KEWPUMP®
Keeps Pumping

KS-SE3

Solid Handling Pump

Operation Manual

TÜV NORD (Malaysia) Sdn. Bhd. ISO 9001 QMS No. 04100 2002 1779

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KEWPUMP®

KS-SE3 OM - 01/13

SAFETY-GENERAL

The pump has been designed to provide safe and reliable service. However, a pump is both a pressure vessel and a piece of rotating machinery. Therefore, the operator(s) must exercise good exercise good judgement and proper safety practices to avoid damage to the equipment, surrounding areas, and to prevent personal injury. It must be understood that the information contained in this manual does not relieve operating and maintenance personnel of the responsibility of exercising normal good judgement in operating and care of these pumps and its components.

In general, all personnel should be guided by all the basic rules of safety associated with the equipment and the process.

STARTING

Note: Do not run the pump dry as the mechanical seal will be severely damaged.

1. Ensure the discharge gate valve is closed. Do not run the pump for very long with the discharge valve closed.

2. Prime the pump. The pump casing and suction line must be filled with the liquid to be pumped. The pump shaft should be turn slowly to expel air trapped in the impeller. It should not be necessary to re-prime the pump before subsequent starts if the foot valve has remained sealed.

3. Direction of rotation. Ensure the driver shaft rotation conforms to the direction arrow on the pump.

4. The unit may now be started. When the pump reaches full speed, open the gate valve on the discharge pipe gradually until the desired quantity of liquid is being delivered. If no liquid is being pumped, shut down the unit immediately.

5. Check for exceptional noise or operating temperature and check pump mechanical seal for leaks.

OPERATION TROUBLESHOOTING

Failure to Deliver Water or Operating Below Rated Capacity

1. Obstruction in suction or discharge line:-
   (a) Valve closed.
   (b) Suction strainer clogged.
   (c) Suction foot valve stuck in closed position or partially closed.
   (d) Foot valve too small.
   (e) Suction and/or discharge pipes of insufficient diameter causing excessive friction loss.

2. Slight air leaks in suction piping or joints or a badly worn or damaged mechanical seal.

3. Pump not properly primed.

4. Speed too low.

5. Discharge head beyond pump's rating. Check both suction and discharge heads with gauges.

6. Excessive suction lift.

7. Incorrect direction of rotation.

8. Impeller partially or fully clogged.

9. Air or gases in liquid handled.

Power Consumption Too High

1. Total head is lower than estimated causing too much water to be pumped. Throttle capacity by means of gate valve delivery side or trim down impeller.

2. Pump speed too high.

3. Density of liquid greater than water.

4. Bent shaft.

5. Foreign body jammed in pump.

6. Misalignment.

Excessive Vibration

1. Misalignment.

2. Foundation not sufficiently rigid.

3. Impeller partially clogged, causing unbalance.

4. Worn bearings.

Excessive Internal Wear of Pump

1. Cavitation from air or gases in liquid.
2. Abrasion caused by solid particles.
3. Corrosive action of liquid pumped.

Noisy Operation

1. Foreign body jammed in impeller or body.
2. Impeller binding in body.
3. Worn or faulty bearings.
4. Pump not properly primed.
5. Cavitation noise.

SHUTDOWN

1. Whenever is possible, the pump should be allowed to operate on water only for a short period to clean any slurry through the system before shutdown.
2. If a check valve is installed in the discharge line, the pump may be shut down by merely stopping the driver. If a check valve is not installed, shut down the pump by slowly closing the discharge valve, after which the driver is to be stopped immediately.
3. Lock driver to prevent accidental rotation.
4. It is good practice to close the suction valve if the pump is to be shut down for an extended period of time.
5. When the pump is idle and there is a possibility of freezing, the pump casing drain plug should be removed and the casing drained.

DISMANTLING PROCEDURE

Note: The pump casing can remain bolted to the suction and discharge pipes. Refer to parts list when dismantling.

