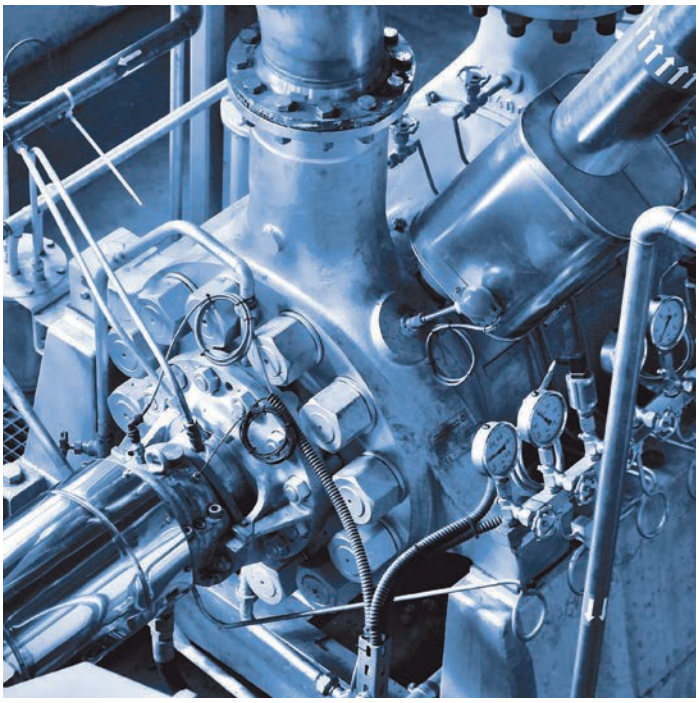
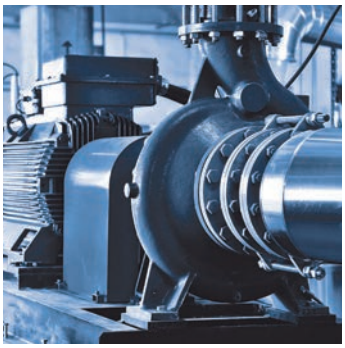
Grupa Powen-Wafapomp SA





# *Pumps for Power and Heat Supplying Industries*

2016 catalogue

## Basic pumps

### Supply pumps



### Condensate pumps



### Cooling water pumps



## Hot water pumps



## Stationary pumps



## Stationary slurry pumps



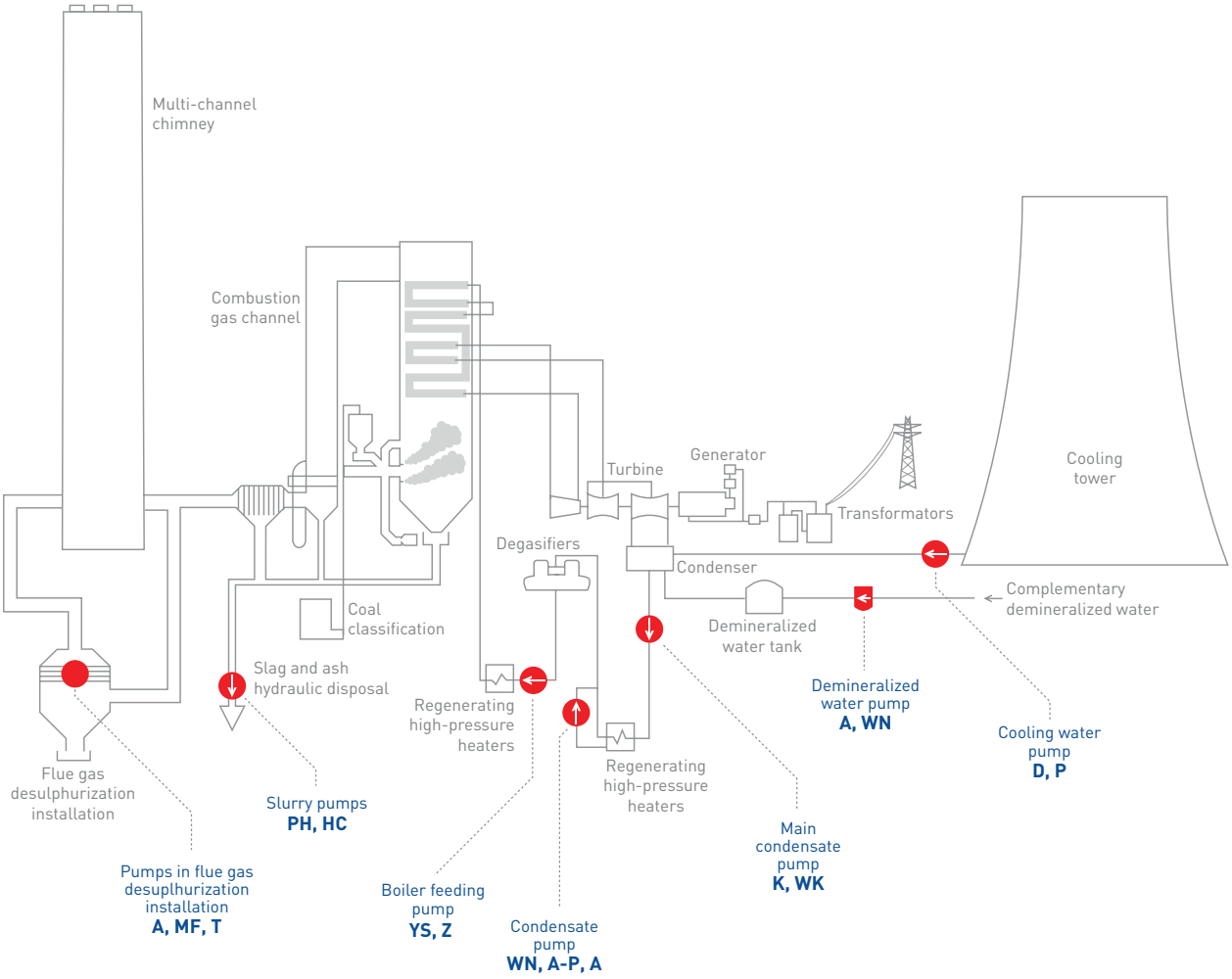
## Submersible slurry pumps



## Submersible pumps

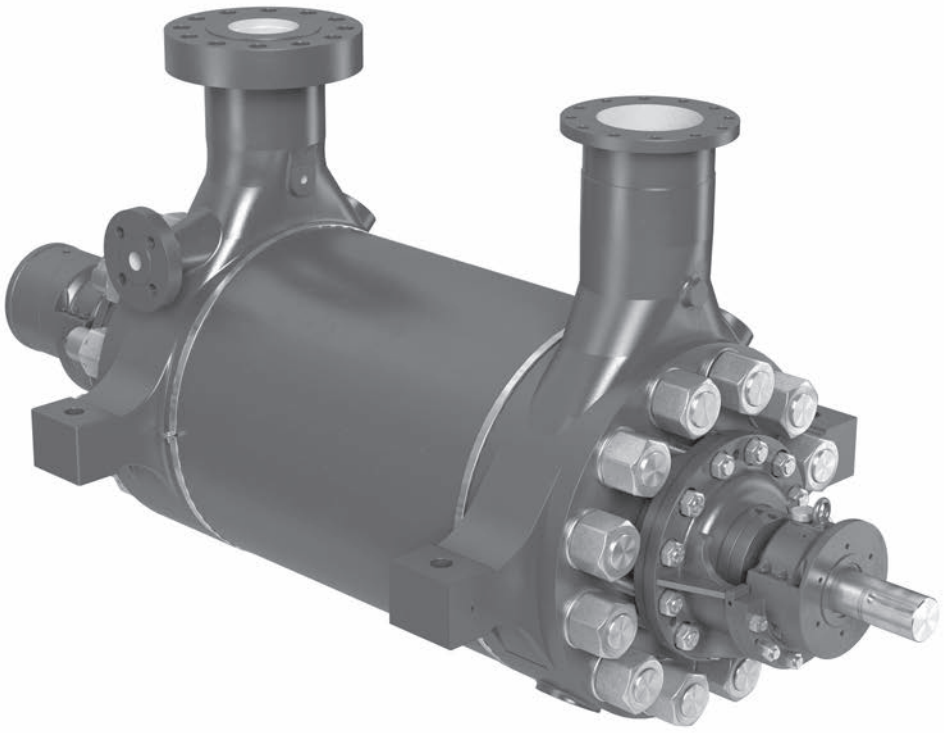
## PUMPS IN A POWER PLANT AND HEAT GENERATING PLANT

examples of application



# SUPPLY PUMPS Z

Z pumps are designed to operate as boiler feeding pumps for pumping clean and hot water in power plants



## APPLICATION

Z-type pumps are designed to operate as boiler feeding pumps in power plants.

They can also be applied in any other industrial application where clean, hot water of pressure up to 230 bar is required.

## DESIGN

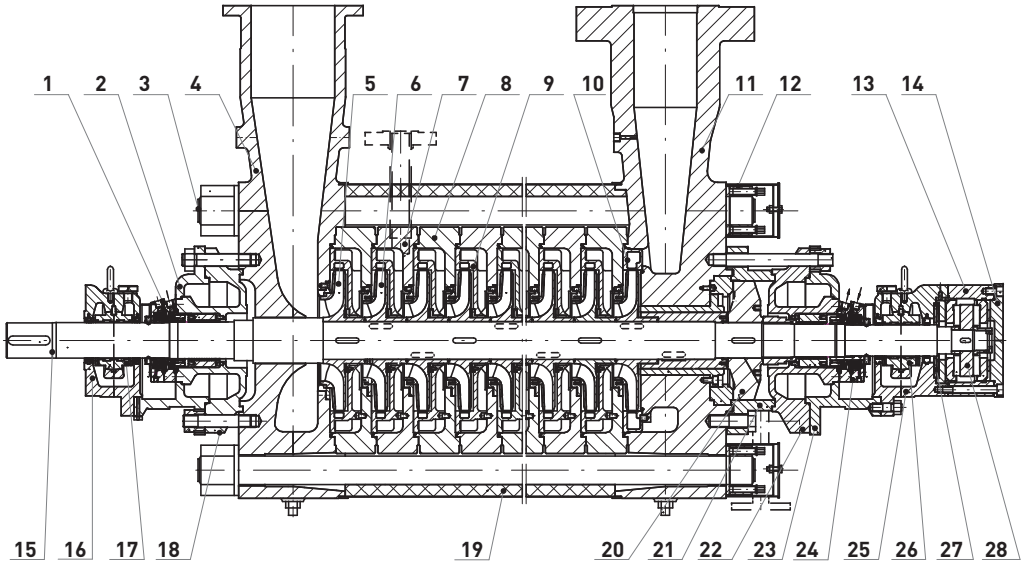
Horizontal, multistage, ring-section centrifugal pumps designed to handle hot water. The pumps are supported at the axis. Both suction and delivery flanges are directed vertically upwards. Version with the suction flange directed downwards is also available. The axial thrust is absorbed by a balance disk. In order to protect the balance disk during start-up the pumps are equipped with an additional axial Mitchell type bearing, which supports the balance disk during the transient period before the pump reaches the full operating speed. The slide bearings are oil lubricated with forced lubricating system consisting of auxiliary oil pump, oil filter and cooler. The pumps are equipped with mechanical seals.

Typically, Z type pumps are delivered with auxiliaries such as: suction filter, minimal flow valve, pressure gauges, temperature and vibration sensors.

## MATERIALS OF CONSTRUCTION

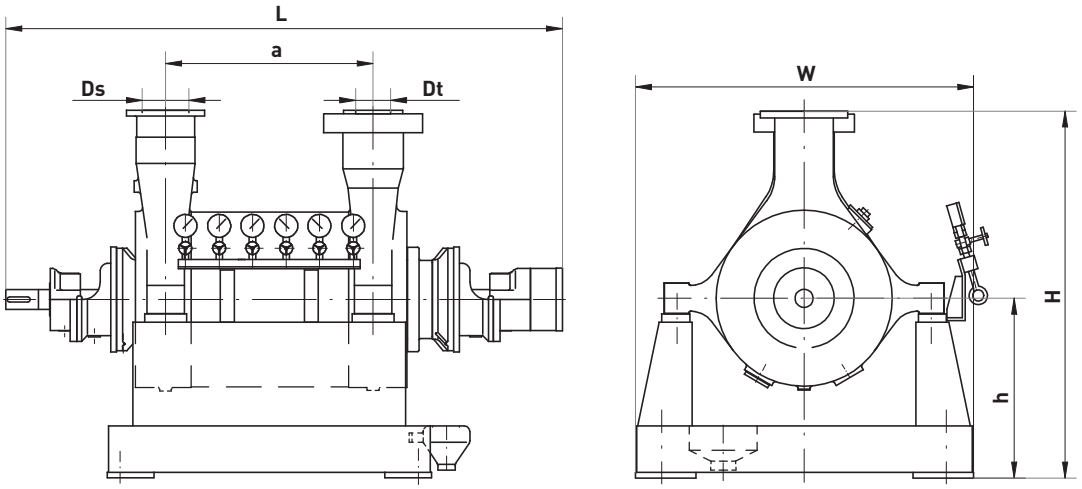
The materials of construction are selected for hot, demineralized boiler water. Chromium steel and chromium cast steel are applied as standard for main pump elements. Alternative, special materials can be selected if necessary.

## CROSS-SECTION / LIST OF PUMP PARTS



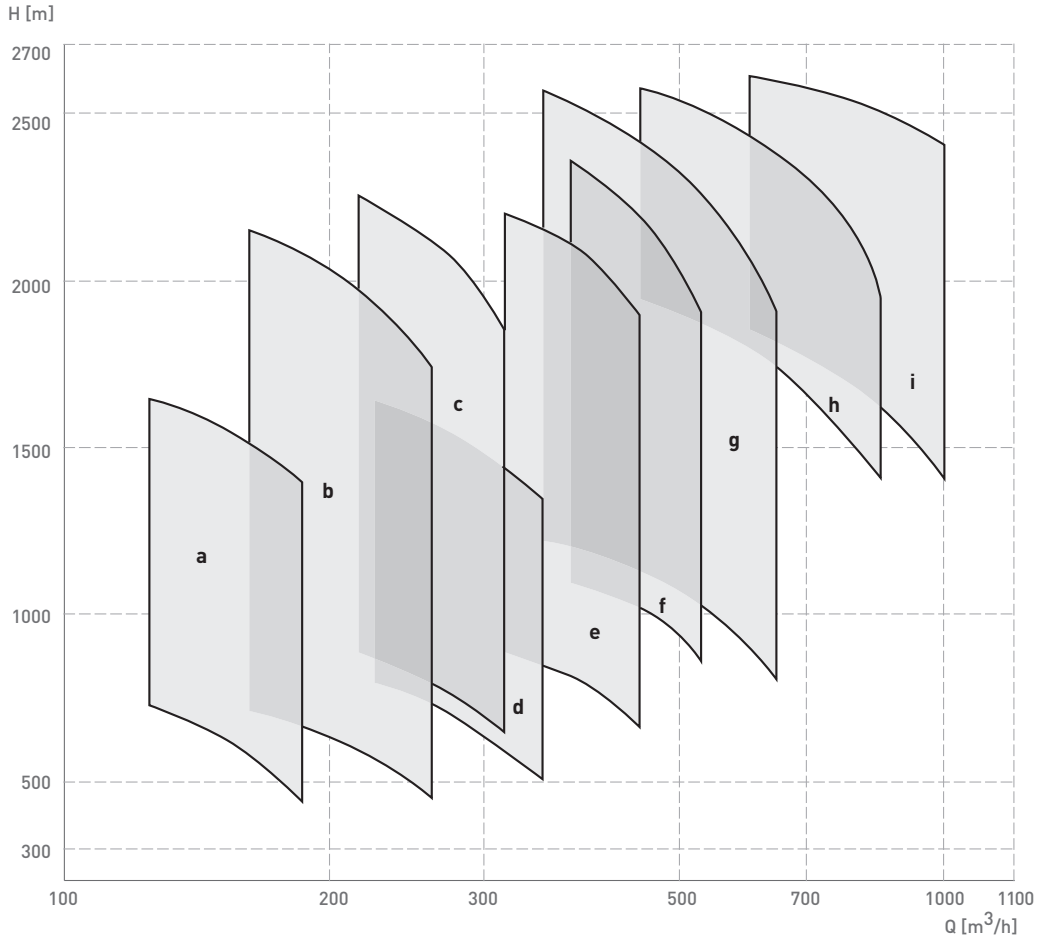

| No. | Part name | No. | Part name |
|---|---|---|---|
| 1 | Mechanical seal | 15 | Shaft |
| 2 | Stuffing box cover | 16 | Bearing housing |
| 3 | Tie bolt | 17 | Bush |
| 4 | Suction casing | 18 | Stuffing box |
| 5 | Impeller 1 | 19 | Shield |
| 6 | Impeller | 20 | Balance disk |
| 7 | Stage casing with bleeder | 21 | Stuffing box spacer |
| 8 | Stage casing | 22 | Stuffing box |
| 9 | Stator | 23 | Stuffing box cover |
| 10 | Stator | 24 | Mechanical seal |
| 11 | Discharge casing | 25 | Bearing housing |
| 12 | Superbolt nut | 26 | Bush |
| 13 | Thrust bearing housing | 27 | Dish spring |
| 14 | Thrust bearing cover | 28 | Counter balance disk |

## DIMENSIONS




| Pump type | Number of stages | Dimensions [mm] | | | | | | | Weight m [kg] |
|---|---|---|---|---|---|---|---|---|---|
| | | L | a | W | H | h | Ds | Dt | |
| 15Z28 | 3 | 1782 | 350 | 1280 | 1330 | 700 | 200 | 150 | 2500 |
| | 4 | 1872 | 440 | | | | | | 2620 |
| | 5 | 1962 | 530 | | | | | | 2740 |
| | 6 | 2032 | 620 | | | | | | 2860 |
| | 7 | 2122 | 710 | | | | | | 2980 |
| | 8 | 2212 | 800 | | | | | | 3100 |
| | 9 | 2302 | 890 | | | | | | 3220 |
| | 10 | 2392 | 980 | | | | | | 3340 |
| | 11 | 2482 | 1070 | | | | | | 3460 |
| | 12 | 2572 | 1160 | | | | | | 3580 |
| | 13 | 2662 | 1250 | | | | | | 3700 |
| 15Z33 | 3 | 1887 | 390 | 1450 | 1547 | 747 | 200 | 150 | 2600 |
| | 4 | 1987 | 490 | | | | | | 2760 |
| | 5 | 2087 | 590 | | | | | | 2920 |
| | 6 | 2187 | 690 | | | | | | 3080 |
| | 7 | 2287 | 790 | | | | | | 3260 |
| | 8 | 2387 | 890 | | | | | | 3420 |
| | 9 | 2487 | 990 | | | | | | 3580 |
| | 10 | 2587 | 1090 | | | | | | 3800 |
| 15Z40 | 4 | 2314 | 600 | 1630 | 1695 | 845 | 250 | 200 | 4509 |
| | 5 | 2439 | 725 | | | | | | 4786 |
| | 6 | 2564 | 850 | | | | | | 5063 |
| | 7 | 2689 | 975 | | | | | | 5340 |
| | 8 | 2814 | 1100 | | | | | | 5617 |
| | 9 | 2939 | 1225 | | | | | | 5894 |
| | 10 | 3064 | 1350 | | | | | | 6171 |
| | 11 | 3189 | 1475 | | | | | | 6448 |
| | 12 | 3314 | 1600 | | | | | | 6725 |

## RANGE OF OPERATION




**a** –15Z28; n = 3000 min$^{-1}$
**b** –15Z28; n = 3920 min$^{-1}$
**c** –15Z28; n = 4660 min$^{-1}$
**d** –15Z33; n = 3000 min$^{-1}$
**e** –15Z33; n = 3920 min$^{-1}$
**f** –15Z33; n = 4660 min$^{-1}$
**g** –15Z40; n = 3000 min$^{-1}$
**h** –15Z40; n = 3920 min$^{-1}$
**i** –15Z40; n = 4660 min$^{-1}$

## NOMINAL PARAMETERS

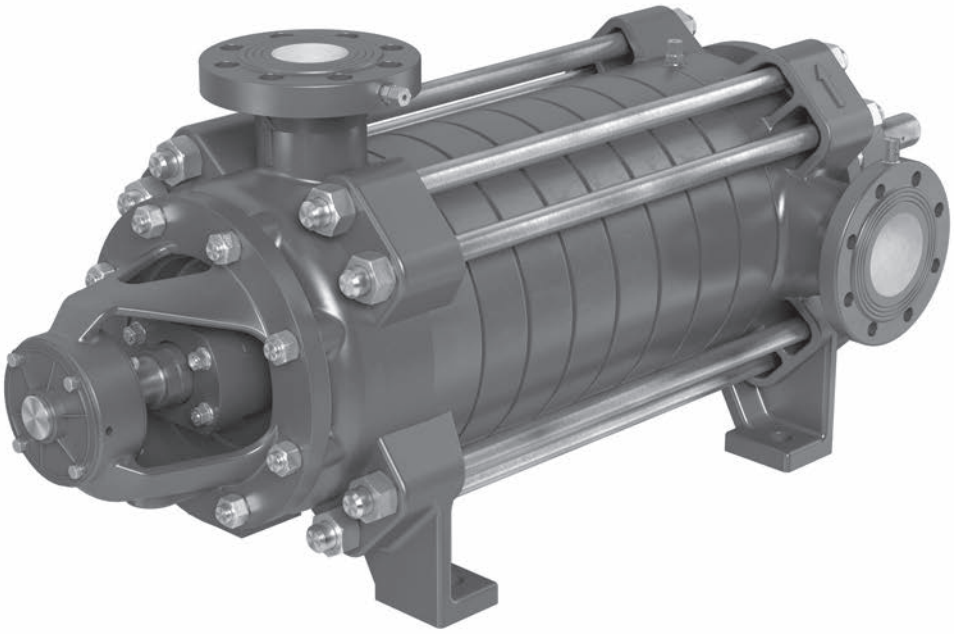
| Pump type | Number of stages | 3000 [rpm] | | | 3920 [rpm] | | | 4660 [rpm] | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Capacity Q [m³/h] | Head H [m] | Motor rated power $P_s$ [kW] | Capacity Q [m³/h] | Head H [m] | Motor rated power $P_s$ [kW] | Capacity Q [m³/h] | Head H [m] | Motor rated power $P_s$ [kW] |
| 15Z28 | 3 | 160 | - | - | 225 | 570 | 630 | 275 | 780 | 1250 |
| | 4 | | - | - | | 760 | 800 | | 1040 | 1250 |
| | 5 | | 575 | 500 | | 950 | 1000 | | 1300 | 1600 |
| | 6 | | 690 | 630 | | 1140 | 1250 | | 1560 | 2000 |
| | 7 | | 805 | 630 | | 1330 | 1600 | | 1820 | 2000 |
| | 8 | | 920 | 800 | | 1520 | 1600 | | 2080 | 2500 |
| | 9 | | 1135 | 800 | | 1710 | 2000 | | - | - |
| | 10 | | 1250 | 1000 | | 1900 | 2000 | | - | - |
| | 11 | | 1365 | 1000 | | - | - | | - | - |
| | 12 | | 1480 | 1250 | | - | - | | - | - |
| | 13 | | 1595 | 1250 | | - | - | | - | - |
| 15Z33 | 3 | 300 | - | - | 390 | 765 | 1250 | 465 | 1080 | 2000 |
| | 4 | | 600 | 800 | | 1020 | 1600 | | 1440 | 2500 |
| | 5 | | 750 | 1000 | | 1275 | 2000 | | 1800 | 3150 |
| | 6 | | 900 | 1250 | | 1530 | 2500 | | 2160 | 4000 |
| | 7 | | 1050 | 1250 | | 1785 | 2500 | | - | - |
| | 8 | | 1200 | 1600 | | 2040 | 3150 | | - | - |
| | 9 | | 1350 | 1600 | | - | - | | - | - |
| | 10 | | 1500 | 2000 | | - | - | | - | - |
| 15Z40 | 4 | 500 | - | - | 660 | - | - | 800 | 2000 | 5400 |
| | 5 | | 1000 | 1900 | | 1700 | 4000 | | 2500 | 6600 |
| | 6 | | 1200 | 2200 | | 2040 | 4800 | | - | - |
| | 7 | | 1400 | 2600 | | 2380 | 5500 | | - | - |
| | 8 | | 1600 | 2900 | | - | - | | - | - |
| | 9 | | 1800 | 3200 | | - | - | | - | - |
| | 10 | | 2000 | 3600 | | - | - | | - | - |
| | 11 | | 2200 | 3900 | | - | - | | - | - |
| | 12 | | 2400 | 4200 | | - | - | | - | - |

The parameters are specified for clean water of density ρ = 1000 kg/m³ and temperature T = 15°C.

# SUPPLY PUMPS

# YS

YS pumps are designed to handle industrial and boiler water



## APPLICATION

YS pumps are designed to handle industrial and boiler water with temperature up to 150°C in all types of industrial installations requiring good suction properties.

Typical application include:

- boiler feeding
- pumping of condensate
- high-pressure washing

## DESIGN

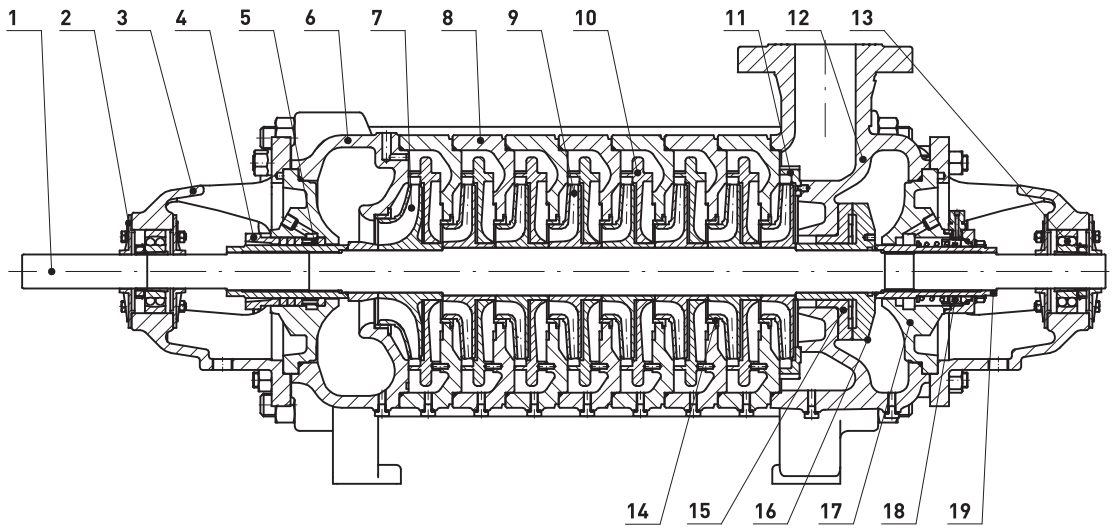
Stationary, horizontal multistage pumps with closed impellers arranged In series, with centrufugal and centri-petal rotary vane guides. Pumps are equipped with different from the other first stage impeller, with enhanced anticaviation properties. The axial force is transmitted by the balance disc. In 25-80YS and 180YS pumps roller bearing are applied with solid lubricant the does not require refrigeneration, while in 125-150YS pumps, shaft is supported on oil lubricated plain berings.

In 25-80YS pumps suction flange depending on the version: for cold water pumps (up to 80°C) is directed to the side, and for the hot water pumps (up to 150°C) is directed vertically upwards. In 125-150YS pumps suction and discharge flange, always are directed vertically upwards. Pump calniks can have applied mechanical seals or gland packing.

## MATERIALS OF CONSTRUCTION

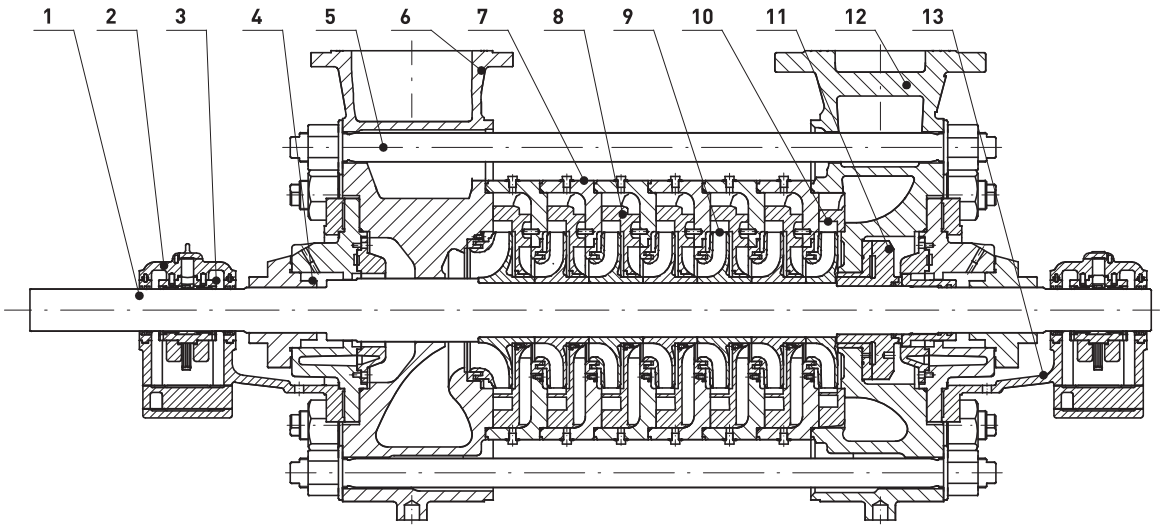
In standard materials version, 25-80YS and 180YS pumps are made of gray cast iron, and 125-150YS pumps are made of cast steel.

