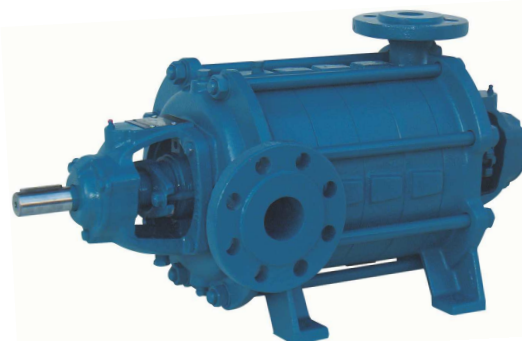


Multistage Centrifugal Pumps

HEGA 2502 ... 8009

TECHNICAL DATA

Flow:	max. 190 m³/h
Head:	max. 425 m
Speed:	max. 3600 rpm
Material:	Cast iron (0B, 0C, 0D, 0E, 0R, 0S, 0U) Stainless steel (4B) Spheroidal graphite cast iron (1B)
Temperature:	max. 190 °C, depending on the shaft sealing and the materials execution.
Casing pressure:	max. 40 bar, depending on the operating temperature.
Shaft seal:	Stuffing box or mechanical seal.
Flange connections:	Suction flange, according to DIN 2501 PN 16, Discharge flange, according to DIN 2501 PN 40
Direction of rotation:	Clockwise, looking from the drive end.



APPLICATION

Series HEG multistage centrifugal pumps are used in applications where the requirement is for trouble-free pumping of clear or slightly dirty liquids. They are used in:

- Heating plants
- Waterworks and water supply plants
- Pressure raising plants
- Circulating water and condensate plants
- Fire extinguishing plants
- Purification plants
- Irrigation plants
- Boiler feed water plants
- Pressurized water producing stations

DESIGN

Multistage horizontal centrifugal pumps with sectional casing and closed impellers.

The manufacturing program covers six sizes, with 2 up to maximum 13 stages, according to the size, the speed and the shaft seal. Axial thrust balancing is carried out by balancing the impellers separately. The remaining axial thrusts are taken up by adequately sized antifriction bearings.

The impellers, diffusers, as well as the wear ring from size 65, are interchangeable between stages.

Arrangements combining impellers of different diameters permit, within the application field, optimum matching to the required performance characteristics with the performance curve.

On the suction side, the mounting feet are arranged on the casing of the first stage. By this means, it is possible to ensure easy adaptation to different installation conditions, even subsequent to initial installation, by pivoting the suction head casing.

The driver is arranged on the suction side but discharge side driver or driver on both sides are possible on request.

All sizes can be supplied with one or more dummy stages, on request.

CONSTRUCTION

Casing pressure [bar]:

Discharge casing	Suction casing	Temperature range ⁽¹⁾
max. 40	max. 16	-10 to 120 °C
max. 38	max. 16	up to 140 °C
max. 32,6	max. 13	up to 194 °C

(1) Take in mind the application limit for the shaft seal

Discharge casing pressure = suction pressure + zero flow head.

NOTE: The relevant technical regulations and safety rules must be observed.

Flanges:

Suction side flange according to DIN 2533 PN16, discharge side flange according to DIN 2535 PN40.

The flanges can be drilled according to ANSI B16.1 class 250, on request.

Flange positions:

Suction flange arranged horizontally towards the right hand side (looking on the shaft end) and discharge vertical upwards.

On request, the suction flange can be arranged on the left and, in the case of pumps with three or more stages, also vertically upwards.

Bearings:

One cylindrical roller bearing according to DIN 5412 on the shaft end side and one deep-groove ball bearing according to DIN 625 on the discharge side, both lubricated by grease.

On request, two single row angular contact ball bearings, mounted in X arrangement, lubricated by grease, can be supplied on the discharge side.

Shaft sealing:

Sealing of the shaft can be carried out either by a stuffing box or mechanical seal as required.

- Designation 001:
Uncooled stuffing box.
Temperature range: -10 up to 110 °C.
- Designation 022:
Externally flushed, uncooled, lengthened stuffing box (nonavailable for sizes 25 and 32).
Temperature range: -10 o 110 °C.
- Designation 511:
Cooled stuffing box.
Temperature range: up to 140 °C (up to 194 °C to co nsult).
- Designation BK3/BKS/BKU:
Unbalanced single mechanical seal with rubber bellows and self-circulation.
Temperature range: -10 °C up to 110 °C
- Designation BX3/BXS/BXU:
Equivalent to BK3/BKS/BKU plus refrigeration/heating chamber.
Temperature range: up to 140 °C

Materials of construction:

Item	Component	Material				Construction ⁽¹⁾									
		Mat. Nr.	DIN denomination	ISO-EN denomination	US Material		0B	0C	0D	0E	0R ⁽²⁾	0S ⁽²⁾	0U ⁽²⁾	1B	4B ⁽³⁾
					ASTM	AISI									
10.6	Suction casing	0.6025	GG-25	EN-GJL 250	A278 Cl. 30		x	x	x	x	x	x	x		
		0.7043	GGG-40,3	EN-GJS-400-18	A395									x	
		1.4408	GX6CrNiMo18-10	GX5CrNiMo19-11-2	A351 CF8M	316									x
10.7	Discharge casing	0.6025	GG-25	EN-GJL 250	A278 Cl. 30		x	x	x	x	x	x	x		
		0.7043	GGG-40,3	EN-GJS-400-18	A395									x	
		1.4408	GX6CrNiMo18-10	GX5CrNiMo19-11-2	A351 CF8M	316									x
10.8	Stage casing	0.6025	GG-25	EN-GJL 250	A278 Cl. 30		x	x	x	x	x	x	x		
		0.7043	GGG-40,3	EN-GJS-400-18	A395									x	
		1.4408	GX6CrNiMo18-10	GX5CrNiMo19-11-2	A351 CF8M	316									x
23.0	Impeller	0.6025	GG-25	EN-GJL 250	A278 Cl. 30		x				x			x	
		2.1060	G-CuSn12 Ni	EN-CC484K	B427 C91700			x	x			x			
		1.4408	GX6CrNiMo18-10	GX5CrNiMo19-11-2	A351 CF8M	316				x			x		x
17.1	Diffuser	0.6025	GG-25	EN-GJL 250	A278 Cl. 30		x	x		x	x	x	x	x	
		2.1060	G-CuSn12 Ni	EN-CC484K	B427 C91700				x						
		1.4408	GX6CrNiMo18-10	GX5CrNiMo19-11-2	A351 CF8M	316									x
21.1	Shaft ⁽⁴⁾	1.4021	X20Cr 13	X20Cr13	A276 Gr. 420	420	x ⁵	x ⁵	x ⁵	x ⁵	x ⁷	x ⁷	x ⁷	x ⁵	x ⁷
		1.4401	X5CrNiMo17-12-2	X5CrNiMo17-12-2	A276 Gr. 316	316					x	x	x		x
		1.7225	42 CrMo 4	42CrMo4	A322 Gr. 4140	4140	x ⁶	x ⁶	x ⁶	x ⁶					x ⁶
52.4	Shaft sleeve (stuffing box)	1.4021	X20Cr 13	X20Cr13	A276 Gr. 420	420	x	x	x	x	x	x	x	x	
		1.4401	X5CrNiMo17-12-2	X5CrNiMo17-12-2	A276 Gr. 316	316									x
52.32	Shaft sleeve (mec. seal)	1.4021	X20Cr 13	X20Cr13	A276 Gr. 420	420	x	x	x	x	x	x	x	x	
		1.4401	X5CrNiMo17-12-2	X5CrNiMo17-12-2	A276 Gr. 316	316									x
46.1	Stuffing box	Synthetic fiber with PTFE impregnation					x	x	x	x	x	x	x	x	x
43.3	Mechanical seal	AQ1EGG	[Carbon graphite / Silicon carbide / EPDM]				x	x	x	x	x	x	x	x	x
		AQ1VGG	[Carbon graphite / Silicon carbide / Viton]												
		Q1Q1VGG	[Silicon carbide / Silicon carbide / Viton]												

- (1) Other combinations are possible. Please consult with the factory.
(2) Construction not available for pumps 3207/11, 5005/08 and 6504/06 running at 3000 or 3600 rpm. For pumps size 80 is only possible for maximum 1500 rpm.
(3) Construction not available for pumps size 80.
(4) Pumps with special shaft support (version: M), consult the factory for the appropriated shaft material, according to the pump application.
(5) For pumps size 80 only is possible for rotation speed up to 1500 rpm, or running at 1800 rpm and temperature lower than 50°C.
(6) Standard construction only for pumps size 80.
(7) Only for pumps 3207/11, 5005/08 and 6504/06, running at 3000 or 3600 rpm.

Casing gasket:

The casings are sealed by means of O-rings.

Temperatures up to 120 °C by means of NBR (Buna-N) O-rings. Code of this version: P.

Temperatures over 120 °C up to 190 °C by means of F KM (Viton ®) O-rings. Code of this version: V.

Motor power, speed and number of stages:

By means of standard electrical motors, construction type IM B3.

