

Visokotlačne pumpe Tipa VS, VSv, KV, KVv, KVL, KVLv



CROATIA PUMPE

Visokotlačne pumpe Tipa VS, VSv, KV, KVv, KVL, KVLv

HIGH-PRESSURE PUMPS VS, VSv, KV, KVv, KVL, KVLv

Primjena

Pumpe tipa VS namijenjene su za dobavu čiste i u manjem stupnju nečiste vode hladnih ulja, tekućih goriva i sl. Podesne su za: javne i industrijske vodovode, umjetnu kišu, vatrogasne svrhe, proizvodnju tlačne vode u hidrauličkim vodnim postrojenjima i sl. Ove pumpe mogu dobavljati medij do temperature 105°C. Pumpe tipa VSv primjenjuju se za dobavu vruće vode do 130°C, jer imaju mogućnost hlađenja brtvenica. Služe kao napojne pumpe i za dobavu kondenzata. Za niže temperature od 105°C isporučujemo ih u VS izvedbi.

Pumpe tipa KV mogu osim čiste dobavljati i u većem stupnju nečistu vodu. Podesne su naročito za teže uvjete usisa, kao kod kondenzata većih geodetskih usisnih visina, otpora u usisnom cjevovodu i sl. Mogu dobavljati medij do temperature 80°C. Pumpe tipa KVv su KV pumpe s ugrađenom komorom za hlađenje brtvenica, pa se primjenjuju za dobavu vruće vode do 105°C. Pumpe tipa KVL i KVLv su namijenjene uglavnom za dobavu kondenzata kao i za dobavu čiste i u većem stupnju nečiste vode. Pumpe u KVL izvedbi primjenjuju se za dobavu vode do 105°C. KVLv izvedba ima mogućnost hlađenja brtvenica pa mogu dobavljati vruću vodu do 130°C. Podesne su za teže uvjete usisa. Zbog vertikalne izvedbe odlikuju se sigurnošću u radu, a za ugradnju trebaju manje prostora.

Područja dobave

Pumpe tipa VS kod 1450 mino' pokrivaju područje od 6 do 210 l/sek, kod visine dobave od 60 do 400 m. Pumpe tipa VSv kod 2900 mino⁻¹ pokrivaju područje od 0,5 do 36 l/s, kod visine dobave od 35 do 600 m. Pumpe tipa KV i KVv kod 1450 mino' pokrivaju područje od 5 do 120 l/s, kod visine dobave od 35 do 330 m.

Pumpe tipa KVL i KVLv pokrivaju područje od 2,5 do 130 l/s, kod visine dobave od 8 do 380 m.

Područja dobave za pojedine veličine i tipove prikazane su dijagramima. Pumpe za druge brojeve okretaja i pumpe izvan navedenih područja, izrađujemo na osnovu posebnog upita.

Application

A row of VS pumps is arranged to suit all requirements regarding supply of clean and slightly turbid water, cold oils, liquid fuels etc. It is also serviceable at civil and industrial waterworks, artificial rain, fire-fighting purposes, for the production of delivery water in hydraulic water plants etc. These pumps can supply medium of temperature up to 105°C.

VSv pumps are applied for hot water supply up to 130°C, because packings can be cooled. They are equally adapted as feed water pumps and condensate supply pumps.

VS design is adapted for temperatures lower than 105°C.

KV pumps are fit for the pumping of clean water and the water containing substantial amount of impurities. Range of these pumps is suitable for particularly heavy suction conditions, then at the condensate supply, higher geodetic suction head and resistances in a suction pipe etc. They can supply medium of temperature up to 80°C.

KVv and KV pumps with packings cooling chamber are applied to supply hot water up to 105°C.

KVL and KVLv pumps are adapted for the pumping of condensate, clean water and the water containing substantial amount of impurities. These pumps are adapted for water supply up to 105°C. Application of these pumps to hot water supply up to 130°C is also obtainable by the cooling of packings. Range of these pumps is suitable for particularly heavy suction conditions. Their vertical desing makes possible safety operation and a very little space is necessary for their assembly.

Range Of Supply

VS pumps, at the speed of 1450 r.p.m. and 60-400 m.w.c. manometric heads, deliver 6-210 l/s.

VSv pumps, at the speed of 2900 r.p.m. and 35-600 m.w.c. manometric heads, deliver 0,5-36 l/s.

KV and KVv pumps, at the speed of 1450 r.p.m. and 35-330 m.w.c. manometric heads; deliver 5-120 l/s.

KVL and KVLv pumps, deliver 2,5-130 l/s. at 8-380 m.w.c. manometric heads.

Range of supply for each particular type and size is shown in the respective diagrams. Pumps for other speed as well as pumps out of the mentioned range are made on the special request.

Konstruktivne karakteristike

Kućišta

Pumpe su sekcione izvedbe, tj. svako statorsko kolo ugrađeno je u svoje sekcione kućište (među kućište) i zajedno s kolom rotora, smještenim na vratilu, čini jedan stupanj. Potreban broj stupnjeva zajedno s usisnim i tlačnim kućištem, stegnuti su preko zajedničkih steznih vijaka.

Kod KVL pumpi čitava pumpa je smještena u loncu zavarene izvedbe sa stalnim dotokom vode. Visina lonca je varijabilna u ovisnosti o zahtjevima projektanta.

Rotorska i statorska kola

Kola rotora su jednostružna s dvostrukim raspornim prstenima. Aksijalne sile kod pumpi tipa VS i VSv preuzima disk za izjednačenje aksijalne sile, a kod tipova KV, KVv, KVL i KVLv na kolima rotora postoje provrti koji praktički izjednačuju sile u aksijalnom smjeru. Rasporni prsteni smješteni u kućištima su izmjenjivi. Statorska kola su posebni dijelovi, koji se mogu lagano montirati i demontirati.

Vratila i ležaji

Vratila su uležištena u dva uljem podmazivana kotrljajuća ležaja. Ovi ležajevi su predviđeni za vijek trajanja od 40000 do 60000 pogonskih sati. Kod tipa KV i KVv jedan od tih ležaja ograničava pomak vratila u aksijalnom smjeru i preuzima ostatak aksijalnih sile, koje mogu nastati zbog nedovoljne izjednačenosti sile u pumpi ili nejednolikog trošenja raspornih prstena. Kod tipova VS i VSv oba valjna ležaja su pomicna u aksijalnom smjeru, jer aksijalne sile preuzima disk. Ležajevi su podmazivani uljem ili mašću, a mogu biti i hlađeni kod visokih temperatura medija. Vratilo kod KVL pumpi je uležišteno u jednom ili više kliznih radijainih ležaja podmazivanih vodom i jednom kotrljajućem ležaju, koji prenosi aksijalnu silu. U slučaju nečiste vode klizni ležajevi se podmazuju mašću posebnom pumpom za mast. Unutar pumpe vratilo je zaštićeno distančnim puškicama, tako da uopće ne dolazi u dodir s medijem koji pumpa dobavlja.

Brtvenica

S obje strane je omogućen pristup brtvenicama. U slučaju podtlaka u usisnom kućištu, brtvena voda se priključuje na prvi stupanj pumpe. Na specijalni zahtjev umjesto brtvenih pletenica ugrađujemo mehaničke brtve s kliznim prstenima.

Design Features

Casing

High-pressure pump is of a sectional design, thus having each diffuser built into the sectional interstage casing, which comprehensively, with and impeller, being affixed on the shaft, forms one stage. Adequate number of stages together with a suction and delivery casing is tightened over joint tightening bolts.

KVL pump is installed in a vessel of welded construction with constant water supply. Vessel height varies depending on the designer requests.

Impellers And Diffusers

Impellers are of the single-suction design with double wearing rings.

Axial thrusts are at the pumps VS and VSv taken by a disc serving to gain their equilibration. Types KV and KVv are characterized by bores existing on the impellers, which practically equalize thrusts in an axial direction. Wearing rings installed in casing are replaceable. Diffusers are separate very easy mantling and dismantling parts.

Shafts And Bearings

High-pressure pump shafts are placed into two oil lubricated roller bearings, provided for the continuous life of 40000-60000 hours of operation. One of these bearings at the pumps KV and KVv limits axial displacement of the shaft, taking the unbalanced axial thrust, which can occur, either due to insufficient equilibration of thrusts in the pump or unequal run out of wearing rings.

At the pumps VS and VSv axial thrusts are taken by a disc thus enabling displacement of both roller bearings. Bearings are lubricated by oil or grease and can be cooled at medium high temperatures. KVL pump shaft is installed in one or more slide journal bearings lubricated by water and one roller bearing transmitting axial thrust. In a case of dirty water slide bearings are grease lubricated with a separate grease pump. Distance sleeves are installed in the pump interior, protecting the shaft and completely preventing it from the medium being handled.

Packings

Access to packings is provided on both sides. Should subpressure in a suction casing occur, sealing water is to be connected to the first pump stage.

Mechanical seals with slide rings can be fitted instead of packings, upon customer's requirements.

Materijali

U normalnoj izvedbi, kućišta izrađujemo od kvalitetnog lijevanog željeza, a rotorska i statorska kola prema izboru od lijevanog željeza ili bronce. Rasporne prstene, distante i zaštitne puškice izrađujemo od bronce, a vratila od SM čelika. Na zahtjev naručioca, pumpe ili dijelove pumpi, izrađujemo i od drugog materijala.

Položaji prirubnica

Položaj usisne i tlačne prirubnice može biti vertikalno gore ili horizontalno lijevo, odnosno desno, neovisno jedna od druge. Na poseban zahtjev izrađujemo pumpe s položajem prirubnica vertikalno dolje. Položaj prirubnica definira se gledano od pogonske strane pumpe, tj. od strane spojke. Shematski prikaz položaja prirubnica dat je ispod mjernih skica.

Kod KVL pumpa su usisna i tlačna prirubnica iznad poda strojarnice u istoj osi pod kutem 180°. Na upit isporučujemo ove pumpe i s drugim položajima prirubnica.

Agregatiranje

Na zahtjev naručioca pumpe aggregatiramo s pogonskim strojevima, kao: elektromotorima, Diesel i benzinskim motorima, parnim turbinama i dr. na jedno ili dvodjelnim temeljnim pločama koje mogu biti odlivene ili varene iz profila. Uz pumpe isporučujemo i armaturu.

Projektiranje

Projektiramo pumpna postrojenja i kompletne pumpne stанице. Preuzimamo izvođenje i nadzor nad montažom. Sudjelujemo u projektiranju pumpnih postrojenja, a prilikom odabiranja, u ekonomskom pogledu najpovoljnijih veličina i izvedbi pumpi, naš iskusni inženjerski kadar našim je kupcima uvijek na usluzi.

