INSTRUCTIONS FOR SPARE PARTS

Spare parts for
DESMI vertical "in-line" centrifugal pump

NSL Spacer

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Special pump No. .................................
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1. DISMANTLING (13 combination) NSL Spacer

1.1 ACCESS TO IMPELLER

The numbers in brackets refer to the position numbers on the assembly drawing.

Dismantle guard (69).

ø215/265

Remove Allen screws (77) between coupling part motor (71) and spacer (72) and the screws (76), which hold the flexible coupling (74) to the coupling part pump (70). It is not necessary to remove the screws (also 76) which hold the flexible coupling to the spacer. After a vertical pull downwards take out the spacer (72). Loosen the pointed screw (73) and pull the coupling part pump (70) off the shaft. Dismantle the copper pipe (58). Remove Allen screws (22) which hold the shaft seal cover (20) to the pump casing. Remove the shaft seal cover from the pump casing by means of the pointed screws (86). The bearing housing with shaft and impeller can now be lifted up from the pump as a unit, and the impeller can be inspected.

ø330/415/418/525

Remove Allen screws (76) at each end of the coupling, and remove the spacer (72). Loosen the pointed screw (73) and pull the coupling part pump (70) off the shaft. Dismantle the copper pipe (58). Remove set screws (22) with washers (23) which hold the shaft seal cover to the pump casing. Remove the shaft seal cover from the pump casing by means of the pointed screws (86). The shaft seal cover and the bearing housing with shaft and impeller can now be lifted up from the pump as a unit, and the impeller can be inspected.

1.2 DISMANTLING SHAFT SEAL

ø215/265

Remove nut (6). Pull off the impeller, and remove sunk key (9). Remove Allen screws (19), which hold the bearing housing to the shaft seal cover, pull shaft seal cover and bearing housing apart, by which the shaft seal (10) and water deflector (11) are pulled off the shaft.

ø330/415/418/525

Remove set screw (6). Pull off the impeller, and remove sunk key (9). Remove set screws (19), which hold the bearing housing to the shaft seal cover, pull shaft seal cover and bearing housing apart, by which the shaft seal (10) is pulled off the shaft.

1.3 DISMANTLING SEAT

Press out the seat from behind the shaft seal cover.

1.4 DISMANTLING SHAFT WITH BEARINGS

Before dismantling the shaft with bearings, remove the sunk key (16). The shaft can now be pulled out of the bearing housing allowing inspection of the bearings.
1.5 INSPECTION

When the pump has been dismantled, check the following parts for wear and damage:

- Sealing rings/impeller: Max. clearance 0.4-0.5 mm measured in radius.
- Shaft seal/shaft seal cover: Check the seat for flatness and cracks.
- Check the rubber parts for elasticity.
- Bearings: Replace in case of wear and noise.

2. ASSEMBLING

2.1 FITTING SEALING RINGS

When fitted, the sealing ring (4) in the pump casing (1) is to bear against the shoulder of the pump casing.

ø330/415/418/525
When fitted, the sealing ring (27) in the shaft seal cover (20) is to bear against the shoulder of the shaft seal cover.

2.2 FITTING SHAFT WITH BEARINGS

Lead shaft with bearings into the bearing housing. Fit sunk key (16).

ø330/415/418/525
Fit cover under bearing (26).

2.3 FITTING WATER DEFLECTOR

ø215/265
Assemble the bearing housing and the shaft seal cover. Lead the water deflector (11) over the shaft until it touches the shaft seal cover and then further 1-1.5 mm into the shaft seal cover.

ø330/415/418/525
Lead the water deflector (11) over the shaft until it touches the cover under bearing (26) and then further 1-1.5 mm towards the cover under bearing. Assemble the bearing housing and the shaft seal cover.

2.4 FITTING SHAFT SEAL

Before fitting the seat, clean the recess in the shaft seal cover. When fitting the seat, remove the protective coating without scratching the lapped surface. Dip the outer rubber ring of the seat into soapy water. Now press the seat into place with the fingers and check that all parts are correctly imbedded.

