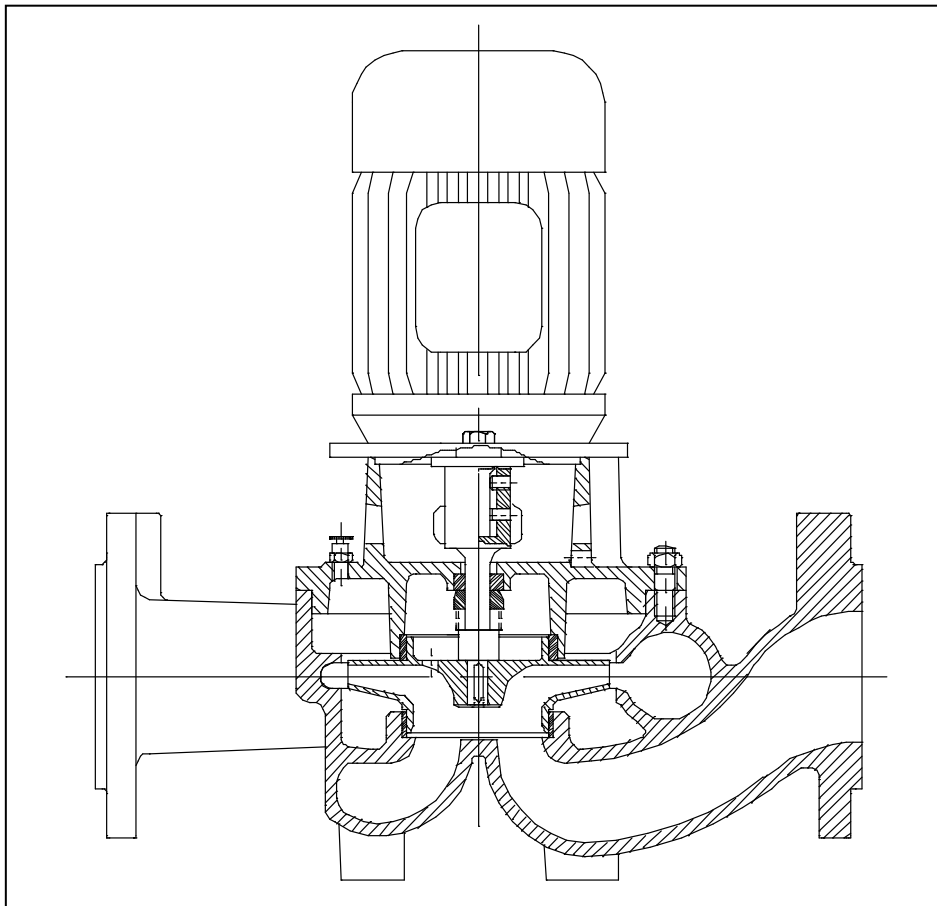


OPERATION AND MAINTENANCE INSTRUCTIONS

DESMI in-line centrifugal pump

PVLN, PVLB, PVLS and PVLJ



DESMI 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

Internet: www.desmi.com

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|------------------|----------------------|------------------------|

Special Pump No.

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1. PRODUCT DESCRIPTION

These operation and maintenance instructions apply to the pump series PVLN, PVLB, PVLS, and PVLJ.

The pumps are manufactured in sizes ranging from 25 mm to 200 mm flanges. The pumps are centrifugal pumps "in-line type", i.e. the suction and pressure flanges have a common centre line and the same dimensions.

The pumps are driven by an electric motor which may be a standard AC motor or a DC motor. The impeller is mounted on the motor shaft at a shaft extension. The pumps are equipped with a mechanical seal shaft and have holes in the bracket for inspection of leaks. Very big holes are provided with a fixed guard.

2. TECHNICAL DATA

The pumps are divided into two groups. The item number of one of the groups is of the type PVLNXXXX.XX-0XX, whereas the other group has a 6-digit item number of the type 69 XX XX. As regards pumps with item number 69 XX XX – see page 6.

2.1 TECHNICAL DATA FOR PUMPS WITH ITEM NUMBER PVLNXXXX.XX-0XX

The material combination appears from the pump type and is expressed by the last 3 figures, for example PVLN0080.21-004.

There are 5 standard material combinations 001, 002, 003, 004 and 005.

PVLN 1025/PVLN 1040

| Material Code | Impeller | Elastomer |
|---------------|----------|----------------|
| 001/005 | Rg5 | EP-rubber |
| 002/003 | Rg5 | Nitrile rubber |
| 004 | Rgl0 | Nitrile rubber |

PVLN1050...PVLN2200

| Material Code | Impeller | Seal Rings | Elastomer | Stop Rings |
|---------------|----------|-------------------------|----------------|-------------------------|
| 001 | GG20 | Rg5 | EP-rubber | Rg5 |
| 002 | Rg5 | Rg5 | EP-rubber | Rg5 |
| 003 | GG20 | Rg5 | Nitrile rubber | Rg5 |
| 004 | GG20 | Stainless ¹⁾ | Nitrile rubber | Stainless ¹⁾ |
| 005 | Rgl0 | Stainless ¹⁾ | Nitrile rubber | Stainless ¹⁾ |

¹⁾Stainless steel DIN designation X5CrNiMo17133.

Pump casing and top piece GG20.

