DR. BENDER *GmbH*
Innovative Power Tools

Operating Manual
Drive unit SXM-V
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

SXM-V

conform is 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

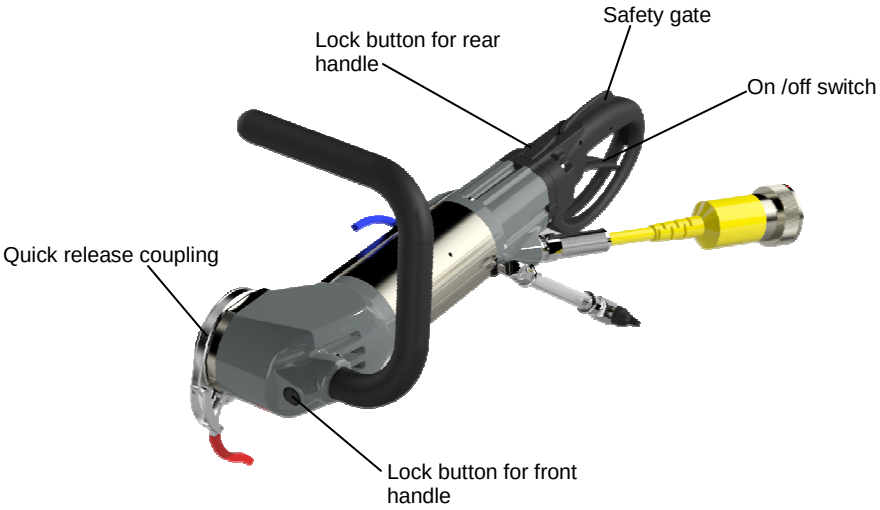
Wear ear protection

Wear a breathing mask

Pull the power plug before work on the device

Read the instructions

1.1 Function description



2.0 General instructions

2.1 Technical description

The BELUGA SXM-V represents 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. 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 = 6.5 kg -> 1.2). 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.

Complete system protected housed in trolley. Can be used immediately on a building site.

Complete drill system.

ARRA DRILL HOLDER

- drilling with tripod, drill diameter of up to 250 mm

ARRA PLANETARY GEARBOX

- drilling with tripod, drill diameter of up to 400 mm
- bidirectional planetary gearbox drill diameter from 6 mm

ARRA HAND DRILL ATTACHMENTS

- drill hands-free wet or dry
  drill diameter of up to 150 mm

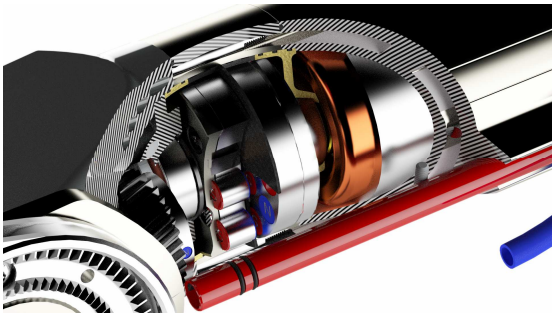
Complete saw system.

SQUATINA
- flush cut with chain saw,
depth of cut of up to 170 mm

KOGIA
- cutting with ring saw, depth of cut of up to 300 mm

ESPADA
- cutting with chain saw, depth of cut of up to 600 mm

Further to this, the BELUGA SXM-V has a completely redeveloped overload-coupling that transfers the supplied torque through a statically sealed wall. Thus there is no need for the contact seal that has previously been required. This drastically increases the service life of the entire machine and the maintenance intervals are significantly longer. The overload coupling is also much more elastic than traditional systems and does not have a slip-and-stick effect. Since the torque is transferred without contact, no wear at all occurs on the coupling. The activation of the coupling is also monitored by a sensor. When triggered, this determines whether the motor is turning and the gearbox is standing, and the motor is immediately stopped. This protects the operator and the machine against excessive heating of the coupling. After the machine is successfully stopped,, it can be set in motion again by activating the start lever again.



