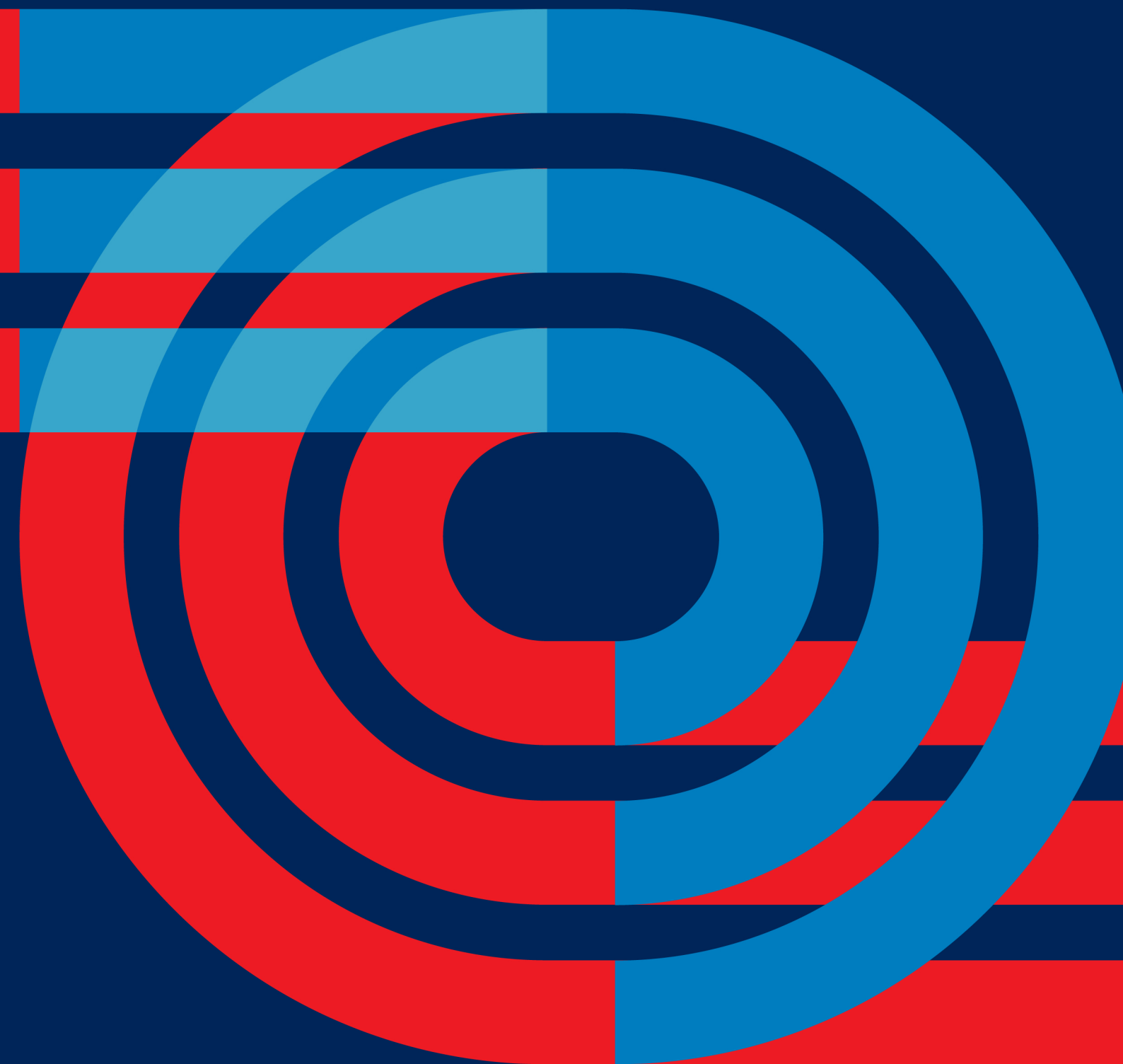


Bunarske pumpe Tipa BO



CROATIA PUMPE

Bunarske pumpe Tipa BO

Well Pumps – BO Type Pumps

Namjena

Bunarske pumpe namijenjene su za dobavu pitke vode, te tehnološke vode u industriji i poljoprivredi. Zbog malih promjera naročito su podesne za dobavu vode iz uskih bunara.

Tehnički opis

Bunarske pumpe su izvedene u radijalnoj ili poluaksijalnoj izvedbi. Voda ulazi u pumpu kroz usisnu košaru sa ili bez ventila ili usisno zvono, prolazi kroz hidraulički dio i nakon toga kroz cijevne nastavke, tlačno koljeno, te odlazi u tlačni vod. Hidraulički dio je sastavljen od sekcija te donjeg i gornjeg nosača ležaja. Svaka sekcija ima sprovedno kolo od sivog ljeva, te rotor koji može biti izveden od bronce, sivog ljeva ili čelika. Usisno zvono odnosno kućište usisne košare su također od sivog ljeva. Cijevni nastavci kao i lanterna motora su varene konstrukcije, zaštićeni zaštitnim premazom. Vratilo, sastavljeno od dva ili više dijelova međusobno spojenih vijčanim spojkama, spojeno je s elektromotorom putem elastične spojke. Radijalni ležaj i su gumeni podmazivani vodom, odnosno medijem koji pumpa dobavlja, aksijalni ležaji su valjkasti podmazivani uljem ili mašću. Prolaz vratila kroz izlazno kućište brtvljen je uobičajenim brtvenim pletenicama, ali se po želji mogu ugraditi i druge brtve. Na poseban zahtjev proizvodimo bunarske pumpe i s drugim konstruktivnim rješenjima. Npr.: radijalni ležaji od bronce podmazivani mašću, vratila sa zaštitnom cijevi i dr.

Projektiranje

Projektiramo pumpna postrojenja i kompletne pumpne stanice. Preuzimamo izvođenje i nadzor nad montažom. Za sve probleme izvolite se bratiti na nas. Naš iskusan stručni kadar uvijek vam stoji na usluzi.

Narudžba pumpi

Osim navedenih podataka u prospektu preporučuje se navesti kod narudžbe još sljedeće:

- Maksimalnu dužinu pumpe od poda strojarnice pa do dna usisne košare ili zvona
- Minimalni nivo vode u bunaru
- Minimalni promjer bunara
- Vrstu radnog medija tj. 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 i vrstu nečistoće (mulj, pijesak i sl.)

Application

Primary use of well pumps is for supply of drinking water, water used in industry and agriculture. Due to small diameters they are especially suitable for use in tight wells.

Technical Description

Well pumps are manufactured in radial or half-axial construction. Water enters the pump through the suction basket with or without valve or suction bell it passes through the hydraulic section up the pipe sections and discharge toggle and exists into the discharge duct.

Hydraulic section is composed of ring sections and upper and lower bearing support. Each ring section has a guide wheel manufactured out of grey iron and impeller which can be manufactured either out of bronze, gray iron or steel. Suction bell or suction basket casing are also manufactured out of gray iron. Pipe sections and motor pedestal are welded construction, protected by protective coating. Shaft comprised out of two or more sections interconnected by bolt-couplings is connected to the electromotor with elastic coupling. Radial bearings are rubber and cooled by pumped medium, whilst axial bearings are roller bearings lubricated with oil or grease. Shaft outlet in the casing is sealed with packing, but if other type of sealing is requested alternatives can be used. At special request we can manufacture other types of well pumps with different construction solutions. For instance radial bearings can be manufactured out of bronze lubricated with grease, protection pipe shaft etc.