Pump shaft stainless steel DIN designation X8CrNiMo275.

| Size | Material Code | Field of Application |
|-----------------|-------------------|---|
| PVLN1025/1040 | 001 002 005 | Pumping of clean water and weak aqueous solutions of non-aggressive chemicals |
| PVLN1050...2200 | 001 | |

| Size | Material Code | Field of Application |
|-----------------|-------------------|---|
| PVLN1025/1040 | 001 002 005 | Same application as above, but where there is a risk of rusting at the impeller because of a long standstill. |
| PVLN1050...2200 | 002 | |

| Size | Material Code | Field of Application |
|-----------------|-------------------|---|
| PVLN1025/1040 | 001 002 005 | Brine, glycol, softened chloric fresh water for swimming baths. |
| PVLN1050...2200 | 003 | |

| Size | Material Code | Field of Application |
|-----------------|---------------|--------------------------------|
| PVLN1025/1040 | 003 004 | Soda lye (004 for PH< 9 only). |
| PVLN1050...2200 | 004 | |

| Size | Material Code | Field of Application |
|-----------------|---------------|--|
| PVLN1025/1040 | 003 004 | Chloric saline water for Swimming baths. |
| PVLN1050...2200 | 005 | |

Permissible temperatures from -30°C to +120°C. EP - rubber cannot be used for mineral oils/grease.

Apart from the above material codes the pumps are available in special material combinations for other liquids. Material codes higher than 005 are used for special material combinations. For special codes fill in the following:

Pump type :
 Pump No. :
 Application :
 Comments :

When using the pump for other media the operator is responsible for checking that the specified materials in the pumps are in order. In case of doubt, contact the supplier.

The noise level for the airborne noise appears from the following list. The values indicated are measured as middle values at a distance of 1 m from the machine surface in free field approx. 1.5 m above the base plate. The sound pressure levels are general directional values which cannot be regarded as guarantee values for each individual pump, as the sound level of a pump is to a large extent dependent on the installation method and the operating conditions. The measurements comprise the pump including the motor.

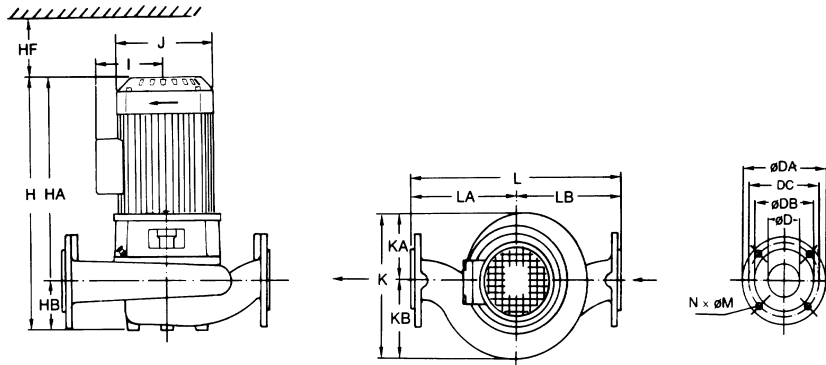
Sound pressure level for the PVLN-pumps:

| PVLN Type | dB(a) |
|-----------|-------|
| 1050.81 | 40 |
| 1050.61 | 47 |
| 1050.27 | 70 |
| 1050.22 | 78 |
| 1050.21 | 80 |
| 1065.61 | 47 |
| 1065.42 | 53 |
| 1065.41 | 55 |
| 2065.23 | 81 |
| 2065.22 | 83 |
| 1065.21 | 84 |
| 0080.61 | 52 |
| 0080.42 | 56 |
| 0080.41 | 57 |
| 0080.22 | 80 |
| 0080.21 | 81 |
| 2080.42 | 58 |
| 2080.41 | 62 |
| 2080.23 | 40 |
| 2080.22 | 84 |
| 2080.21 | 84 |
| 1100.61 | 58 |

| PVLN Type | dB(a) |
|-----------|-------|
| 1100.41 | 71 |
| 2100.61 | 64 |
| 2100.41 | 72 |
| 2125.62 | 68 |
| 2125.44 | 74 |
| 2125.43 | 76 |
| 2125.42 | 77 |
| 2125.41 | 78 |
| 2150.82 | 69 |
| 2150.62 | 73 |
| 2150.61 | 74 |
| 2150.43 | 78 |
| 2150.42 | 79 |
| 2150.41 | 80 |
| 2200.82 | 70 |
| 2200.81 | 71 |
| 2200.62 | 74 |
| 2200.61 | 76 |
| 2200.44 | 79 |
| 2200.43 | 80 |
| 2200.42 | 81 |
| 2200.41 | 82 |

Environment: The pumps are as a standard equipped with motors with protection class IP54, which means that the motor is protected against penetrating dust and that water without pressure does not damage the motor. The motors are dimensioned for an ambient temperature of 40°C. Pumps installed in explosive areas must be equipped with explosion-proof motors. The pump capacity is stamped on the name plate.