1. Slowly close discharge valve. For suction head conditions, close suction valve too. Shut down and lock out power to driver.
2. Observe the discharge pressure gauge to make sure casing (100) is not pressurized. Slowly open discharge valve to release pressure in casing (100) if required. Close back the discharge valve after depressurisation of the casing (100) has been done.
3. Disconnect all auxiliary piping and tubing from pump.
4. For models SEK, SEL and SES, remove coupling or driving belts guard, and disconnect couplings or pulleys. Drain oil from bearing bracket (301) by removing bearing bracket drain plug (400). Replace plug after oil is drained.
5. For models SEK, SEL and SES, remove support foot (410) hold down bolts and nuts.
6. Remove six (6) casing bolts from casing nuts. Jack out the back pull-out assembly from casing (100). Make sure casing cover gasket (431) (for torque flow impeller) or casing cover "O" ring (420) (for other types of impeller) is not damaged.
7. Move back pull-out assembly to clean workbench.
8. Remove impeller (120) from shaft (130) (for models SEK, SEL and SES) or motor extension shaft (132) (for models SEMK, SEML and SEMS) by hammering the impeller (120) through a piece of hardwood on the impeller discharge vane tip in counterclockwise direction (viewed from the impeller end of the shaft), with a spanner slide over the shaft (130) and shaft end key (136) and resting on the workbench or a solid block (for models SEK, SEL and SES), or block motor extension shaft (132) from rotating with a metal rod (for models SEMK, SEML and SEMS).
9. For mechanical sealing, remove rotary portion of mechanical seal (200) from shaft (130).
10. For gland packing, remove two (2) gland nuts from casing cover stud. Back off gland (213) from sealing chamber (211).

11. Remove two (2) casing cover nuts behind the adaptor extension ring (221).

12. For mechanical sealing, remove casing cover (210) and sealing chamber (211) as a unit from adaptor extension ring (221). Remove casing cover "O" ring (420) and sealing chamber (211) from casing cover (210). Remove sealing chamber "O" ring (421) and stationary portion of mechanical seal (200) from sealing chamber (211) by tapping out gently with a piece of wood.

13. For gland packing, remove casing cover (210) and sealing chamber (211) as a unit from adaptor extension ring (221). Remove casing cover "O" ring (420) and sealing chamber (211) from casing cover (210). Remove sealing chamber "O" ring (421) and packings (201) from sealing chamber (211). Remove shaft sleeve (133) and shaft sleeve "O" ring (423) from shaft (130).

14. For dynamic sealing, remove casing cover (210) from adaptor extension ring (221). Remove casing cover "O" ring (420) and two (2) casing cover stud "O" rings (492) from casing cover (210). Remove expeller (121) from shaft (130).

15. Remove eight (8) adaptor extension ring bolts.

16. For mechanical sealing and gland packing, remove adaptor extension ring (221) from bearing bracket (301) (for models SEK, SEL and SES) or frame adaptor (220) (for models SEMK, SEML and SEMS).

17. For dynamic sealing, remove adaptor extension ring (221) and sealing chamber (211) as a unit from bearing bracket (301). Remove four (4) sealing chamber holding bracket bolts and remove sealing chamber holding bracket (235) and sealing chamber (211) from adaptor extension ring (221). Remove sealing chamber "O" ring (421), cir clip (460) and v-seals (202) from sealing chamber (211). Loosen two (2) shaft sleeve set screws and remove shaft sleeve (133) and shaft sleeve "O" ring (423) from shaft (130).

18. For models SEK, SEL and SES, remove shaft end key (136) from shaft (130). Remove eight (8) bearing cover bolts and remove two (2) bearing covers (320) from bearing bracket (301). Remove bearing cover gasket (430) and oil seal (321) from bearing cover (320).

    Remove shaft (130) assembly from bearing bracket (301), deflector (440) and gland (213) (for gland packing). Jack off two (2) bearings (310) from shaft (130).

    Remove oil cover (330), oil gauge (331), bearing bracket drain plug (400) and support foot from bearing bracket (301).

