

Propelerne pumpe Tipa AVZ, AVZR



CROATIA PUMPE

Propelerne pumpe Tipa AVZ, AVZR

Namjena

Propelerne pumpe su namijenjene za dobavu velikih količina vode pri malim visinama dobave, uz veoma veliku ekonomičnost, kao npr.: u sustavima za navodnjavanje i odvodnjavanje, u industriji i sl.

Tehnički opis

Propelerne pumpe su aksijalnog tipa, tj. voda ulazi kroz usisno zvono, i aksijalno prolazi kroz kolo rotora i kućište statora, te u produžetku kroz tlačnu cijev u tlačni vod.

Pumpa je jednostavne i solidne konstrukcije. Usisno zvono i kućište statora su od kvalitetnog sivog lijeva, a cijevni nastavak, tlačno koljeno i lanterna motora obično su u varenoj izvedbi. Lopatice rotora mogu biti od: SL; bronce i ČL. Vratilo je od ugljičnog čelika.

U normalnoj izvedbi lopatice su izvedene tako, da se za vrijeme montaže u tvornici može podešiti potreban napadni kut lopatice za određenu radnu točku.

Prema narudžbi proizvodimo pumpe sa zakretnim lopaticama u radu. U toj izvedbi lopatice se putem posebnog uređaja, prema potrebi, mogu za vrijeme pogona zakrenuti za određeni kut kako bi pumpa radila sa što boljim stupnjem djelovanja. Prema zahtjevu naručioca isporučujemo pumpe i takve konstrukcije da se rotirajući dijelovi mogu aksijalno izvući iz kućišta. Pumpe sa zakretnim lopaticama u radu proizvodimo samo od veličine 80-100 na dalje.

Vratilo je sastavljeno od dva ili više dijelova, međusobno spojenih odgovarajućom spajkom.

Ležaj i su klizni, od bronce, podmazivani mašču iz posebne pumpe za mast, montirane na lanterni motor ili od nemetalnih materijala koji se podmazuju vodom. Glavni aksijalni ležaj je valjkasti ili klizni i podmazuje se uljem.

Vratilo je putem elastične spojke spojeno s elektromotorom.

Brtvljenje pumpe vrši se uobičajenim brtvenim pletenicama ili labirintnim brtvama, ali se po želji mogu ugraditi i druge brtve.

Propeller Pumps Type AVZ, AVZR

Application

Propeller pumps are designed for the supply of capacious quantities of water at low heads, being thus very economically applied in the systems of irrigation and drainage, industry and others.

Technical Description

Propeller pumps are of an axial type, i.e. water flows into a suction bell mouth axially passing via impeller and stator diffuser, being further directed through a discharge pipe to the piping.

The pump itself is of a simple and solid construction Bell mouth, stator diffuser, tube casing, discharge elbow and electro-motor pedestal are made of qualitative grey cast. Rotor blades can be of alloyed steel or bronze. A shaft is of alloyed steel as well.

A normal design of blades is executed so to enable adjusting of a blade angle of attack as required for an adequate working point during erection in the works.

Upon a customer's requirement, the pumps provided with deflecting blades in operation, are also produced. Such design ensures deflection of blades by means of a special device. If necessary, the blades can be deflected during operation, for an adequate angle to achieve as much as better efficiency. Upon requirement, we supply pumps of a such design, which enables axial removings, of rotating parts out of the casing. Pumps with deflecting blades in operation are manufactured only from the size 80-100 onwards.

The shaft consists of two or more parts, reciprocally joined by a rigid coupling.

Bearings are of a slide type, either of bronze, grease lubricated from an additional lubricating pump mounted on a motor pedestal, or of water lubricated non-metal materials. Main axial bearing is a roller or slide one and it is lubricated by oil.

The shaft is by means of a flexible coupling joined with an electro-motor.

Sealing of pump is carried out by ordinary packings or labyrinth ones, however, upon requirement other various packings can be installed.

Područja dobave

Područja dobave propelernih pumpi kreću se od $0,09 \text{ m}^3/\text{s}$ pa do $10\text{m}^3/\text{s}$, a visina dobave od 0,5 pa do 18 metara. Prema posebnom zahtjevu nudimo pumpe i izvan toga područja. Područja dobave prikazana su na dijagramu.

Koristan stupanj djelovanja za određenu količinu i visinu dobave ovisi o veličini izabrane pumpe i napadnom kutu lopatice. Na dijagramu su dana područja dobave pojedinih pumpi, koja one pokrivaju sa stupnjem korisnog djelovanja od 75% do 85%, te odgovarajuća oznaka pumpe, broj okretaja i dijagram pumpe koji se dostavlja na poseban zahtjev.

Projektiranje

Projektiramo pumpna postrojenja i kompletne pumpne stанице. Preuzimamo također i izvođenje i nadzor nad montažom. Za sve probleme izvolite se obratiti na nas. Naš iskusni stručni kadar uvijek vam stoji na usluzi.

Capacities

Capacities of propeller pumps start from 90 liters up to 10 000 liters per second at a manometric head from 0,5 to 18 meters of water column. We also offer pumps out of this range, if specially required. Ranges of their capacities are shown on a diagram. Full efficiency for an adequate capacity and head depends upon a size of chosen pump and a blade angle of attack, as shown on the diagram.

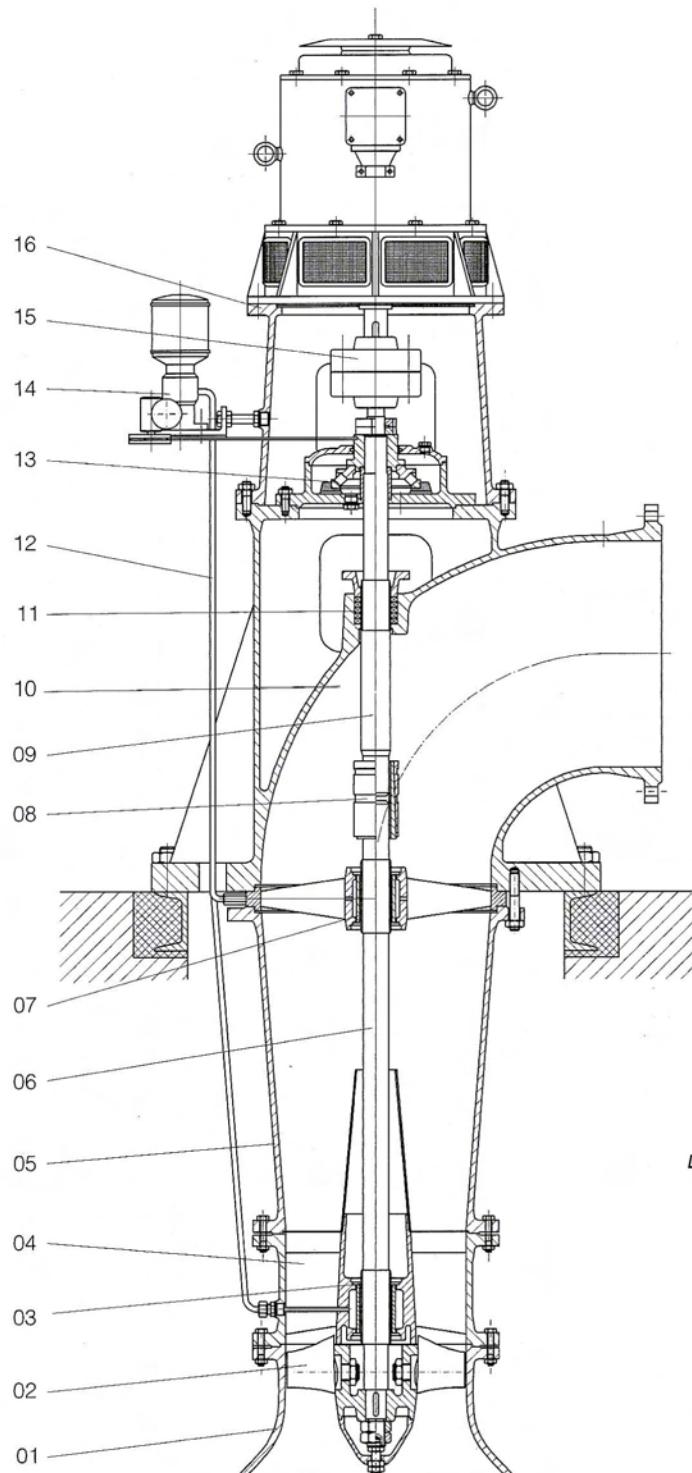
Capacities of some pumps are diagrammatically given, therewith covering a degree of their efficiency of than 75% up to 88% as well as showing a corresponding type of pump and speed and number of detailed diagram of pump to be got on the special request.

Design

A complete design of pumping plants and stations together with their erection or a supervision of erection only, is available. Our experienced and highly skilled staff is always ready to give the fullest and closest attention to any requirement of our customers regarding these pumps and their application.

Presjek pumpe tipa AVZ

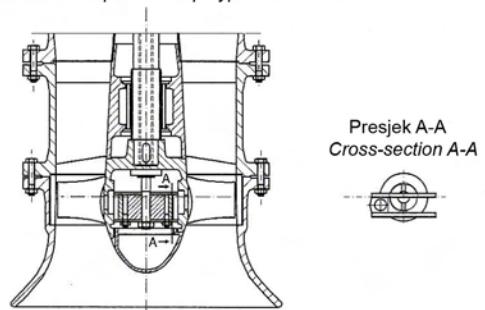
AVZ Type Pump Cross Section



**Glavni dijelovi pumpe
Pump Main Parts**

- 01 - Usisna zvono / Bell Mouth
- 02 – Propeler / Propeller
- 03 - Donji ležaj / Bottom Bearing
- 04 – Stator / Stator
- 05 - Cijevni nastavak / Tube Casting
- 06 - Vratilo pumpe / Pump Shaft
- 07 - Međuležaj / Intermediate Bearing
- 08 – Spojka / Rigid Coupling
- 09 - Pogonsko vratilo / Driving Shaft
- 10 - Tlačno koljeno / Discharge Toggle
- 11 - Brtvenica vratila / Shaft Packing
- 12 - Cijev za mazivo / Lubricant Pipe
- 13 - Aksijalni ležaj / Axial Bearing
- 14 - Pumpa za mast / Grease Feed Pump
- 15 - Elastična spojka / Flexible Coupling
- 16 - Lanterna motora / Motor Pedestal

**Detalj propelera pumpe tipa AVZR
Detail of Propeller Pump Type AVZR**



Izvedbe propelernih pumpi

Normalna izvedba pumpe nosi oznaku AVZ, uz oznaku veličine pumpe, npr. AVZ 50-50, gdje je prvi broj promjer rotora, a drugi, promjer tlačne prirubnice (u cm). Ako pumpa ima zakretne lopatice tokom rada, dobiva oznaku AVZR, gdje je R oznaka za zakretanje lopatica u radu.

Ovisno o projektu, postoje četiri izvedbe pumpi. Normalna izvedba prikazana je na slici A. Motor je svojom lanternom direktno pričvršćen na pumpu. Kod velikih pumpnih jedinica motor je pričvršćen na pod strojarnice (izvedba B). Ako zahtijeva projekt čitava pumpa se ovjesi o lanternu motora (izvedba C). Ako je visina od tlačnog koljenja pumpe do poda strojarnice velika, dajemo izvedbu D.

U sva četiri slučaja svi elementi pumpe su jednaki, samo što u izvedbi C, tlačno koljeno nema noseću ploču. Ukoliko ne postoji mogućnost pristupa u donji pumpni prostor sa strane, gornji otvor u podu strojarnice mora biti toliko velik, da kroz njega prođe tlačno koljeno pumpe.

Mjerni podaci za izvedbu A dati su na mjerenoj skici, a oni ujedno vrijede i za sve ostale izvedbe, osim kota L , L_1 , H_1 , H_2 i H_3 , koje diktira projekt.

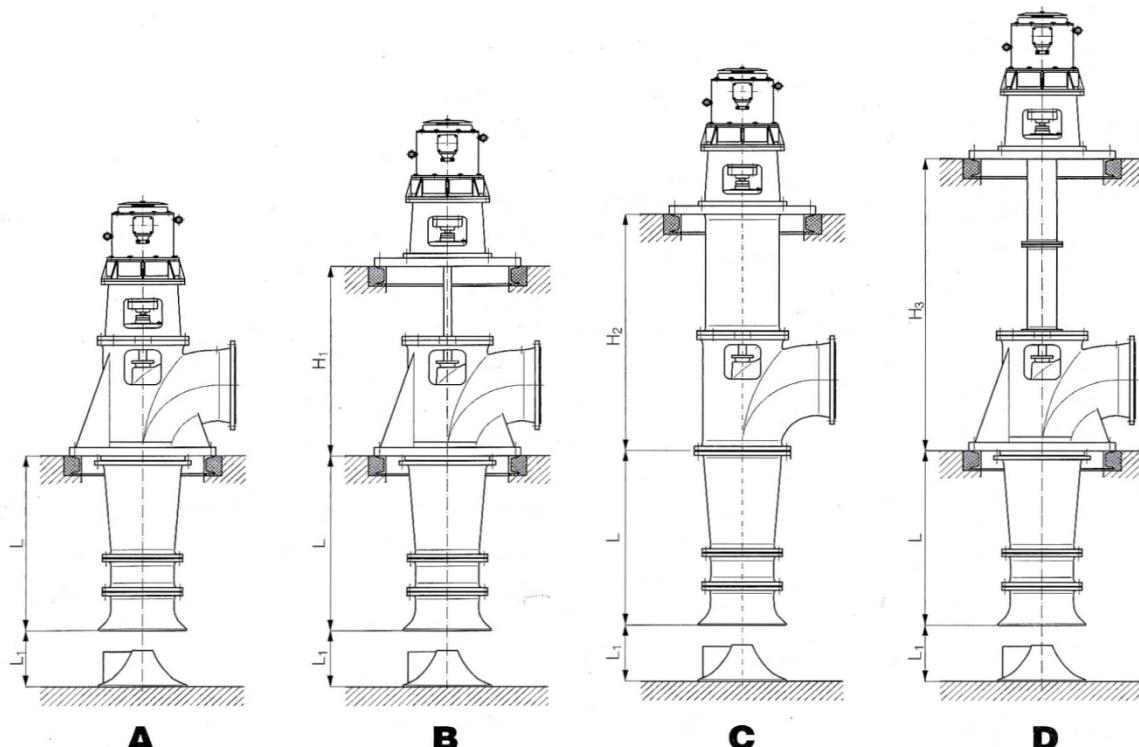
Design of propeller pumps

An ordinary design of this type of pumps is marked with AVZ, in addition of its size being also marked, such a AVZ 50-50; the first number shows a diameter of rotor, the second one is a diameter of discharge flange (in cm). If the Pump is provided with deflecting blades during run, it is marked with AVZR - at which R shows this feature.

Depending on design four executions of pumps are available. A normal design is shown on A sketch. An electro-motor is by means of its pedestal directly fastened to the pump. At very capacious pumping units. the motor is fixed to the engine-room floor (B.. sketch). If necessary, the complete pump can be hung upon the motor pedestal (C sketch). If the lift between the pump discharge elbow and the engine-room floor is large, the execution D is recommended to be applied.