## CROSS-SECTION / LIST OF PUMP PARTS FOR 25 - 80YS & 180YS PUMPS



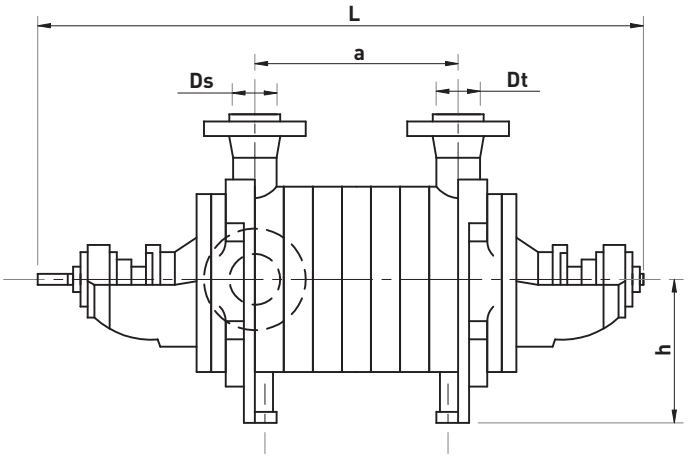

| No. | Part name | No. | Part name |
|---|---|---|---|
| 1 | Shaft | 11 | Centrifugal guide |
| 2 | Thrust bearing cover | 12 | Discharge casing |
| 3 | Bearing housing | 13 | Radial bearing |
| 4 | Stuffing box | 14 | Sealing ring |
| 5 | Lantern ring | 15 | Anti-disc |
| 6 | Suction casing | 16 | Balance disk |
| 7 | 1st stage impeller | 17 | Stuffing box casing |
| 8 | Stage casing | 18 | Gland packing or Mechanical seal |
| 9 | Impeller | 19 | Shaft protecting sleeve |
| 10 | Centrifugal-supply guide | | |

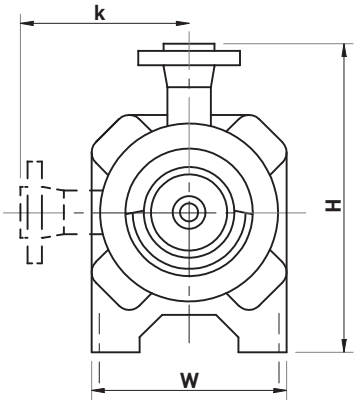
## CROSS-SECTION / LIST OF PUMP PARTS FOR 125 - 150YS PUMPS



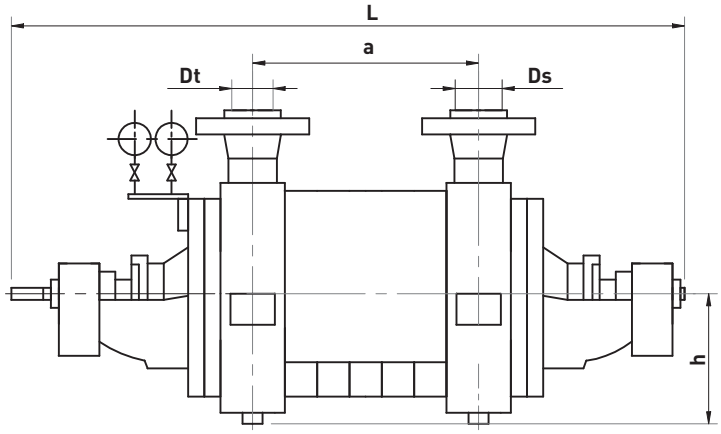

| No. | Part name | No. | Part name |
|---|---|---|---|
| 1 | Shaft | 8 | Centrifugal-supply guide |
| 2 | Bearing housing cover | 9 | Impeller |
| 3 | Bearing bushing | 10 | Centrifugal guide |
| 4 | Mechanical seal | 11 | Balance disk |
| 5 | Tie bolt | 12 | Discharge casing |
| 6 | Suction casing | 13 | Bearing housing |
| 7 | Stage casing | | |

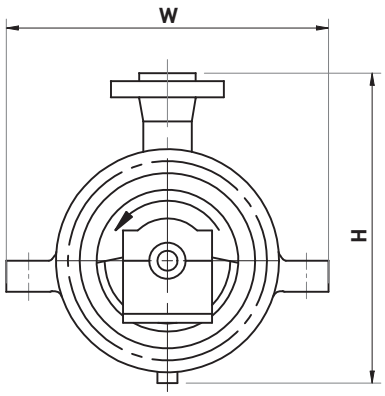
## DIMENSIONS



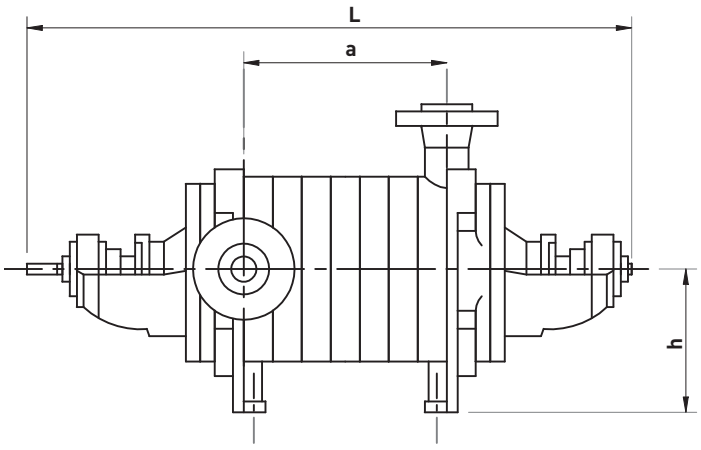



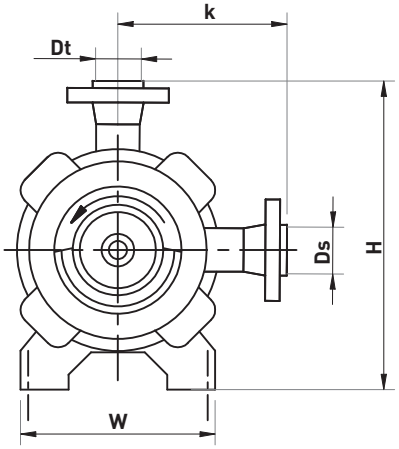

**25 - 80 YS**




**125 - 150 YS**



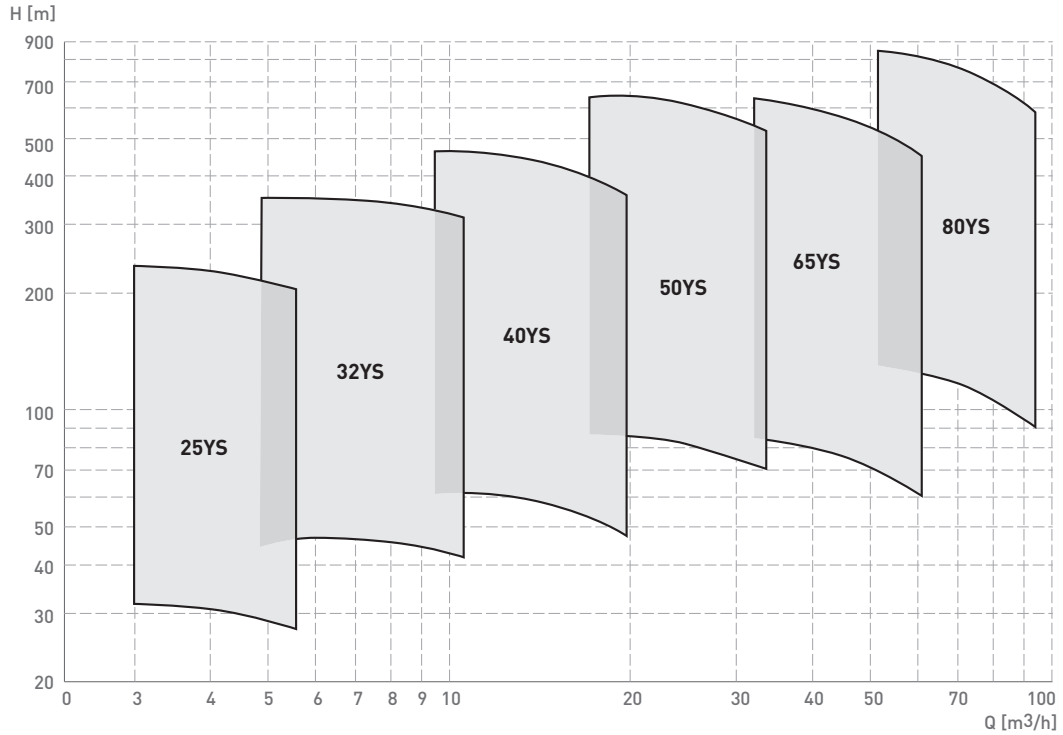



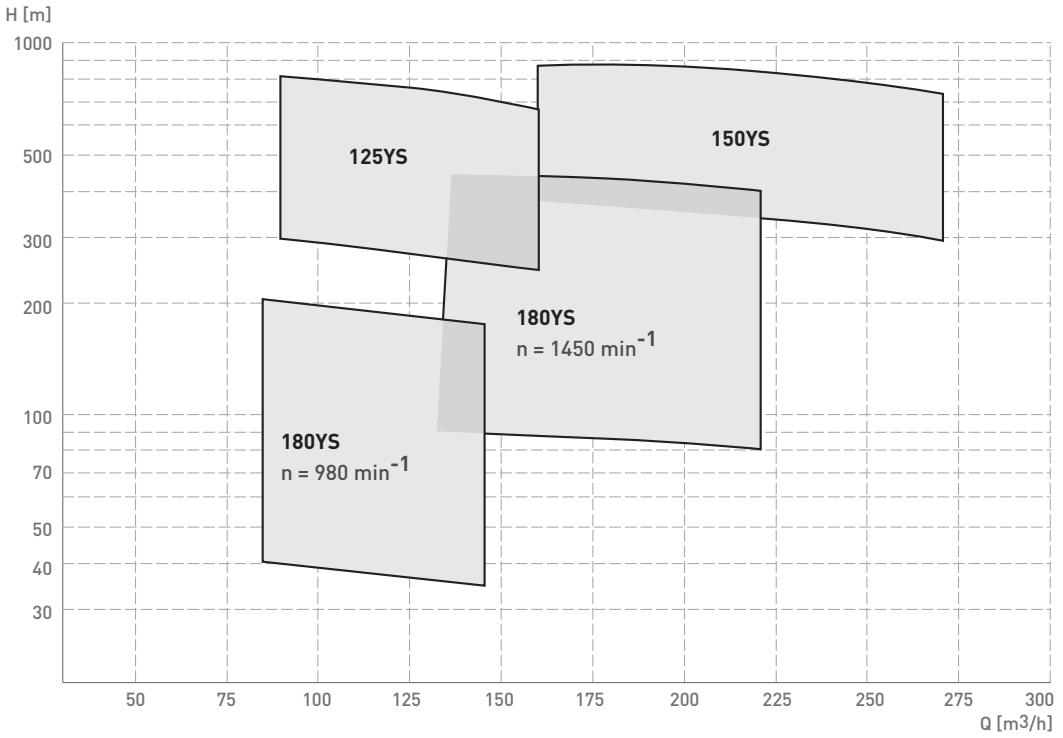

**180 YS**

| Pump type | Number of stages | Dimensions [mm] | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | L | a | H | h | W | k | Ds | Dt |
| 25YS | 2 | 620 | 95 | 205 | 140 | 210 | 165 | 32 | 25 |
| | 3 | 655 | 130 | | | | | | |
| | 4 | 690 | 165 | | | | | | |
| | 5 | 725 | 200 | | | | | | |
| | 6 | 760 | 235 | | | | | | |
| | 7 | 795 | 270 | | | | | | |
| | 8 | 830 | 305 | | | | | | |
| | 9 | 865 | 340 | | | | | | |
| | 10 | 900 | 375 | | | | | | |
| | 11 | 935 | 410 | | | | | | |
| | 12 | 970 | 445 | | | | | | |
| | 13 | 1005 | 480 | | | | | | |
| | 14 | 1040 | 515 | | | | | | |
| | 15 | 1075 | 550 | | | | | | |
| 32YS | 2 | 645 | 120 | 350 | 160 | 250 | 190 | 40 | 32 |
| | 3 | 685 | 160 | | | | | | |
| | 4 | 725 | 200 | | | | | | |
| | 5 | 765 | 240 | | | | | | |
| | 6 | 805 | 280 | | | | | | |
| | 7 | 845 | 320 | | | | | | |
| | 8 | 885 | 360 | | | | | | |
| | 9 | 925 | 400 | | | | | | |
| | 10 | 965 | 440 | | | | | | |
| | 11 | 1005 | 480 | | | | | | |
| | 12 | 1045 | 520 | | | | | | |
| | 13 | 1085 | 560 | | | | | | |
| | 14 | 1125 | 600 | | | | | | |
| | 15 | 1165 | 640 | | | | | | |
| 40YS | 2 | 711 | 134 | 420 | 200 | 300 | 220 | 50 | 40 |
| | 3 | 758 | 181 | | | | | | |
| | 4 | 805 | 228 | | | | | | |
| | 5 | 852 | 275 | | | | | | |
| | 6 | 899 | 322 | | | | | | |
| | 7 | 946 | 369 | | | | | | |
| | 8 | 993 | 416 | | | | | | |
| | 9 | 1040 | 463 | | | | | | |
| | 10 | 1087 | 510 | | | | | | |
| | 11 | 1134 | 557 | | | | | | |
| | 12 | 1181 | 604 | | | | | | |
| | 13 | 1228 | 651 | | | | | | |
| | 14 | 1275 | 698 | | | | | | |
| | 15 | 1322 | 745 | | | | | | |
| 50YS | 2 | 820 | 165 | 500 | 250 | 350 | 250 | 65 | 50 |
| | 3 | 875 | 220 | | | | | | |
| | 4 | 930 | 275 | | | | | | |
| | 5 | 985 | 330 | | | | | | |
| | 6 | 1040 | 385 | | | | | | |
| | 7 | 1095 | 440 | | | | | | |
| | 8 | 1150 | 495 | | | | | | |
| | 9 | 1205 | 550 | | | | | | |
| | 10 | 1260 | 605 | | | | | | |
| | 11 | 1315 | 660 | | | | | | |
| | 12 | 1370 | 715 | | | | | | |
| | 13 | 1425 | 770 | | | | | | |
| | 14 | 1480 | 825 | | | | | | |
| | 15 | 1535 | 880 | | | | | | |

| Pump type | Number of stages | Dimensions [mm] | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | L | a | H | h | W | k | Ds | Dt |
| 65YS | 2 | 820 | 165 | 500 | 250 | 350 | 250 | 80 | 65 |
| | 3 | 875 | 220 | | | | | | |
| | 4 | 930 | 275 | | | | | | |
| | 5 | 985 | 330 | | | | | | |
| | 6 | 1040 | 385 | | | | | | |
| | 7 | 1095 | 440 | | | | | | |
| | 8 | 1150 | 495 | | | | | | |
| | 9 | 1205 | 550 | | | | | | |
| | 10 | 1260 | 605 | | | | | | |
| | 11 | 1315 | 660 | | | | | | |
| | 12 | 1370 | 715 | | | | | | |
| | 13 | 1425 | 770 | | | | | | |
| | 14 | 1480 | 825 | | | | | | |
| | 15 | 1535 | 880 | | | | | | |
| 80YS | 2 | 1010 | 210 | 580 | 280 | 420 | 300 | 100 | 80 |
| | 3 | 1080 | 280 | | | | | | |
| | 4 | 1150 | 350 | | | | | | |
| | 5 | 1220 | 420 | | | | | | |
| | 6 | 1290 | 490 | | | | | | |
| | 7 | 1360 | 560 | | | | | | |
| | 8 | 1430 | 630 | | | | | | |
| | 9 | 1500 | 700 | | | | | | |
| | 10 | 1570 | 770 | | | | | | |
| | 11 | 1640 | 840 | | | | | | |
| | 12 | 1710 | 910 | | | | | | |
| 125YS | 4 | 1480 | 435 | 725 | 315 | 820 | - | 150 | 125 |
| | 5 | 1560 | 515 | | | | | | |
| | 6 | 1640 | 595 | | | | | | |
| | 7 | 1720 | 675 | | | | | | |
| | 8 | 1800 | 755 | | | | | | |
| | 9 | 1880 | 835 | | | | | | |
| | 10 | 1960 | 915 | | | | | | |
| | 11 | 2040 | 995 | | | | | | |
| 150YS | 4 | 1590 | 507 | 778 | 348 | 890 | - | 200 | 150 |
| | 5 | 1680 | 597 | | | | | | |
| | 6 | 1770 | 687 | | | | | | |
| | 7 | 1860 | 777 | | | | | | |
| | 8 | 1950 | 867 | | | | | | |
| | 9 | 2040 | 957 | | | | | | |
| | 10 | 2130 | 1047 | | | | | | |
| 180YS | 2 | 1125 | 270 | 715 | 340 | 625 | 375 | 150 | 150 |
| | 3 | 1230 | 375 | | | | | | |
| | 4 | 1335 | 480 | | | | | | |
| | 5 | 1440 | 585 | | | | | | |
| | 6 | 1545 | 690 | | | | | | |
| | 7 | 1650 | 795 | | | | | | |
| | 8 | 1755 | 900 | | | | | | |
| | 9 | 1860 | 1005 | | | | | | |
| | 10 | 1965 | 1110 | | | | | | |

## RANGE OF OPERATION



## NOMINAL PARAMETERS

| Pump type | Number of stages | Capacity Q [m³/h] | Head H [m] | Rotation speed n [rpm] | Shaft power P [kW] | Weight m [kg] |
|---|---|---|---|---|---|---|
| 25YS | 2 | 4,5 | 30 | 3000 | 0,9 | 52,6 |
| | 3 | | 45 | | 1,4 | 57,8 |
| | 4 | | 60 | | 1,8 | 63 |
| | 5 | | 75 | | 2,3 | 68,2 |
| | 6 | | 90 | | 2,8 | 73,1 |
| | 7 | | 105 | | 3,2 | 78,6 |
| | 8 | | 120 | | 3,7 | 83,8 |
| | 9 | | 135 | | 4,1 | 89,4 |
| | 10 | | 150 | | 4,6 | 94,2 |
| | 11 | | 165 | | 5,1 | 99,4 |
| | 12 | | 180 | | 5,5 | 104,6 |
| | 13 | | 195 | | 6,0 | 109,8 |
| | 14 | | 210 | | 6,4 | 115 |
| | 15 | | 225 | | 6,9 | 120,2 |
| 32YS | 2 | 8,5 | 44 | 3000 | 2,3 | 64,5 |
| | 3 | | 66 | | 3,5 | 72 |
| | 4 | | 88 | | 4,6 | 80 |
| | 5 | | 110 | | 5,8 | 87,5 |
| | 6 | | 132 | | 6,9 | 95 |
| | 7 | | 154 | | 8,1 | 103 |
| | 8 | | 176 | | 9,3 | 110,5 |
| | 9 | | 198 | | 10,4 | 118 |
| | 10 | | 220 | | 11,6 | 126 |
| | 11 | | 242 | | 12,7 | 134 |
| | 12 | | 264 | | 13,9 | 141,5 |
| | 13 | | 286 | | 15,1 | 149 |
| | 14 | | 308 | | 16,2 | 157 |
| | 15 | | 330 | | 17,4 | 164,5 |
| 40YS | 2 | 16 | 54 | 3000 | 4,2 | 108 |
| | 3 | | 81 | | 6,3 | 119,8 |
| | 4 | | 108 | | 8,4 | 130,5 |
| | 5 | | 135 | | 10,5 | 142 |
| | 6 | | 162 | | 12,6 | 153 |
| | 7 | | 189 | | 14,7 | 164,5 |
| | 8 | | 216 | | 16,8 | 176 |
| | 9 | | 243 | | 18,9 | 187 |
| | 10 | | 270 | | 21,0 | 198,5 |
| | 11 | | 297 | | 23,1 | 210 |
| | 12 | | 324 | | 25,2 | 221 |
| | 13 | | 351 | | 27,3 | 232,5 |
| | 14 | | 378 | | 29,4 | 243,5 |
| | 15 | | 405 | | 31,5 | 255 |
| 50YS | 2 | 27 | 80 | 3000 | 11,2 | 160 |
| | 3 | | 120 | | 16,8 | 177 |
| | 4 | | 160 | | 22,4 | 194 |
| | 5 | | 200 | | 28,0 | 210 |
| | 6 | | 240 | | 33,6 | 227 |
| | 7 | | 280 | | 39,2 | 244 |
| | 8 | | 320 | | 44,8 | 261 |
| | 9 | | 360 | | 50,5 | 278 |
| | 10 | | 400 | | 56,1 | 295 |
| | 11 | | 440 | | 61,7 | 311 |
| | 12 | | 480 | | 67,3 | 328 |
| | 13 | | 520 | | 72,9 | 345 |
| | 14 | | 560 | | 78,5 | 362 |
| | 15 | | 600 | | 84,1 | 378 |

| Pump type | Number of stages | Capacity Q [m³/h] | Head H [m] | Rotation speed n [rpm] | Shaft power P [kW] | Weight m [kg] |
|---|---|---|---|---|---|---|
| 65YS | 2 | 45 | 80 | 3000 | 14,4 | 162 |
| | 3 | | 120 | | 21,6 | 181 |
| | 4 | | 160 | | 28,9 | 199 |
| | 5 | | 200 | | 36,1 | 217 |
| | 6 | | 240 | | 43,3 | 235 |
| | 7 | | 280 | | 50,5 | 253 |
| | 8 | | 320 | | 57,7 | 272 |
| | 9 | | 360 | | 64,9 | 290 |
| | 10 | | 400 | | 72,1 | 308 |
| | 11 | | 440 | | 79,3 | 326 |
| | 12 | | 480 | | 86,6 | 344 |
| | 13 | | 520 | | 93,8 | 363 |
| | 14 | | 560 | | 101,0 | 381 |
| | 15 | | 600 | | 108,2 | 399 |
| 80YS | 2 | 75 | 120 | 3000 | 35,9 | 286 |
| | 3 | | 180 | | 53,9 | 319 |
| | 4 | | 240 | | 71,8 | 352 |
| | 5 | | 300 | | 89,8 | 385 |
| | 6 | | 360 | | 107,7 | 418 |
| | 7 | | 420 | | 125,7 | 451 |
| | 8 | | 480 | | 143,6 | 484 |
| | 9 | | 540 | | 161,6 | 517 |
| | 10 | | 600 | | 179,5 | 550 |
| | 11 | | 660 | | 197,5 | 583 |
| | 12 | | 720 | | 215,4 | 616 |
| 125YS | 4 | 130 | 280 | 3000 | 135,9 | 858 |
| | 5 | | 350 | | 169,8 | 908 |
| | 6 | | 420 | | 203,8 | 958 |
| | 7 | | 490 | | 237,8 | 1008 |
| | 8 | | 560 | | 271,8 | 1058 |
| | 9 | | 630 | | 305,7 | 1108 |
| | 10 | | 700 | | 339,7 | 1158 |
| | 11 | | 770 | | 373,7 | 1208 |
| 150YS | 4 | 230 | 320 | 3000 | 269,2 | 1174 |
| | 5 | | 400 | | 336,5 | 1245 |
| | 6 | | 480 | | 403,8 | 1316 |
| | 7 | | 560 | | 471,1 | 1387 |
| | 8 | | 640 | | 538,4 | 1458 |
| | 9 | | 720 | | 605,7 | 1529 |
| | 10 | | 800 | | 673,0 | 1600 |
| 180YS | 2 | 180 | 85 | 1500 | 55,6 | 967 |
| | 3 | | 128 | | 83,7 | 1020 |
| | 4 | | 170 | | 111,2 | 1080 |
| | 5 | | 212 | | 138,6 | 1132 |
| | 6 | | 255 | | 166,8 | 1185 |
| | 7 | | 297 | | 194,2 | 1240 |
| | 8 | | 340 | | 222,4 | 1295 |
| | 9 | | 383 | | 250,5 | 1350 |
| | 10 | | 425 | | 278,0 | 1405 |
| 180YS | 2 | 120 | 37 | 1000 | 16,1 | 967 |
| | 3 | | 56 | | 24,4 | 1020 |
| | 4 | | 75 | | 32,7 | 1080 |
| | 5 | | 93 | | 40,5 | 1132 |
| | 6 | | 112 | | 48,8 | 1185 |
| | 7 | | 131 | | 57,2 | 1240 |
| | 8 | | 150 | | 65,4 | 1295 |
| | 9 | | 168 | | 73,2 | 1350 |
| | 10 | | 187 | | 81,5 | 1405 |

The parameters are specified for clean water of density ρ = 1000 kg/m³ and temperature T = 15°C.

# CONDENSATE PUMPS

# K WK

K and KW pumps are designed as multi-stage vertical pumps for pumping condensate and clean water in thermal power plants

## APPLICATION

K and WK type pumps are designed as condensate extraction pumps for thermal power plants. Due to their good suction properties they can be also applied in any other cases when extremely low NPSH is available.

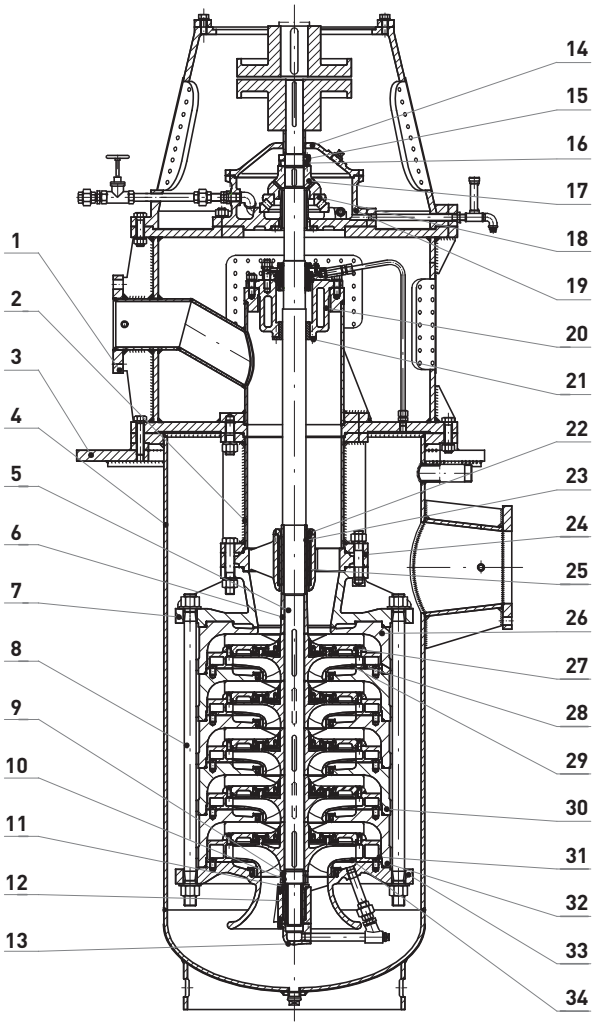
## DESIGN

Vertical, multistage pumps installed in a can. The suction and delivery flanges are arranged horizontally on opposite sides of the pumps. Water from the suction flange is directed to the bottom of the can in order to provide an increased suction head. The first stage impeller, installed on the lower end of the vertical shaft is of special design with improved suction properties. In larger pump sizes a double- suction first stage impeller is applied. The radial bearings submerged in water are slide type and the axial thrust bearing is roller type, oil lubricated. Mechanical seal is applied.

## MATERIALS OF CONSTRUCTION

The impellers and diffusers are made of stainless chromium cast steel.

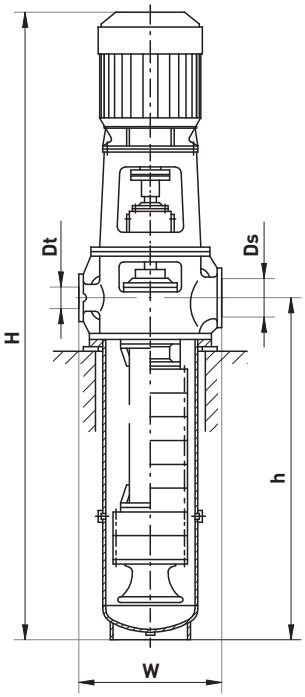
## CROSS-SECTION / LIST OF PUMP PARTS



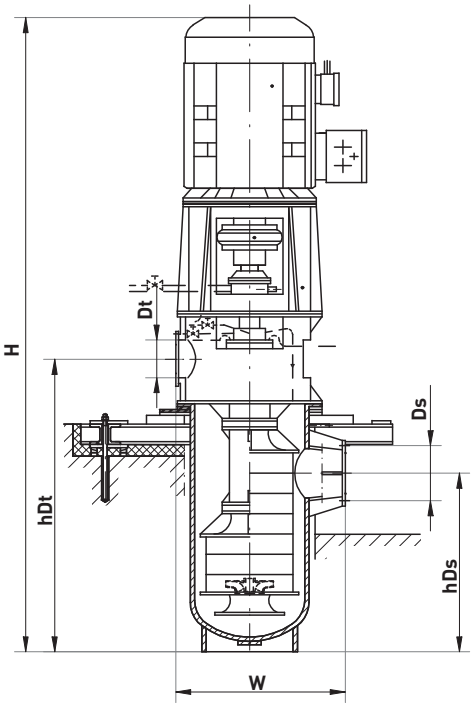

| No. | Part name | No. | Part name | No. | Part name |
|---|---|---|---|---|---|
| 1 | Discharge flange | 13 | Cover | 25 | Bushing |
| 2 | Discharge column | 14 | Thrust bearing cover | 26 | 2nd stage casing |
| 3 | Base plate | 15 | Slotted nut | 27 | Guide vane |
| 4 | Can | 16 | Slotted nut | 28 | Radial diffuser |
| 5 | Shaft | 17 | Thrust plate | 29 | Impeller |
| 6 | Spacer sleeve | 18 | Rolling bearing | 30 | Stage casing |
| 7 | Casing | 19 | Bearing housing | 31 | Radial diffuser1 |
| 8 | Tie bolt | 20 | Stuffing box casing | 32 | 1st stage casing |
| 9 | Shaft nut | 21 | Sealing sleeve | 33 | Inlet funnel |
| 10 | Shaft nut | 22 | Ring | 34 | Impeller 1 |
| 11 | Retainer ring | 23 | Bushing bearing | | |
| 12 | Bushing | 24 | Bearing insert | | |

## DIMENSIONS

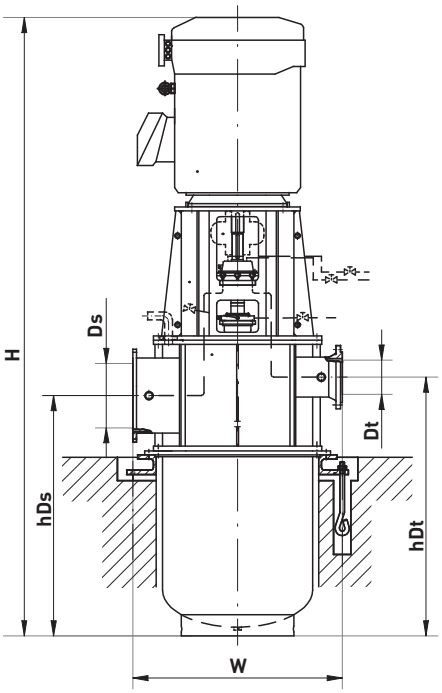
**10K22, 12K28**




**10K34, 15K34, 20K37, 25K41**



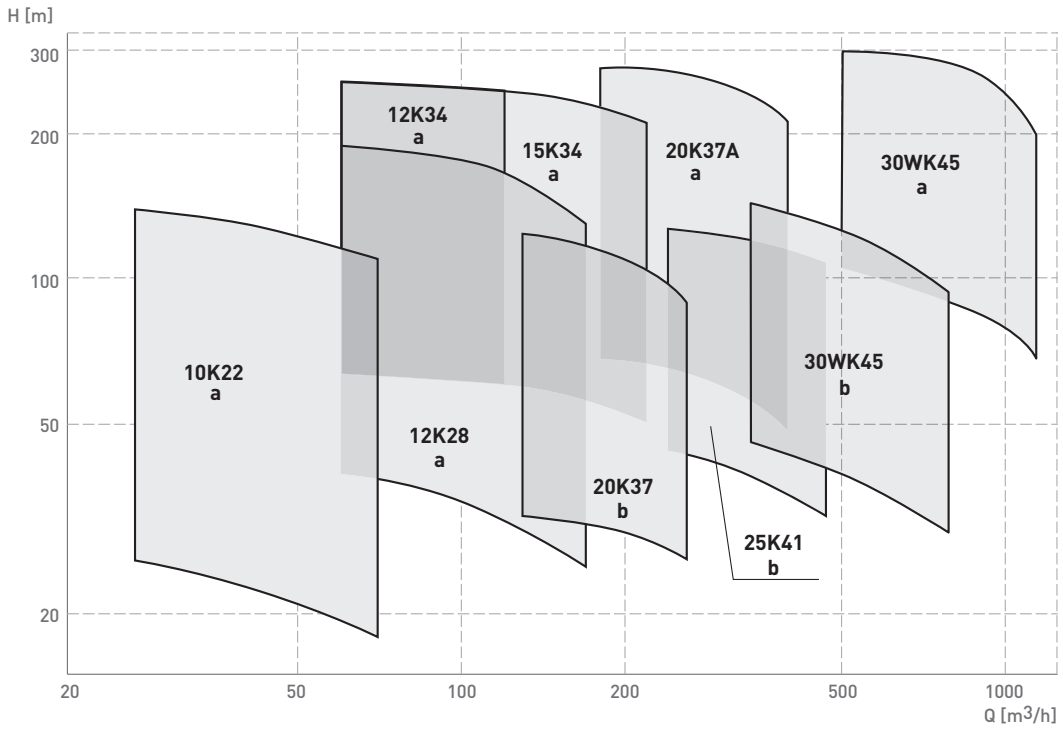

**30WK45**




| Pump types | Numer of stages | Dimensions [mm] | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | H | h | hDs | hDt | W | Ds | Dt |
| 10K22A | 2 | 2446 | 1415 | - | - | 700 | 150 | 100 |
| | 3 | 2542 | 1415 | | | | | |
| | 4 | 2586 | 1415 | | | | | |
| | 5 | 2722 | 1525 | | | | | |
| | 6 | 2612 | 1415 | | | | | |
| | 7 | 2722 | 1525 | | | | | |
| | 8 | 2870 | 1635 | | | | | |
| 10K22B | 2 | 2512 | 1415 | - | - | 700 | 150 | 100 |
| | 3 | 2586 | 1415 | | | | | |
| | 4 | 2612 | 1415 | | | | | |
| | 5 | 2786 | 1525 | | | | | |
| | 6 | 2741 | 1415 | | | | | |
| | 7 | 2851 | 1525 | | | | | |
| | 8 | 3016 | 1635 | | | | | |
| 12K28 | 2 | 2615 | 1275 | - | - | 850 | 200 | 125 |
| | 3 | 2615 | 1275 | | | | | |
| | 4 | 2640 | 1275 | | | | | |
| | 5 | 2895 | 1390 | | | | | |
| | 6 | 3205 | 1505 | | | | | |
| | 7 | 3520 | 1620 | | | | | |
| 12K34 | 2 | 3380 | - | 1220 | 1890 | 1100 | 200 | 125 |
| | 3 | 1960 | | | | | | |
| | 4 | 2020 | | | | | | |
| | 5 | 2190 | | | | | | |
| | 6 | 2190 | | | | | | |

| Pump types | Numer of stages | Dimensions [mm] | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | H | h | hDs | hDt | W | Ds | Dt |
| 15K34 | 2 | 3550 | - | 1220 | 1890 | 1100 | 250 | 150 |
| | 3 | 1960 | | | | | | |
| | 4 | 2050 | | | | | | |
| | 5 | 2190 | | | | | | |
| | 6 | 2560 | | | | | | |
| 20K37 | 3 | 3760 | - | 1300 | 2080 | 1150 | 300 | 200 |
| | 4 | 2010 | | | | | | |
| | 5 | 2285 | | | | | | |
| | 6 | 2285 | | | | | | |
| | 7 | 2285 | | | | | | |
| 20K37A | 2 | 3800 | - | 1350 | 2080 | 1150 | 350 | 200 |
| | 3 | 2170 | | | | | | |
| | 4 | 2170 | | | | | | |
| | 5 | 2540 | | | | | | |
| | 6 | 2580 | | | | | | |
| 25K41 | 2 | 3725 | - | 1125 | 2005 | 1250 | 500 | 250 |
| | 3 | 2170 | | | | | | |
| | 4 | 2355 | | | | | | |
| | 5 | 2355 | | | | | | |
| 30WK45 | 2 | 5274 | - | 2050 | 2200 | 1700 | 600 | 300 |
| | 3 | 3893 | | | | | | |
| | 4 | 4154 | | | | | | |

## RANGE OF OPERATION




**a** – 1470 min$^{-1}$ **b** – 960 min$^{-1}$

## NOMINAL PARAMETERS

| Pump type | Number of stages | Capacity Q [m³/h] | Head H [m] | Motor rated power $P_s$ [kW] | Rotation speed n [rpm] | Weight m [kg] |
|---|---|---|---|---|---|---|
| 10K22A | 2 | 36 | 30 | 5,5 / 7,5 | 1500 | 764 |
| | 3 | | 45 | 7,5 / 11 | | 885 |
| | 4 | | 60 | 11 / 15 | | 961 |
| | 5 | | 75 | 15 / 18,5 | | 1066 |
| | 6 | | 90 | 18,5 | | 1095 |
| | 7 | | 105 | 18,5 / 22 | | 1194 |
| | 8 | | 120 | 22 | | 1273 |
| 10K22B | 2 | 60 | 30 | 11 | 1500 | 826 |
| | 3 | | 45 | 15 | | 895 |
| | 4 | | 60 | 18,5 | | 983 |
| | 5 | | 75 | 22 | | 1084 |
| | 6 | | 90 | 30 | | 1196 |
| | 7 | | 105 | 20 | | 1286 |
| | 8 | | 120 | 37 | | 1403 |
| 12K28 | 2 | 100 130* | 44 | 18,5 / 22 | 1500 | 1139 |
| | 3 | | 66 | 22 / 30 / 37 | | 1328 |
| | 4 | | 88 | 37 / 45 | | 1411 |
| | 5 | | 110 | 45 / 55 | | 1592 |
| | 6 | | 132 | 55 / 75 | | 1841 |
| | 7 | | 154 | 75 | | 2013 |
| 15K34 | 2 | 180 | 72 | 45 / 55 | 1500 | 200 |
| | 3 | | 108 | 75 | | 2240 |
| | 4 | | 144 | 90 / 110 | | 2495 |
| | 5 | | 180 | 110 /132 | | 2670 |
| | 6 | | 216 | 132 / 160 | | 2770 |
| 20K37 | 3 | 240 | 51 | 45 / 55 | 1000 | 2849 |
| | 4 | | 68 | 55 / 75 | | 3368 |
| | 5 | | 85 | 75 / 90 | | 3591 |
| | 6 | | 102 | 110 | | 3738 |
| | 7 | | 119 | 132 | | 3936 |
| 20K37A | 2 | 300 | 80 | 90 | 1500 | 2985 |
| | 3 | | 120 | 132 | | 2695 |
| | 4 | | 160 | 160 / 200 | | 3560 |
| | 5 | | 200 | 200 / 250 | | 3870 |
| | 6 | | 240 | 250 / 320 | | 4450 |
| 25K41 | 2 | 360 | 46 | 55 / 75 | 1000 | 3470 |
| | 3 | | 69 | 75 / 90 | | 3695 |
| | 4 | | 92 | 110 / 132 | | 4100 |
| | 5 | | 115 | 132 / 160 | | 4860 |
| 30WK45 | 2 | 900 | 112,5 | 320 / 400 | 1500 | 8330 |
| | 3 | | 180 | 500 / 630 | | 9100 |
| | 4 | | 260 | 800 / 1000 | | 9470 |
| 30WK45 | 2 | 600 | 50 | 110 / 132 | 1000 | 8330 |
| | 3 | | 80 | 160 / 200 | | 9100 |
| | 4 | | 116 | 250 / 320 | | 9470 |

The parameters are specified for clean water of density ρ = 1000 kg/m³ and temperature T = 15°C.