The weight and dimensions of the pump appear from the following table.
The weight comprises an AC motor in cast iron.



| Type | TN | Flange | TN | D | DA | DB | DC | H | HA | HB | HF | I | J | K | KA | KB | L | LA | LB | NxM | Weight | |
|------|---------|--------|--------------|-----|----|-----|-----|---------|---------|-----|-----|-----|-----|------------|-----|-----|-----|-----|-----|-----|--------|------------|
| | | | | mm | mm | mm | mm | Max. mm | Max. mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | | mm |
| 1 | 1025.21 | 10 | 1" 25 mm | 10 | 25 | 115 | 68 | 85 | 434 | 374 | 60 | 60 | 150 | 186 | 202 | 101 | 101 | 300 | 150 | 150 | 4xØ14 | 30 kg |
| | 1025.22 | 10 | | 409 | | | | | 349 | 150 | | | 186 | 30 kg | | | | | | | | |
| | 1025.23 | 10 | | 397 | | | | | 337 | 137 | | | 162 | 30 kg | | | | | | | | |
| 2 | 1025.41 | 10 | 1" 25 mm | 10 | 25 | 115 | 68 | 85 | 382 | 322 | 60 | 60 | 127 | 140 | 202 | 101 | 101 | 300 | 150 | 150 | 4xØ14 | 25 kg |
| | 1025.42 | 10 | | 382 | | | | | 302 | 127 | | | 140 | 25 kg | | | | | | | | |
| 3 | 1025.61 | 10 | 1" 25 mm | 10 | 25 | 115 | 68 | 85 | 360 | 300 | 60 | 60 | 127 | 140 | 202 | 101 | 101 | 300 | 150 | 150 | 4xØ14 | 25 kg |
| | 1025.62 | 10 | | 360 | | | | | 300 | 127 | | | 140 | 25 kg | | | | | | | | |
| 4 | 1040.21 | 10 | 1 1/2" 40 mm | 10 | 40 | 150 | 88 | 110 | 568 | 488 | 80 | 60 | 166 | 224 | 224 | 105 | 119 | 350 | 175 | 175 | 4xØ18 | 50-55 kg |
| | 1040.22 | 10 | | 487 | | | | | 407 | 154 | | | 200 | 45-50 kg | | | | | | | | |
| | 1040.23 | 10 | | 457 | | | | | 377 | 150 | | | 186 | 40-45 kg | | | | | | | | |
| 5 | 1040.41 | 10 | 1 1/2" 40 mm | 10 | 40 | 150 | 88 | 110 | 400 | 320 | 80 | 60 | 137 | 162 | 224 | 105 | 119 | 350 | 175 | 175 | 4xØ18 | 35 kg |
| | 1040.42 | 10 | | 405 | | | | | 325 | 127 | | | 140 | 30 kg | | | | | | | | |
| | 1040.43 | 10 | | 405 | | | | | 325 | 127 | | | 140 | 30 kg | | | | | | | | |
| 6 | 1040.61 | 10 | 1 1/2" 40 mm | 10 | 40 | 150 | 88 | 110 | 383 | 303 | 80 | 60 | 127 | 140 | 224 | 105 | 119 | 350 | 175 | 175 | 4xØ18 | 30 kg |
| | 1040.62 | 10 | | 383 | | | | | 303 | 127 | | | 140 | 30 kg | | | | | | | | |
| | 1040.63 | 10 | | 383 | | | | | 303 | 127 | | | 140 | 30 kg | | | | | | | | |
| 7 | 1050.21 | 10 | 2" 50 mm | 10 | 50 | 165 | 102 | 125 | 649 | 559 | 90 | 110 | 184 | 249 | 265 | 125 | 140 | 400 | 200 | 200 | 4xØ18 | 75-90 kg |
| | 1050.22 | 10 | | 576 | | | | | 486 | 166 | | | 224 | 60-70 kg | | | | | | | | |
| | 1050.23 | 10 | | 545 | | | | | 455 | 154 | | | 200 | 55-65 kg | | | | | | | | |
| | 1050.27 | 10 | | 510 | | | | | 420 | 150 | | | 186 | 50-55 kg | | | | | | | | |
| | 1050.28 | 10 | | 485 | | | | | 395 | 150 | | | 186 | 45-50 kg | | | | | | | | |
| 8 | 1050.41 | 10 | 2" 50 mm | 10 | 50 | 165 | 102 | 125 | 460 | 370 | 90 | 110 | 137 | 162 | 265 | 125 | 140 | 400 | 200 | 200 | 4xØ18 | 40 kg |
| | 1050.42 | 10 | | 460 | | | | | 370 | 137 | | | 162 | 40 kg | | | | | | | | |
| | 1050.43 | 10 | | 460 | | | | | 370 | 137 | | | 162 | 40 kg | | | | | | | | |
| 9 | 1050.61 | 10 | 2" 50 mm | 10 | 50 | 165 | 102 | 125 | 460 | 370 | 90 | 110 | 137 | 162 | 265 | 125 | 140 | 400 | 200 | 200 | 4xØ18 | 40 kg |
| | 1050.81 | 10 | | 460 | | | | | 370 | 137 | | | 162 | 40 kg | | | | | | | | |
| 10 | 1065.41 | 10 | 2 1/2" 65 mm | 10 | 65 | 185 | 122 | 145 | 470 | 370 | 100 | 110 | 137 | 162 | 285 | 130 | 155 | 440 | 220 | 220 | 4xØ18 | 50 kg |
| | 1065.42 | 10 | | 470 | | | | | 370 | 137 | | | 162 | 45 kg | | | | | | | | |
| | 1065.61 | 10 | | 470 | | | | | 370 | 137 | | | 162 | 50 kg | | | | | | | | |
| 11 | 2065.21 | 10 | 2 1/2" 65 mm | 10 | 65 | 185 | 122 | 145 | 815 | 705 | 110 | 125 | 242 | 313 | 350 | 175 | 175 | 450 | 225 | 225 | 4xØ18 | 150-195 kg |
| | 2065.22 | 10 | | 815 | | | | | 705 | 224 | | | 305 | 145-155 kg | | | | | | | | |
| | 2065.23 | 10 | | 658 | | | | | 548 | 184 | | | 249 | 100-115 kg | | | | | | | | |
| 12 | 2065.41 | 10 | 2 1/2" 65 mm | 10 | 65 | 185 | 122 | 145 | 564 | 454 | 110 | 125 | 154 | 200 | 350 | 175 | 175 | 450 | 225 | 225 | 4xØ18 | 90-95 kg |
| | 2065.42 | 10 | | 520 | | | | | 410 | 150 | | | 186 | 85-90 kg | | | | | | | | |
| 13 | 0080.21 | 10 | 3" 80 mm | 10 | 80 | 200 | 138 | 160 | 699 | 579 | 120 | 120 | 184 | 249 | 320 | 150 | 170 | 480 | 240 | 240 | 8xØ18 | 90-105 kg |
| | 0080.22 | 10 | | 679 | | | | | 559 | 184 | | | 249 | 85-100 kg | | | | | | | | |
| | 0080.23 | 10 | | 642 | | | | | 522 | 166 | | | 224 | 75-80 kg | | | | | | | | |
| 14 | 0080.41 | 10 | 3" 80 mm | 10 | 80 | 200 | 138 | 160 | 530 | 410 | 120 | 120 | 150 | 186 | 320 | 150 | 170 | 480 | 240 | 240 | 8xØ18 | 60-65 kg |
| | 0080.42 | 10 | | 505 | | | | | 385 | 150 | | | 186 | 55-60 kg | | | | | | | | |
| | 0080.43 | 10 | | 492 | | | | | 372 | 137 | | | 162 | 50-55 kg | | | | | | | | |
| | 0080.61 | 10 | | 490 | | | | | 370 | 137 | | | 162 | 50-55 kg | | | | | | | | |

