Service instructions

SP 1A - SP 5A

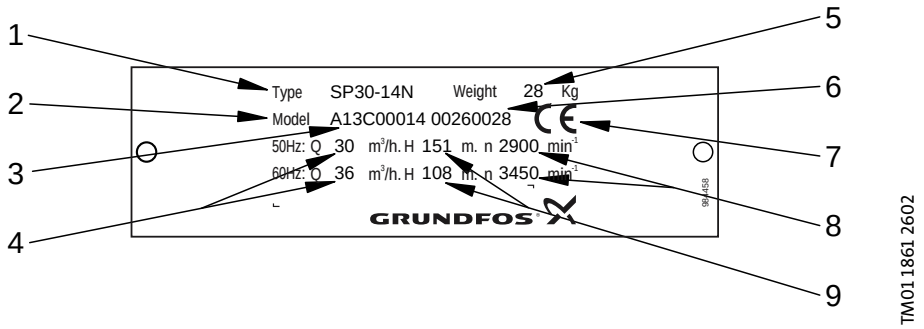
50/60 Hz

1/3~

Contents

1. Type identification

1.1 Nameplate



Pos.	Designation	Pos.	Designation
1	Type designation	5	Weight
2	Model	6	Serial number
3	Product number	7	CE mark
4	Rated flow rate	8	Speed
		9	Head at rated flow rate

1.2 Type key

Example	SP	1	A	- 12	N

Submersible pump

Rated flow rate in m³/h at maximum efficiency, 50 Hz

Type range

Number of stages

Code for materials

Blank = W.-Nr. 1.4301 (AISI 304, SUS 304)

N = W.-Nr. 1.4401 (AISI 316, SUS 316)

2. Torques and lubricants

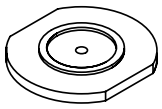
Pos.	Designation	Dimension	Torque [Nm]	Lubricant
11	Nut		7.5 - 10	Gardolube L6034 or O-ring grease
19	Screw	M8	15	
	Nut	M8	18	
19a	Nut	M8	18	
	Screw	½" UNF	70	
19b	Nut	M8	9	

Gardolube L6034, part no. SV9995 (1 l).

3. Service tools

3.1 SP 1A, SP 1.5A

A

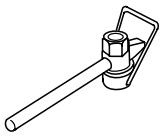


B

C

D

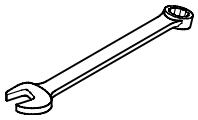
E



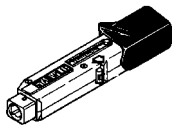
J

K

L



M



N

O

Special tools

Pos.	Designation	Motor	For pos.	Description	Part no.	
					Pump with splined shaft	Pump with cylindrical shaft
A	Mounting plate	4"			SV0049	SV0049
B	Spline pin and screw	4"			SV0226	
C	Spacing pipe	4"		ø13/ø8.5 x 39.5		SV0006
D	Screw with washer	4"		M8		SV0074
E	Spanner	4"				SV0182
J	Mounting punch	4"			SV7925	SV7925

Standard tools

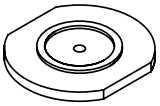
Pos.	Designation	Motor	For pos.	Description	Part no.	
					Pump with splined shaft	Pump with cylindrical shaft
K	Hexagon key	4"	D	6 mm		ID1204
L	Ring/open-end spanner	4"	19, 19a, 19b	M8 - 13 mm	SV005	SV0055

Torque tools

Pos.	Designation	Motor	For pos.	Description	Part no.	
					Pump with splined shaft	Pump with cylindrical shaft
M	Torque wrench	4"		4-20 Nm, 9 x 12	SV0292	SV0292
N	Ring insert tool	4"	19, 19a, 19b	M8 - 13 mm, 9 x 12	SV0294	SV0294
O	Open-end insert tool	4"	M, E	19 mm, 9 x 12		SV0619

3.2 SP 2A, SP 3A, SP 5A

A

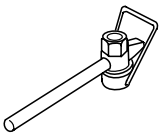


B

C

D

E



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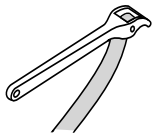
G

