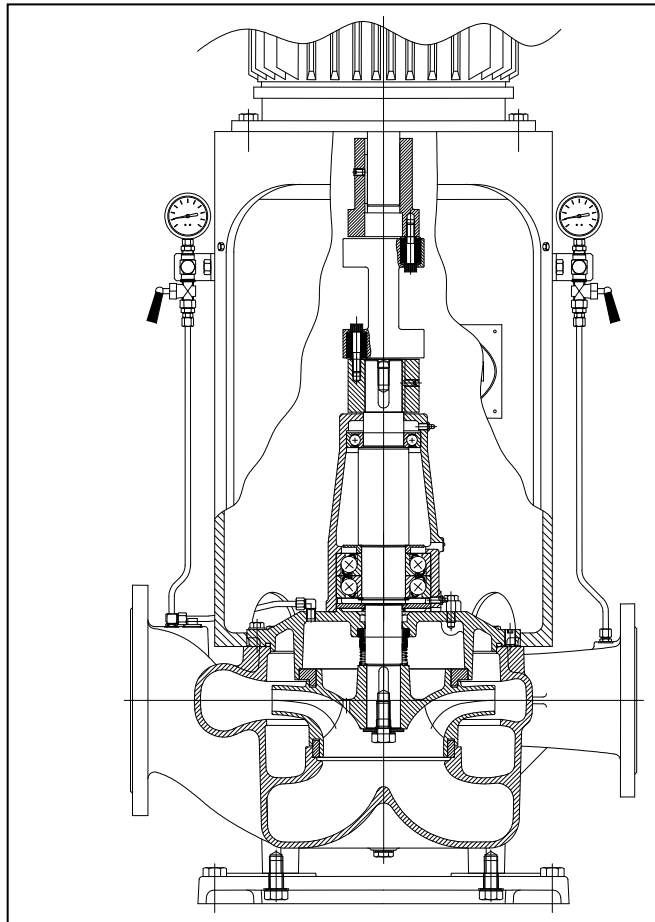


INSTRUCTIONS FOR SPARE PARTS

## Spare parts for DESMI vertical "in-line" centrifugal pump NSL Spacer



**DESMI PUMPING TECHNOLOGY A/S**  
Tagholm 1 – DK-9400 Nørresundby – Denmark

Tel.: +45 96 32 81 11  
Fax: +45 98 17 54 99  
E-mail: [desmi@desmi.com](mailto:desmi@desmi.com)  
Internet: [www.desmi.com](http://www.desmi.com)

Manual: T1509	Language: English	Revision: B (11/17))
------------------	----------------------	-------------------------

Special pump No. ....



TABLE OF CONTENTS:	PAGE
<b>1. DISMANTLING (13 COMBINATION) NSL SPACER 1.1 ACCESS TO IMPELLER .....</b>	<b>3</b>
1.2 DISMANTLING SHAFT SEAL .....	3
1.3 DISMANTLING SEAT .....	3
1.4 DISMANTLING SHAFT WITH BEARINGS .....	3
1.5 INSPECTION .....	4
<b>2. ASSEMBLING.....</b>	<b>4</b>
2.1 FITTING SEALING RINGS.....	4
2.2 FITTING SHAFT WITH BEARINGS.....	4
2.3 FITTING WATER DEFLECTOR .....	4
2.4 FITTING SHAFT SEAL.....	4
2.5 FITTING IMPELLER.....	5
2.6 FITTING BEARING HOUSING AND SHAFT SEAL COVER .....	5
2.7 SHAFT .....	5
2.8 FITTING COUPLING .....	5
<b>3. DISMANTLING .....</b>	<b>6</b>
<b>4. START-UP .....</b>	<b>6</b>
4.1 STARTING.....	7
<b>5. ASSEMBLY DRAWING AND SPARE PARTS LIST Ø215/265.....</b>	<b>8</b>
<b>6. ASSEMBLY DRAWING AND SPARE PARTS LIST Ø330/415/525.....</b>	<b>9</b>
<b>7. ASSEMBLY DRAWING AND SPARE PARTS LIST NSL300-418.....</b>	<b>10</b>
<b>8. ASSEMBLY DRAWING AND SPARE PARTS LIST NSL350-525.....</b>	<b>11</b>

## 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 ( $\varnothing 215/265$ ) or a set screw ( $\varnothing 330/415/525$ ) 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

### $\varnothing 215/265$

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.