To determine the motor power we recommend consider the following safety margins:

Up to 4 kW (5 HP):	25%
Over 4 kW up to 7,5 kW (5 up to 10 HP):	20%
Over 7,5 kW up to 40 kW (10 up to 50 HP):	15%
Over 40 kW (50 HP):	10%

The following maximum numbers of stages as a function of shaft seal and speeds must be observed:

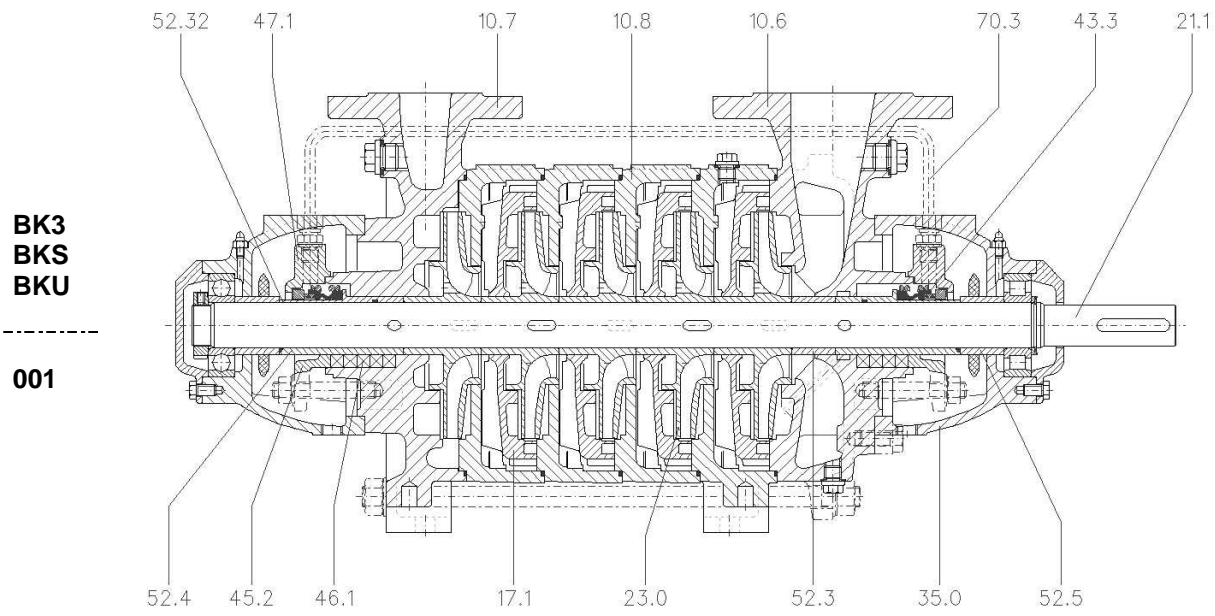
Pump size	Maximum speed [rpm]	Maximum number of stages according to the shaft seal				
		001	022	511	BK3/BKS/BKU	BX3/BXS/BXU
2500	1 800	13	-	11	13	11
	3 000	11	-	11	13	11
	3 600	8	-	8	10	8
3200	1 800	12	-	10	12	10
	3 000	9	-	9	11	9
	3 600	6	-	6	7	6
4000	1 800	12	10	10	12	10
	3 000	8	8	8	9	8
	3 600	6	6	6	6	6
5000	1 800	11	9	9	11	9
	3 000	6	6	6	8	6
	3 600	4	4	4	5	4
6500	1 800	10	8	8	10	8
	3 000	5	5	5	6	5
	3 600	3	3	3	4	3
8000	1 800	9	7	7	9	7
	3 000	4	4	4	5	4
	3 600	2	2	2	3	2

General notes:

The following additional design is available:

HESB: Vertical multistage centrifugal pumps, base supported for casing pressures up to 25 bar.

Sectional drawing and list of parts



**BK3
BKS
BKU**

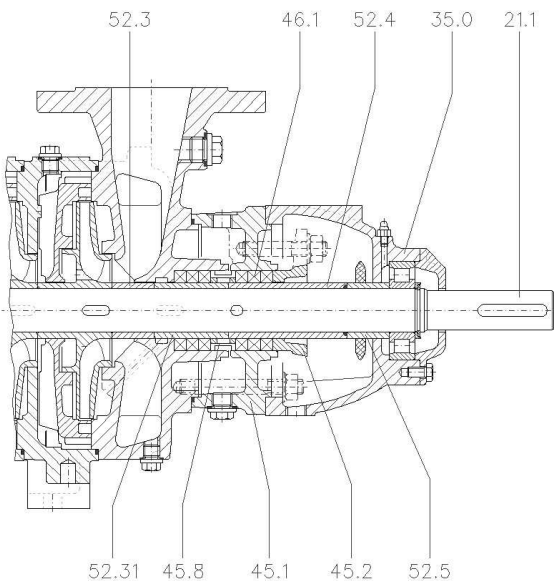
001

10.6	Suction casing	43.3	Mechanical seal	52.3	Spacer sleeve
10.7	Discharge casing	45.1	Stuffing box housing	52.31	Spacer sleeve
10.8	Stage casing	45.2	Stuffing box gland	52.32	Shaft protection sleeve
17.1	Diffuser	45.8	Lantern ring	52.4	Shaft protection sleeve
21.1	Shaft	46.1	Stuffing box	52.5	Spacer sleeve
23.0	Impeller	47.1	Seal cover	70.3	Liquid circulating tube
35.0	Bearing housing				

Other types of shaft sealing arrangement:

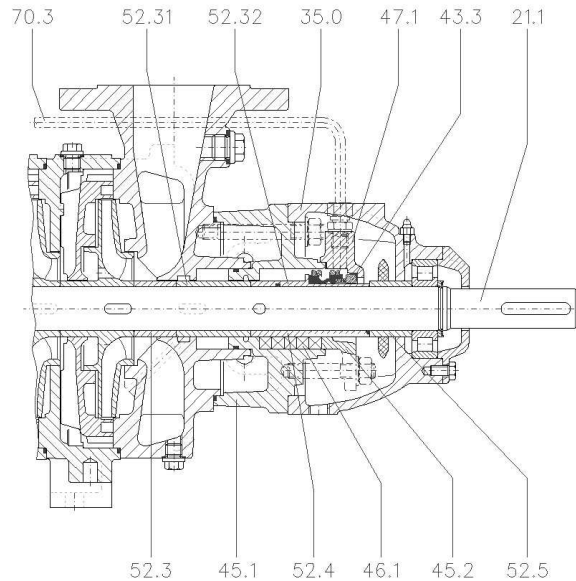
Execution 022 ⁽¹⁾

Uncooled, lengthened stuffing box with external flushed.



Execution 511 – Execution BX3/BXS/BXU

Cooled stuffing box – Refrigeration / Heating chamber.

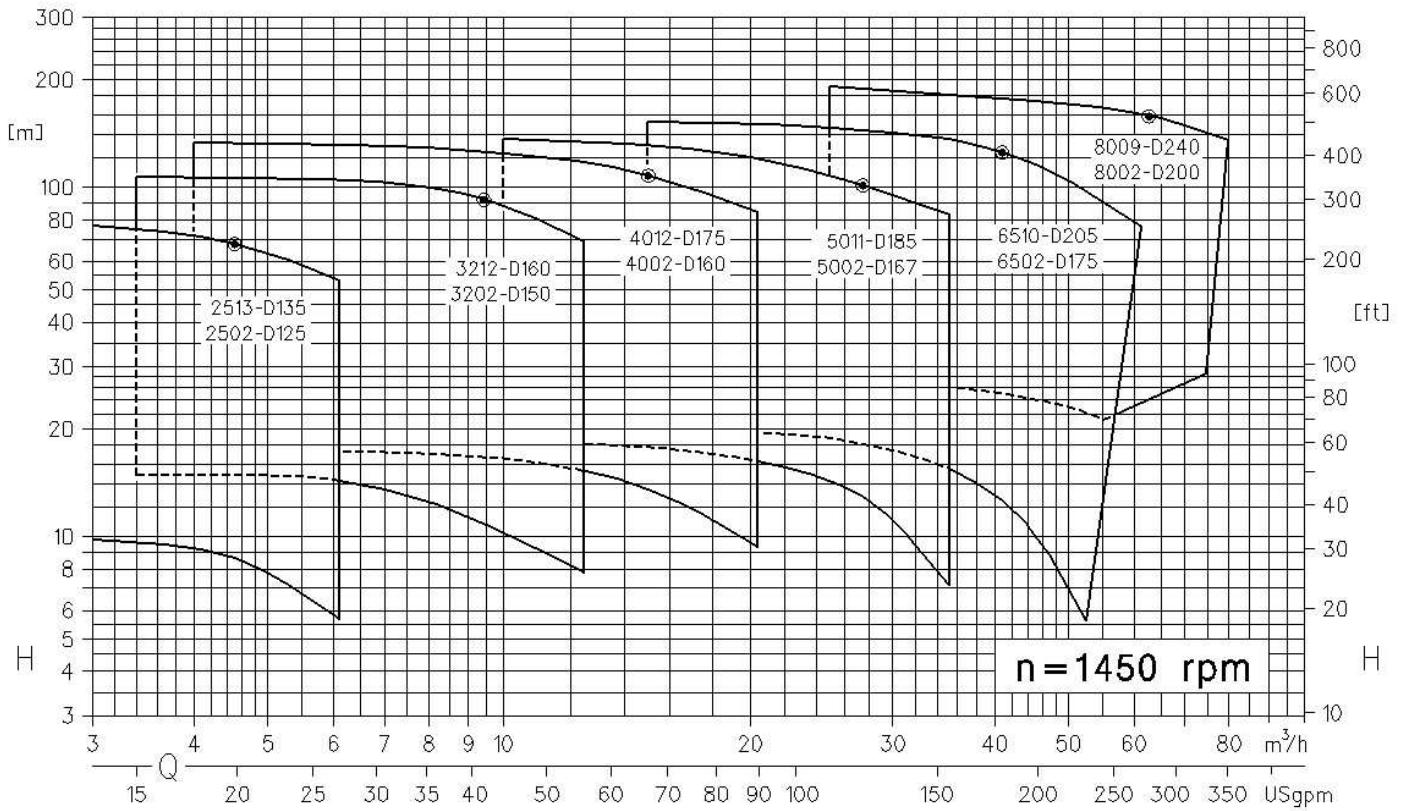
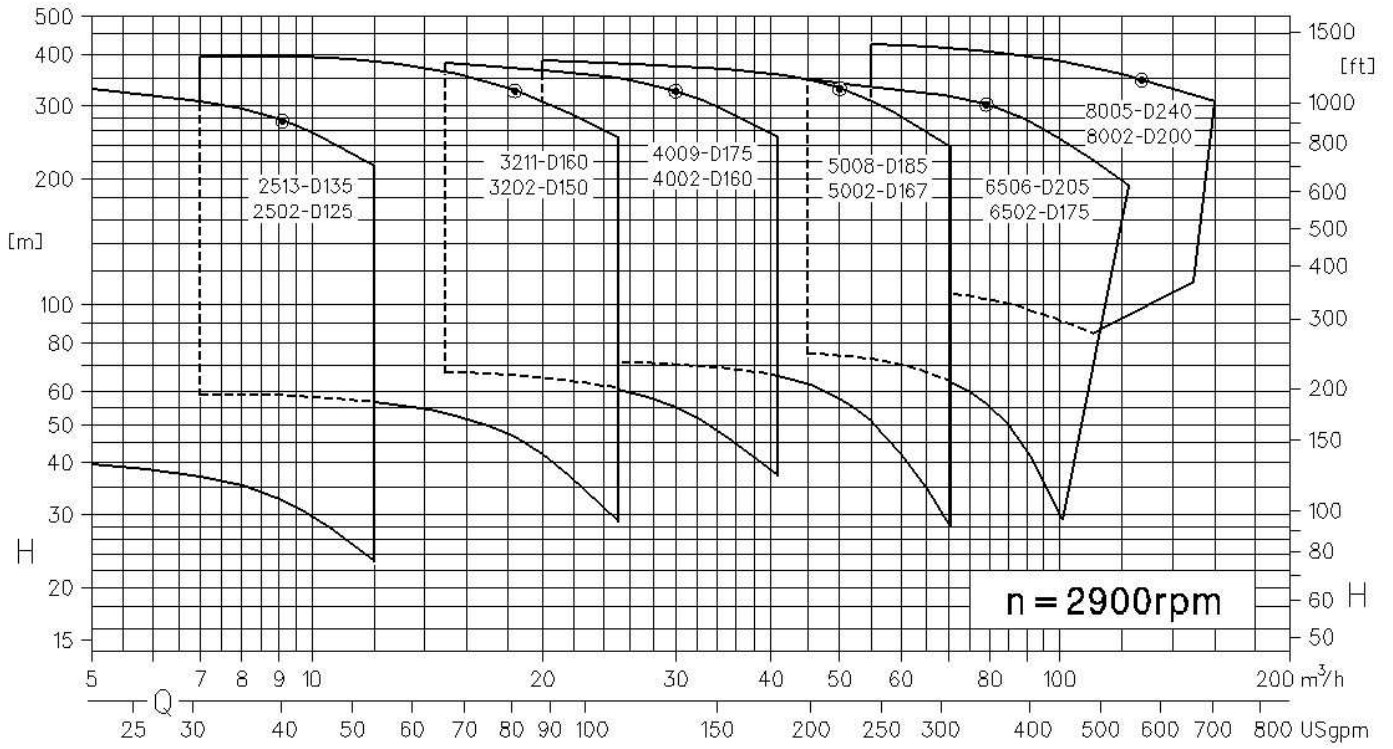