| | Type | TN | Flange | TN | D mm | DA mm | DB mm | DC mm | H Max. mm | HA Max. mm | HB mm | HF Min. Mm | I Max. mm | J Max. mm | K mm | KA mm | KB mm | L mm | LA mm | LB mm | NxM mm | Weight |
|----|---|----------------------------|----------------|----------------------------|---------|----------|----------|---------------------|--------------------------------------|-----------------------------------|----------|-------------------|---------------------------------|---------------------------------|---------|----------|----------|---------|----------|----------|--|--|
| | 2080.21 2080.22 2080.23 | 10 10 10 | 3" 80 mm | 10 10 10 | 80 | 200 | 138 | 160 | 882 830 830 | 752 700 700 | 130 | 120 | 255 242 224 | 330 313 305 | 380 | 175 | 205 | 540 | 260 | 280 | 8xø18 | 180-220 kg 155-200 kg 150-165 kg |
| 16 | 2080.41 2080.42 | 10 10 | | 10 10 | 80 | 200 | 138 | 160 | 579 579 | 449 449 | 130 | 120 | 154 154 | 200 200 | 380 | 175 | 205 | 540 | 260 | 280 | 8xø18 | 80-85 kg 75-80 kg |
| 17 | 1100.41 1100.42 1100.61 1100.81 | 10 10 10 10 | 4" 100 mm | 10 10 10 10 | 100 | 220 | 158 | 180 | 631 600 555 555 | 486 455 410 410 | 145 | 125 | 166 154 150 150 | 224 200 186 186 | 375 | 170 | 205 | 590 | 270 | 320 | 8xø18 | 90-100 kg 80-90 kg 75-80 kg 75-80 kg |
| 18 | 2100.41 2100.61 | 10 10 | | 10 10 | 100 | 220 | 158 | 180 | 699 594 | 559 454 | 140 | 125 | 184 154 | 249 200 | 430 | 195 | 235 | 620 | 300 | 320 | 8xø18 | 115-125 kg 90-95 kg |
| 19 | 2125.41 2125.42 2125.43 2125.44 2125.45 | 10 10 10 10 10 | 5" 125 mm | 10 10 10 10 10 | 125 | 250 | 188 | 210 | 1035 977 930 822 781 | 835 777 730 622 581 | 200 | 170 | 255 255 224 205 184 | 351 330 305 260 249 | 460 | 205 | 255 | 800 | 400 | 400 | 8xø18 | 300-315 kg 265-300 kg 240-255 kg 190-210 kg 180-190 kg |
| 20 | 2125.62 | 10 | | 10 | 125 | 250 | 188 | 210 | 701 | 501 | 200 | 170 | 166 | 224 | 460 | 205 | 255 | 800 | 400 | 400 | 8xø18 | 165-170 kg |
| 21 | 2150.41 2150.42 2150.43 2150.44 | 6 6 6 6 | 6" 150 mm | 10 10 10 10 | 150 | 285 | 212 | 240 | 1123 1070 1070 1012 | 963 910 910 852 | 160 | 175 | 327 261 255 255 | 392 351 351 330 | 625 | 285 | 340 | 925 | 475 | 450 | 8xø22 | 465-490 kg 410-425 kg 395-410 kg 355-390 kg |
| 22 | 2150.61 2150.62 | 6 6 | | 10 10 | 150 | 285 | 212 | 240 | 960 857 | 800 697 | 160 | 175 | 224 205 | 305 260 | 625 | 285 | 340 | 925 | 475 | 450 | 8xø22 | 335-350 kg 790-310 kg |
| 23 | 2150.82 | 6 | 10 | 150 | 285 | 212 | 240 | 857 | 697 | 160 | 175 | 205 | 260 | 625 | 285 | 340 | 925 | 475 | 450 | 8xø22 | 290-300 kg | |
| 24 | 2200.41 2200.42 2200.43 2200.44 2200.45 | 6 6 6 6 6 | 8" 200 mm | 10 10 10 10 10 | 200 | 340 | 268 | 295 | 1291 1278 1174 1130 1130 | 1101 1088 984 940 940 | 190 | 190 | 345 345 327 261 255 | 442 442 392 351 351 | 710 | 310 | 400 | 1095 | 565 | 530 | 8xø22 | 665-730 kg 605-655 kg 550-575 kg 505-520 kg 485-500 kg |
| 25 | 2200.61 2200.62 | 6 6 | | 10 10 | 200 | 340 | 268 | 295 | 1072 1020 | 882 830 | 190 | 190 | 255 224 | 330 305 | 710 | 310 | 400 | 1095 | 565 | 530 | 8xø22 | 460-480 kg 440-455 kg |
| 26 | 2200.81 2200.82 2200.83 | 6 6 6 | 10 10 10 | 200 | 340 | 268 | 295 | 1020 1020 956 | 830 830 766 | 190 | 190 | 224 224 205 | 305 305 260 | 710 | 310 | 400 | 1095 | 565 | 530 | 8xø22 | 430-445 kg 415-430 kg 400-410 kg | |

