Service instructions

SP 8A

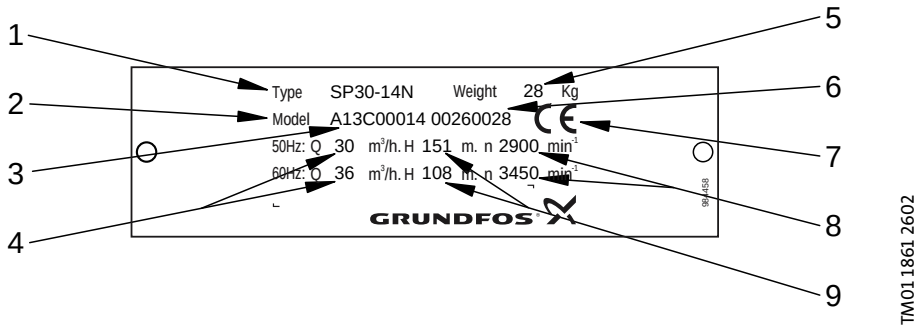
50/60 Hz

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	8	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)

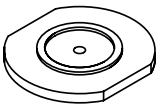
2. Torques and lubricants

Pos.	Designation	Dimension	Torque [Nm]	Lubricant
11	Nut	22 mm	22	Gardolube L6034 or o-ring grease
		27 mm	30	
19	Nut	M8	18	
19a	Nut	M8	18	
		M12	70	

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

3. Service tools

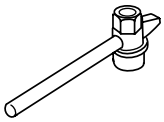
A



B

C

D



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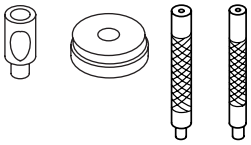
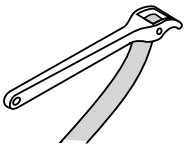


F

G

H

I



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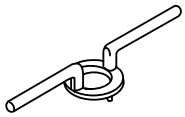
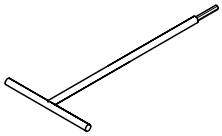


K

L

M



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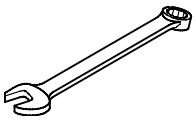

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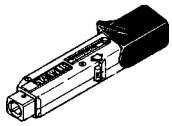


P

Q

Special tools

Pos.	Designation	Motor	For pos.	Description	Part no.
A	Mounting plate	4" - 6"	14, 14a		SV0049
B	Spacing pipe	4"		ø13/ø8.5 x 39.5	SV0008
		4"		ø22/ø10.5 x 71	SV0390
C	Screw with washer	4"		M8 x 65	SV0074
		6"		M8 x 110	SV0183
D	Spanner	4" - 6"	11, 12	22 mm	SV0187
		6"		27 mm	SV0217
E	Assembly/dismantling kit	4" - 6"	6, 8		SV0280
F	Punch*	4" - 6"	6, 8	Dismantling	SV0281
G				Assembly	SV0282
H	Holder for chamber	4" - 6"			SV0283
I	Strap wrench		102	48", for pumps in sleeve	SV0853
J	Special key		100, 101	For pumps in sleeve	SV0288
K	Mounting punch	4"			SV7925
		6"			SV7924

* Used for pos. 8 up to and including p.c. 9443 and for pos. 6 up to and including p.c. 9603.

Standard tools

Pos.	Designation	Motor	For pos.	Description	Part no.
L	Hexagon key	4" - 6"	C	6 mm	ID1204
M	Tee key	6"	24	3 mm	SV0153
N	Ring/open-end spanner		19a, 19	13 mm	SV0055
			19a	19 mm	SV0054

Torque tools

Pos.	Designation	Motor	For pos.	Description	Part no.
O	Torque wrench			4-20 Nm, 9 x 12	SV0292
				20-100 Nm, 9 x 12	SV0269
P	Ring insert tool		19a, 19	13 mm, 9 x 12	SV0294
			19a	19 mm, 9 x 12	SV0271
Q	Open-end insert tool*		D, O	19 mm, 9 x 12	SV0619
				22 mm, 9 x 12	SV0622

* Used for pos. D, spanner SV0217.

4. Dismantling and assembly

4.1 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.

4.1.1 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*.