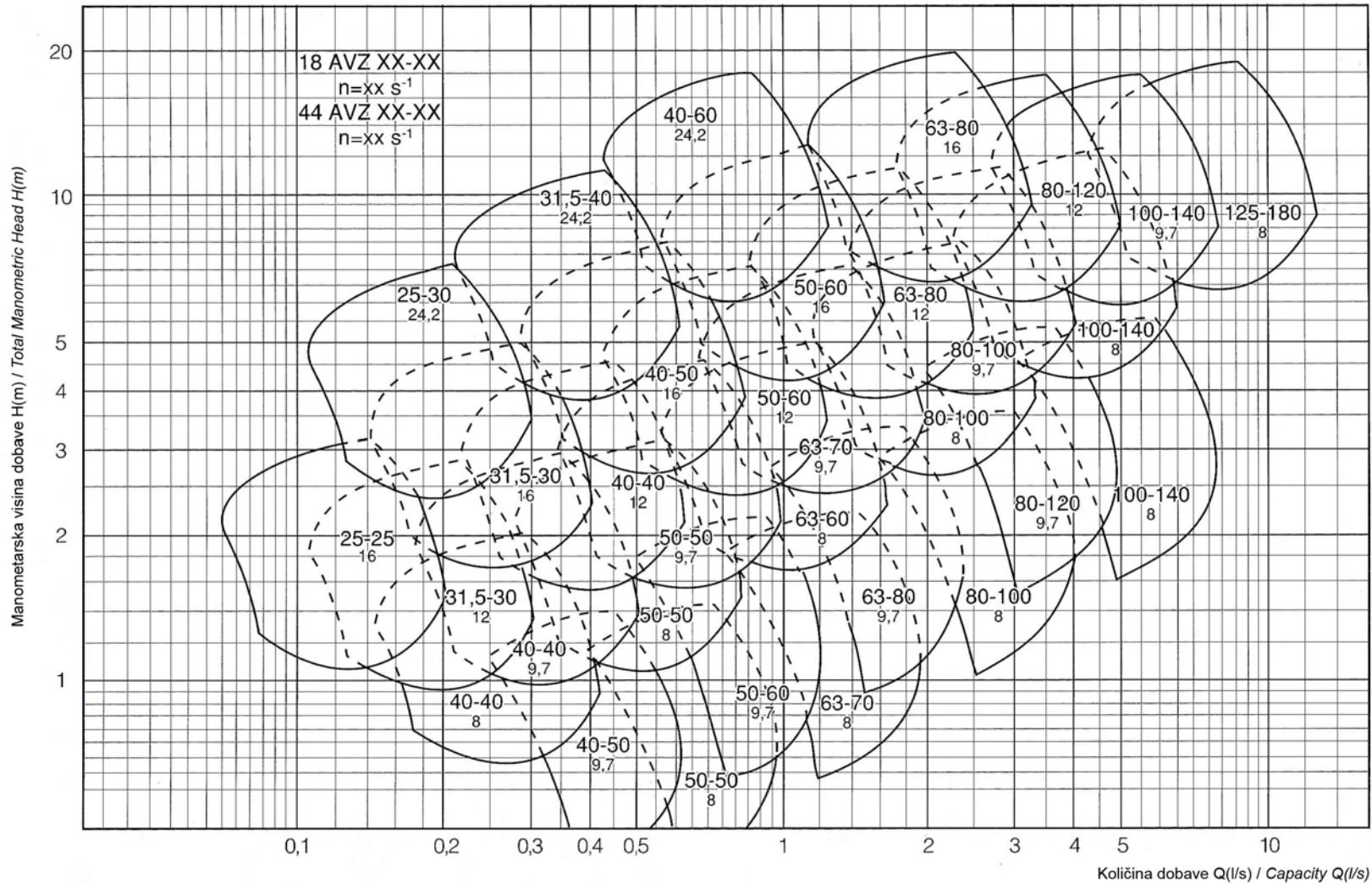
All pump elements are identical for these four designs, except in the C execution, at which the discharge elbow has no support. Unless an access to the lower pump space is not provided from a side, the upper opening in the engine-room floor has to be large enough to enable the pump discharge elbow to pass through it.

Measuring data for the A execution are given on the sketch and they can be also applied to all other executions, but dimensions L , L_1 , H_1 , H_2 and H_3 which are directed by design itself.



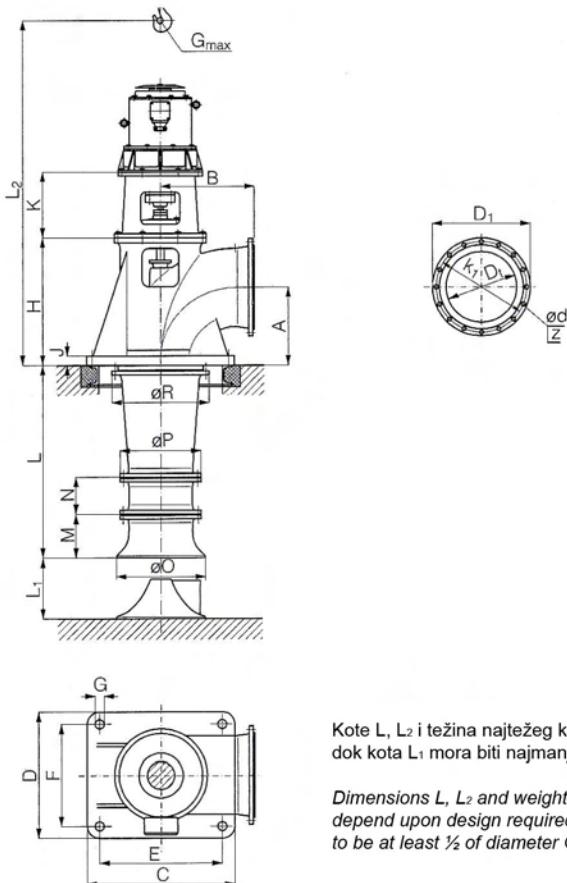
Područja dobave pumpi tipa AVZ i AVZR

Ranges Of Supply – Pumps Type AVZ and AVZR



Mjerna skica pumpi tipa AVZ i AVZR
Measuring Sketch Of Pumps Type AVZ and AVZR

(Crtano za A izvedbu)
(Drawn for A execution)



Kote L, L₂ i težina najtežeg komada G_{max} ovise o projektu, dok kota L₁ mora biti najmanje $\frac{1}{2}$ promjera O.

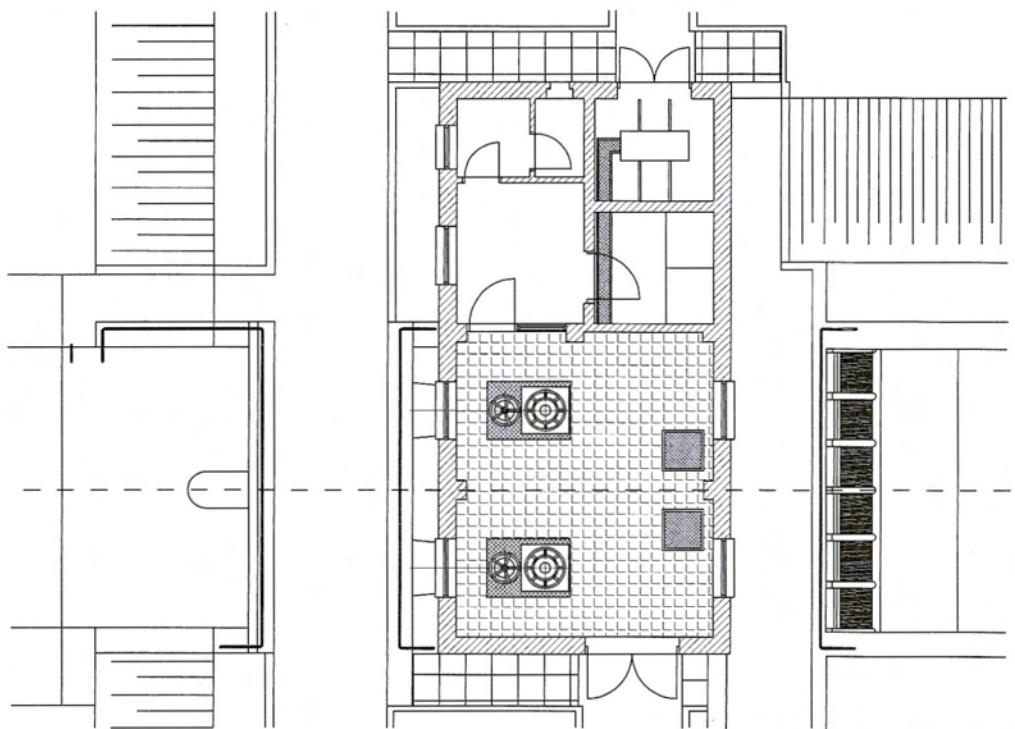
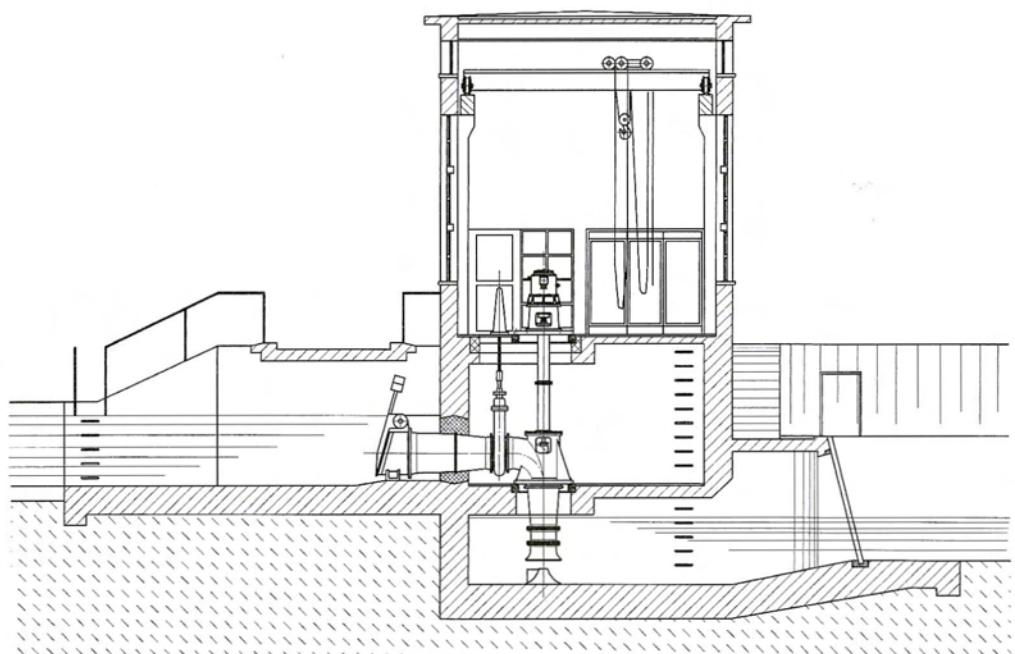
Dimensions L, L₂ and weight of the heaviest piece G_{max} depend upon design required, since the dimension L₁ has to be at least $\frac{1}{2}$ of diameter O.

	AVZ												AVZ i AVZR				
	25-25	25-30	31,5-30	31,5-40	36-40	40-40	40-50	40-60	50-50	50-60	63-60	63-70	63-80	80-100	80-120	100-140	125-180
A	250	300	300	400	400	400	500	600	500	600	620	715	800	1000	1200	1400	1800
B	300	400	400	500	500	450	500	600	500	600	620	700	800	1000	1200	1400	1800
C	620	700	700	550	550	800	1050	1050	1050	1050	1130	1180	1400	1600	1800	2100	2500
D	620	700	700	780	780	800	1015	920	1015	920	1130	1180	1050	1600	1800	2100	2500
E	560	600	600	450	450	720	970	950	970	950	1070	1080	1280	1500	1680	1950	2340
F	560	600	600	720	720	720	935	860	935	860	1070	1080	930	1500	1680	1950	2340
G	27	27	27	27	27	33	27	27	27	27	27	33	39	33	39	45	45
H	500	600	600	670	670	700	920	980	900	980	980	1350	1300	1750	1850	2200	2500
J	30	30	30	35	35	40	45	50	40	50	40	40	45	45	45	50	60
K	295	325	444	474	364	373	480	615	480	560	600	600	600	752	800	850	1000
M	195	195	230	230	260	300	300	300	365	365	445	445	445	650	650	880	980
N	150	150	200	200	220	240	240	240	285	285	400	400	400	440	440	620	810
O	380	380	480	480	550	620	620	620	760	760	980	980	980	1250	1250	1500	1880
P	370	370	430	430	480	535	535	535	640	640	810	810	810	1000	1000	1190	1500
R	370	445	430	530	520	535	630	755	670	755	780	860	970	1175	1455	1650	2115
Dt	250	300	300	400	400	400	500	600	500	600	600	700	800	1000	1200	1400	1800
D1	395	445	445	565	565	565	670	780	670	780	780	895	1015	1230	1455	1675	2115
k1	350	400	400	515	515	515	620	725	620	725	725	840	950	1160	1380	1590	2020
d	23	23	23	27	27	27	27	30	27	30	30	30	33	36	39	42	48
z	12	12	12	16	16	16	20	20	20	20	20	24	24	28	32	36	44

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

Idejni projekt melioracione pumpne stanice
s dvije ugrađene propelerne pumpe

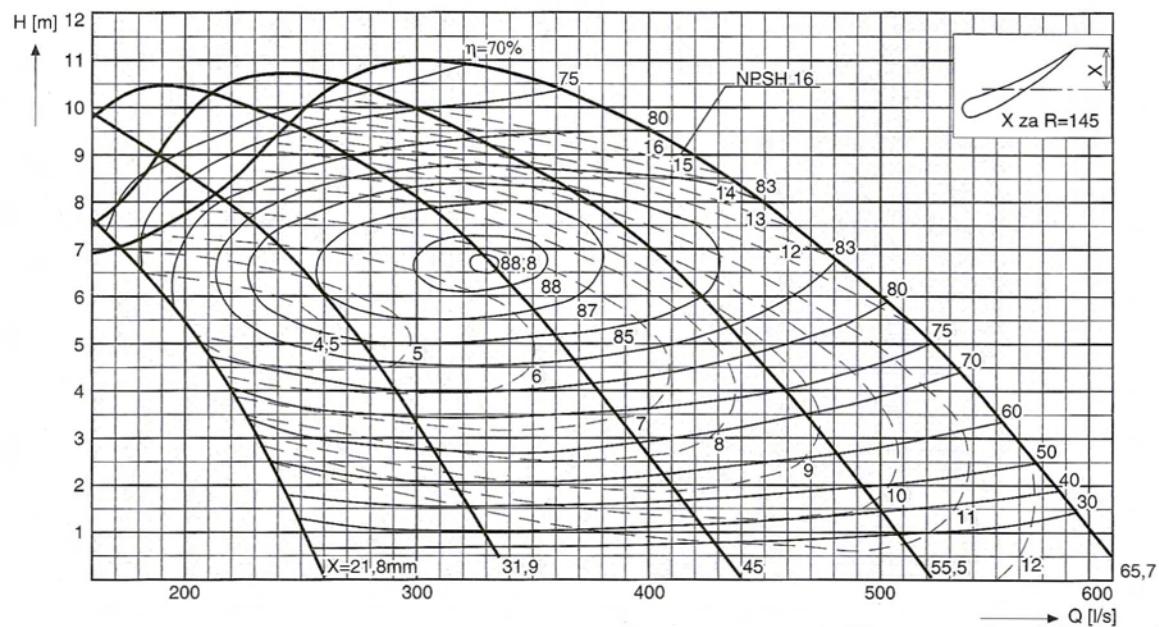
*Disposition Of An Irrigation Pump Plant
With Two Propeller Pumps Installed*



