

BE2810 Operating Instructions

(Translation of original)

BRINKMANN Immersion Pumps

SGL801...1103



Brinkmann Immersions pumps of the series SGL801 ... 1103

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1 Indication to the manual

This operating manual gives basic instructions which are to be observed during installation, operation and maintenance of the pump. It is therefore imperative that this manual be read by the responsible personnel and operator prior to assembly and commissioning. It is always to be kept available at the installation site.

1.1 Identification of safety instructions in the operating manual

Safety instructions given in this manual non-compliance with which would affect **safety** are identified by the following symbol



Safety sign according with
ISO 3864 – B.3.1

or where **electrical safety** is involved, with:



Safety sign according with
ISO 3864 – B.3.6

Where non-compliance with the safety instructions may cause a risk to the machine and it's function the word

ATTENTION

is inserted.

2 Description of product

2.1 General description of the pump

Pumps of this type are one or multi-stage rotary pumps where the impellers are fixed on the driving shaft extension. The pump shaft and motor shaft are interconnected by means of a shaft clamp. Pump and motor form a compact and space-saving unit. These pumps are fitted out with semi-open impellers and a suction screw.

Vertically mounted pumps are equipped with a mounting flange. The pump end immerses into the tank and the motor extends vertically above the tank.

2.2 Intended use

The immersion pumps of the series SGL are suitable for handling extremely inflated fluids (grinding oils) within the limiting application in accordance with table 1.

Limit of Application (Table 1)

Type	SGL801...804	SGL1101...1103
Mediums	Coolants, cooling- and cutting-oils, grinding oils	
Kinetic viscosity of the medium	...45 mm ² /s	...45 mm ² /s
Temperature of medium	0 ... 80 °C	0 ... 80 °C
Particle-size in the medium	6 mm SGL 801... 804 8 mm SGL1101...1103	
min. delivery volume	1% of Q max.	
Dry running	Dry running causes increased wear and should be avoided. During the test of the direction of rotation (< 30 s) permissible.	
Switching-on frequency per hour	Motors less 3 kW max. 200 from 3 kW to 4.0 kW max. 40 from 5.0 kW to 10.3 kW max. 20 Motors 11 kW and higher max. 15	
Ambient temperature	40 °C	
Set-up altitude	1000 m	

ATTENTION

The pumps are to be operated within their design limits. Applications outside of these limits are not approved. The manufacturer is not responsible for any damages resulting from use of the pumps in such applications.

2.3 Technical data

Type	Max. del. pressure bar / spec. weight 1	Max. del. volume l/min	Height ¹⁾ H mm	Depth of immersion ¹⁾ h mm	Weight kg	Power 50 60 Hz kW
SGL801 / 220 / 320 / 450 / 570 / 770 /1000	2.0	800	464	220 320 450 570 770 1000	51 54 58 62 74 81	2.6 2.94
SGL802 / 290 / 390 / 520 / 640 / 840 /1070	4.3	830	533	290 390 520 640 840 1070	76 80 83 86 99 105	5.5 6.3
SGL803 / 360 / 460 / 590 / 710 / 910	6.5	850	612	360 460 590 710 910	121 124 127 131 144	9.0 10.3
SGL804 / 430 / 530 / 660 / 780 / 980	8.6	850	620	430 530 660 780 980	151 154 159 162 177	13.0 15.0
SGL1101 / 230 / 330 / 460 / 580 / 780 /1010	1.9	1200	533	230 330 460 580 780 1010	69 72 76 81 91 98	5.0 5.75
SGL1102 / 310 / 410 / 540 / 660 / 860 /1090	4.0	1280	612	310 410 540 660 860 1090	108 110 113 118 130 138	9.0 10.3
SGL1103 / 390 / 490 / 620 / 740 / 940	6.1	1300	620	390 490 620 740 940	143 147 151 155 167	13.0 15.0

1) Dimensions in accordance with page 5

The motor is surface-cooled and compliant with
DIN IEC 34 and EN 60034 (protection degree IP 55).

