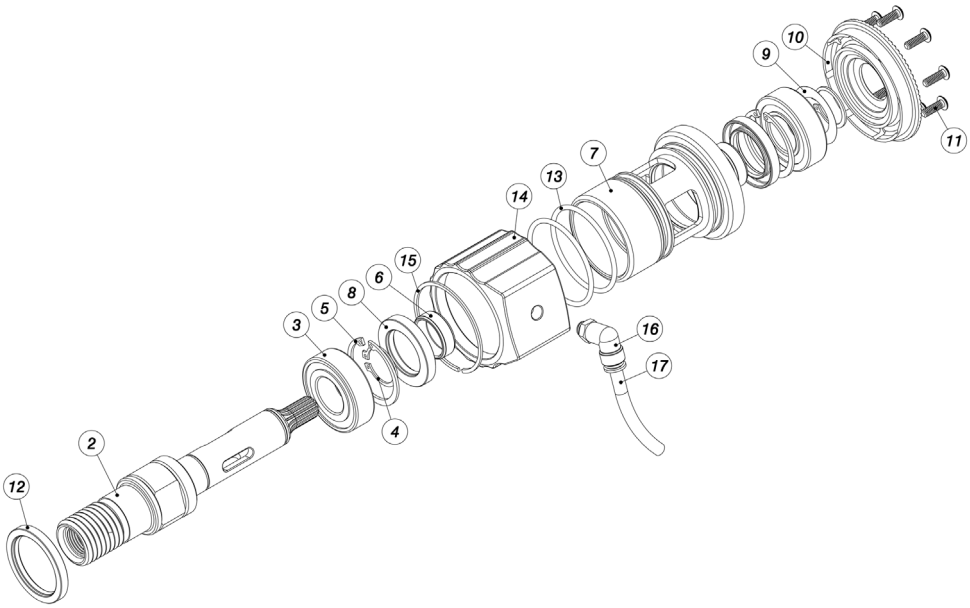
8.0 Spare parts lists

8.1 Dry drilling attachment



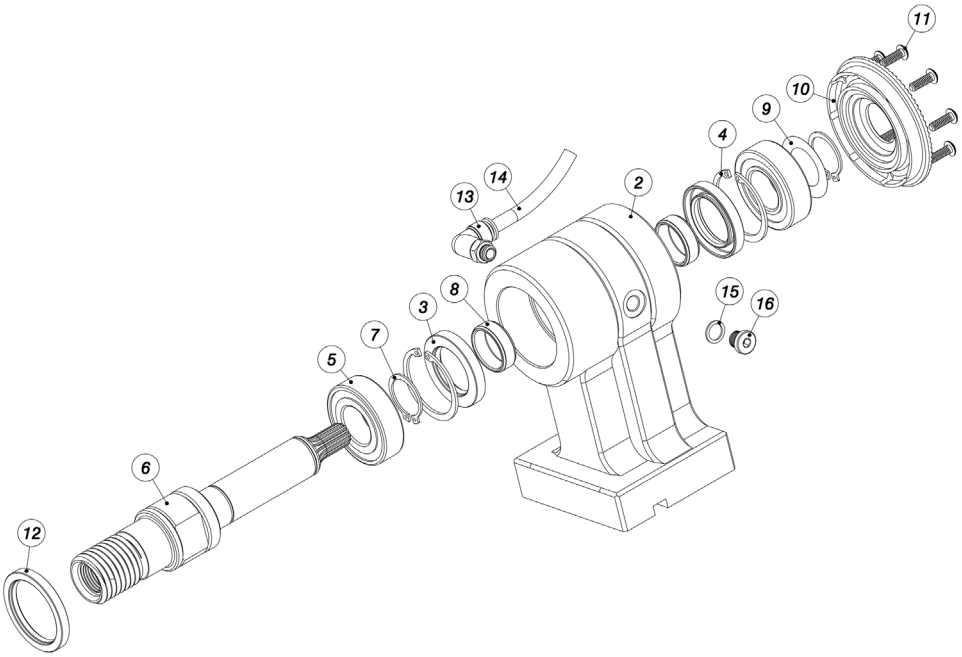
Item	Part number	Description	Quantity
1	301686	Dry drilling attachment Rotor TS	1
2	201036	Drill spindle	1
3	901201	Radial thrust bearing	2 **
4	900202	Snap ring	2
5	401845	Bushing	2
6	802442	Labyrinth seal ring	2 **
7	301687	Rotor housing	1
8	800014	Shim washer	1
9	301688	Flange	1
10	802446	Raised head screw	8
11	901202	Rotary shaft seal	1 **
12	802441	O-ring	2 **
13	401844	Complete suction ring	1
14	800591	Retainer ring	1
			Consumable parts **