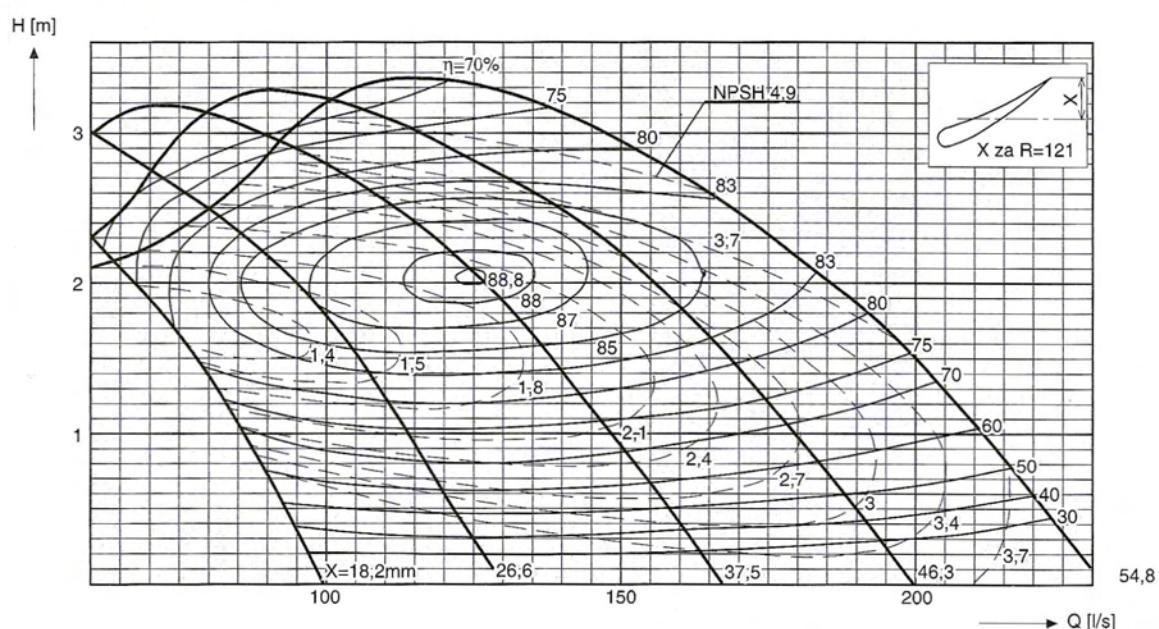
Pojedinačni dijagrami

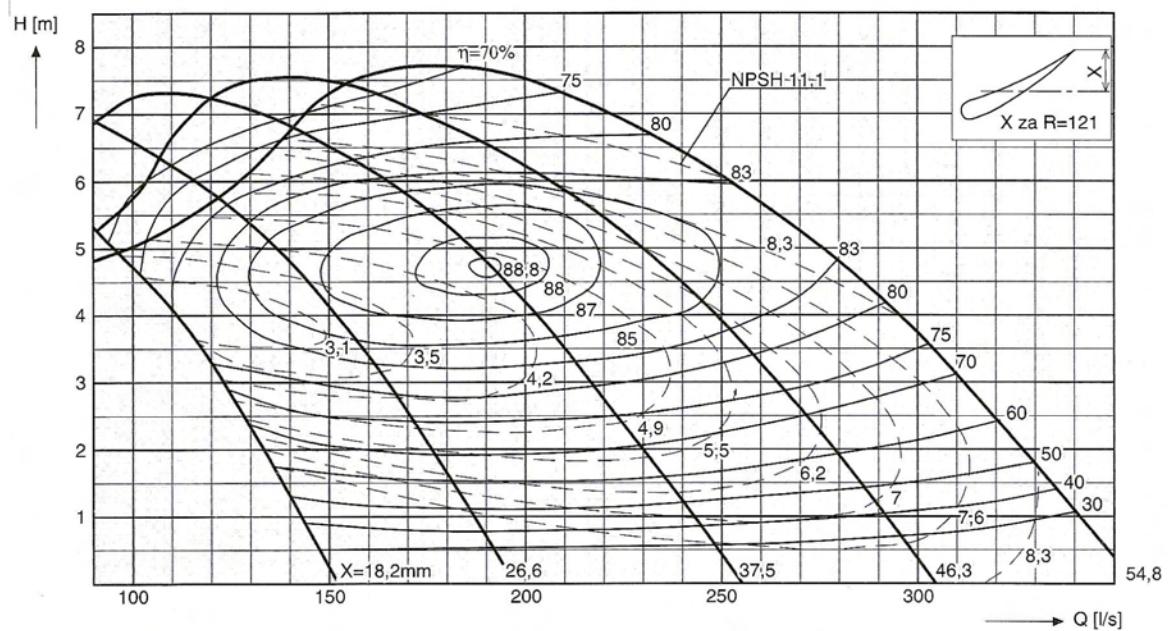
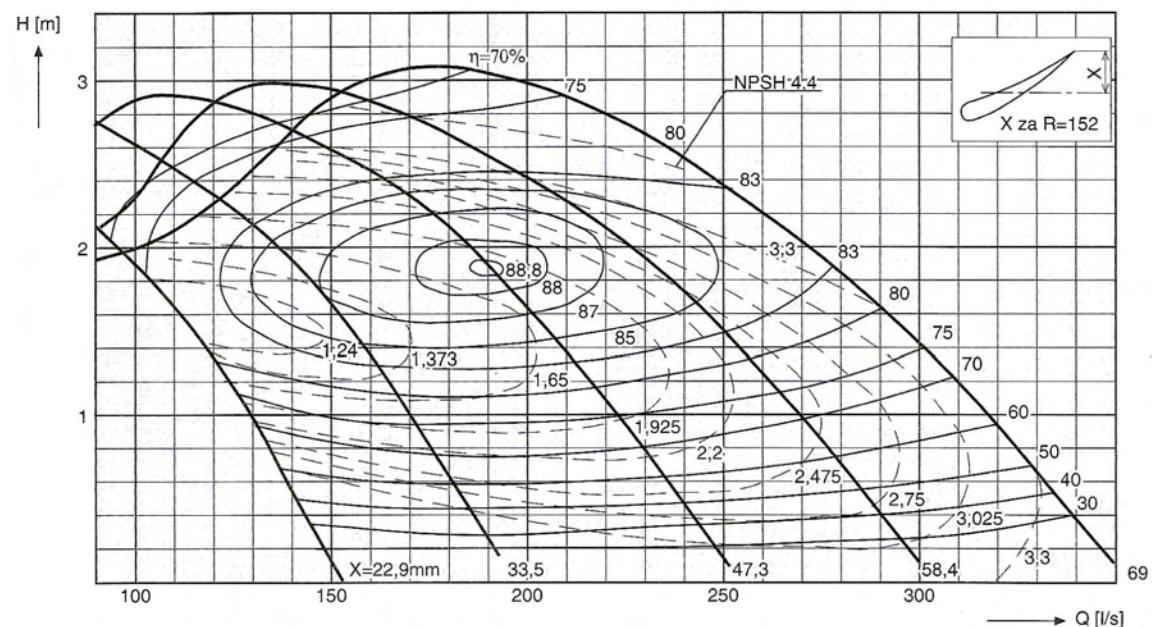
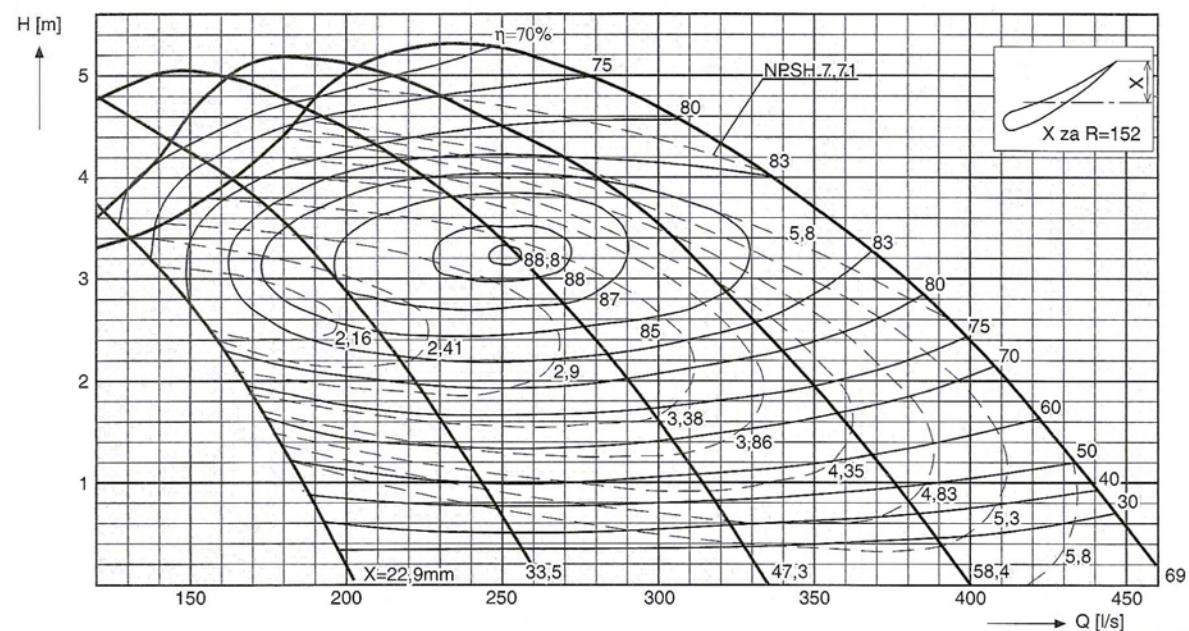
Single Diagrams

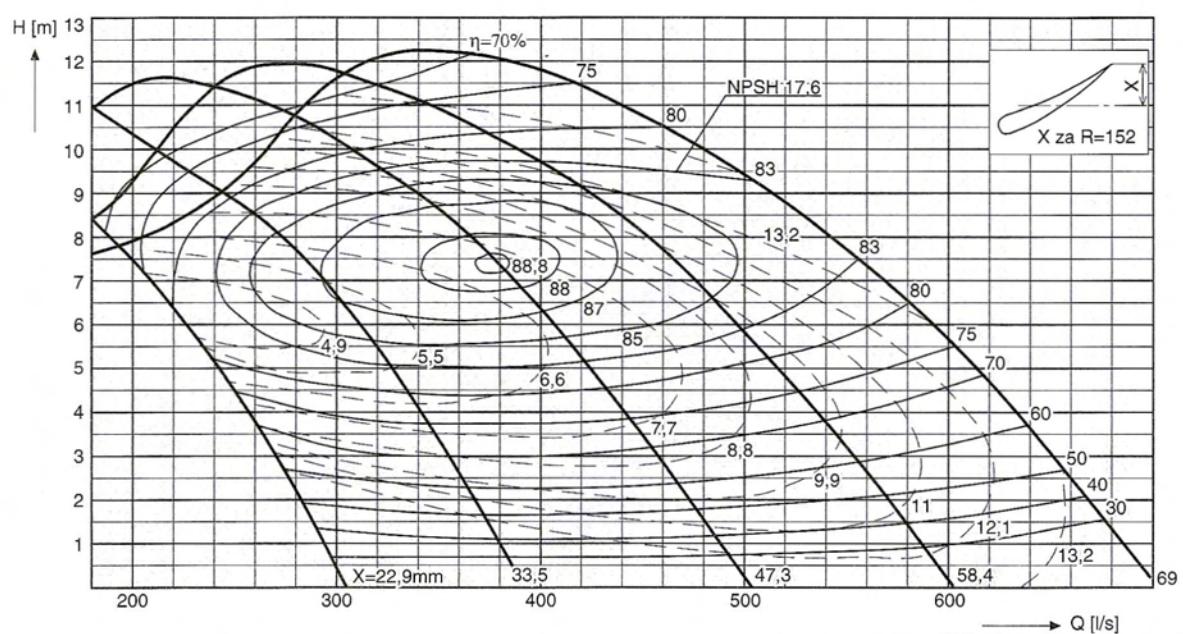
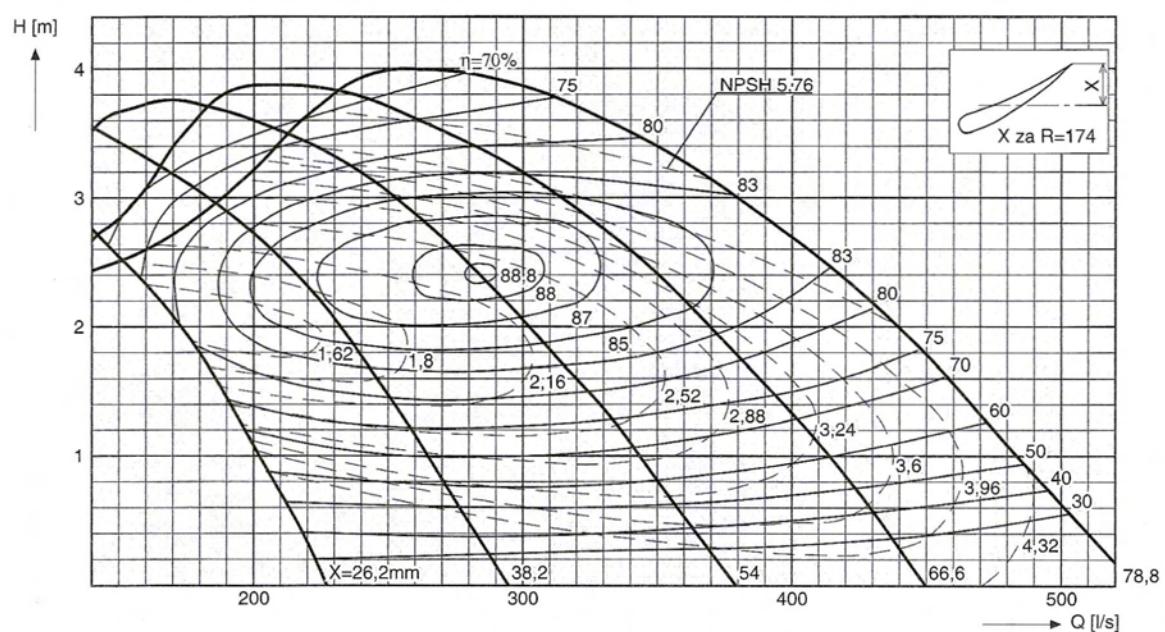
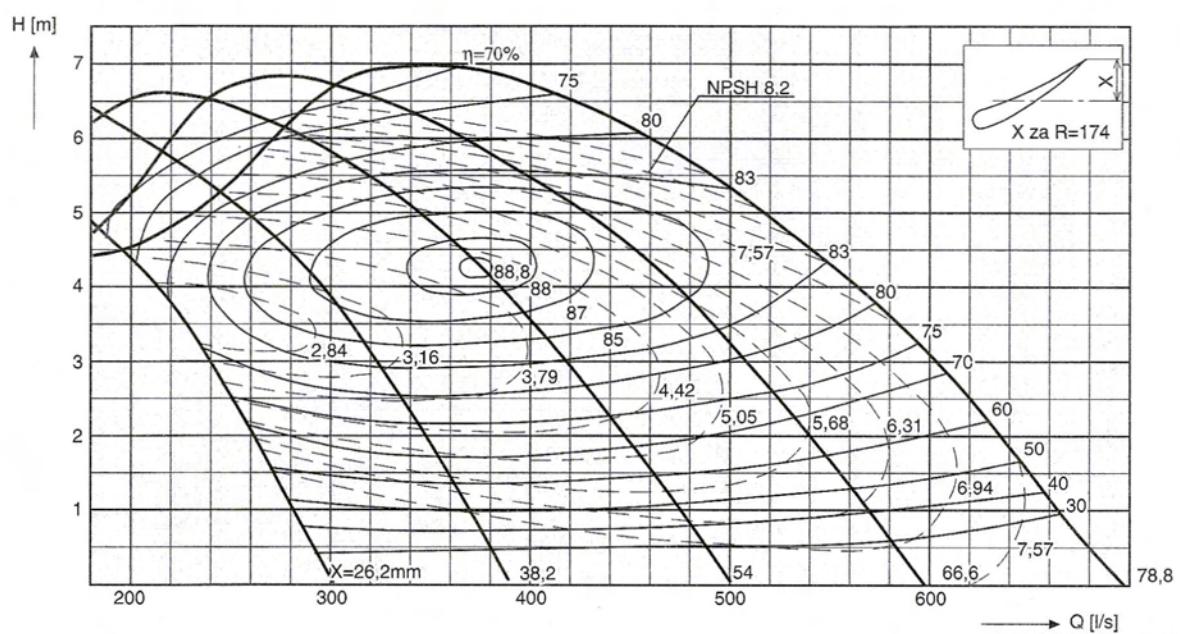
18 AVZ 30-30