19. For models SEMK, SEML and SEMS, remove motor bolts and remove frame adaptor (220) assembly from motor extension shaft (132). Remove motor adaptor extension ring bolts and motor frame adaptor bolts (where applicable). Remove motor adaptor extension ring (225) and motor frame adaptor (233) (where applicable) from frame adaptor (220).

    Remove motor extension shaft set screw and remove motor extension shaft (132) from flange-mounted motor (501).

REASSEMBLY PROCEDURE

Reassembly the pump by reversing the dismantling procedure, paying attention to the following:

1. Ensure gasket and "O" ring contact surfaces are clean.

2. When fitting the mechanical seal, the following points should be observed:
   (a) The mechanical seal seat and rotating faces must be handled with care, ensuring the rubbing faces are kept clean and free from scratches, otherwise they are unfit for use.

   (b) Oil outside of the rubber cap of stationary portion of mechanical seal (200) and recess in sealing chamber (211). Push seat completely into recess using a clean soft cloth.
   (c) Clean the sliding face with lint free cloths to make sure seal face is in a completely dry, dusk free and clean state.

(d) Place sealing chamber (211) assembly into casing cover (210). Install casing cover (210) assembly onto adaptor extension ring (221). Install casing cover gasket (431) (for torque flow impeller) or casing cover "O" ring (420) (for other types of impeller).
(e) Oil shaft (130) (for models SEK, SEL, and SES) or motor extension shaft (132) (for models SEMK, SEML and SEMS) surface where the rotary portion of mechanical seal (200) operates, slide the rotary portion of mechanical seal (200) onto shaft (130) or motor extension shaft (132) carefully by hand until the rubbing faces are seated on each other.
(f) Fit mechanical seal spring and spring cap (where applicable).
(g) Install impeller (120) to shaft (130) (for models SEK, SEL and SES) or motor extension shaft (132) (for models SEMK, SEML and SEMS) carefully by turning impeller (120) clockwise (viewed from the impeller end of the shaft). Make sure impeller hub end is seated correctly onto mechanical seal spring cap.

3. When fitting the gland packing, the following points should be observed:
   (a) Stagger all packing joints at 90^{o} interval when insert packings (201) into sealing chamber (211).
   (b) Install gland (213) into sealing chamber (211) until adequate leakage (normal gland leakage rate is between 20 to 30 drops/minute) is obtained during operation. Tighten two (2) gland nuts evenly if the leakage is excessive or vice versa.

LUBRICATION

For models SEK, SEL and SES

1. Check the oil level and condition periodically thru oil gauge (331) to be sure there is an adequate supply of oil.
2. Change the oil after 200 hours for new bearings, thereafter every 2000 operating hours or 3 months (whichever comes first), or sooner if the operating conditions or pump environment dictates.

3. Before filling with new oil, flush the bearing bracket (301) with hot, light oil, rotating the shaft (130) by hand to remove dirt and contaminants. After complete removal of the cleaning agents through bearing bracket drain hole, flush the bearing bracket (301) with proper lubricating oil to ensure oil quality after cleaning.

4. Remove oil cover (330) from bearing bracket (301), and refilling the bearing bracket (301) with proper lubricating oil through the oil connection hold until oil level is at the centre of the oil gauge (331), and replace oil cover (330).

5. High quality turbine oil which is non-detergent, and has anti-rust and anti-oxidant additive should be used. The grade of oil should be ISO viscosity grade 100 (between SAE grade 30 and 40).

For models SEMK, SEML and SEMS

The bearings in flange-mounted motor (501) are grease packed and sealed for life and need no further lubrication.

IMPELLER CLEARANCE SETTING

A change in pump performance may be noted over time by a drop in head or flow or an increase in power required. Performance can usually be renewed by adjusting the open impeller clearance; therefore pumps furnished with open impeller are specially designed to make open impeller close running clearance adjustments easy and accurate to extend pump performance life.