Design

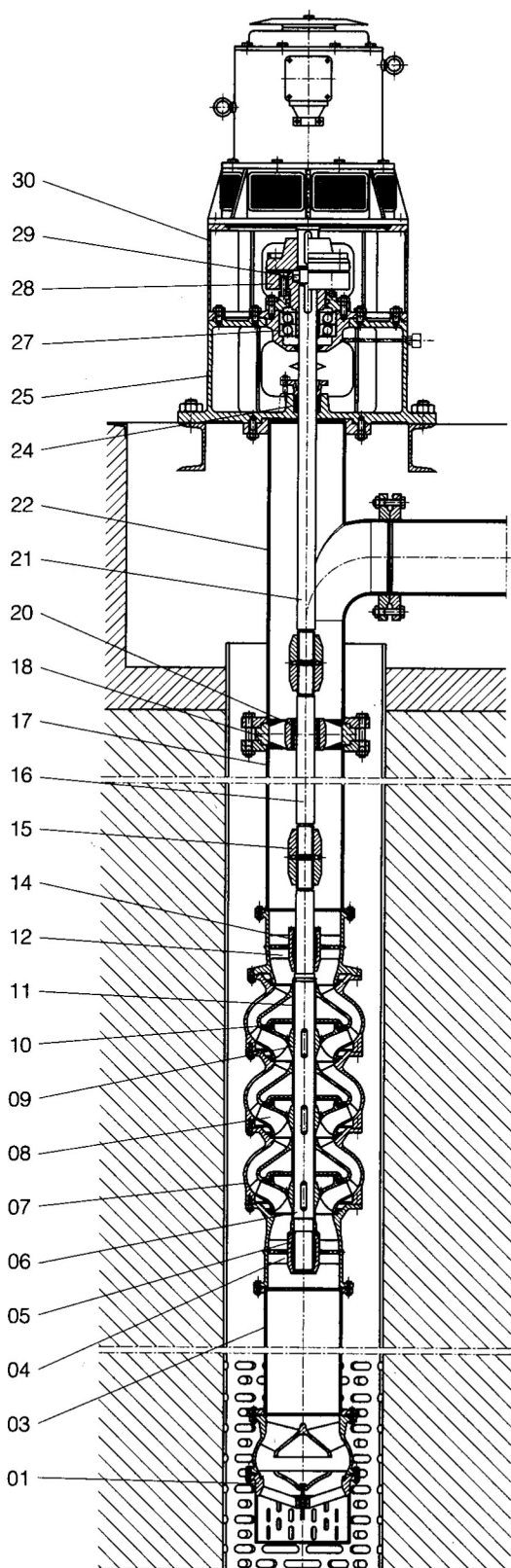
We can design whole pumping installations and pumping stations. Additionally we can manufacture designed installations in their entirety as well as oversee the construction. Feel free to contact us with any question. Our engineers are at your disposal.

Order

Aside from the data stipulated in the brochure, upon order, we recommend supplying following information:

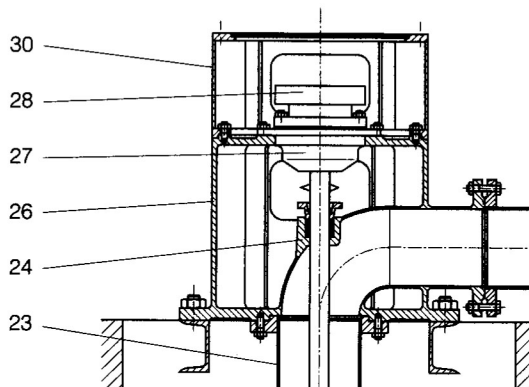
- Maximum length of the pump from the floor of the engine room to the bottom of suction basket or bell
- Minimal water level in the well
- Minimal well diameter
- Type of the transported medium, if it is sea or fresh water, if water is aggressive (pH value, chemical composition), turdiness of the medium, the level and type of impurities (sludge, sand, etc.)

Presjek pumpe



Pump Cross Section

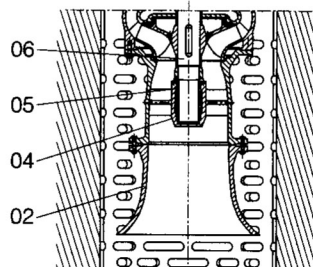
Detalj izvedba s tlačnom priрубnicom u strojarnici
 Pump Construction With Discharge
 Flange installed inside Engine Room



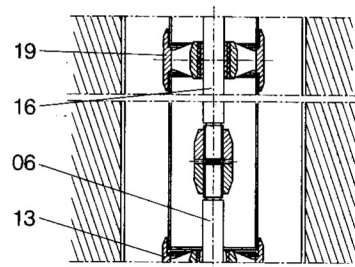
Glavni dijelovi pumpe / Pump Main Parts

- 01 - Usisna košara (s nepovratnom zaklopkom) / Suction Basket (with Non-Return Valve)
- 02 - Usisno zvono / Suction Bell
- 03 - Cijevni nastavak usisne košare / Suction Baskets Pipe Section
- 04 - Nosač donjeg ležaja pumpe / Lower Bearing Carrier
- 05 - Donji ležaj pumpe / Lower Bearing
- 06 - Vratilo pumpe / Pump Shaft
- 07 - Kućište kola rotora / Impeller Casing
- 08 - Kolo rotora / Impeller
- 09 - Konična ljuska / Conic Shell
- 10 - Rasporni prsten / Wearing Ring
- 11 - Ležaj kola rotora / Impeller Bearing
- 12 - Nosač gornjeg ležaja pumpe (s priрубnicom) / Upper Bearing Carrier (with Flange)
- 13 - Nosač gornjeg ležaja pumpe (s navojem) / Upper Bearing Carrier (threaded)
- 14 - Gornji ležaj pumpe / Upper Bearing
- 15 - Spojka / Clutch
- 16 - Međuvratilo / Reduction Shaft
- 17 - Cijevni nastavak / Pipe Section
- 18 - Nosač vodećeg ležaja (s priрубnicom) / Lead Bearing Carrier (with Flange)
- 19 - Nosač vodećeg ležaja (s navojem) / Lead Bearing Carrier (Threaded)
- 20 - Vodeći ležaj / Lead Bearing
- 21 - Pogonsko vratilo / Driving Shaft
- 22 - Cijevni nastavak (s tlačnim koljenom) / Pipe Section (with Discharge Toggle)
- 23 - Cijevni nastavak / Pipe Section
- 24 - Brtvenica vratila / Packing
- 25 - Lanterna pumpe / Pump Pedestal
- 26 - Lanterna pumpe (s tlačnim koljenom) / Pump Pedestal (with Discharge Toggle)
- 27 - Sklop aksijalnog ležaja / Axial Bearing Assembly
- 28 - Elastična spojka (s osiguranjem protiv suprotnog smjera vrtnje) / Elastic Coupling (with Security Assembly To Prevent Counter Directional Spin)
- 29 - Regulaciona matica / Regulation Nut
- 30 - Lanterna motora / Motor Pedestal

Detalj usisa s usisnim zvonom
 Suction Bell



Detalj spoja cijevnih nastavaka s navojem
 Pipe Section Connection (Threaded)



Izvedba pumpi

Radi svoje široke primjene, ovisno o uvjetima na mjestu ugradnje, te zahtjevima naručioca ili projektanta, bunarske pumpe se razlikuju u tri osnovna detalja: .