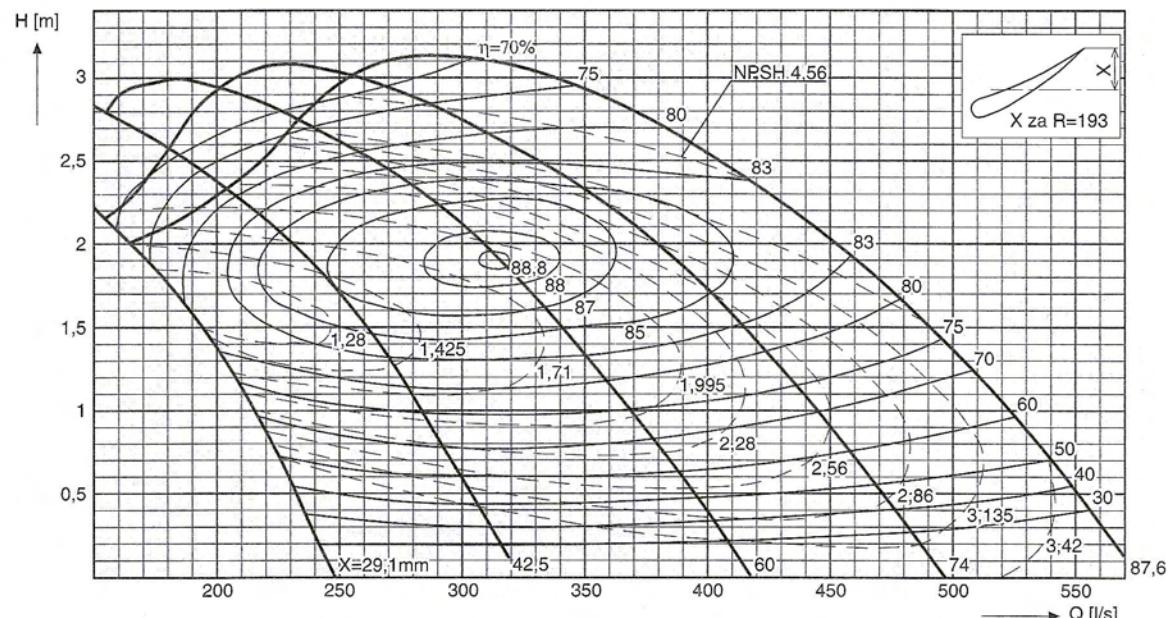
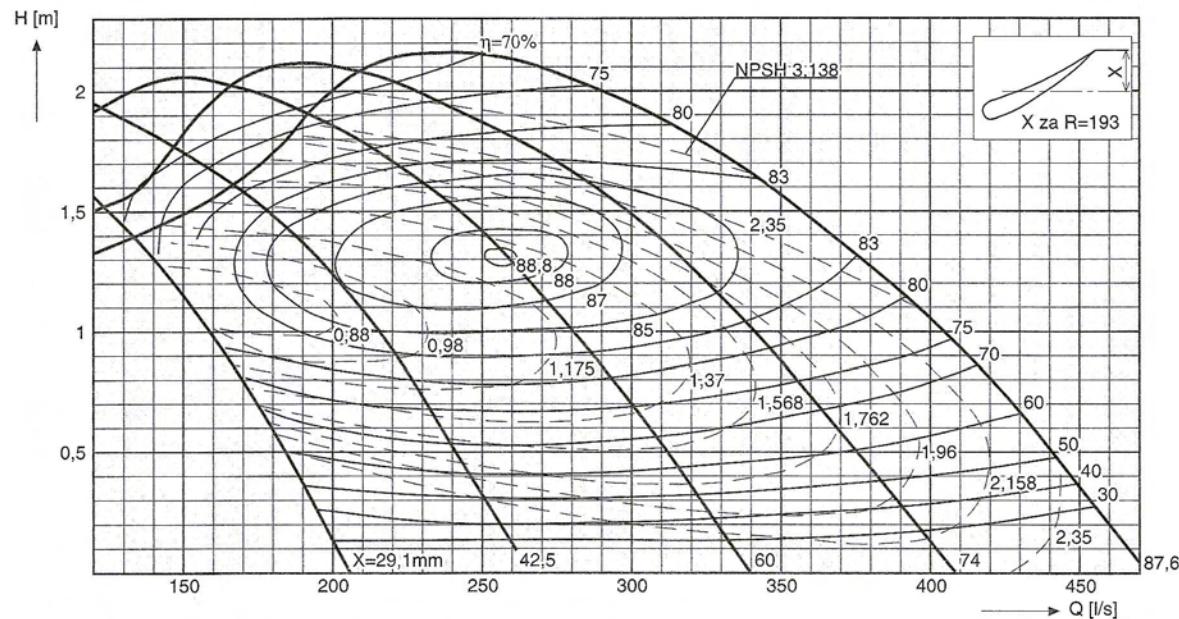
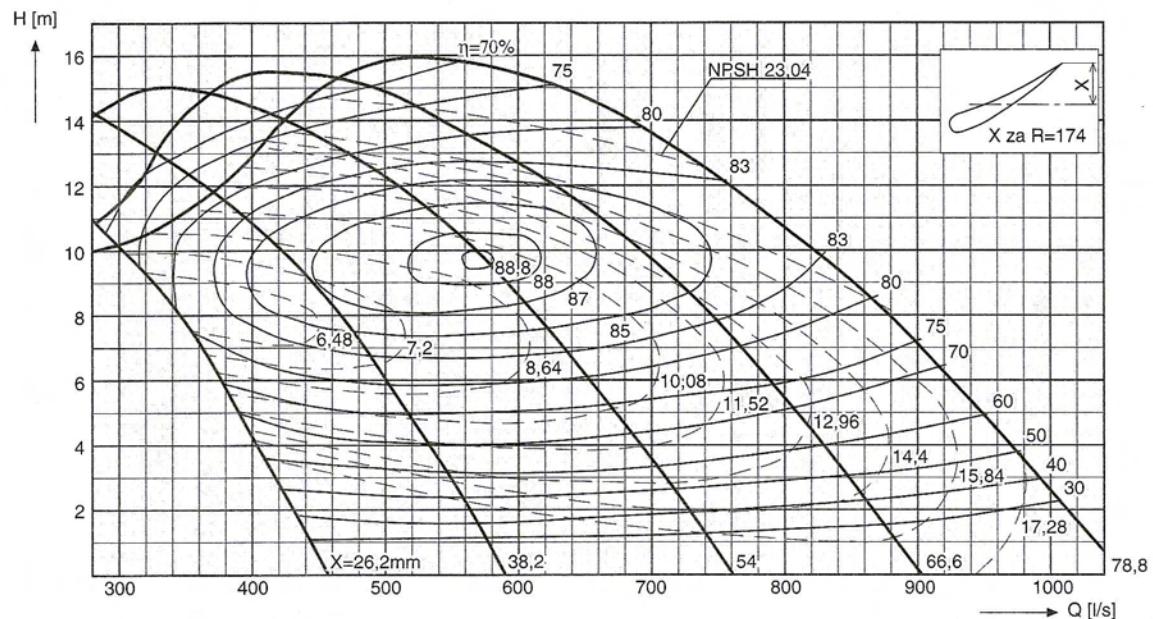


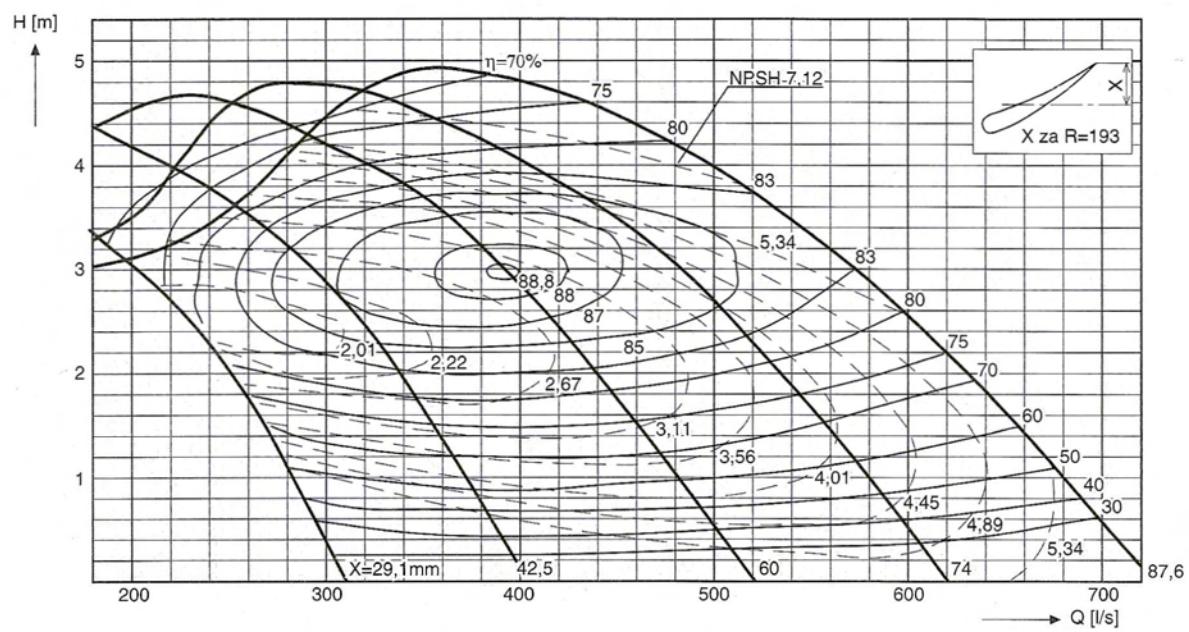
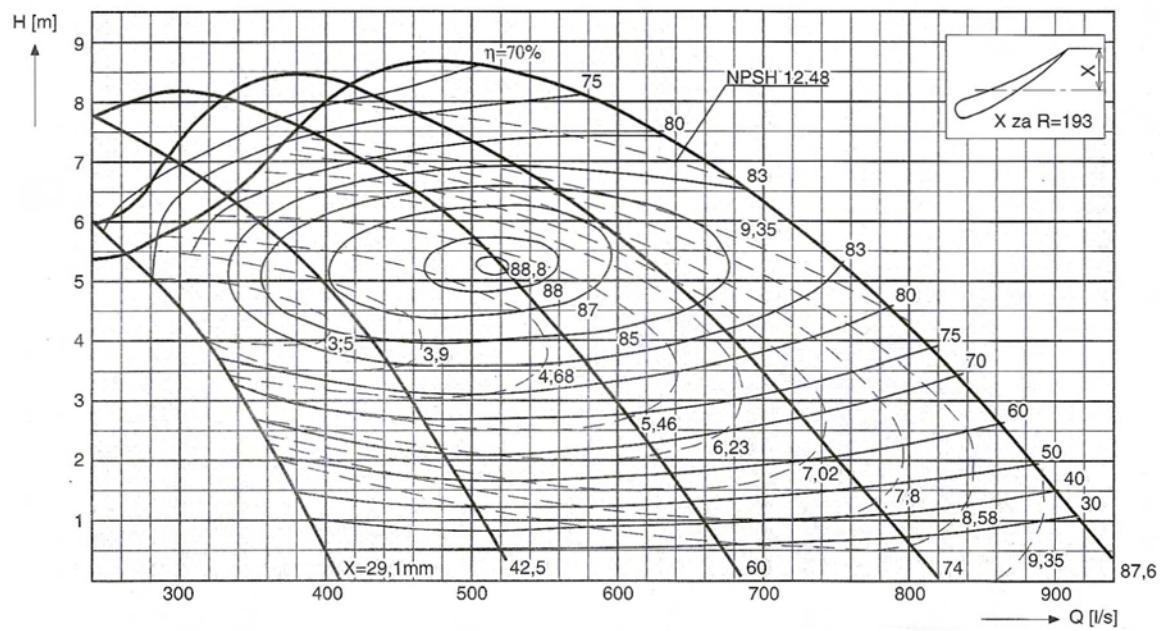
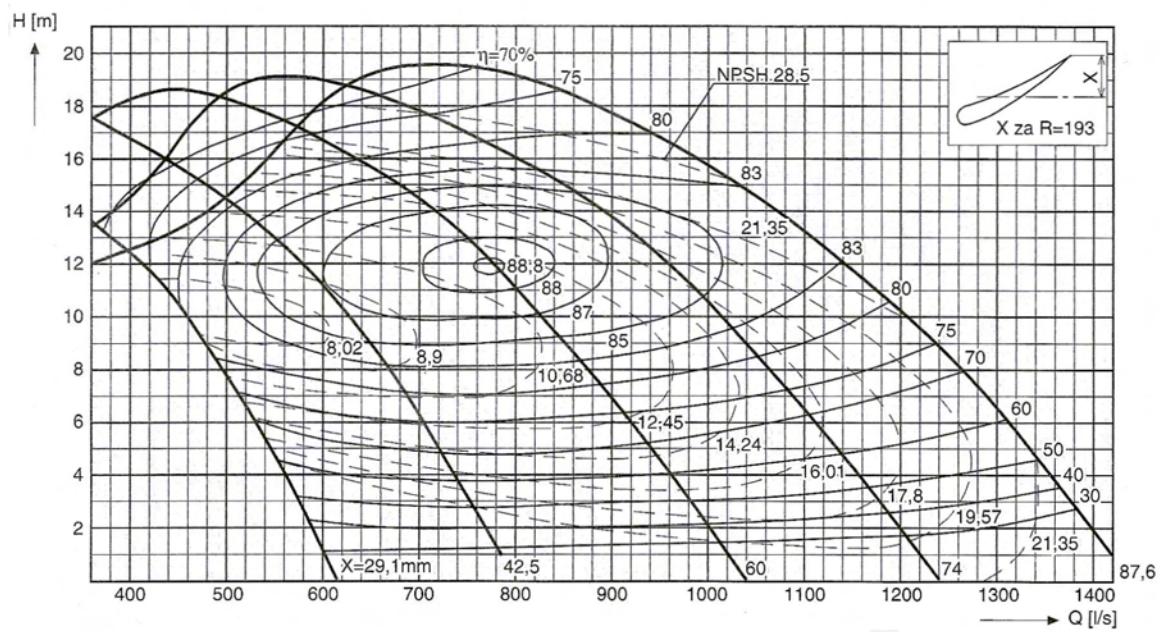
18 AVZ 25-25