1. Slowly close discharge valve. For suction head conditions, close suction valve too. Shut down and lock out power to driver.

2. Observe the discharge pressure gauge to make sure casing (100) is not pressurized. Slowly open discharge valve to release pressure in casing (100) if required. Close back the discharge valve after depressurisation of the casing (100) has been done.

3. For models SEK, SEL and SES, remove coupling or driving belts guard, and disconnect couplings or pulleys. Loosen support foot (410) hold down bolts and nuts.

4. Loosen three (3) jam nuts (464) on three (3) clearance adjusting screws (451) and

back clearance adjusting screws (451) about two turns.

5. Tighten six (6) casing bolts evenly, drawing back pull-out assembly towards casing (100) assembly until impeller (120) touches the casing (100). Turn pump coupling or pulley (for models SEK, SEL and SES) or flange-mounted motor fan (for models SEMK, SEML and SEMS) by hand to ensure contact is made.

6. Using a feeler gauge, set the gaps between six (6) casing bolts and adaptor extension ring (221) evenly to 0.13mm.

7. Evenly back out back pull-out assembly using the three (3) clearance adjusting screws (451) until adaptor extension ring (221) contacts the six (6) casing bolts. Evenly tighten three (3) jam nuts (464).

8. Check shaft (130) (for models SEK, SEL and SES) or motor extension shaft (132) (for models SEMK, SEML and SEMS) for free turning. Now the clearance between impeller (120) and casing (100) is just about 0.13mm.

9. For models SEK, SEL and SES, tighten support foot (410) hold down bolts and nuts. Check shafts alignment and realign as required. Reconnect couplings or pulleys and reinstall coupling or driving belts guard.

RECOMMENDED SPARE PARTS

- Casing (100)
- Impeller (120)
- Expeller (121)
- Shaft (130)
- Motor Extension Shaft (132)
- Shaft Sleeve (133)
- Mechanical Seal (200)
- Packing (201)
- V-Seal (202)
- Casing Cover (210)
- Sealing Chamber (211)
- Bearing (310)
- Oil Seal (321)
- Casing Cover "O" Ring (420)
- Sealing Chamber "O" Ring (421)
- Shaft Sleeve "O" Ring (423)
- Bearing Cover Gasket (430)
- Casing Cover Gasket (431)
- Casing Cover Stud "O" Ring (492)

WARRANTY STATEMENT

Kewpump products are guaranteed to be free from defects in material and/or workmanship and to perform as advertised when properly installed, used and maintained per instructions in the manual. Should any part(s) prove defective within one (1) year from the date of purchase, it (they) will be replaced without charge provided the defective part(s) is returned to our factory or branch transportation charges prepaid. **Warranty is valid only when genuine Kewpump parts are used**.