Narudžba pumpe

Preporuča se navesti kod narudžbe:

- vrstu medija
- količinu dobave
- visinu dobave
- NPSH postrojenja ili potrebnu usisnu visinu
- tlak na ulazu u pumpu
- temperaturu medija
- ako je medij voda potrebno je navesti: da li se radi o morskoj ili slatkoj vodi, da li je voda agresivna (pH vrijednost, kemijski sastav), da li je čista ili nečista i stupanj nečistoće (mulj, pijesak i sl.)
- položaj prirubnica
- kod KVL pumpa navesti kolika je potrebna kota »L«

Materials

Casing of a standard design is made of qualitative cast iron; whilst an impeller and diffuser of cast iron or bronze depending on customers' requirements.

Wearing rings, distance and protecting sleeves are made of bronze; shaft of SM steel.

Pumps and accessory parts can be made of other materials as per customers' requirements.

Position Of The Flanges

Positions of a suction and delivery flanges can be directed vertically upwards, horizontally left or right, thus being independent of each other. Pumps having the flange position vertically downwards are made on a special requirement. Flange position is defined, taking a view from a pump driving side i.e. coupling side. Diagrammatic drawing of flange positions is given below the measuring sketches.

KVL pumps have suction and delivery flange above the engine room floor in the same axis under angle of 180°. We deliver these pumps also with the other flange positions.

Installation Of Units

On a customer's requirement there is a possibility of an aggregation by joining pumps with electro-motors, diesel and petrol motors, steam turbines and other driving engines. Such units are installed on single or double, either cast or profiled weld bedplates. Pumps are also accompanied by adequate fittings.

Design

Complete design of pump stations and plants together with a performance and inspection of the assembling concerned is available. Taking part in the construction of pump plants and selection of their most convenient types and sizes from the point of economic reliability, our experienced and eminent. Technical Staff will readily give the fullest and closest attention regarding these pumps and their applications.

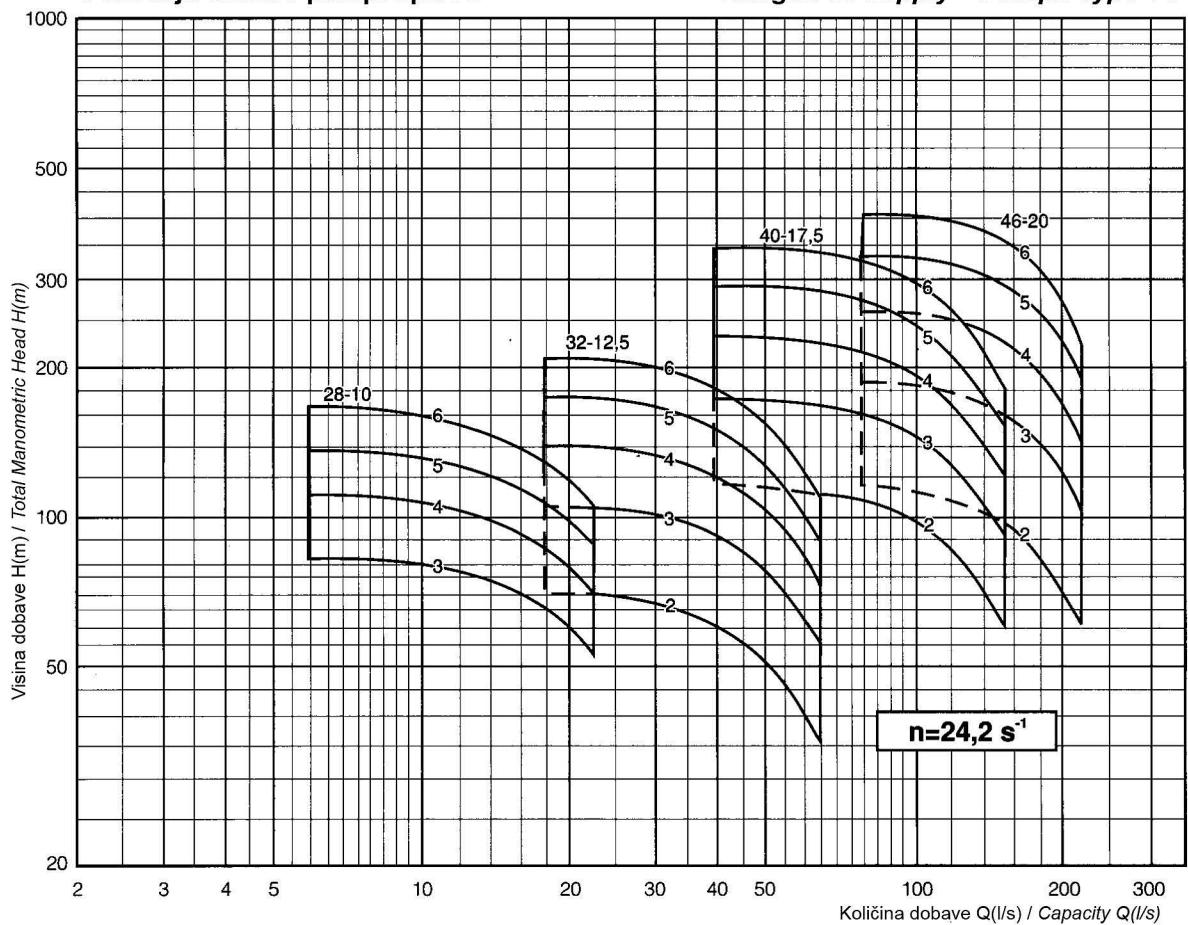
Order

The following is to be mentioned at ordering:

- kind of medium
- capacity
- total head
- NPHS of plant or necessary suction head
- pump inlet pressure
- medium temperature
- if a medium is water the following must be mentioned: is it sea or fresh water, is it agresive (pH value, chemical composition), clean or dirty water, degree of impurity (sand, etc.)
- position of flanges
- necessary cote "L" at KVL pumps