**BX3
BXS
BXU**

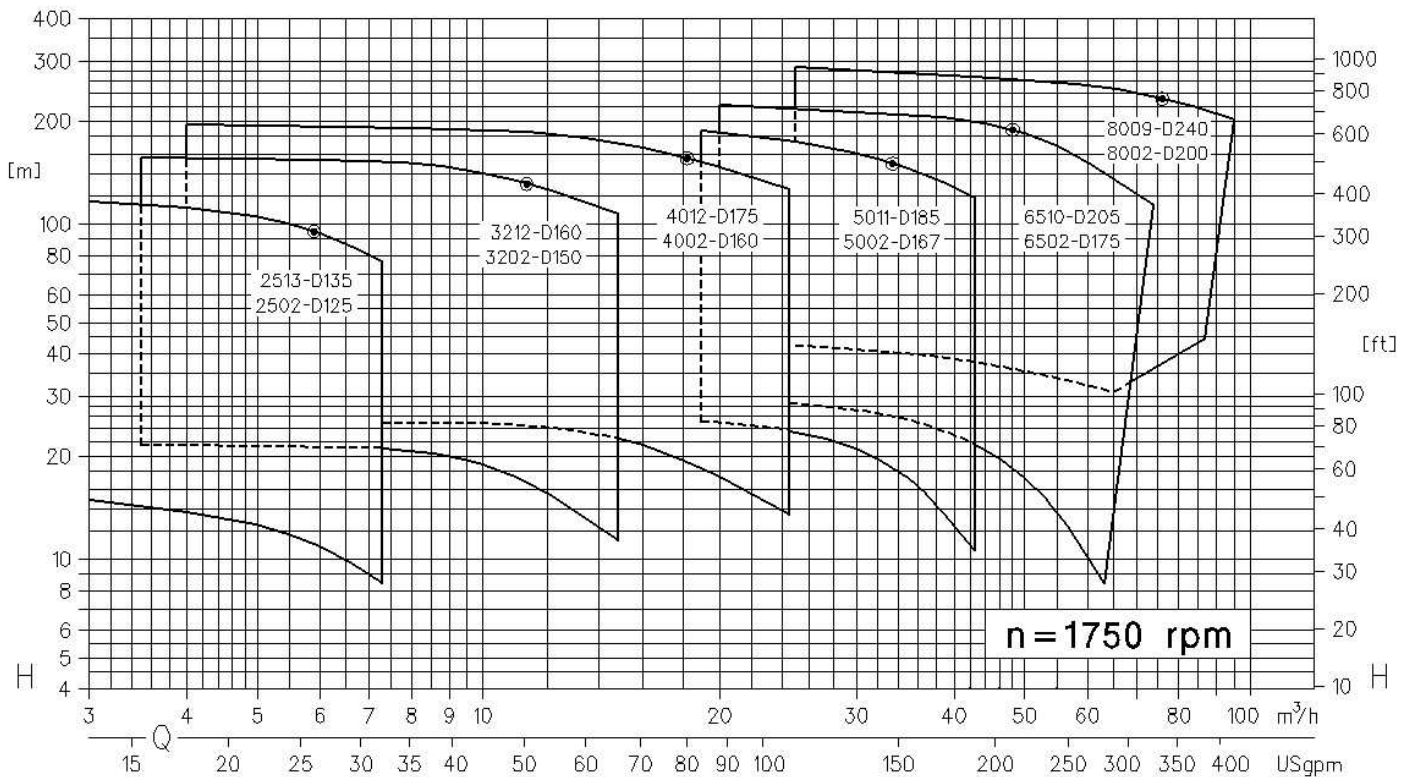
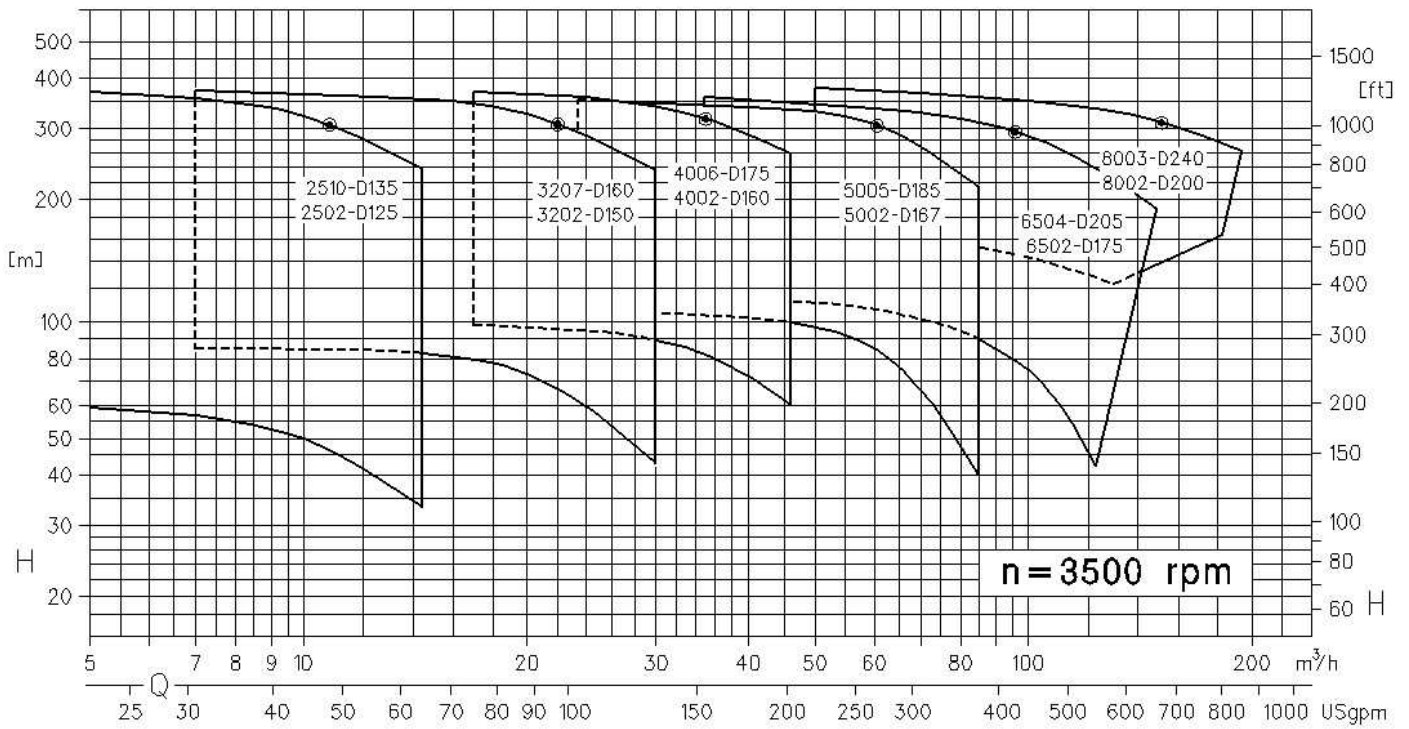
511