# COOLING WATER PUMPS

# D

D range pumps are designed as mixed-flow vertical pumps, either single-stage or multi-stage with either closed or open impellers and vane diffusers

## APPLICATION

D type pumps are typically applied at water intakes and as cooling water pumps in power plants and other industrial installations. They are also applicable in any other cases when high capacity is required at relatively low head.

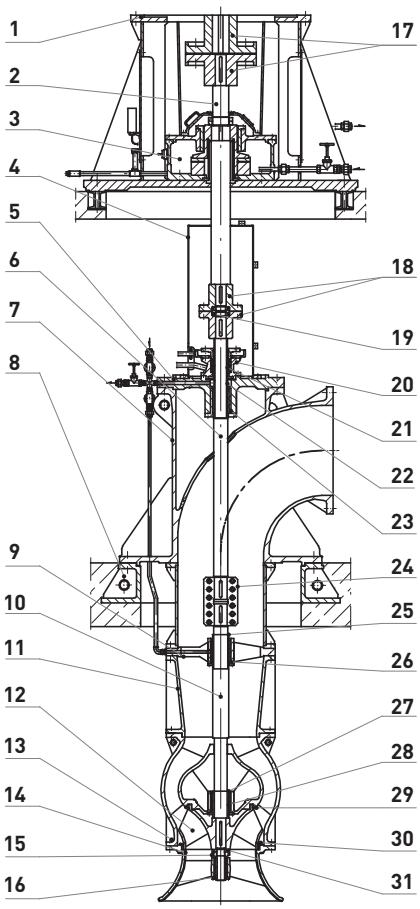
## DESIGN

D-type pumps are vertical, mixed flow turbine pumps. They are available in many versions both single and multistage. The pump inlet is at the bottom of the pump. Impellers are assembled on the end of the vertical shaft. Water flows through the vane diffuser and then through the vertical column along the shaft with radial bearings lubricated by the pumped water. The delivery flange is directed horizontally over the floor on which the pump is supported. The axial bearing mounted over the elbow leading to the delivery flange is a roller type for smaller sizes and Mitchell type for bigger pumps. The axial bearings are oil lubricated and cooled by water if necessary. For smaller pumps the motor is supported on the pump, while for biggest units it is assembled on a separate floor.

## MATERIALS OF CONSTRUCTION

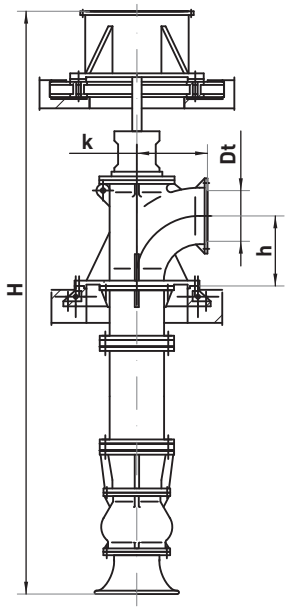
The impellers are made of bronze or stainless cast steel. The other elements in standard version are made of cast iron or steel.

## CROSS-SECTION / LIST OF PUMP PARTS



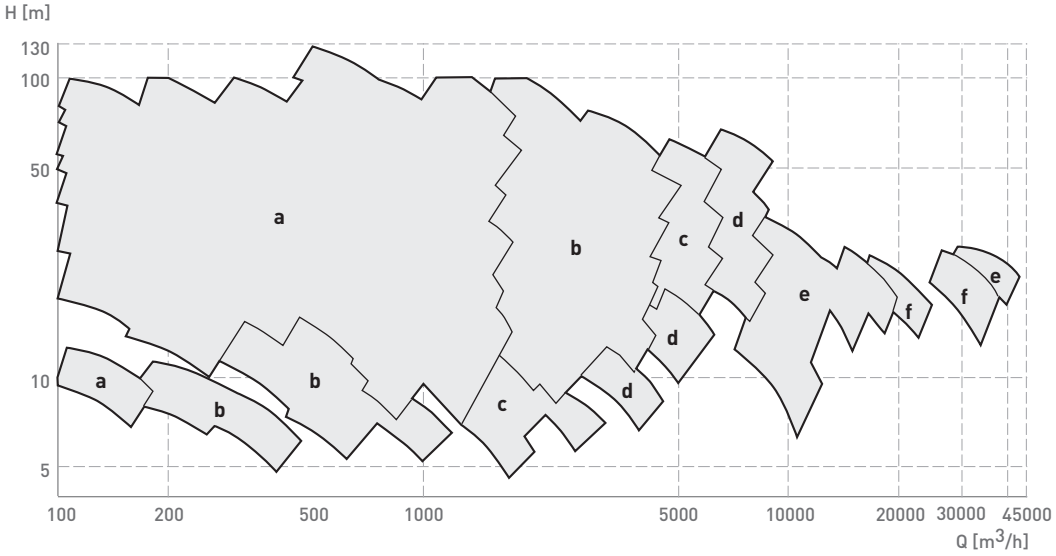

| No. | Part name | No. | Part name |
|---|---|---|---|
| 1 | Motor support | 17 | Elastic coupling |
| 2 | Upper shaft | 18 | Rigid coupling |
| 3 | Thrust bearing subassembly | 19 | Slotted nut |
| 4 | Coupling guard | 20 | Gland seal |
| 5 | Elbow cover | 21 | Gland sleeve |
| 6 | Intermediary shaft | 22 | Slide bearing |
| 7 | Discharge elbow | 23 | Bushing |
| 8 | Ceiling ring | 24 | Split-muff coupling |
| 9 | Bearing insert | 25 | Slide bearing |
| 10 | Lower shaft | 26 | Bushing |
| 11 | Vaneless diffuser | 27 | Bushing bearing |
| 12 | Impeller | 28 | Bushing |
| 13 | Vane diffuser | 29 | Sealing ring |
| 14 | Inlet bell | 30 | Sealing ring |
| 15 | Bushing bearing with thread | 31 | Impeller nut |
| 16 | Bush | | |

## DIMENSIONS




| Pump type size | Dimensions [mm] | | | |
|---|---|---|---|---|
| | H | h | k | Dt |
| 15D | 2950÷27765 | 300 | 300 | 150 |
| 20D | 3050÷27350 | 350 | 350 | 200 |
| 25D | 3170÷26450 | 350 | 350 | 250 |
| 30D | 3260÷26660 | 400 | 400 | 300 |
| 35D | 3190÷23770 | 400 | 400 | 350 |
| 40D | 3470÷22820 | 450 | 450 | 400 |
| 50D | 3970÷21000 | 500 | 500 | 500 |
| 60D | 4350÷18790 | 550 | 550 | 600 |
| 80D | 4960÷20330 | 600 | 600 | 800 |
| 90D | 5742÷9880 | 800 | 800 | 900 |
| 100D | 6020÷8452 | 900 | 1000 | 1000 |
| 120D | 6450÷7850 | 1050 | 1100 | 1200 |
| 140D | 6650÷9685 | 990 | 1250 | 1400 |
| 160D | 7915÷10315 | 1250 | 1250 | 1600 |
| 180D | 8966÷11366 | 1350 | 1500 | 1800 |

## RANGE OF OPERATION




**a** – 1470 min$^{-1}$
**b** – 980 min$^{-1}$
**c** – 725 min$^{-1}$
**d** – 590 min$^{-1}$
**e** – 490 min$^{-1}$
**f** – 360 min$^{-1}$

## NOMINAL PARAMETERS

| Pump hydraulic type size x Number of stages | Capacity Q [m³/h] | Head H [m] | Rotation speed n [rpm] | Motor rated power $P_s$ [kW] |
|---|---|---|---|---|
| 15D17-2 | 190 | 10 | 1500 | 11 |
| 15D17-2x2 | 190 | 20 | 1500 | 18,5 |
| 15D17-2x3 | 190 | 30 | 1500 | 30 |
| 15D17-2x4 | 190 | 40 | 1500 | 37 |
| 15D17-2x5 | 190 | 50 | 1500 | 45 |
| 15D17-2x6 | 190 | 60 | 1500 | 55 |
| 15D17-2x7 | 190 | 70 | 1500 | 55 |
| 15D17-2x8 | 190 | 80 | 1500 | 75 |
| 20D15-2 | 250 | 17,5 | 1500 | 22 |
| 20D15-2x2 | 250 | 35 | 1500 | 45 |
| 20D15-2x3 | 250 | 52,5 | 1500 | 75 |
| 20D15-2x4 | 250 | 70 | 1500 | 90 |
| 20D15-2x5 | 250 | 87,5 | 1500 | 110 |
| 25D17-2 | 400 | 22 | 1500 | 37 |
| 25D17-2x2 | 400 | 44 | 1500 | 75 |
| 25D17-2x3 | 400 | 66 | 1500 | 110 |
| 25D17-2x4 | 400 | 88 | 1500 | 160 |
| 25D17-3 | 265 | 10 | 1000 | 15 |
| 30D17-2 | 640 | 30 | 1500 | 90 |
| 30D17-2x2 | 640 | 60 | 1500 | 160 |
| 30D17-2x3 | 640 | 90 | 1500 | 250 |
| 30D17-2x4 | 640 | 112 | 1500 | 320 |
| 30D17-3 | 400 | 13 | 1000 | 30 |
| 30D22-2 | 620 | 19 | 1500 | 55 |
| 30D22-2x2 | 620 | 38 | 1500 | 110 |
| 30D22-3 | 400 | 7,5 | 1000 | 15 |
| 35D22-2 | 1000 | 28 | 1500 | 110 |
| 35D22-2x2 | 1000 | 56 | 1500 | 250 |
| 35D22-2x3 | 1000 | 84 | 1500 | 400 |
| 35D22-3 | 630 | 11 | 1000 | 37 |
| 35D30-2 | 950 | 20 | 1500 | 90 |
| 35D30-2x2 | 950 | 40 | 1500 | 160 |
| 35D30-3 | 630 | 9 | 1000 | 30 |
| 35D40-2 | 800 | 12 | 1500 | 45 |
| 40D22-2 | 1500 | 35 | 1500 | 250 |
| 40D22-2x2 | 1500 | 70 | 1500 | 500 |
| 40D22-2x3 | 1500 | 96 | 1500 | 630 |
| 40D30-2 | 1500 | 24 | 1500 | 160 |
| 40D30-2x2 | 1500 | 48 | 1500 | 315 |
| 40D40-2 | 1575 | 17 | 1500 | 110 |
| 40D40-3 | 1050 | 7,5 | 1000 | 37 |
| 40D32-3 | 1250 | 12 | 1000 | 75 |
| 50D22a-3 | 2250 | 30 | 1000 | 315 |

| Pump hydraulic type size x Number of stages | Capacity Q [m³/h] | Head H [m] | Rotation speed n [rpm] | Motor rated power $P_s$ [kW] |
|---|---|---|---|---|
| 50D22a-3x2 | 2250 | 60 | 1000 | 500 |
| 50D22a-3x3 | 2250 | 90 | 1000 | 800 |
| 50D30-3 | 2250 | 20 | 1000 | 200 |
| 50D30-3x2 | 2250 | 40 | 1000 | 400 |
| 50D30-4 | 1700 | 10,5 | 750 | 90 |
| 50D40-3 | 2400 | 14 | 1000 | 160 |
| 50D40-4 | 1800 | 7,5 | 750 | 75 |
| 60D20-3 | 4800 | 53 | 1000 | 900 |
| 60D22-3 | 3600 | 35 | 1000 | 500 |
| 60D22-3x2 | 3600 | 70 | 1000 | 1000 |
| 60D26-3 | 5750 | 46 | 1000 | 1000 |
| 60D26-4 | 4250 | 26 | 750 | 400 |
| 60D30-3 | 3600 | 23 | 1000 | 400 |
| 60D30-3x2 | 3600 | 48 | 1000 | 710 |
| 60D40-3 | 3600 | 18 | 1000 | 250 |
| 60D40-4 | 2700 | 8,5 | 750 | 90 |
| 80D22-4 | 6000 | 27 | 750 | 630 |
| 80D22-4x2 | 6000 | 54 | 750 | 1250 |
| 80D25-4 | 6000 | 38 | 750 | 1000 |
| 80D30-4 | 5250 | 22 | 750 | 500 |
| 80D31-5 | 5500 | 17,5 | 600 | 400 |
| 80D32-5 | 4750 | 15 | 600 | 315 |
| 80D32-6 | 4000 | 10 | 500 | 160 |
| 90D22-5 | 7500 | 30 | 600 | 1000 |
| 90D30-5 | 7500 | 22,5 | 600 | 800 |
| 90D30-5x2 | 7500 | 45 | 600 | 1600 |
| 100D22-6 | 10500 | 30 | 500 | 1250 |
| 100D30-6 | 10500 | 21,5 | 500 | 1000 |
| 100D40-6 | 9700 | 14,5 | 500 | 630 |
| 120D30-6 | 13500 | 24 | 500 | 1250 |
| 120D40-6 | 13500 | 20 | 500 | 1000 |
| 140D40-6 | 17500 | 24 | 500 | 1600 |
| 160D30-8 | 22000 | 22 | 375 | 1800 |
| 180D30-8 | 37500 | 24 | 375 | 3200 |
| 180D40-8 | 32000 | 22 | 375 | 2500 |

The parameters are specified for clean water of density ρ = 1000 kg/m³ and temperature T = 15°C.

# COOLING WATER PUMPS

# P

P pumps are designed as vertical single-stage propeller pumps with a vane diffusers

## APPLICATION

P type pumps are applicable in any case when high capacity is required at low head.
Typically P type pumps are applied as cooling water pumps in power plants with external source of cooling water and in melioration pumping stations.

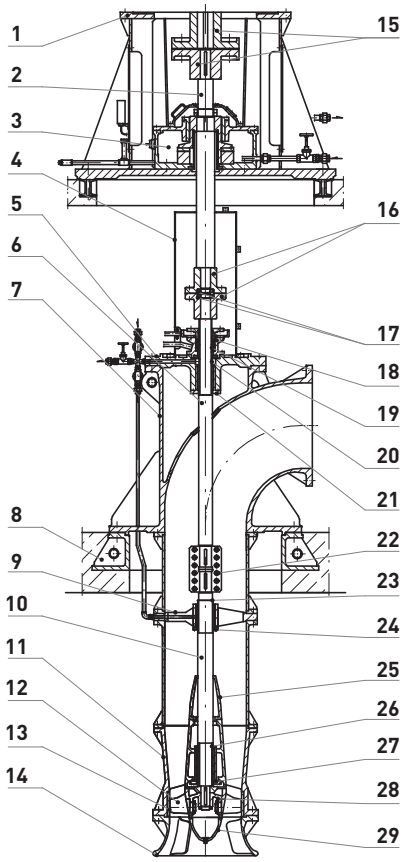
## DESIGN

P-type pumps are vertical, axial flow propeller pumps.The pump inlet is at the bottom of the pump. Impellers are assembled on the end of the vertical shaft. Water flows through the vane diffuser and then through the vertical column along the shaft with radial bearings lubricated by the pumped water. The delivery flange is directed horizontally over the floor on which the pump is supported. The axial bearing mounted over the elbow leading to the delivery flange is a roller type for smaller sizes and Mitchell type for bigger pumps. The axial bearings are oil lubricated and cooled by water if necessary. For smaller pumps the motor is supported on the pump, while for biggest units it is assembled on a separate floor.

## MATERIALS OF CONSTRUCTION

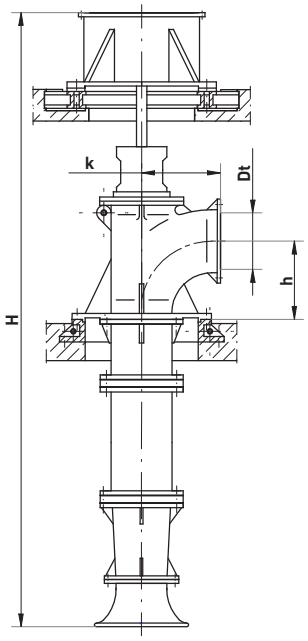
The impellers are made of bronze or stainless cast steel. The other elements in standard version are made of cast iron or steel.

## CROSS-SECTION / LIST OF PUMP PARTS



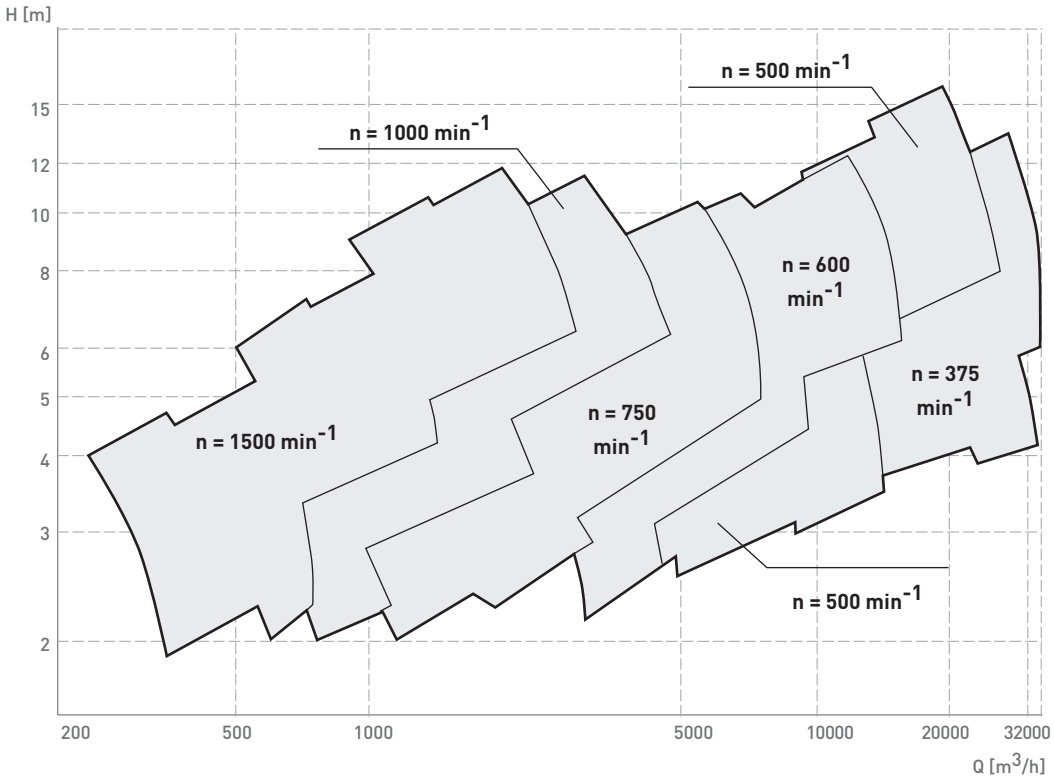

| No. | Part name |
|---|---|
| 1 | Motor support |
| 2 | Upper shaft |
| 3 | Thrust bearing subassembly |
| 4 | Coupling guard |
| 5 | Elbow cover |
| 6 | Intermediate shaft |
| 7 | Discharge elbow |
| 8 | Ceiling ring |
| 9 | Bearing insert |
| 10 | Lower shaft |
| 11 | Diffuser |
| 12 | Impeller vane |
| 13 | Diffuser layer |
| 14 | Inlet bell |
| 15 | Elastic coupling |
| 16 | Rigid coupling |
| 17 | Slotted nut |
| 18 | Gland seal |
| 19 | Gland sleeve |
| 20 | Slide bearing |
| 21 | Bushing |
| 22 | Split-muff coupling |
| 23 | Slide bearing |
| 24 | Bushing |
| 25 | Fairwater cone |
| 26 | Slide bearing |
| 27 | Bushing |
| 28 | Impeller hub |
| 29 | Impeller cup |

## DIMENSIONS




| Pump type | Dimensions [mm] | | | |
|---|---|---|---|---|
| | H | h | k | Dt |
| 25P | 2350÷5240 | 350 | 350 | 250 |
| 30P | 2540÷5560 | 400 | 400 | 300 |
| 40P | 2700÷6950 | 500 | 500 | 400 |
| 50P | 2900÷8500 | 550 | 550 | 500 |
| 60P | 3200÷9170 | 600 | 600 | 600 |
| 80P | 3770÷10150 | 800 | 800 | 800 |
| 100P | 5165÷11895 | 900 | 900 | 1000 |
| 120P | 5600÷12130 | 1000 | 1000 | 1200 |
| 160P | 7150÷14750 | 1250 | 1250 | 1600 |
| 180P | 7550÷15485 | 1350 | 1500 | 1800 |

## RANGE OF OPERATION




## NOMINAL PARAMETERS

| Pump hydraulic type size - Number of stages | Capacity Q [m³/h] | Head H [m] | Rotation speed n [rpm] | Motor rated power $P_s$ [kW] |
|---|---|---|---|---|
| 25P21-2 | 420 | 4 | 1500 | 7,5 |
| 30P23-2 | 650 | 4,5 | 1500 | 15 |
| 30P19-2 | 900 | 5,8 | 1500 | 22 |
| 40P23-2 | 1250 | 6 | 1500 | 37 |
| 40P21-2 | 1400 | 9,2 | 1500 | 55 |
| 40P21-3 | 900 | 4,2 | 1000 | 18,5 |
| 40P19-2 | 2100 | 9,6 | 1500 | 90 |
| 50P17-3 | 2100 | 5,7 | 1000 | 45 |
| 50P17-4 | 1600 | 3,2 | 750 | 22 |
| 60P23-4 | 2700 | 4 | 750 | 45 |
| 60P18-3 | 3520 | 9,5 | 1000 | 160 |
| 60P18-4 | 2900 | 5,7 | 750 | 75 |
| 80P23-5 | 3800 | 4,5 | 600 | 75 |
| 80P17-4 | 6100 | 9,5 | 750 | 250 |
| 80P17-5 | 4900 | 5,8 | 600 | 125 |
| 100P17-5 | 8500 | 8 | 600 | 320 |
| 100P17-6 | 7000 | 5,5 | 500 | 160 |
| 120P23-5 | 13200 | 9 | 600 | 500 |
| 120P23-6 | 11200 | 6 | 500 | 320 |
| 160P19-6 | 21200 | 10,5 | 500 | 1000 |
| 160P19-8 | 17000 | 5,5 | 375 | 400 |
| 180P19-8 | 32000 | 9,5 | 375 | 1250 |
| 180P27-8 | 27000 | 5,5 | 375 | 630 |

The parameters are specified for clean water of density ρ = 1000 kg/m³ and temperature T = 15°C.

# HOT WATER PUMPS

# B
# BV

B and BV pumps are designed as horizontal splitcasing centrifugal, double suction pumps with closed impellers

## APPLICATION

The B and BV pumps are designed to handle hot, clean and slightly contaminated water. They can be applied in water supply systems, industrial cooling systems, and, for the ability to pump hot water, in district heating and power plants.

## DESIGN

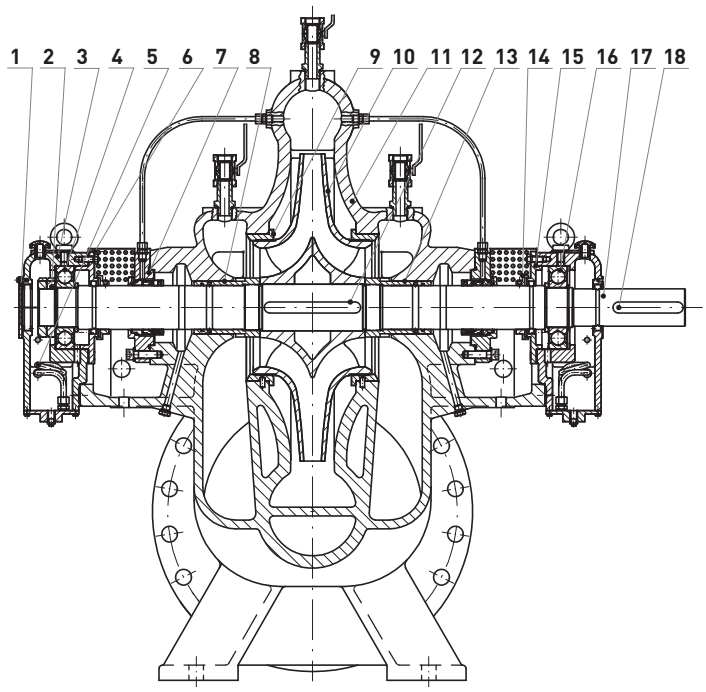
Stationary, horizontal, double suction, horizontally split pumps. The suction and delivery flanges are arranged horizontally in-line. The upper part of the casing can be lifted and the entire rotating assembly can be taken out for repair without disconnecting the pump from the pipelines. The oil-lubricated roller bearings and the mechanical seals installed on both sides of the shaft are equipped with cooling chambers, so the pumps are able to handle hot fluids.

BV pums are a vertical version of B pumps. They are based on the same hydraulics.

## MATERIALS OF CONSTRUCTION

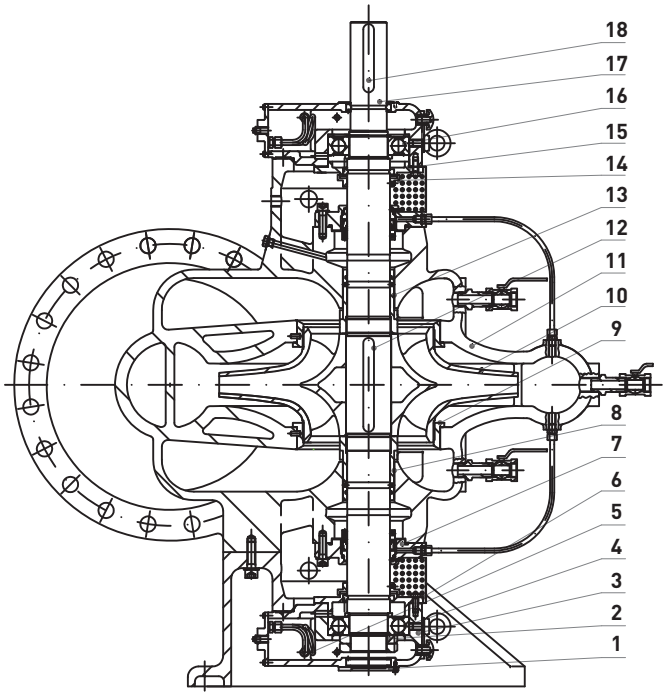
The casings are made of cast iron or, for higher heads, of cast steel. The impellers are of cast iron or stainless chromium cast steel.

## CROSS-SECTION / LIST OF B PUMP PARTS



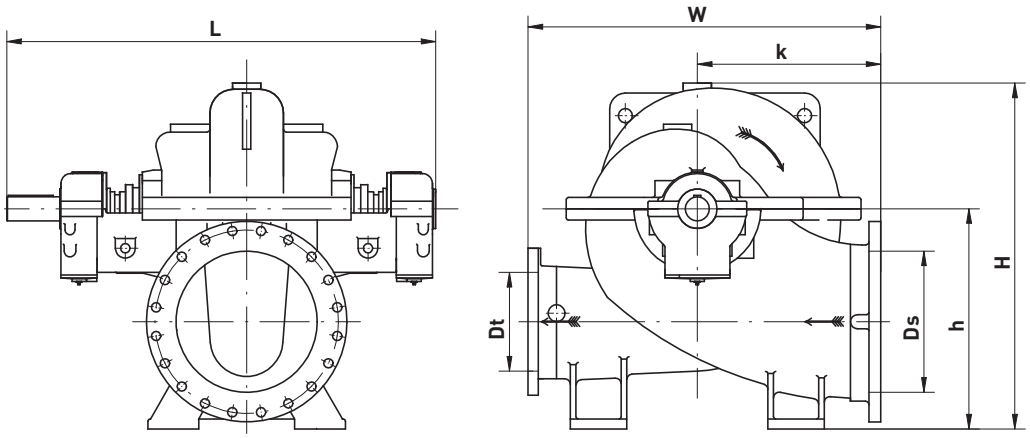

| No. | Part name |
|---|---|
| 1 | Bearing housing cover |
| 2 | Nut |
| 3 | Bearing housing |
| 4 | Bearing |
| 5 | Cooler |
| 6 | Thrust Thrust bearing cover |
| 7 | Mechanical seal |
| 8 | Gland seal |
| 9 | Seal ring |
| 10 | Impeller |
| 11 | Casing |
| 12 | Key groove |
| 13 | Left gland sleeve |
| 14 | Expeller |
| 15 | Radial bearing cover |
| 16 | Bearing |
| 17 | Shaft |
| 18 | Key groove |

## CROSS-SECTION / LIST OF BV PUMP PARTS



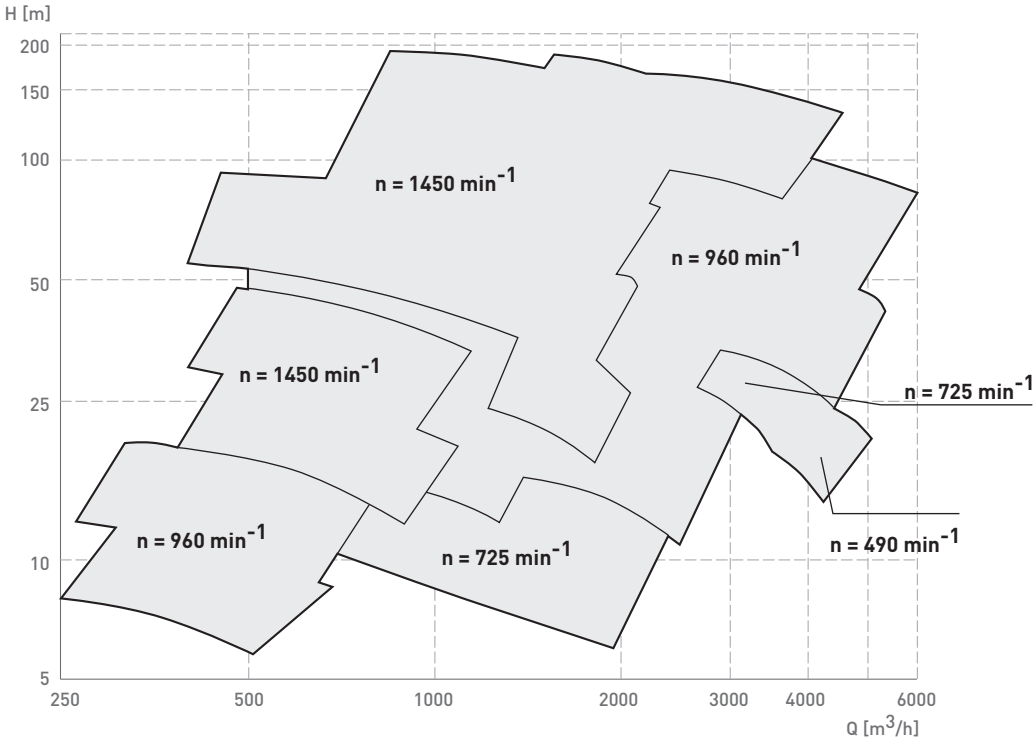

| No. | Part name |
|---|---|
| 1 | Bearing housing cover |
| 2 | Nut |
| 3 | Bearing housing |
| 4 | Bearing |
| 5 | Cooler |
| 6 | Thrust Thrust bearing cover |
| 7 | Mechanical seal |
| 8 | Gland seal |
| 9 | Seal ring |
| 10 | Impeller |
| 11 | Casing |
| 12 | Key groove |
| 13 | Left gland sleeve |
| 14 | Expeller |
| 15 | Radial bearing cover |
| 16 | Bearing |
| 17 | Shaft |
| 18 | Key groove |

## DIMENSIONS




| Pump type | Dimensions [mm] | | | | | | | Weight m [kg] |
|---|---|---|---|---|---|---|---|---|
| | L | W | k | H | h | Ds | Dt | |
| 20B47 | 1060 | 1000 | 500 | 930 | 560 | 250 | 200 | 1150 |
| 25B32 | 1165 | 870 | 470 | 910 | 580 | 350 | 250 | 850 |
| 25B35 | 1040 | 950 | 550 | 805 | 520 | 300 | 250 | 730 |
| 25B50 | 1380 | 970 | 500 | 975 | 610 | 350 | 250 | 890 |
| 30B30 | 1165 | 870 | 470 | 875 | 560 | 350 | 300 | 880 |
| 30B46 | 1215 | 1200 | 600 | 1030 | 630 | 350 | 300 | 1135 |
| 30B50 | 1380 | 1200 | 600 | 1135 | 720 | 400 | 300 | 1250 |
| 30B52 | 1415 | 1150 | 500 | 1015 | 630 | 350 | 300 | 1170 |
| 30B70 | 1520 | 1250 | 650 | 1290 | 800 | 400 | 300 | 1680 |
| 35B35 | 1520 | 1150 | 600 | 940 | 600 | 400 | 350 | 1170 |
| 35B40 | 1520 | 1210 | 650 | 1215 | 780 | 500 | 350 | 1500 |
| 35B50 | 1520 | 1250 | 650 | 1225 | 780 | 500 | 350 | 1520 |
| 35B63 | 1520 | 1250 | 650 | 1340 | 850 | 500 | 350 | 1730 |
| 40B36 | 1655 | 1230 | 680 | 1115 | 735 | 500 | 400 | 2100 |
| 40B40 | 1520 | 1350 | 750 | 1295 | 820 | 500 | 400 | 1720 |
| 40B49 | 1336 | 1600 | 800 | 1290 | 800 | 450 | 400 | 2355 |
| 40B50 | 1520 | 1310 | 710 | 1370 | 860 | 500 | 400 | 1750 |
| 40B61A | 1960 | 1680 | 830 | 1310 | 800 | 500 | 400 | 2860 |
| 40B63 | 1584 | 1760 | 880 | 1345 | 800 | 500 | 400 | 2660 |
| 40B80 | 2080 | 1800 | 900 | 1540 | 950 | 600 | 400 | 3920 |
| 50B40 | 1785 | 1560 | 850 | 1490 | 950 | 600 | 500 | 2470 |
| 50B50 | 1820 | 1650 | 900 | 1490 | 960 | 600 | 500 | 2880 |
| 50B50D | 1615 | 1750 | 750 | 1290 | 800 | 600 | 500 | 2750 |
| 50B50F | 1615 | 1750 | 750 | 1290 | 800 | 600 | 500 | 1750 |
| 50B52A | 1060 | 1930 | 930 | 1250 | 850 | 600 | 500 | 2800 |
| 50B63 | 1785 | 1700 | 850 | 1520 | 950 | 600 | 500 | 2780 |
| 50B80 | 2015 | 2000 | 1000 | 1770 | 1100 | 700 | 500 | 4015 |
| 60B63A | 2015 | 1900 | 950 | 1670 | 1050 | 700 | 600 | 3200 |
| 70B90 | 2800 | 2900 | 1300 | 2700 | 1800 | 900 | 700 | ~5500 |

## RANGE OF OPERATION



## NOMINAL PARAMETERS

| Pump type* | 725 [rpm] /(490 [rpm] 70B90 only) | | | 960 [rpm] | | | 1450 [rpm] | | |
|---|---|---|---|---|---|---|---|---|---|
| | Capacity Q [m³/h] | Head H [m] | Shaft power P [kW] | Capacity Q [m³/h] | Head H [m] | Shaft power P [kW] | Capacity Q [m³/h] | Head H [m] | Shaft power P [kW] |
| 20B47 | - | - | - | 343 | 28 | 35 | 510 | 62 | 116 |
| 25B32 | - | - | - | 600 | 18,5 | 38 | 900 | 42 | 123 |
| 25B35 | - | - | - | 400 | 15 | 19 | 600 | 34 | 66 |
| 25B50 | - | - | - | - | - | - | 900 | 80 | 242 |
| 30B30 | - | - | - | 600 | 10,5 | 21,5 | 900 | 24 | 72 |
| 30B46 | - | - | - | 545 | 29 | 54 | 810 | 65 | 172 |
| 30B50 | - | - | - | - | - | - | 1250 | 90 | 360 |
| 30B52 | - | - | - | 600 | 40 | 83 | 1000 | 89 | 304 |
| 30B70 | - | - | - | 940 | 68 | 212 | 1400 | 150 | 690 |
| 35B35 | - | - | - | 940 | 15 | 47 | 1400 | 33 | 152 |
| 35B40 | - | - | - | 1250 | 26 | 108 | 2000 | 60 | 380 |
| 35B50 | - | - | - | 1250 | 40 | 162 | 2000 | 90 | 570 |
| 35B63 | - | - | - | 1600 | 65 | 341 | 2400 | 152 | 1170 |
| 40B36 | - | - | - | 1010 | 16 | 56 | 1500 | 36 | 183 |
| 40B40 | 1250 | 15 | 61 | 2000 | 26 | 167 | - | - | - |
| 40B49 | - | - | - | 968 | 32 | 106 | 1440 | 70 | 335 |
| 40B50 | - | - | - | 2000 | 50 | 320 | - | - | - |
| 40B61A | - | - | - | 2220 | 63 | 448 | 3300 | 140 | 1448 |
| 40B63 | 1345 | 24 | 107 | 2000 | 52 | 337 | - | - | - |
| 40B80 | 2260 | 49 | 355 | 3000 | 86 | 809 | - | - | - |
| 50B40 | 2300 | 12,5 | 94 | 3000 | 22 | 212 | - | - | - |
| 50B50 | 2110 | 10 | 70 | 2800 | 18 | 162 | - | - | - |
| 50B50D | - | - | - | 1614 | 28 | 150 | 2400 | 61 | 480 |
| 50B50F | - | - | - | 1735 | 33 | 192 | 2580 | 74 | 627 |
| 50B52A | 2260 | 15 | 108 | 3000 | 26 | 247 | - | - | - |
| 50B63 | - | - | - | 3000 | 60 | 570 | - | - | - |
| 50B80 | 3800 | 50 | 623 | 5000 | 90 | 1442 | - | - | - |
| 60B63A | 3800 | 36 | 443 | 5000 | 62 | 985 | | | |
| 70B90 | 4400 | 24 | 338 | - | - | - | - | - | - |

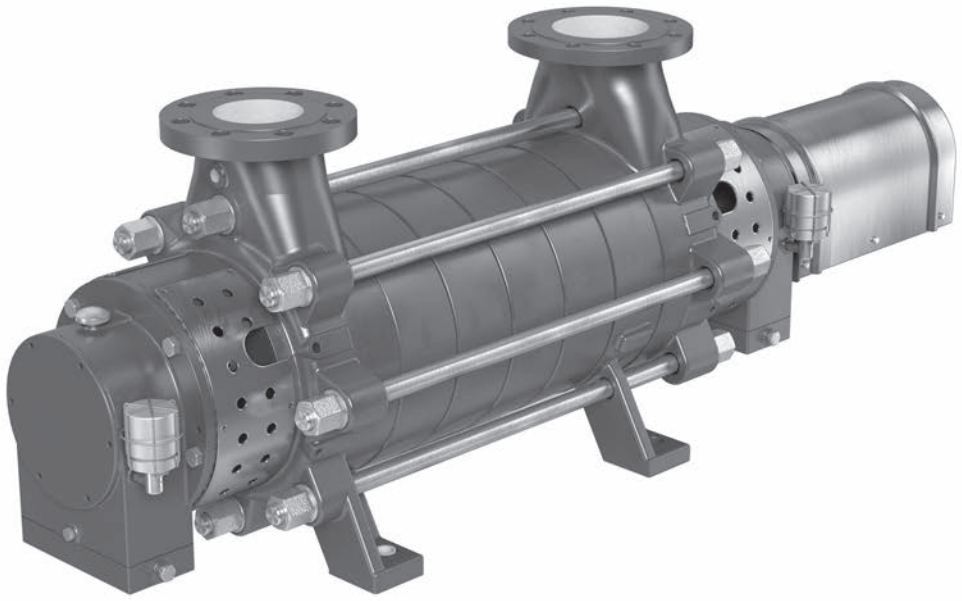
* All sizes of B pumps are also available in BV version

The parameters are specified for clean water of density ρ = 1000 kg/m³ and temperature T = 15°C.