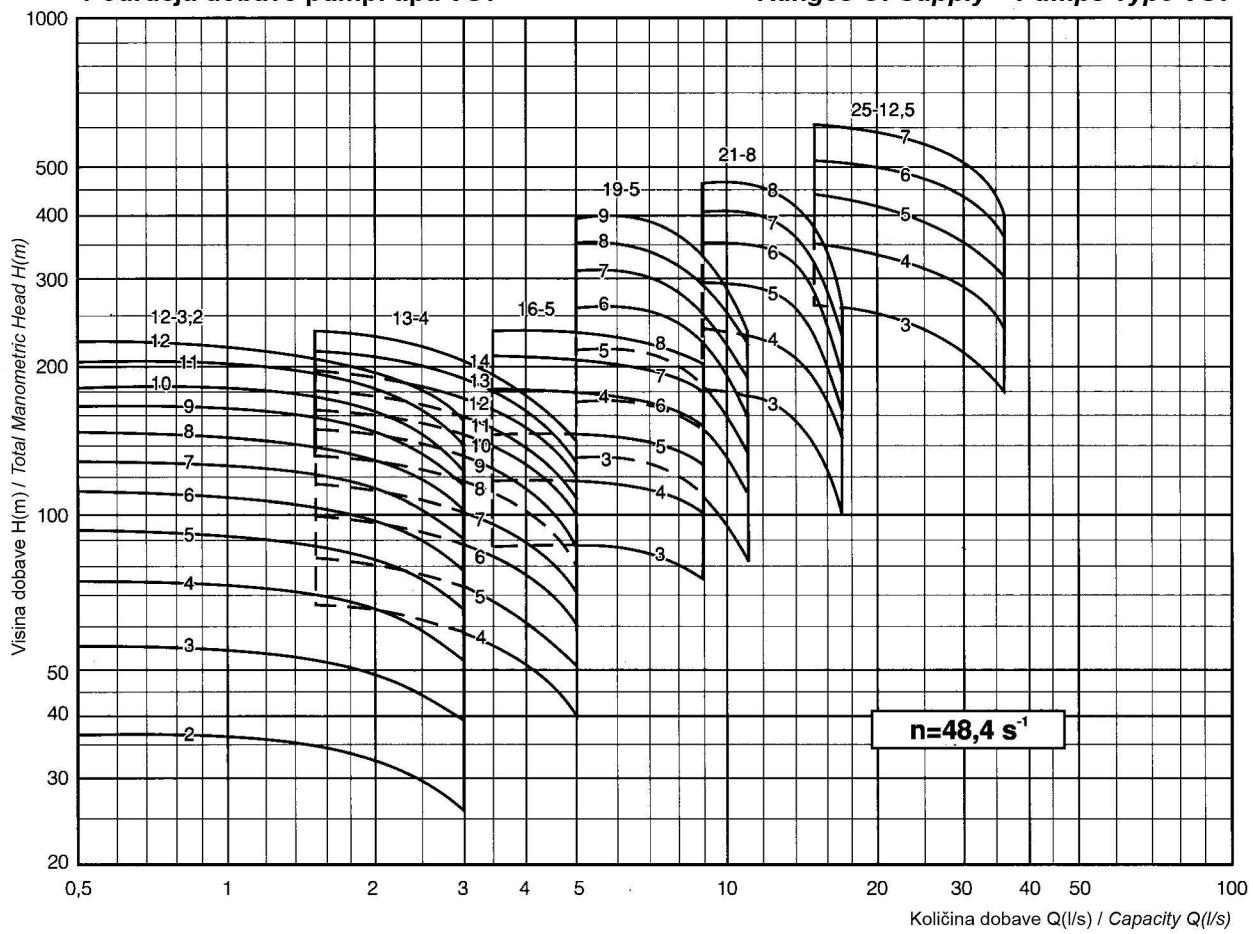
Područja dobave pumpi tipa VS

Ranges Of Supply – Pumps Type VS



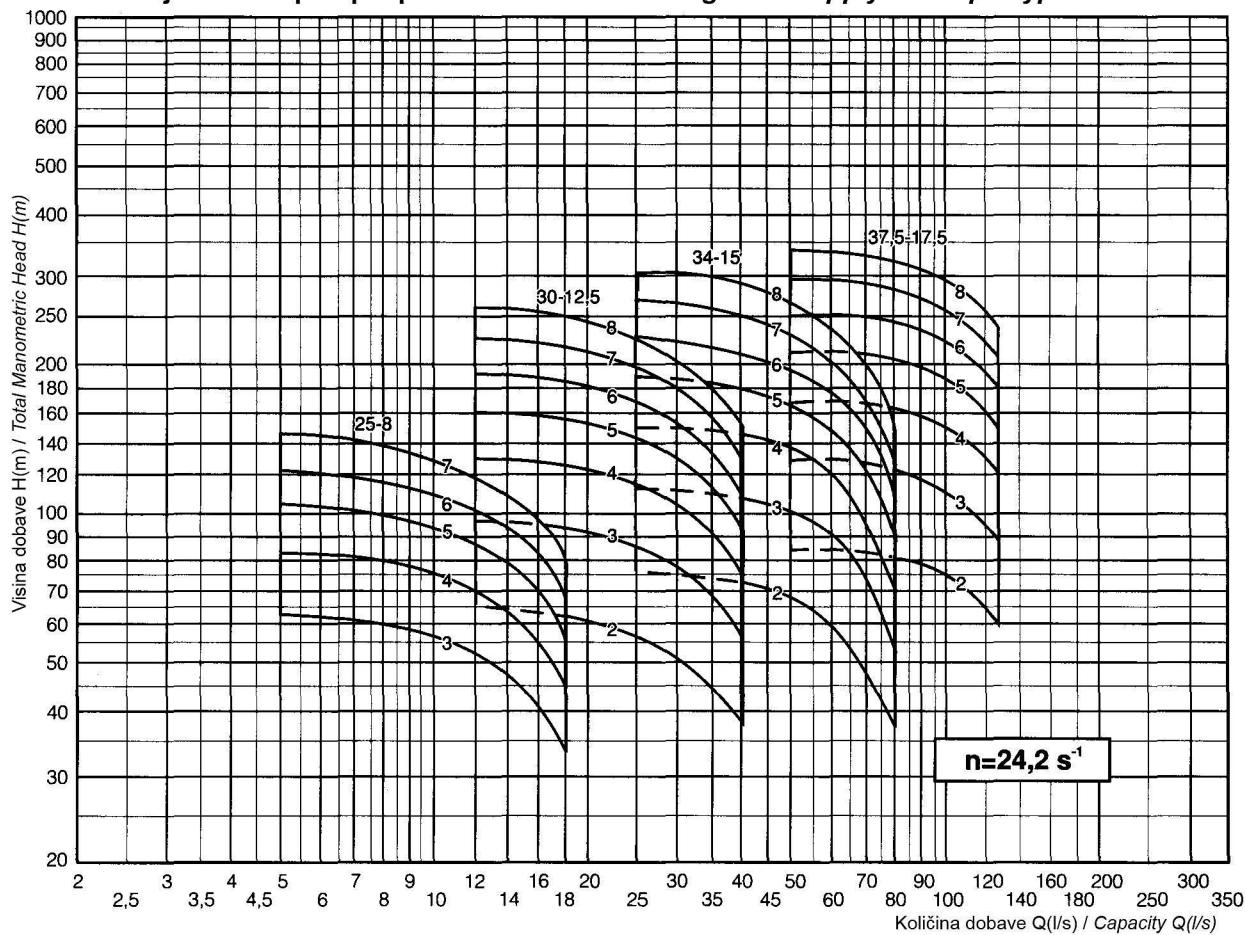
Područja dobave pumpi tipa VSv

Ranges Of Supply – Pumps Type VSv



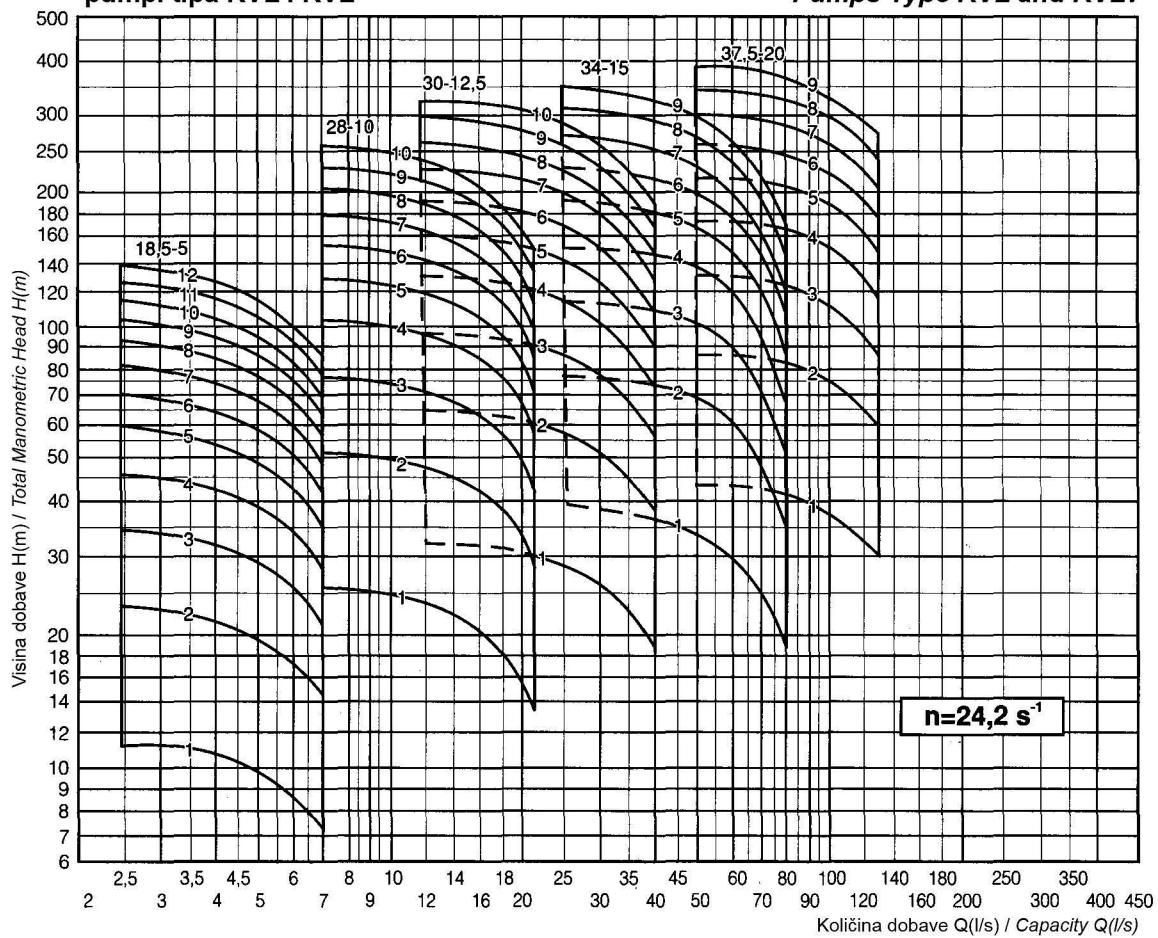
Područja dobave pumpi tipa KV i KVv

Ranges Of Supply – Pumps Type KV and KVv



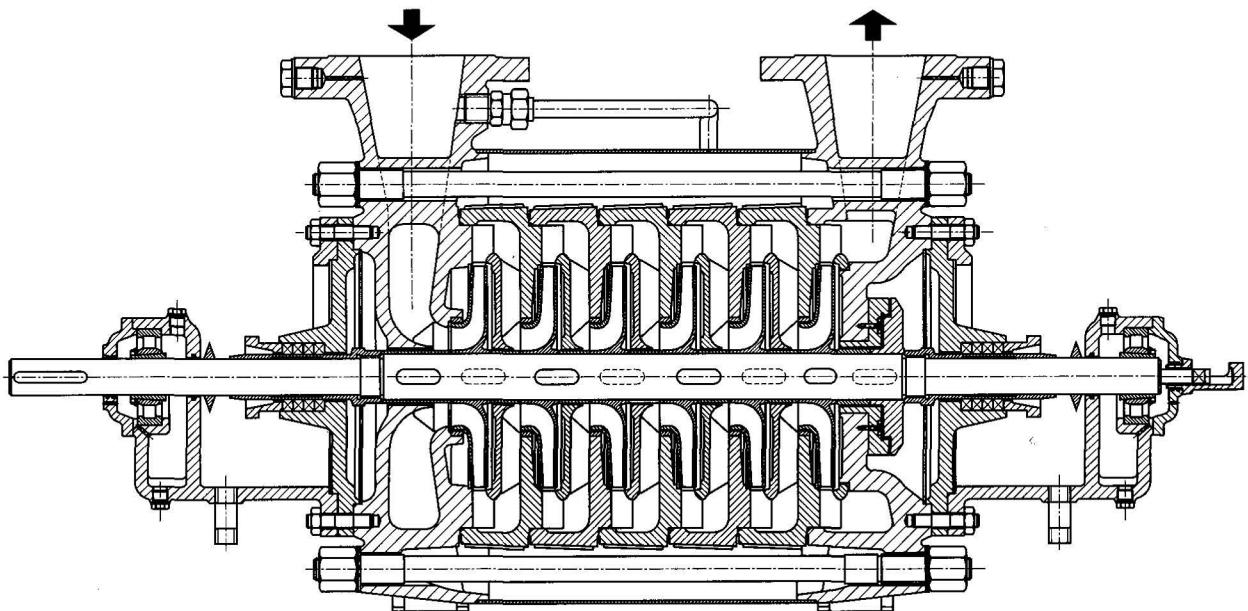
**Područja dobave
pumpi tipa KVL i KVL**