(1) Non-available for sizes 25 and 32

Field chart 50 Hz

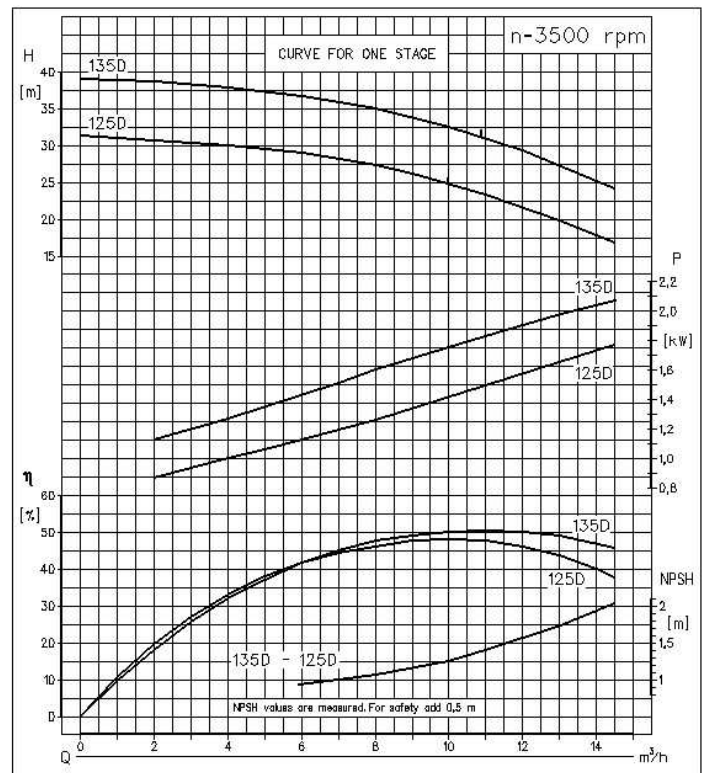
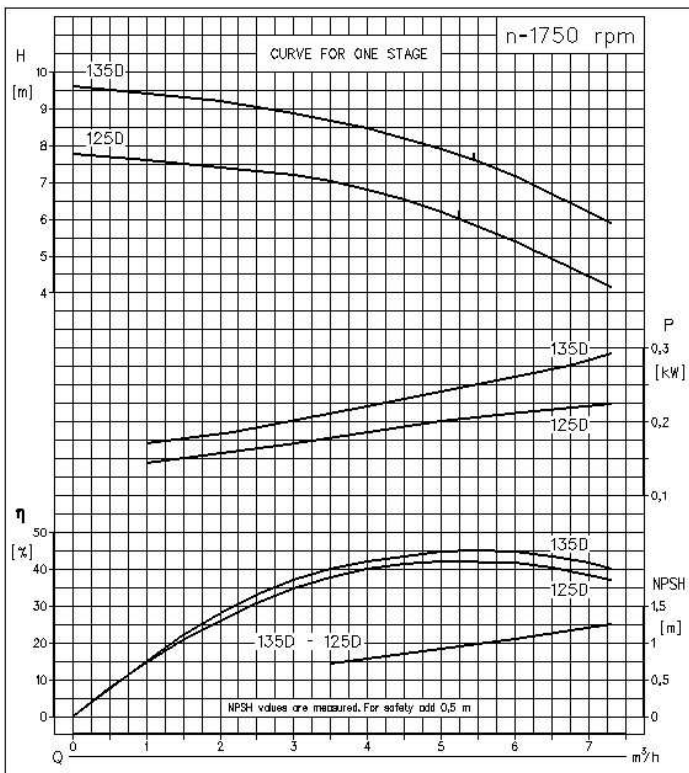
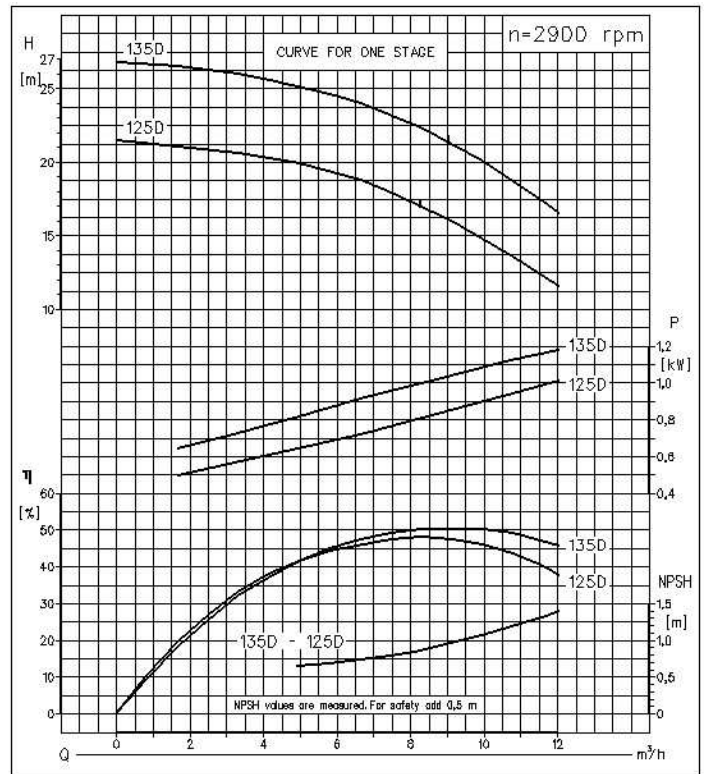
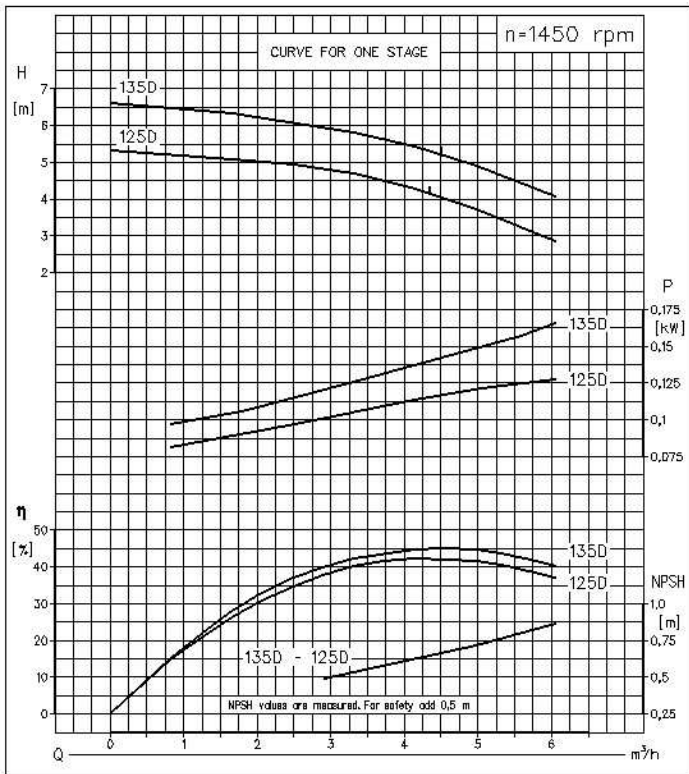