ATTENTION

For technical and design reasons, for example by installing an agitator, the size of the integrated motor may vary. See the identification plate.

3 Safety instructions

When operating the pump, the safety instructions contained in this manual, the relevant national accident prevention regulations and any other service and safety instructions issued by the plant operator are to be observed.

3.1 Hazards in the event of non-compliance with the safety instructions

Non-compliance with the safety instructions may produce a risk to the personnel as well as to the environment and the machine and results in a loss of any right to claim damages.

For example, non-compliance may involve the following hazards:

- Failure of important functions of the machines/plant
- Failure of specified procedures of maintenance and repair
- Exposure of people to electrical, mechanical and chemical hazards
- Endangering the environment due to hazardous substances being released

3.2 Unauthorized modes of operation



- Pump may not be used in potentially explosive environments!
- Pump and discharge piping are not designed to hold any weight and may not be used as a step ladder.

3.3 Remaining Risk



Risk of Injury!

Risk of squeezing or crushing body parts when installing or removing the pump exists. Proper and secured lifting tools must be used.

Risk of burns!

The pump must have cooled down sufficiently prior to commencing any repair, maintenance or installation.

3.4 Qualification and training of operating personnel

The personnel responsible for operation, maintenance, inspection and assembly must be adequately qualified. Scope of responsibility and supervision of the personnel must be exactly defined by the plant operator. If the staff does not have the necessary knowledge, they must be trained and instructed, which may be performed by the machine manufacturer or supplier on behalf of the plant operator. Moreover, the plant operator is to make sure that the contents of the operating manual are fully understood by the personnel.

3.5 Safety instructions relevant for operation

- If hot or cold machine components involve hazards, they must be guarded against accidental contact.
- Guards for moving parts (e.g. coupling) must not be removed from the machine while in operation.
- Any leakage of hazardous (e.g. explosive, toxic, hot) fluids (e.g. from the shaft seal) must be drained away so as to prevent any risk to persons or the environment. Statutory regulations are to be complied with.
- Hazards resulting from electricity are to be prevented (see for example, the VDE Specifications and the bye-laws of the local power supply utilities).
- The pumps' stability against falling over is not ensured unless it is properly mounted onto the tank.
- The female threads on the motor MUST NOT be used to lift the entire pump and motor assembly.

3.6 Safety instructions relevant for maintenance, inspection and assembly work

Any work on the machine shall only be performed when it is at a standstill, it being imperative that the procedure for shutting down the machine described in this manual be followed.

Pumps and pump units which convey hazardous media must be decontaminated.

On completion of work all safety and protective facilities must be re-installed and made operative again.

Prior to restarting the machine, the instructions listed under "Start up" are to be observed.

3.7 Signs on the pump

It is imperative that signs affixed to the machine, e.g.:

- arrow indicating the direction of rotation
- symbols indicating fluid connections be observed and kept legible.

3.8 Unauthorized alterations and production of spare parts

Any modification may be made to the machine only after consultation with the manufacturer. Using spare parts and accessories authorized by the manufacturer is in the interest of safety. Use of other parts may exempt the manufacturer from any liability.

4 Transport and storage

Protect the pump against damage when transporting.

The pumps may only be transported in a horizontal position and hooks or straps must be attached on the motor and pump end.

Do not use the pump shaft for connecting any transportation aids such as hooks or straps.

Pumps must be drained prior to their storage.

Store pump in dry and protected areas and protect it against penetration of foreign bodies.

Always store pump above the freezing point!