Thread	Torque	Coupling element	Distance
M8	25 Nm	V1700-0832	4 mm
M10	50 Nm	V1700-1042	4 mm
M12	90 Nm	V1700-1242	6 mm
M14	140 Nm	V1700-1442	6 mm

## 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

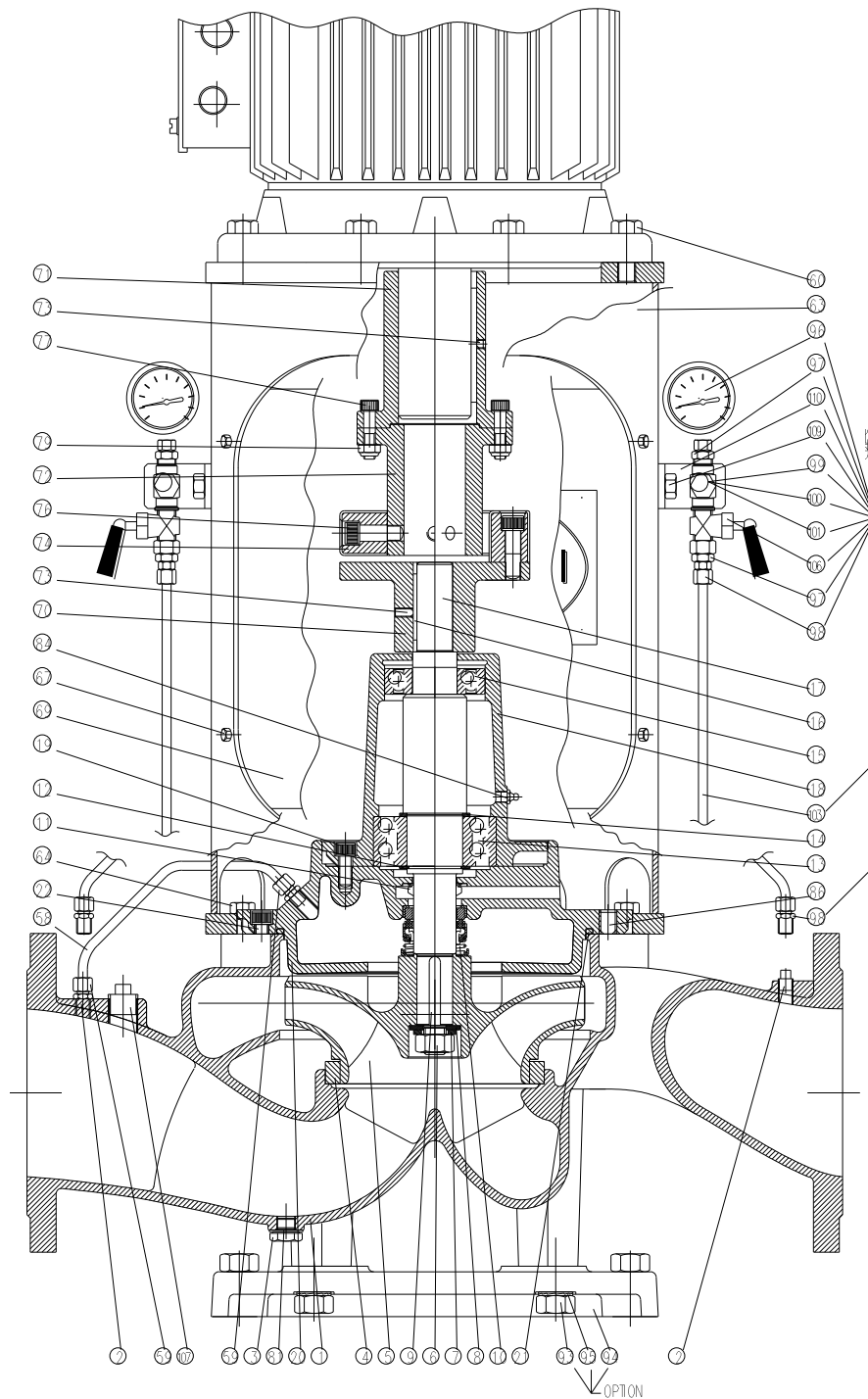
Before starting the pump check that:

- 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

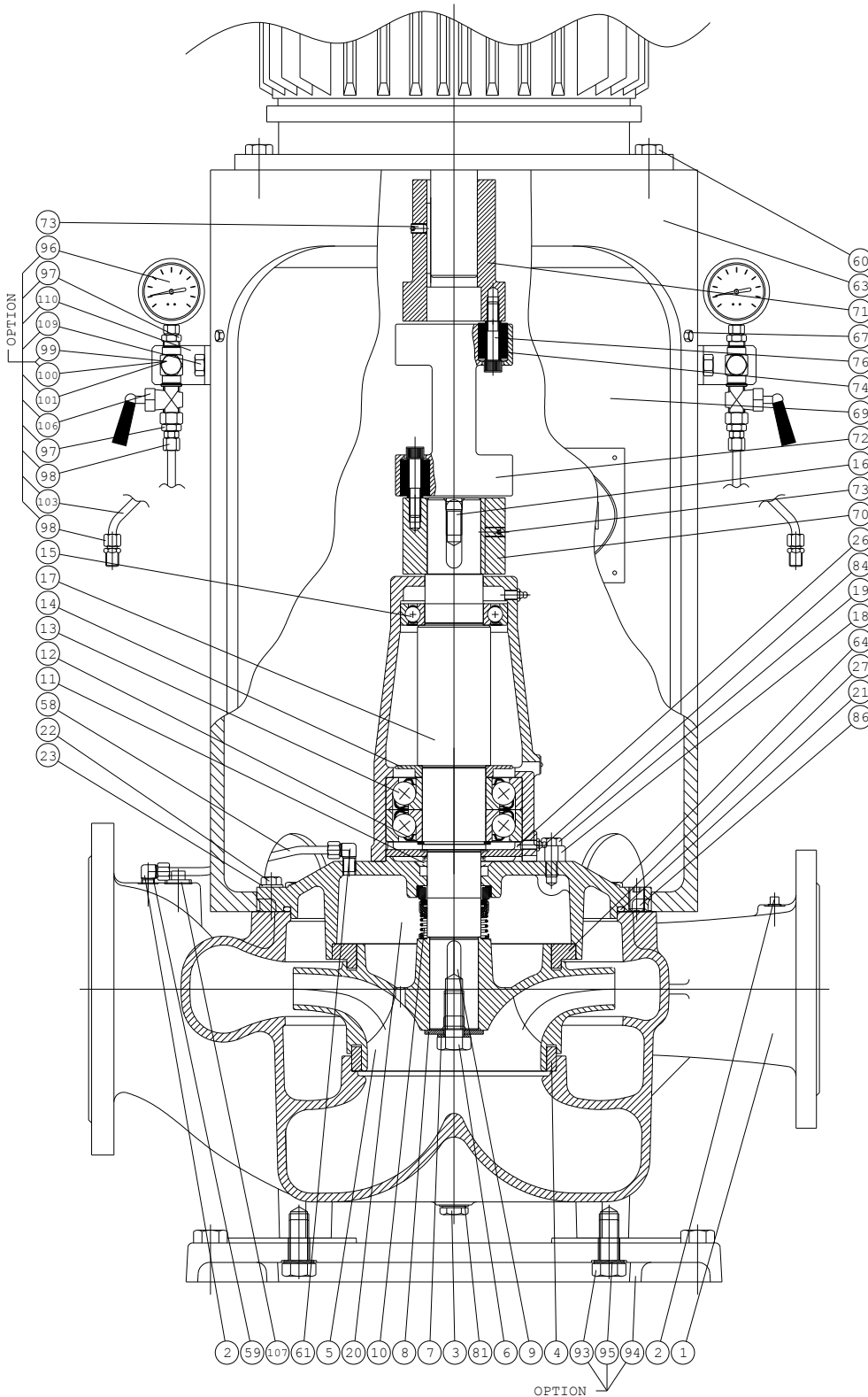
### DESMI PUMPING TECHNOLOGY A/S

Tagholm 1  
9400 Nørresundby - Denmark  
Tel.: +45 96 32 81 11  
Fax +45 98 17 54 99  
E-mail: desmi@desmi.com

[www.desmi.com](http://www.desmi.com)



## 6. ASSEMBLY DRAWING AND SPARE PARTS LIST ø330/415/525



- 1 Pump casing
- 2 Pipe plug
- 3 Pipe plug
- 4 Sealing ring
- 5 Impeller
- 6 Set screw
- 7 Spring collar
- 8 Washer
- 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
- 26 Cover under bearing
- 27 Sealing ring 2
- 58 Copper pipe
- 59 Hexagon nipple
- 60 Set screw
- 61 Hexagon nipple
- 63 Bracket
- 64 Set screw
- 67 Set screw
- 69 Guard
- 70 Coupling part pump
- 71 Coupling part motor
- 72 Spacer
- 73 Pointed screw
- 74 Coupling bush
- 76 Allen screw
- 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