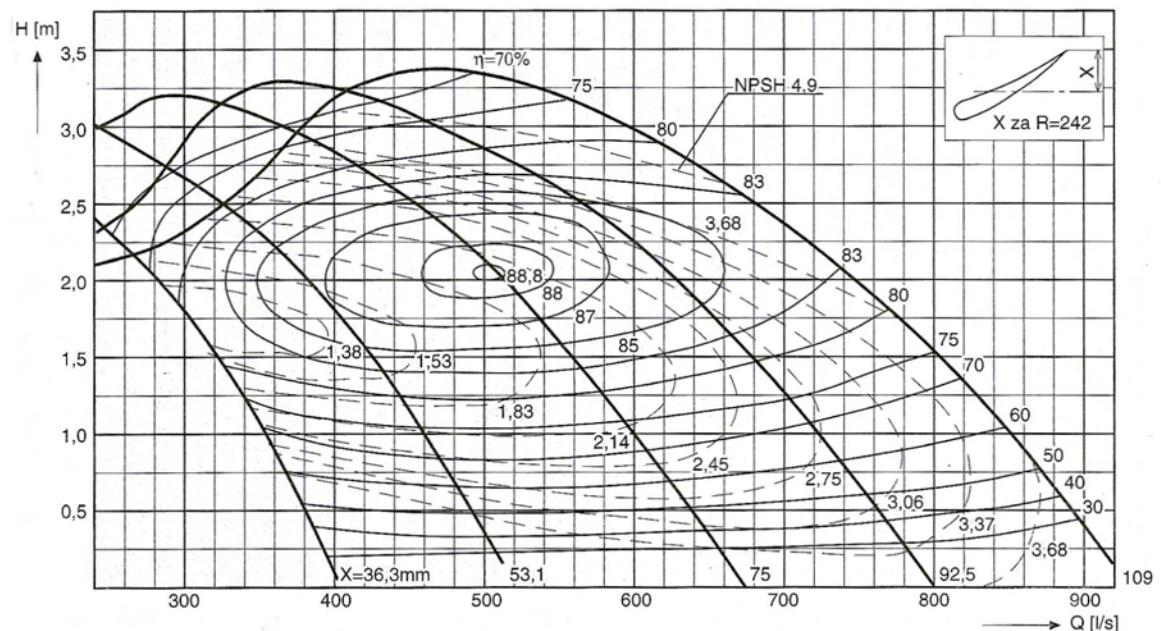
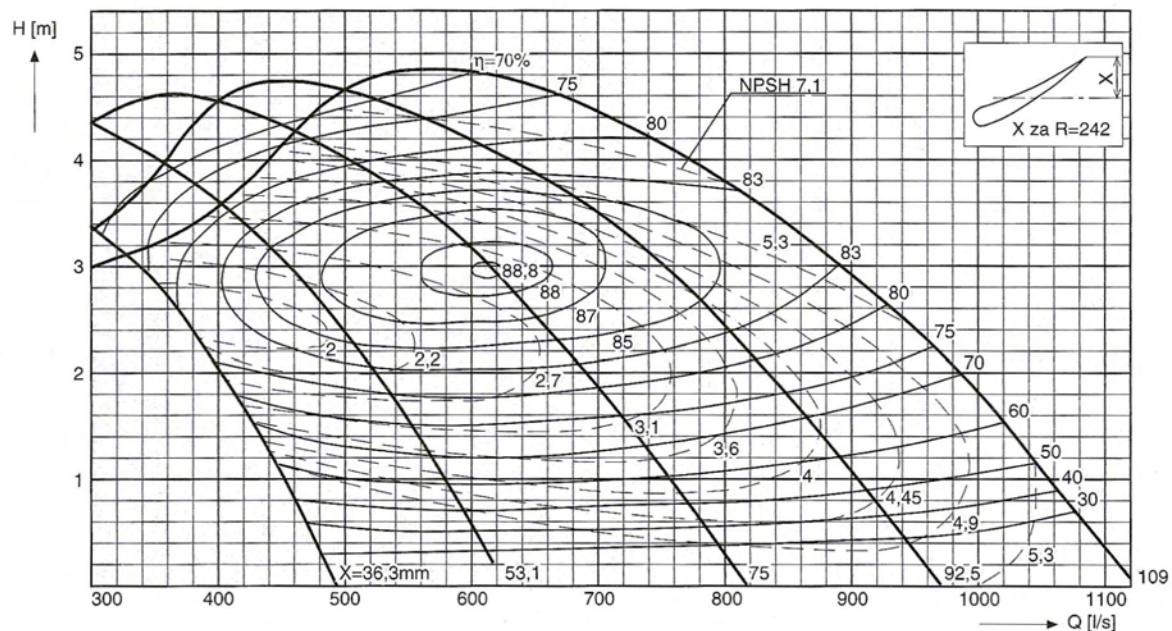
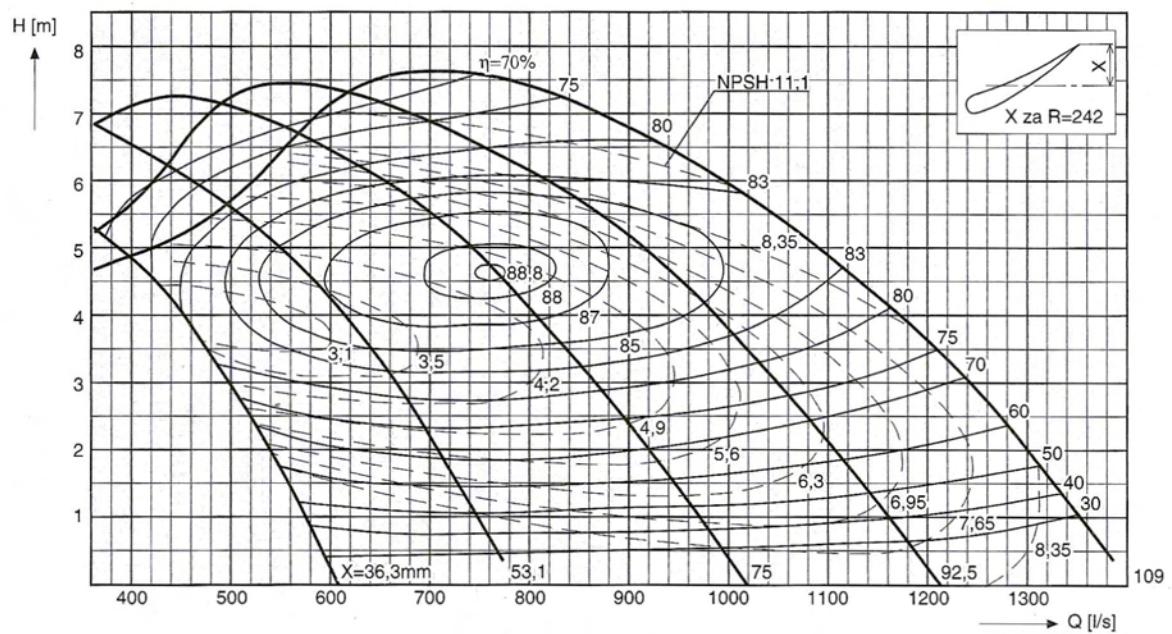


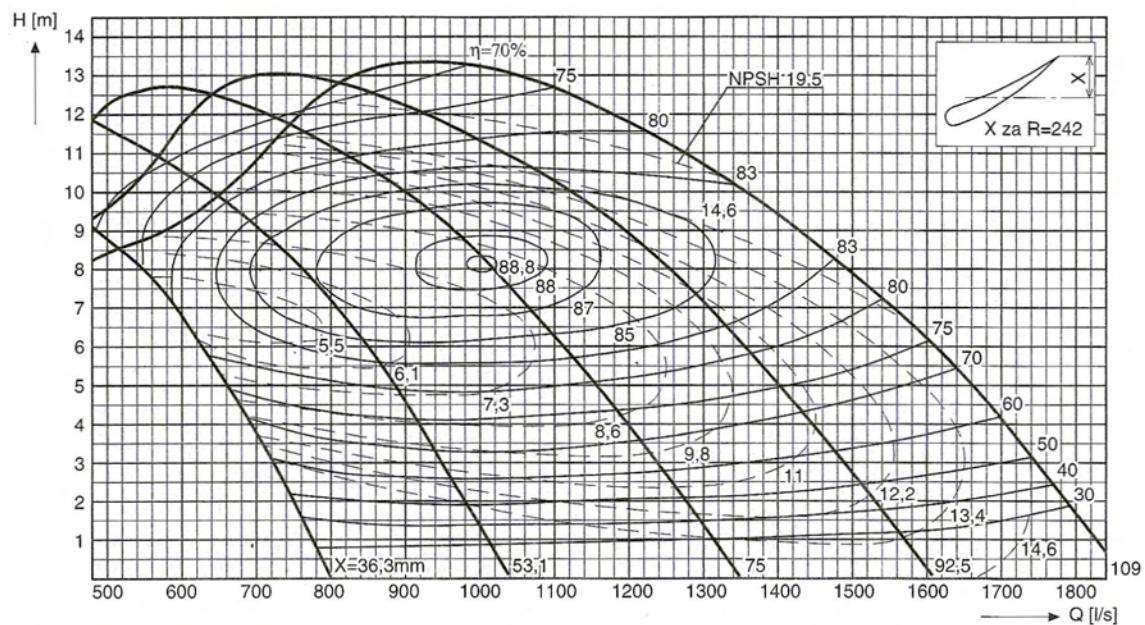
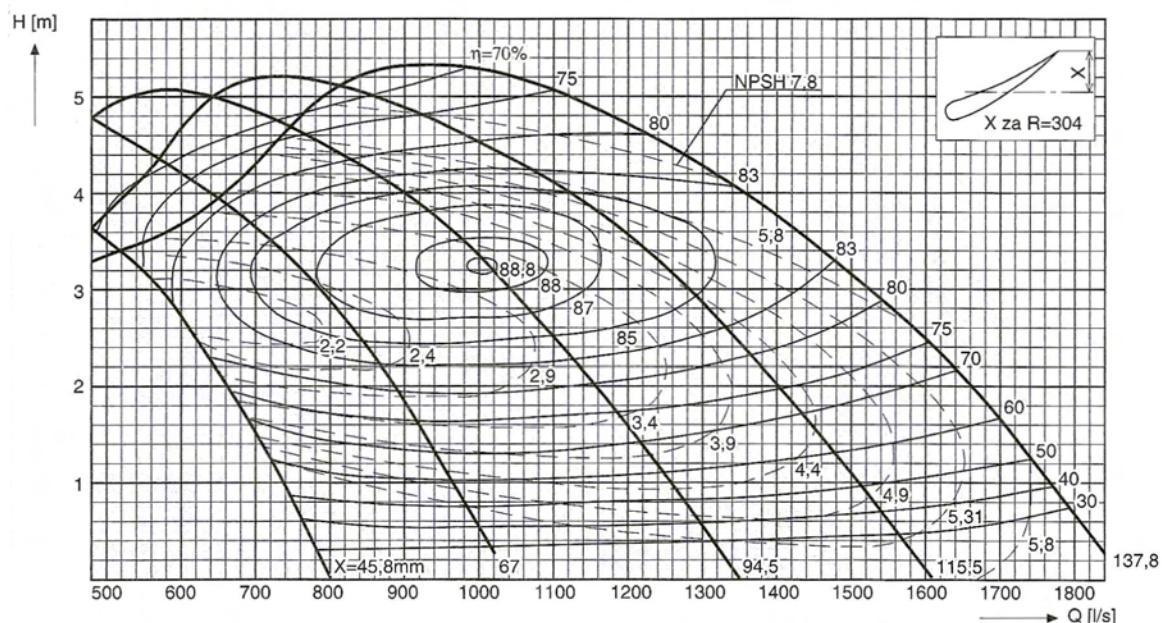
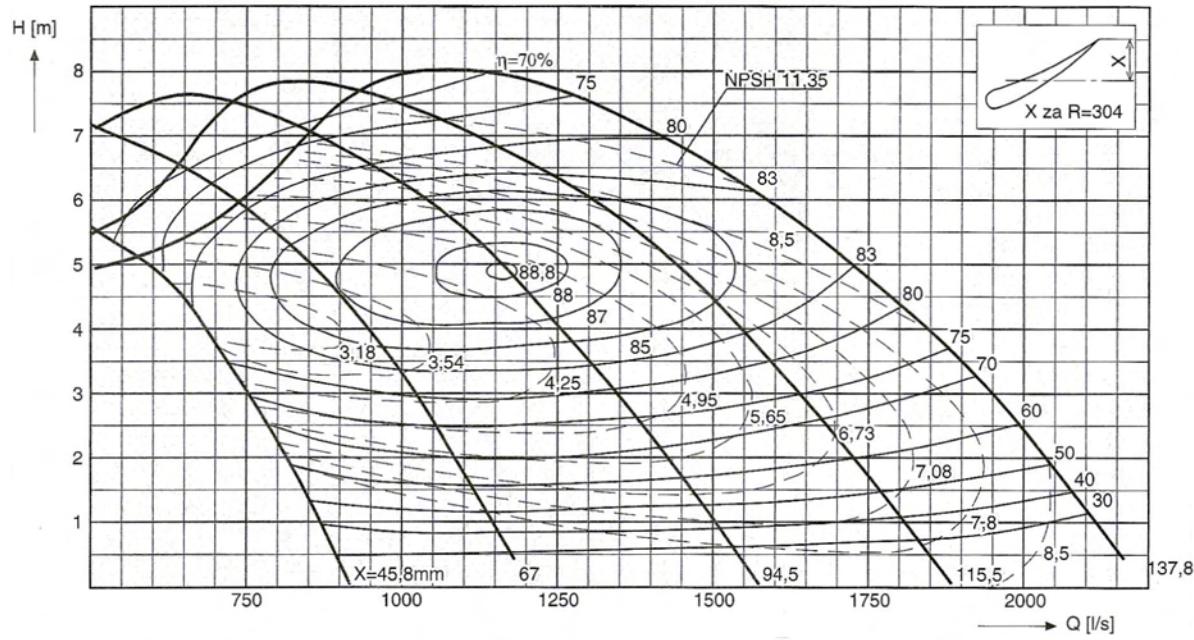
18 AVZ 25-30 $n=24,2\text{s}^{-1}$ **18 AVZ 31,5-30** $n=12\text{s}^{-1}$ **18 AVZ 31,5-30** $n=16\text{s}^{-1}$ 