5 Installation and Connection

5.1 Mechanical installation

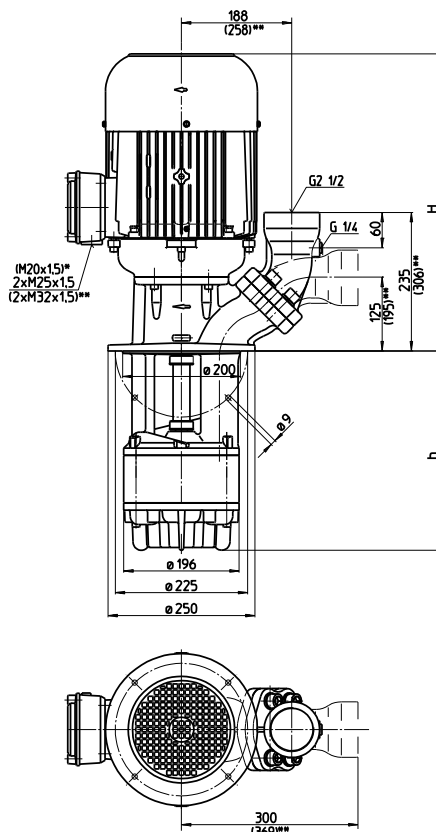
During any assembly or disassembly process the pumps must be secured against tipping through ropes for example at all times.

Pumps must be mounted securely. Piping, tank and pumps must be mounted without any tension.

The inlet is at the bottom of the immersed pump body. The distance between the inlet and the tank bottom must be so large that the inlet can not be blocked by deposits during longer shutdowns.

To obtain the full flow rate it is recommended to choose for the pipework the nominal bore diameter of the pumps cross section for connection. Therefore pipe bends should be used, not pipe angles!

The pipework must be qualified for occurring hydraulic pressure.



*) Dimensions. for SGL801, 1101

**) Dimensions. for SGL804, 1103

ATTENTION

Maximum tightening torque for piping connections is 200 Nm!

When installed the space around the pump must be large enough to provide sufficient cooling of the motor.

Do not prop up the pressure line via the joining socket.



The pump must be mounted in that way that rotating parts under the cover of the coolant tank cannot be touched!

5.2 Electric wiring



All service work must be carried out by qualified service personnel. Pump must be disconnected from the power source and all rotating parts must stand still. Reassure that pump is disconnected from power source and cannot be switched on. Verify that there is no voltage at the terminal board!

According to the European Standard EN809 a motor overload must be installed and properly set to the full load amps stated on the pump name plate.

It is the responsibility of the machine operator to decide whether or not an additional emergency switch must be installed.



Danger!

Risk of electric shock

Our asynchronous motors can optionally be fitted with temperature sensors in the form of triplet PTC thermistors, which are used for thermal monitoring of the motor windings. Please note that the temperature sensors meet the insulation requirements of basic insulation. The improper connection of the triplet PTC thermistors to evaluation units that do not have a protective function against overvoltage in the event of a fault can lead to voltages dangerous to the touch and electric shock.

Please check whether the evaluation units you intend to use are permissible for the electrical connection of the temperature sensors.

5.2.1 Circuit

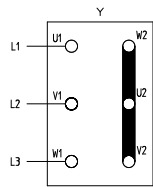


Tension voltage and frequency must correspond with the shown specification on the nameplate.

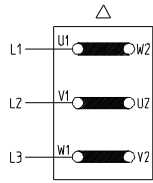
The pump must be wired so that a solid longterm electrical connection is ensured. Establish a solid ground connection.

The electrical wiring must be performed according to the wiring diagram shown inside the terminal box cover. (Please see above sample wiring diagrams)

Wiring diagram e.g.



Star connection
up to 5.5 kW
3 x 400 V, 50 Hz
resp. 380-415 V, 50 Hz



Delta connection
up to 5.5 kW
3 x 230 V, 50 Hz
resp. 220-240 V, 50 Hz
From 9.0 kW and higher
3 x 400 V, 50 Hz
resp. 380-415 V, 50 Hz

There may be no foreign objects such as dirt, particles or humidity inside the terminal board.

Mount terminal board cover to motor tight against dust and humidity and close up all unused wiring ports.

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When Variable Frequency Drives are used interfering signals might occur.

Non-sinus shaped supply voltage from a variable frequency drive might result in elevated motor temperatures.