2.2 Applications

The drive units BELUGA 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 drive units 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

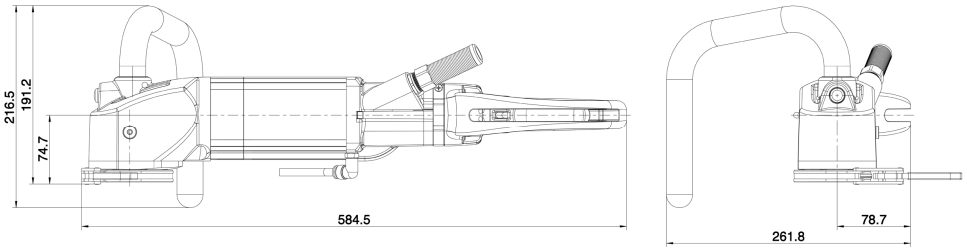
The drive units must be inspected for transport damage after receipt.
Any damage present must be recorded in writing.

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



4.2 Technical data

Rated voltage	400V ~3 / 230V ~1	*V*
Current rating	15 / 16	*A*
Power consumption	10.000 / 3.200	*W*
Frequency	1000	*Hz*
Idle – Full load speed	0 – 2.800	min^{-1}
Power output	9.400 / 3.000	*W*
Torque	32 / 16	*Nm*
Weight	7,5	*kg*
Degree of protection	IP 67	-
Cooling medium	Water	-

4.3 Noise emission and vibration *[EN 50144]*

Sound pressure level	Sound power level	Vibration
db(A)	dB	m/s^2
84	98	< 2.5

4.4 Operating temperatures

If the system is sufficiently cooled, the **BELUGA SXM-V** attains to the cooling water temperature. The plastic housing of the hand operated **BELUGA SXM-V** attains temperatures of up to 35°C. Therefore, hold the machine with the handles provided.

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

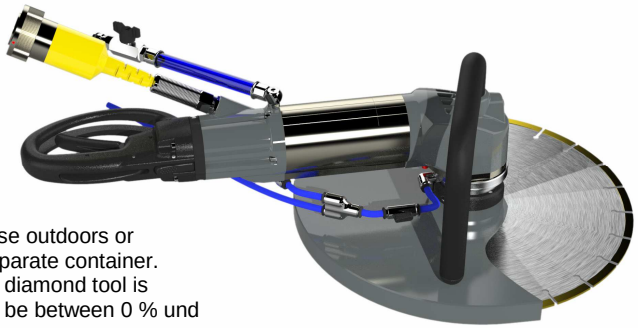
The water must first flow through the Powerbox, then through the drive unit, and only then to the saw blade or the drill bit. Therefore, connect the water supply to the water line (with tap) provided on the Powerbox.
Attention: If possible, do not exceed a maximum water pressure of 3 bar.

The BELUGA SXM-V drive unit is 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.

5.2.1 Dry cutting by bypass solution

If you need to dry cut with the BELUGA SXM-V, there is a very simple option to do so with the help of the dry cutting kit, order no. 302137. This kit consists of a tap, a Y-piece, and a 10 m long water hose as is used for supplying water. The water needed for machine cooling is disposed of with a long hose outdoors or into a wash basin or simply into a separate container. The required quantity of water to the diamond tool is regulated by the tap. The figure may be between 0 % und 100 % of the water quantity.