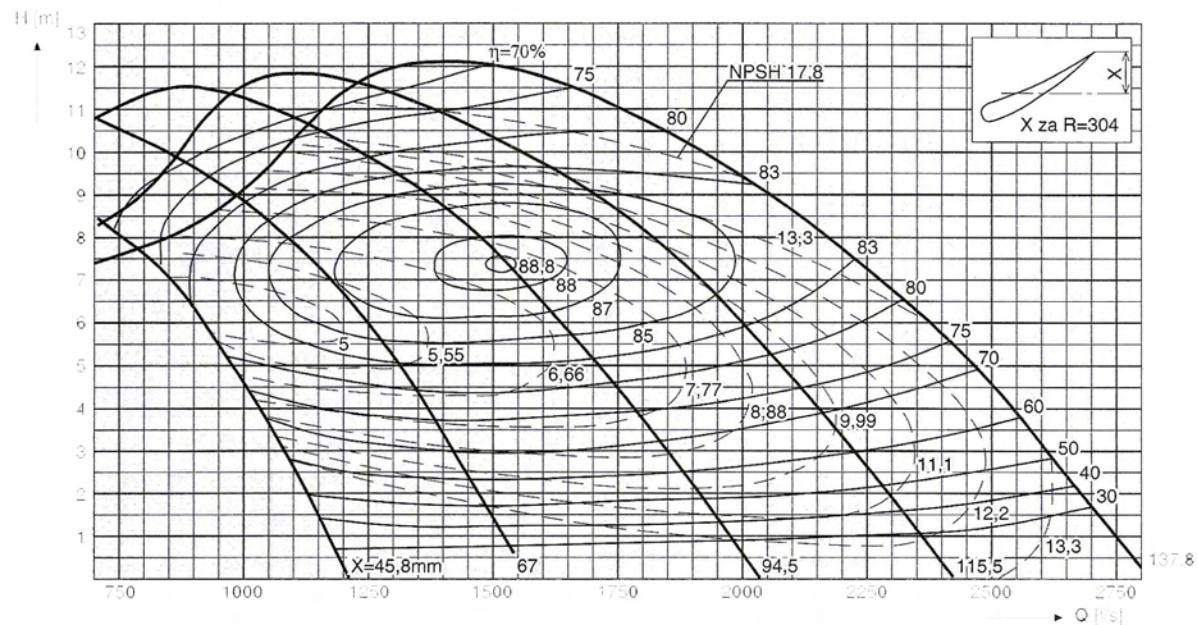
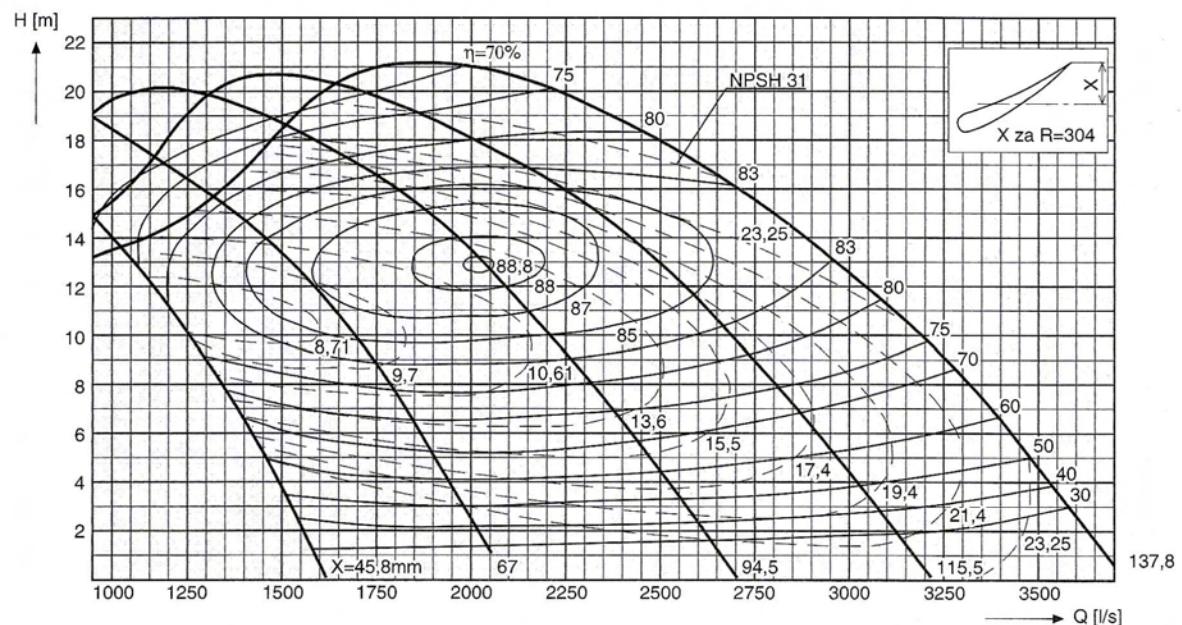
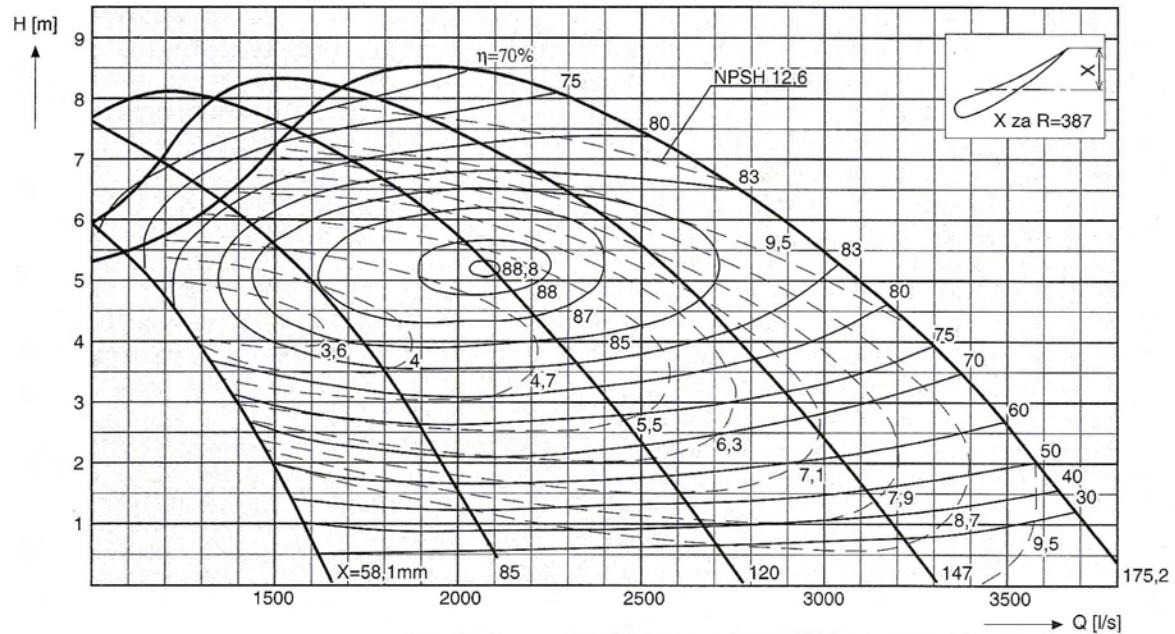
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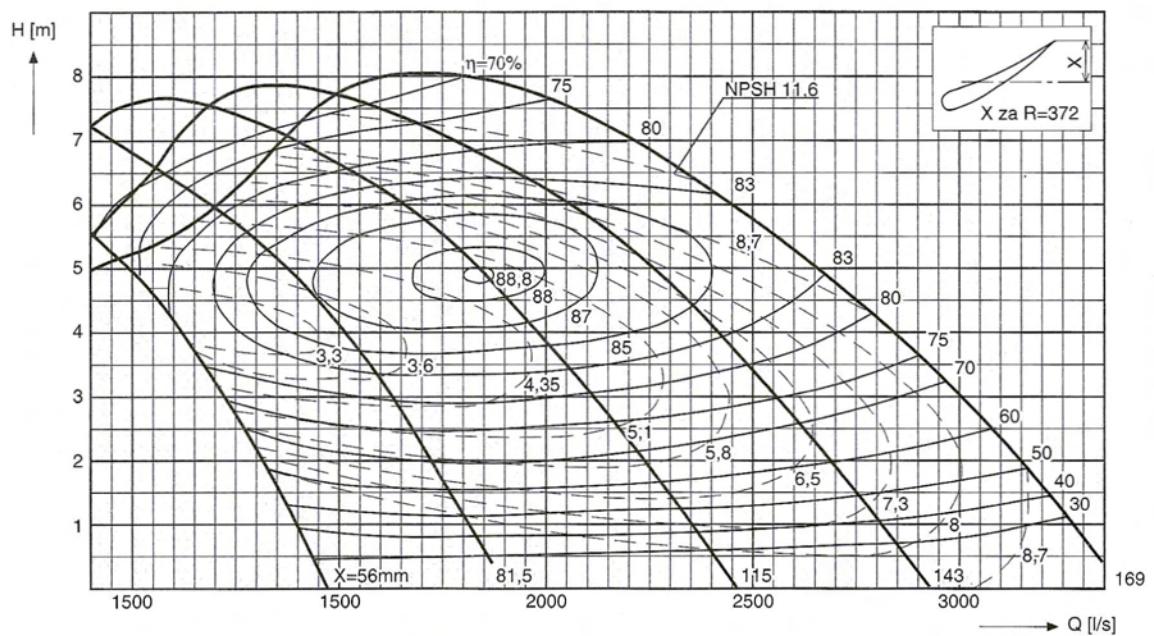
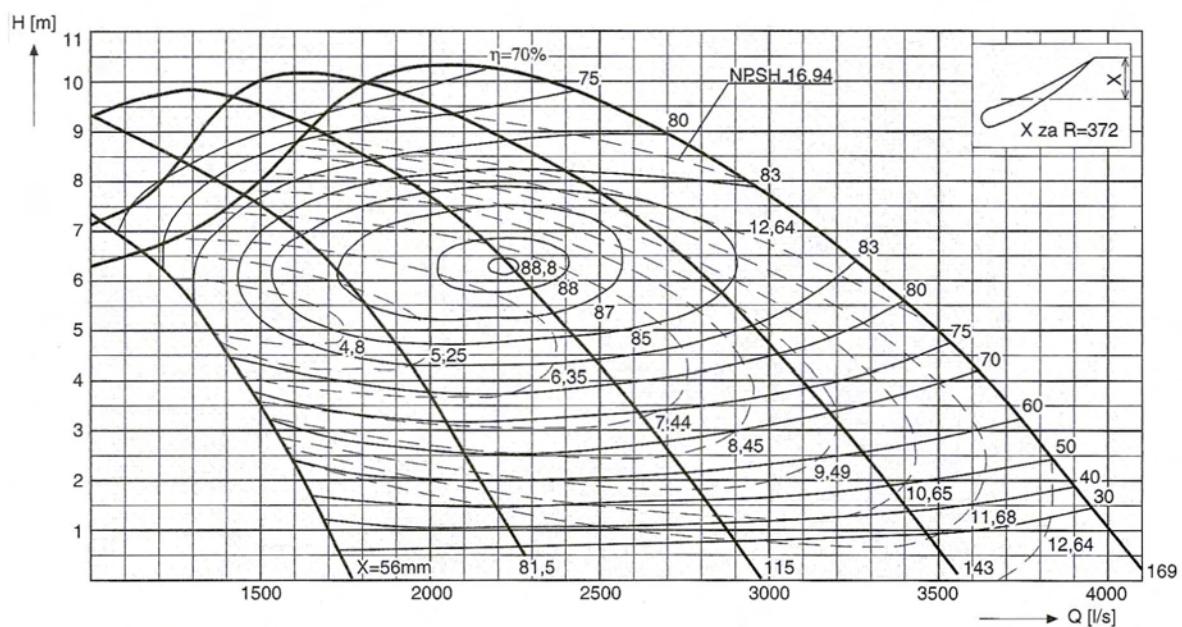
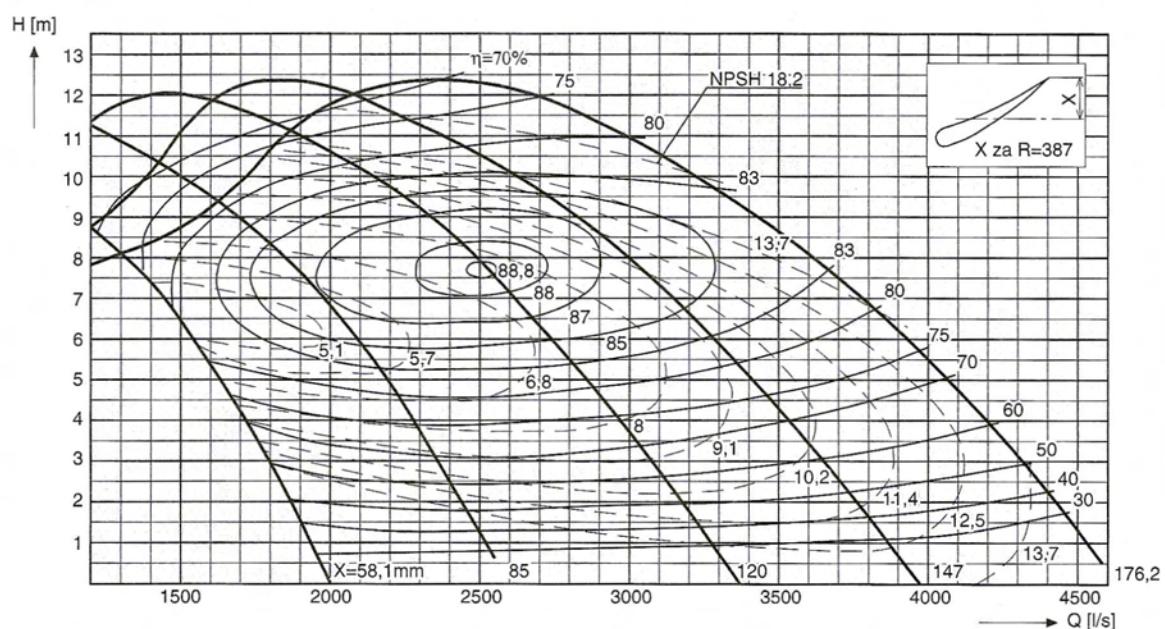


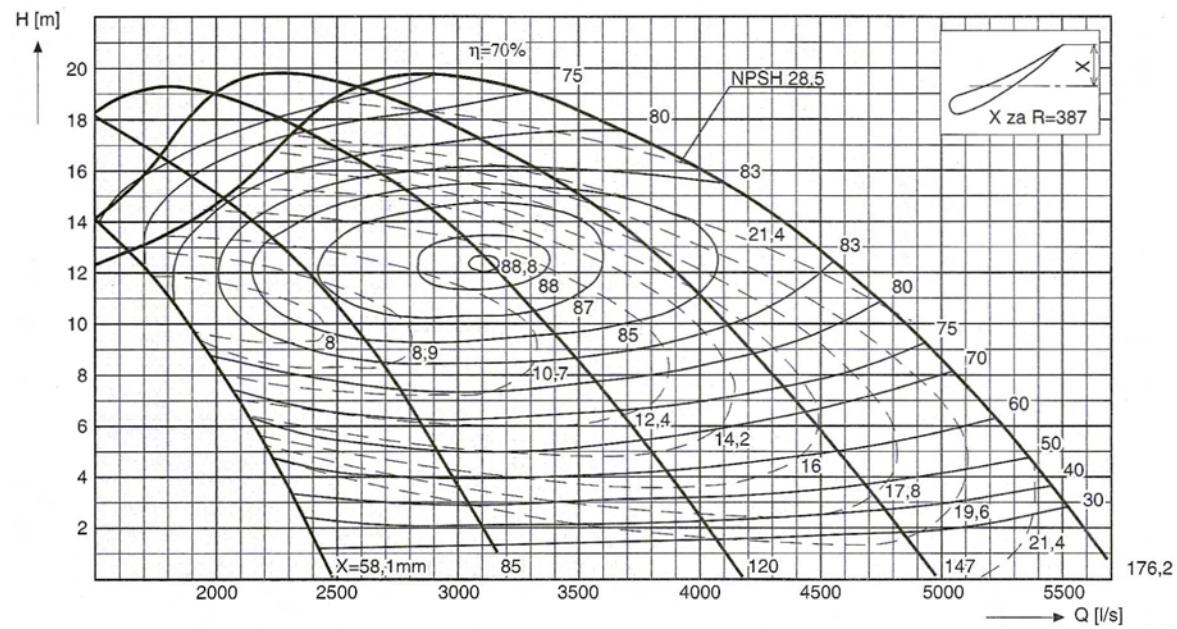
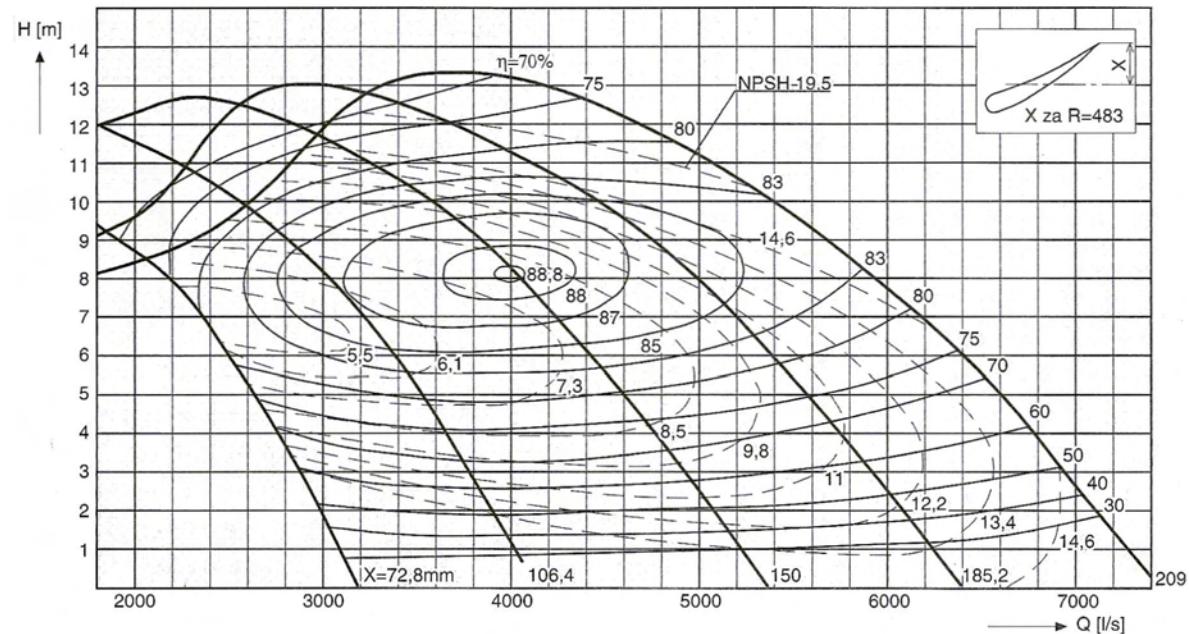
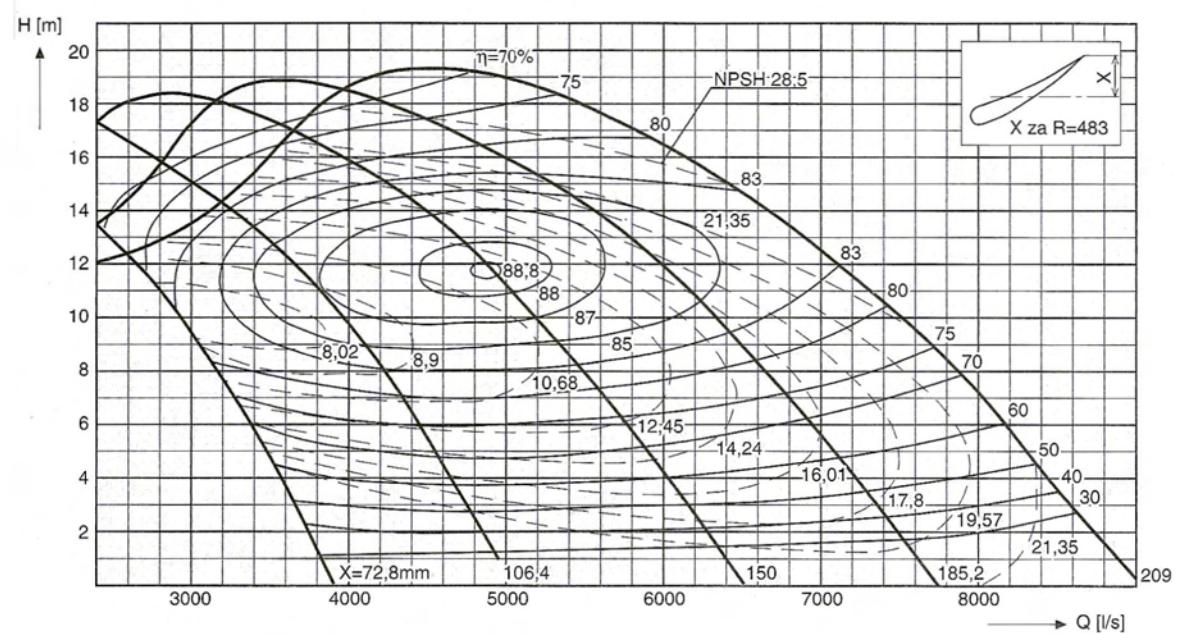
18 AVZ 40-40 $n=12\text{s}^{-1}$ **18 AVZ 40-50** $n=16\text{s}^{-1}$ **18 AVZ 40-60** $n=24.2\text{s}^{-1}$ 