H



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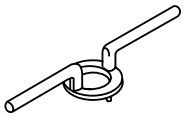
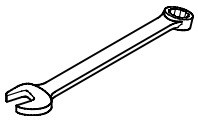


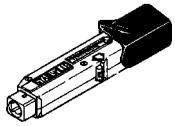
J

K

L



M



N

O

Special tools

Pos.	Designation	Motor	For pos.	Description	Part no.	
					Pump with splined shaft	Pump with cylindrical shaft
A	Mounting plate	4" - 6"			SV0049	SV0049
B	Spline pin and screw	4"			SV0226	
C	Spacing pipe	4"		ø13/ø8.5 x 39.5		SV0006
		6"		ø22/ø10.5 x 71		SV0390
D	Hex. socket head screw	4"		M8		SV0074
		6"				SV0183
E	Spanner	4" - 6"				SV0182
F	Punch	4"	6	Up to and incl. p.c. 9603		SV0281
G	Punch	4"	6	Up to and incl. p.c. 9603		SV0282
H	Strap wrench	6"		48", for pumps in sleeve		SV0853
I	Special key	4"		For pumps in sleeve		SV0288
J	Mounting punch*	4"				SV7925
		6"				SV7924

* Used as a guide when engaging the motor shaft with the pump shaft. The punch is removed before the final assembly of pump.

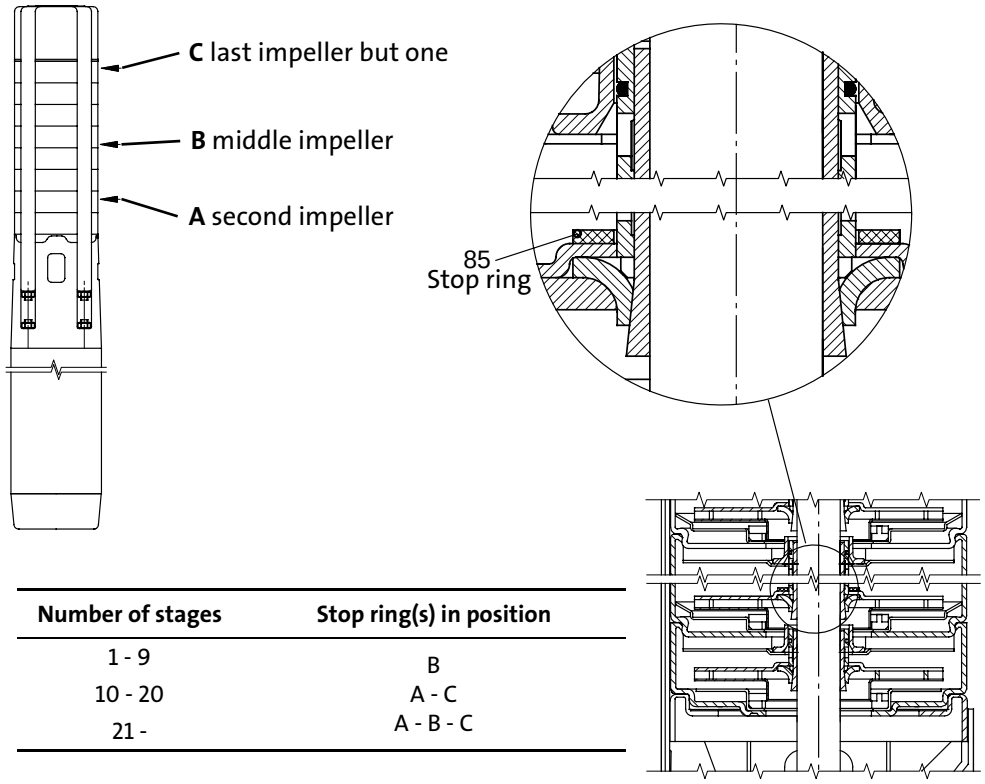
Standard tools

Pos.	Designation	Motor	For pos.	Description	Part no.	
					Pump with splined shaft	Pump with cylindrical shaft
K	Key for hex. socket head screw	4" - 6"	D	6 mm		ID1204
L	Ring/open-end spanner	4" - 6"	19	M8 - 13 mm	SV0055	SV0055
		4"	19b	M8 - 13 mm	SV0055	
		4"	19a	M8 - 13 mm	SV0055	SV0055
		6"		M12 - 19 mm		SV0054