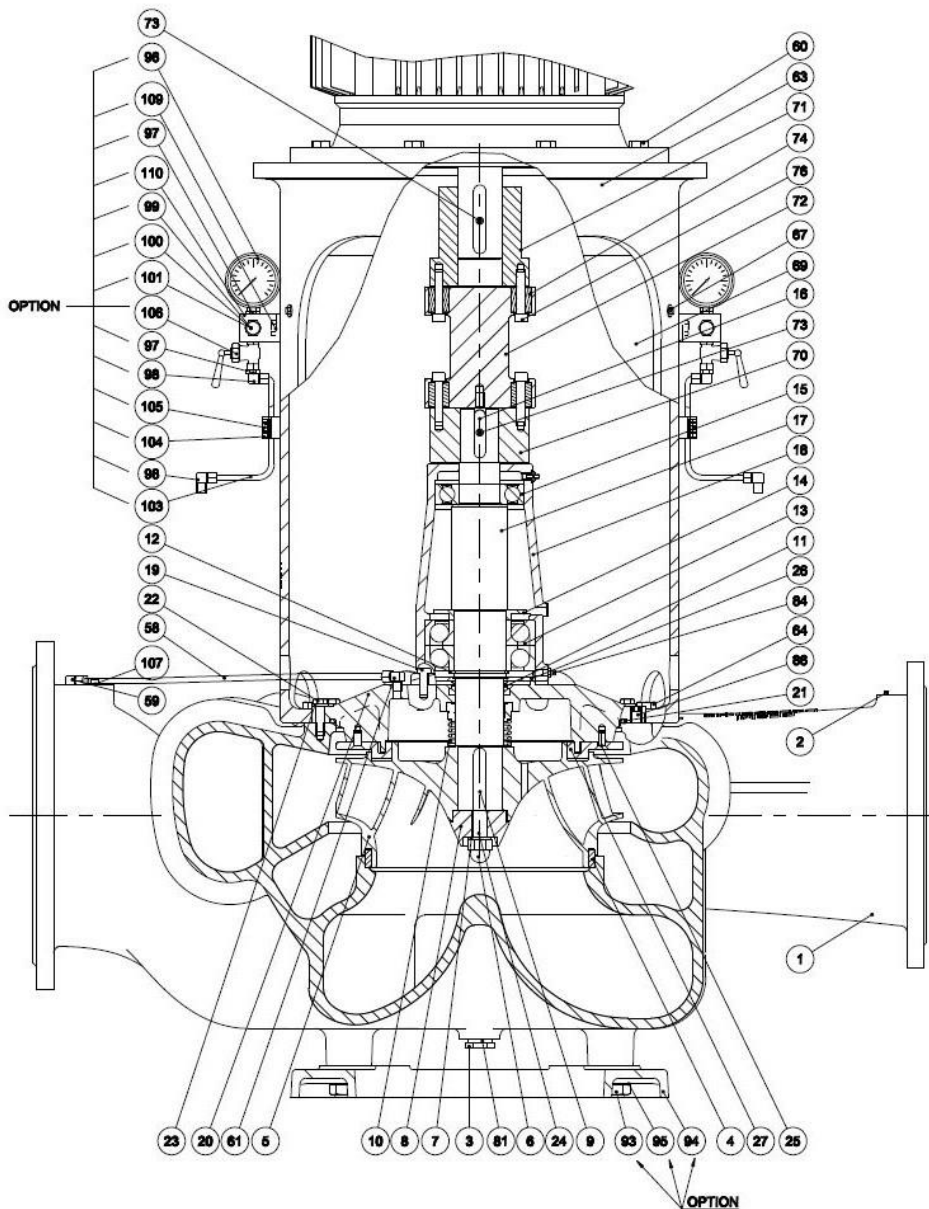
\*) Support disc in comb. 13.

### DESMI PUMPING TECHNOLOGY A/S

Tagholm 1  
 9400 Nørresundby - Denmark  
 Tel.: +45 96 32 81 11  
 Fax +45 98 17 54 99  
 E-mail: desmi@desmi.com