6 Start up / Shut down

6.1 Start up

ATTENTION

Switch off at the mains.

After connection the electrical wires, close the terminal box. Briefly start the motor (max. 30 sec.) and check the rotation according to the arrow on the top of the motor.

If the direction is incorrect change over two of the power leads.

6.2 Shut down

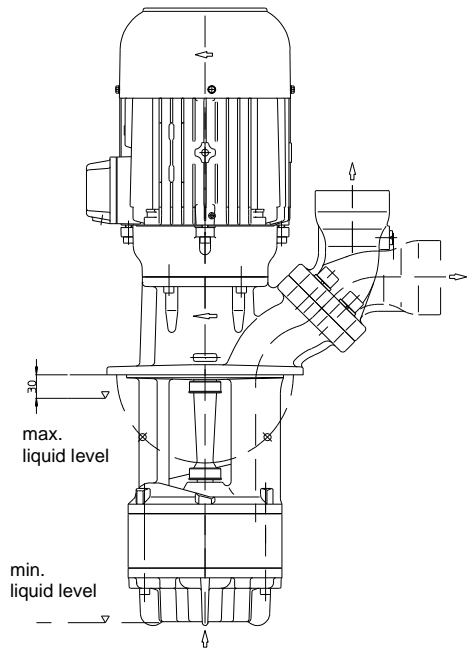
All service work must be carried out by qualified service personnel. Pump must be disconnected from the power source and all rotating parts must stand still. Reassure that pump is disconnected from power source and cannot be switched on. Verify that there is no voltage at the terminal board!

Open terminal box and disconnect the power leads. Empty out the pump.

7 Operation

Liquid level

According to the drawing shown below, the maximum liquid level must stay about 30 mm below the mounting flange, also ensure that the suction hole of the pump body must be covered with liquid before starting up the motor.



If the pump should lock up and cease, shut pump down (see 6.2) and disconnect from power supply. Pump must be uninstalled and removed from the system prior to its repair.

8 Servicing and Maintenance

ATTENTION

The surface of the motor must be kept free of dirt.