- vrsti pogona
- položaju tlačne priрубnice
- obliku usisa

Bunarske pumpe, ovisno o vrsti pogona, raspoložive su u tri izvedbe

- direktni pogon elektromotorom
- pogon preko zupčanog prijenosnika
- kombinirani pogon

Na poseban upit isporučujemo i pumpe s pogonom preko remenice

Pump Constructions

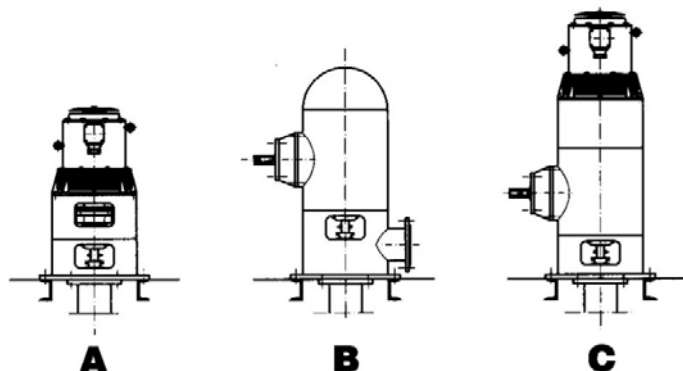
Due to its widespread use, dependant on the place of installation and customers demands or project itself well pumps differ in regards to three main aspects:

- drive type
- location of the flange
- suction configuration

Well pumps, dependant on the type of drive, are manufactured in three main constructions:

- direct drive by electromotor
- gear wheel drive
- combination of the two

At special inquiry we deliver pumps with belt drive.

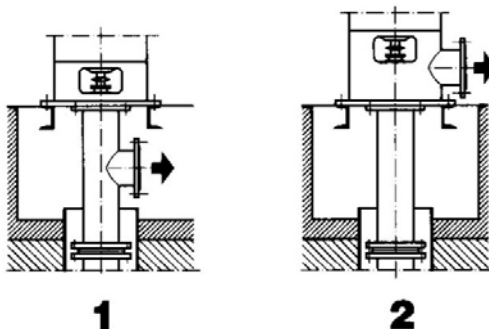


Projekt pumpne stanice i uvjeti na mjestu ugradnje, diktiraju dva položaja tlačne priрубnice u odnosu na pod strojarnice, odnosno temeljnu ploču:

- Tlačna priрубnica ispod poda strojarnice
- Tlačna priрубnica iznad poda strojarnice

Pump station design and conditions onsite dictate one of two positions of the flange dependant on the engine room, or base plate:

- Discharge Flange below engine room floor
- Discharge Flange above engine room floor



Oblik bunara, te vrsta i stupanj nečistoće tekućine koju pumpa dobavlja, uvjetovali su dvije izvedbe usisnog dijela pumpe:

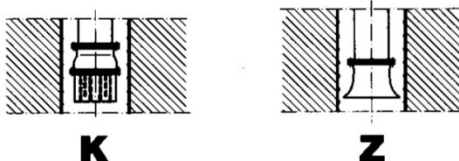
K - usis kroz usisnu košaru s nepovrat-zaklopkom

Z - usis kroz usisno zvono

Shape of the well, type and the degree of impurities of the fluid transported stipulate one of two:

K – suction through suction basket with non-return valve

Z – suction through suction bell



Izvedba vrste pogona, položaj tlačne priрубnice i oblik usisa, međusobno se kombiniraju (vidi primjer pod „PODRUČJA DOBAVE“.

Drive type, position of flange and suction configuration are interchangeable. (see example under “SUPPLY RANGES”

Označavanje pumpi

Osnovna oznaka bunarskih pumpi je BO. Brojevi uz tu oznaku označavaju brzohodnost deset puta manju, veličinu pumpe, tj. promjer kola rotora, nazivni promjer tlačne priрубnice, te broj stupnjeva. Primjer označavanja:



Pump Marking

Main marking for well pumps is BO. Numbers accompanying this marking determine specific speed decreased tenfold, size of the pump, impeller size, nominal flange diameter and number of ring sections. Markings example:

Područje dobave

Područje dobave bunarskih pumpi kreće se od 2,5 do 400 l/s, a visina dobave od 4 do 380 metara. Područja dobave pojedinih veličina pumpi i brzohodnost dana su na dijagramima. Za svaku veličinu, područje je ograničeno podebljanim linijama. Broj u svakom polju označava broj stupnjeva pumpe. Koristan stupanj djelovanja za određenu količinu i visinu dobave, ovisi o veličini odabrane pumpe. Njegovu veličinu kao i garantirane karakteristike pumpe dajemo uz konkretnu ponudu. Radi lakšeg snalaženja navodimo primjer oznake pumpe, za količinu dobave $Q = 10$ l/s, $H = 50$ m, s kombinacijom izvedbe C1K.

4,8 BO 15-10/8 izvedba C1K

Navedena pumpa ima brzohodnost 48, promjer kola rotora 150 mm, nazivni promjer tlačne priрубnice 100 mm i osam ugrađenih stupnjeva: Kao pogonski stroj služi elektromotor, ali zupčani prenosnik omogućava priključak još jednog pogonskog stroja, koji može služiti kao rezerva u slučaju nestanka električne energije. Tlačna priрубnica pumpe nalazi se ispod poda strojarnice, a usis tekućine je kroz usisnu košaru sa ili bez ventila

Mjerna skica

Na mjernoj skici dane su osnovne dimenzije bunarskih pumpi, za izvedbe A 1 K, A 2, te detalj usisnog zvona (izvedba Z). Za izvedbe B i C, dimenzije donjeg dijela pumpe su jednake dimenzijama iz tablice, dok priključne mjere reduktora dostavljamo samo na osnovu posebnog upita.

Supply Range

Supply range of well pumps is from 2,5 to 400 l/s and total manometric head from 4 to 380 meters. Supply ranges of individual pumps with their specific speed are supplied in diagrams. For each size the area is determined by thickened lines. Number in each field marks the number of pumps segments. Efficiency for specific quantity and total head depends on the size of the pump. Its size and guaranteed characteristics are supplied with individual offers. As a reference we are supplying example of the markings of the pumps, for quantity $Q=10$ l/s, $H=50$ m, with construction combination C1K.

4,8 BO 15-10/8 construction C1K

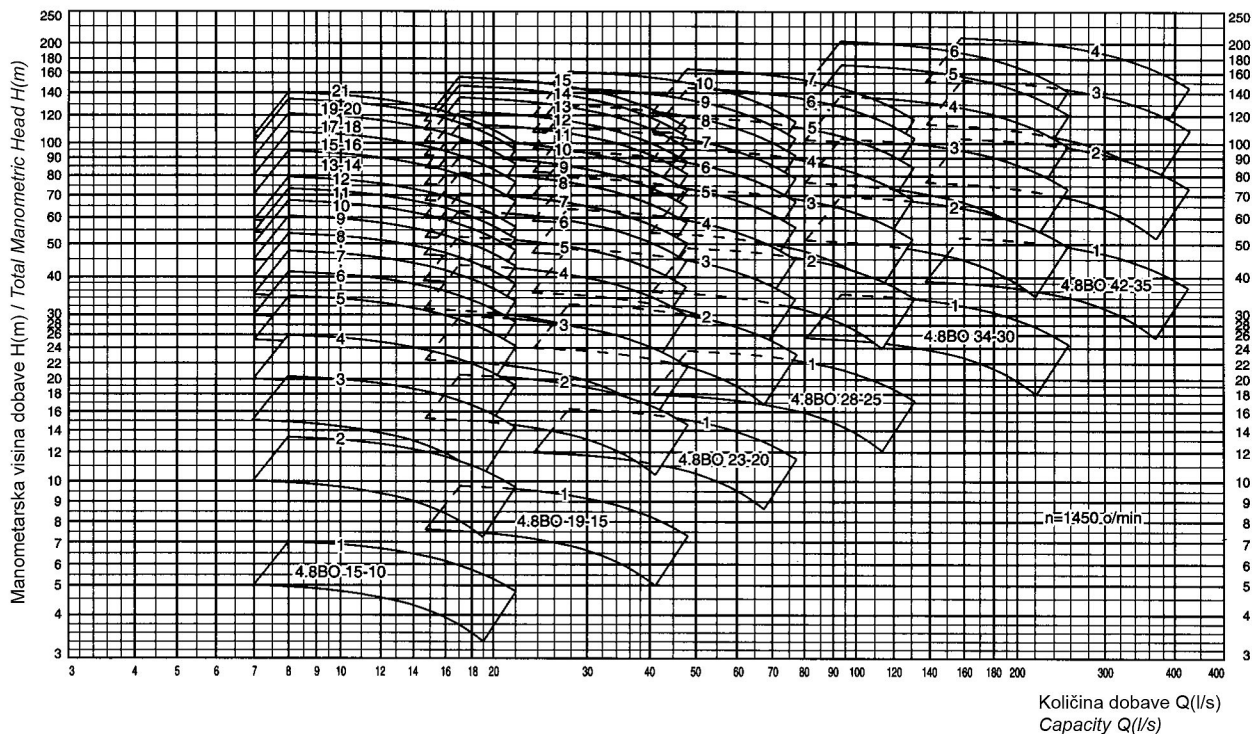
Specified pump has specific speed of 48, impeller diameter 150 mm, nominal diameter of discharge flange 100 mm and eight ring sections. As drive, electromotor is used, but gearwheel transmission enables attachment of secondary drive, which can be used as backup in case of power failure. Discharge flange is located below the engine room floor and the suction of the fluid is done through suction basket with or without valve.