**Ranges Of Supply –
Pumps Type KVL and KVLv**

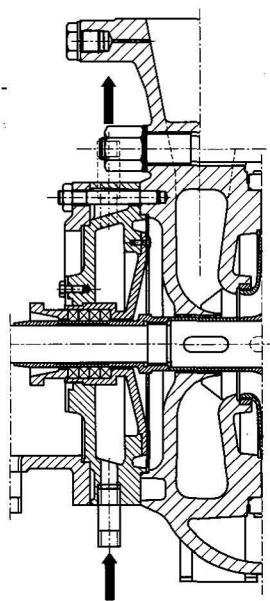


Presjek pumpe tipa VS

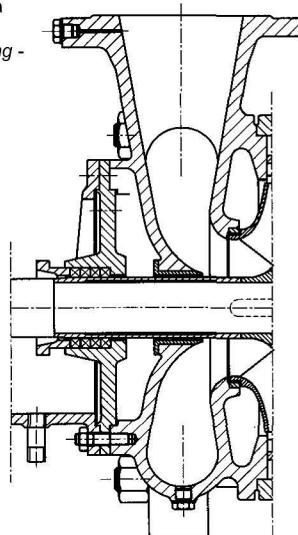
VS Pump Cross Section



Detalj brtvenice vratila
pumpe tipa VSv
Detail Of Shaft Packing -
Pump VSv Type

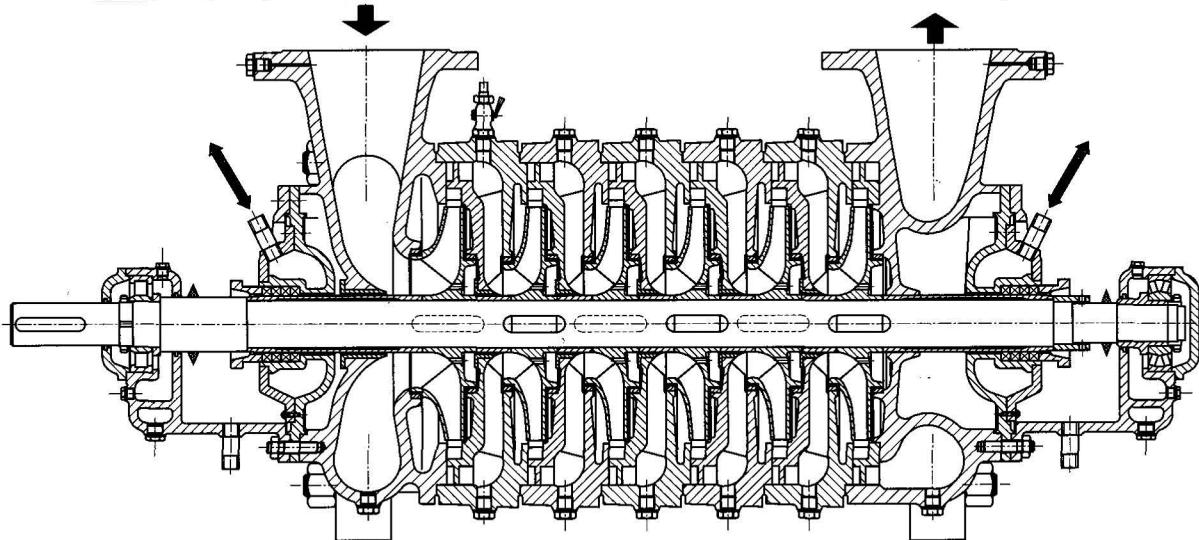


Detalj brtvenice vratila
pumpe tipa KV
Detail Of Shaft Packing -
Pump KV Type



Presjek pumpe tipa KVv

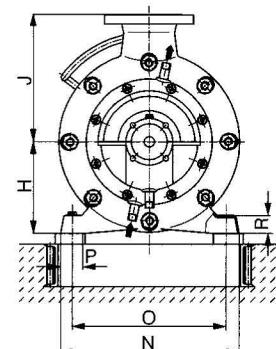
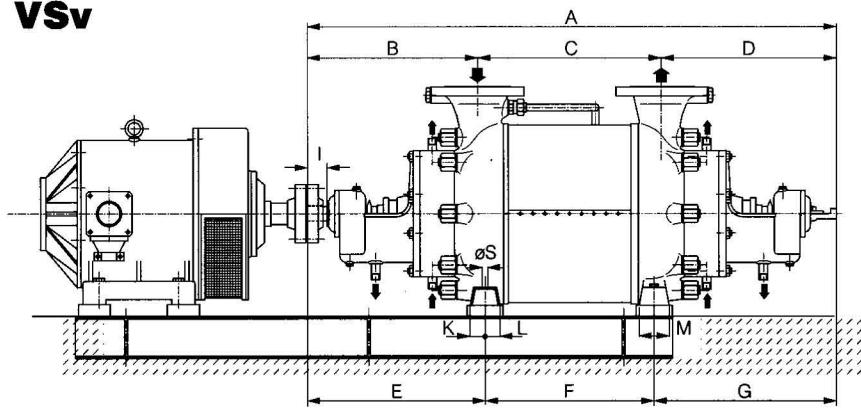
KVv Pump Cross Section



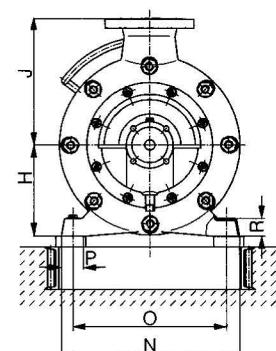
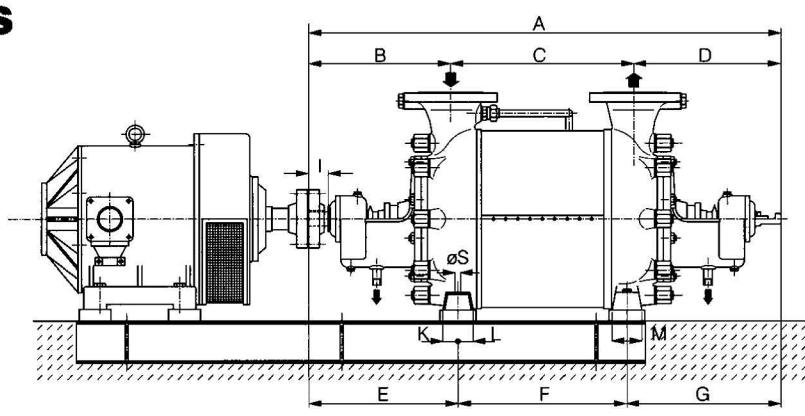
Mjerne skice

Pump Sketch With Dimensions

VSv

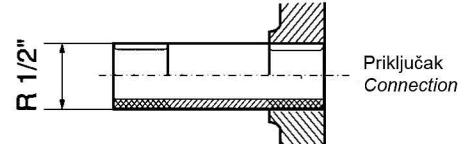


VS

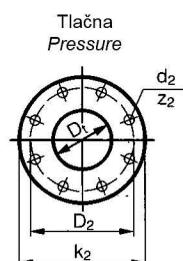
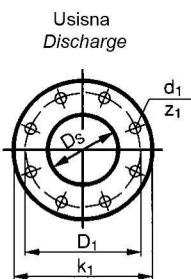
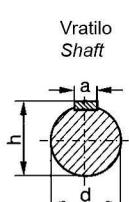


Odvod i dovod vode za hlađenje brtvenica
Supply And Discharge Of Water
For The Cooling Of Packings ➡

Drenaža brtvene vode ➡
Sealing Water Drainage



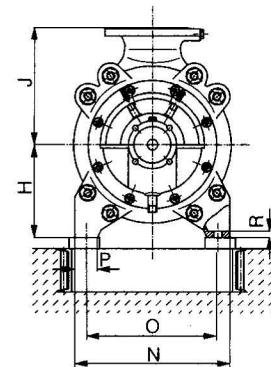
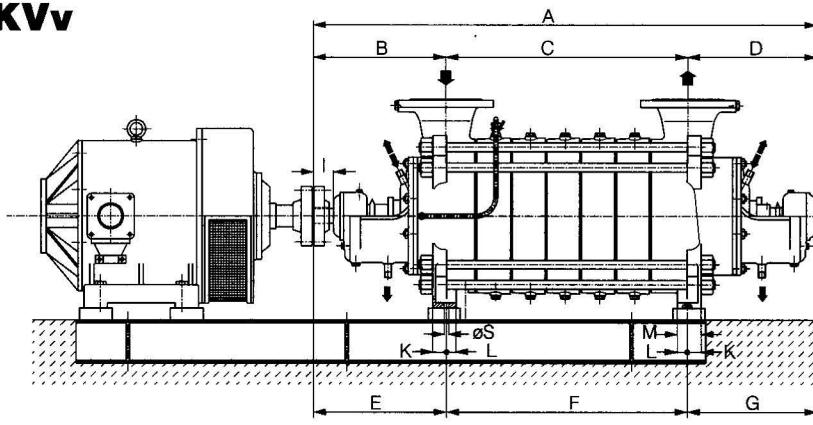
Prirubnice Flanges



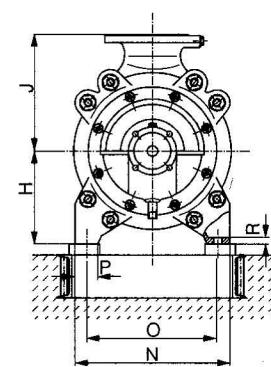
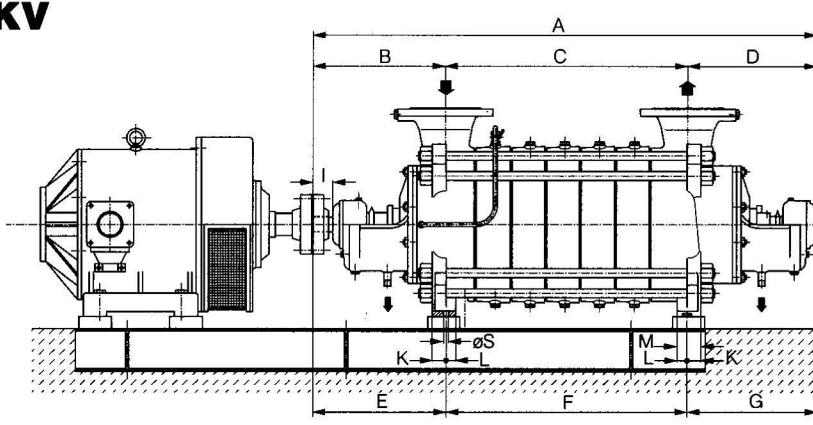
Mjerne skice

Pump Sketch With Dimensions

KVv



KV



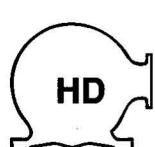
Odvod i dovod vode za hlađenje brtvenica
Supply And Discharge Of Water
For The Cooling Of Packings →

Drenaža brtvene vode
Sealing Water Drainage →

R 1/2"

Priklučak
Connection

Oznaka položaja usisne i tlačne prirubnice (glezano od spojke)
Discharge And Pressure Flange Position Marks (View From Coupling)