4.1.2 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.

4.1.3 During assembly

- Lubricate and tighten screws and nuts to the torque stated in section 2. Torques and lubricants.

4.2 Dismantling

4.2.1 Removing the motor of pumps without sleeve

4" motor

1. Bend out the two flaps of the support pos. 18 holding the cable guard to the pump (used only for certain numbers of stages).
2. Free the cable guard pos. 18 from the two flaps of the suction interconnector pos. 14.
3. Push out the cable guard to free the recess of the cable guard from the suction interconnector and pull the cable guard upwards along the pump and free of the two flaps of the suction interconnector and the valve casing pos. 1/discharge chamber pos. 1a.

6" motor

1. Remove one of the two straps pos. 17 close to the cable guard pos. 18.
2. Pull the cable guard holder free of the strap.
3. Remove the cable guard.
4. Remove the nuts holding the pump and motor together.

4.2.2 Removing the motor of pumps with sleeve

4" and 6" motor

1. Remove the screws pos. 18a together with the rubber guard pos. 23 and the cable guard pos. 18.
2. Remove the eye bolt pos. 105 and the screws pos. 103.
3. Screw the counter flange pos. 100 out of the sleeve pos. 102 (right-hand thread) using the special key pos. J.
4. Remove the screws pos. 103 and screw the clamping flange pos. 101 out of the sleeve using the special key pos. J.
5. Screw the sleeve pos. 102 off the suction interconnector with connecting piece pos. 14a (right-hand thread) using the strap wrench pos. I.
6. Remove the nuts holding the pump and motor together.
7. Pull the pump body off the motor.

4.2.3 Dismantling the pump body

1. Fit the mounting plate pos. A to the suction interconnector pos. 14 or 14a using the spacing pipe pos. B and the screw pos. C. The recess of the mounting plate and that suction must fit into each other.
2. Tighten the mounting plate in a vice.
3. Remove the nuts pos. 19 together with the straps pos. 17 and the support pos. 18b, if fitted.
4. **Pumps up to and including p.c. 9603:**
   Remove the valve casing pos. 1, valve cup and top chamber pos. 4. In large pumps, these parts are combined in a discharge chamber, but it is no longer available. These parts are replace by the following parts: Valve casing pos. 1 and chamber pos. 4.
   Pumps as from p.c. 9604:
   Remove the valve casing pos. 1 and chamber pos. 4.
5. Remove the split cone nut pos. 11 (right-hand thread) using the spanner pos. D.
6. Knock the split cone pos. 12 down against and free of the impeller pos. 13 using the spanner pos. D.
7. Remove the impeller pos. 13, split cone pos. 12 and the chamber pos. 9.
8. Dismantle the pump body in the following order:
   Nut, impeller, split cone and chamber until all chambers have been removed.
9. Lift the suction interconnector pos. 14 or 14a off the mounting plate.
10. Pull the strainer out of the suction interconnector. The pump body has now been dismantled.
11. Remove the screw pos. C.

Note: The priming screw of pumps produced up to and including p.c. 9643 cannot be replaced, as a new type was introduced.

4.2.4 Removing the top bearing and valve seat

Replace the top bearing pos. 6 and bearing pos. 8 if they are damaged.

Pumps up to and including p.c. 9603

1. Drive out the bearing from the bottom of the chamber using the service tool pos. E.
2. Clean the hole for the bearing and press in a new bearing from the top of the chamber.
3. Replace the valve seat pos. 3 if the rubber is hard or pressed together so that the valve cup touches the metal. Loosen the valve seat by inserting a screwdriver between the valve seat and the bottom of the chamber. Clean the recess edge and press in a new valve seat. The rubber side must be upwards.
4. Replace the discharge chamber pos. 1a with valve casing complete pos. 1 and chamber pos. 4 if it is defective.

Pumps as from p.c. 9604

1. Press the top bearing pos. 6 together and push it out of the valve casing.
2. Clean the hole for the bearing and moisten a new bearing with soapy water before pressing it into the valve casing.

4.2.5 Replacing the neck ring

If the rubber of the neck ring pos. 7 is hard or worn, it may result in a considerable reduction of the pump performance.