Pump Sketch With Dimensions

Pump sketch stipulates basic dimensions for constructions A 1 K, A 2 and suction bell detail (construction Z). For constructions B and C dimensions of lower part of the pump are equal to dimensions stipulated in the table, while reductor attachment dimensions are supplied on request.

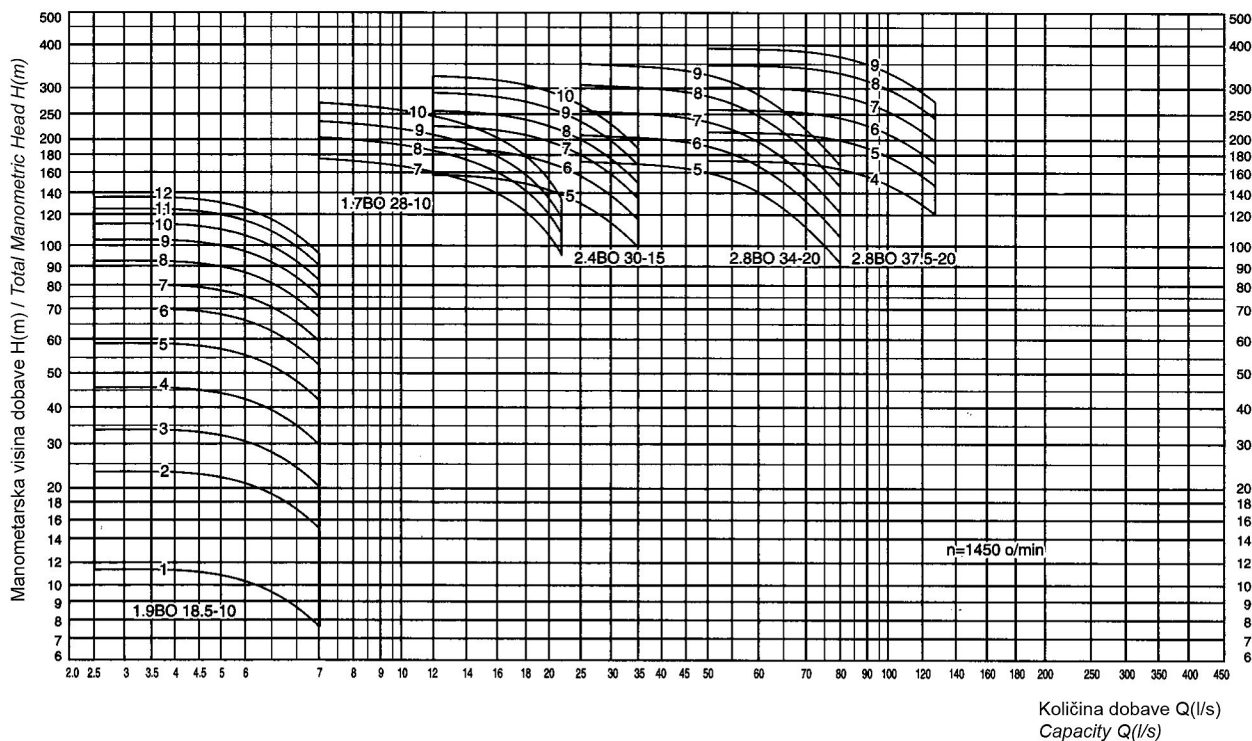
**Područja dobave
pumpi tipa 4,8 BO**

**Ranges Of Supply –
Pumps Type 4,8 BO**



**Područja dobave
pumpi tipa 1,7-2,8 BO**

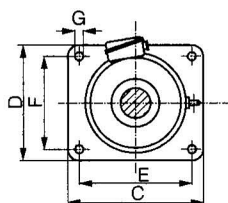
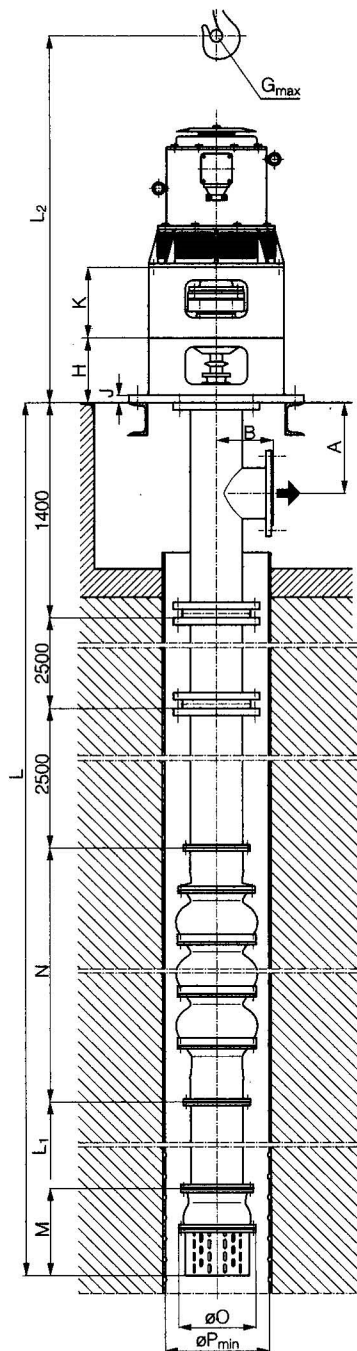
**Ranges Of Supply –
Pumps Type 1,7-2,8 BO**