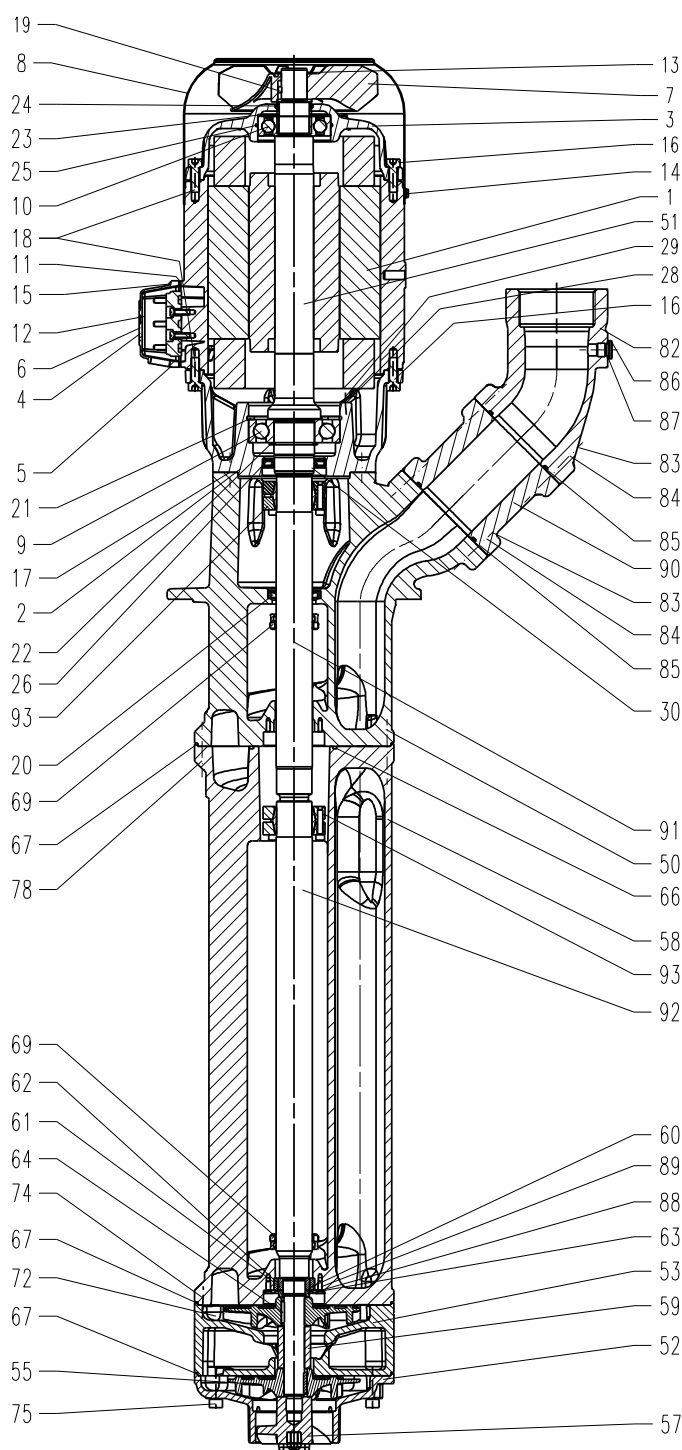
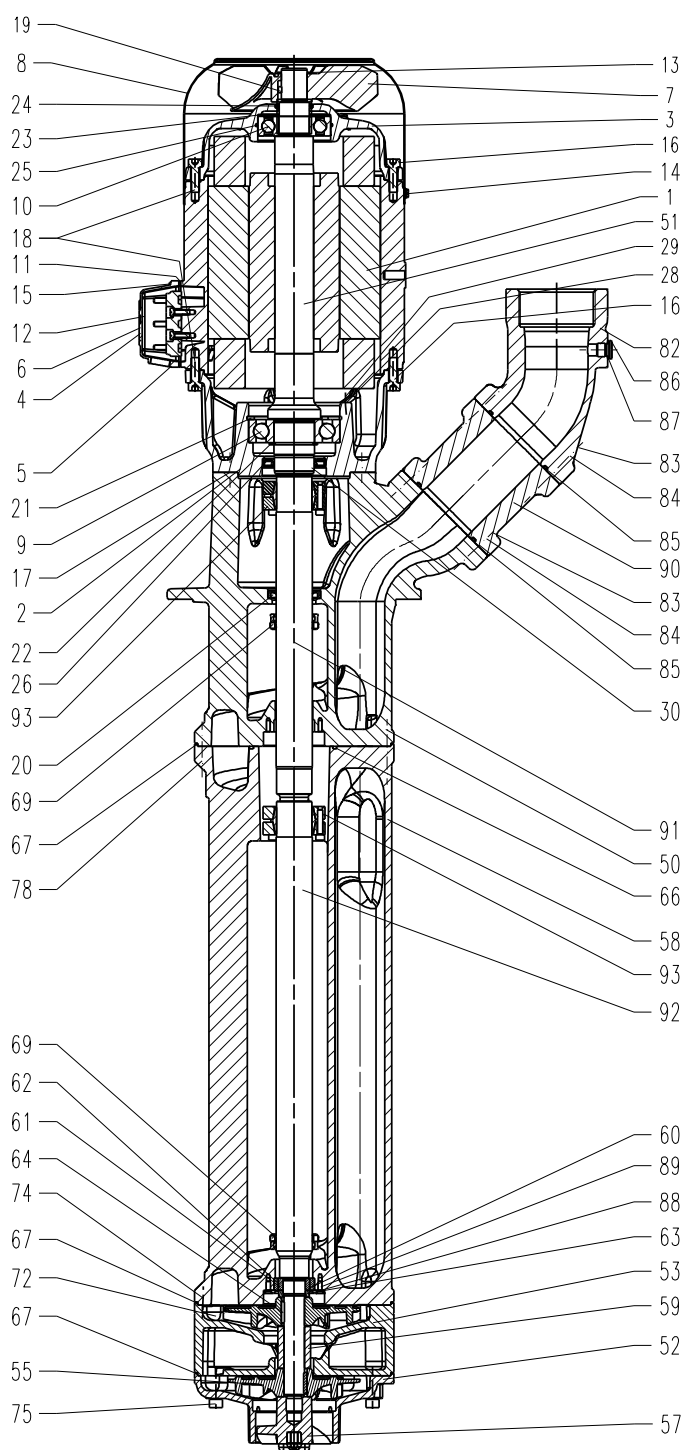
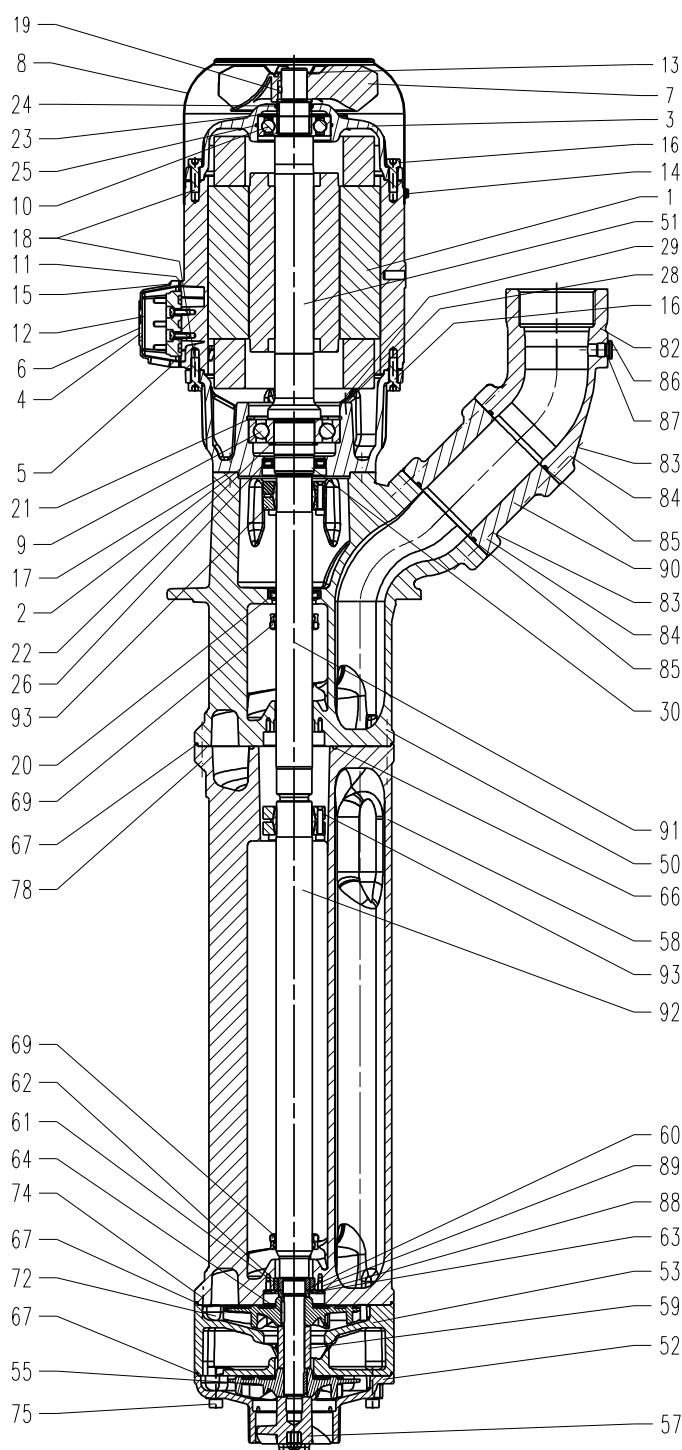
The motor shaft is spinning in permanently greased ball bearings (with special grease and increased bearing play) and does not require any special maintenance.