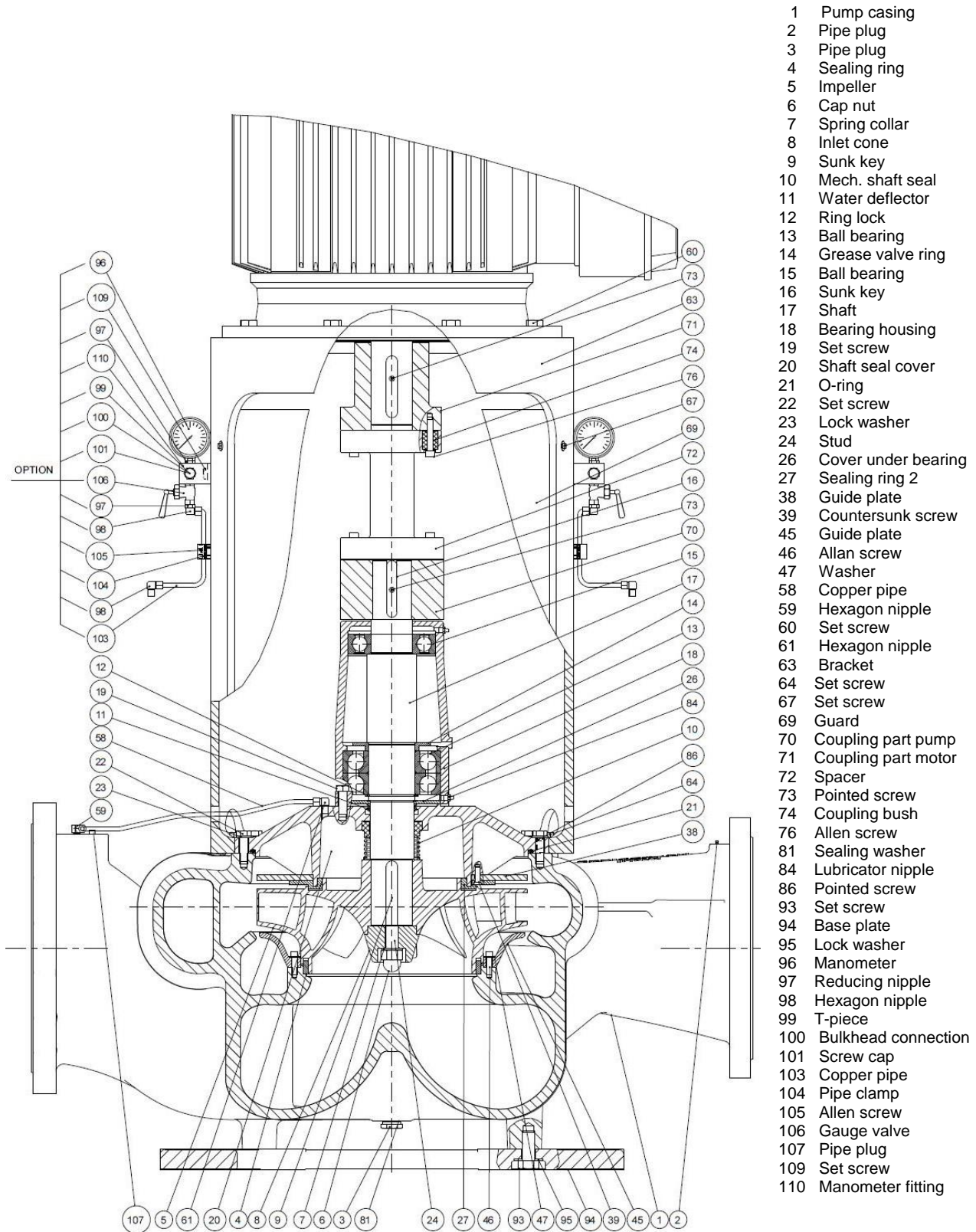
[www.desmi.com](http://www.desmi.com)

## 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
- 58 Copper pipe
- 59 Hexagon nipple
- 60 Set screw
- 61 Hexagon nipple
- 63 Bracket
- 64 Set screw
- 67 Set screw
- 69 Guard
- 70 Coupling part pump
- 71 Coupling part motor
- 72 Spacer
- 73 Pointed screw
- 74 Coupling bush
- 76 Allen screw
- 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
- 104 Pipe clamp
- 105 Allen screw
- 106 Gauge valve
- 107 Pipe plug
- 109 Set screw
- 110 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
- 26 Cover under bearing
- 27 Sealing ring 2
- 38 Guide plate
- 39 Countersunk screw
- 45 Guide plate
- 46 Allen screw
- 47 Washer
- 58 Copper pipe
- 59 Hexagon nipple
- 60 Set screw
- 61 Hexagon nipple
- 63 Bracket
- 64 Set screw
- 67 Set screw
- 69 Guard
- 70 Coupling part pump
- 71 Coupling part motor
- 72 Spacer
- 73 Pointed screw
- 74 Coupling bush
- 76 Allen screw
- 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
- 104 Pipe clamp
- 105 Allen screw
- 106 Gauge valve
- 107 Pipe plug
- 109 Set screw
- 110 Manometer fitting

### DESMI PUMPING TECHNOLOGY A/S

Tagholm 1  
 9400 Nørresundby - Denmark  
 Tel.: +45 96 32 81 11  
 Fax +45 98 17 54 99  
 E-mail: desmi@desmi.com

[www.desmi.com](http://www.desmi.com)