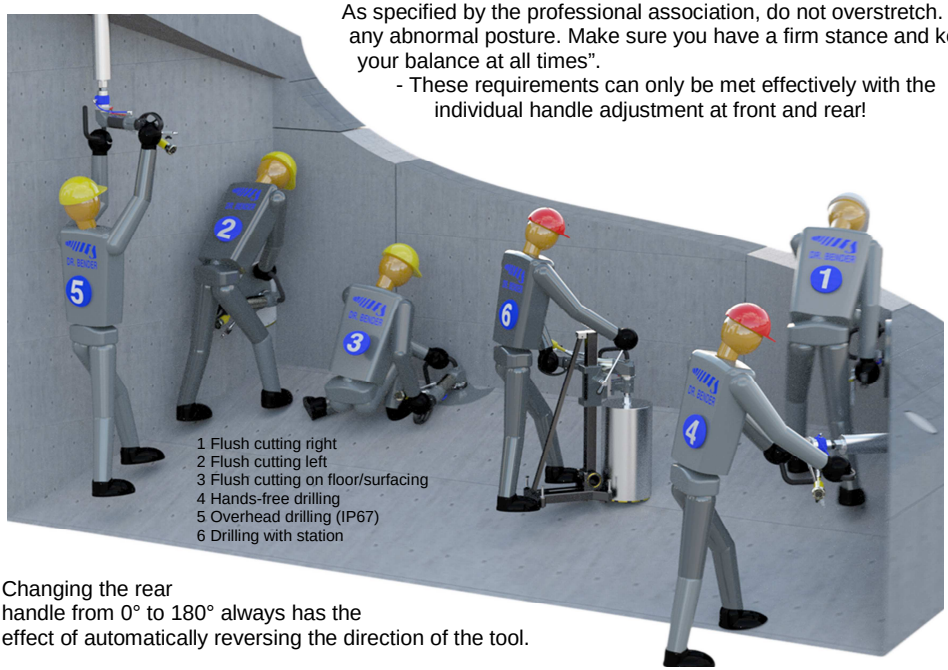


5.3 Handle adjustment

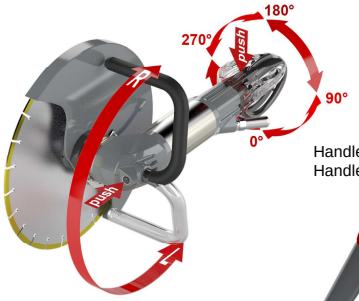
The BELUGA SXM-V drive unit is a completely redeveloped unit with many integrated features such as: individual handle adjustment front and rear.

As specified by the professional association, do not overstretch. Avoid any abnormal posture. Make sure you have a firm stance and keep your balance at all times".

- These requirements can only be met effectively with the individual handle adjustment at front and rear!



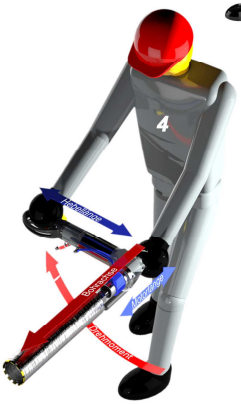
Changing the rear handle from 0° to 180° always has the effect of automatically reversing the direction of the tool.



Handle back: 0 °
Handle front: R

Handle back: 180 °
Handle front: L

Handle back: 90°
Handle front: R



The BELUGA SXM-V is ergonomically adjusted to suit hands-free drilling.

- maximum lever length to counter the torque when drilling.
- short motor length, enables perfect machine handling
- The front handle is located along the line of the drill axis, enabling 100% application of force to the drill bit

Handle back: 90°
Handle front: R/L

Handle back: 90°
Handle front: attached to station

5.3.1 Cleaning / changing the handle

Since the mechanics of the rear handle are most exposed to the drilling sludge during cutting, this can be changed very easily. Order number 301915 Using 6 screws, you can simply detach the handle, clean it, and re-attach it. In doing so, no switch or electrical part is involved.
Since the handle is a safety-relevant part and is also exposed to a high degree of dirt, clean the handle regularly or replace it.

It is vital that you replace it, if the start lever can no longer be activated.

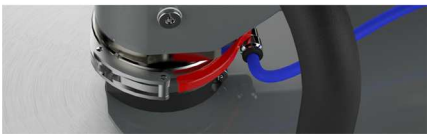
5.4 Quick release coupling

The BELUGA SXM-V drive unit is fitted with a quick release coupling that allows the different attachments to be changed very easily and quickly.

The red clip must be open.
Grease the shaft fitting well. Guide the shaft fitting with the splined hollow shaft into the BELUGA SXM-V bore.

Attention

Lock the red clip. Please ensure that the red clip is located behind the attachment guard. It must not be in the cutting area under any circumstances, since it could be opened by the feed motion.



5.5 Saw blades and drill bits

You can use any saw blade with a connection bore of 1“ (25,4 mm) . Only use saw blades that are suitable for the stone type. Using only concentric saw blades 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 saw blade.
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.
Before each work start, check the on/ off function of your switch of the front and rear handles as well as all mechanical parts of the quick release device.
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 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.