If it is necessary to use tools for assembling, then protect the sliding surface of the seat to prevent it from being scratched or cut. Lubricate the inner diameter of the slide ring rubber bellows with soapy water and push it over the shaft. The use of a fitting bush as shown on the assembly drawing is recommended to avoid that the rubber bellows is cut.

Push the slide ring over the shaft with the hand. If the rubber bellows is tight, use a fitting tool and take
care that the slide ring is not damaged. If the carbon ring is not fixed, it is important to check that it is fitted correctly, i.e. the chamfered/lapped side is to face the seat. The carbon ring can be held by a little grease.

When using soapy water on the shaft, the bellows will settle and seat in about 15 minutes, and until then tightness should not be expected. After start, check by viewing the leak hole at the bottom of the bearing housing that there are no leaks.

2.5 FITTING IMPELLER

Fit the sunk key in the shaft and lead the impeller towards the shoulder of the shaft. Take care that the ring at the end of the shaft seal spring locates in the recess of the impeller. Secure the impeller with washers (7 and 8) and a nut (ø215/265) or a set screw (ø330/415/525) or a nut and stud (300-418/350-525).

2.6 FITTING BEARING HOUSING AND SHAFT SEAL COVER

Place the O-ring (21) between pump casing and shaft seal cover on the shaft seal cover where it can be held with a little grease. However, check the material of the O-ring first. As standard the material is nitrile, but it might be EPDM which will be damaged by mineral grease. Use soft soap or silicone grease for EPDM. Fit and fasten bearing housing and shaft seal cover. Screw the pointed screw (86) back into the shaft seal cover before tightening. Insert the copper pipe (58).

2.7 SHAFT

When the pump has been assembled, check that the shaft rotates freely.

2.8 FITTING COUPLING

ø215/265

Fit the flexible coupling (74) to the spacer (72) by means of the Allen screws (76) which are tightened up with torque according to the table below. Check that the aluminum insert in the rubber part does not rotate during tightening as it may damage the coupling. To prevent this, apply a little grease to the bolts under the bolt head. The Allen screws (76) can be used again and up to 3 times before they are to be replaced by new original bolts to secure the locking function. Do not use Loctite as it will damage the rubber element.

Fix the spacer with the flexible coupling to the coupling part motor (71) by means of the Allen screws (77) and lock nuts (79), also with torque according to the table below. In order to secure the bolt connection fit a new lock nut or secure with a locking means.

Check that the distance, cf. the table below, between spacer and coupling part pump corresponds to the actual coupling size which appears from the coupling element itself. Fit the flexible coupling to the coupling part pump by means of the Allen screws (76) which are to be greased a little under the bolt head and tightened with the torque stated.

<table>
<thead>
<tr>
<th>Thread</th>
<th>Torque</th>
<th>Coupling element</th>
<th>Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>M8</td>
<td>25 Nm</td>
<td>V1700-0832</td>
<td>4 mm</td>
</tr>
<tr>
<td>M10</td>
<td>50 Nm</td>
<td>V1700-1042</td>
<td>4 mm</td>
</tr>
<tr>
<td>M12</td>
<td>90 Nm</td>
<td>V1700-1242</td>
<td>6 mm</td>
</tr>
<tr>
<td>M14</td>
<td>140 Nm</td>
<td>V1700-1442</td>
<td>6 mm</td>
</tr>
</tbody>
</table>
ø330/415/418/525
Check Allen screws (76) and coupling bushes (74) for damage and clean these with a cloth. Replace them in case of damage.

Remove grease from the screw threads by means of benzene, and clean the threaded holes in the coupling halves for pump and motor by means of pressure air. If new coupling halves are mounted, also remove grease from the threaded holes by means of benzene.