8.2 Wet drilling attachment



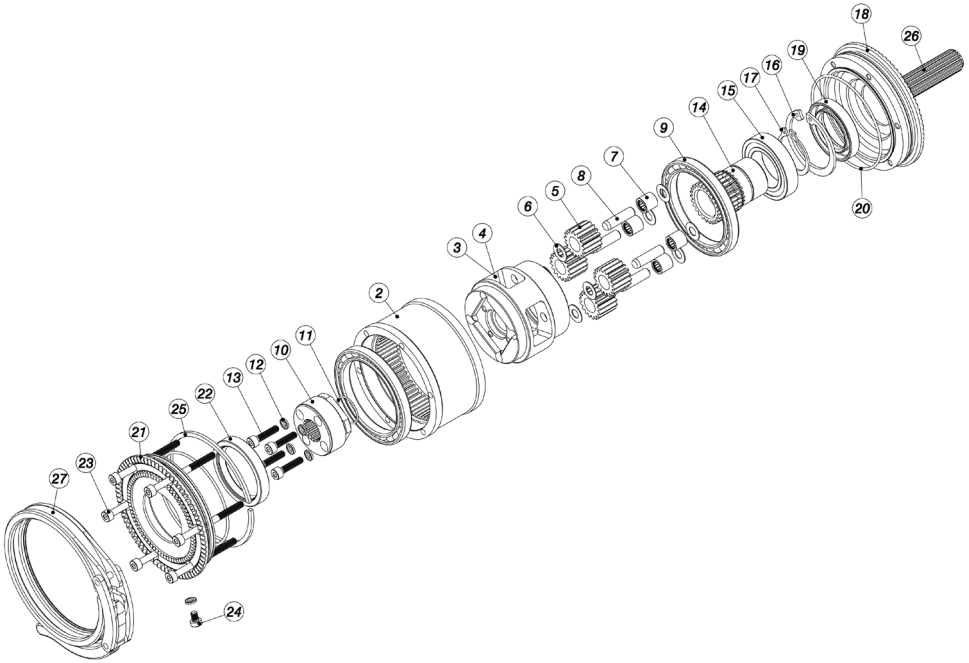
Item	Part number	Description	Quantity
1	301689	Wet drilling attachment Rotor TS	1
2	201036	Drill spindle	1
3	901201	Radial thrust bearing	2 **
4	900202	Snap ring	2
5	801345	Snap ring	2
6	401840	Shaft sleeve	2
7	301687	Rotor housing	1
8	900687	Rotary shaft seal	2 **
9	800014	Shim washer	1
10	301688	Flange	1
11	802446	Raised head screw	8
12	901202	Rotary shaft seal	1 **
13	802441	O-ring	2 **
14	301680	Suction ring	1
15	800591	Retainer ring	1
16	802402	Threaded nipple	1
17	802785	Water hose	1 **
			Consumable parts **