2.2 TECHNICAL DATA FOR PUMPS WITH ITEM NUMBER 69 XX XX

The pumps are manufactured in various material combinations, which appear from the type designation on the nameplate. See below.

2.3 EXPLANATION OF THE TYPE DESIGNATION

All PVLN pumps are provided with a nameplate. The type designation indicated on the nameplate is built up as follows:

PVLNYYXX/MR-Z

XX: Pressure branch diameter

M: The material combination of the pump

R: The assembly combination of the pump

Z: Other variants

M may be the following:

A: Casing and shaft seal cover : Cast iron + cast iron alloy. Impeller and sealing rings: Bronze (Rg10)

D: Casing and shaft seal cover : Bronze (Rg5). Impeller and sealing rings: Bronze (Rg10)

E: Special materials

The pumps can be delivered in other material combinations according to agreement with the supplier.

R may be the following:

12: Monobloc, without bearing in the pump

Z may be the following:

- i : PN16 flanges
- j : PN25 flanges
- k : Special flange
- l : Other stuffing box
- m : BS flanges
- n : ANSI flanges
- o : Shockproof design
- p : Other design
- q : JIS flanges

Any use of the pump is to be evaluated on the basis of the materials used in the pump. In case of doubt, contact the supplier.

Pumps in material combinations A are primarily used for fresh water.

Pumps in material combination D are primarily used for seawater.

If the pumps are designed for special purposes the following is to be indicated:

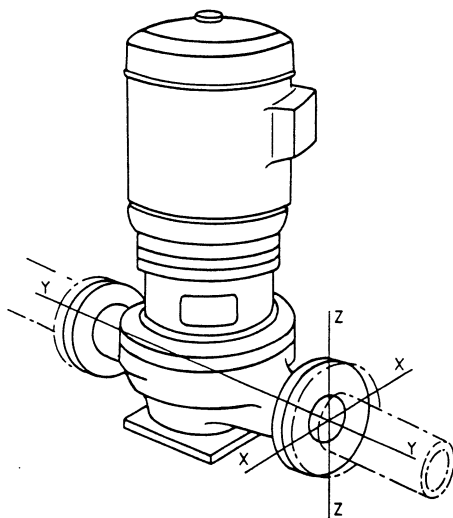
- Pump No. :
- Pump type :
- Application :
- Comment :

2.4 TECHNICAL DESCRIPTION

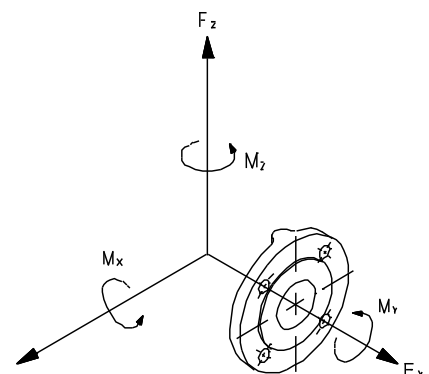
The noise level indicated is the airborne noise including the motor. The noise depends on the motor type supplied, as the noise from the pump can be calculated as the noise level of the motor + 2dB(A). The noise level is for pumps with electric motors.

The capacity of the pump appears from the nameplate on the pump. If the pump has been delivered without motor, the pump capacity is to be indicated on the plate when mounting the motor.

The permissible loads on the flanges appear from the following table. The values apply to standard pumps in bronze (Rg5) and cast iron (GG20). As to pumps in SG iron (GGG40) the values are to be increased by factor 1.5.