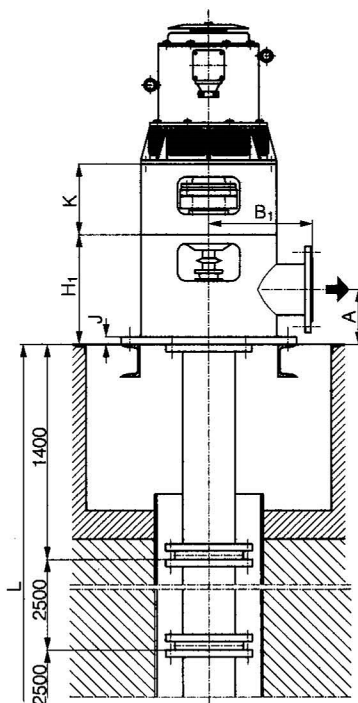
Mjerna skica

Pump Sketch With Dimensions

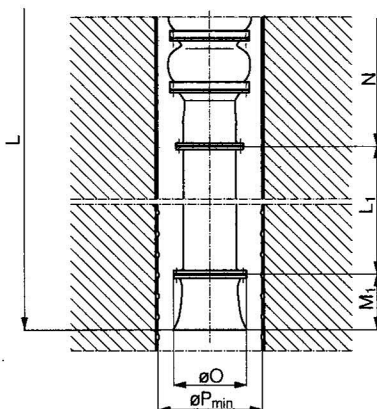
Izvedba A1K
Construction A1K



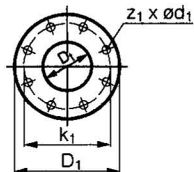
Izvedba A2
Construction A2



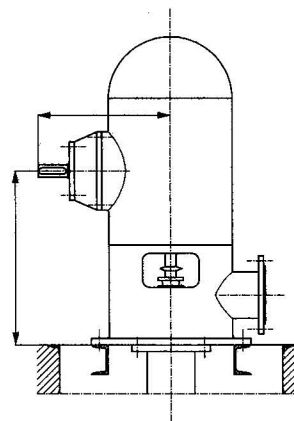
Detalj usisnog zvona (izvedba Z)
Suction bell detail (Z construction)



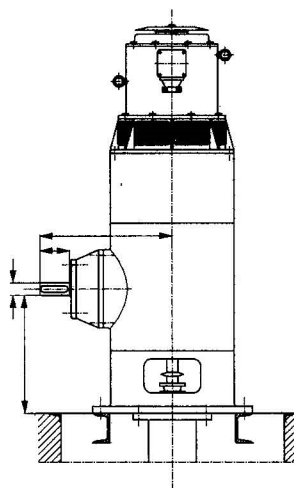
Tlačna priрубica
Pressure Flange



Izvedba B2
Construction B2



Izvedba C1
Construction C1



Priključne mjere za izvedbu B i C
dostavljamo samo na osnovu posebnog upita

Connection dimensions for B and C
constructions are provided at inquiry

Dimenzije u mm (neobavezne)
Dimensions in mm (non-compulsory)

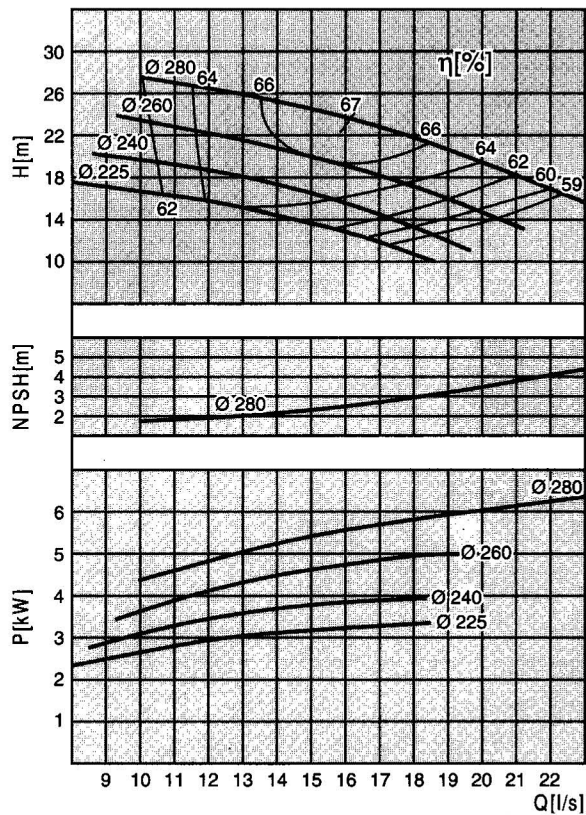
			4,8 BO 15-10	4,8 BO 19-15	4,8 BO 23-20	4,8 BO 28-25	4,8 BO 34-30	4,8 BO 42-35	1,9 BO 18,5-10	1,7 BO 28-10	2,4 BO 30-15	2,8 BO 34-20	3,0 BO 37,5-25		
Dimenzije pumpi b	Pump Dimensions	A	800	800	800	800	800	800	800	800	800	800	800	800	
		A ₁	200	250	250	250	300	350	200	250	250	300	300	300	
		B	200	250	250	250	300	400	200	250	250	250	300	300	
		B ₁	400	450	500	550	650	750	250	350	400	500	600	600	
		C	510	550	600	850	1000	1200	450	600	700	1100	1300	1300	
		D	410	550	600	850	1000	1200	450	600	700	1100	1300	1300	
		E	460	500	550	770	920	1100	400	530	630	1000	1200	1200	
		F	360	500	550	770	920	1100	400	530	630	1000	1200	1200	
		G	23	23	23	27	33	33	23	27	27	33	33	33	
		H	200	280	280	300	400	500	200	200	280	300	400	400	
		H ₁	450	500	550	600	600	700	400	450	500	600	650	650	
		J	25	25	25	30	35	40	25	30	30	40	40	40	
		K	260	350	400	400	500	550	260	300	350	500	600	600	
		M	340	475	600	675	745	785	340	340	475	600	675	675	
	M ₁	110	180	220	260	320	400	110	180	220	260	320	320		
	Z	Za broj stupnjeva	No. of Stages	1	450	500	628	900	1100	1360	320				
				2	590	665	836	1140	1400	1730	375				
				3	730	830	1044	1380	1700	2100	430				
				4	870	995	1232	1620	2000	2470	485				1135
				5	1010	1160	1440	1860	2300		540		870	1040	1275
				6	1150	1325	1648	2100	2600		595		975	1165	1415
7				1290	1490	1856	2340			650	840	1080	1290	1555	
8				1430	1655	2064				705	920	1185	1415	1695	
9				1570	1820	2272				760	1000	1290	1540	1835	
10				1710	1985	2480				815	1080	1395			
11				2030	2150					870					
12				2170	2315					925					
13				2310	2480										
14				2450	2645										
15				2590	2810										
16				2730											
17				2870											
18				3010											
19				3150											
20				3290											
21	3430														
Tlačna priрубica Pressure Flange	O	220	285	340	395	445	505	370	450	570	670	750	750		
	P	300	320	400	450	500	650	400	480	600	680	780	780		
	Dt	100	150	200	250	300	350	100	100	150	200	250	250		
	D ₁	220	285	340	405	460	520	220	235	300	375	450	450		
	K ₁	180	240	295	355	410	470	180	190	250	320	385	385		
	d ₁	18	23	23	25	25	25	18	23	27	30	33	33		
Z ₁	8	8	12	12	12	16	8	8	8	12	12	12			

Dužine L i L₁ određuje projektant prema projektu.
Visina kuke L₂ uzima se prema dužini najdužeg
komada dok se nosivost dizalice G_{max} odabire
prema težini najtežeg komada pumpe.