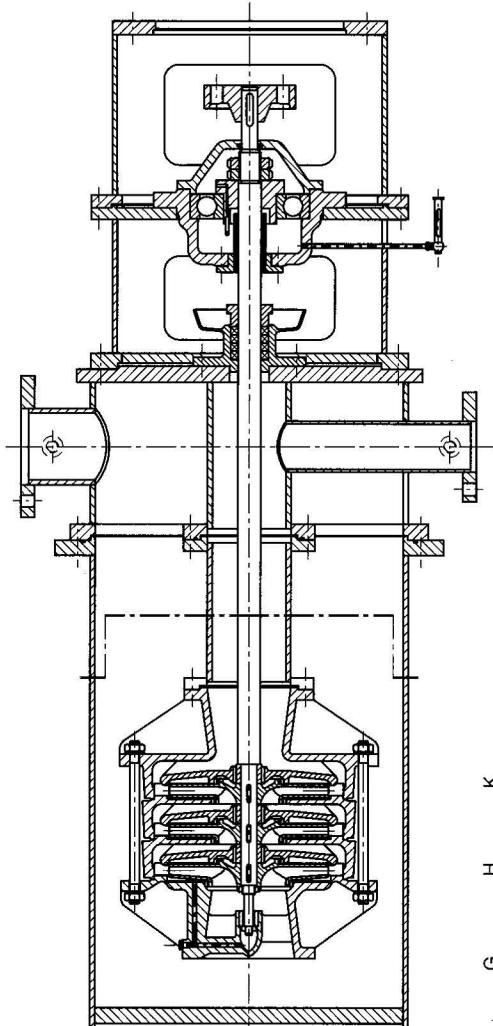


Na poseban upit
Upon Special Application

| | | VSv | | | | | VS | | | | | KV | | KVv | | | | |
|------------------------------------|---------------|-----------------------------------|--------|----------------|--------|---------|--------|-------|---------|---------|-------|------|---------|-------|-----------|------|------|-----|
| | | 13-4 | 16-5 | 19-5 | 21-8 | 25-12,5 | 12-3,2 | 28-10 | 32-12,5 | 40-17,5 | 46-20 | 25-8 | 30-12,5 | 34-15 | 37,5-17,5 | | | |
| Pump Dimensions Dimenzijs pumpe | A | 2 | 604,5 | 741 | 796,5 | 925 | 1020 | 457 | 939 | 1013 | 1450 | 1517 | 796 | 1195 | 1262 | 1328 | | |
| | | 3 | 645,5 | 791 | 851,5 | 985 | 1110 | 502 | 1019 | 1113 | 1580 | 1667 | 877 | 1200 | 1387 | 1468 | | |
| | | 4 | 686,5 | 841 | 906,5 | 1050 | 1200 | 547 | 1099 | 1213 | 1710 | 1817 | 958 | 1305 | 1512 | 1608 | | |
| | | 5 | 727,5 | 895 | 961,5 | 1115 | 1290 | 592 | 1179 | 1313 | 1840 | 1967 | 1039 | 1410 | 1637 | 1748 | | |
| | | 6 | 768,5 | 947 | 1016,5 | 1180 | 1380 | 637 | 1259 | 143 | 1970 | 2117 | 1120 | 1515 | 1762 | 1888 | | |
| | | 7 | 809,5 | 999 | 1071,5 | 1245 | 1470 | 682 | | | 2100 | | 1201 | 1620 | 1887 | 2028 | | |
| | | 8 | 850,5 | 1051 | 1126,5 | 1310 | | 727 | | 2230 | | | 1725 | 2012 | 2168 | | | |
| | | 9 | 891,5 | | 1181,5 | | | 772 | | | | | | | | | | |
| | | 10 | 932,5 | | | | 817 | | | | | | | | | | | |
| | | 11 | 973,5 | | | | 862 | | | | | | | | | | | |
| | | 12 | 1014,5 | | | | 907 | | | | | | | | | | | |
| | | 13 | 1056,5 | | | | | | | | | | | | | | | |
| | | 14 | 1097,5 | | | | | | | | | | | | | | | |
| | B | Za broj stupnjeva / No. of Stages | 2 | 206,5 | 315 | 335 | 390 | 426 | 262 | 382 | 426 | 595 | 601 | 358 | 453 | 520 | 573 | |
| | | Za broj stupnjeva / No. of Stages | 3 | 112 | 222 | 147 | 165 | 150 | 121 | 210 | 252 | 330 | 400 | 197 | 285 | 357 | 355 | |
| | | Za broj stupnjeva / No. of Stages | 4 | 153 | 190 | 202 | 230 | 340 | 166 | 290 | 352 | 460 | 550 | 278 | 390 | 482 | 495 | |
| | | Za broj stupnjeva / No. of Stages | 5 | 194 | 242 | 257 | 295 | 430 | 211 | 370 | 452 | 590 | 700 | 359 | 495 | 607 | 635 | |
| | | Za broj stupnjeva / No. of Stages | 6 | 235 | 294 | 312 | 360 | 520 | 256 | 450 | 552 | 720 | 850 | 440 | 600 | 732 | 775 | |
| | | Za broj stupnjeva / No. of Stages | 7 | 276 | 346 | 367 | 425 | 610 | 301 | 530 | 652 | 850 | 1000 | 521 | 705 | 857 | 915 | |
| | | Za broj stupnjeva / No. of Stages | 8 | 317 | 398 | 422 | 490 | 700 | 346 | | 980 | | | 602 | 910 | 982 | 1055 | |
| | | Za broj stupnjeva / No. of Stages | 9 | 358 | 450 | 477 | 555 | | 391 | | 1110 | | | | 1015 | 1107 | 1195 | |
| | | Za broj stupnjeva / No. of Stages | 10 | 399 | | 532 | | 436 | | | | | | | | | | |
| | | Za broj stupnjeva / No. of Stages | 11 | 440 | | | 481 | | 526 | | | | | | | | | |
| | | Za broj stupnjeva / No. of Stages | 12 | 522 | | | | 571 | | | | | | | | | | |
| | | Za broj stupnjeva / No. of Stages | 13 | 563 | | | | | | | | | | | | | | |
| | | Za broj stupnjeva / No. of Stages | 14 | 645 | | | | | | | | | | | | | | |
| | C | Za broj stupnjeva / No. of Stages | 2 | 232 | 286 | 314,5 | 365 | 344 | 195 | 347 | 335 | 525 | 516 | 241 | 335 | 385 | 400 | |
| | | Za broj stupnjeva / No. of Stages | 3 | 252,5 | 335 | 351 | 410 | 436 | 282 | 392 | 446 | 615 | 631 | 394 | 453 | 550 | 593 | |
| | | Za broj stupnjeva / No. of Stages | 4 | 110 | 92 | 107 | 140 | 230 | 79 | 195 | 213 | 300 | 358 | 131 | 280 | 297 | 335 | |
| | | Za broj stupnjeva / No. of Stages | 5 | 151 | 144 | 162 | 205 | 320 | 124 | 275 | 313 | 430 | 308 | 212 | 385 | 422 | 475 | |
| | | Za broj stupnjeva / No. of Stages | 6 | 192 | 196 | 217 | 270 | 410 | 169 | 355 | 413 | 560 | 658 | 293 | 490 | 547 | 615 | |
| | | Za broj stupnjeva / No. of Stages | 7 | 233 | 248 | 272 | 335 | 500 | 214 | 435 | 513 | 690 | 808 | 374 | 595 | 672 | 755 | |
| | | Za broj stupnjeva / No. of Stages | 8 | 274 | 300 | 327 | 400 | 590 | 259 | 515 | 613 | 820 | 958 | 455 | 700 | 797 | 895 | |
| | | Za broj stupnjeva / No. of Stages | 9 | 315 | 352 | 382 | 465 | 680 | 304 | | 950 | | | 536 | 805 | 922 | 1035 | |
| | | Za broj stupnjeva / No. of Stages | 10 | 356 | 404 | 437 | 530 | | 349 | | 1080 | | | | 910 | 1047 | 1175 | |
| | | Za broj stupnjeva / No. of Stages | 11 | 397 | | 492 | | 394 | | | | | | | | | | |
| | | Za broj stupnjeva / No. of Stages | 12 | 438 | | | 439 | | | | | | | | | | | |
| | | Za broj stupnjeva / No. of Stages | 13 | 479 | | | 484 | | | | | | | | | | | |
| | | Za broj stupnjeva / No. of Stages | 14 | 520 | | | | 529 | | | | | | | | | | |
| | F | Za broj stupnjeva / No. of Stages | 2 | 242 | 312 | 338,5 | 370 | 354 | 217 | 352 | 354 | 535 | 528 | 271 | 362 | 415 | 400 | |
| | | Za broj stupnjeva / No. of Stages | 3 | 120 | 150 | 170 | 220 | 265 | 110 | 245 | 300 | 400 | 480 | 200 | 280 | 300 | 400 | |
| | | Za broj stupnjeva / No. of Stages | 4 | 150 | 200 | 230 | 300 | 340 | 150 | 350 | 380 | 500 | 580 | 260 | 350 | 440 | 500 | |
| | | Za broj stupnjeva / No. of Stages | 5 | 50 | 40 | 56 | 35 | 50 | 45 | 35 | 60 | 70 | 100 | 25 | 40 | 90 | 70 | |
| | | Za broj stupnjeva / No. of Stages | 6 | 25 | 20 | 24 | 35 | 50 | 15 | 35 | 60 | 70 | 100 | 55 | 30 | 30 | 70 | |
| | | Za broj stupnjeva / No. of Stages | 7 | 75 | 60 | 80 | 70 | 100 | 60 | 70 | 120 | 140 | 200 | 80 | 70 | 120 | 140 | |
| | | Za broj stupnjeva / No. of Stages | 8 | 220 | 230 | 330 | 450 | 630 | 220 | 500 | 600 | 800 | 1050 | 355 | 480 | 560 | 840 | |
| | | Za broj stupnjeva / No. of Stages | 9 | 190 | 170 | 280 | 400 | 560 | 190 | 450 | 520 | 700 | 940 | 300 | 420 | 480 | 740 | |
| | | Za broj stupnjeva / No. of Stages | 10 | 65 | 60 | 50 | 80 | 100 | 50 | 80 | 100 | 150 | 250 | 78 | 90 | 110 | 150 | |
| | | Za broj stupnjeva / No. of Stages | 11 | 12 | 10 | 15 | 55 | 60 | 12 | 55 | 60 | 100 | 140 | 15 | 25 | 20 | 100 | |
| | | Za broj stupnjeva / No. of Stages | 12 | 18 | 18 | 18 | 18 | 22 | 18 | 16 | 18 | 27 | 26 | 23 | 22 | 23 | 27 | |
| | | Za broj stupnjeva / No. of Stages | 13 | 4 | 4 | 4 | 8 | 8 | 4 | 8 | 8 | 12 | 12 | 8 | 8 | 12 | 12 | |
| | | Za broj stupnjeva / No. of Stages | 14 | NP | 25 | 25 | 64 | 64 | 64 | 25 | 25 | 25 | 40 | 40 | 25 | 25 | 40 | 40 |
| Usisna prirubnica Discharge Flange | Vratilo Shaft | Za broj stupnjeva / No. of Stages | 1 | D _s | 50 | 65 | 65 | 100 | 150 | 40 | 125 | 150 | 200 | 250 | 100 | 150 | 200 | 200 |
| | | Za broj stupnjeva / No. of Stages | 2 | D ₁ | 125 | 145 | 145 | 180 | 240 | 110 | 210 | 240 | 290 | 355 | 180 | 240 | 295 | 295 |
| | | Za broj stupnjeva / No. of Stages | 3 | k ₁ | 165 | 180 | 185 | 220 | 285 | 150 | 250 | 285 | 340 | 405 | 220 | 285 | 340 | 340 |
| | | Za broj stupnjeva / No. of Stages | 4 | d ₁ | 18 | 18 | 18 | 18 | 23 | 18 | 18 | 23 | 23 | 25 | 18 | 23 | 23 | 23 |
| | | Za broj stupnjeva / No. of Stages | 5 | z ₁ | 4 | 4 | 4 | 8 | 8 | 4 | 8 | 8 | 12 | 12 | 8 | 8 | 12 | 12 |
| | | Za broj stupnjeva / No. of Stages | 6 | NP | 25 | 25 | 64 | 64 | 64 | 25 | 25 | 25 | 40 | 40 | 25 | 25 | 40 | 40 |
| | | Za broj stupnjeva / No. of Stages | 7 | D _t | 40 | 50 | 50 | 80 | 125 | 32 | 100 | 125 | 175 | 200 | 80 | 125 | 150 | 175 |
| Tlačna prirubnica Pressure Flange | Vratilo Shaft | Za broj stupnjeva / No. of Stages | 8 | D ₂ | 110 | 125 | 135 | 170 | 240 | 100 | 190 | 220 | 285 | 320 | 160 | 220 | 250 | 285 |
| | | Za broj stupnjeva / No. of Stages | 9 | k ₂ | 150 | 165 | 180 | 215 | 295 | 140 | 235 | 270 | 335 | 375 | 200 | 270 | 300 | 335 |
| | | Za broj stupnjeva / No. of Stages | 10 | d ₂ | 18 | 18 | 22 | 22 | 30 | 18 | 23 | 25 | 27 | 28 | 18 | 27 | 27 | 27 |
| | | Za broj stupnjeva / No. of Stages | 11 | z ₂ | 4 | 4 | 4 | 8 | 8 | 4 | 8 | 8 | 12 | 12 | 8 | 8 | 8 | 8 |
| | | Za broj stupnjeva / No. of Stages | 12 | | | | | | | | | | | | | | | |