Permissible loads and torques on pump flanges:



| Piping | DN | Forces (N) | | | | Torques (Nm) | | | |
|--|-----|----------------|----------------|----------------|------|----------------|----------------|----------------|----------|
| | mm | F _y | F _z | F _x | Σ F | M _y | M _z | M _x | Σ M |
| Horizontal pipeline at right angles to the shaft | 25 | 250 | 320 | 250 | 480 | 300 | 150 | 260 | 420 |
| | 40 | 400 | 500 | 400 | 750 | 400 | 200 | 300 350 | 550 |
| | 50 | 500 | 600 | 550 | 1000 | 450 | 250 | 380 | 600 |
| | 65 | 650 | 840 | 750 | 1340 | 510 | 310 | | 700 |
| Suction and pressure flanges above level of installation | 80 | 800 | 950 | 850 | 1500 | 550 | 350 | 400 | 750 |
| | 100 | 1000 | 1250 | 1150 | 2000 | 650 | 400 | 500 650 | 900 1150 |
| | 125 | 1250 | 1600 | 1430 | 2500 | 830 | 520 | | |
| | 150 | 1500 | 1900 | 1700 | 2950 | 1000 | 650 | 800 | 1400 |
| | 200 | 2000 | 2520 | 2200 | 3920 | 1330 | 860 | 1060 | 1860 |

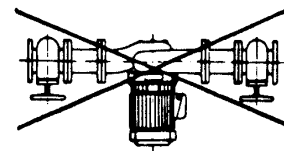
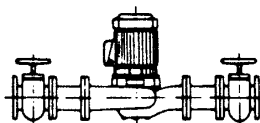
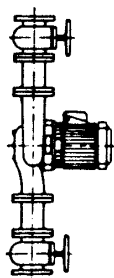
In connection with the permissible loads on the flanges indicated in the above table there is the following limitation:

$$\left(\frac{\Sigma F_{calculated}}{\Sigma F_{Max.permissible}} \right)^2 + \left(\frac{\Sigma M_{calculated}}{\Sigma M_{Max.permissible}} \right)^2 < 2$$

3. INSTALLATION

Insert the pump in the pipeline in the same way as a valve. The pump can be inserted in both horizontal and vertical pipes, but not in a horizontal pipe if the motor is placed below horizontal level. The max. loads on the flanges appear from the technical description.

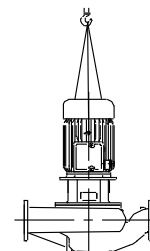
When installing the pump check that it is earthed to avoid an electrical potential in the pump.



At installations pumping hot or very cold liquids the operator must be aware that it is dangerous to touch the pump surface, and he is to take the necessary safety measures.

4. TRANSPORT/STORAGE

The pumps are to be lifted as shown. The weights of the pumps are stated in the technical description. Before shipment the pump is to be fastened securely on a pallet or the like. The centre of gravity will be on the centre line of the motor. The pump is to be stored in a dry area.



5. START-UP



Before starting the pump for the first time check that the electrical data of the motor correspond to the network.

Connect the motor according to the wiring diagram in the cover of the terminal box and provide it with a motor protection according to the rules. The motor protection to be adjusted in accordance with the supplier's instructions. The work is to be carried out by skilled workmen and is to observe the rules and regulations in force.

In order to protect the shaft seal the pump must never run dry.

If there is a positive suction lift, open the valve on the suction side of the pump and evacuate the air through the air vent screw (5). If there is no positive suction lift, the plant must be equipped with a foot valve or a non-return valve on the suction side.

Prime the pump while the air vent screw (5) is kept open. When the pump has been filled with water, and the air has been evacuated, the system can be started. Check the direction of rotation. If the direction is incorrect interchange 2 of the power cords. The direction of rotation is indicated by an arrow. Make sure the bearings are running correctly and that they do not become warm.

6. SYSTEM BALANCING

Adapt pressure and water quantity to the requirements by regulating a valve on the pressure side of the pump - never on the suction side as this may cause cavitation.

| FAULT | CAUSE | REMEDY |
|-------------------------------------|--|--|
| The pump has no or too low capacity | 1. Wrong direction of rotation 2. Piping system choked 3. The pump is choked 4. Suction line leaks, pump takes air 5. Suction lift too high 6. Pump and piping system wrongly dimensioned | Change direction of rotation to clockwise when viewed from shaft end Clean or replace Clean the pump Find the leakage, repair the fault, non-return valve not submerged Check data sheet Q/H curve and NPSH or contact DESMI As 5 |
| The pump uses too much power | 1. Counter-pressure too low 2. The liquid is heavier than water 3. Foreign body in pump 4. Electric motor is running on 2 phases | Insert orifice plate or check valve, contact DESMI Contact DESMI Dismantle the pump, remove the cause Check fuses, cable connection and cable |
| The pump makes noise | 1. Cavitation in pump | Suction lift too high/Suction line wrongly dimensioned/Liquid temperature too high |

7. MAINTENANCE

The motors for small pumps are equipped with ball bearings lubricated for life and, therefore, they do not require any attention.

As far as the big pumps are concerned, follow the lubricating prescription indicated on the motor.

During long periods of standstill it will be an advantage to start the pump every week or every two weeks. Check the shaft seal for leaks at regular intervals.

8. 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.



The cable connections to be dismantled by skilled workmen.

9. REPAIRS

The following parts are exposed to wear: Shaft seal (22), impeller (2), seal rings (16 and 17) and the ball bearings of the motor.

9.1 REPLACING THE IMPELLER (2)

Close the valves on both sides of the pump. Loosen the nuts (15) and dismantle the top piece from the pump casing. Remove the screw (20) and take off the impeller (2). Fit the new impeller.