# HOT WATER PUMPS

# WN

WN pumps are designed as stationary, horizontal multi-stage, ring-section pumps



## APPLICATION

The WN type pumps are designed to handle hot, clean and industrial water, of temperature up to 150°C. They can be applied in water supply systems, industrial cooling systems, and for the ability to pump hot water, in district heating and power plants.

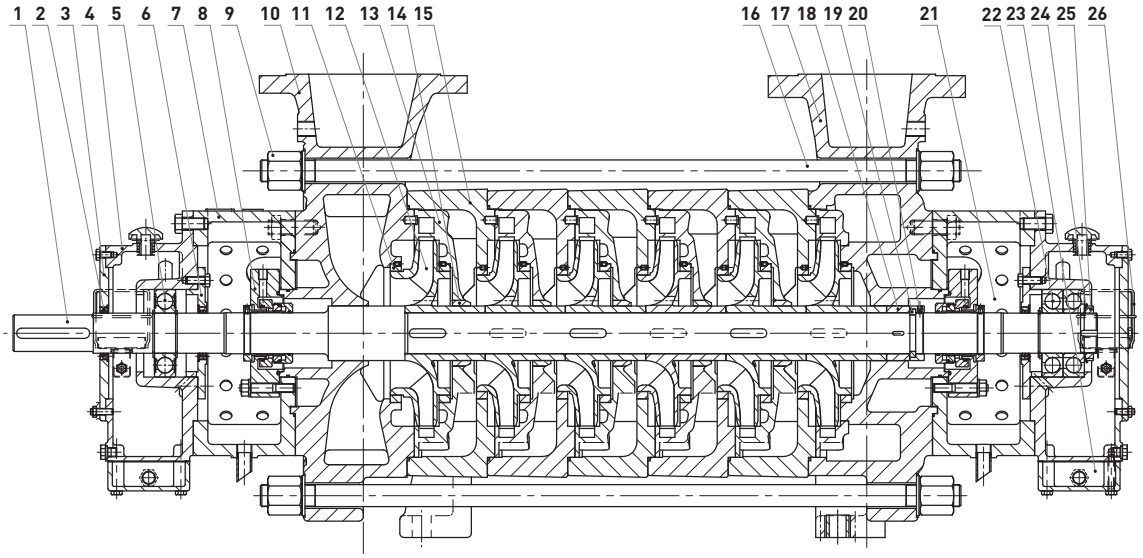
## DESIGN

The WN are horizontal, stationary, multistage, ring-section pumps. The delivery flange is directed vertically upward and the suction flange is directed horizontally or vertically depending on the size of pump. Closed impellers and vane diffusers are applied. The axial thrust is absorber by a balance disk. The shaft seal can be sealed by a gland or mechanical seal

## MATERIALS OF CONSTRUCTION

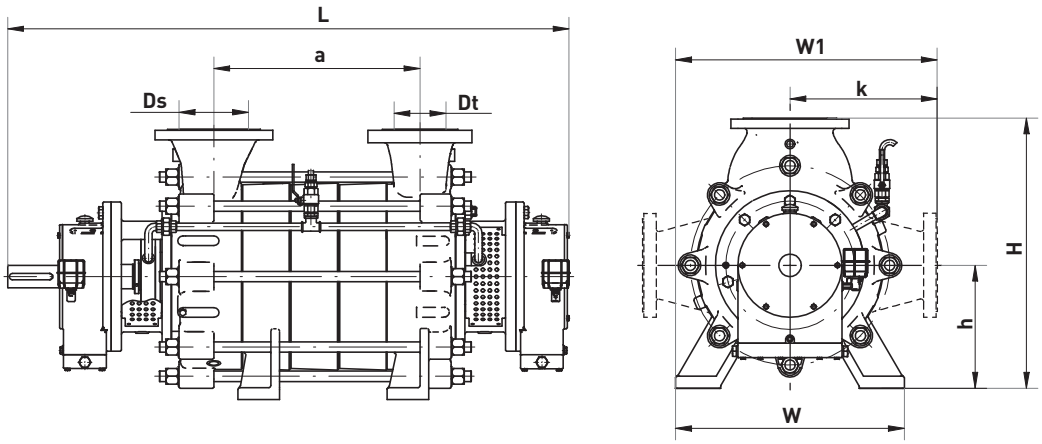
The casings are made of cast iron. The impellers are made of cast steel or bronze.
Special material versions can be selected for handling non-typical fluids.

## CROSS-SECTION / LIST OF PUMP PARTS



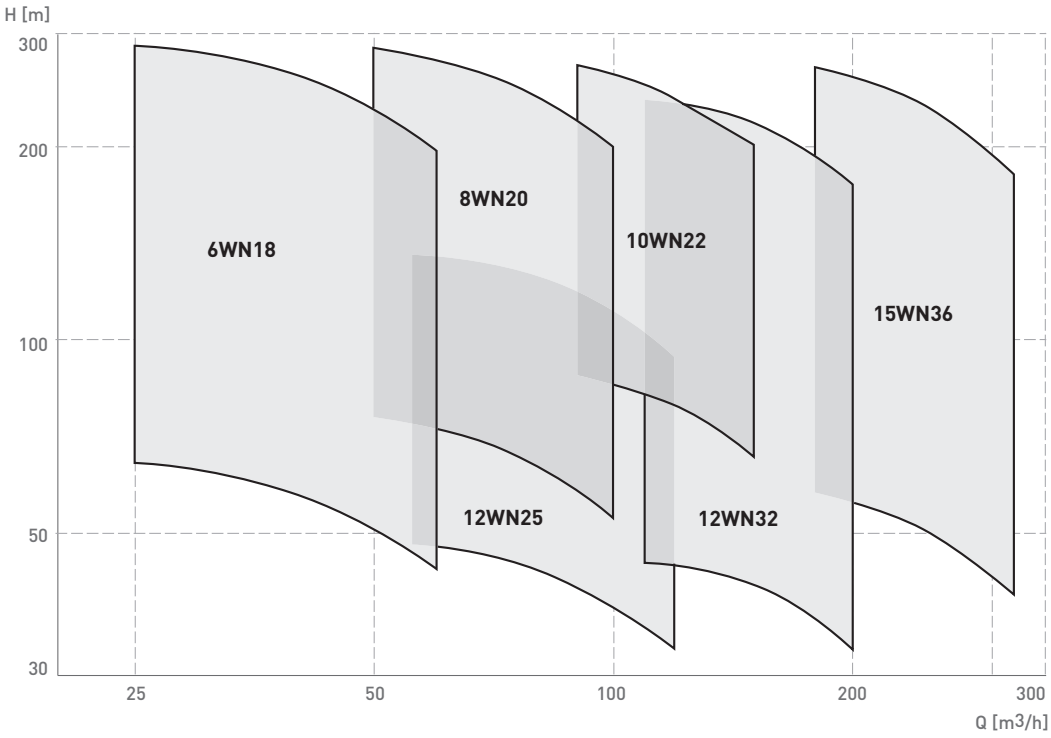

| No. | Part name | No. | Part name |
|---|---|---|---|
| 1 | Shaft | 14 | Impeller Sealing ring |
| 2 | Labyrinth ring | 15 | Stage casing |
| 3 | Bearing housing cover | 16 | Tie bolt |
| 4 | Bearing housing | 17 | Discharge casing |
| 5 | Standard roller bearing | 18 | Spacer sleeve |
| 6 | Thrust bearing cover | 19 | Split ring |
| 7 | Bearing housing adapter | 20 | Retaining ring |
| 8 | Mechanical seal | 21 | Stuffing box guard |
| 9 | Tie bolt nut | 22 | Angular contact ball bearing |
| 10 | Suction casing | 23 | Cooling chamber cover |
| 11 | Impeller Sealing ring | 24 | Toothed washer |
| 12 | Impeller | 25 | Bearing nut |
| 13 | Vane diffuser | 26 | Oil level control |

## DIMENSIONS




| Pump type | Number of stages | Dimensions [mm] | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | L | a | W | W1 | k | H | h | Ds | Dt |
| 6WN18 | 2 | 760 | 155 | 320 | 385 | 225 | 425 | 200 | 80 | 65 |
| | 3 | 825 | 220 | 320 | 385 | 225 | | | | |
| | 4 | 890 | 285 | 320 | 385 | 225 | | | | |
| | 5 | 955 | 350 | 320 | 385 | 225 | | | | |
| | 6 | 1020 | 415 | 320 | 385 | 225 | | | | |
| 8WN20 | 2 | 848 | 175 | 400 | 480 | 280 | 505 | 225 | 100 | 80 |
| | 3 | 923 | 250 | 400 | 480 | 280 | | | | |
| | 4 | 998 | 325 | 400 | 480 | 280 | | | | |
| | 5 | 1073 | 400 | 400 | 480 | 280 | | | | |
| 10WN22 | 2 | 946 | 205 | 400 | 515 | 315 | 565 | 250 | 125 | 100 |
| | 3 | 1036 | 295 | 400 | 515 | 315 | | | | |
| | 4 | 1126 | 385 | 400 | 515 | 315 | | | | |
| | 5 | 1216 | 475 | 400 | 515 | 315 | | | | |
| | 6 | 1306 | 565 | 400 | 515 | 315 | | | | |
| | 7 | 1396 | 655 | 400 | 515 | 315 | | | | |
| 12WN25 | 2 | 1074 | 230 | 500 | 605 | 355 | 635 | 280 | 150 | 125 |
| | 3 | 1164 | 320 | 500 | 605 | 355 | | | | |
| | 4 | 1254 | 410 | 500 | 605 | 355 | | | | |
| | 5 | 1344 | 500 | 500 | 605 | 355 | | | | |
| | 6 | 1434 | 590 | 500 | 605 | 355 | | | | |
| 12WN32 | 2 | 1110 | 265 | 500 | 650 | 400 | 715 | 315 | 150 | 125 |
| | 3 | 1225 | 380 | 500 | 650 | 400 | | | | |
| | 4 | 1340 | 495 | 500 | 650 | 400 | | | | |
| | 5 | 1455 | 610 | 500 | 650 | 400 | | | | |
| | 6 | 1570 | 725 | 500 | 650 | 400 | | | | |
| 15WN36 | 2 | 1340 | 315 | 660 | 755 | 425 | 780 | 355 | 200 | 150 |
| | 3 | 1480 | 455 | 660 | 755 | 425 | | | | |
| | 3 | 1620 | 595 | 660 | 755 | 425 | | | | |
| | 5 | 1760 | 735 | 660 | 755 | 425 | | | | |
| | 6 | 1900 | 875 | 660 | 755 | 425 | | | | |
| | 7 | 2040 | 1015 | 660 | 755 | 425 | | | | |

## RANGE OF OPERATION




## NOMINAL PARAMETERS

| Pump type | Number of stages | Capacity Q [m³/h] | Head H [m] | Rotation speed n [rpm] | Motor rated power $P_s$ [kW] | Weight m [kg] |
|---|---|---|---|---|---|---|
| 6WN18 | 2 | 50 | 76 | 3000 | 18,5 | 138 |
| | 3 | | 114 | 3000 | 30 | 157 |
| | 4 | | 152 | 3000 | 37 | 176 |
| | 5 | | 190 | 3000 | 45 | 195 |
| | 6 | | 228 | 3000 | 55 | 214 |
| 8WN20 | 2 | 80 | 96 | 3000 | 30, 37 | 275 |
| | 3 | | 144 | 3000 | 45, 55 | 302 |
| | 4 | | 192 | 3000 | 75 | 329 |
| | 5 | | 240 | 3000 | 75, 90 | 356 |
| 10WN22 | 2 | 120 | 120 | 3000 | 55, 75 | 283 |
| | 3 | | 180 | 3000 | 75, 90, 110 | 320 |
| | 4 | | 240 | 3000 | 90, 110, 132 | 357 |
| | 5 | | 300 | 3000 | 110, 132, 160 | 394 |
| | 6 | | 360 | 3000 | 132, 160, 200 | 431 |
| | 7 | | 420 | 3000 | 160, 200, 250 | 468 |
| 12WN25 | 2 | 90 | 40 | 1500 | 15, 22 | 460 |
| | 3 | | 60 | 1500 | 22, 30 | 514 |
| | 4 | | 80 | 1500 | 22, 30, 37 | 568 |
| | 5 | | 100 | 1500 | 30, 37, 45 | 622 |
| | 6 | | 120 | 1500 | 37, 45, 55 | 676 |

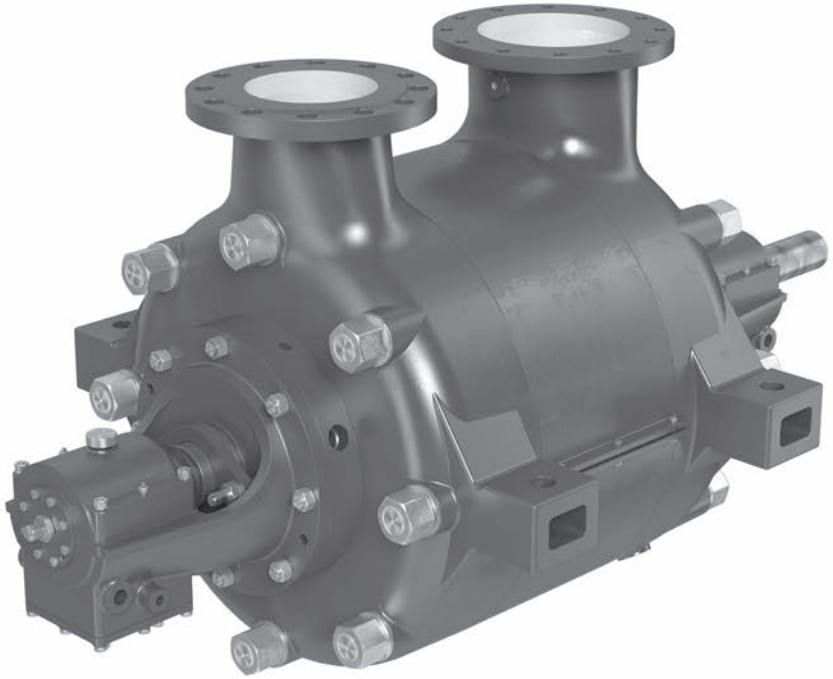
| Pump type | Number of stages | Capacity Q [m³/h] | Head H [m] | Rotation speed n [rpm] | Motor rated power $P_s$ [kW] | Weight m [kg] |
|---|---|---|---|---|---|---|
| 12WN32 | 2 | 170 | 60 | 1500 | 37, 55 | 568 |
| | 3 | | 90 | 1500 | 55, 75 | 622 |
| | 4 | | 120 | 1500 | 75, 90, 110 | 676 |
| | 5 | | 150 | 1500 | 90, 110, 132 | 730 |
| | 6 | | 180 | 1500 | 110, 132, 160 | 784 |
| 15WN36 | 2 | 250 | 80 | 1500 | 55, 75, 90 | 827 |
| | 3 | | 120 | 1500 | 75, 90, 132 | 960 |
| | 4 | | 160 | 1500 | 110, 132, 160 | 1093 |
| | 5 | | 200 | 1500 | 132, 160, 200 | 1226 |
| | 6 | | 240 | 1500 | 160, 200, 250 | 1359 |
| | 7 | | 280 | 1500 | 200, 250, 315 | 1492 |

The parameters are specified for clean water of density ρ = 1000 kg/m³ and temperature T = 15°C.

# HOT WATER PUMPS

# W

Horizontal, multistage,
ringsection centrifugal pumps
for hot water applications



## APPLICATION

The W pumps are designed to handle hot, clean and industrial water, of temperature up to 150°C. They can be applied in water supply systems, industrial cooling systems, and for the ability to pump hot water, in district heating and power plants.

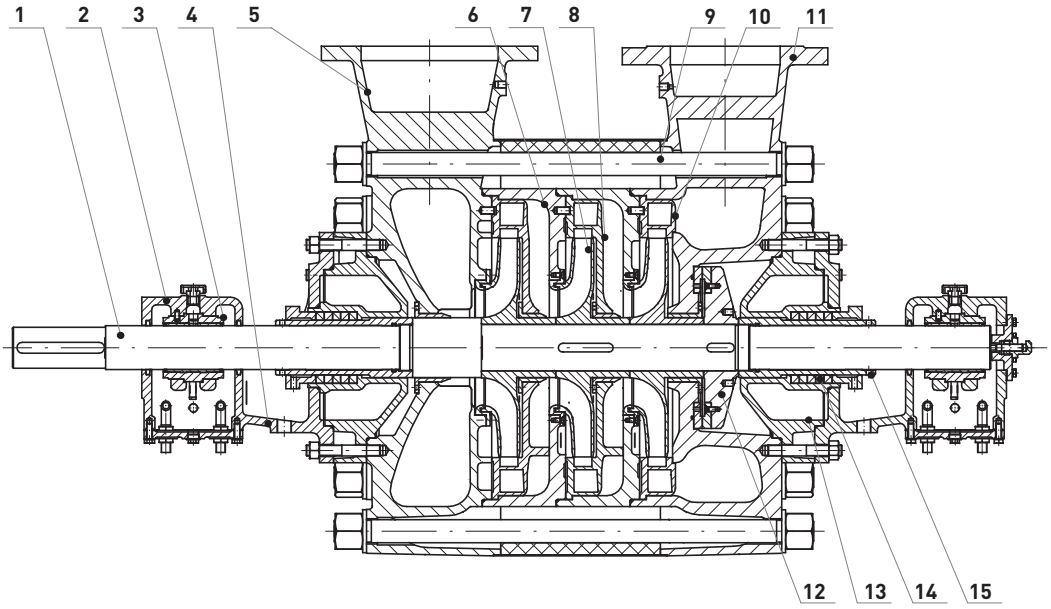
## DESIGN

The W pumps are horizontal, stationary, multistage, ring-section pumps. The delivery flange is directed vertically upward and the suction flange is directed horizontally or vertically depending on the size of pump. Closed impellers and vane diffusers are applied. The axial thrust is absorber by a balance disk. The shaft seal can be sealed by a gland or mechanical seal.

## MATERIALS OF CONSTRUCTION

The casings are made of cast iron. The impellers are made of cast steel or bronze.
Special material versions can be selected for handling non-typical fluids.

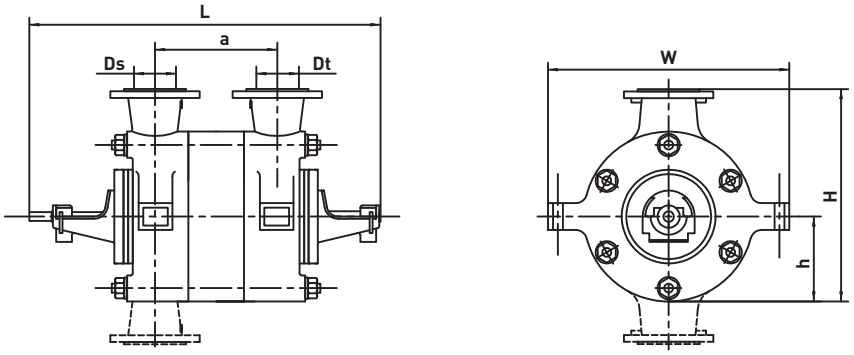
## CROSS-SECTION / LIST OF PUMP PARTS



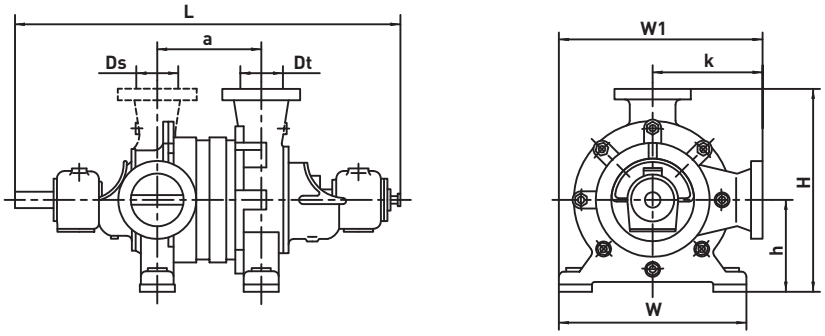

| No. | Part name | No. | Part name | No. | Part name |
|---|---|---|---|---|---|
| 1 | Shaft | 6 | Stage casing | 11 | Discharge casing |
| 2 | Bearing housing cover | 7 | Impeller | 12 | Balance disk |
| 3 | Slide bearing | 8 | Diffuser | 13 | Stuffing box guard |
| 4 | Bearing casing | 9 | Tie bolt | 14 | Mechanical seal |
| 5 | Suction casing | 10 | Radial vane diffuser | 15 | Gland sleeve |

## DIMENSIONS

**20W39, 35W50**

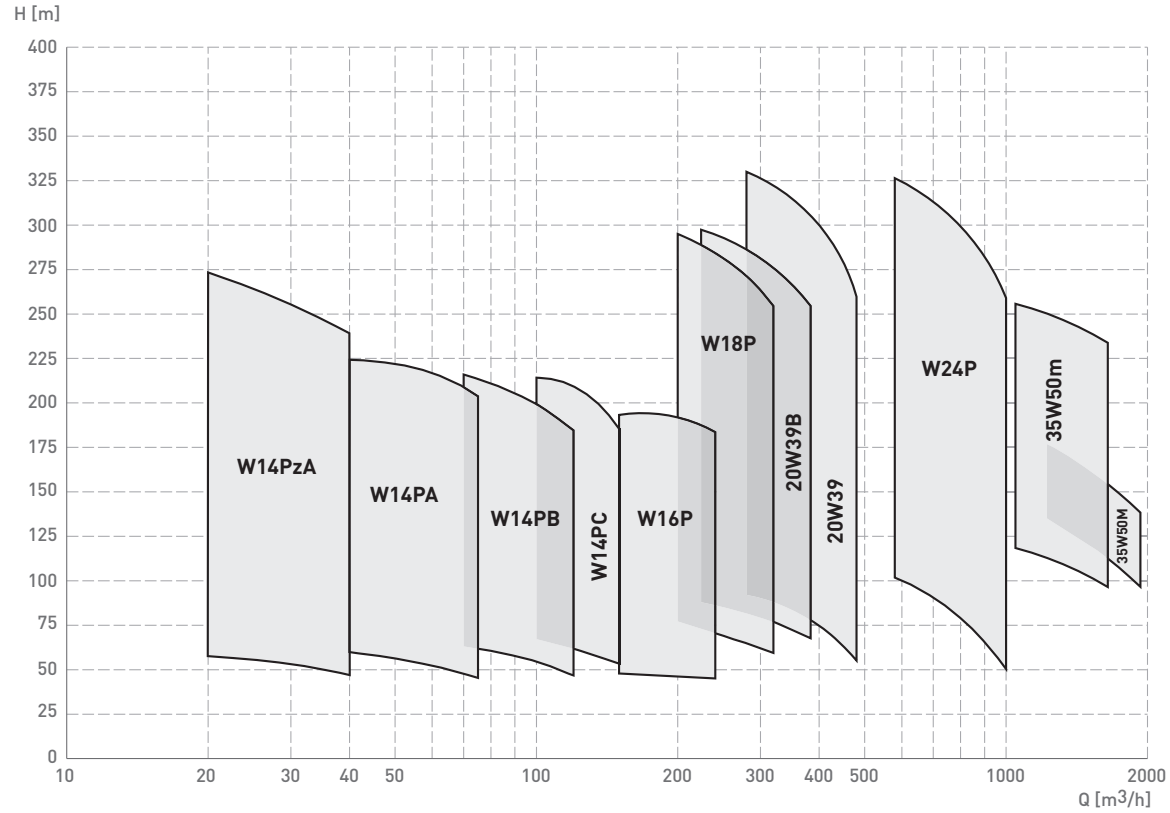



**W14PzA, W14P, W16P, W18P, W24P**



| Pump type | Number of stages | Dimensions [mm] | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | L | a | W1 | W | k | H | h | Ds | Dt |
| 20W39 | 2 | 1723 | 405 | - | 1050 | - | 930 | 380 | 250 | 200 |
| | 3 | 1858 | 540 | | | | | | | |
| | 4 | 1993 | 675 | | | | | | | |
| | 5 | 2128 | 810 | | | | | | | |
| | 6 | 2263 | 945 | | | | | | | |
| 35W50 | 2 | 2455 | 660 | - | 1600 | - | 1425 | 575 | 400 | 350 |
| | 3 | 2690 | 895 | | | | | | | |
| W14PzA | 2 | 1340 | 250 | 695 | 650 | 370 | 650 | 280 | 125 | 100 |
| | 3 | 1430 | 340 | | | | | | | |
| | 4 | 1550 | 430 | | | | | | | |
| | 5 | 1640 | 520 | | | | | | | |
| | 6 | 1730 | 610 | | | | | | | |
| | 7 | 1820 | 700 | | | | | | | |
| | 8 | 1910 | 790 | | | | | | | |
| W14PA | 3 | 1477 | 370 | 695 | 650 | 370 | 650 | 280 | 150 | 125 |
| | 4 | 1587 | 480 | | | | | | | |
| | 5 | 1697 | 590 | | | | | | | |
| | 6 | 1807 | 700 | | | | | | | |
| | 7 | 1917 | 810 | | | | | | | |
| | 8 | 2027 | 920 | | | | | | | |
| W14PB | 3 | 1477 | 370 | 695 | 650 | 370 | 650 | 280 | 150 | 125 |
| | 4 | 1587 | 480 | | | | | | | |
| | 5 | 1697 | 590 | | | | | | | |
| | 6 | 1807 | 700 | | | | | | | |
| | 7 | 1917 | 810 | | | | | | | |
| | 8 | 2027 | 920 | | | | | | | |
| W14PC | 3 | 1477 | 370 | 695 | 650 | 370 | 650 | 280 | 150 | 125 |
| | 4 | 1587 | 480 | | | | | | | |
| | 5 | 1697 | 590 | | | | | | | |
| | 6 | 1807 | 700 | | | | | | | |
| | 7 | 1917 | 810 | | | | | | | |
| | 8 | 2027 | 920 | | | | | | | |
| W16P | 2 | 1446 | 320 | 810 | 720 | 450 | 780 | 330 | 200 | 150 |
| | 3 | 1576 | 450 | | | | | | | |
| | 4 | 1706 | 580 | | | | | | | |
| | 5 | 1836 | 710 | | | | | | | |
| | 6 | 1966 | 840 | | | | | | | |
| W18P | 2 | 1710 | 375 | 885 | 810 | 480 | 845 | 365 | 250 | 200 |
| | 3 | 1850 | 515 | | | | | | | |
| | 4 | 1990 | 655 | | | | | | | |
| | 5 | 2130 | 795 | | | | | | | |
| | 6 | 2270 | 935 | | | | | | | |
| W24P | 2 | 2283 | 580 | 1275 | 1150 | 700 | 1240 | 540 | 350 | 300 |
| | 3 | 2493 | 790 | | | | | | | |
| | 4 | 2703 | 1000 | | | | | | | |

## RANGE OF OPERATION




## NOMINAL PARAMETERS

| Pump type | Number of stages | Capacity Q [m³/h] | Head H [m] | Rotation Speed n [rpm] | Shaft power P [kW] | Weight m [kg] |
|---|---|---|---|---|---|---|
| W14PZA | 2 | 30 | 69 | 1500 | 18,5 | 483 |
| | 3 | | 104 | | 30 | 545 |
| | 4 | | 128 | | 30 | 607 |
| | 5 | | 160 | | 37 | 670 |
| | 6 | | 192 | | 45 | 732 |
| | 7 | | 224 | | 45 | 794 |
| | 8 | | 256 | | 55 | 856 |
| W14PA | 3 | 60 | 81 | 1500 | 30 | 630 |
| | 4 | | 108 | | 37 | 735 |
| | 5 | | 135 | | 45 | 840 |
| | 6 | | 162 | | 55 | 945 |
| | 7 | | 189 | | 75 | 1050 |
| | 8 | | 216 | | 75 | 1155 |
| W14PB | 3 | 100 | 75 | 1500 | 30 | 630 |
| | 4 | | 100 | | 45 | 735 |
| | 5 | | 125 | | 55 | 840 |
| | 6 | | 150 | | 75 | 945 |
| | 7 | | 175 | | 75 | 1050 |
| | 8 | | 200 | | 90 | 1155 |

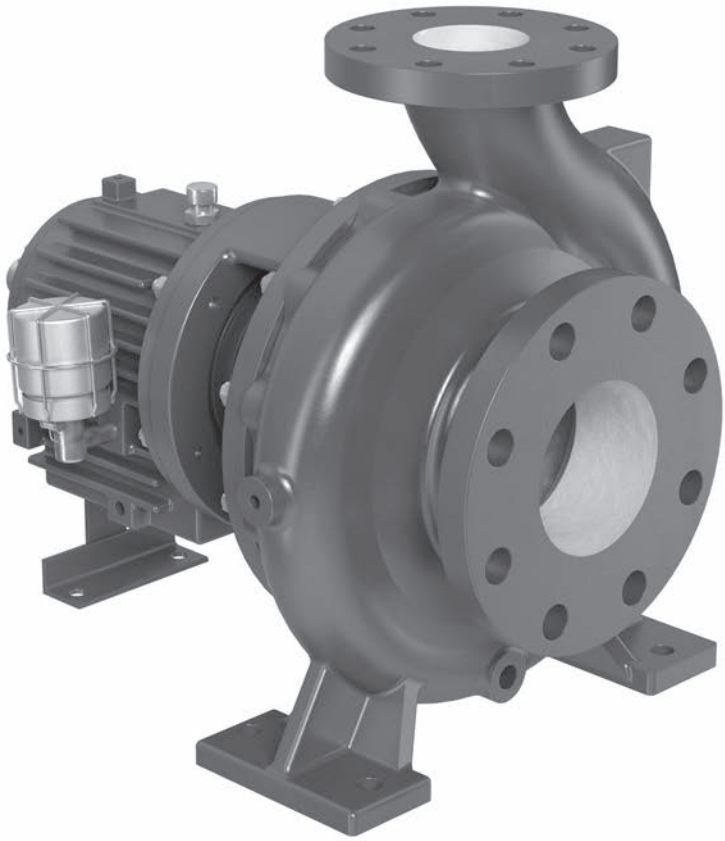
| Pump type | Number of stages | Capacity Q [m³/h] | Head H [m] | Rotation Speed n [rpm] | Shaft power P [kW] | Weight m [kg] |
|---|---|---|---|---|---|---|
| W14PC | 3 | 125 | 69 | 1500 | 45 | 630 |
| | 4 | | 104 | | 55 | 735 |
| | 5 | | 130 | | 75 | 840 |
| | 6 | | 156 | | 90 | 945 |
| | 7 | | 161 | | 110 | 1050 |
| | 8 | | 208 | | 132 | 1155 |
| W16P | 2 | 200 | 64 | 1500 | 55 | 830 |
| | 3 | | 96 | | 90 | 1000 |
| | 4 | | 128 | | 132 | 1170 |
| | 5 | | 160 | | 160 | 1340 |
| | 6 | | 192 | | 200 | 1510 |
| W18P | 2 | 250 | 94 | 1500 | 110 | 1245 |
| | 3 | | 141 | | 160 | 1475 |
| | 4 | | 188 | | 200 | 1705 |
| | 5 | | 235 | | 250 | 1940 |
| | 6 | | 282 | | 315 | 2170 |
| 20W39B | 2 | 320 | 92 | 1500 | 132 | 1250 |
| | 3 | | 138 | | 200 | 1410 |
| | 4 | | 184 | | 250 | 1570 |
| | 5 | | 230 | | 315 | 1730 |
| | 6 | | 276 | | 355 | 1890 |
| 20W39 | 2 | 400 | 100 | 1500 | 160 | 1250 |
| | 3 | | 150 | | 250 | 1410 |
| | 4 | | 200 | | 315 | 1570 |
| | 5 | | 250 | | 400 | 1730 |
| | 6 | | 300 | | 500 | 1890 |
| W24P | 2 | 800 | 150 | 1500 | 400 | 3380 |
| | 3 | | 225 | | 800 | 3610 |
| | 4 | | 300 | | 1000 | 3850 |
| 35W50M | 2 | 1500 | 160 | 1500 | 900 | 4560 |
| | 3 | | 240 | | 1250 | 5140 |
| 35W50M | 2 | 1730 | 150 | 1500 | 1000 | 4560 |

The parameters are specified for clean water of density ρ = 1000 kg/m³ and temperature T = 15°C.