Torque tools

Pos.	Designation	Motor	For pos.	Description	Part no.	
					Pump with splined shaft	Pump with cylindrical shaft
M	Torque wrench	4" - 6"		4-20 Nm, 9 x 12	SV0292	SV0292
		6"		20 - 100 Nm, 9 x 12		SV0269
N	Ring insert tool	4"	19, 19a, 19b	M8 - 13 mm, 9 x 12	SV0294	SV0294
		6"		M12 - 19 mm, 9 x 12		SV0271
O	Open-end insert tool	4" - 6"	M, E	19 mm, 9 x 12		SV0619

4. Fitting the stop ring in pumps with cylindrical shaft



Number of stages	Stop ring(s) in position
1 - 9	B
10 - 20	A - C
21 -	A - B - C

TM01 3710 4598

5. Dismantling and assembly

5.1 General information

If the pump is pulled out of the well, for instance due to reduced head/flow rate, it is important to check both the pump and the submersible motor.

Position numbers of parts (digits) refer to exploded views, sectional drawings and parts lists; position numbers of tools (letters) refer to 3. Service tools.

5.1.1 Before dismantling

- Order the necessary service kits.
- Obtain a spare pump, if necessary.
- Disconnect the electricity supply to the motor.
- Close the isolating valves, if fitted.
- *Remove the electric cable in accordance with local regulations*.

5.1.2 Before assembly

Gaskets and O-rings should always be replaced when the pump is overhauled.

- Clean and check all parts.
- Replace defective parts by new parts.

5.1.3 During assembly

- Lubricate and tighten screws and nuts to the torque stated, see 2. Torques and lubricants.

5.2 Dismantling

5.2.1 Dismantling the pump, motor and impeller

1. Remove the screws pos. 18a and push the cable guard pos. 18 free of the slots in the discharge piece.
2. Remove the cable guard by pulling it free of the two flaps of the suction interconnector pos. 14.
3. Remove the nut pos. 19a.
4. Pull the pump body off the motor.
5. Fit the spline pin and screw pos. B to the mounting plate pos. A. Make sure that the mounting plate is positioned correctly so that the recess fits the suction interconnector.
6. Tighten the mounting plate in the vice.
7. Place the pump body on the mounting plate.
8. Remove the screws pos. 19 and the straps pos. 71.
9. Dismantle the pump body in the following order:

   - discharge piece pos. 1b
   - valve casing complete pos. 1
   - nut pos. 19b
   - washer pos. 76
   - impeller pos. 13.

10. Then remove the chamber pos. 4 or pos. 9.

5.2.2 Removing the shaft and shaft seal

1. Lift the shaft pos. 16 with coupling free of the suction interconnector and bottom chamber pos. 10.
2. Pull the priming disc pos. 64 off the shaft.
3. Lift the bottom chamber with strainer pos. 10 (as from p.c. 9134) and the suction interconnector pos. 14 free of the mounting plate pos. A. Replace the bearing pos. 8 if it is damaged. Press the bearing together and push it out of the chamber.
4. Replace the valve seat pos. 3 if the rubber is hard or pressed together so that the valve cup touches the metal.
5. Pull the valve guide pos. 70 free from the three points where it is positioned under the recess of the valve casing.
6. Pull the guide and valve cup pos. 2 out of the valve casing.
7. Push the valve seat pos. 3 free of the valve casing by inserting a screwdriver between the valve seat and the valve casing.
8. Push the top bearing pos. 6 down and out of the valve casing if the bearing is damaged. (As from p.c. 9432.)
9. Replace the neck ring pos. 7 if the rubber is hard or worn, as wear will result in a reduction of the pump performance.
10. Push the neck ring free of the chamber by inserting a screwdriver between the neck ring and the bottom of the chamber.