9.2 REPLACING SEAL RINGS (16 AND 17)

When motor and pump have been separated, the seal ring (17) in the pump casing (1) can be pulled out.

In order to replace the upper seal ring (16) it is necessary first to dismantle the impeller. Press the new seal rings into place with an even push all over the face of the ring. Normal diameter difference between seal ring and impeller 0.3-0.4 mm.

9.3 REPLACING SHAFT SEAL (22)

Dismantling as described in paragraph 9.1.

When the impeller has been dismantled, remove the key (19) and then the space bushing (21) which is locked with a pointed screw. The sealing element itself can now be pulled off the shaft.

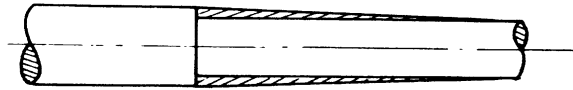
Remove the seat ring from the top piece by pressing with a pair of screwdrivers or the like under the collar

off the seat. If the seat cannot be removed, dismantle the top piece (4) from the motor (9) to permit pressing from the back.

Clean the bore for seat and shaft thoroughly of dirt and rust. Remove persistent coatings, if any, by grinding the shaft lightly with very fine emery cloth.

Grease the new seat ring and the inserted O-ring well with glycerine - not oil - and press it into place in the casing. Check that the seat is fitted correctly by knocking lightly with a piece of wood. The seat ring is to be treated very carefully to prevent the sliding surface from being scratched.

It is necessary to use a conical bush as shown below to prevent the rubber bellows from being damaged during mounting.



Grease the back of the carbon ring with glycerine to ensure that it stays in its correct place during the mounting. Grease the shaft, the conical bush and the rubber bellows amply with glycerine.

Press the shaft seal on to the shaft until it resists. Press the driving ring only,

Finally place the space bush (21) on the shaft and lock it with the pointed screw.

When the pump has been mounted, ventilate the pump casing carefully before putting the pump into operation.

When the pump has been running for 1-2 min., ventilate it again, after which it can start normal operation.

Do not forget to check the direction of rotation if there is a risk that the power cords to motor have been exchanged.

9.4 REPLACING BALL BEARINGS IN MOTOR

The ball bearing in the front bearing of the motor can be replaced without disassembling the pump.

If the ball bearing in the rear bearing of the motor is to be replaced, it is necessary to disassemble the pump and dismantle the pump shaft (as described in paragraph 9.1):

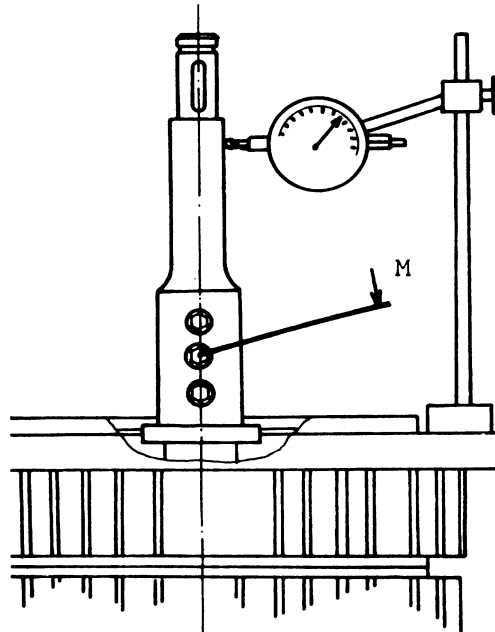
Dismantle the top piece (4) from the motor (9). Remove the pointed screws (11) in the pump shaft (6), the pump shaft can now be pulled off the motor shaft.

When assembling the pump again, check the motor shaft for damages in the form of marks, burrs, or upsetting of the shaft end.

Damages, if any, are to be remedied by means of a file and fine emery cloth. This work has to be done very carefully, especially on new motors, the shaft ends of which are often damaged during transport. If this is not done carefully, the throw will be bigger than permitted and/or the pump shaft will scratch the motor shaft when fitted.

Normally, the pump shaft is to go relatively smoothly on the motor shaft (manually or by means of light strokes with a plastic hammer).

Tighten the pointed screws (the one in the middle first) in accordance with the torque indicated in the table (page 12) and finally check that the throw stays within the indicated limits by means of an indicator clock.



10. TESTING

After each repair check that the motor rotates easily before connecting the current. Also remember to check the direction of rotation and to ventilate the pump.

| Pump Type | Puller | M: Tightening Torque | Max. Throw |
|--|--|---|---|
| PVLN1025.61/62 PVLN1025.41/42 PVLN1025.21/22/23 | | 4 Nm 4 Nm 6 Nm | 60 µm 60 µm 60 µm |
| PVLN1040.61/62/63 PVLN1040.42/43 PVLN1040.41 PVLN1040.21/22/23 | | 4 Nm 4 Nm 6 Nm 6 Nm | 60 µm 60 µm 60 µm 60 µm |
| PVLN1050.61/81 PVLN1050.41/42/43 PVLN1050.27/28 PVLN1050.22/23 PVLN1050.21 | SK 336 SK 336 SK 337 SK 337 SK 338 | 6 Nm 6 Nm 18 Nm 18 Nm 30 Nm | 60 µm 60 µm 60 µm 60 µm 70 µm |
| PVLN1065.61 PVLN1065.41/42 | SK 336 SK 336 | 6 Nm 6 Nm | 60 µm 60 µm |
| PVLN2065.41/42 PVLN2065.23 PVLN2065.21/22 | SK 337 SK 338 SK 338 | 18 Nm 30 Nm 60 Nm | 70 µm 70 µm 70 µm |
| PVLN0080.43/61 PVLN0080.42 PVLN0080.23/41 PVLN0080.21/22 | SK 336 SK 336 SK 337 SK 338 | 6 Nm 18 Nm 18 Nm 30 Nm | 60 µm 60 µm 60 µm 70 µm |