1. Push the neck ring free of the chamber by insert a screwdriver between the neck ring and the bottom of the chamber.
2. Clean the recess edge and press in a new neck ring. The text "This side up" must be upwards.

4.3 Assembly

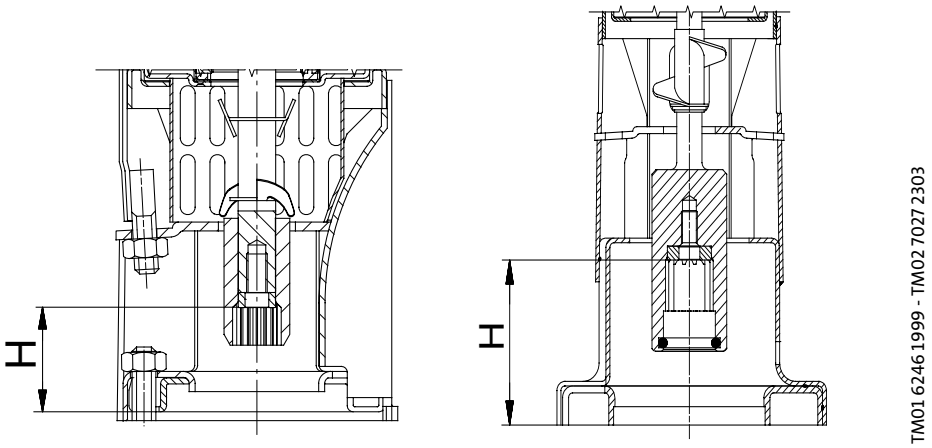
4.3.1 Assembling the pump body

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

1. Fit the shaft with coupling pos. 16 to the mounting plate pos. A using the spacing pipe pos. B and screw pos. C. Make sure that the mounting plate is positioned correctly so that the recess fits the suction interconnector.
2. Tighten the mounting plate pos. A in a vice.
3. **Pumps up to and including p.c. 9643:**
   Press the priming screw with pipe down on the shaft if it has been removed. Make sure that the end of the pipe without collar is uppermost.
   4" motor:
   Press the priming screw down to a distance of 1 mm from the coupling.
   6" motor:
   Press the priming screw down to a distance of 6-7 mm from the spacing pipe at the bottom of the shaft. For pumps in sleeve the distance must be 135 mm. The priming screw must be firmly fixed to the shaft.
4. Fit the strainer pos. 15 in the suction interconnector pos. 14. In the case of 4" suction interconnectors, the inclined face on the outside of the strainer must face the cable opening of the suction interconnector.
5. Slide the suction interconnector pos. 14 (or suction interconnector with connecting piece pos. 14a - used only for pumps in sleeve) over the shaft so that the recess of the suction interconnector engages with the recess of the mounting plate pos. A.
6. Fit the bottom chamber pos. 10 with neck ring and press it home in the recess of the suction interconnector.
7. Fit the split cone pos. 12, impeller pos. 13 (with the skirt pointing towards the chamber) and the split cone nut pos. 11.
8. Tighten the split cone nut by two turns (right-hand thread).
9. Press the impeller home in the chamber using the spanner pos. D.
10. Tighten the split cone nut pos. 11 with 20 Nm (22 mm) or 30 Nm (27 mm). See 2. Torques and lubricants.
11. Continue the assembly in the following order until the last impeller has been fitted:
    Chamber pos. 9 with neck ring and bearing, split cone pos. 12, impeller pos. 13 and split cone nut pos. 11.
12. **Pumps up to and including p.c. 9603:**
    Fit the top chamber pos. 4 with valve seat and top bearing, valve cup and valve casing pos. In large pumps these part are combined in a discharge chamber.
    Pumps as from p.c. 9604:
    Fit the chamber pos. 4 and valve casing complete pos. 1.
13. Turn the valve casing/discharge chamber so that the holes for the steel straining wire are located 180° opposite to the motor cable (cable opening in the suction interconnector) and that the slots for the straps are aligned to the points where the straps are attached to the suction interconnector.
14. Lubricate the threads of the straps pos. 17 with Gardolube L6034 and fit the straps and nuts.
15. If the cable guard was fitted with the support pos. 18b, push the cable guard with support under the straps in the middle of the pump above the cable opening of the suction interconnector.
16. Fit and tighten the nuts pos. 19 diagonally to 18 Nm.
17. Remove the pump body from the mounting plate pos. A.