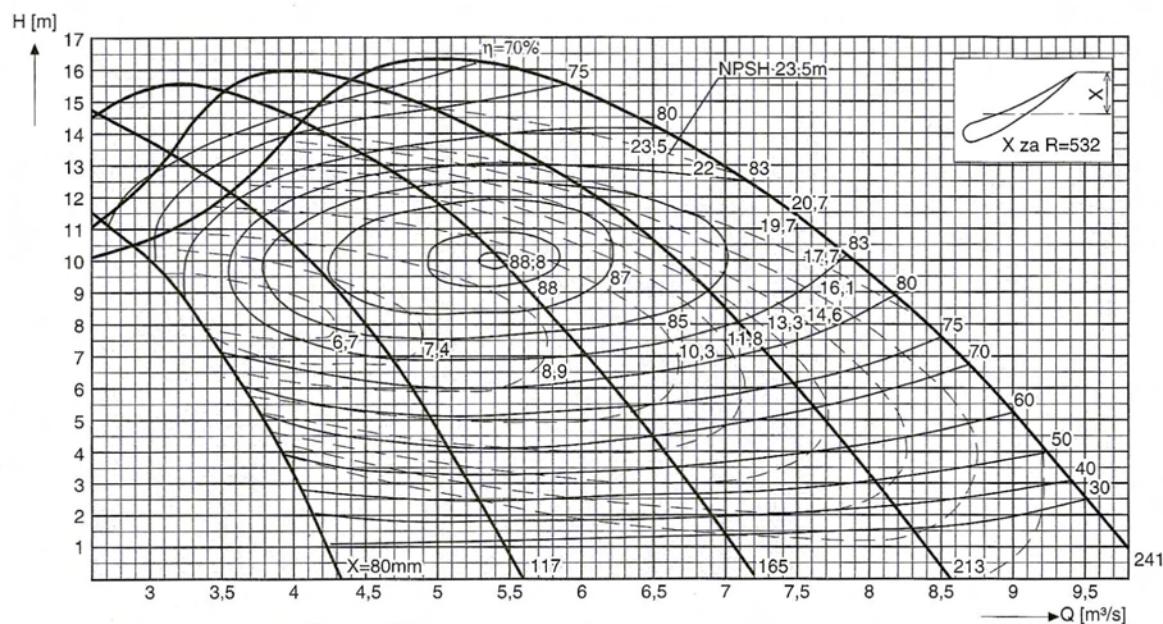
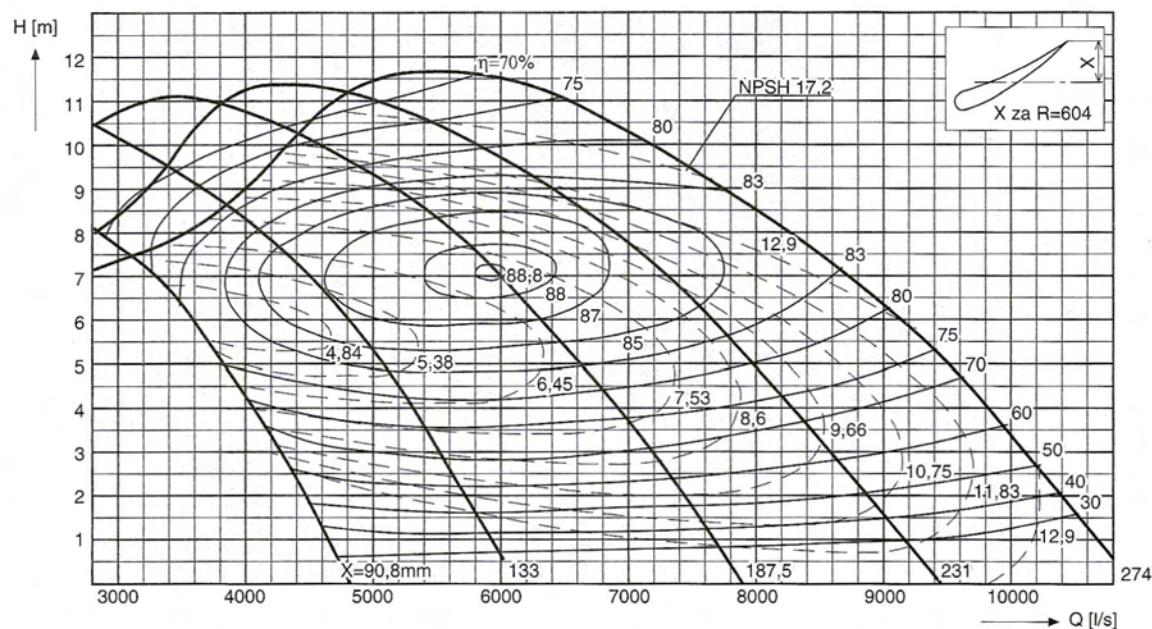
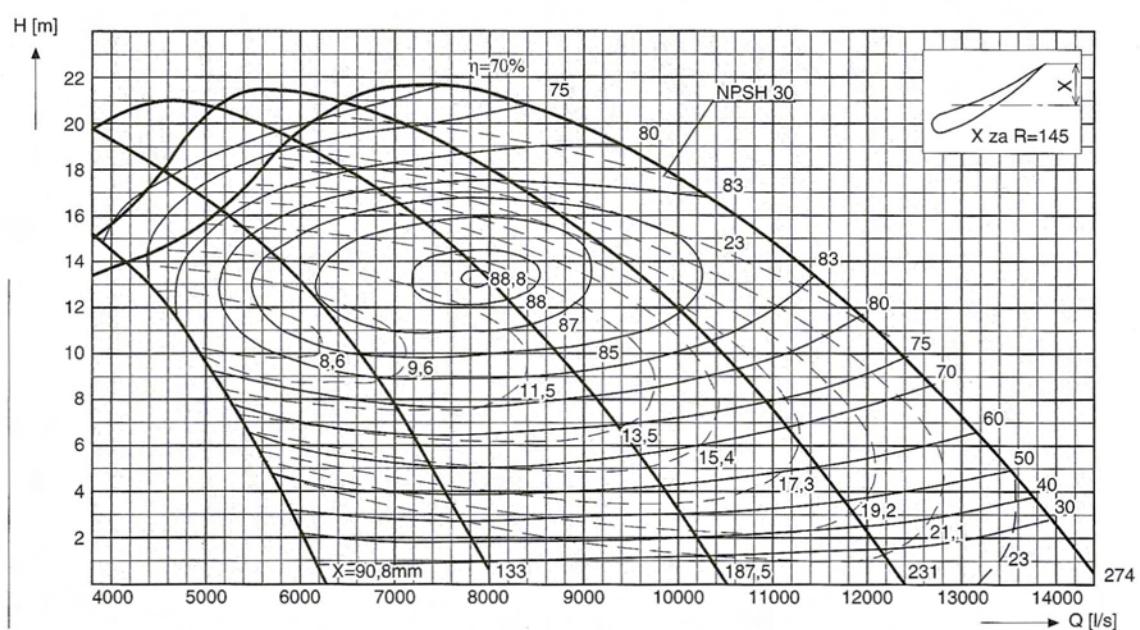
18 AVZ 50-50 $n=8\text{s}^{-1}$ **18 AVZ 50-50** $n=9.7\text{s}^{-1}$ **18 AVZ 50-60** $n=12\text{s}^{-1}$ 

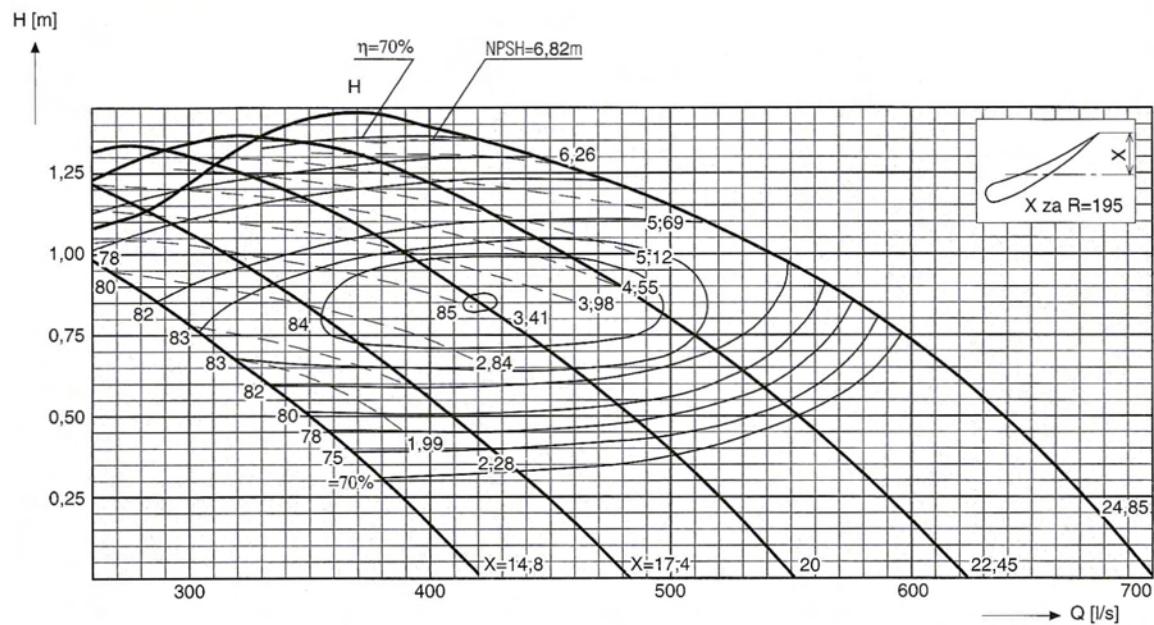
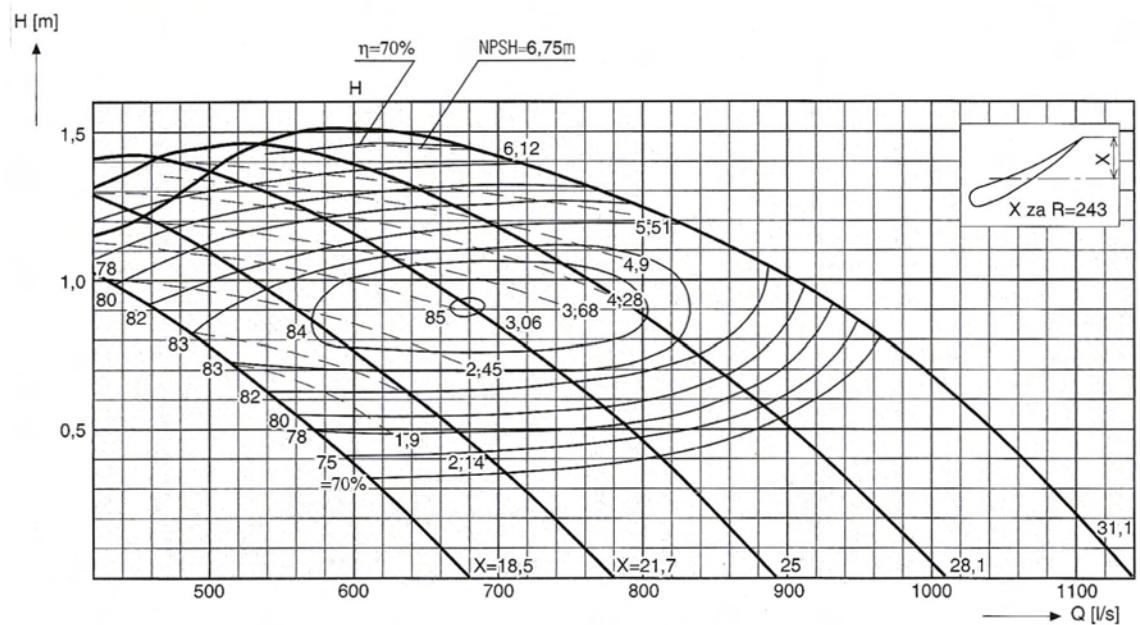
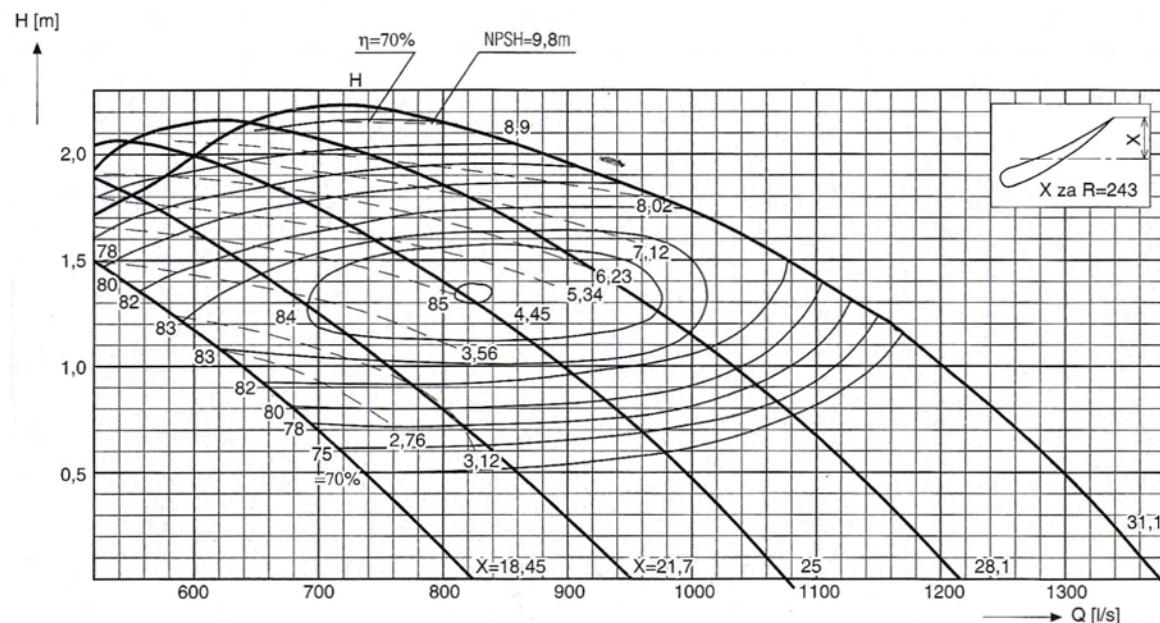
18 AVZ 50-60 $n=16\text{s}^{-1}$ **18 AVZ 63-60** $n=8\text{s}^{-1}$ **18 AVZ 63-70** $n=9.7\text{s}^{-1}$ 