| Pump Type | Puller | M: Tightening Torque | Max. Throw |
|--|--|--|---|
| PVLN2080.41/42 PVLN2080.21/22/23 | SK 337 SK 338 | 18 Nm 60 Nm | 60 µm 70 µm |
| PVLN1100.41/61 PVLN2100.61 PVLN2100.41 | SK 337 SK 337 SK 338 | 18 Nm 18 Nm 30 Nm | 60 µm 60 µm 70 µm |
| PVLN2125.62 PVLN2125.44/45 PVLN2125.41/42/43 | SK 339 SK 339 SK 340 | 18 Nm 30 Nm 60 Nm | 60 µm 70 µm 70 µm |
| PVLN2150.62/82 PVLN2150.44/61 PVLN2150.42/43 PVLN2150.41 | SK 339 SK 340 SK 340 SK 340 | 30 Nm 60 Nm 60 Nm 150 Nm | 70 µm 70 µm 70 µm 80 µm |
| PVLN2200.83 PVLN2200.81/82 PVLN2200.61/62 PVLN2200.44/45 PVLN2200.41/42/43 | SK 339 SK 340 SK 340 SK 340 SK 340 | 30 Nm 60 Nm 60 Nm 60 Nm 150 Nm | 70 µm 70 µm 70 µm 70 µm 80 µm |

Pumps with item number 69 XX XX:

| Motor Size | Puller | M: Tightening Torque | Max. Throw |
|-------------|--------|----------------------|------------|
| IEC 71 | | 4 Nm | 60 µm |
| IEC 80 | SK 336 | 6 Nm | 60 µm |
| IEC 90 | SK 336 | 6 Nm | 60 µm |
| IEC 100/112 | SK 337 | 18 Nm | 60 µm |
| IEC 132 | SK 338 | 30 Nm | 60 µm |
| IEC 160 | | 60 Nm | 70 µm |

11. EU DECLARATION OF CONFORMITY

DESMI A/S, hereby declare that our pumps of type PVLN, PVLB, PVLS and PVLJ are manufactured in conformity with the following essential safety and health requirements in the COUNCIL DIRECTIVE 2006/42/EC on machines, Annex 1.

The following harmonized standards have been used:

| | |
|-----------------|--|
| EN 294:1994 | Safety of machinery. Safety distances to prevent danger zones being reached by the upper limbs |
| EN 809 + A1 | Pumps and pump units for liquids – Common safety requirements |
| EN 12162:2001 | Liquid pumps – Safety requirements – Procedure for hydrostatic testing |
| EN 60204-1:2006 | Safety of machinery – Electrical equipment of machines (item 4, General requirements) |

Pumps delivered by us connected with prime movers are CE-marked and comply with the above requirements.

Pumps delivered by us without prime movers (as partly completed machinery) must only be used when the prime mover and the connection between prime mover and pump comply with the above requirements.

Nørresundby, June 1, 2010



Kurt Bech Christensen
Technical Director

DESMI A/S
Tagholm 1
9400 Nørresundby

12. POSITION NUMBERS - PUMP

| POS. | BENÆVNELSE | DESIGNATION | BEZEICHNUNG |
|------|-----------------------|---------------------|-----------------------|
| 1 | Pumpehus | Pump casing | Pumpengehäuse |
| 2 | Løbehjul | Impeller | Laufrad |
| 3 | Pakning | Gasket | Dichtung |
| 4 | Overdel | Top piece | Zwischengehäuse |
| 5 | Udluftningsventil | Air vent screw | Imbusschraube |
| 6 | Aksel | Pump shaft | Pumpenwelle |
| 7 | Akselbøsning | Shaft bush | Wellenbuchse |
| 8 | Aftrækkerflange | Dismantling flange | Abziehflansch |
| 9 | Motor | Motor | Motor |
| 10* | Skrue | Screw | Schraube |
| 11 | Pinolskrue med krater | Pointed screw | Gewindestift |
| 14 | Pindbolt | Stud | Spannschraube |
| 15 | Møtrik | Nut | Mutter |
| 16 | Slutring, trykside | Seal ring, pressure | Spaltring druckseitig |
| 17 | Slutring, sugeside | Seal ring, suction | Spaltring saugseitig |
| 18 | Aftapningsskrue | Drain screw | Verschlussschraube |
| 19 | Pasfeder | Key | Passfeder |
| 20 | Skrue | Screw | Schraube |
| 21 | Afstands bøsning | Space bushing | Abstandsbuchse |
| 22 | Mekanisk akseltætning | Mech. shaft seal | Gleitringdichtung |
| 23 | Spændeskive | Washer plate | Federscheibe |

* Screw or stud + nut.

Pos. No. refers to drawing.

When ordering spare parts please state pump number, type number as well as position numbers and designation.

13. ASSEMBLY DRAWING - PUMP