# HOT WATER PUMPS

# A-P

A-P pumps are end suction, single stage horizontal, centrifugal pumps of upgraded semi-process design



## APPLICATION

The A-P pumps are designed to handle chemical products of high temperature and pressure. Due to the robust design, apart from the basic application in chemical plants, the A-P pumps can be applied in any industry where hot or toxic fluids under high pressure are to be pumped, such as, for example, power plants or district heating plants. Due to the compliance with Atex directive the A-P pumps can operate in areas where hazard of explosion is present.

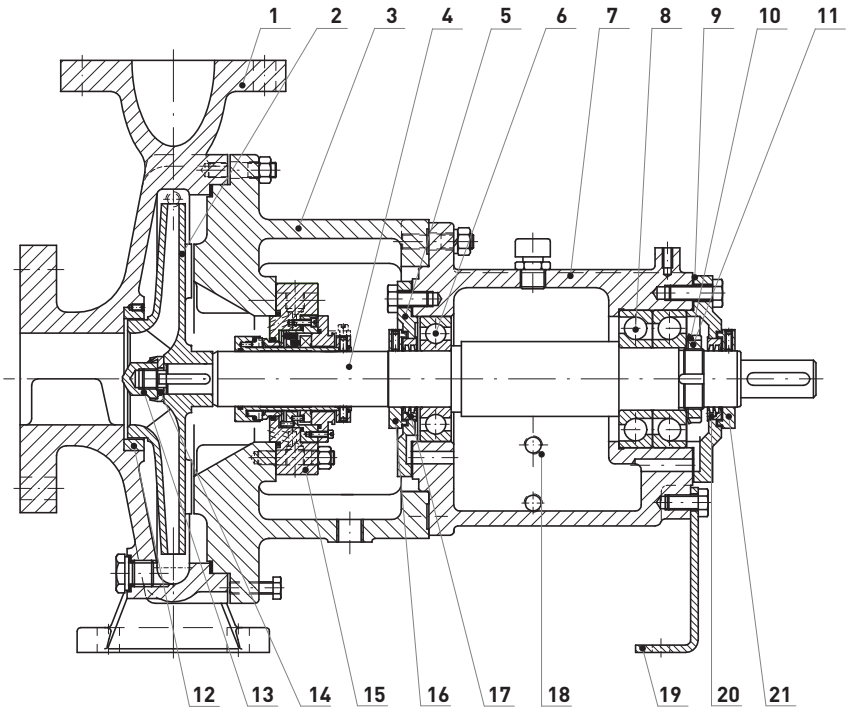
## DESIGN

Single stage, horizontal, end suction pumps with own bearings classified as UMDP (upgraded medium duty pumps). The design is also in compliance with Atex directive. The A-P pumps are equipped with large seal chamber providing space to install any required mechanical seal configuration . If necessary the pumps can be equipped with heating or cooling jackets or with inducers to improve the suction properties. The design of the pumps of different sizes is unified – there are five standard bearings assemblies and seal chambers which can be combined with different wet ends. Such a unification reduces the quantity of spare parts to be stored and eases the maintenance.

## MATERIALS OF CONSTRUCTION

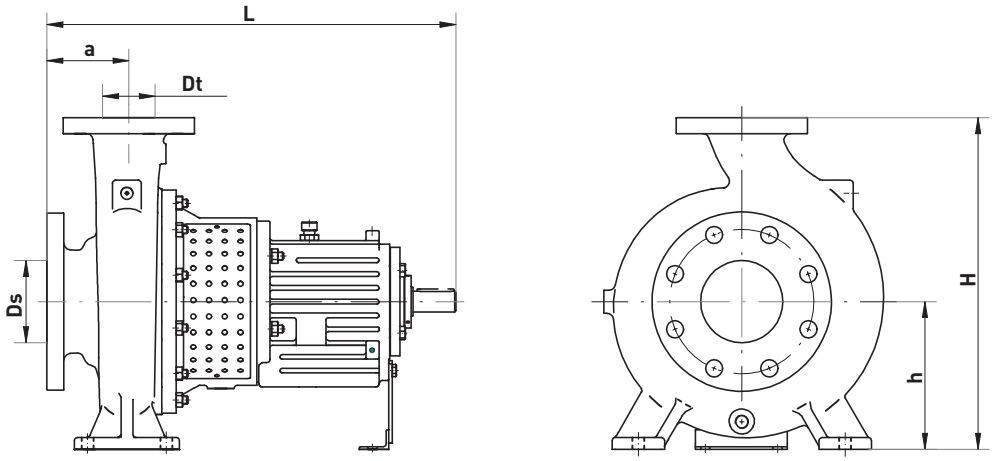
A-P pumps are available in different material versions including stainless steel, stainless cast steel, duplex, superduplex and hastalloy. The materials of construction are selected individually for each application.

## CROSS-SECTION / LIST OF PUMP PARTS



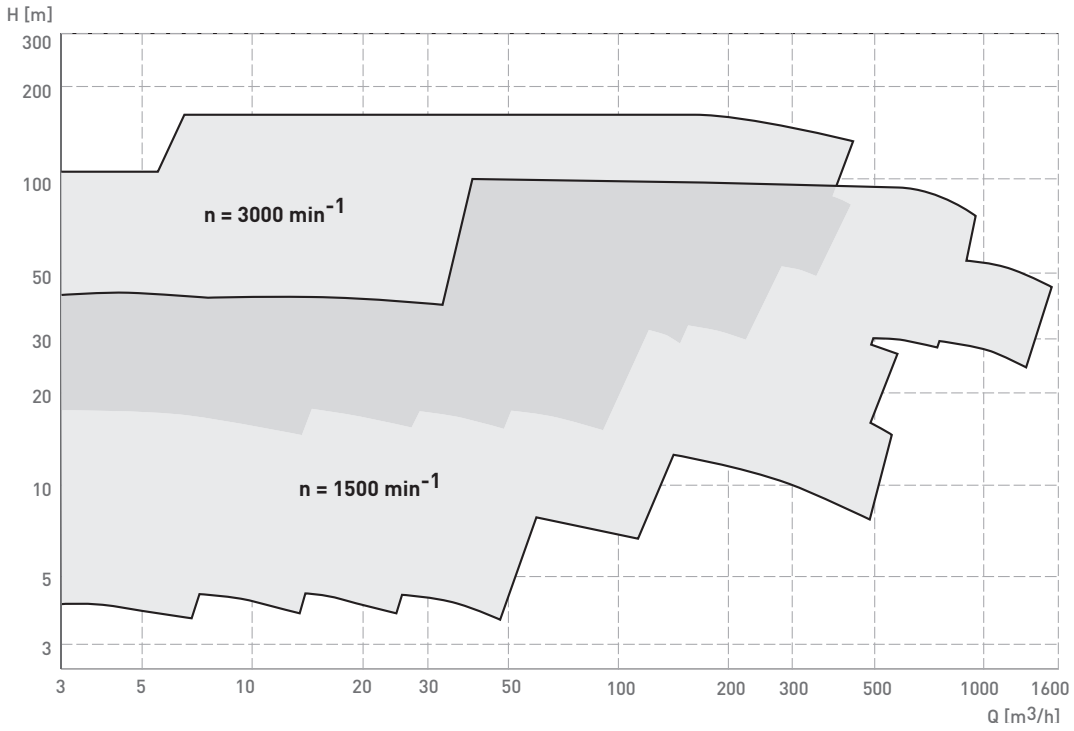

| No. | Part name | No. | Part name |
|---|---|---|---|
| 1 | Pump casing | 12 | Casing Sealing ring |
| 2 | Impeller | 13 | Impeller nut |
| 3 | Seal casing | 14 | Impeller washer |
| 4 | Shaft | 15 | Mechanical seal |
| 5 | Radial Thrust bearing cover | 16 | Expeller |
| 6 | Radial bearing | 17 | Labyrinth |
| 7 | Bearing housing | 18 | Oil filler |
| 8 | Thrust bearing | 19 | Casing support |
| 9 | Thrust Thrust bearing cover | 20 | Labyrinth |
| 10 | Toothed washer | 21 | Expeller |
| 11 | Bearing nut KM | | |

## DIMENSIONS




| Pump type | Dimensions [mm] | | | | | |
|---|---|---|---|---|---|---|
| | Ds | Dt | L | a | H | h |
| 3A16-P | 50 | 32 | 465 | 80 | 292 | 132 |
| 3A20-P | | | 465 | 80 | 340 | 160 |
| 3A25-P | | | 600 | 100 | 405 | 180 |
| 4A20-P | 65 | 40 | 485 | 100 | 340 | 160 |
| 4A25-P | | | 600 | 100 | 405 | 180 |
| 4A32-P | | | 625 | 125 | 450 | 200 |
| 5A16-P | 65 | 50 | 465 | 80 | 292 | 132 |
| 5A20-P | 80 | 50 | 485 | 100 | 360 | 160 |
| 5A25-P | | | 625 | 125 | 405 | 180 |
| 5A32-P | | | 625 | 125 | 505 | 225 |
| 6A16-P | | | 485 | 100 | 340 | 160 |
| 6A20-P | 100 | 65 | 600 | 100 | 405 | 180 |
| 6A25-P | | | 625 | 125 | 450 | 200 |
| 6A32-P | | | 655 | 125 | 505 | 225 |
| 8A16-P | 100 | 80 | 600 | 100 | 360 | 160 |
| 8A20-P | 125 | 80 | 625 | 125 | 430 | 180 |
| 8A25-P | | | 625 | 125 | 505 | 225 |
| 8A32-P | | | 655 | 125 | 565 | 250 |
| 10A20-P | 125 | 100 | 625 | 125 | 480 | 200 |
| 10A25-P | | | 670 | 140 | 505 | 225 |
| 10A32-P | | | 670 | 140 | 565 | 250 |
| 12A25-P | 150 | 125 | 670 | 140 | 605 | 250 |
| 12A32-P | | | 670 | 140 | 635 | 280 |
| 15A25-P | 200 | 150 | 690 | 160 | 655 | 280 |
| 15A32-P | | | 830 | 160 | 715 | 315 |
| 15A40-P | | | 830 | 160 | 765 | 315 |
| 20A25-P | 200 | 200 | 850 | 180 | 780 | 355 |
| 20A32-P | 250 | 200 | 870 | 200 | 805 | 355 |
| 20A40-P | | | 870 | 200 | 855 | 355 |
| 20A50-P | | | 900 | 200 | 990 | 425 |
| 25A40-P | 300 | 250 | 900 | 200 | 1025 | 425 |
| 25A50-P | 250 | 250 | 900 | 200 | 1145 | 475 |
| 30A40-P | 350 | 300 | 950 | 250 | 1105 | 475 |

## RANGE OF OPERATION



## NOMINAL PARAMETERS

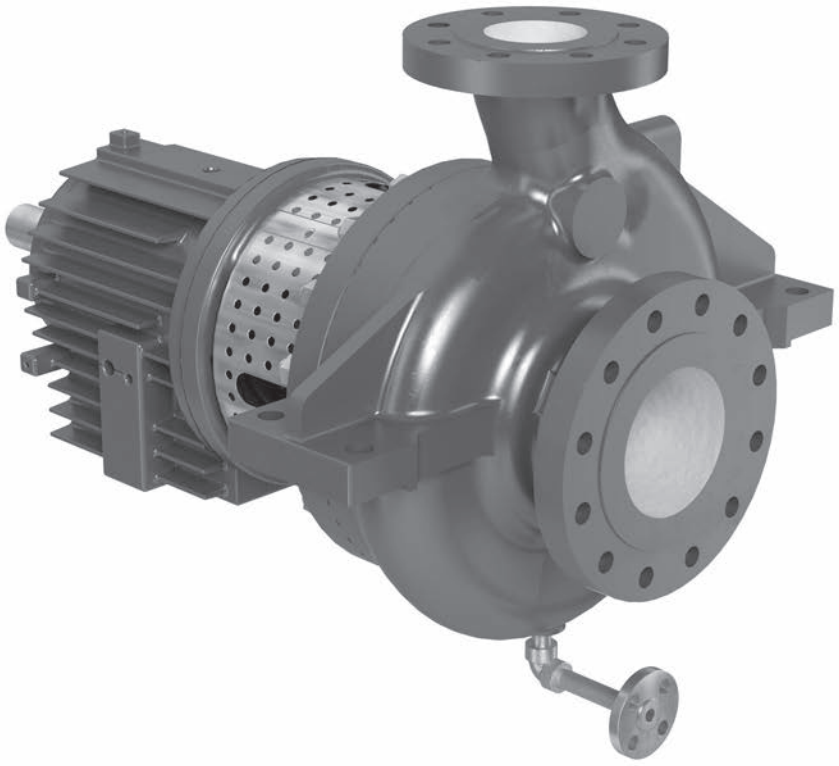
| Pump type | Rotation speed n=3000 [rpm] | | | Rotation speed n=1500 [rpm] | | | Weight m [kg] |
|---|---|---|---|---|---|---|---|
| | Capacity Q [m³/h] | Head H [m] | Shaft power P [kW] | Capacity Q [m³/h] | Head H [m] | Shaft power P [kW] | |
| 3A16-P | 12,5 | 32 | 2 | 6,3 | 8 | 0,3 | 65 |
| 3A20-P | 12,5 | 50 | 3,8 | 6,3 | 12,5 | 0,6 | 75 |
| 3A25-P | 12,5 | 80 | 7,8 | 6,3 | 20 | 1,1 | 120 |
| 4A20-P | 25 | 50 | 5,7 | 12,5 | 12,5 | 0,8 | 80 |
| 4A25-P | 25 | 80 | 11,6 | 12,5 | 20 | 1,6 | 122 |
| 4A32-P | 25 | 128 | 23,6 | 12,5 | 32 | 3,4 | 153 |
| 5A16-P | 25 | 32 | 3,8 | 12,5 | 8 | 0,5 | 70 |
| 5A20-P | 50 | 50 | 9,2 | 25 | 12,5 | 1,3 | 82 |
| 5A25-P | 50 | 80 | 19,1 | 25 | 20 | 2,4 | 124 |
| 5A32-P | 50 | 128 | 33,5 | 25 | 32 | 4,5 | 158 |
| 6A16-P | 50 | 32 | 6,0 | 25 | 8 | 0,8 | 73 |
| 6A20-P | 100 | 50 | 17,7 | 50 | 12,5 | 2,4 | 110 |
| 6A25-P | 100 | 80 | 32,5 | 50 | 20 | 4,4 | 138 |
| 6A32-P | 100 | 128 | 53,7 | 50 | 32 | 7,3 | 190 |
| 8A16-P | 100 | 32 | 11,7 | 50 | 8 | 1,7 | 98 |
| 8A20-P | 160 | 50 | 27,2 | 80 | 12,5 | 3,7 | 119 |
| 8A25-P | 160 | 80 | 45,9 | 80 | 20 | 5,8 | 142 |
| 8A32-P | 160 | 128 | 79,7 | 80 | 32 | 10,6 | 196 |
| 10A20-P | 250 | 50 | 42,6 | 125 | 12,5 | 5,5 | 138 |
| 10A25-P | 250 | 80 | 69,9 | 125 | 20 | 8,7 | 204 |
| 10A32-P | 250 | 128 | 118,6 | 125 | 32 | 15,1 | 212 |
| 12A25-P | 400 | 80 | 111,8 | 200 | 20 | 13,1 | 218 |
| 12A32-P | 400 | 128 | 176,6 | 200 | 32 | 22,6 | 230 |
| 15A25-P | - | - | - | 315 | 20 | 21,5 | 268 |
| 15A32-P | - | - | - | 315 | 32 | 33,5 | 310 |
| 15A40-P | - | - | - | 315 | 50 | 51,7 | 385 |
| 20A25-P | - | - | - | 500 | 20 | 34,5 | 342 |
| 20A32-P | - | - | - | 500 | 32 | 52,5 | 392 |
| 20A40-P | - | - | - | 500 | 50 | 82,1 | 422 |
| 20A50-P | - | - | - | 500 | 80 | 145,3 | 450 |
| 25A40-P | - | - | - | 800 | 50 | 129,8 | 465 |
| 25A50-P | - | - | - | 800 | 80 | 235,7 | 495 |
| 30A40-P | - | - | - | 1250 | 50 | 212,9 | 580 |

The parameters are specified for clean water of density ρ = 1000 kg/m³ and temperature T = 15°C.

# HOT WATER PUMPS

# A-P10

A-P10 pumps are end suction, single stage, horizontal process pumps compliant with 10th edition of API 610 standard



## APPLICATION

The A-P10 pumps are designed to handle petrochemical and chemical products of high temperature and pressure. Due to the robust design, apart from the basic application in petrochemical and chemical plants the A-P10 pumps can be applied in any industry where hot or toxic fluids under high pressure are to be pumped, such as, for example, power plants or district heating plants. Due to the compliance with Atex directive the A-P10 pumps can operate in areas where hazard of explosion is present.

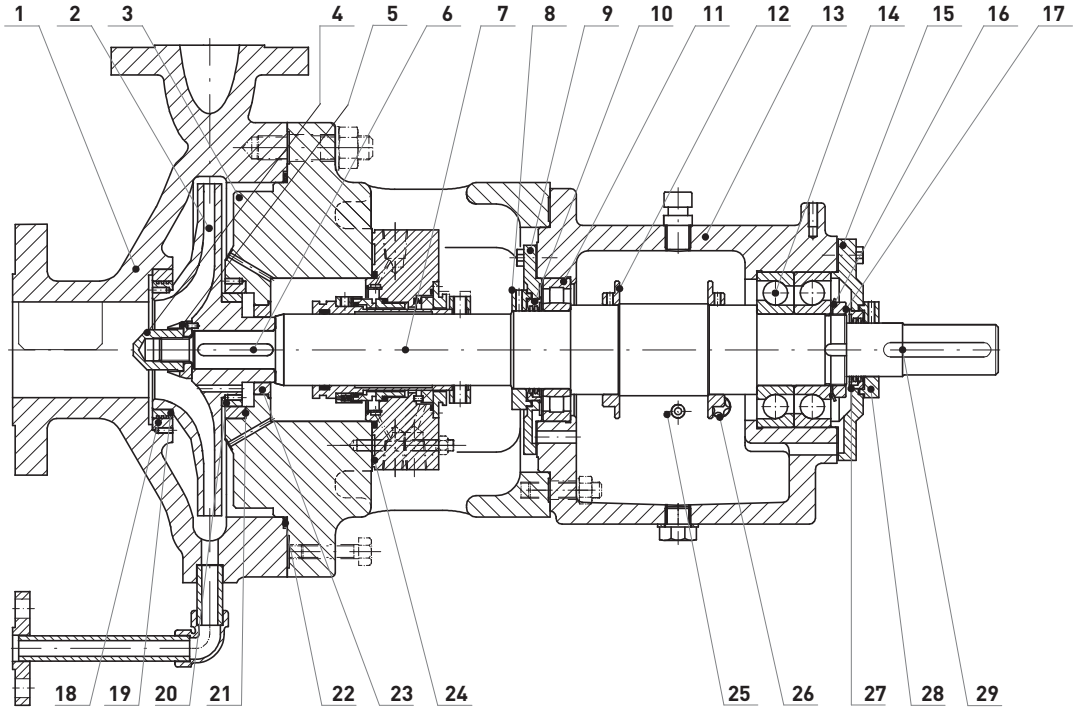
## DESIGN

Single stage, horizontal, end suction pumps with own bearings designed according to API 610 standard 10th edition – OH2 type. All the dimensions and design features are compliant with the standard.The design is also in compliance with Atex directive. The A-P10 pumps are equipped with large seal chamber providing space to install any required mechanical seal configuration (API plan). If necessary the pumps can be equipped with heating or cooling jackets or with inducers to improve the suction properties. The design of the pumps of different sizes is unified – there are four standard bearings assemblies and seal chambers which can be combined with different wet ends. Such a unification reduces the quantity of spare parts to be stored and eases the maintenance.

## MATERIALS OF CONSTRUCTION

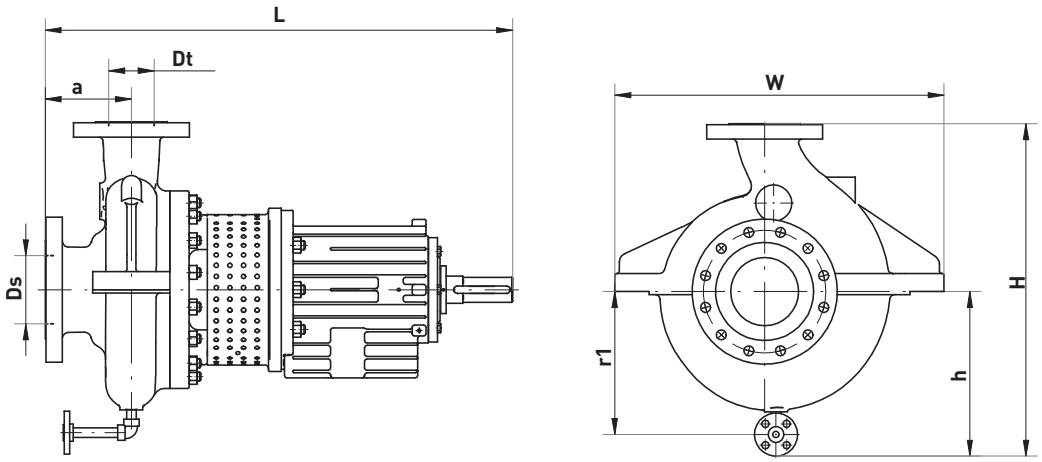
A-P10 pumps are available in material classes according to API 610 standard, including stainless steel, stainless cast steel, duplex, superduplex and hastalloy. The materials of construction are selected individually for each application according to the recommendations included in the API 610 standard and following the client's suggestions.

## CROSS-SECTION / LIST OF PUMP PARTS



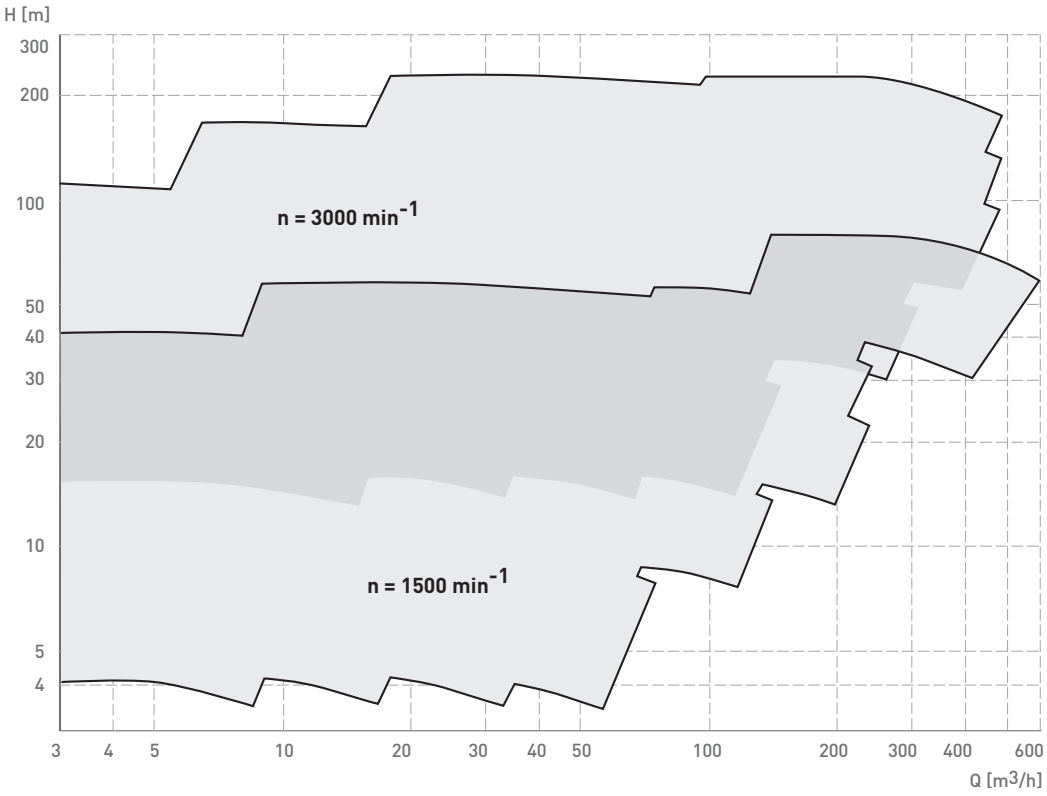

| No. | Part name | No. | Part name |
|---|---|---|---|
| 1 | Pump casing | 16 | Toothed washer |
| 2 | Impeller | 17 | KM bearing nut |
| 3 | Casing cover | 18 | Casing sealing ring |
| 4 | Impeller nut | 19 | Impeller sealing ring |
| 5 | Impeller washer | 20 | Impeller sealing ring |
| 6 | Parallel key | 21 | Gland sealing ring |
| 7 | Shaft | 22 | Spiral gasket |
| 8 | Deflector | 23 | Stuffing box insert |
| 9 | Radial Thrust bearing cover | 24 | Mechanical seal |
| 10 | Labyrinth | 25 | Constant level oil |
| 11 | Radial bearing | 26 | Oil level indicator |
| 12 | Expeller ring | 27 | Labyrinth |
| 13 | Bearing housing | 28 | Expeller |
| 14 | Thrust bearing | 29 | Parallel key |
| 15 | Thrust Thrust bearing cover | | |

## DIMENSIONS




| Pump type | Dimensions [mm] | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Ds | Dt | L | a | W | H | h | r1 |
| 3A16-P10 | 50 | 40 | 710 | 130 | 365 | 440 | 225 | 195 |
| 3A20-P10 | | | 725 | 145 | 430 | 490 | 275 | 220 |
| 3A25-P10 | | | 805 | 145 | 520 | 560 | 305 | 250 |
| 4A16-P10 | 80 | 40 | 710 | 130 | 430 | 440 | 255 | 195 |
| 4A20-P10 | | | 725 | 145 | 430 | 490 | 275 | 220 |
| 4A25-P10 | | | 805 | 145 | 520 | 560 | 305 | 250 |
| 4A32-P10 | | | 805 | 145 | 580 | 612 | 327 | 275 |
| 5A16-P10 | 80 | 50 | 710 | 130 | 430 | 470 | 270 | 210 |
| 5A20-P10 | | | 725 | 145 | 430 | 500 | 275 | 220 |
| 5A25-P10 | | | 825 | 165 | 520 | 560 | 305 | 250 |
| 5A32-P10 | | | 825 | 165 | 580 | 622 | 337 | 280 |
| 5A38-P10 | | | 825 | 165 | 680 | 715 | 375 | 320 |
| 6A16-P10 | 100 | 80 | 725 | 145 | 470 | 522 | 287 | 230 |
| 6A20-P10 | | | 825 | 165 | 520 | 560 | 305 | 245 |
| 6A25-P10 | | | 825 | 165 | 580 | 620 | 335 | 275 |
| 6A32-P10 | | | 1030 | 190 | 660 | 665 | 340 | 285 |
| 6A38-P10 | | | 1050 | 210 | 740 | 760 | 375 | 320 |
| 10A20-P10 | 150 | 100 | 825 | 165 | 580 | 630 | 330 | 270 |
| 10A25-P10 | | | 1030 | 190 | 660 | 710 | 360 | 305 |
| 10A32-P10 | | | 1030 | 190 | 395-330 | 745 | 375 | 320 |
| 10A38-P10 | | | 1050 | 210 | 405-355 | 835 | 415 | 360 |
| 12A25-P10 | 200 | 150 | 1050 | 210 | 395-330 | 775 | 380 | 325 |
| 12A32-P10 | | | 1050 | 210 | 395-330 | 830 | 410 | 355 |
| 12A38-P10 | | | 1050 | 210 | 425-375 | 920 | 460 | 405 |
| 20A45-P10 | 250 | 200 | 1090 | 250 | 515-430 | 1080 | 530 | 470 |

## RANGE OF OPERATION



## NOMINAL PARAMETERS

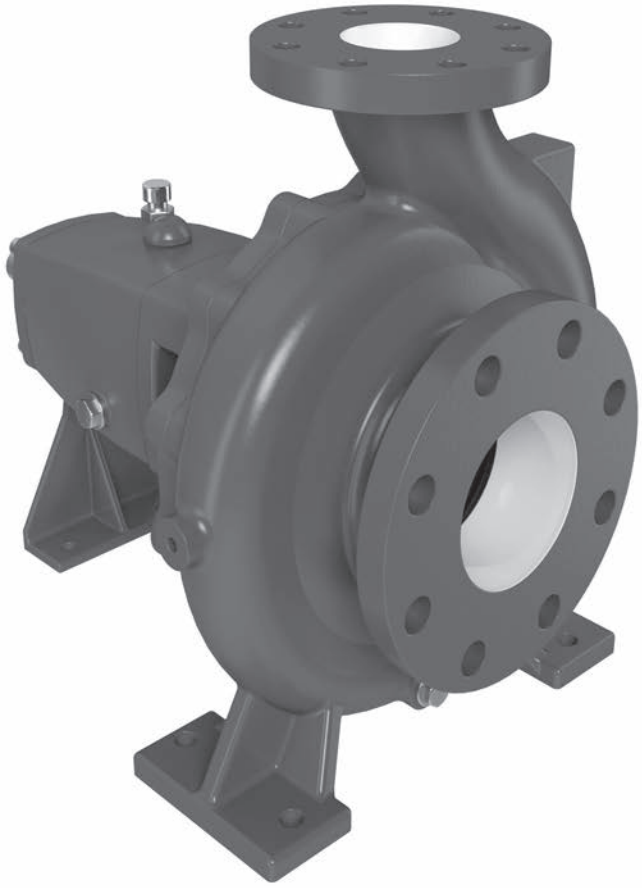
| Pump type | Rotation speed n=3000 [rpm] | | | Rotation speed n=1500 [rpm] | | | Weight m [kg] |
|---|---|---|---|---|---|---|---|
| | Capacity Q [m³/h] | Head H [m] | Shaft power P [kW] | Capacity Q [m³/h] | Head H [m] | Shaft power P [kW] | |
| 3A16-P10 | 12,5 | 32 | 2,3 | 6,3 | 8 | 0,3 | 129 |
| 3A20-P10 | 12,5 | 50 | 4,4 | 6,3 | 12,5 | 0,6 | 154 |
| 3A25-P10 | 12,5 | 80 | 10,1 | 6,3 | 20 | 1,5 | 230 |
| 4A16-P10 | 25 | 32 | 3,6 | 12,5 | 8 | 0,5 | 125 |
| 4A20-P10 | 25 | 50 | 6,2 | 12,5 | 12,5 | 0,9 | 140 |
| 4A25-P10 | 25 | 80 | 24,8 | 12,5 | 20 | 0,4 | 232 |
| 4A32-P10 | 25 | 128 | 22,6 | 12,5 | 32 | 2,7 | 267 |
| 5A16-P10 | 50 | 32 | 6,2 | 25 | 8 | 0,9 | 136 |
| 5A20-P10 | 50 | 50 | 9,2 | 25 | 12,5 | 1,2 | 161 |
| 5A25-P10 | 50 | 80 | 17,3 | 25 | 20 | 2,4 | 240 |
| 5A32-P10 | 50 | 128 | 33,5 | 25 | 32 | 4,4 | 276 |
| 5A38-P10 | 50 | 200 | 56,8 | 25 | 50 | 7,7 | 354 |
| 6A16-P10 | 100 | 32 | 11,5 | 50 | 8 | 1,5 | 164 |
| 6A20-P10 | 100 | 50 | 17,7 | 50 | 12,5 | 2,3 | 239 |
| 6A25-P10 | 100 | 80 | 30,7 | 50 | 20 | 3,9 | 237 |
| 6A32-P10 | 100 | 128 | 56,3 | 50 | 32 | 7,3 | 416 |
| 6A38-P10 | 100 | 200 | 94 | 50 | 50 | 12,2 | 543 |
| 10A20-P10 | 250 | 50 | 43,7 | 125 | 12,5 | 5,5 | 233 |
| 10A25-P10 | 250 | 80 | 66,5 | 125 | 20 | 8,5 | 416 |
| 10A32-P10 | 250 | 128 | 122,8 | 125 | 32 | 15,6 | 425 |
| 10A38-P10 | 250 | 200 | 189,2 | 125 | 50 | 24,0 | 559 |
| 12A25-P10 | 400 | 80 | 110,4 | 200 | 20 | 14,0 | 469 |
| 12A32-P10 | 400 | 128 | 178,9 | 200 | 32 | 22,9 | 506 |
| 12A38-P10 | 400 | 200 | 307,0 | 315 | 50 | 62,2 | 621 |
| 20A45-P10 | - | - | - | 500 | 70 | 117,7 | 775 |

The parameters are specified for clean water of density ρ = 1000 kg/m³ and temperature T = 15°C.