Pojedinačni dijagrami

1,7BO 28-10/1 (1-18)

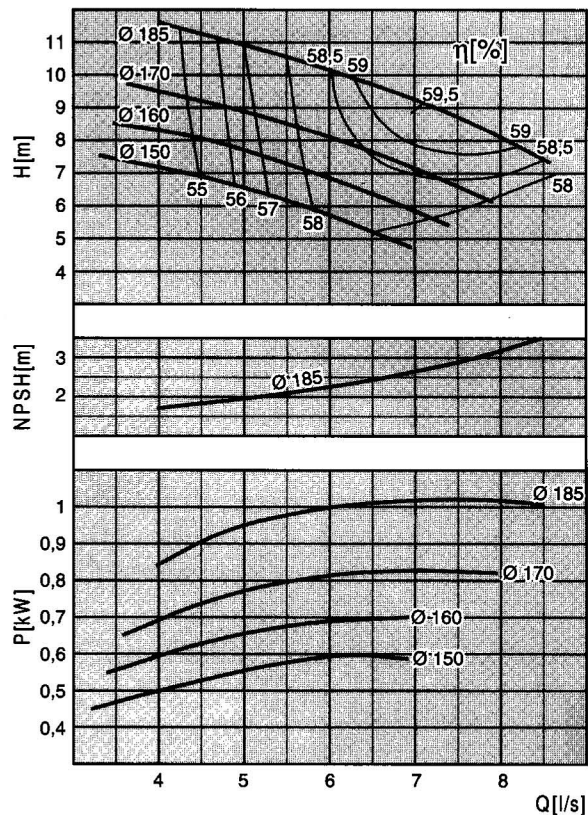
$n=24,16s^{-1}$



Single Diagrams

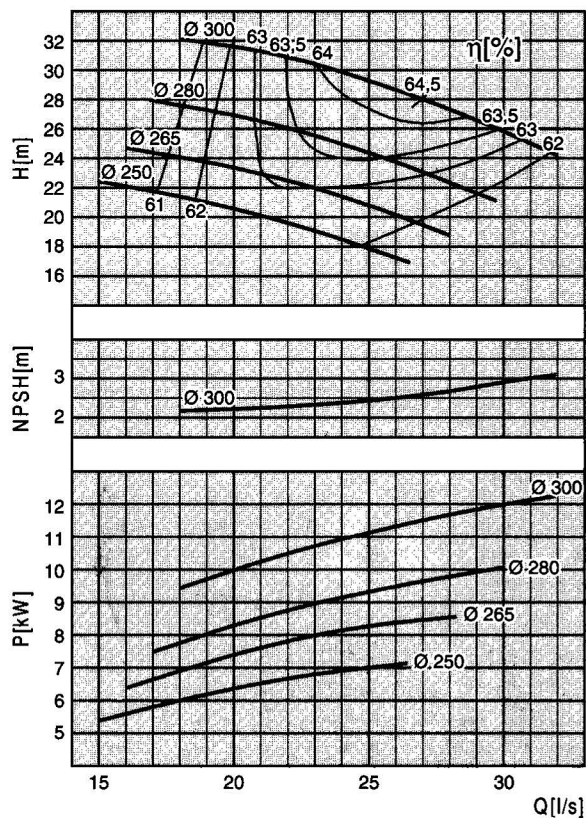
1,9BO 18,5-10/1 (1-30)

$n=24,16s^{-1}$



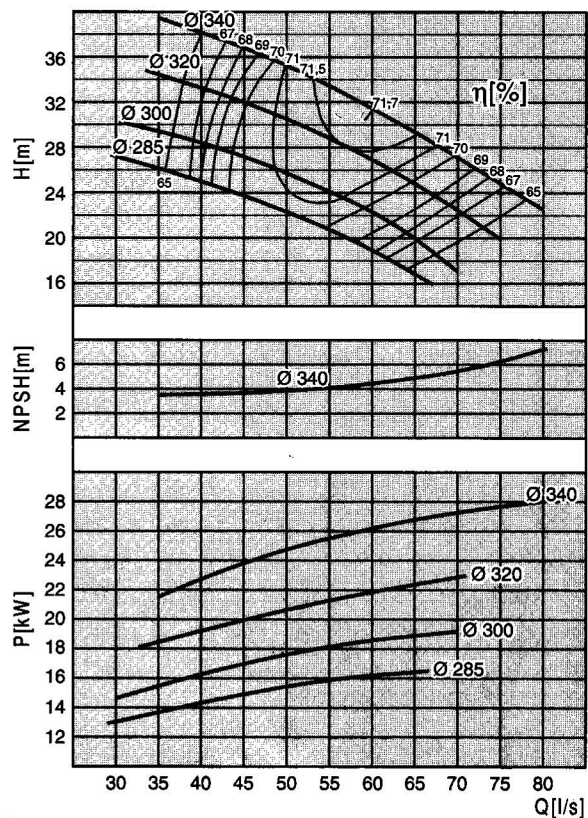
2,4BO 30-15/1 (1-16)

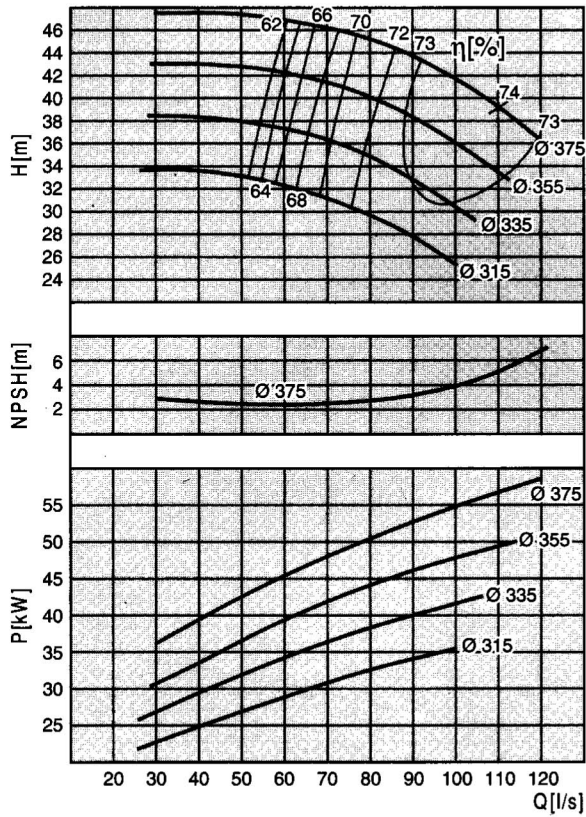
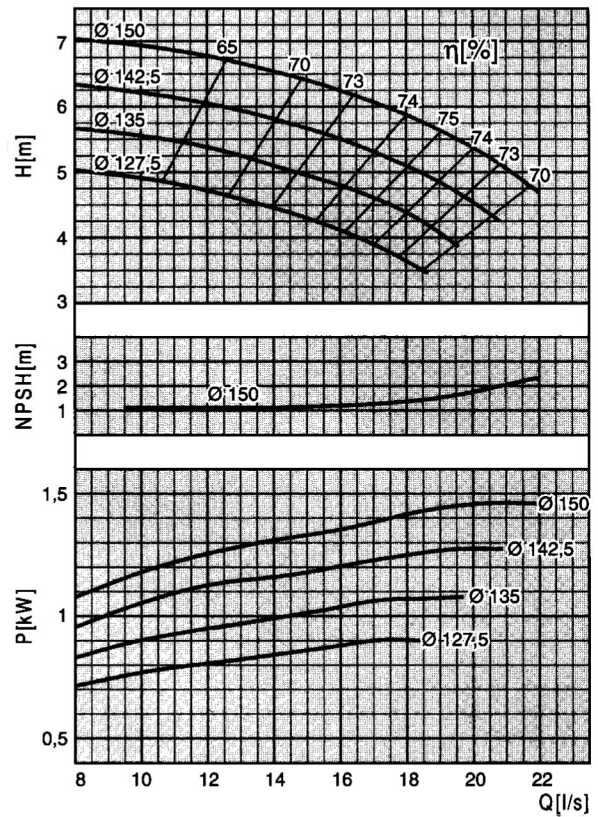
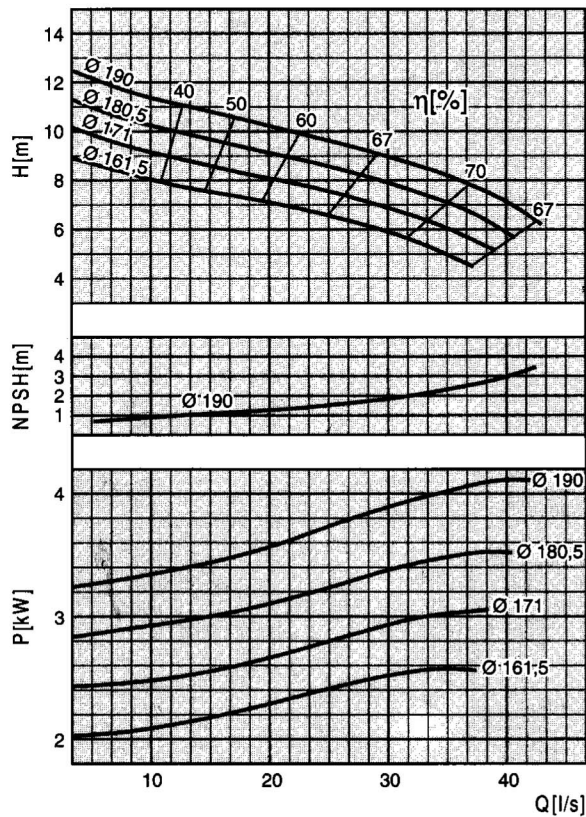
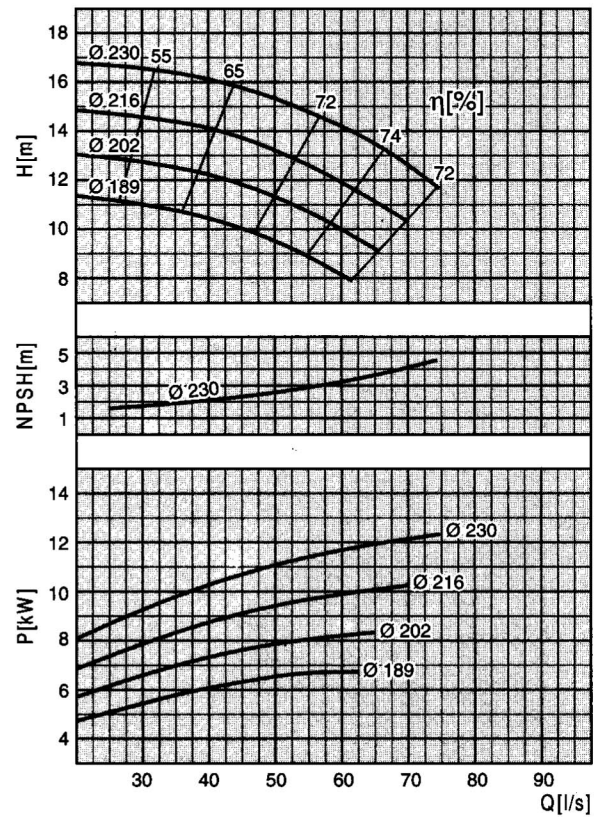
$n=24,16s^{-1}$