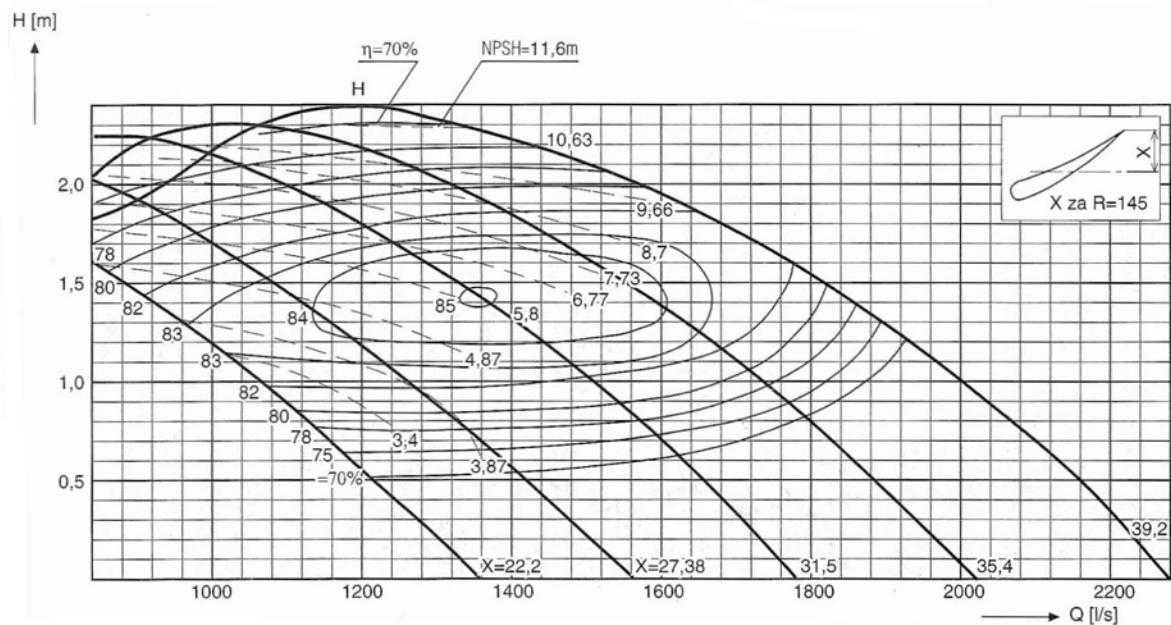
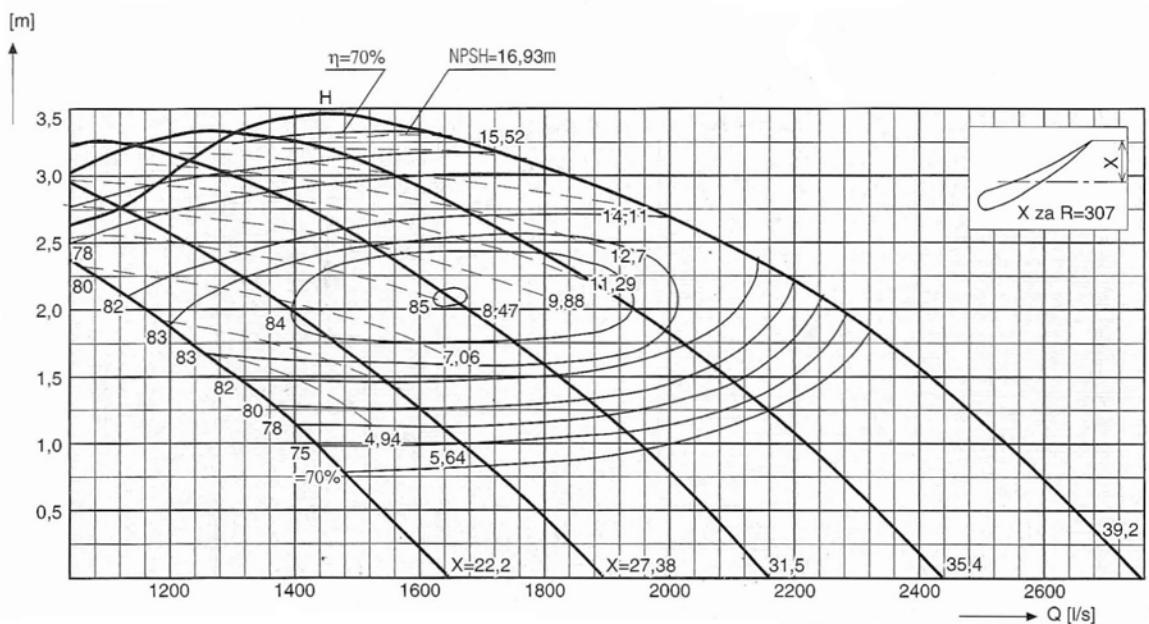
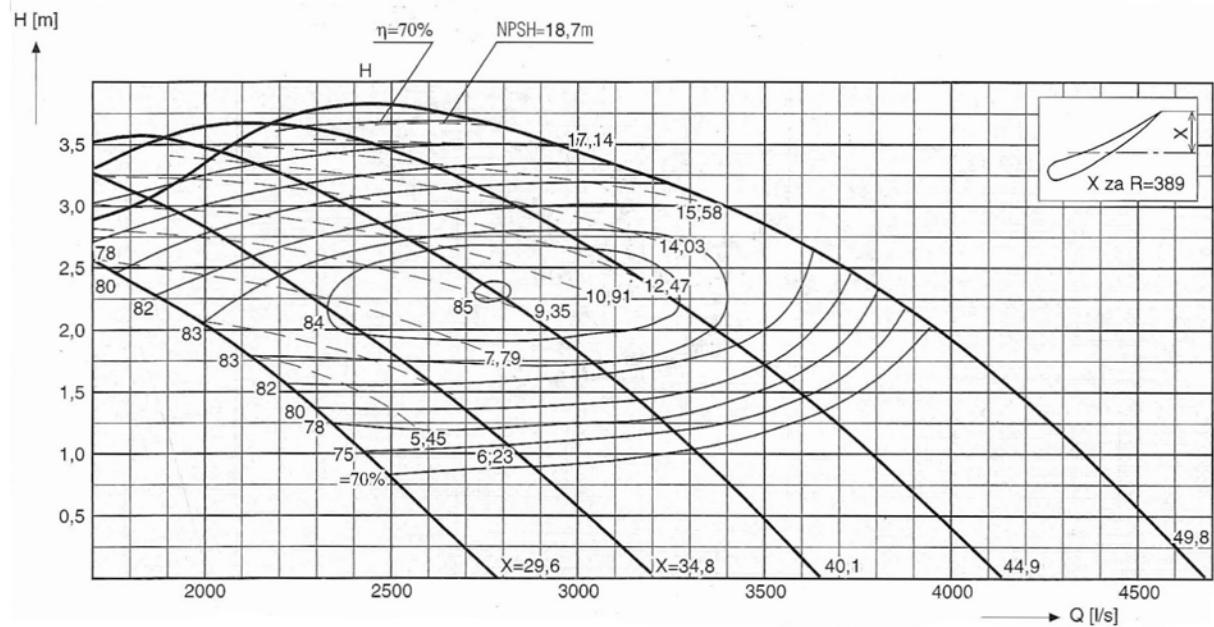
18 AVZ 63-80 $n=12\text{s}^{-1}$ **18 AVZ 63-80** $n=16\text{s}^{-1}$ **18 AVZ 80-100** $n=8\text{s}^{-1}$ 

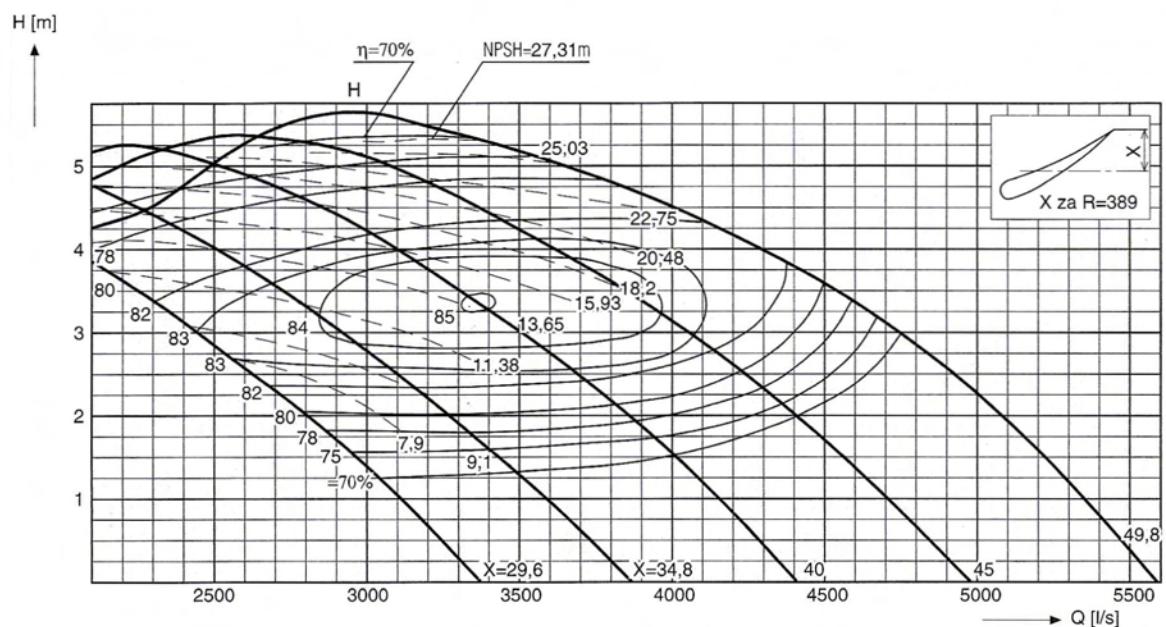
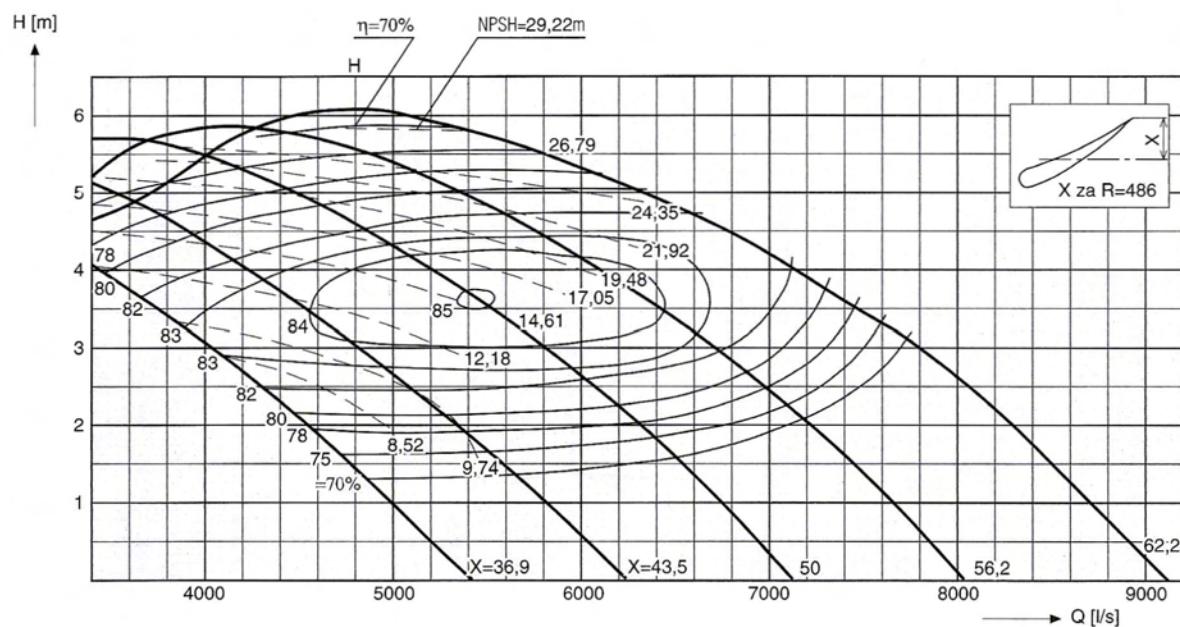
18 AVZ 80*-100 (Rotor 770)n=8s⁻¹**18 AVZ 80*-100 (Rotor 770)**n=9,7s⁻¹**18 AVZ 80-100**n=9,7s⁻¹

18 AVZ 80-120 $n=12\text{s}^{-1}$ **18 AVZ 100-140** $n=8\text{s}^{-1}$ **18 AVZ 100-140** $n=9,7\text{s}^{-1}$ 

18 AVZ 110-140 $n=8\text{s}^{-1}$ **18 AVZ 125-180** $n=6\text{s}^{-1}$ **18 AVZ 125-180** $n=8\text{s}^{-1}$ 

44 AVZ 40-50 $n=9,7\text{s}^{-1}$ **44 AVZ 50-50** $n=8\text{s}^{-1}$ **44 AVZ 50-60** $n=9,7\text{s}^{-1}$ 

44 AVZ 63-70 $n=8\text{s}^{-1}$ **44 AVZ 63-80** $n=9,7\text{s}^{-1}$ **44 AVZ 80-100** $n=8\text{s}^{-1}$ 

44 AVZ 80-120 $n=9,7\text{s}^{-1}$ **44 AVZ 100-140** $n=8\text{s}^{-1}$ 



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