9 Trouble shooter's guide

Fault	Cause	Remedy
Motor does not start, no motor noise	At least two of the power supply leads have failed	Check fuses, terminals and supply leads .
	Overload has tripped	Inspect overload
Motor does not start, humming noise	One of the supply leads has failed	See above
	Impeller faulty Motor bearing faulty	Replace impeller Replace bearing
Overload trips	Pump locked up mechanically	Inspect pump hydraulics
	High on/of cycling frequency	Check application
Power consumption is too high	Wrong direction of rotation of impeller	See above
	Lime or other deposits mechanical friction	Clean pump mechanism repair pump
Motor overheats	High on/off cycling frequency	See above
	Wrong power supply (voltage or cycles)	Power supply must correspond with name plate rating
	Insufficient cooling	Check air flow at motor fan
Pump does not pump	liquid level too low	Fill up liquid
	Pump mechanism faulty Pipe blocked	replace pump mechanism Clean pipe
Insufficient flow and pressure	Wrong direction of rotation of impeller	Change over two power supply leads
	Pump mechanism silted up Worn pump mechanism	Clean pump mechanism Replace pump mechanism
Incorrect flow or pressure	Wrong power supply (voltage or cycles)	Power supply must correspond with name plate rating
Running noise/Vibration	Foreign objects in pump end	Remove foreign objects
	Impeller damaged Bearing/Bushing broken	Replace impeller Replace bearing/bushing

10 Spare part

10.1 Spare part list for the immersion pumps of the series SGL801 ... 1103

		Item Description	
	19	1 Stator with terminal board	
	8	2 Motor flange	
	24	3 End shield	
	23	4 Terminal box up to 5.5 kW	
	25	5 Terminal box frame up 9.0 kW	
	10	6 Terminal box cover up 9.0 kW	
	18	7 Fan	
	11	8 Fan cover	
	15	9 Ball bearing 5.0...5.5 kW	DIN 625
	12	9 Ball bearing 2.6 and up 9.0 kW	DIN 628
	6	10 Ball bearing	DIN 625
	4	11 Gasket	
	5	12 Gasket up 9.0 kW	
	21	13 Retaining ring 2.6 kW	DIN 471
	9	13 Retaining ring	
	17	14 Thread rolling screw	DIN 7500
	2	15 Slotted cheese head screw	DIN 84
	22	16 Socket head cap screw	DIN 912
	26	17 Socket head cap screw	DIN 912
	93	18 Nut up 11 kW	DIN 934
	20	19 Parallel pin	DIN 7
	69	20 Shaft seal	
	67	21 Retaining ring up to 5.5 kW	DIN 472
	78	22 Retaining ring up to 5.5 kW	DIN 471
		23 Compensation disk	
		24 Shaft seal	
		25 O-ring	
		26 Shaft seal	
		28 Bearing cover 9.0 kW and over	
		29 Socket head cap screw 9.0 kW	DIN 931
		30 Shaft nut 9.0 kW and over	
		50 Pump body	
		51 Shaft with rotor	
		52 Intake cover	
		53 Pump plate up SGL802...1103	
		55 Impeller	
		57 Suction screw	
		58 Extension pump body up 770 mm depth of immersion	
		59 Distance liner SGL802...1103	
		60 Distance liner	
	69	61 Running sleeve	
	62	62 Bearing bush	
	61	63 Distance plate	
	64	64 Woodruff key	DIN 6888
	74	66 O-ring up 770 mm depth of immersion	
	67	67 O-ring	
	72	68 Splash ring	
	67	69 Splash ring	
	55	72 Socket head cap screw	DIN 912
	75	74 Stud bolt SGL1102...1103	
		75 Hexagon domed cap nut SGL1102...1103	DIN 1587
		78 Socket head cap screw up 770 mm depth of immersion	DIN 912
	82	Joining socket	
	83	Socket head cap screw	DIN 912
	84	Spring washer	DIN 7980
	85	O-ring	
	86	Screw plug	DIN 908
	87	Sealing ring	DIN 7603
	88	Serrated lock washer	
	89	Flat head screw	DIN 7991
	90	Adapter up 11 kW	
	91	Extension shaft up 770 mm depth of immersion	
	92	Insert shaft	
	93	Shaft clamp 2 x up 770 mm depth of immersion	