# STATIONARY PUMPS

# A

A pumps are general purpose end suction, single stage, horizontal centrifugal pumps



## APPLICATION

The A pumps are universal, general purpose pumps designed to handle different fluids such as clean, cold water, hot water, contaminated water and some chemicals. They are applicable in many industries including, for example, water supply, power industry, steel works etc.

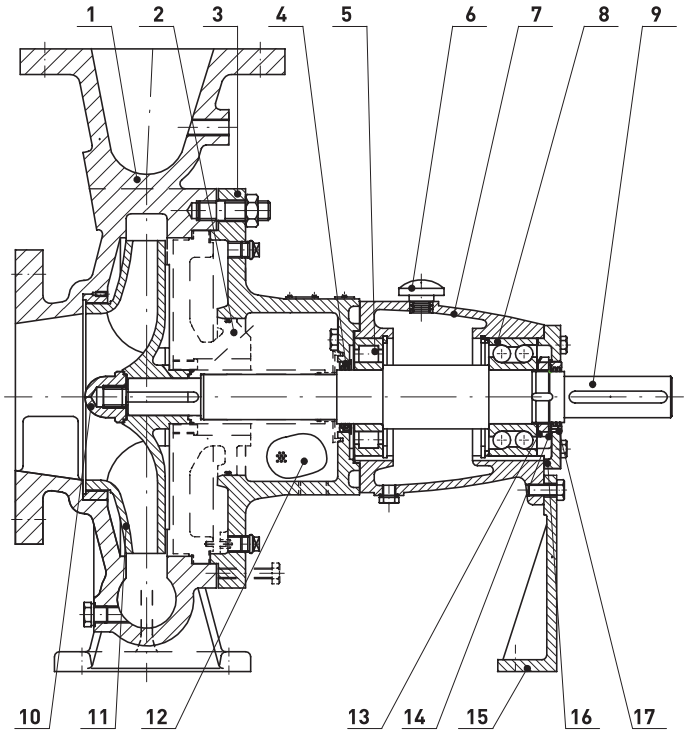
## DESIGN

Single stage, horizontal, end suction pumps with own bearings, closed impellers and spiral casings. The pumps are of back-pull out design, so they can be disassembled without disconnecting from the pipelines after removing the distant coupling. Mechanical seals of different types can be applied depending on the fluid pumped. The bearings are roller type, oil lubricated.

## MATERIALS OF CONSTRUCTION

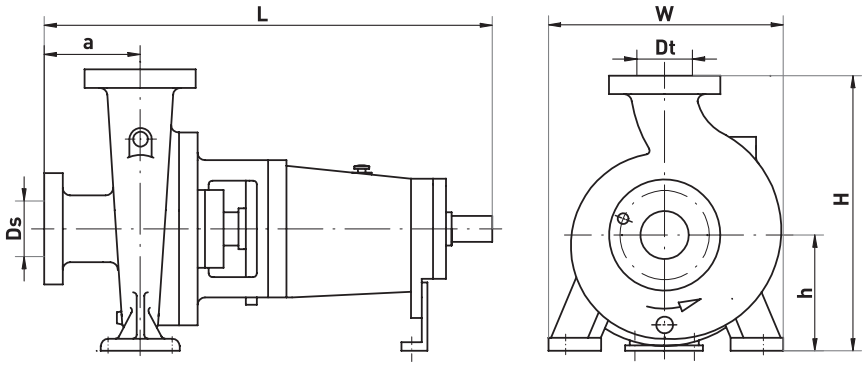
A pumps are available in different material versions including cast iron, cast steel and stainless cast steel. The materials of construction are selected individually for each application according to the kind of fluid.

## CROSS-SECTION / LIST OF PUMP PARTS



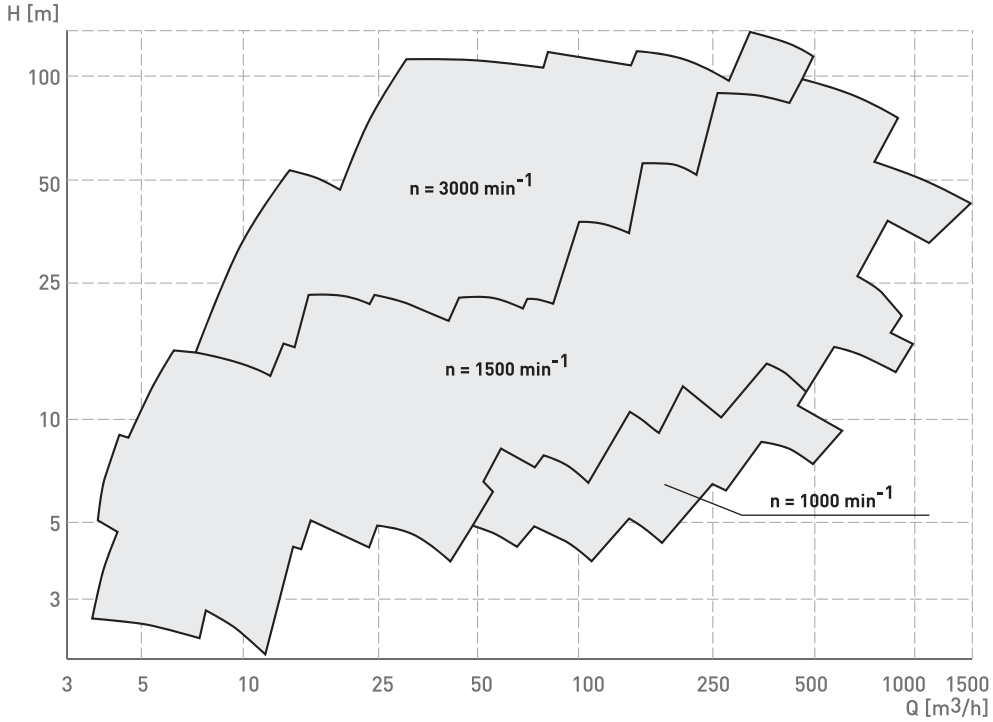

| No. | Part name | No. | Part name |
|---|---|---|---|
| 1 | Casing | 10 | Impeller nut |
| 2 | Stuffing box | 11 | Impeller |
| 3 | Bearing housing adapter | 12 | Stuffing box guard |
| 4 | Labyrinth seal | 13 | Toothed washer |
| 5 | Bearing | 14 | Bearing nut |
| 6 | Vent plug | 15 | Support |
| 7 | Bearing housing | 16 | Thrust bearing cover |
| 8 | Bearing | 17 | Labyrinth seal |
| 9 | Shaft | | |

## DIMENSIONS




| Pump type | Dimension [mm] | | | | | | |
|---|---|---|---|---|---|---|---|
| | L | a | W | H | h | Ds | Dt |
| 3A13 | 465 | 80 | 190 | 252 | 112 | 50 | 32 |
| 3A16 | 465 | 80 | 240 | 292 | 132 | 50 | 32 |
| 3A20 | 465 | 80 | 240 | 340 | 160 | 50 | 32 |
| 5A13 | 465 | 80 | 210 | 252 | 112 | 65 | 50 |
| 5A16 | 465 | 80 | 240 | 292 | 132 | 65 | 50 |
| 5A20A | 485 | 100 | 265 | 360 | 160 | 80 | 50 |
| 5A25 | 625 | 125 | 320 | 405 | 180 | 80 | 50 |
| 6A16 | 485 | 100 | 265 | 340 | 160 | 80 | 65 |
| 6A20 | 600 | 100 | 320 | 405 | 180 | 100 | 65 |
| 6A25A | 625 | 125 | 360 | 450 | 200 | 100 | 65 |
| 8A16 | 600 | 100 | 280 | 360 | 160 | 100 | 80 |
| 8A20 | 625 | 125 | 345 | 430 | 180 | 125 | 80 |
| 8A25A | 625 | 125 | 400 | 505 | 225 | 125 | 80 |
| 10A20 | 625 | 125 | 360 | 480 | 200 | 125 | 100 |
| 10A25A | 670 | 140 | 400 | 505 | 225 | 125 | 100 |
| 12A25 | 670 | 140 | 400 | 605 | 250 | 150 | 125 |
| 12A32A | 670 | 140 | 500 | 635 | 280 | 150 | 125 |
| 15A25 | 690 | 160 | 500 | 655 | 280 | 200 | 150 |
| 15A32A | 830 | 160 | 550 | 715 | 315 | 200 | 150 |
| 15A40 | 830 | 160 | 550 | 765 | 315 | 200 | 150 |
| 20A25 | 850 | 180 | 550 | 780 | 355 | 200 | 200 |
| 20A32 | 870 | 200 | 550 | 805 | 355 | 250 | 200 |
| 20A40 | 870 | 200 | 550 | 855 | 355 | 250 | 200 |
| 20A50A | 970 | 200 | 660 | 985 | 425 | 250 | 200 |
| 25A32 | 920 | 250 | 660 | 960 | 400 | 300 | 250 |
| 25A40 | 970 | 200 | 800 | 1025 | 425 | 300 | 250 |
| 25A50 | 970 | 200 | 800 | 1145 | 475 | 250 | 250 |
| 30A40 | 1020 | 250 | 800 | 1105 | 475 | 350 | 300 |

## RANGE OF OPERATION




## NOMINAL PARAMETERS

| Pump type | Rotation speed n=1450 [rpm] | | | Rotation speed n=2900 [rpm] | | | Weight m [kg] |
|---|---|---|---|---|---|---|---|
| | Capacity Q [m³/h] | Head H [m] | Shaft power P [kW] | Capacity Q [m³/h] | Head H [m] | Shaft power P [kW] | |
| 3A13 | 6,3 | 5 | 0,75 | 12,5 | 20 | 3 | 47 |
| 3A16 | | 8 | 1,5 | 12,5 | 32 | 5,5 | 45 |
| 3A20 | | 12,5 | 3,0 | 12,5 | 50 | 7,5 | 55 |
| 5A13 | 12,5 | 5 | 2,2 | 25 | 20 | 7,5 | 49 |
| 5A16 | 12,5 | 8 | 3,0 | 25 | 32 | 15 | 56 |
| 5A20A | 25 | 12,5 | 5,5 | 50 | 50 | 22 | 66 |
| 5A25 | 25 | 20 | 11 | 50 | 80 | 45 | 96 |
| 6A16 | 25 | 8 | 4 | 50 | 32 | 18,5 | 72 |
| 6A20 | 50 | 12,5 | 7,5 | 100 | 50 | 45 | 81 |
| 6A25A | 50 | 20 | 15 | 100 | 80 | 75 | 114 |
| 8A16 | 50 | 8 | 4 | 100 | 32 | 30 | 80 |
| 8A20 | 80 | 12,5 | 11 | 160 | 50 | 55 | 103 |
| 8A25A | 80 | 20 | 18,5 | 160 | 80 | 90 | 130 |

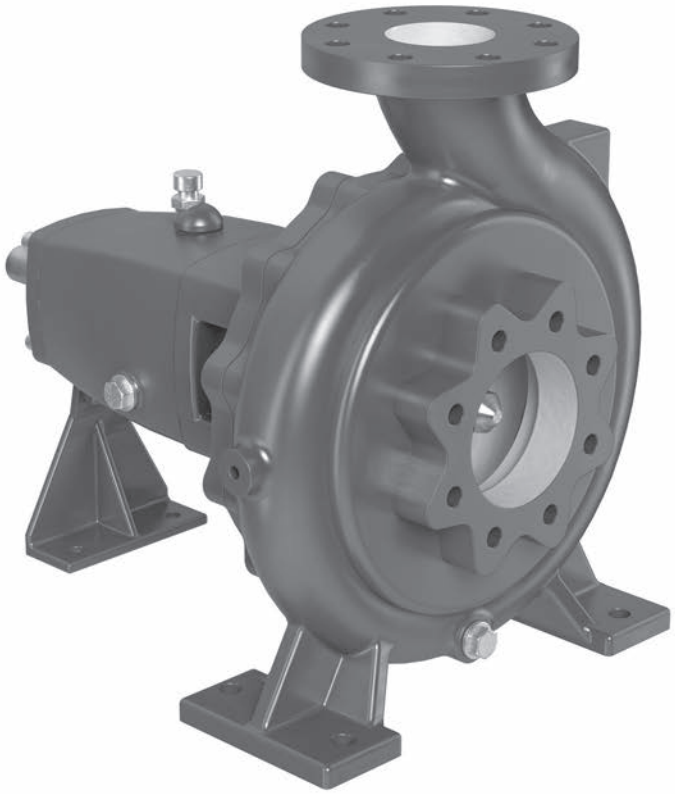
| Pump type | Rotation speed n=1450 [rpm] | | | Rotation speed n=2900 [rpm] | | | Weight m [kg] |
|---|---|---|---|---|---|---|---|
| | Capacity Q [m³/h] | Head H [m] | Shaft power P [kW] | Capacity Q [m³/h] | Head H [m] | Shaft power P [kW] | |
| 10A20 | 125 | 12,5 | 15 | 250 | 50 | 90 | 100 |
| 10A25A | | 20 | 30 | | 80 | 132 | 148 |
| 12A25 | 200 | 20 | 37 | 400 | 80 | 200 | 152 |
| 12A32A | | 32 | 55 | | 128 | 250 | 175 |
| 15A25 | 315 | 20 | 45 | - | - | - | 180 |
| 15A32A | | 32 | 75 | - | - | - | 292 |
| 15A40 | | 50 | 90 | - | - | - | 322 |
| 20A25 | 500 | 16 | 55 | - | - | - | 256 |
| 20A32 | | 32 | 110 | - | - | - | 335 |
| 20A40 | | 50 | 160 | - | - | - | 380 |
| 20A50A | | 80 | 250 | - | - | - | 480 |
| 25A32 | 800 | 32 | 132 | - | - | - | 350 |
| 25A40 | | 50 | 250 | - | - | - | 458 |
| 25A50 | | 80 | 355 | - | - | - | 524 |
| 30A40 | 1250 | 50 | 315 | - | - | - | 560 |

The parameters are specified for clean water of density ρ = 1000 kg/m$^3$ and temperature T = 15°C.

# STATIONARY PUMPS

# FY

FY are single stage, end suction horizontal centrifugal pumps for contaminated and viscous fluids



## APPLICATION

The FY type pumps are designed to handle fluids of higher density and viscosity, such as contaminated water, sewage, juices, lime slurries etc. The typical applications include sugar factories, waste water treatment plants, FDG installations in power plants etc.

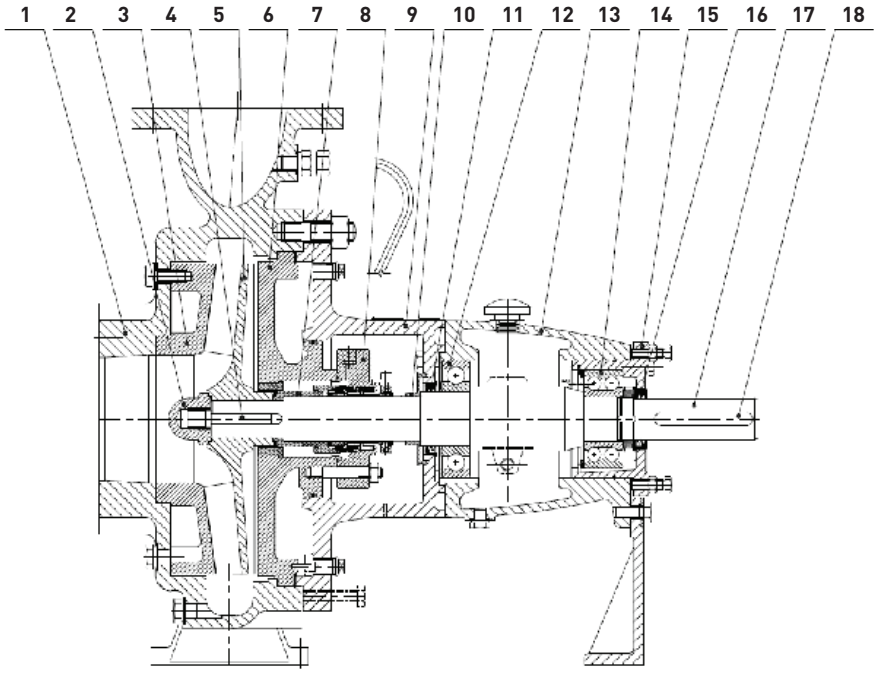
## DESIGN

Single stage, horizontal, end suction pumps with own bearings and spiral casings. Semi-open impellers are applied in order to reduce the danger of blocking by solid particles. The casing is protected by a liners made of wear resistant alloy. The pumps are of back-pull out design, so they can be disassembled without disconnecting from the pipelines after removing the distant coupling. Gland seals or mechanical seals of different types can be applied depending on the fluid pumped. The bearings are roller type, oil lubricated.

## MATERIALS OF CONSTRUCTION

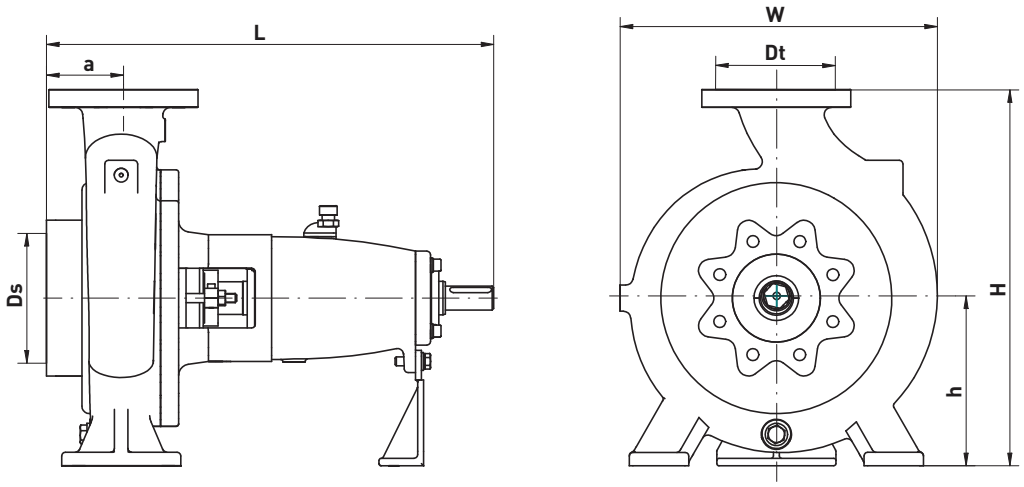
F-Y pumps are available in different material versions selected individually for each application according to the kind of fluid. In standard version the wet end elements are made of wear resistant chromium cast steel.

## CROSS-SECTION / LIST OF PUMP PARTS



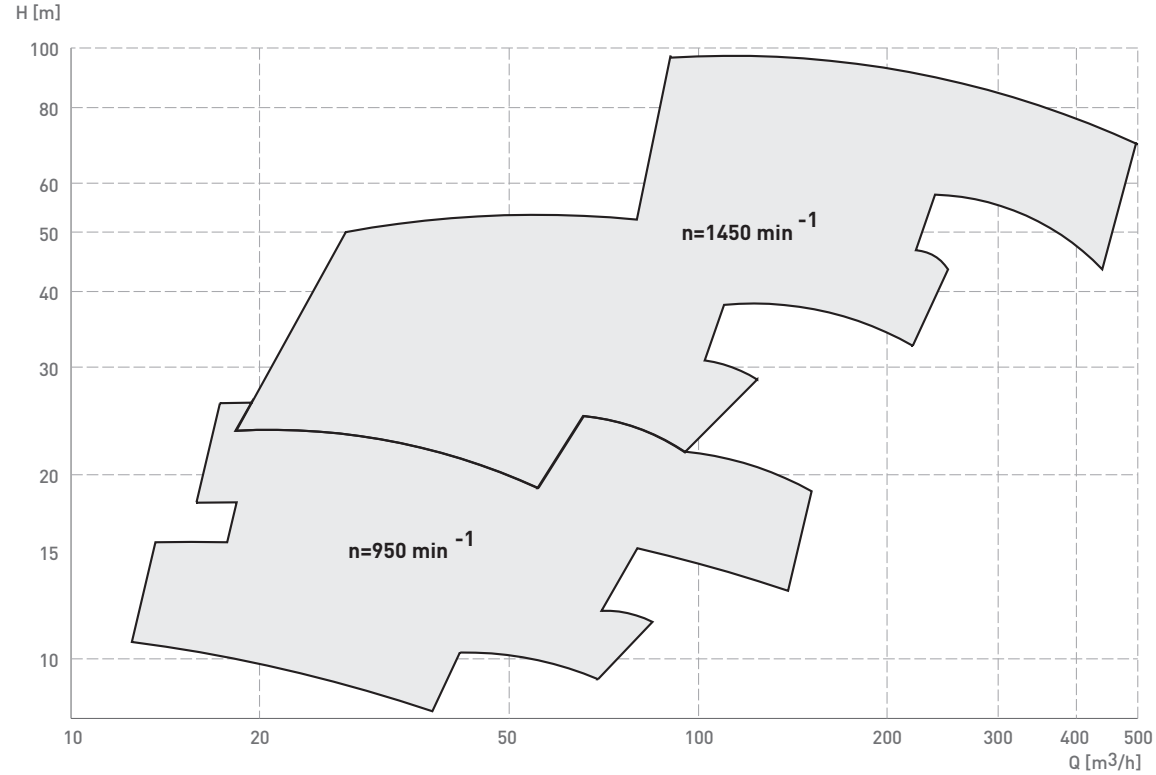

| No. | Part name | No. | Part name | No. | Part name |
|---|---|---|---|---|---|
| 1 | Casing | 7 | Shaft seal | 13 | Bearing housing |
| 2 | Nut | 8 | Mechanical seal | 14 | Bearing |
| 3 | Front liner | 9 | Joining piece | 15 | Insert |
| 4 | Key | 10 | Expeller | 16 | Labyrinth |
| 5 | Impeller | 11 | Labyrinth | 17 | Shaft |
| 6 | Rear liner | 12 | Bearing | 18 | Key groove |

## DIMENSIONS



| Pump type | Dimension [mm] | | | | | | |
|---|---|---|---|---|---|---|---|
| | L | a | W | H | h | Ds | Dt |
| 5FY32 | 655 | 125 | 403 | 505 | 225 | 80 | 50 |
| 6FY32 | 655 | 125 | 403 | 505 | 225 | 100 | 65 |
| 6FY40 | 655 | 125 | 488 | 635 | 280 | 100 | 65 |
| 10FY32 | 670 | 140 | 425 | 565 | 250 | 125 | 100 |
| 10FY40 | 610 | 140 | 501 | 635 | 280 | 125 | 100 |
| 12FY40 | 810 | 140 | 555 | 715 | 315 | 150 | 125 |
| 12FY50 | 830 | 160 | 683 | 875 | 375 | 150 | 125 |
| 15FY50 | 950 | 180 | 697 | 875 | 375 | 200 | 150 |

## RANGE OF OPERATION




## NOMINAL PARAMETERS

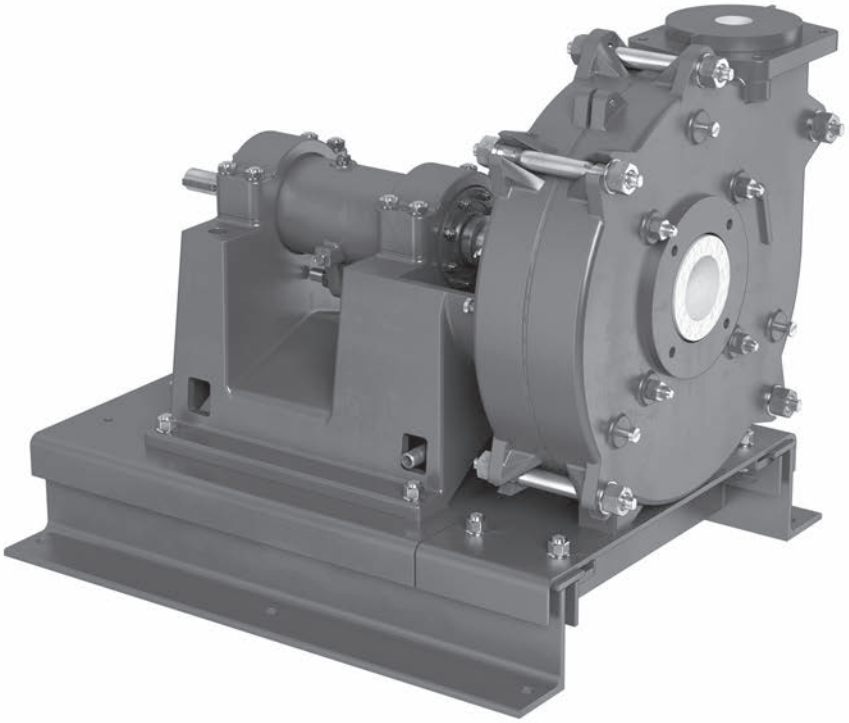
| Pump type | Rotation speed n=950 [rpm] | | | Rotation speed n=1450 [rpm] | | | Weight m [kg] |
|---|---|---|---|---|---|---|---|
| | Capacity Q [m³/h] | Head H [m] | Motor rated power $P_s$ [kW] | Capacity Q [m³/h] | Head H [m] | Motor rated power $P_s$ [kW] | |
| 5FY32 | 13 | 14 | 11 | 20 | 32 | 22 | 160 |
| 6FY32 | 33 | 14 | 15 | 50 | 32 | 30 | 170 |
| 6FY40 | 33 | 21 | 18,5 | 50 | 50 | 37 | 210 |
| 10FY32 | 66 | 14 | 11 | 100 | 32 | 37 | 180 |
| 10FY40 | 66 | 21 | 18,5 | 100 | 50 | 55 | 230 |
| 12FY40 | 131 | 21 | 30 | 200 | 50 | 90 | 280 |
| 12FY50 | 131 | 34 | 45 | 200 | 80 | 132 | 370 |
| 15FY50 | 262 | 34 | 75 | 400 | 80 | 200 | 430 |

The parameters are specified for clean water of density ρ = 1000 kg/m³ and temperature T = 15°C.

# STATIONARY SLURRY PUMPS

# MF

MF are rubber-lined single stage, horizontal slurry pumps for abrasive solids



## APPLICATION

MF pumps are designed to handle slurries containing high concentration of fine solids.

Typical application include:

- Copper ore processing plants
- Hydraulic transport of sand
- FGD installations in power plants

## DESIGN

Stationary, horizontal, single-stage rubber lined slurry pumps with rubber impellers and spiral casing. The entire rotating assembly can be shifted in axial direction in order to adjust the sealing gap between the impeller and the front liner. The axial thrust is absorbed by roller bearings. The suction flange is situated horizontally at the pump axis. The delivery flange can be directed vertically upwards, horizontally or at an angle of 45o. The pumps are powered by motor by v-belt transmission. The pumps are equipped with a special frame allowing for moving the bearing casing and one half of the pump casing which enables rubber liners and impeller replacement without disconnecting the pump flanges from the pipelines. A stuffing box with gland water led to the lantern ring is applied as a standard for shaft sealing. Version with mechanical seal is also applicable.

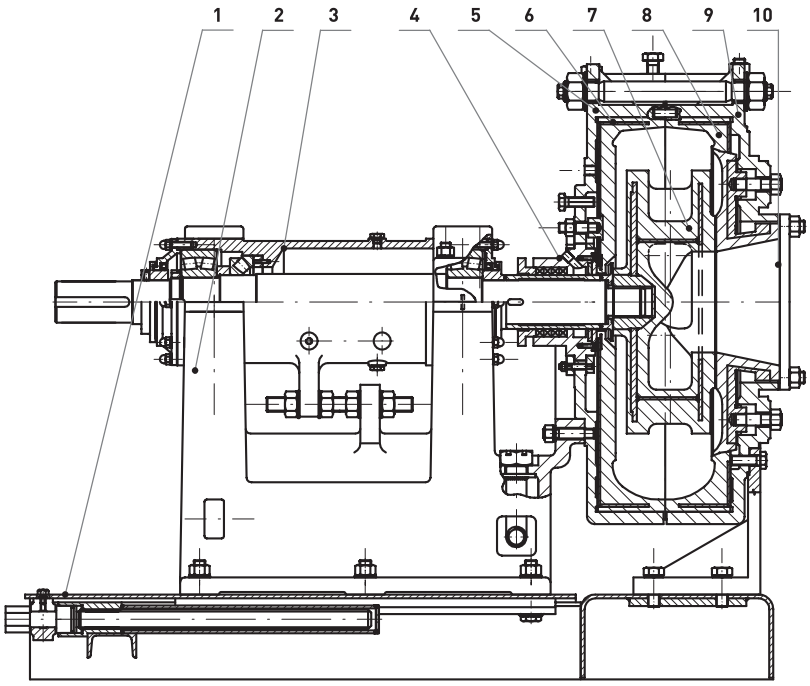
MF pumps can be made in a vertical version.

## MATERIALS OF CONSTRUCTION

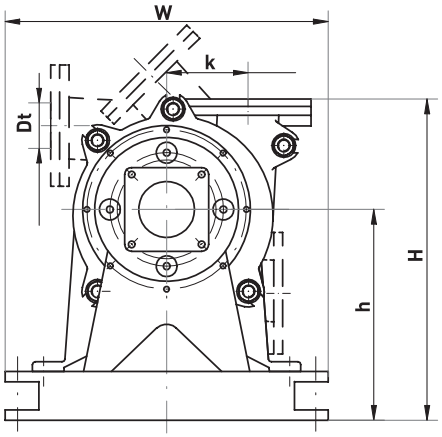
Impeller and liners – rubber
Pump casing and bearing casing – cast iron
Shaft – alloy steel

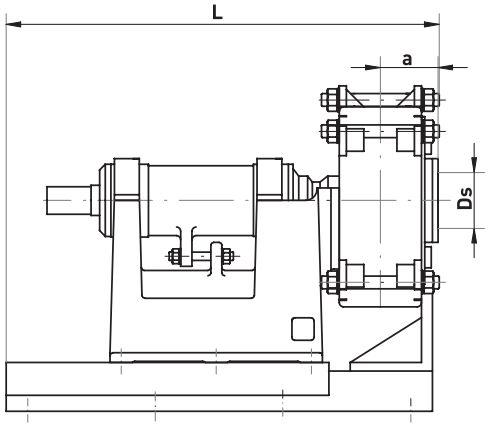
## CROSS-SECTION / LIST OF PUMP PARTS

| No. | Part name |
|---|---|
| 1 | Pump base frame |
| 2 | Pump casing |
| 3 | Bearing assembly |
| 4 | Stuffing box casing |
| 5 | Casing 2 |
| 6 | Casing liner |
| 7 | Impeller |
| 8 | Casing liner |
| 9 | Casing 1 |
| 10 | Suction liner |



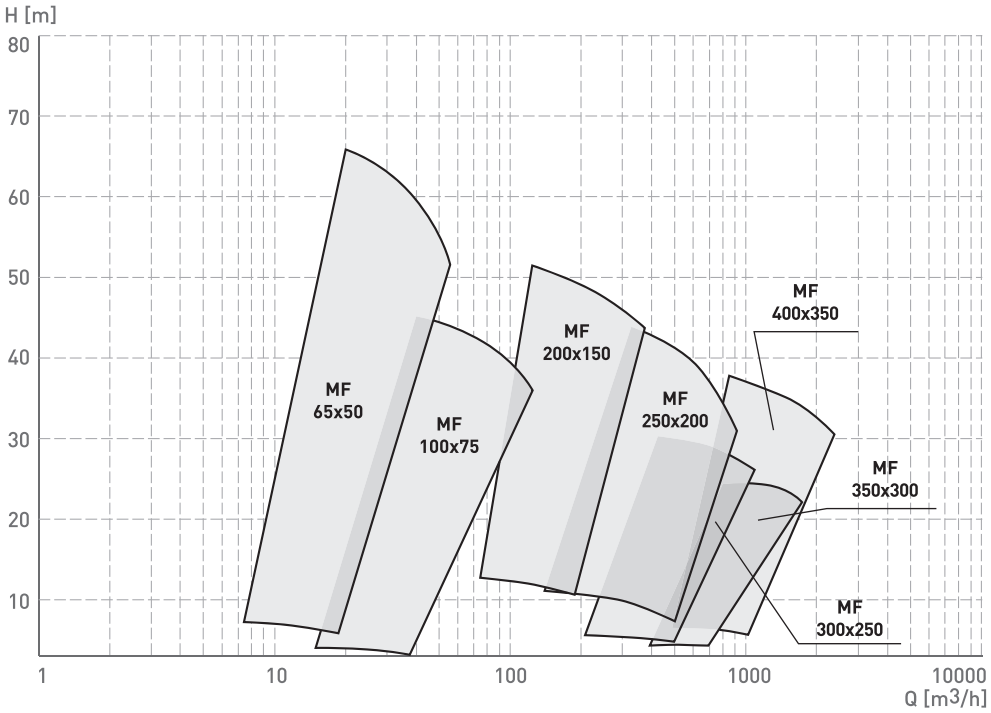

## DIMENSIONS




| Dimension [mm] | Pump type | | | | | | |
|---|---|---|---|---|---|---|---|
| | MF 65x50 | MF 100x75 | MF 200x150 | MF 250x200 | MF 300x250 | MF 350x300 | MF400x350 |
| L | 864 | 864 | 1525 | 1525 | 1855 | 1855 | 1855 |
| a | 111 | 111 | 206 | 247 | 270 | 307 | 323 |
| W | 764 | 764 | 1156 | 1156 | 1330 | 1330 | 1330 |
| k | 225 | 200 | 293 | 381 | 457 | 515 | 578 |
| H | 740 | 720 | 1186 | 1242 | 1624 | 1664 | 1778 |
| h | 455 | 455 | 774 | 774 | 1028 | 1028 | 1108 |
| Ds | 65 | 100 | 200 | 250 | 300 | 350 | 400 |
| Dt | 50 | 75 | 150 | 200 | 250 | 300 | 350 |

## RANGE OF OPERATION




## NOMINAL PARAMETERS

| Pump type | Capacity Q [m³/h] | Head H [m] | Rotation speed n [rpm] | Shaft power P [kW] | Weight m [kg] |
|---|---|---|---|---|---|
| MF 65x50 | 7,5 – 55 | 5,5 – 65 | 600 – 1800 | 30 | 600 |
| MF 100x75 | 15 – 125 | 4 – 44 | 600 – 2000 | 30 | 600 |
| MF 200x150 | 75 – 375 | 10,5 – 51 | 600 – 1200 | 90 | 1540 |
| MF 250x200 | 140 – 920 | 11 – 44 | 500 – 1000 | 160 | 1660 |
| MF 300x250 | 210 – 1100 | 4,5 – 30 | 300 – 700 | 200 | 2415 |
| MF 350x300 | 450 – 1750 | 4,5 – 25 | 300 – 700 | 250 | 2890 |
| MF 400x350 | 490 - 2400 | 5,5 – 37,5 | 300 - 700 | 355 | 3535 |

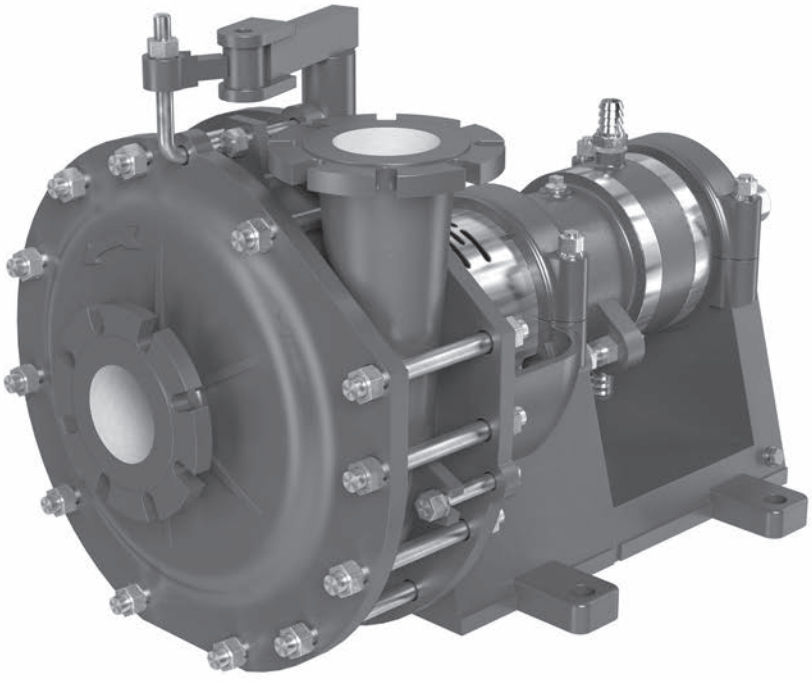
The parameters are specified for clean water of density ρ = 1000 kg/m³ and temperature T = 15°C.

| Pump type | Maximum size of solids [mm] | Maximum speed of the pump n [rpm] |
|---|---|---|
| MF 65x50 | 2 | 1800 |
| MF 100x75 | 3 | 2000 |
| MF 200x150 | 5 | 1200 |
| MF 250x200 | 7 | 1000 |
| MF 300x250 | 9 | 700 |
| MF 350x300 | 11 | 700 |
| MF 400x350 | 15 | 700 |

# STATIONARY SLURRY PUMPS

# PH

PH are single stage, horizontal heavy-duty slurry pumps for handling mixtures containing high concentration of abrasive solids.