8.3 Drill holder attachment



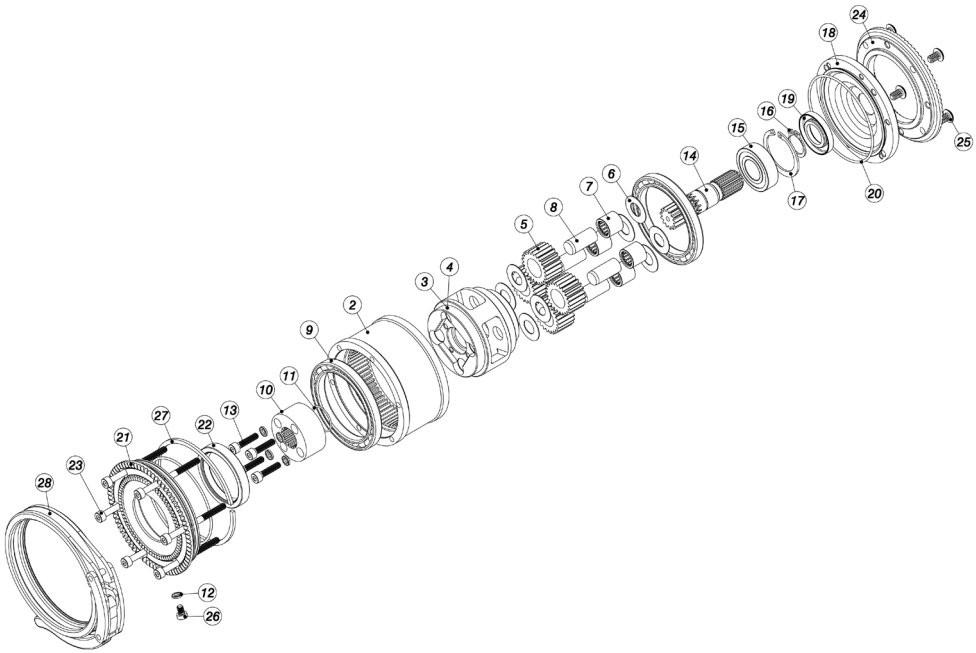
Item	Part number	Description	Quantity
1	301548	Drill holder attachment	1
2	201038	Drill holder attachment	1
3	900687	Rotary shaft seal	2 **
4	801345	Snap ring	2
5	901201	Radial thrust bearing	2 **
6	201064	Drill spindle	1
7	900202	Snap ring	2
8	401840	Shaft sleeve	2
9	800014	Shim washer	1
10	301688	Flange	1
11	802446	Raised head screw	8
12	901202	Rotary shaft seal	1 **
13	802402	Threaded nipple	1
14	802785	Water hose	1 **
15	800027	Sealing ring	1 **
16	800026	Screwed seal plug	1
			Consumable parts **

8.4 Planetary gearbox attachment i = 3.3



Item	Part number	Description	Quantity
1	301730	Planetary gearbox attachment i=3.3	1
2	301665	Annulus gear	1
3	301731	Complete planetary gear housing	1
4	301734	Planetary gear housing	1
5	301732	Planet gear	4
6	802510	Shim washer	8
7	901227	Needle bushing	4 **
8	901228	Dowel pin	4
9	901195	Groove ball bearing	2 **
10	401834	Drive hub	1
11	802448	O-ring	1 **
12	800391	Sealing ring	5 **
13	901225	Allen head screw	4
14	301733	Sun gear shaft	1
15	902085	Groove ball bearing	1 **
16	900216	Snap ring	1
17	900202	Snap ring	1
18	301747	Flange	1
19	900020	Rotary shaft seal	1 **
20	802028	O-ring	2 **
21	301701	Flange	1
22	802439	Rotary shaft seal	1 **
23	900704	Allen head screw	6
24	901220	Allen head screw	1
25	802461	Retainer ring	1
26	401862	Shaft	1
27	301369	Complete clamping ring	1
			Consumable parts **

8.5 Planetary gearbox attachment i = 5.5



Item	Part number	Description	Quantity
1	301666	Planetary gearbox attachment i=5.5	1
2	301665	Annulus gear	1
3	301667	Complete planetary gear housing	1
4	301668	Planetary gear housing	1
5	301669	Planet gear	4
6	800108	Shim washer	8
7	901194	Needle bushing	4 **
8	901204	Dowel pin	4
9	901195	Groove ball bearing	2 **
10	401834	Drive hub	1
11	802448	O-ring	1 **
12	800391	Sealing ring	5 **
13	901225	Allen head screw	4
14	301695	Sun gear shaft	1
15	900483	Groove ball bearing	1 **
16	900210	Snap ring	1
17	901094	Snap ring	1
18	301671	Flange	1
19	802435	Rotary shaft seal	1 **
20	802028	O-ring	2 **
21	301701	Flange	1
22	802439	Rotary shaft seal	1 **
23	900704	Allen head screw	6
24	301522	Flange	1
25	901196	Raised head screw	4
26	901220	Allen head screw	1
27	802461	Retainer ring	1
28	301369	Complete clamping ring	1

Consumable parts **