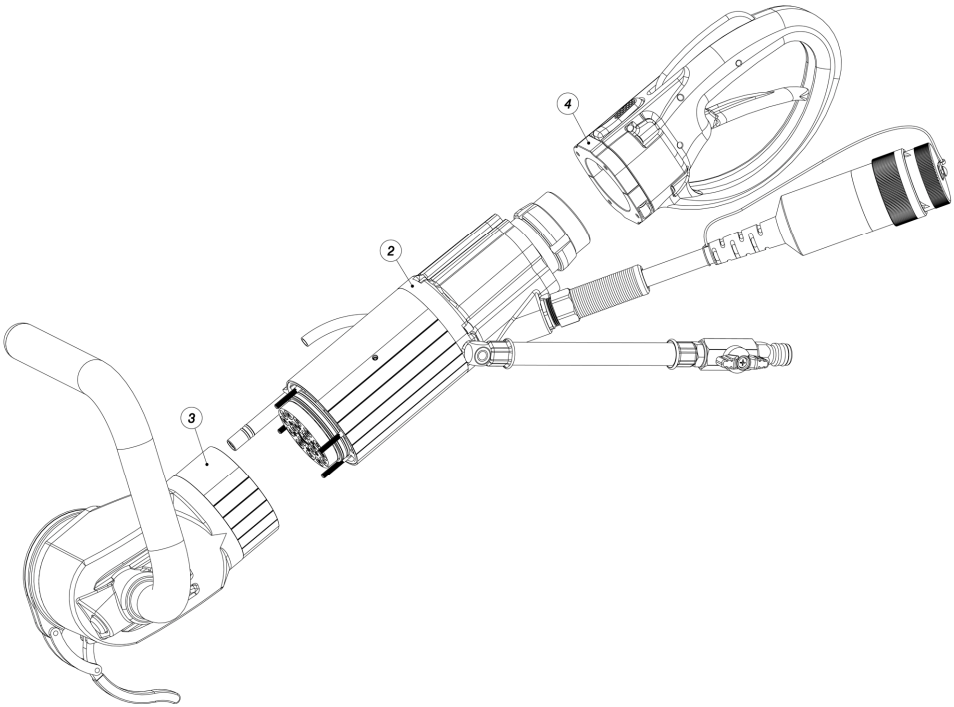
You must ensure that only original spare parts and accessories are used. The products must be purchased from an authorised dealer. If non-original parts are used, this may result in consequential damage and increased risk of accidents. The manufacturer is not liable for such damage. Disassembled, partially 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