## APPLICATION

PH pumps are used for pumping liquids containing significant amounts of solid particles (sludge). Permissible pumpage density is mainly 1700 kg/m$^3$, but in individual cases, depending on the type of medium, pumping slurries of higher density is permitted at a limited rotary speed. The maximum allowable size of sold particles (passage) increases with the pump size and can reach 52 mm.

PH pumps are used in the mining industry in processing plants and enrichment of minerals, in hydraulic filling systems, hydraulic waste removal, as well as in other applications where pumping mixtures containing significant amounts of solids is required. PH-Ex pump versions are suitable for use in potentially explosive underground mines, as group I, M2 category installation.

## DESIGN

PH pumps are horizontal, single stage, centrifugal pumps, with design adapted for pumping liquid mixtures and solids with abrasive properties. The inlet connection port is at the pump axis and the discharge connection port, in the basic version, is directed vertically upwards, offset laterally in relation to the pump axis.

PH pumps have closed impellers, with a small number of thickened vanes, thus increasing their life and allowing for pumping solid particles of larger size. Impellers are fitted on the front and rear discs with relieving vanes limiting the penetration of solid particles to the area of the shaft seal and the impeller neck sealing gap. This gap forms a frontal slot and its width can be adjusted with wear, without removing the pump, by moving the entire rotating assembly with Bearing housing in relation to the pump stator using special adjustment screws.

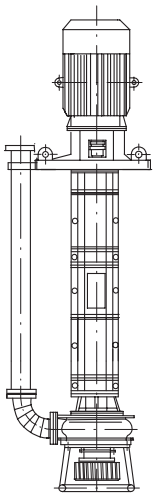
PH pumps can be made in a vertical version.

## MATERIALS OF CONSTRUCTION

Standard design material version for PH pumps used in manufacturing of the flowing system is hard-wearing alloy steel casting. Cast iron is used for manufacturing bearing elements. Carbon alloy steel casting and copper-cast iron is used in manufacturing of the remaining castings.

PH pumps are also available in the following special versions:

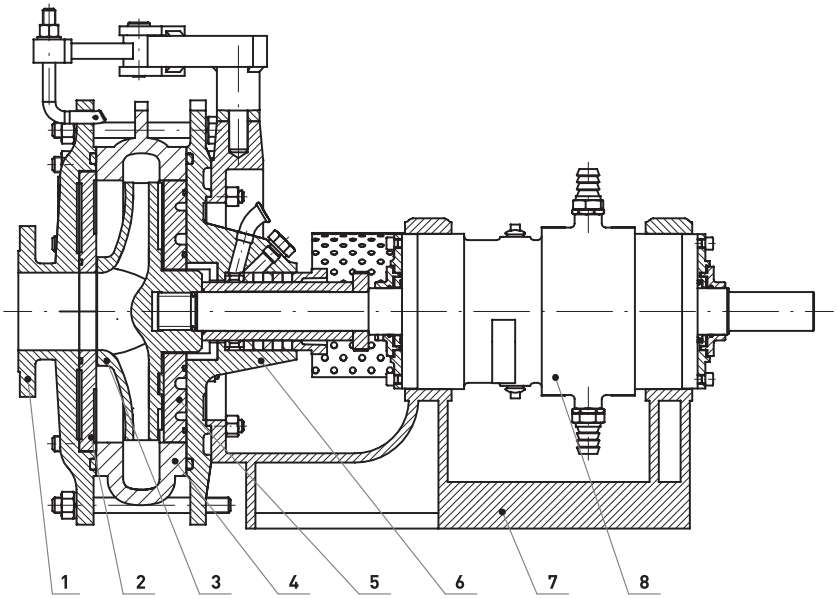
- saline-resistant steel casting version,
- hot water version,
- PH-Ex version designed for areas where explosion hazard is present in underground mines.



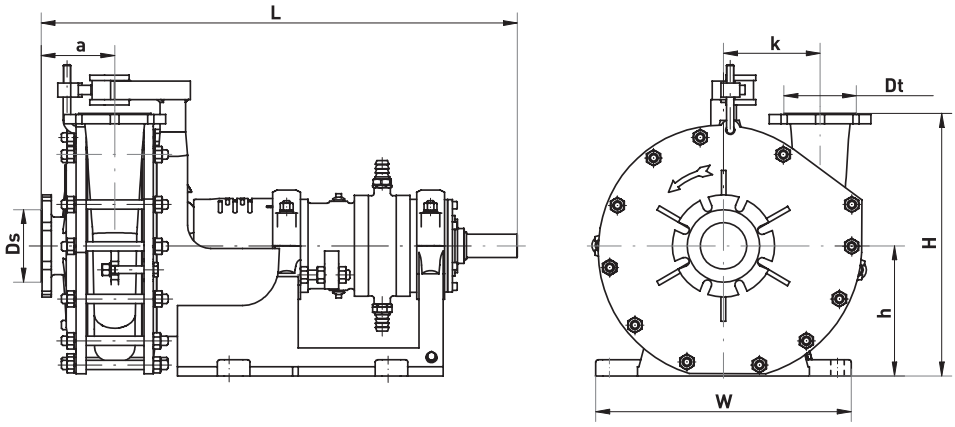
Sample of vertical version.

## CROSS-SECTION / LIST OF PUMP PARTS

| No. | Part name |
|---|---|
| 1 | Suction flange |
| 2 | Front liner |
| 3 | Impeller |
| 4 | Casing |
| 5 | Rear liner |
| 6 | Stuffing box casing |
| 7 | Pedestal |
| 8 | Bearing assembly |



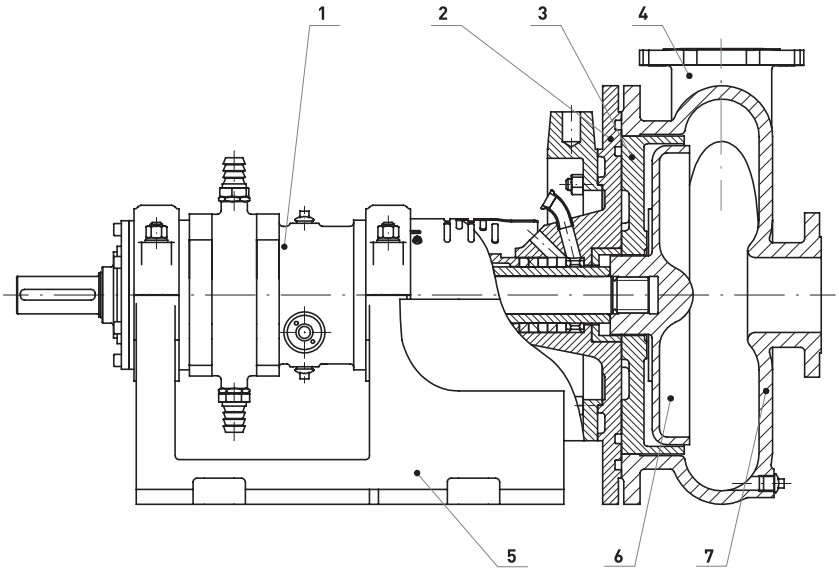

## DIMENSIONS



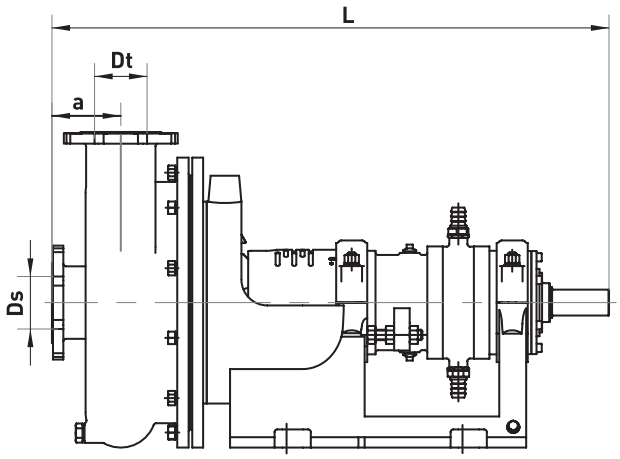

| Dimension [mm] | Pump type | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | PH-50 W/ WO/ WG | PH–65/174 | PH-80/244 | PH-100/332 | PH-100W | PH-150/440 | PH-200/504 | PH-250/570 | PH-300/725 | PH-100S | PH-150S |
| L | 826 | 630 | 843 | 1026 | 1237 | 1236 | 1467 | 1593 | 1817 | 1073 | 1273 |
| a | 115 | 108 | 127 | 158 | 224 | 202 | 244 | 255 | 286 | 133 | 170 |
| W | 420 | 320 | 420 | 560 | 590 | 590 | 690 | 690 | 910 | 602 | 642,5 |
| k | 129 | 112,5 | 162 | 208 | 292 | 256 | 347 | 365 | 453 | 212 | 205 |
| H | 445 | 340 | 445 | 565 | 715 | 735 | 975 | 1080 | 1200 | 610 | 735 |
| h | 225 | 160 | 225 | 280 | 360 | 335 | 475 | 560 | 630 | 280 | 335 |
| Ds | 50 | 70 | 80 | 100 | 150 | 200 | 200 | 250 | 300 | 100 | 150 |
| Dt | 50 | 70 | 80 | 100 | 100 | 150 | 200 | 250 | 300 | 100 | 150 |

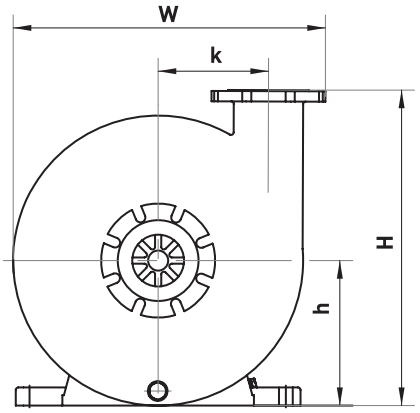
## CROSS-SECTION / LIST OF PUMP PARTS PH-S

| No. | Part name |
|---|---|
| 1 | Bearing assembly |
| 2 | Stuffing box casing |
| 3 | Wear plate |
| 4 | Discharge flange |
| 5 | Base |
| 6 | Impeller |
| 7 | Casing |



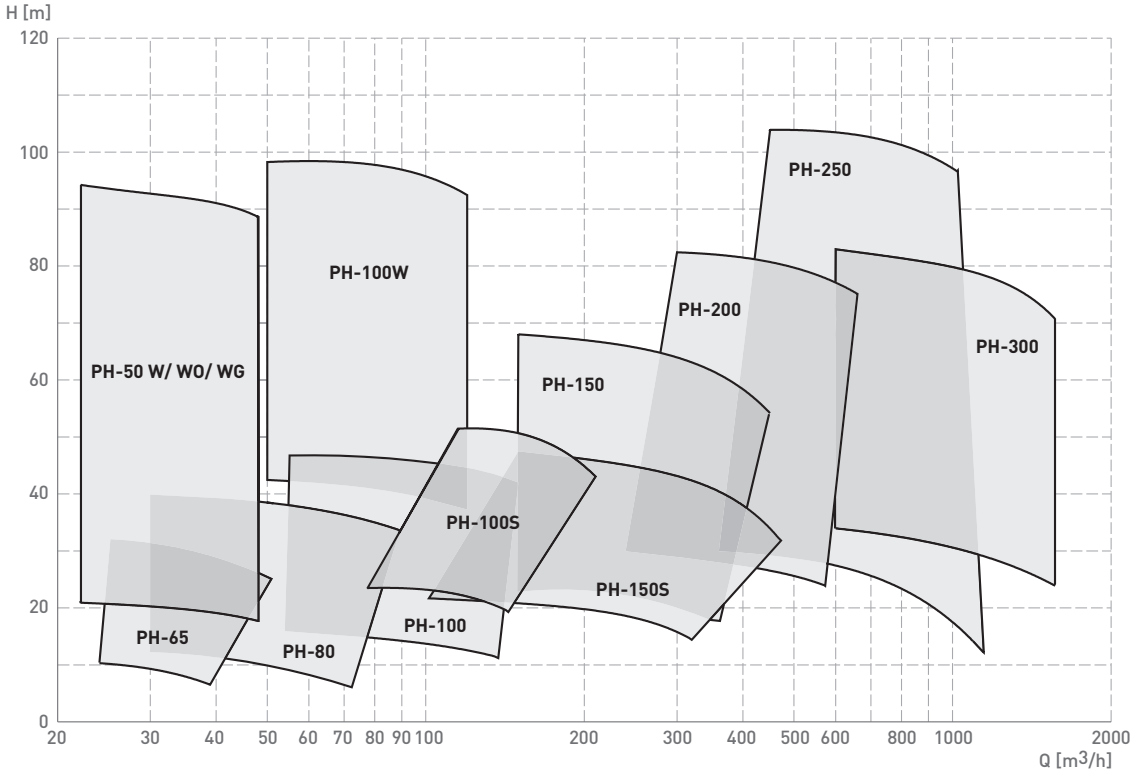

## DIMENSIONS




| dimensions [mm] | Pump types | |
|---|---|---|
| | PH-100S | PH-150S |
| L | 1073 | 1273 |
| a | 133 | 170 |
| W | 602 | 642,5 |
| k | 212 | 205 |
| H | 610 | 735 |
| h | 280 | 335 |
| Ds | 100 | 150 |
| Dt | 100 | 150 |

## RANGE OF OPERATION




## NOMINAL PARAMETERS

| Pump type | Capacity Q [m³/h] | Head H [m] | Rotation speed n [rpm] | Shaft power P [kW] | Weight m [kg] |
|---|---|---|---|---|---|
| PH-50 W/ WO/ WG | 40 | 74 | 2945 | 17 | 188 |
| PH-65/174 | 50 | 25 | 2650 | 6,1 | 94 |
| PH-80/244 | 80 | 25 | 1800 | 7,8 | 194 |
| PH-100/332 | 125 | 40 | 1600 | 21 | 359 |
| PH-100W | 100 | 95 | 1470 | 51 | 826 |
| PH-150/440 | 315 | 63 | 1450 | 75 | 720 |
| PH-200/504 | 500 | 80 | 1450 | 168 | 1230 |
| PH-250/570 | 960 | 90 | 1450 | 308 | 1522 |
| PH-300/725 | 1400 | 73 | 980 | 357 | 2646 |
| PH-100S | 185 | 48 | 1450 | 53 | 330 |
| PH-150S | 315 | 44 | 1450 | 80,5 | 609 |

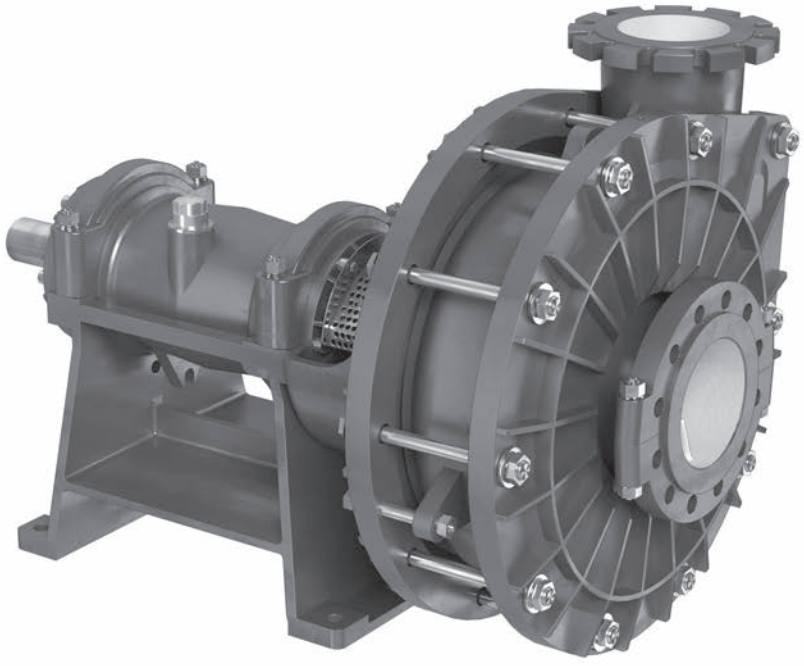
The parameters are specified for clean water of density ρ = 1000 kg/m³ and temperature T = 15°C.

| Pump type | Maximum solid size [mm] | Maximum pressure in the pump [MPa] |
|---|---|---|
| PH-50 W/WO/WG | 11 | 1,1 |
| PH-65/174 | 9 | 0,64 |
| PH-80/244 | 11 | 0,82 |
| PH-100/332 | 14 | 0,94 |
| PH-100W | 20 | 1,15 |
| PH-150/440 | 42 | 1,42 |
| PH-200/504 | 50 | 1,6 |
| PH-250/570 | 52 | 1,6 |
| PH-300/725 | 50 | 1,6 |
| PH-100S | 75 | 1,0 |
| PH-150S | 100 | 1,05 |

# STATIONARY SLURRY PUMPS

# HC

HC pumps are Single stage, horizontal, heavy-duty slurry pumps for handling mixtures containing high concentration of abrasive solids



## APPLICATION

HC pumps are designed to handle slurries containing high concentration of solids such as sand, gravel, stone, coal, slag, ores, clay, whitewash, tailings etc.

Typical application include:

- Mines – in coal or ore processing plants
- Mineral raw materials mines – for hydraulic transport of sand, gravel and stones
- Power industry – for hydraulic disposal of slag and ash
- Steelworks – for pumping water with scale
- Cement plants – for pumping sand and raw materials
- Sugar factories – for pumping industrial waste

## DESIGN

Stationary, single-stage, centrifugal, horizontal slurry pumps with closed impellers. The suction flange is located horizontally at the axis while the delivery flange is located vertically upwards. The pump outer casing is protected from inside by replaceable wear resistant liners. The axial thrust is absorbed by a thrust roller bearing. The bearings are oil lubricated. The shaft is centrifugal consisting of a gland seal fed with grease and of an additional expeller reducing the pressure on the packing. Version with mechanical seal is also available. The whole rotating assembly together with the bearing housing can be shifted along the axial direction without pump disassembly in order to adjust the sealing gap between the impeller and the front liner.

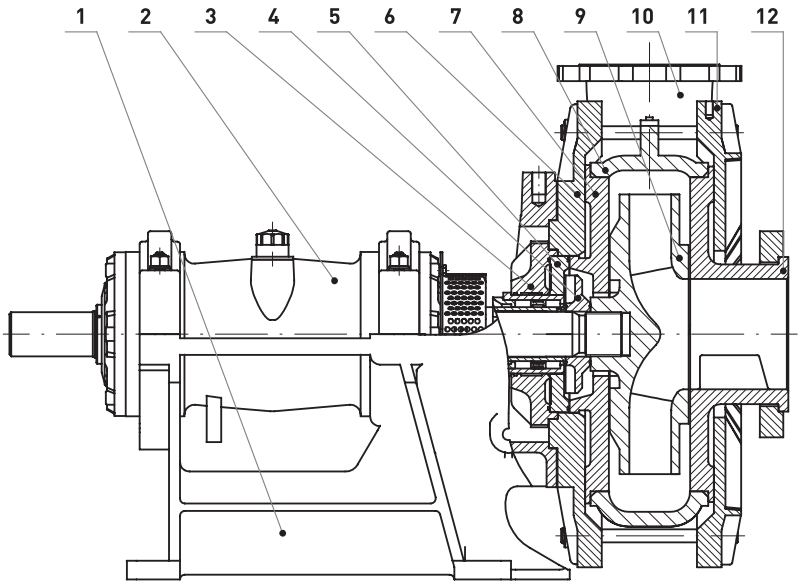
HC pumps can be made in a vertical version.

## MATERIALS OF CONSTRUCTION

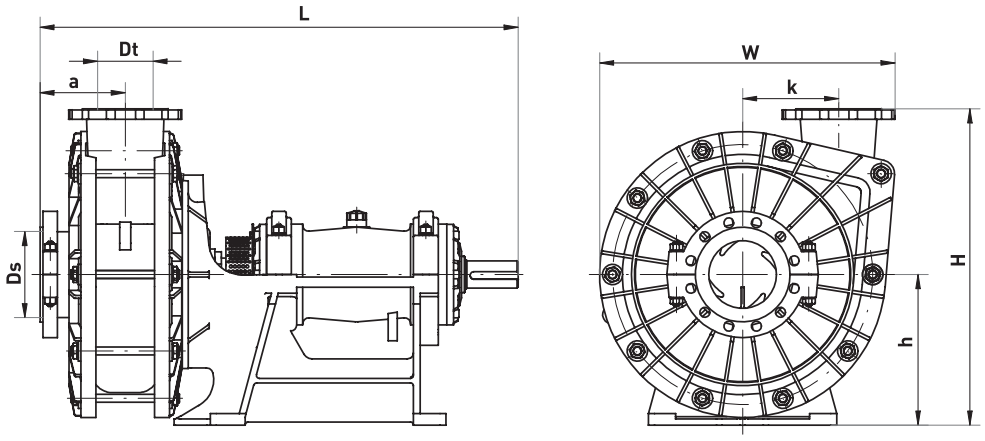
Wet end components are made of MTL-26 – wear resistant high chromium alloy cast steel

## CROSS-SECTION / LIST OF PUMP PARTS

| No. | Part name |
|---|---|
| 1 | Pedestal |
| 2 | Bearing assembly |
| 3 | Gland casing |
| 4 | Expeller |
| 5 | Expeller liner |
| 6 | Rear casing |
| 7 | Rear liner |
| 8 | Casing |
| 9 | Impeller |
| 10 | Discharge flange |
| 11 | Front external casing |
| 12 | Suction flange |

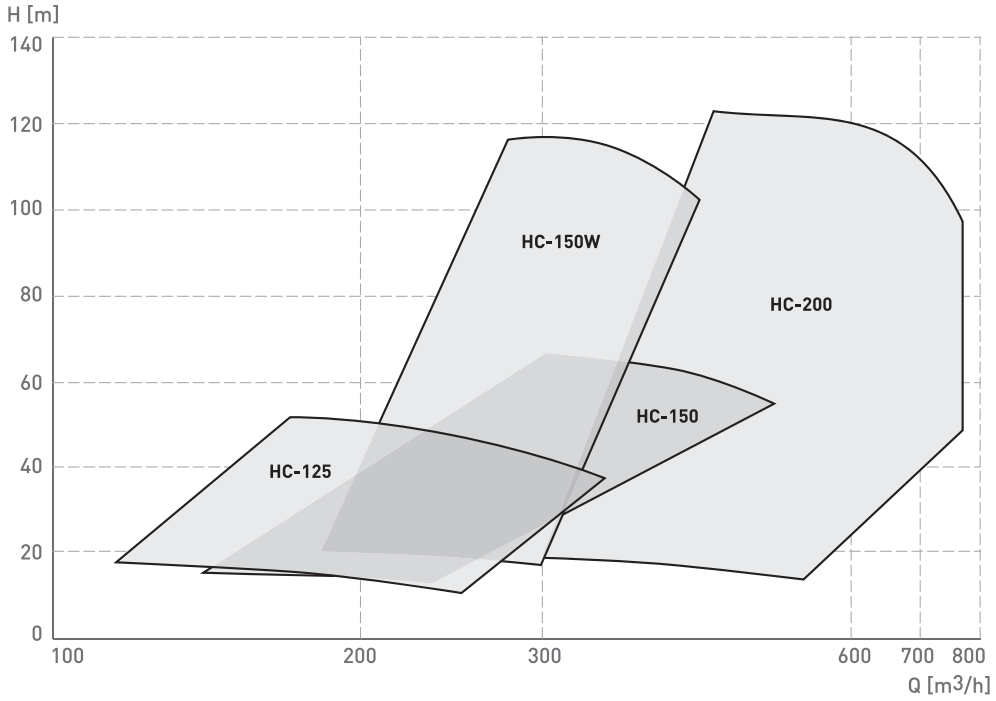



## DIMENSIONS




| Dimension [mm] | Pump type | | | |
|---|---|---|---|---|
| | HC–125 | HC–150 | HC–150W | HC–200 |
| L | 1132 | 1536 | 1516 | 1577 |
| a | 220,5 | 239 | 229 | 283 |
| W | ~ 786 | ~ 872 | ~ 980 | ~ 980 |
| k | 253 | 280 | 338 | 319 |
| H | 880 | 982 | 1052 | 1050 |
| h | 450 | 500 | 500 | 500 |
| Ds | 150 | 175 | 175 | 225 |
| Dt | 125 | 150 | 150 | 200 |

## RANGE OF OPERATION




## NOMINAL PARAMETERS

| Pump type | Capacity Q [m³/h] | Head H [m] | Rotation speed n [rpm] | Shaft power P [kW] | Weight m [kg] |
|---|---|---|---|---|---|
| HC – 125/380 | 250 | 45 | 1450 | 44 | ok. 913 |
| HC-150/440 | 400 | 63 | 1470 | 100 | ok. 1447 |
| HC-150/580 | 400 | 105 | 1465 | 174 | ok. 1680 |
| HC-200/570 | 600 | 120 | 1475 | 300 | ok. 1848 |

The parameters are specified for clean water of density ρ = 1000 kg/m³ and temperature T = 15°C.

| Pump type | Maximum solid size [mm] | Maximum pressure in the pump [MPa] |
|---|---|---|
| HC – 125 | 25 | 1,2 |
| HC-150 | 60 | 1,6 |
| HC-150W | 20 | 1,6 |
| HC-200 | 60 | 1,6 |

# SUBMERSIBLE SLURRY PUMPS

# HZ

HZ are submersible heavy-duty slurry pumps for abrasive solids

## APPLICATION

HZ pumps are submersible pumps designed to handle water containing significant amounts of solids with dimensions exceeding 100 mm (in version with the free movement impellers) wherein the density of the pumped liquid must not be greater than 1400 kg/m3.

Typical applications:

- For pumping highly contaminated liquids,
- For pumping sludge and similar.

## DESIGN

Submersible, vertical single-stage impeller pumps. Free movement or closed impellers are mounted directly on submersible electric motor shaft. Drive motor is located right on the pump part. Hydraulic part located under the engine is separated from the shaft mechanical seal with oil chamber. An inlet to the pump is in axis from the bottom of the pump, and discharge casing is directed to the side perpendicular to the pump axis.

Drive motors have protection against the ingress of external factors IP X8 and are adapted for immersion service up to 6 m. Standard voltage is 400 V, but 500 V version is also available.

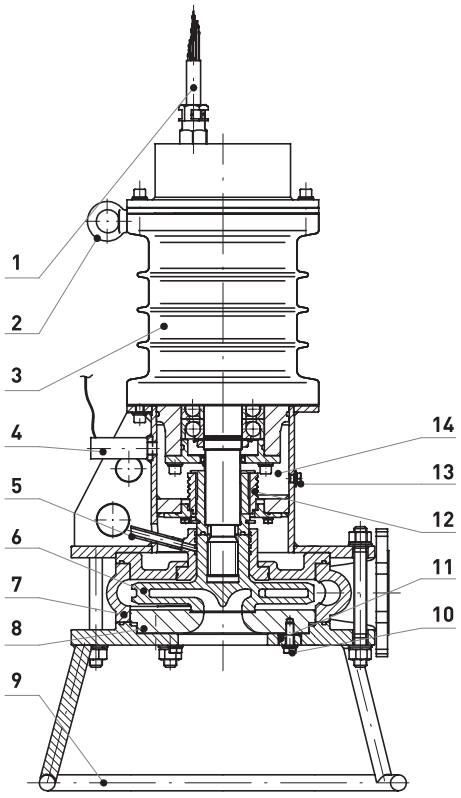
HZ pumps are equipped with security systems including motor winding and bearings temperature sensors, presence of moisture sensor in the motor and the presence of water sensor in the oil chamber. The pump has a rack from the bottom, which allow to set pump at the bottom of reservoir.

## MATERIALS OF CONSTRUCTION

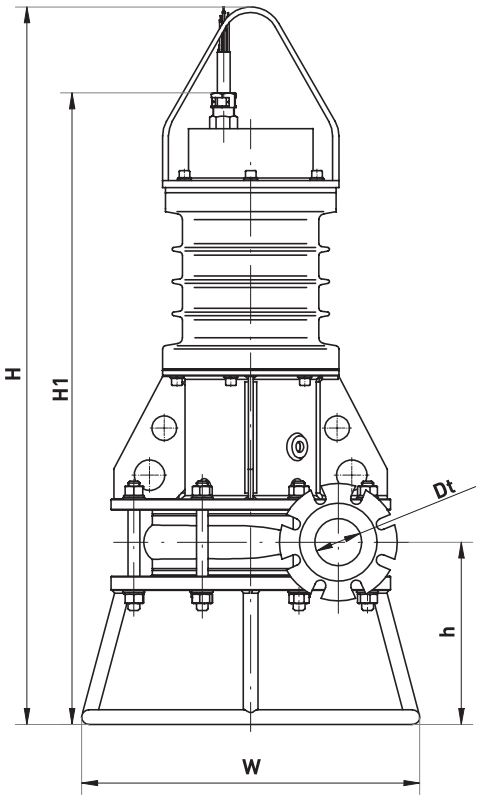
HZ pumps are made with two different versions of the materials, hard-abrasiveness and salt-resistant.

## CROSS-SECTION / LIST OF PUMP PARTS

| No. | Part name |
|---|---|
| 1 | Power supply cable |
| 2 | Handle |
| 3 | Motor |
| 4 | Pug or oil moisture sensor (optional) |
| 5 | Supply pipe |
| 6 | Impeller |
| 7 | Discharge casing |
| 8 | Front liner |
| 9 | Base |
| 10 | Adjusting screw |
| 11 | Adjusting sleeve |
| 12 | Mechanical seal |
| 13 | Drain plug |
| 14 | Oil |

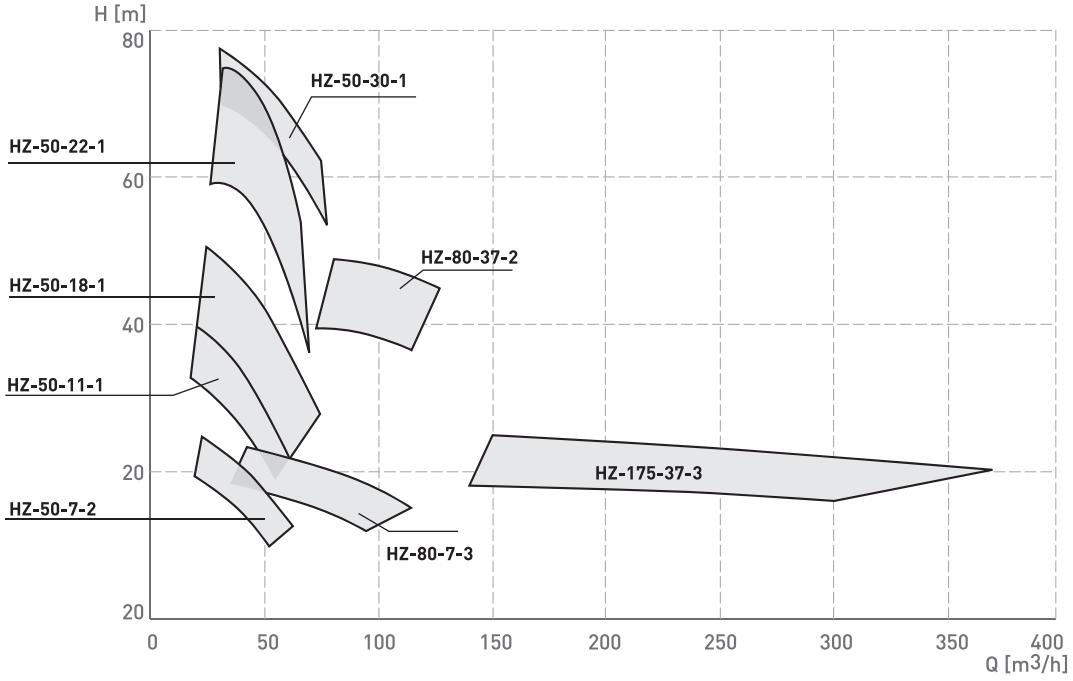



## DIMENSIONS




| Pump type | Dimension [mm] | | | | |
|---|---|---|---|---|---|
| | H | H1 | h | W | Dt |
| HZ-50-7-2 | - | 1075 | 310 | 600 | 50 |
| HZ-50S-11-1 | 1201 | 1131 | 262 | 700 | 50 |
| HZ-50S-18-1 | 1361 | 1291 | 262 | 700 | 50 |
| HZ-50-22-1 | 1292 | 1222 | 268 | 700 | 50 |
| HZ-50S-30-1 | 1408 | 1338 | 252 | 700 | 50 |
| HZ-80-7-3 | - | 1150 | 316 | 595 | 80 |
| HZ-80-22-2 | 1445 | 1270 | 320 | 575 | 80 |
| HZ-80-37-2 | 1100 | - | 320 | 575 | 80 |
| HZ-175-37-3 | 1709 | - | 590 | 1000 | 175 |

## RANGE OF OPERATION




## NOMINAL PARAMETERS

| Pump type | Capacity Q [m³/h] | Head H [m] | Rotation speed n [rpm] | Motor rated power $P_s$ [kW] | Weight m [kg] |
|---|---|---|---|---|---|
| HZ-50-7-2 | 40 | 20 | 1465 | 7,5 | 274 |
| HZ-50S-11-1 | 25 | 34 | 2930 | 11 | 278 |
| HZ-50S-18-1 | 50 | 42 | 2930 | 18,5 | 325 |
| HZ-50-22-1 | 45 | 61 | 2920 | 22 | 412 |
| HZ-50S-30-1 | 60 | 69 | 2940 | 30 | 370 |
| HZ-80-7-3 | 40 | 19 | 960 | 7,5 | 398 |
| HZ-80-22-2 | 90 | 40 | 1465 | 22 | 477 |
| HZ-80-37-2 | 125 | 44 | 1475 | 37 | 661 |
| HZ-175-37-3 | 250 | 21 | 980 | 37 | 1245 |

The parameters are specified for clean water of density ρ = 1000 kg/m³ and temperature T = 15°C.