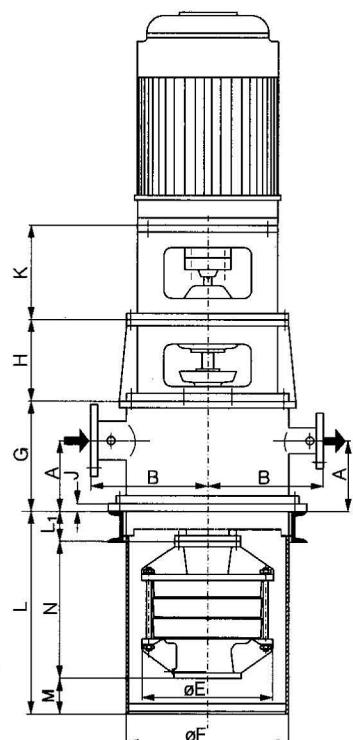
Mjere u mm (neobavezno)

**Presjek i mjerna skica
pumpe tipa KVL**



Presjek pumpe tipa KVL
KVL Pump Cross-section

Prirubnice / Flange



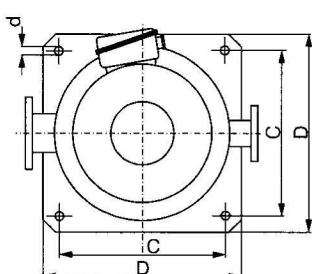
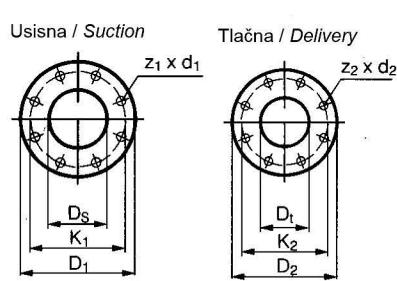
Kote L i L1 određuje projektant prema projektu
Designer Determines Dimensions L and L1 Per Object

**Cross Section and Sketch with Dimensions
of KVL Type Pump**

| | KVL 18,5-5 | KVL 28-10 | KVL 30-12,5 | KVL 34-15 | KVL 37,5-20 |
|---|-------------------|------------------|--------------------|------------------|--------------------|
| A | 215 | 245 | 270 | 300 | 320 |
| B | 350 | 400 | 500 | 550 | 625 |
| C | 520 | 640 | 720 | 890 | 1000 |
| D | 600 | 720 | 800 | 980 | 1100 |
| E | 30 | 33 | 33 | 39 | 39 |
| F | 370 | 450 | 570 | 670 | 750 |
| G | 450 | 550 | 700 | 800 | 900 |
| H | 300 | 380 | 430 | 480 | 550 |
| I | 250 | 300 | 350 | 400 | 450 |
| J | 30 | 35 | 40 | 45 | 50 |
| K | 300 | 350 | 400 | 450 | 500 |
| L | 130 | 150 | 170 | 200 | 220 |
| M | | | | | |

| | Pump Dimensions | Dimenzije pumpe | N |
|--|------------------------|-----------------------------------|-------------------------|
| | | Broj stupnjeva / Number of Stages | |
| | | 1 | 320 360 450 540 715 |
| | | 2 | 375 440 555 665 855 |
| | | 3 | 430 520 660 790 995 |
| | | 4 | 485 600 765 915 1135 |
| | | 5 | 540 680 870 1040 1275 |
| | | 6 | 595 760 975 1165 1415 |
| | | 7 | 650 840 1080 1290 1555 |
| | | 8 | 705 920 1185 1415 1695 |
| | | 9 | 760 1000 1290 1540 1835 |
| | | 10 | 815 1080 1395 |
| | | 11 | 870 |
| | | 12 | 925 |

| | Prirubnice / Flange | Usisna / Suction | Tlačna / Delivery |
|--|----------------------------|-------------------------|--------------------------|
| | | NP | 16 16 16 16 16 |
| | | D _s | 65 125 150 200 250 |
| | | D ₁ | 185 250 285 340 405 |
| | | k ₁ | 145 210 240 295 355 |
| | | d ₁ | 18 18 23 23 27 |
| | | Z ₁ | 4 8 8 12 12 |
| | | NP | 25 25 40 40 40 |
| | | D _t | 50 100 125 150 200 |
| | | D ₂ | 165 235 270 300 375 |
| | | k ₂ | 125 190 220 250 320 |
| | | d ₂ | 18 23 27 27 30 |
| | | Z ₂ | 4 8 8 8 12 |

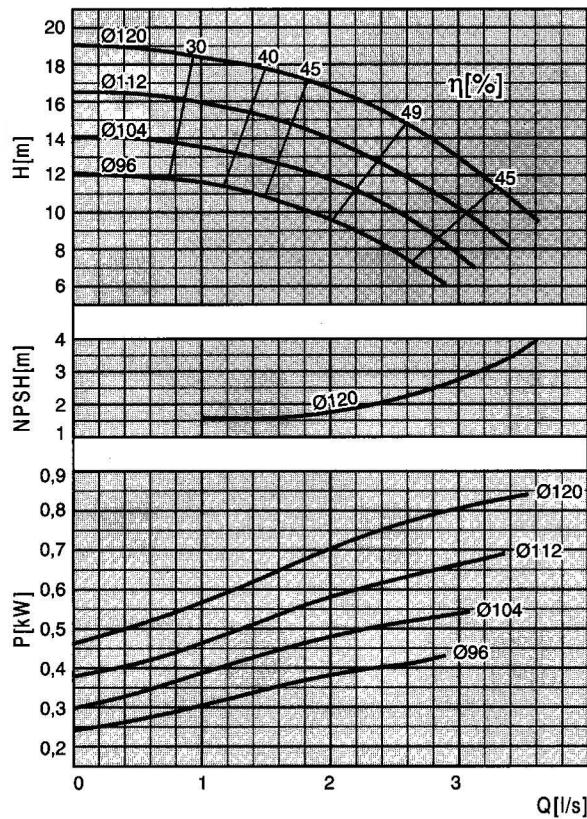


Pojedinačni dijagrami

Single Diagrams

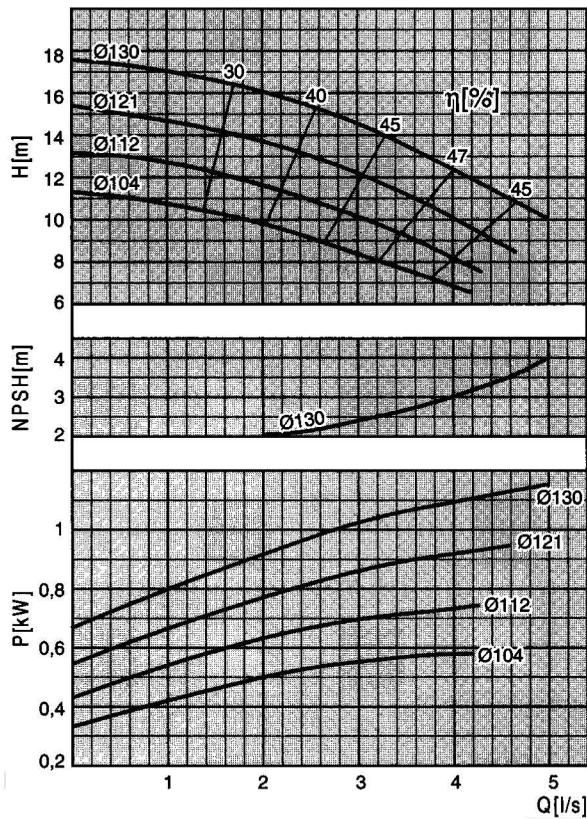
VS 12-3,2/1 (2-12)

$n=48,4 \text{ s}^{-1}$



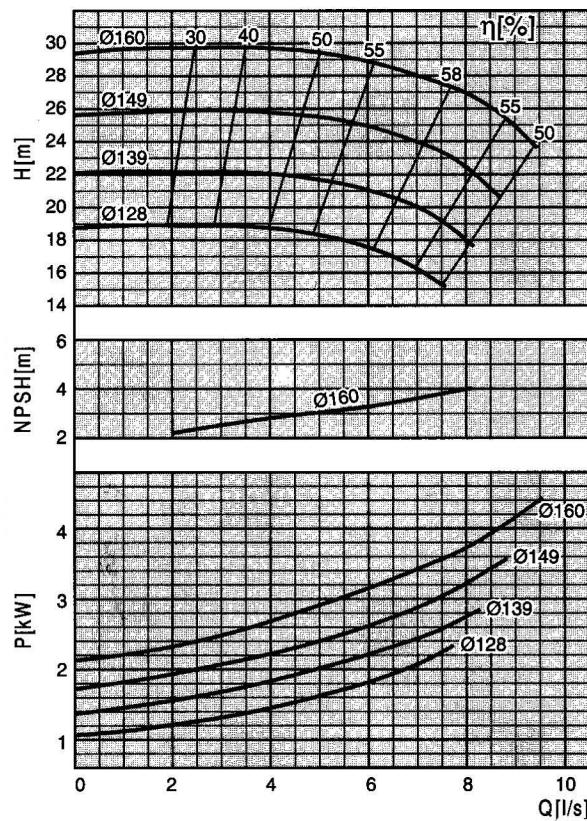
VS 13-4/1 (4-14)

$n=48,4 \text{ s}^{-1}$



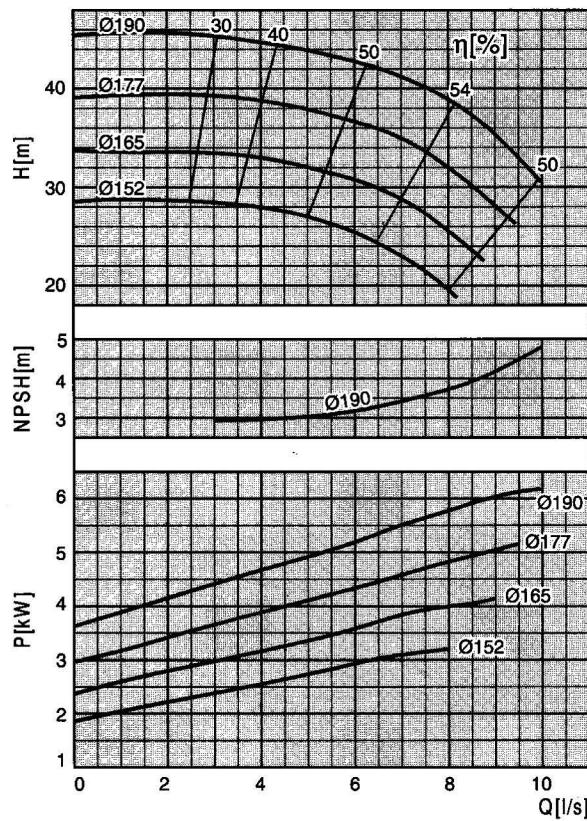
VS 16-5/1 (3-8)