4.3.2 Checking and fitting the pump body on the motor

1. Check the axial clearance.



4" motor

Shaft in bottom position: H = 37.15 +0/-1 mm
Shaft in top position: H = 40.15 +1/-0 mm

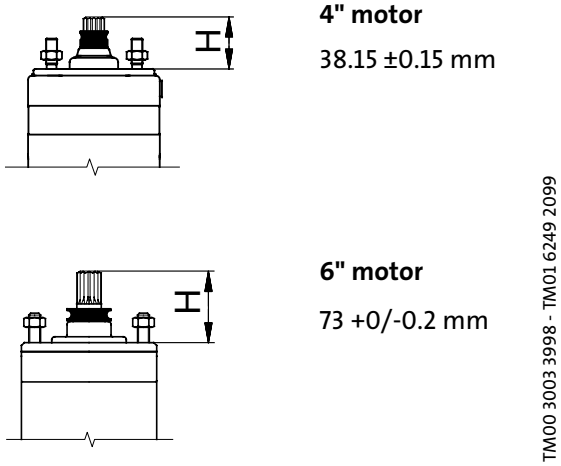
6" motor

Shaft without coupling in bottom position: H = 78.1 +0/-1 mm
Shaft without coupling in top position: H = 81.1 +1/-0 mm

Shaft with coupling in bottom position: H = 71.8 +0/-1 mm
Shaft with coupling in top position: H = 74.8 +1/-0 mm

4.3.3 Pumps with separate coupling

1. Clean and fit the coupling and press it home against the pump shaft. The parallel key must be fitted correctly before the screws in the coupling are tightened.
2. If there is no axial clearance or it is lower than the measurement stated, the pump has not been assembled correctly, and it should be checked.
3. Check the shaft height of the motor before fitting the pump body.



4" motor

38.15 ±0.15 mm

6" motor

73 +0/-0.2 mm

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.

4. Fit the pump body to the motor so that the cable opening in the suction interconnector fits over the motor socket.
5. Lubricate and tighten the nuts pos. 19a holding the pump and motor together diagonally to 18 Nm (M8) or 70 Nm (M12). See 2. Torques and lubricants.

4.3.4 Assembling pumps without sleeve

1. Position the motor cable up the side of the pump so that it lies flat without twisting.

4" motor

1. Place the cable guard over the motor cable so that it engages with the flaps of the valve casing and the suction interconnector.
2. Press the cable guard against the pump at the same time as the two flaps of the support are pushed over and into the grooves of the cable guard if the support pos. 18b is used.

6" motor

1. Remove one of the two straps close to the motor cable socket before fitting the cable guard pos. 18.
2. Slide the cable guard holder under the strap.
3. Fit the rubber guard pos. 23 at the top of the cable guard.
4. Fit and tighten the strap with 18 Nm.

4.3.5 Assembling pumps with sleeve

1. Pull/push the sleeve carefully over the pump (the two end of the sleeve are identical).
2. Centre the sleeve around the pump to facilitate the assembly.
3. Screw the sleeve (right-hand thread) on the connecting piece of the suction interconnector and tighten it by means of the strap wrench pos. I.
4. Screw the clamping flange pos. 101 into the sleeve.
5. *Make sure that the recess of the clamping flange engages with the flange of the discharge chamber (centres the pump in the sleeve).*
6. Tighten the clamping flange so that the screws pos. 103 can fitted and tightened in the flange of the discharge chamber.
7. Fit and tighten the screws pos. 103.
8. Screw the counter flange pos. 100 into the sleeve. The counter flange must stick 2-3 mm out of the sleeve.
9. Fit and tighten the screws pos. 103 in the clamping flange pos. 101.
10. Screw the eye bolts pos. 105 into the counter flange.
11. Position the motor cable up the side of the sleeve so that it lies flat without twisting.
12. Place the cable guard pos. 18 over the motor cable and push it so that it engages *with the flaps of the suction interconnector.*
13. Fit the rubber guard pos. 23 at the top of the cable guard.
14. Fit the screws pos. 18a holding the cable guard to the sleeve.