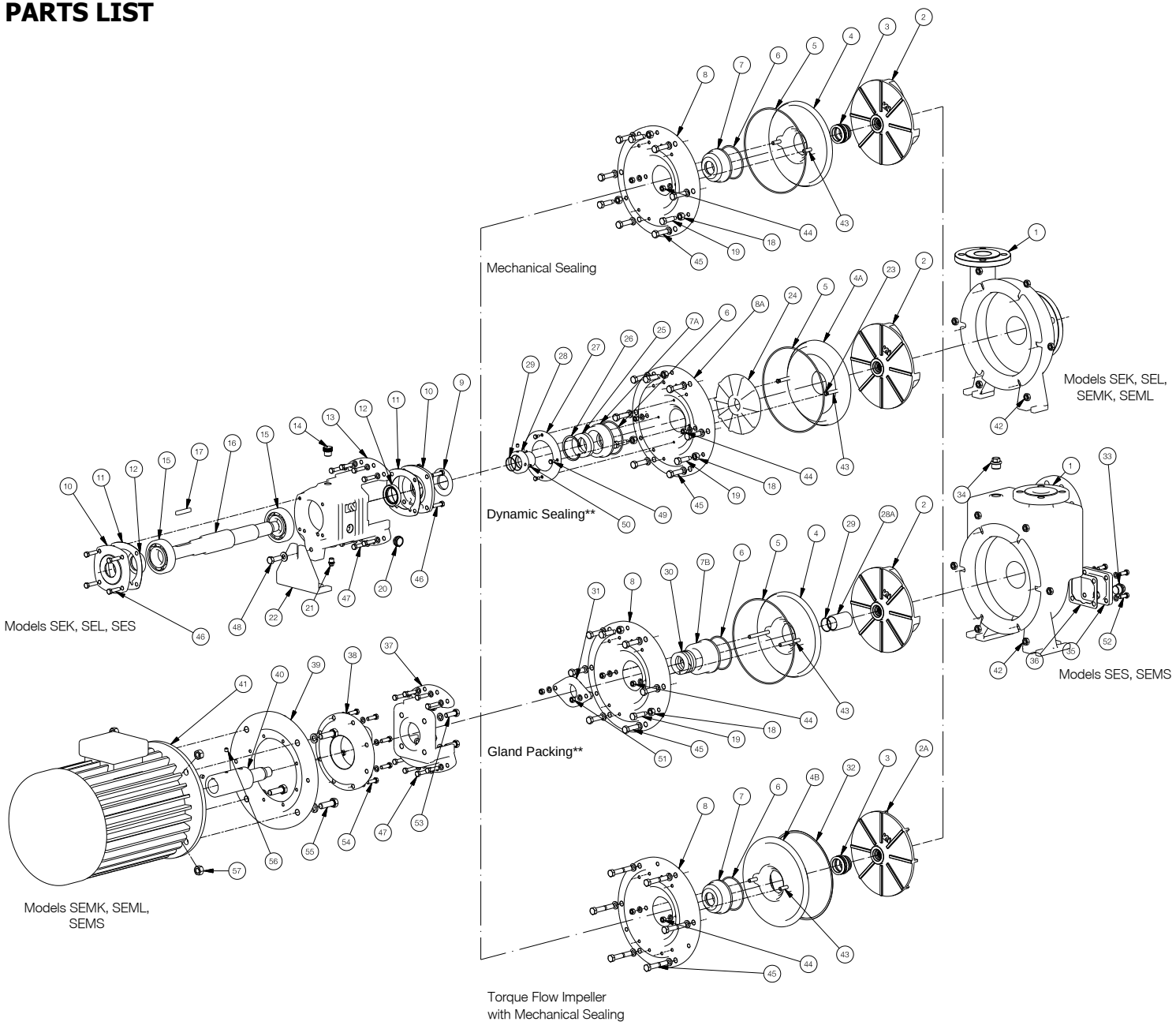
Kewpump (M) Sdn. Bhd. will not be responsible for labour charges, loss, or consequential damage of any kind of character caused by defective parts or for charges incurred in the replacement or repair of defective parts by Purchaser. This warranty does not apply when damage is caused by sand or abrasive materials, chemical deposits, corrosion, or wear and tear unless written approval is obtained in advance from Kewpump (M) Sdn. Bhd.. Careless handling and improper installation or use may void all warranties.

Drivers that are furnished with part of our own manufacture to make complete pumping units are warranted as to workmanship and materials for a period of six (6) months from date of purchase. Should any failure occur within six (6) months period, determination of warranty responsibility can be made only by the driver companies or their service shops. An inoperative unit should be taken to an authorised service shop and, according to the service shop's determination of the cause of failure, the actual repair will be either charged to the customer or put on a no charge basis. If the repair is on a no charge basis, it will not cover removal or reinstallation charges, mileage, service calls, or other charges not part of the actual repair.

Kewpump (M) Sdn. Bhd. must be notified of a failure within the warranty period and will then supply instructions to Customer or Dealer.

The forgoing states the Company's entire liability for any claim to damages whatever, and is made by Company and accepted by Purchaser in lieu of all other warranties, obligations, or liabilities expressed or implied.