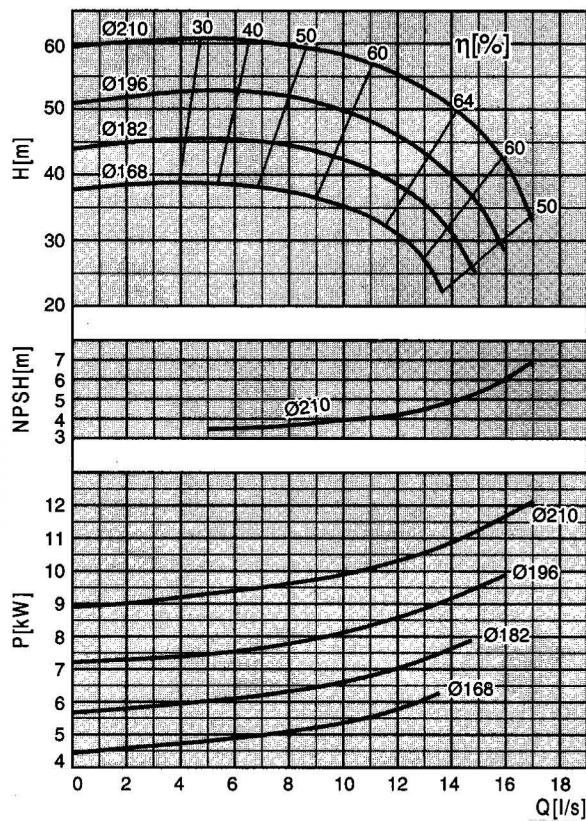
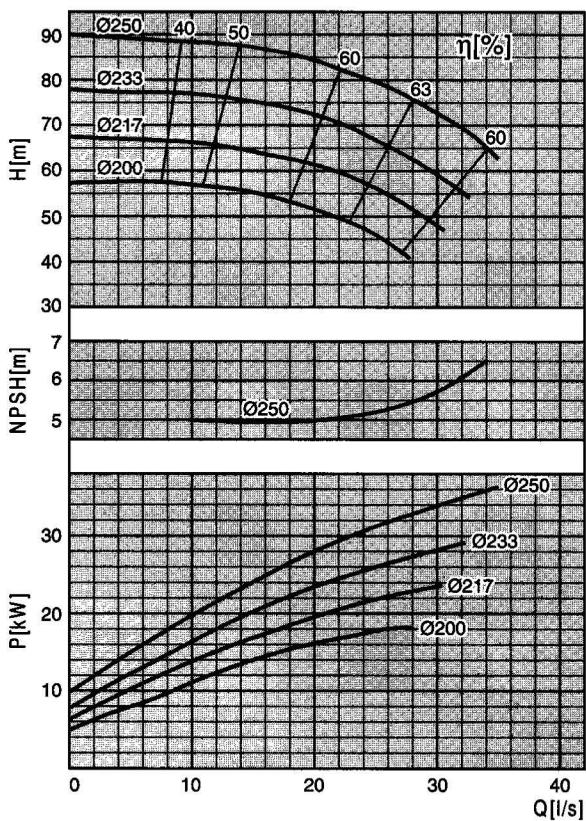
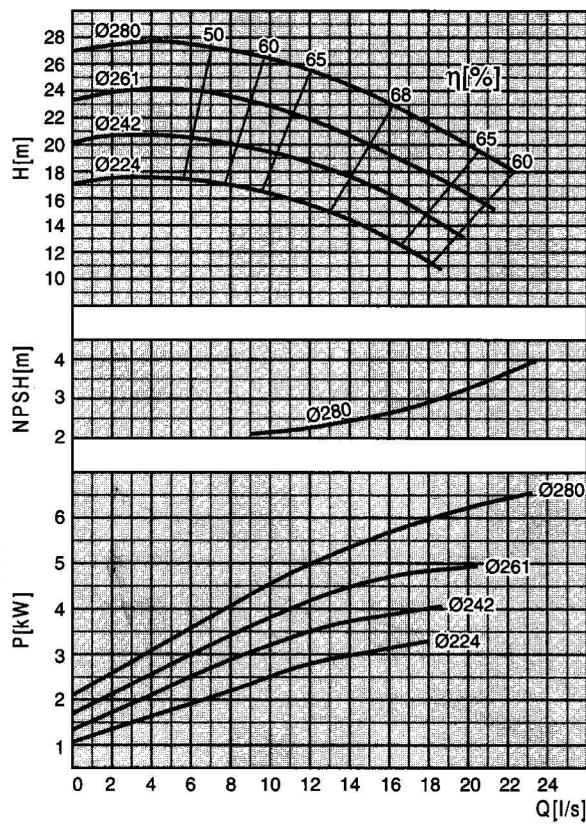
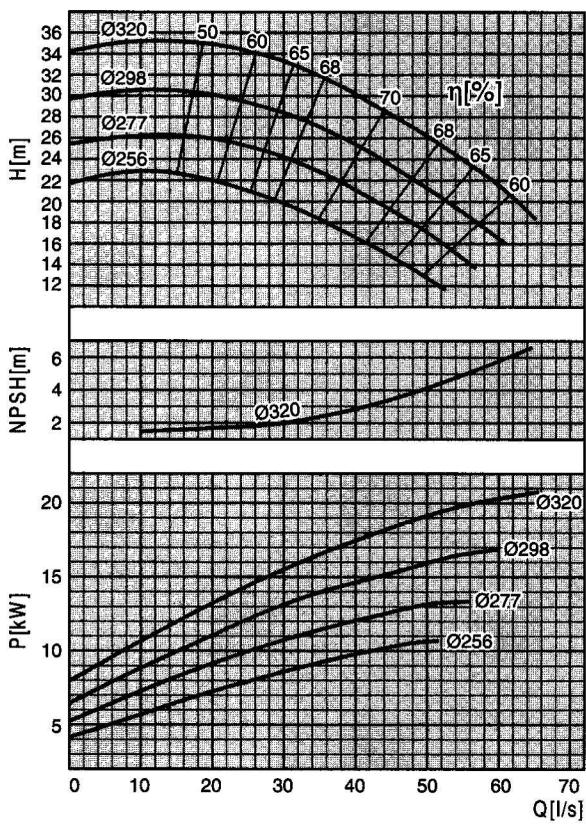
$n=48,4 \text{ s}^{-1}$

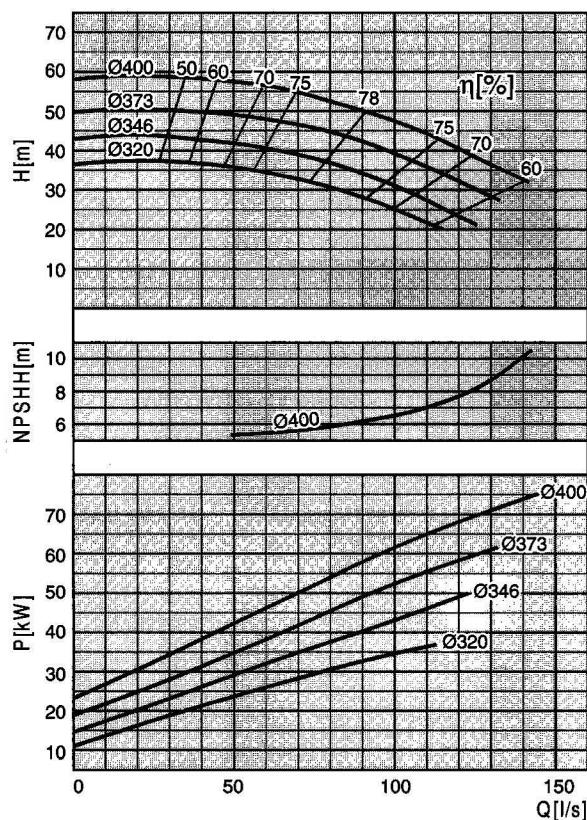
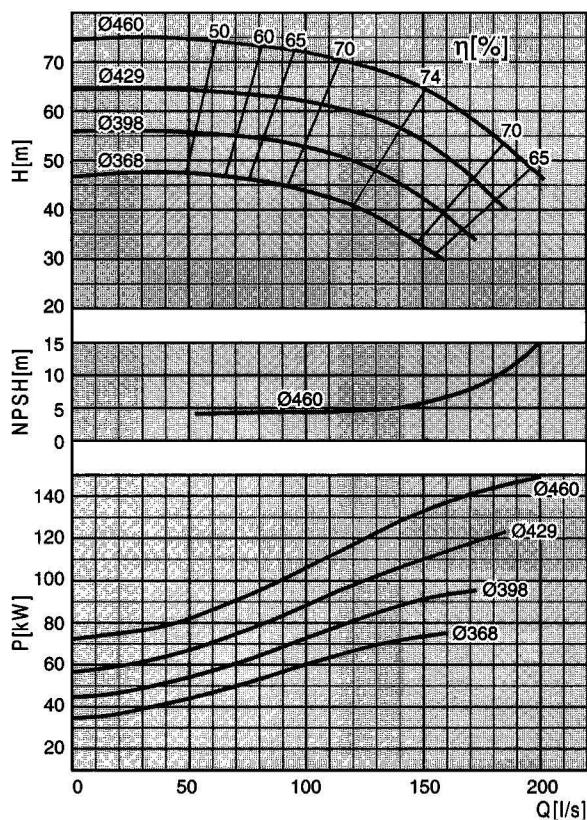
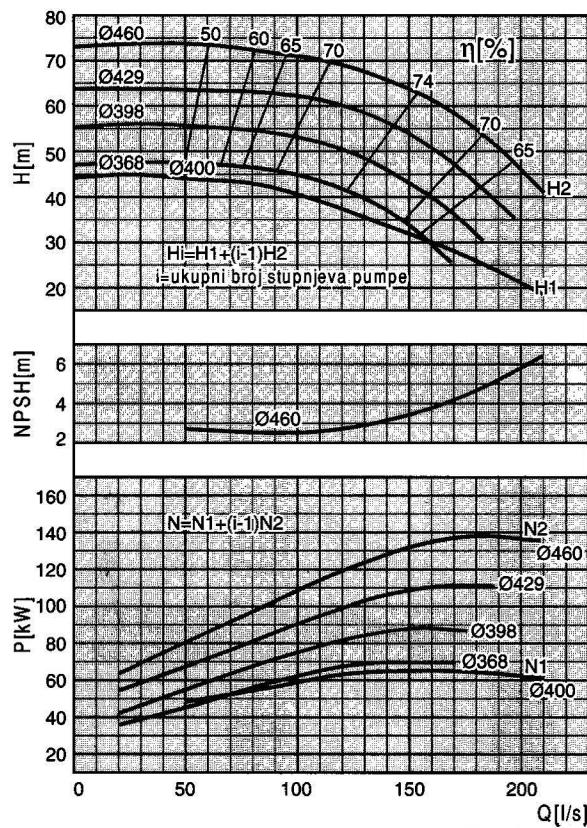