10.2 Indications to the spare part order

Spare parts are available from the supplier. Standard commercially available parts are to be purchased in accordance with the model type. The ordering of spare parts should contain the following details:

1. Pumptype

e.g. SGL801 / 320

2. Pump No.

e.g. 05242810

The date of the construction year is a component of the pumps type number.

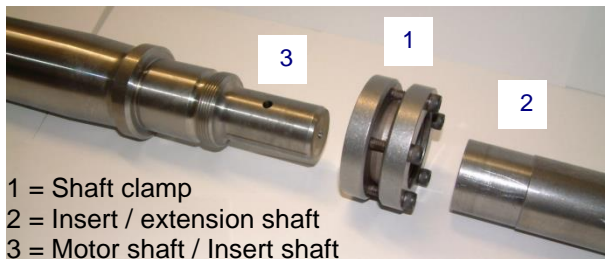
3. Voltage, Frequency and Power

Take item 1, 2 and 3 from the nameplate

4. Spare part with item No.

e.g. Intake cover item No. 52

11 Repair Instructions / Replacing shaft clamps and shafts



11.1 Dismantling the insert shaft or extension shaft

- Disconnect the submersible pump from the mains both electrically and mechanically.
- Remove pump from system. Secure pump against tipping over, i.e. use ropes to secure pump.
- Set the pump down on the fan cover. Dismantle the pump unit and the extension pump body (if appropriate).



Wear safety gloves!

Risk of injury due to sharp edges on pump components, i.e. impeller blades.

- Loosen the screws on the shaft clamp (1) one after the other.



Do not, under any circumstances, remove the screws completely, **danger of injury!**

- Remove the extension shaft (2) and shaft clamp (1).
- Dismantle the pump body.
- Loosen the screws on the shaft clamp (1) (see above), pull the insert shaft (2) off the motor shaft (3).

11.2 Assembling the insert shaft and motor shaft

ATTENTION

Clean the contact surfaces of the insert shaft (2) (inside) and the motor shaft (3). They must not be lubricated or oiled.

- Set the motor down on the fan cover.
- Position the shaft clamp (1) (use a new shaft clamp) in the centre of the cranked clamping diameter (2) of the insert shaft.
- Insert the motor shaft (3) into the insert shaft (2).
- **Tighten:**
Mark the first screw and tighten all the screws evenly by hand, one after the other in a clockwise direction (not cross-ways).
- (up to 11 kW)
Use a torque screwdriver to tighten each screw first with 2 Nm then with 3,5 Nm and finally with 5 Nm (in a clockwise direction again). Repeat the last turn (with 5 Nm) 3 times.
- (12 kW and higher)
Use a torque screwdriver to tighten each screw first with 2 Nm then with 7 Nm and finally with 12 Nm (in a clockwise direction again).

- Mount the pump body.

The remainder of the reassembly process is to be completed in the opposite order of the prior described dismantling process.

Repeat the last turn (with 5 Nm) 3 times.

ATTENTION

Note torques for the screw connections!

When putting the pump back into use, **make sure the direction of rotation is correct!**

Thread - Ø	M5	M6	M8	M10	M16
Strength classes	4.8	8.8	8.8	10.0	8.8
Tightening torque (Nm)	3 Nm	4,5 Nm	20 Nm	30 Nm Item. 18	60 Nm Item. 83

12 Disposal

When disposing of the pump or the packaging materials the local and national regulation for proper disposal must be complied with.

Prior to its disposal, the pump must be completely drained and decontaminated if necessary.