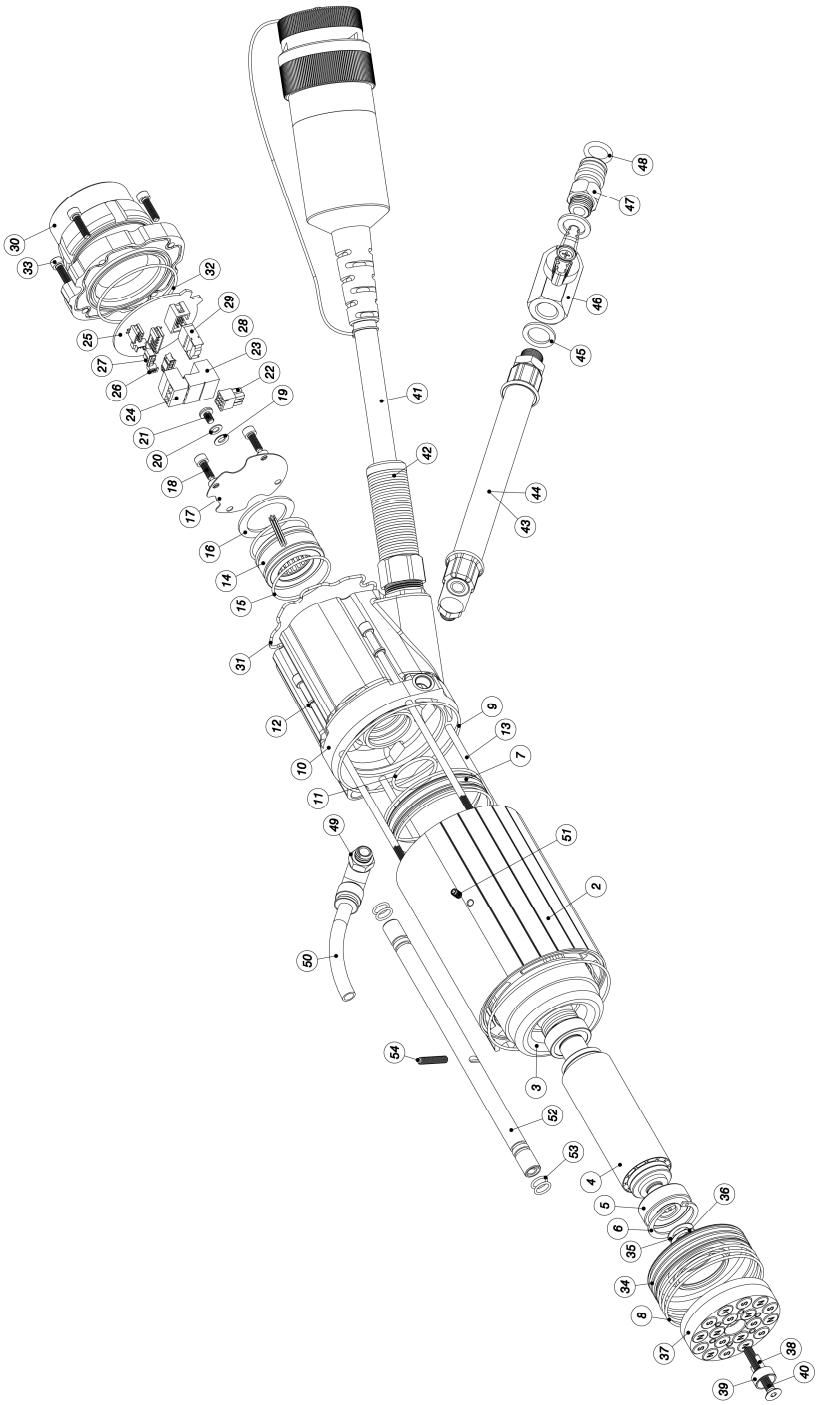
The general safety instructions can be found in the supplied safety instruction booklet.

11.0 Spare parts lists
11.1 Drive unit SXM-V



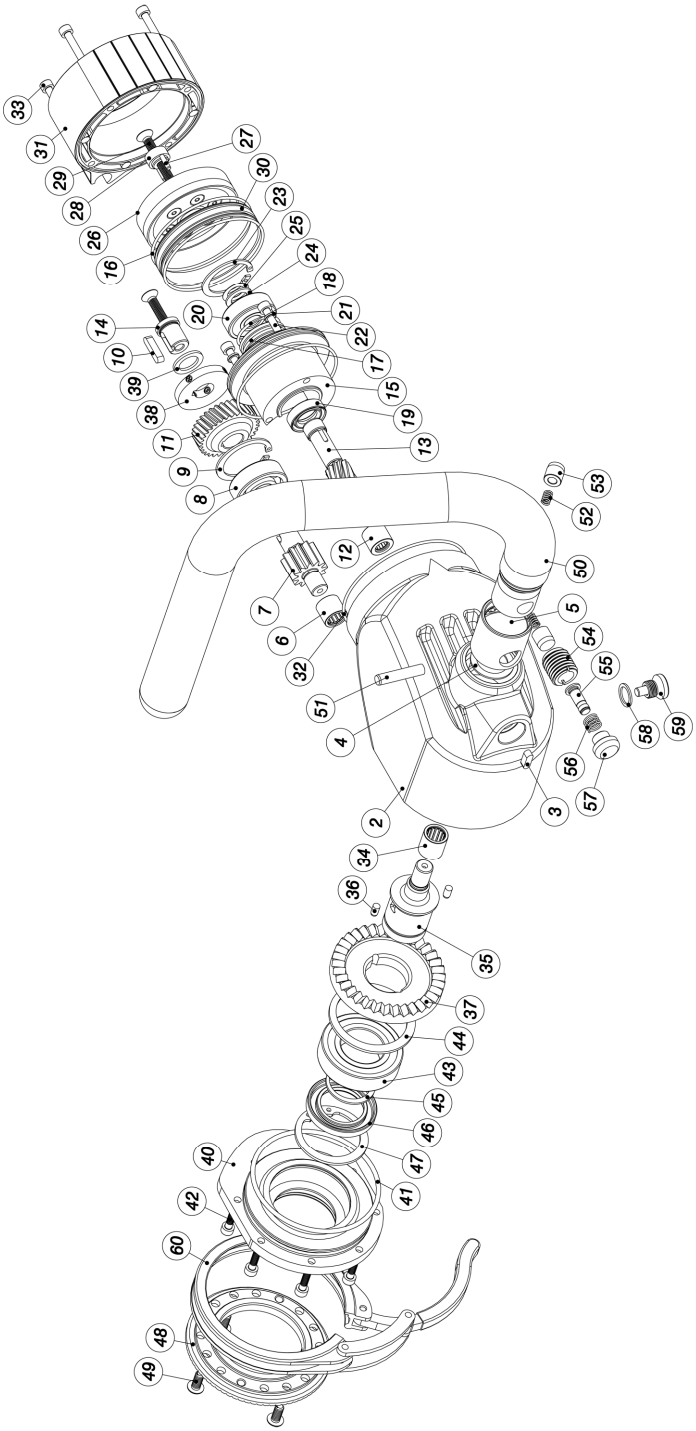
Item	Part no.	Description	No.
1	201185	Drive unit SXM-V	1
2	301993	Motor complete	1
3	302260	Gear complete	1
4	301915	Handle complete	1
			Wearing parts **