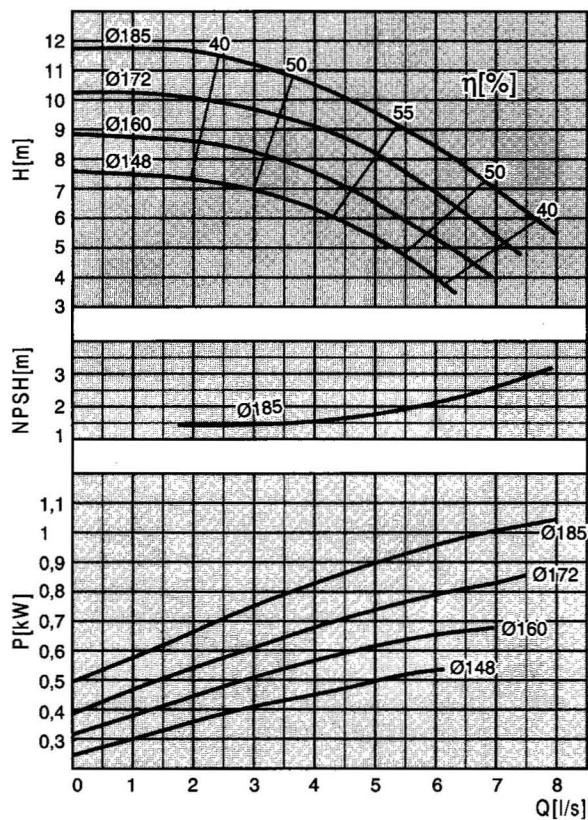
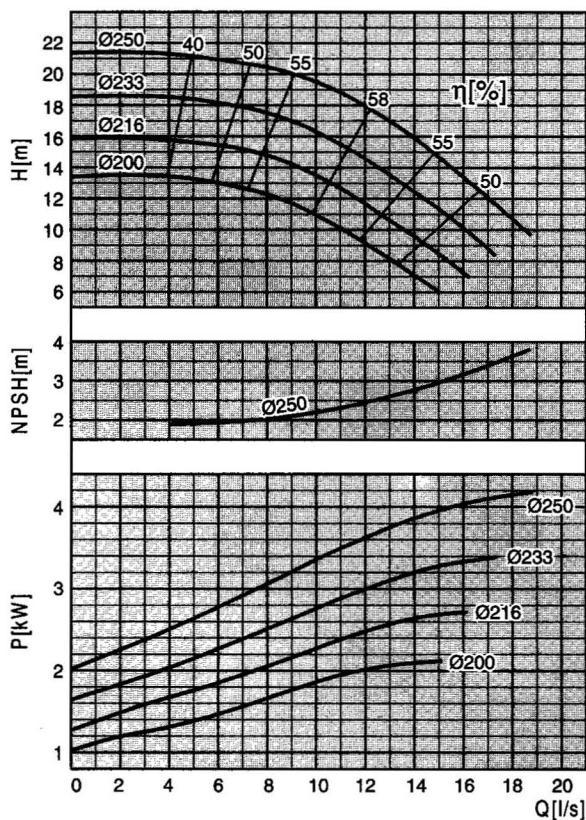
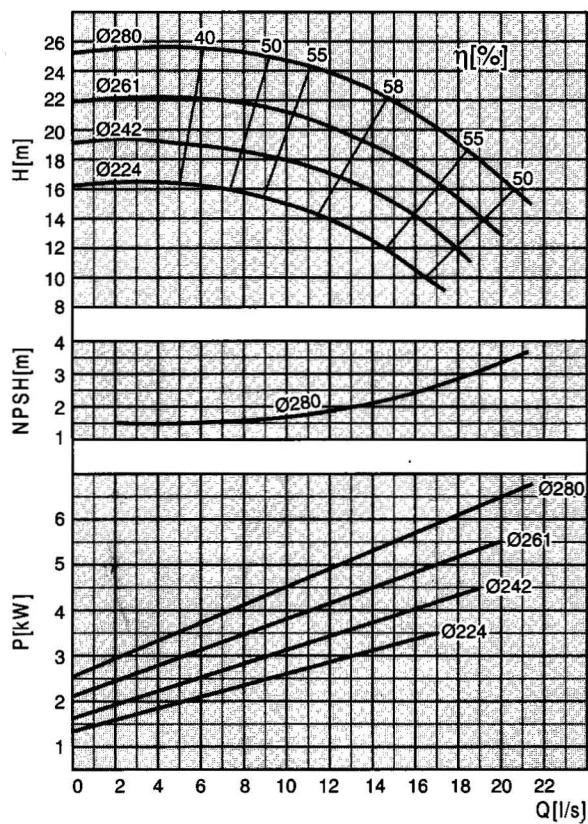
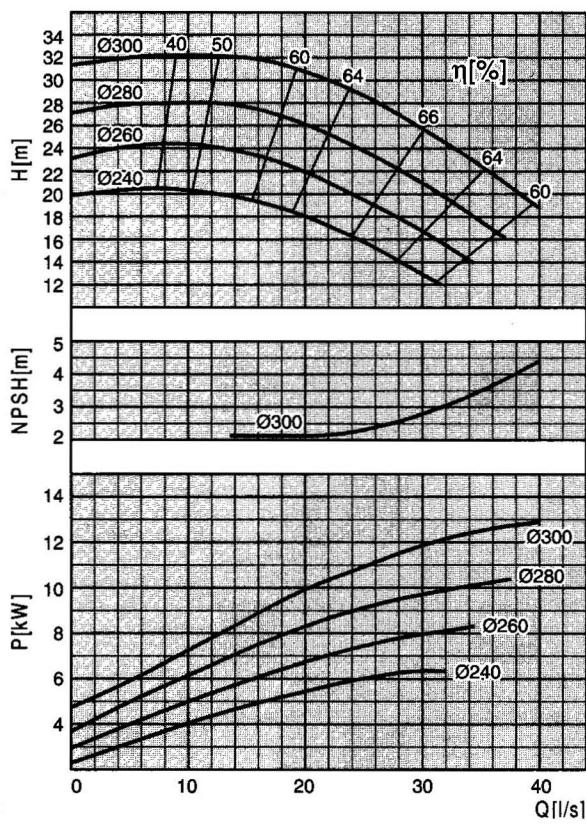
VS 19-5/1 (3-9)

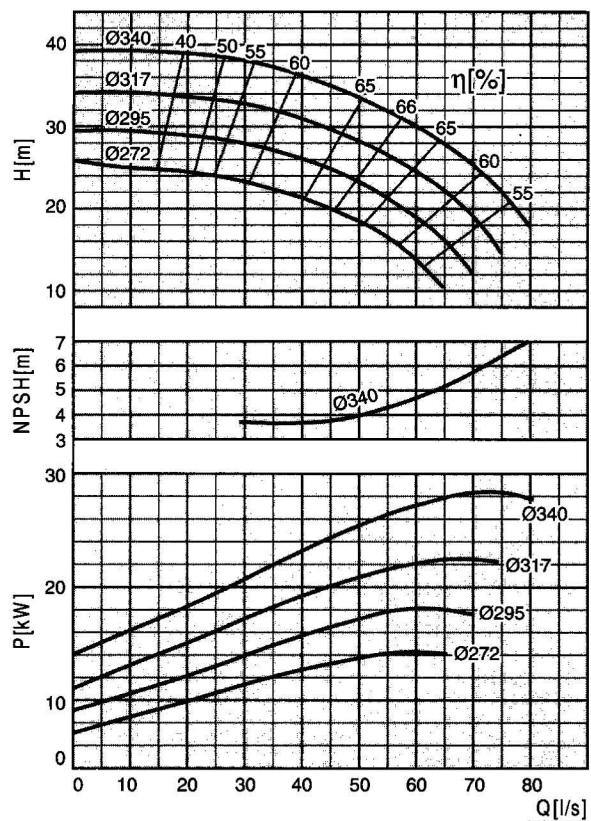
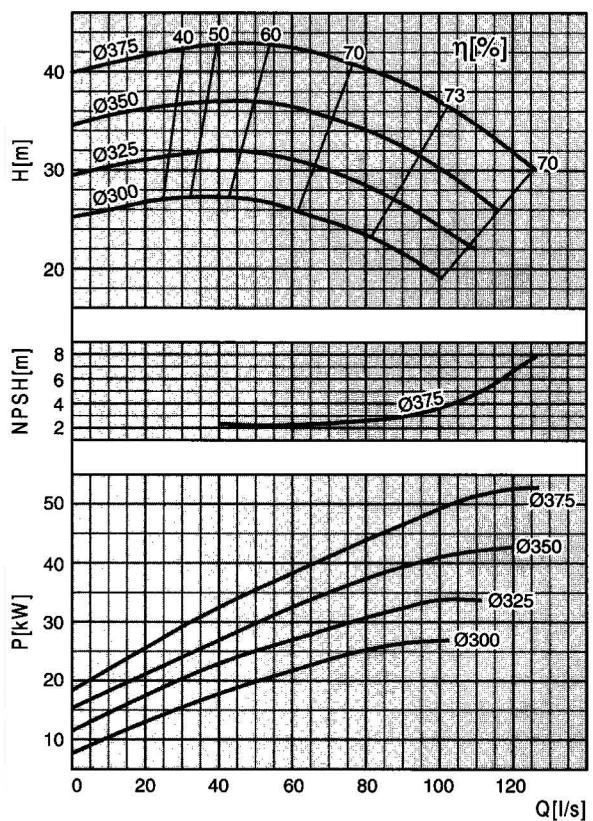
$n=48,4 \text{ s}^{-1}$



VS 21-8/1 (3-8) $n=48,4\text{s}^{-1}$ **VS 25-12,5/1(3-7)** $n=48,4\text{s}^{-1}$ **VS 28-10/1(3-6)** $n=24,2\text{s}^{-1}$ **VS 32-12,5/1(2-6)** $n=24,2\text{s}^{-1}$ 

VS 40-20/1 (2-6) $n=24,2\text{s}^{-1}$ **VS 46-20/1 (2-6)** $n=24,2\text{s}^{-1}$ **VS 46-20/ (3-6)** s poboljšanim usisom
with improved suction $n=24,2\text{s}^{-1}$ 

KV 18,5-5/1 (1-6) $n=24,2\text{s}^{-1}$ **KV 25-8/1 (3-7)** $n=24,2\text{s}^{-1}$ **KV 28-10/1 (1-10)** $n=24,2\text{s}^{-1}$ **KV 30-12,5 (2-8)** $n=24,2\text{s}^{-1}$ 

KV 34-15/1 (2-8) $n=24,2\text{s}^{-1}$ **KV 37,5-20/1 (2-8)** $n=24,2\text{s}^{-1}$ 



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