Place coupling bushes (74) in the top holes of the spacer (72), the chamfering on the bushes is to face downwards. Place the coupling bush in the bottom holes of the spacer, the chamfering on the bushes is to face upwards. Hold the hand under the spacer and the bottom coupling bushes and carefully push the spacer into place.

Apply Loctite type 242 on the Allen screws (Loctite 242 is recommended as it will allow dismantling) and tighten all screws with the hand. It might be necessary to push the spacer a little until the screws have located in the thread and you feel that the spacer has found the right position.

Tighten the screws with a torque wrench at 55 Nm. As motor/pump shaft will rotate during this operation it is necessary to hold the spacer by wedging a pin bolt, a piece of flat bar or the like between the two following screw heads in order to lock the system while the screws are tightened.

Fit guard (69).

3. DISMANTLING

Before dismantling the pump make sure that it has stopped. Empty the pump of liquid before it is dismantled from the piping system. If the pump has been pumping dangerous liquids you are to be aware of this and take the necessary safety measures.

If the pump has been pumping hot liquids, take great care that it is drained before it is removed from the piping system.

4. START-UP

A centrifugal pump will not function until it has been filled with liquid between the foot valve and somewhat above the impeller of the pump. The liquid also serves as coolant for the shaft seal. In order to protect the shaft seal the pump must not run dry.

ATTENTION

For safety reasons the pump is only allowed to operate against closed suction and discharge valves for a short time (max. 5-10 minutes and at a max. temperature of 130°C). Otherwise there is a risk of damage to the pump and, at worst, of a steam explosion. If the pump is not manually observed, the installation of a safety device is recommended.
4.1 STARTING

Before starting the pump check that:

- the shaft rotates freely without jarring sounds.
- the pump casing and the suction line are filled with liquid.

Start the pump for a moment to check the direction of rotation. If the direction is correct (i.e. in the direction of the arrow) the pump may be started.
5. ASSEMBLY DRAWING AND SPARE PARTS LIST ø215/265
See ø330/415/525 pumps on the next page

1. Pump casing
2. Pipe plug
3. Pipe plug
4. Sealing ring
5. Impeller
6. Nut
7. Spring collar
8. Washer
9. Sunk key
10. Mech. shaft seal
11. Water deflector
12. Ring lock
13. Ball bearing
14. Support disc
15. Ball bearing
16. Sunk key
17. Shaft
18. Bearing housing
19. Allen screw
20. Shaft seal cover
21. O-ring
22. Allen screw
58. Copper pipe
59. Hexagon nipple
60. Set screw
63. Bracket
64. Set screw
67. Set screw
69. Guard
70. Coupling part pump
71. Coupling part motor
72. Spacer
73. Pointed screw
74. Elastomer
76. Allen screw
77. Allen screw
79. Nut
81. Sealing washer
84. Lubricator nipple *)
86. Pointed screw
93. Set screw
94. Base plate
95. Lock washer
96. Manometer
97. Reducing nipple
98. Hexagon nipple
99. T-piece
100. Bulkhead connection
101. Screw cap
103. Copper pipe
106. Manometer cock
107. Pipe plug
109. Set screw
110. Manometer fitting