5.3 Assembly

Moisten the various rubber parts with soapy water before fitting them.

5.3.1 Fitting the shaft and shaft seal

1. Push the neck ring pos. 7 home in the chamber with the smooth surface uppermost.
2. Press the top bearing pos. 6 home in the valve casing pos. 1 from the underside.
3. Fit the valve cup pos. 2 on the valve seat.
4. Position the valve guide pos. 70 so that the recess for the valve cup points downwards (against the valve cup) and press the valve cup down so that it engages with the recess of the valve casing.
5. Press the neck ring pos. 3 home in the valve casing with the plane surface downwards.
6. Pumps with splined shaft:
   Press a new bearing pos. 8 into the chamber pos. 9 from the underside so that the largest diameter of the bearing rests against the bottom of the chamber.
7. Place the suction interconnector pos. 14 on the mounting plate.
8. Press the bottom chamber with strainer pos. 10 into the suction interconnector.
9. Fit the shaft pos. 16 with coupling on the spline pin pos. B.

5.3.2 Fitting the pump, motor and impeller

1. Fit the impeller pos. 13 so that it engages with the neck ring pos. 7.
2. Assemble the pump body in the following order:

   - chamber pos. 9
   - impeller pos. 13 until the last impeller has been fitted.

   Note: As from p.c. 9133 up to and including p.c. 9430 the pump included a chamber with stop ring pos. 4. This chamber is fitted as the last chamber before valve casing pos. 1. See 4. Fitting the stop ring in pumps with cylindrical shaft.
3. Fit the priming disc pos. 76 with the three hollows upwards against the top bearing pos. 6.
4. Fit the self-locking nut pos. 19b.
5. Turn the top impeller so that it engages with the splined shaft.
6. Tighten the nut with 9 Nm.
7. Check that the chambers can be raised and lowered, as it is important that the nut is tightened against the impellers/spacers.
8. Fit valve casing complete pos. 1.
9. Fit the discharge piece pos. 1b and turn it so that the slots for the cable guard is aligned with the cable opening of the suction interconnector.
10. Lubricate the threads of the straps with Gardolube L6304 or O-ring grease.
11. Fit the straps pos. 17, washers pos. 71 and screws pos. 19 and tighten with 18 Nm.
12. Remove the pump body from the mounting plate.
13. Check the axial clearance.

Shaft im bottom position = Max. 37.5 +0/-1 mm
Shaft in top position = Min. 38.4 +1/-0 mm

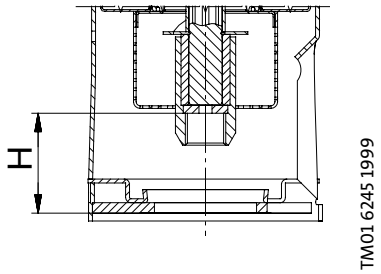


Fig. 1 Clearance of the pump shaft

14. Check the shaft height of the motor. If the shaft height does not comply with the measurement stated, it should be adjusted, or it may be necessary to replace the axial bearing.

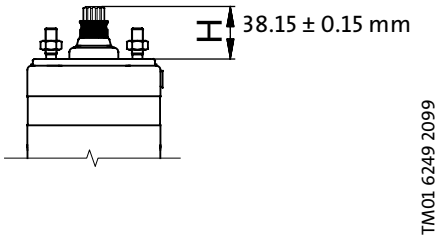


Fig. 2 Shaft height of the motor

15. Fit the pump body to the motor so that the cable opening in the suction interconnector fits over the motor socket.
16. Lubricate the nuts pos. 19a holding the pump/motor and tighten them diagonally with 18 Nm.
17. Position the motor cable up the side of the pump so that it lies flat without twisting.
18. Place the cable guard pos. 18 over the motor so that it engages with the flaps of the suction interconnector and the slits of the discharge piece, or fasten it in both ends with the screws pos. 18a.