# SUBMERSIBLE PUMPS

# OSZ

OSZ pumps are vertical, multistage submersible pumps for mechanicaly and chemicaly contaminated fluids

## APPLICATION

OSZ pumps are typically applied for open cast mine and deep mine dewatering.They are also applicable in any other case when submersible pumps of medium capacity and head are required to pump contaminated water.

## DESIGN

Multi-stage, vertical, submersible centrifugal pumps with closed impellers and vane diffusers. Water inlet is located around the perimeter between then pump and the motor while the delivery flange is directed horizontally at the upper part of the pump.

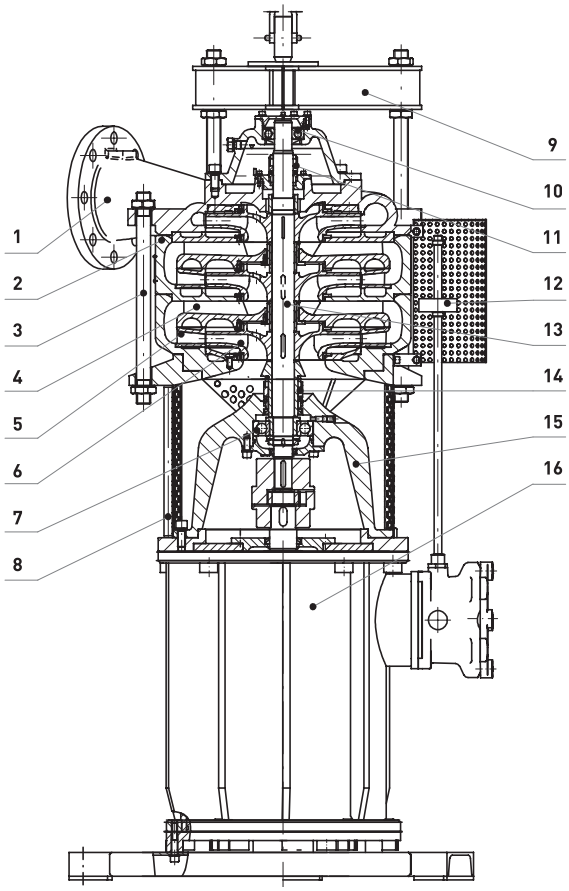
The roller bearings are installed in oil chambers sealed by mechanical seals. Thus the presence of abrasive solids in the pumped fluid does not affect the bearing operation. The upper bearing absorbs the axial thrust.
The pump is driven by dry type submersible motor located under the pump. The power from electric motor is transmitted via a flexible coupling. The motor has own roller bearings. The pump set is equipped with the monitoring system including bearings and motor windings temperature sensors as well as water presence sensors in the oil chambers and in the motor.

## MATERIALS OF CONSTRUCTION

Impellers, diffusers, casings are made of cast iron or stainless cast steel

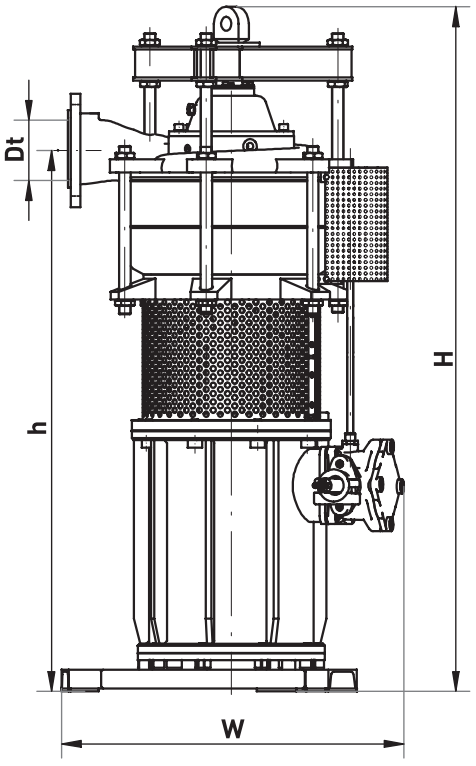
## CROSS-SECTION / LIST OF PUMP PARTS

| No. | Part name |
|---|---|
| 1 | Discharge flange |
| 2 | Stage casing |
| 3 | Tie bolt |
| 4 | Guide vane |
| 5 | Vane diffuser |
| 6 | Impeller |
| 7 | Bearings |
| 8 | Suction strainer |
| 9 | Hanger |
| 10 | Hanging bracket |
| 11 | Mechanical seal |
| 12 | Level sensor |
| 13 | Shaft |
| 14 | Mechanical seal |
| 15 | Suction casing |
| 16 | Motor |

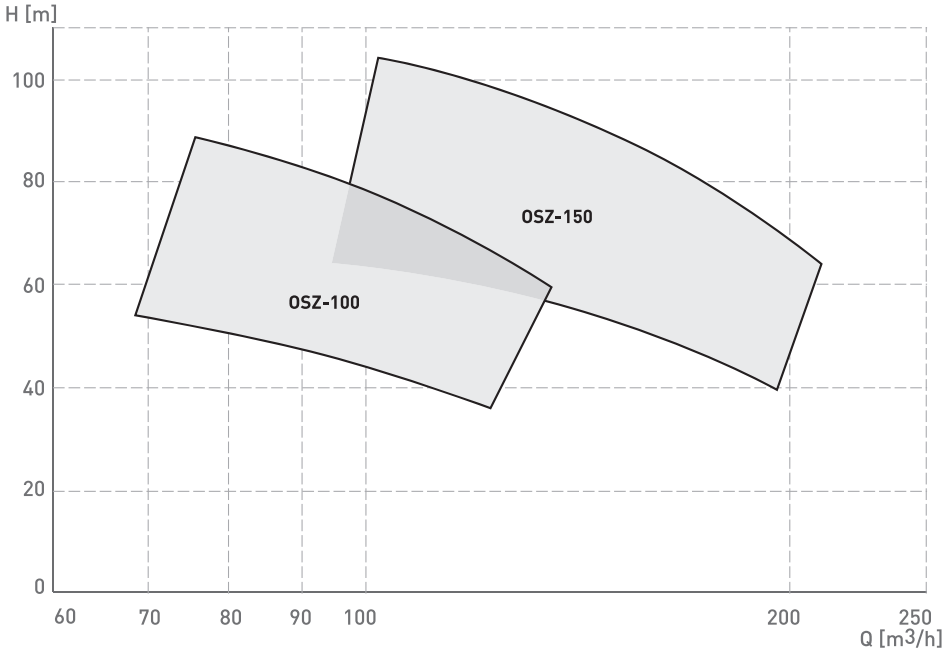



## DIMENSIONS

| Dimension [mm] | Pump type | | | |
|---|---|---|---|---|
| | OSZ-100 | | OSZ-150 | |
| Number of stages | 3 | 2 | 3 | 2 |
| H | 1600 | 1500 | 1700 | 1574 |
| h | 1360 | 1260 | 1443 | 1317 |
| W | 860 | | 880 | |
| Dt | 100 | | 150 | |



## RANGE OF OPERATION




## NOMINAL PARAMETERS

| Pump type | Number of stages | Capacity Q [m³/h] | Head H [m] | Rotation speed n [rpm] | Motor rated power $P_s$ [kW] | Weight m [kg] |
|---|---|---|---|---|---|---|
| OSZ-100 | 2 | 90 | 56 | 1475 | 37 | 827 |
| | 3 | | 84 | | | 892 |
| OSZ-150 | 2 | 155 | 58 | 1475 | 75 | 1044 |
| | 3 | | 87 | | | 1150 |

The parameters are specified for clean water of density ρ = 1000 kg/m³ and temperature T = 15°C.

# SUBMERSIBLE PUMPS

# SP

SP pumps are designed to handle mine and industrial water containing solids

## APPLICATION

SP pumps are designed to handle mine and industrial water containing solids.

**Typical applications include:**

- underground mines – for mine face dewatering, including cases where methane hazard or coal dust explosion hazard are present,
- construction site dewatering.

## DESIGN

Submersible, single stage impeller pumps with closed impellers mounted directly on electric motor shaft under the motor. The motor is cooled by the fluid pumped through a cooling jacket. The delivery flange is located at the upper part of the pump. Pump shaft is sealed by double mechanical seal in the oil chamber between the impeller and the motor.

The pump set is equipped with monitoring system consisting of motor bearings and windings temperature sensors, moisture sensors and electric protections against overload or dry run of the pump.

The pumps are compliant with Atex directive and are certified for operation at sites exposed to explosion hazard – I M2c, EEx dl.

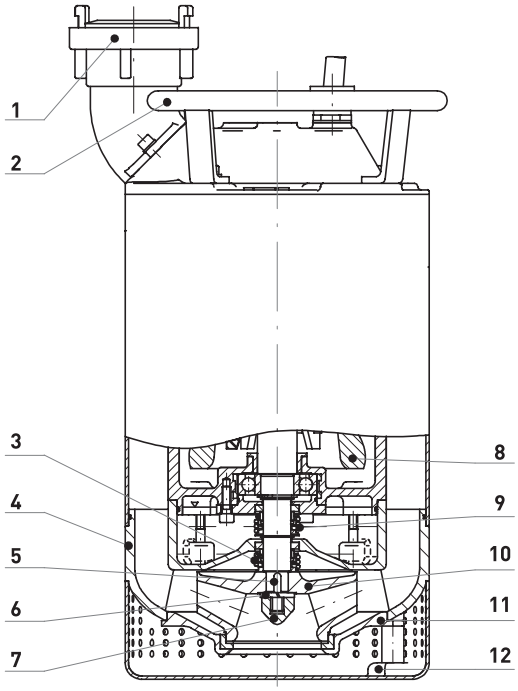
Non Atex version of smaller mass is also available.

## MATERIALS OF CONSTRUCTION

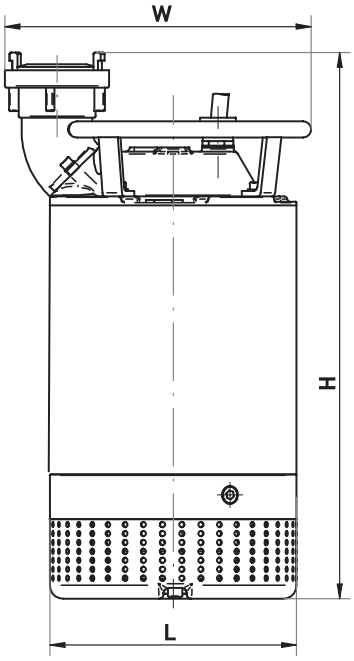
Standard version: impeller – wear-resistant cast steel, pump casing– aluminum alloy, shaft, bolts, nuts – stainless steel.
In salt-resistant version all elements are made of stainless cast steel.

## SECTIONAL VIEW / LIST OF PUMP PARTS

| No. | Part name |
|---|---|
| 1 | Discharge flange |
| 2 | Handle |
| 3 | Mechanical seal |
| 4 | Discharge casing |
| 5 | Key |
| 6 | Washer |
| 7 | Impeller nut |
| 8 | Motor |
| 9 | Mechanical seal |
| 10 | Impeller |
| 11 | Suction cover |
| 12 | Suction rose |

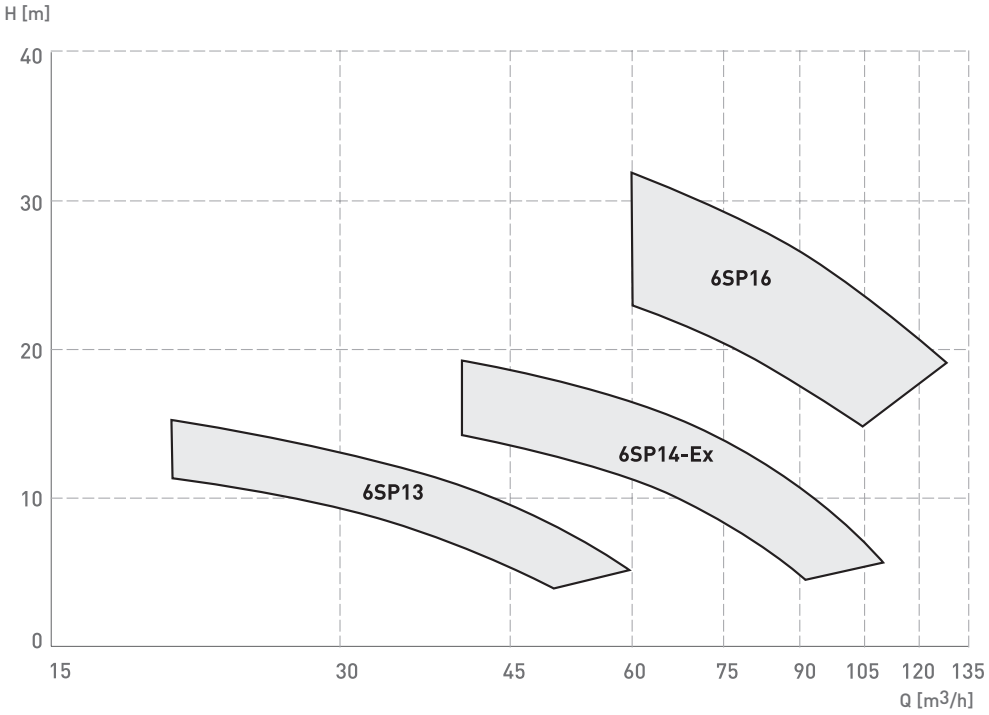



## DIMENSIONS




| Dimensions [mm] | Pump type | | |
|---|---|---|---|
| | 6SP13 | 6SP14-Ex | 6SP16 |
| L | 222 | 276 | 303 |
| W | 308 | 343 | 314 |
| H | 620 | 611 | 865 |

## RANGE OF OPERATION




## NOMINAL PARAMETERS

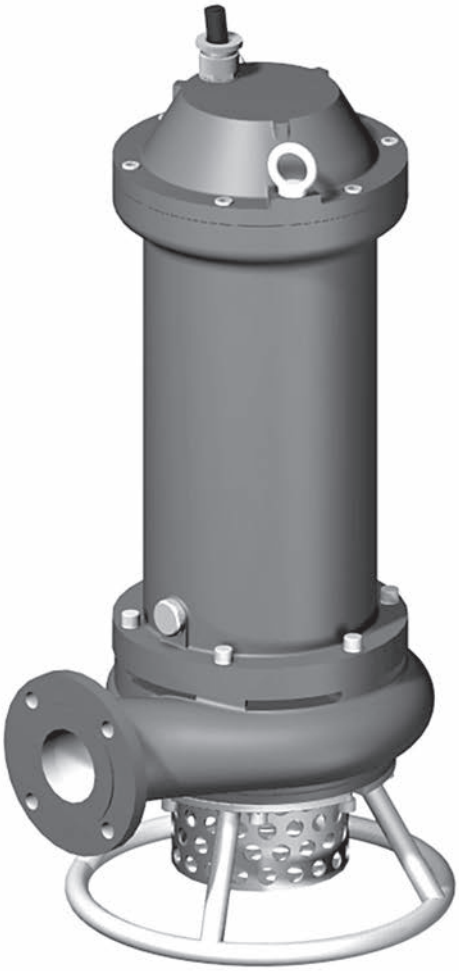
| Pump type | Capacity Q [m3/h] | Head H [m] | Rotation speed n [rpm] | Motor rate power $P_s$[kW] | Weight m [kg] |
|---|---|---|---|---|---|
| 6SP13 | 32 | 12,5 | 3000 | 3 | 30 |
| 6SP14-Ex | 63 | 16 | 3000 | 5,5 | 65 |
| 6SP16 | 95 | 25 | 3000 | 11 | 70 |

The parameters are specified for clean water of density ρ = 1000 kg/$m^3$ and temperature T = 15°C.

# SUBMERSIBLE PUMPS

# NZ

Submersible pumps NZ are designed to deal with water containing solids and salt



## APPLICATION

Submersible pumps NZ type are designated to handle mixtures of water with solids of dimensions up to 15 mm for 6NZ15 pump, 10 mm for 6NZ18 pump and 32 mm for 10NZ22 pump. The density of pumped mixture must not exceed 1200 kg/m$^3$.

Typical applications:

- for local dewatering in coal, ore and minerals mines as well as in power industry.

## DESIGN

Submersible, vertical single-stage centrifugal pumps. The impeller is installed directly on the shaft end of a submersible electric motor. Motor is assembled over the pump. The hydraulic assembly is located under the motor and is separated from it by a mechanical seal in an oil chamber. The pump inlet is located at the axis under the pump and the delivery flange is directed horizontally, perpendicularly to the axis.

The motors are of IP 68 protection class and are designed to operate in submergence up to 20 m. A support is provided in lower part the pump in order to place the pump on the sump bottom.

The pump sets are equipped with electric protection systems against overload and dry-run. Bearing temperature sensors are provided.

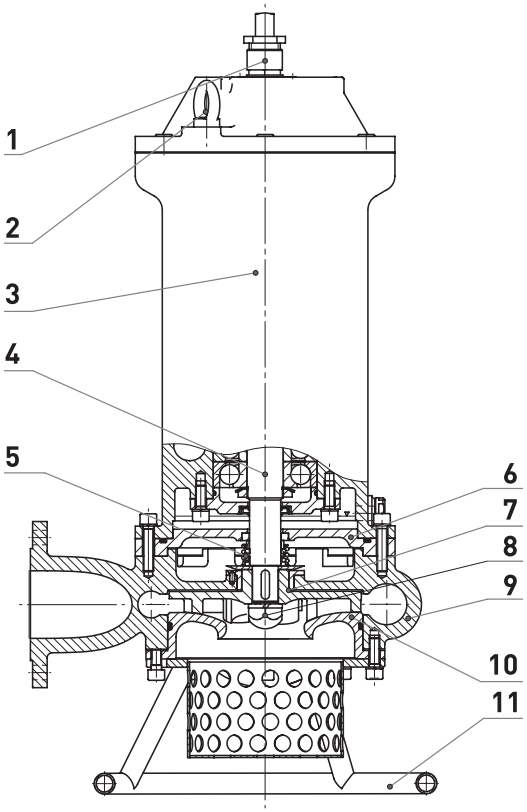
Pumps can be equipped with motors for various supply voltages 400V, 500V, 660V, 1140V and switchable 500V/1000V. The pumps are compliant with ATEX directive and are certified for operation in explosion hazardous areas – I M2c Ex dI. Mb.

## MATERIALS OF CONSTRUCTION

Pump impellers are made of wear resistant alloy cast steel. The casings are made of cast iron. Nuts, bolts and pump supports are made of stainless steel.

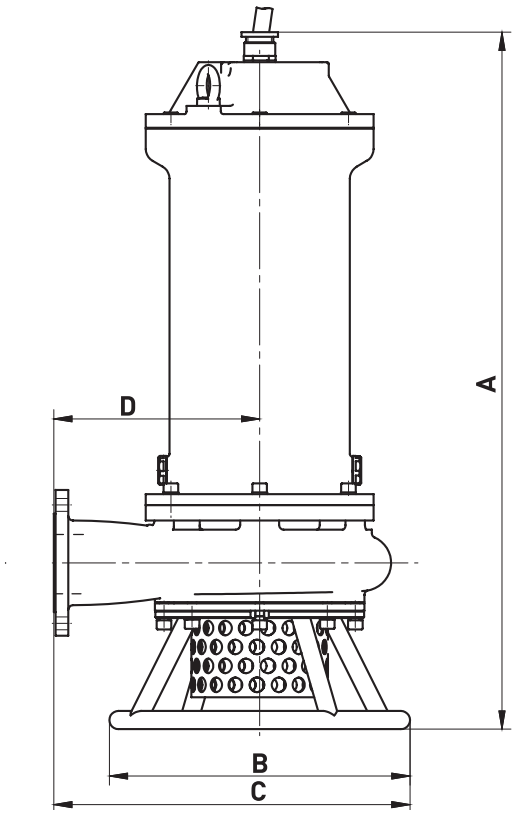
## SECTIONAL VIEW / LIST OF PUMP PARTS

| No. | Part name |
|---|---|
| 1 | Power supply cable |
| 2 | Handle |
| 3 | Motor |
| 4 | Shaft |
| 5 | Mechanical seal |
| 6 | Seal chamber |
| 7 | Impeller |
| 8 | Impeller nut |
| 9 | Delivery casing |
| 10 | Suction cover |
| 11 | Support |

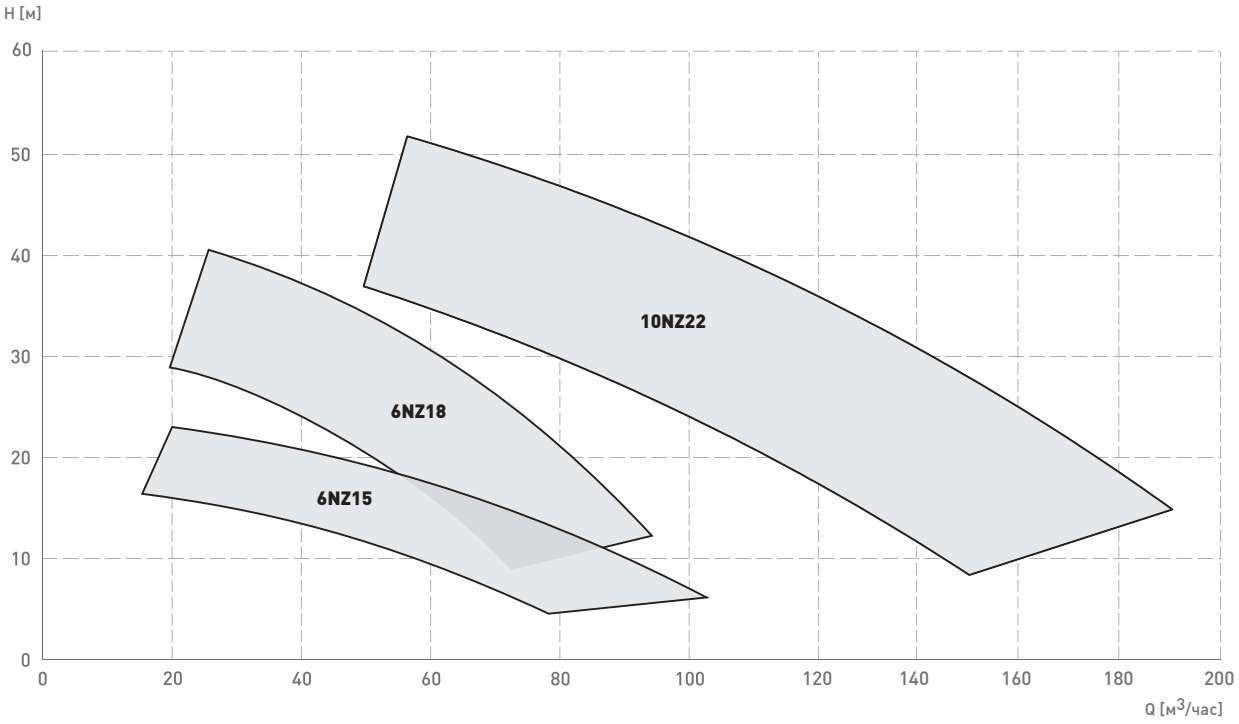



## DIMENSIONS

| Dimensions [mm] | Pump type | | |
|---|---|---|---|
| | 6NZ15 | 6NZ18 | 10NZ22 |
| A | 720 | 760 | 1100 |
| B | 330 | 330 | 520 |
| C | 390 | 390 | 564 |
| D | 225 | 226 | 304 |



## RANGE OF OPERATION




## NOMINAL PARAMETERS

| Pump type | Capacity Q [$m^3$/h] | Head H [m] | Rotation speed n [rpm] | Motor rated power $P_s$ [kW] | Weight m [kg] |
|---|---|---|---|---|---|
| 6NZ15-Ex | 60 | 15 | 3000 | 5,5 | 87 |
| 6NZ18-Ex | 45 | 27 | 3000 | 7,5 | 98 |
| 10NZ22-EX | 125 | 37 | 3000 | 22 | 275 |
| 6NZ15 | 60 | 15 | 3000 | 5,5 | 87 |
| 6NZ18 | 45 | 27 | 3000 | 7,5 | 98 |
| 10NZ22 | 125 | 37 | 3000 | 22 | 275 |

The parameters are specified for clean water of density ρ = 1000 kg/$m^3$ and temperature T = 15°C.

# SUBMERSIBLE PUMPS

# P-BA

P-BA pumps are single stage submersible pumps for handling mechanicaly and chemicaly contaminated fluids

## APPLICATION

P-BA pumps are designed to handle mine and industrial water containing solids.

Typical applications include:

- Underground mines – for mine face dewatering, including cases where methane hazard or coal dust explosion hazard are present,
- construction site dewatering

## DESIGN

Submersible, single stage impeller pumps with closed impellers mounted directly on electric motor shaft under the motor. The motor is cooled by the fluid pumped through a cooling jacket. The delivery flange is located at the upper part of the pump. Pump shaft is sealed by double mechanical seal in the oil chamber between the impeller and the motor.

The pump set is equipped with monitoring system consisting of motor bearings and windings temperature sensors, moisture sensors and electric protections against overload or dry run of the pump.

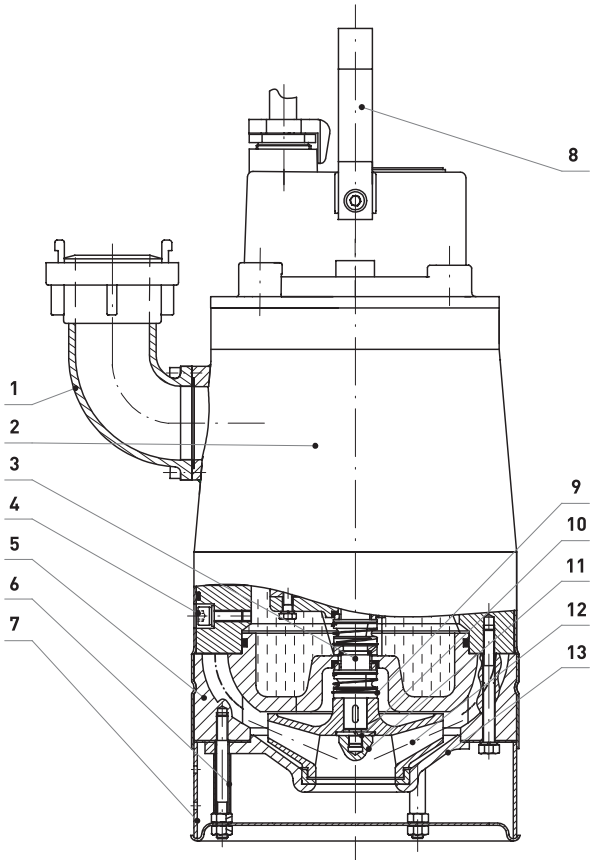
The pumps are compliant with Atex directive and are certified for operation at sites exposed to explosion hazard – I M2c, EEx dl. Non Atex version of smaller mass is also available.

## MATERIALS OF CONSTRUCTION

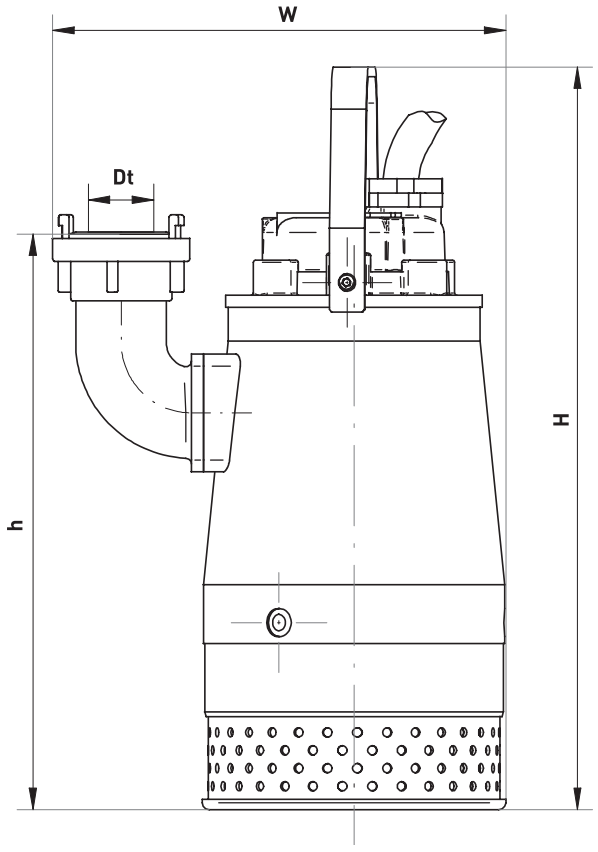
Standard version: impeller – wear-resistant cast steel, pump casing– aluminum alloy, shaft, bolts, nuts – stainless steel. In salt-resistant version all elements are made of stainless cast steel.

## SECTIONAL VIEW / LIST OF PUMP PARTS

| No. | Part name |
|---|---|
| 1 | Discharge pipe quick release joint |
| 2 | Motor |
| 3 | Shaft |
| 4 | Draining plug |
| 5 | Discharge casing |
| 6 | Connecting bolt |
| 7 | Suction strainer |
| 8 | Handle |
| 9 | Mechanical seal |
| 10 | Spring washer |
| 11 | Impeller nut |
| 12 | Impeller |
| 13 | Suction cover |

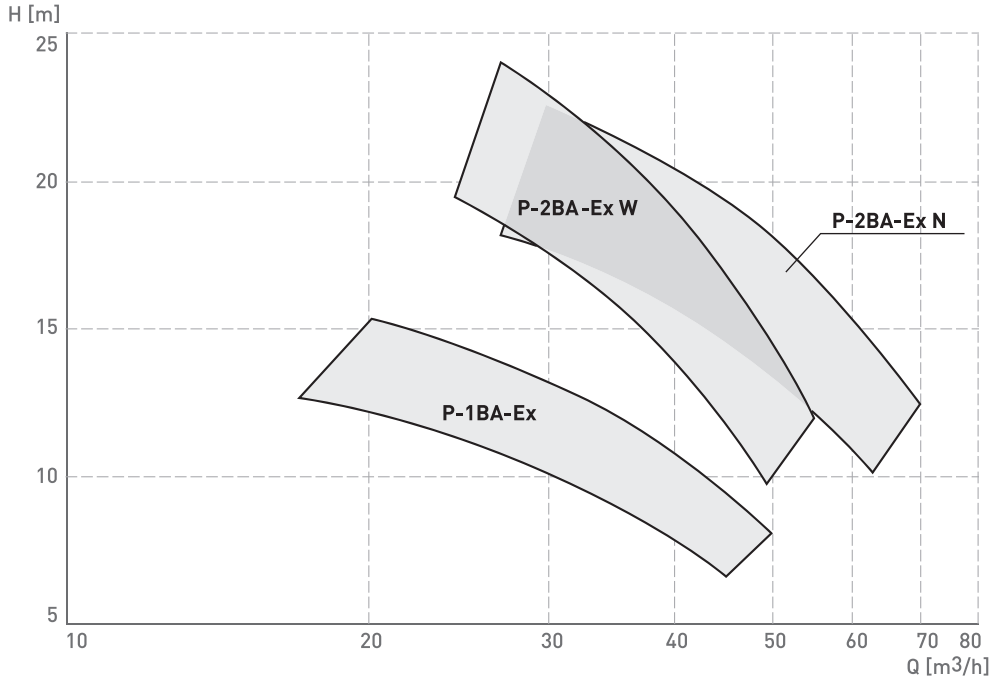



## DIMENSIONS




| Dimensions [mm] | Pump type | |
|---|---|---|
| | P-1BA-Ex | P-2BA-Ex |
| W | 375 | 411 |
| D | 258 | 290 |
| H | 590 | 676 |
| h | 490 | 515 |
| Dt | 65 | 65 |

## RANGE OF OPERATION




## NOMINAL PARAMETERS

| Pump type | Capacity Q [m³/h] | Head H [m] | Rotation speed n [rpm] | Motor rated power $P_s$ [kW] | Weight m [kg] |
|---|---|---|---|---|---|
| P-1BA/I-Ex | 32 | 12,5 | 2840 | 2,2 | 62 |
| P-1BA-Ex | 32 | 12,5 | 2840 | 2,2 | 62 |
| P-1BA/D-Ex | 32 | 12,5 | 2840 | 2,2 | 62 |
| P-1BA/E-Ex | 32 | 12,5 | 2840 | 2,2 | 62 |
| P-1BA/EC-Ex | 32 | 12,5 | 2840 | 2,2 | 62 |
| P-1BA/A | 32 | 12,5 | 2840 | 2,2 | 62 |
| P-2BA-Ex wyk N/wykW | 36/42 | 21/18 | 2865 | 4 | 83 |
| P-2BA/D-Ex wyk N/wykW | 36/42 | 21/18 | 2865 | 4 | 83 |
| P-2BA/E-Ex wyk N/wykW | 36/42 | 21/18 | 2865 | 4 | 83 |
| P-2BA/EC-Ex wyk N/wykW | 36/42 | 21/18 | 2865 | 4 | 83 |
| P-2BA/A wyk N/wykW | 36/42 | 21/18 | 2865 | 4 | 83 |

The parameters are specified for clean water of density ρ = 1000 kg/m³ and temperature T = 15°C.

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