*) 84 only combination 14
6. ASSEMBLY DRAWING AND SPARE PARTS LIST ø330/415/525

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
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<tbody>
<tr>
<td>1</td>
<td>Pump casing</td>
</tr>
<tr>
<td>2</td>
<td>Pipe plug</td>
</tr>
<tr>
<td>3</td>
<td>Pipe plug</td>
</tr>
<tr>
<td>4</td>
<td>Sealing ring</td>
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<tr>
<td>5</td>
<td>Impeller</td>
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<tr>
<td>6</td>
<td>Set screw</td>
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<tr>
<td>7</td>
<td>Spring collar</td>
</tr>
<tr>
<td>8</td>
<td>Washer</td>
</tr>
<tr>
<td>9</td>
<td>Sunk key</td>
</tr>
<tr>
<td>10</td>
<td>Mech. shaft seal</td>
</tr>
<tr>
<td>11</td>
<td>Water deflector</td>
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<tr>
<td>12</td>
<td>Ring lock</td>
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<tr>
<td>13</td>
<td>Ball bearing</td>
</tr>
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<td>Grease valve ring*</td>
</tr>
<tr>
<td>15</td>
<td>Ball bearing</td>
</tr>
<tr>
<td>16</td>
<td>Sunk key</td>
</tr>
<tr>
<td>17</td>
<td>Shaft</td>
</tr>
<tr>
<td>18</td>
<td>Bearing housing</td>
</tr>
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</tr>
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<td>Shaft seal cover</td>
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<td>O-ring</td>
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<td>Set screw</td>
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<td>23</td>
<td>Lock washer</td>
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<td>Cover under bearing</td>
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<td>Copper pipe</td>
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<td>Guard</td>
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<td>Spacer</td>
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<td>Allen screw</td>
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<td>Pointed screw</td>
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<td>Set screw</td>
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<td>Lock washer</td>
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<td>58</td>
<td>Set screw</td>
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<td>59</td>
<td>Manometer fitting</td>
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</tbody>
</table>

*) Support disc in comb. 13.
7. ASSEMBLY DRAWING AND SPARE PARTS LIST NSL300-418

1. Pump casing
2. Pipe plug
3. Pipe plug
4. Sealing ring
5. Impeller
6. Cap nut
7. Spring collar
8. Inlet cone
9. Sunk key
10. Mech. shaft seal
11. Water deflector
12. Ring lock
13. Ball bearing
14. Grease valve ring
15. Ball bearing
16. Sunk key
17. Shaft
18. Bearing housing
19. Set screw
20. Shaft seal cover
21. O-ring
22. Set screw
23. Lock washer
24. Stud
25. Countersunk screw
26. Cover under bearing
27. Sealing ring 2
28. Copper pipe
29. Hexagon nipple
30. Set screw
31. Hexagon nipple
32. Bracket
33. Set screw
34. Set screw
35. Guard
36. Coupling part pump
37. Coupling part motor
38. Spacer
39. Pointed screw
40. Coupling bush
41. Allen screw
42. Sealing washer
43. Lubricator nipple
44. Pointed screw
45. Set screw
46. Base plate
47. Lock washer
48. Manometer
49. Reducing nipple
50. Hexagon nipple
51. T-piece
52. Bulkhead connection
53. Screw cap
54. Copper pipe
55. Pipe clamp
56. Allen screw
57. Gauge valve
58. Pipe plug
59. Set screw
60. Manometer fitting
8. ASSEMBLY DRAWING AND SPARE PARTS LIST NSL350-525

1. Pump casing
2. Pipe plug
3. Pipe plug
4. Sealing ring
5. Impeller
6. Cap nut
7. Spring collar
8. Inlet cone
9. Sunk key
10. Mech. shaft seal
11. Water deflector
12. Ring lock
13. Ball bearing
14. Grease valve ring
15. Ball bearing
16. Sunk key
17. Shaft
18. Bearing housing
19. Set screw
20. Shaft seal cover
21. O-ring
22. Set screw
23. Lock washer
24. Stud
25. Cover under bearing
26. Sealing ring 2
27. Guide plate
28. Countersunk screw
29. Washer
30. Copper pipe
31. Hexagon nipple
32. Set screw
33. Guard
34. Coupling part pump
35. Coupling part motor
36. Spacing
37. Pointed screw
38. Coupling bush
39. Allen screw
40. Sealing washer
41. Lubricator nipple
42. Pointed screw
43. Set screw
44. Base plate
45. Lock washer
46. Manometer
47. Reducing nipple
48. Hexagon nipple
49. T-piece
50. Bulkhead connection
51. Screw cap
52. Copper pipe
53. Pipe clamp
54. Allen screw
55. Gauge valve
56. Pipe plug
57. Set screw
58. Manometer fitting