11.2 Motor complete



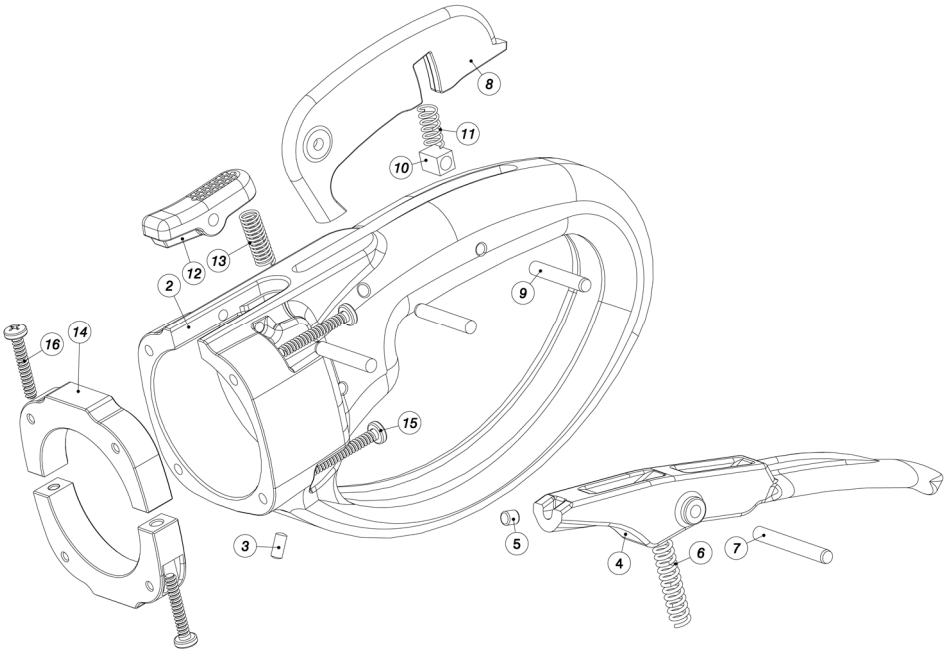
Item	Part no.	Description	No.
1	301993	Motor complete	1
2	302025	Motor housing	1
3	802022	Stator	1
4	301994	Rotor complete	1
5	901305	Groove ball bearing	1 **
6	901060	Snap ring	1 **
7	402014	Ring	1
8	802931	O-ring	5 **
9	801231	O-ring	2 **
10	201116	Bearing cap	1
11	800100	O-ring	1 **
12	800391	Sealing ring	4 **
13	802197	Allen head screw	4
14	802353	Stator resolver	1
15	800092	O-ring	2 **
16	901173	Shim	1
17	401889	Cover	1
18	900339	Allen head screw	4
19	900231	Washer	1
20	900181	Spring washer	1
21	900412	Flat head screw	1
22	802453	Plug connector socket	1
23	802842	Cable exit	1
24	802841	Cable exit	1
25	102369	Board complete	1
26	802853	Female terminal housing	1
27	802850	Female terminal housing	1
28	802852	Female terminal housing	1
29	802915	Female IDC connector	1
30	301946	Bushing	1
31	802770	O-ring	1 **
32	802832	O-ring	1 **
33	902026	Allen head screw	4
34	301978	Intermediate cover	1
35	901279	Shim	1
36	901338	Shim	1
37	302036	Magnetic coupling north pole	1
38	901304	Dowel pin	2
39	401995	Washer	1
40	901298	Hex socket countersunk head screw	1
41	802854	Connection cable complete	1
42	802198	Cable gland	1
43	800359	Water connection complete	1 **
44	800415	Hose compl.	1
45	800028	Sealing ring	2
46	800023	Ball valve compl.	1
47	800020	Nipple	1
48	800040	O-ring	1
49	802402	Threaded nipple	1
50	802785	Water hose	1 **
51	901326	Threaded pin	1
52	302098	Sensor complete	1
53	802843	O-ring	4 **
54	901099	Threaded pin	1
			Wearing parts **