PARTS LIST



Item No.	Part No.	Description	Standard Material
1	100	Casing	Stainless Steel
2	120.S	Semi-Open Impeller	Stainless Steel
2A	120.F	Torque Flow Impeller	Stainless Steel
3	200.A	Mechanical Seal	Carbon vs. Ceramic
4	210.M/G	Casing Cover for Mechanical Sealing and Gland Packing	Stainless Steel
4A	210.D	Casing Cover for Dynamic Sealing	Stainless Steel
4B	210.FM/G	Casing Cover for Torque Flow Impeller with Mechanical Sealing and Gland Packing	Stainless Steel
5	420	Casing Cover "O" Ring	Synthetic Rubber
6	421	Sealing Chamber "O" Ring	Synthetic Rubber
7	211.M	Sealing Chamber for Mechanical Sealing	Stainless Steel
7A	211.D	Sealing Chamber for Dynamic Sealing	Stainless Steel
7B	211.G	Sealing Chamber for Gland Packing	Stainless Steel
8	221.M/G	Adaptor Extension Ring for Mechanical Sealing and Gland Packing	Cast Iron
8A	221.D	Adaptor Extension Ring for Dynamic Sealing	Stainless Steel
9	440	Deflector	Synthetic Rubber
10	320	Bearing Cover	Cast Iron
11	430	Bearing Cover Gasket	Oil Proof Paper
12	321	Oil Seal	Synthetic Rubber
13	301	Bearing Bracket	Cast Iron
14	330	Oil Cover	Aluminium Alloy
15	310	Bearing	Steel
16	130	Shaft	Stainless Steel
17	136	Shaft End Key	Stainless Steel
18	464	Jam Nut	Steel
19	451	Clearance Adjusting Screw	Steel
20	331	Oil Gauge	Plastic Threaded
21	400	Bearing Bracket Drain Plug	Galvanise Steel
22	410	Support Foot	Cast Iron
23	492	Casing Cover Stud "O" Ring	Synthetic Rubber
24	121	Expeller	Stainless Steel
25	202	V-Seal	Synthetic Rubber
26	460	Clr Clip	Steel
27	235	Sealing Chamber Holding Bracket	Cast Iron
28	133.D	Shaft Sleeve for Dynamic Sealing	Stainless Steel
28A	133.G	Shaft Sleeve for Gland Packing	Stainless Steel
29	423	Shaft Sleeve "O" Ring	Synthetic Rubber
30	201	Packing	Cotton
31	213	Gland	Stainless Steel
32	431	Casing Cover Gasket	Asbestos Sheet
33	401	Casing Drain Plug	Stainless Steel
34	402	Venting Plug	Stainless Steel
35	217	Casing Drain Cover	Stainless Steel
36	439	Casing Drain Cover Gasket	Synthetic Rubber
37	220	Frame Adaptor	Cast Iron
38	233*	Motor Frame Adaptor	Cast Iron
39	225	Motor Adaptor Extension Ring	Cast Iron
40	132	Motor Extension Shaft	Stainless Steel
41	501	Flange-Mounted Motor	--
42	–	Casing Nut	Steel
43	–	Casing Cover Stud	Steel
44	–	Casing Cover Nut	Steel
45	–	Casing Bolt	Steel
46	–	Bearing Cover Bolt	Steel
47	–	Adaptor Extension Ring Bolt	Steel
48	–	Support Foot Bolt	Steel
49	–	Sealing Chamber Holding Bracket Bolt	Steel
50	–	Shaft Sleeve Set Screw	Steel
51	–	Gland Nut	Steel
52	–	Casing Drain Cover Bolt	Steel
53	–	Motor Frame Adaptor Bolt	Steel
54	–	Motor Adaptor Extension Ring Bolt	Steel
55	–	Motor Bolt	Steel
56	–	Motor Extension Shaft Set Screw	Steel
57	–	Motor Nut	Steel

* Only available in models SEMK, SEML and SEMS with motor horsepower 15HP or 20HP
** Only available in models SEK, SEL and SES