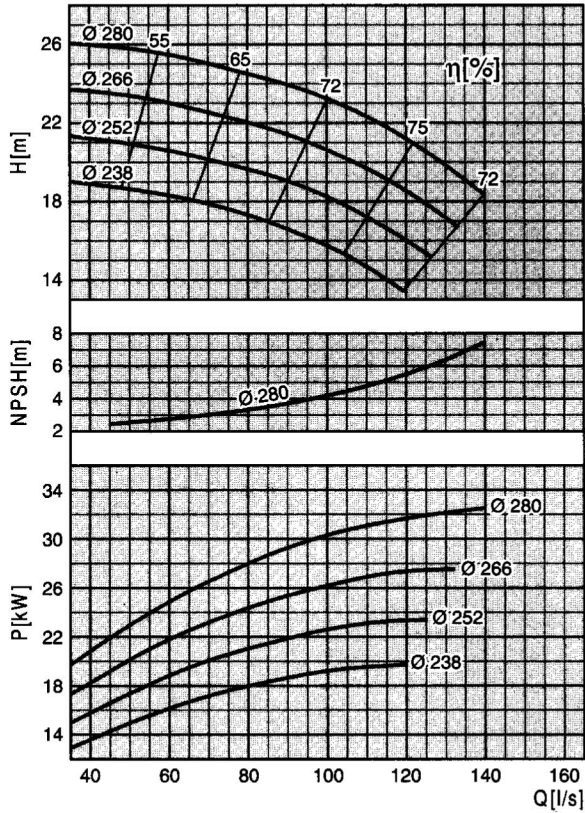
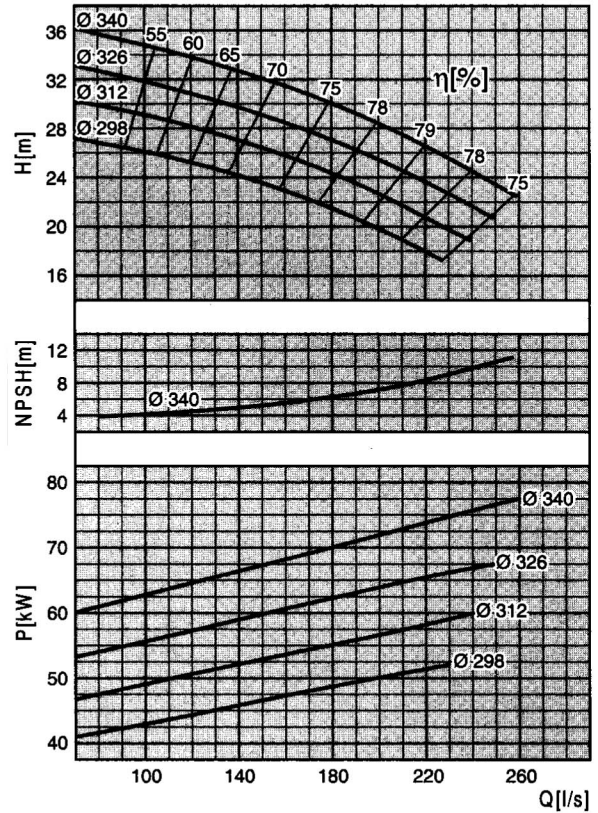
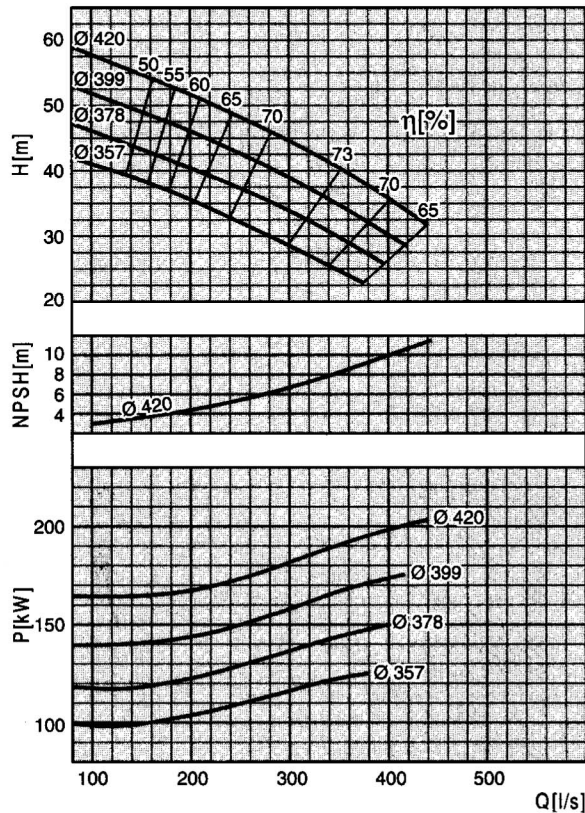
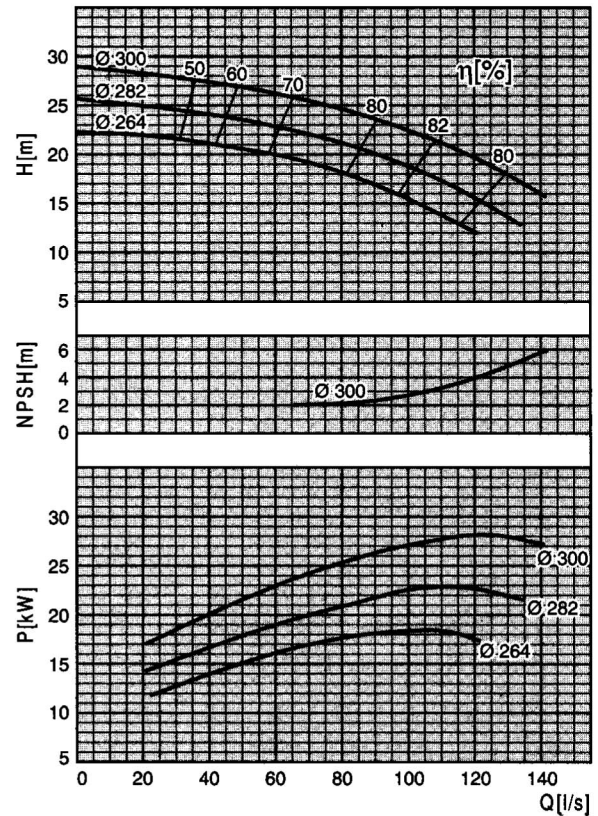