11.3 Gear complete



Item	Part no.	Description	No.
1	302260	Gear complete	1
2	201134	Gear housing complete	1
3	900608	Parallel key	1
4	901360	Shim ring	1
5	402023	Bushing	1
6	901194	Needle bushing	1 **
7	301966	Gear shaft	1
8	900061	Groove ball bearing	1 **
9	901094	Snap ring	1 **
10	900125	Shaft key	1
11	301965	Clutch wheel	1
12	901302	Needle bearing	1 **
13	302294	Pinion shaft complete	1
14	402032	Incremental shim	1
15	301976	Flange	1
16	802931	O-ring	3 **
17	402138	Sleeve	1
18	802426	O-ring	1 **
19	802948	Rotary shaft seal	1
20	901305	Groove ball bearing	1 **
21	800391	Sealing ring	3 **
22	900356	Allen head screw	3
23	901060	Snap ring	1 **
24	900559	Shim	1
25	901338	Shim	1
26	301981	Magnetic coupling south pole	1
27	901304	Dowel pin	2
28	401995	Washer	1
29	901298	Hex socket countersunk head screw	2
30	402014	Ring	1
31	302264	Intermediate cover complete	1
32	801231	O-ring	1 **
33	900656	Allen head screw	4
34	902083	Needle bushing	1 **
35	301980	Crown gear wheel shaft	1
36	900616	Dowel pin	2
37	301967	Crown gear wheel	1
38	302107	Magnet holder complete	1
39	900503	Shim	1
40	901120	Flange	1
41	802718	O-ring	1 **
42	900719	Allen head screw	8
43	900000	Groove ball bearing	1 **
44	801368	Snap ring	1 **
45	900202	Snap ring	1 **
46	802624	Rotary shaft seal	1 **
47	900217	Snap ring	1 **
48	301522	Flange	1
49	801700	Raised head screw	4
50	301984	Handle complete	1
51	901230	Dowel pin	1
52	802270	Compression spring	2
53	401998	Locking pin	2
54	401997	Locking bushing	1
55	401999	Pin	1
56	802716	Compression spring	1
57	301986	Push button	1
58	800027	Sealing ring	1 **
59	800026	Screwed seal plug	1
60	301369	Complete clamping ring	1
61	802848	Gearbox oil	1 **
			Wearing parts **

11.4 Handle complete



Item	Part no.	Description	No.
1	301915	Handle complete	1
2	102344	Handle	1
3	901325	Dowel pin	1
4	102345	Lever	1
5	802522	Magnet	1
6	802805	Compression spring	1
7	900077	Dowel pin	1
8	102347	Catch mechanism	1
9	901261	Dowel pin	3
10	102348	Spring bracket	1
11	802722	Compression spring	1
12	102346	Lock	1
13	802562	Compression spring	1
14	102349	Clamping ring	2
15	802808	Raised head screw	4
16	802811	Raised head screw	2
			Wearing parts **