2,8BO 34-20/1 (1-15)

$n=24,16s^{-1}$

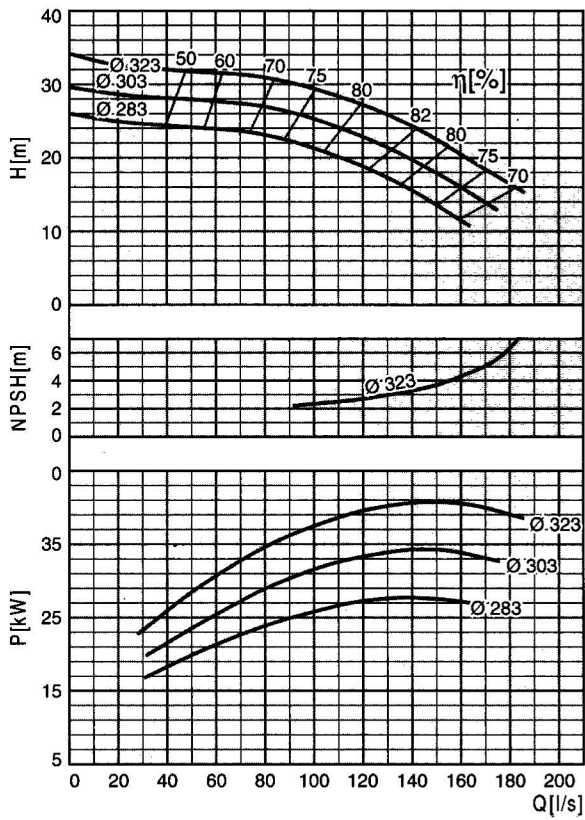


2,8BO 37,5-20/1 (1-11) $n=24,16s^{-1}$ **4,8BO 15-10/1 (1-21)** $n=24,16s^{-1}$ **4,8BO 19-15/1 (1-15)** $n=24,16s^{-1}$ **4,8BO 23-20/1 (1-10)** $n=24,16s^{-1}$ 

4,8BO 28-25/1 (1-9) $n=24,16s^{-1}$ **4,8BO 34-30/1 (1-15)** $n=24,16s^{-1}$ **4,8BO 42-35/1 (1-4)** $n=24,16s^{-1}$ **5,2BO 30-30/1 (1-6)** $n=24,9s^{-1}$ 

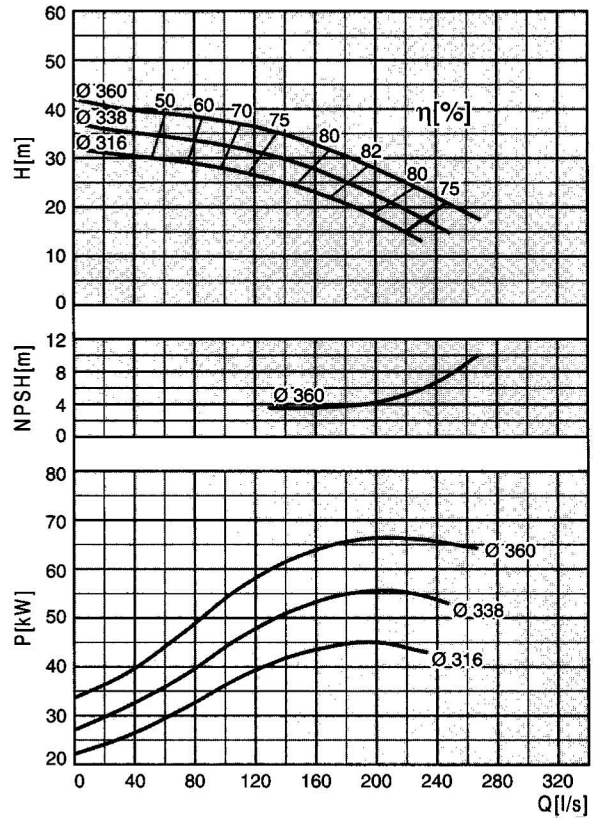
5,2BO 33-30/1 (1-6)

$n=24,7s^{-1}$



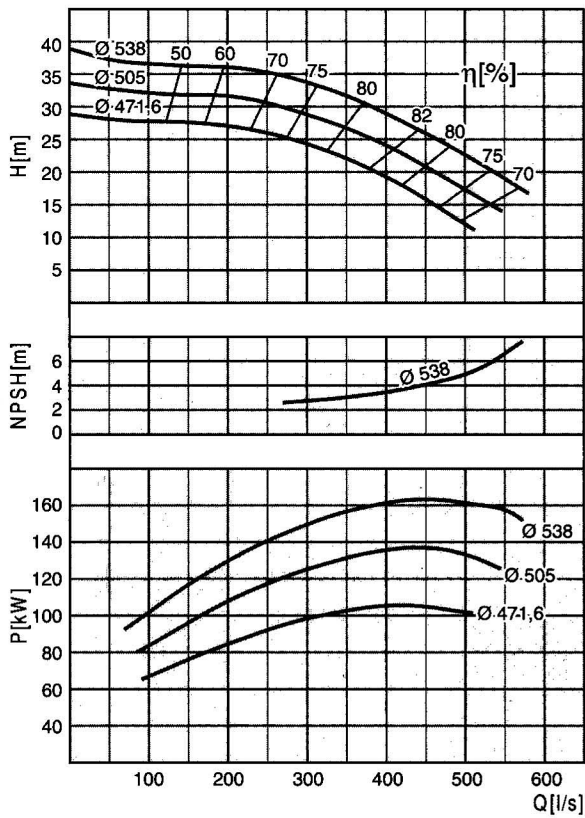
5,2 BO 36-30 /1 (1-4)

$n=24,6s^{-1}$



5,2BO 55-40/1 (1-4)

$n=16s^{-1}$





**CROATIA
PUMPE**

Croatia Pumpe Nova d.o.o.
Mala Švrača 155
47000 Karlovac
HRVATSKA

Telefon: +385 47 434 022, 47 434 032
Fax: +385 47 434 110
E-mail: info@croatia-pumpe.com

Prodaja:
Telefon: +385 47 434 033, 47 434 038, 47 434 121

Marketing:
Telefon: +385 47 434 099
E-mail: info@croatia-pumpe.com