Field chart 60 Hz



Performance curves

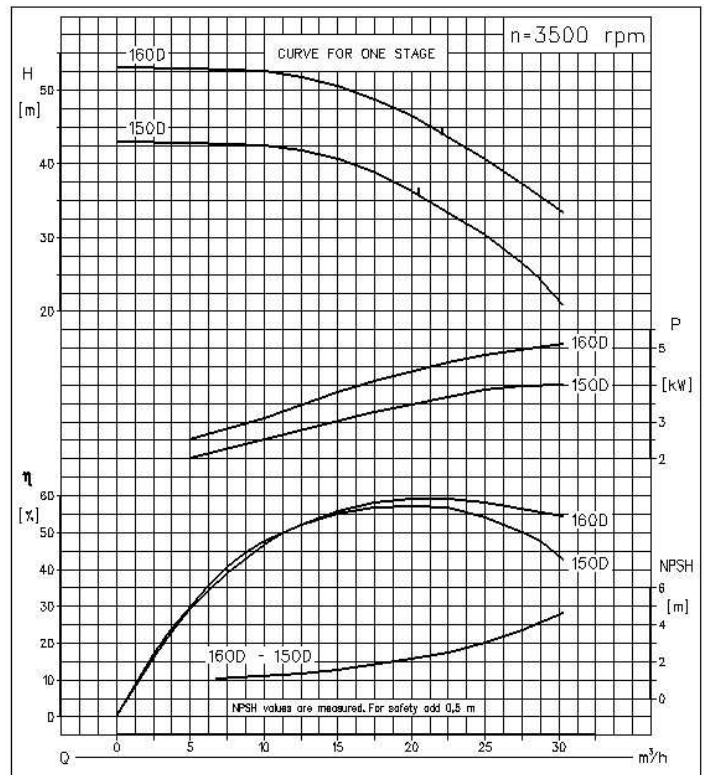
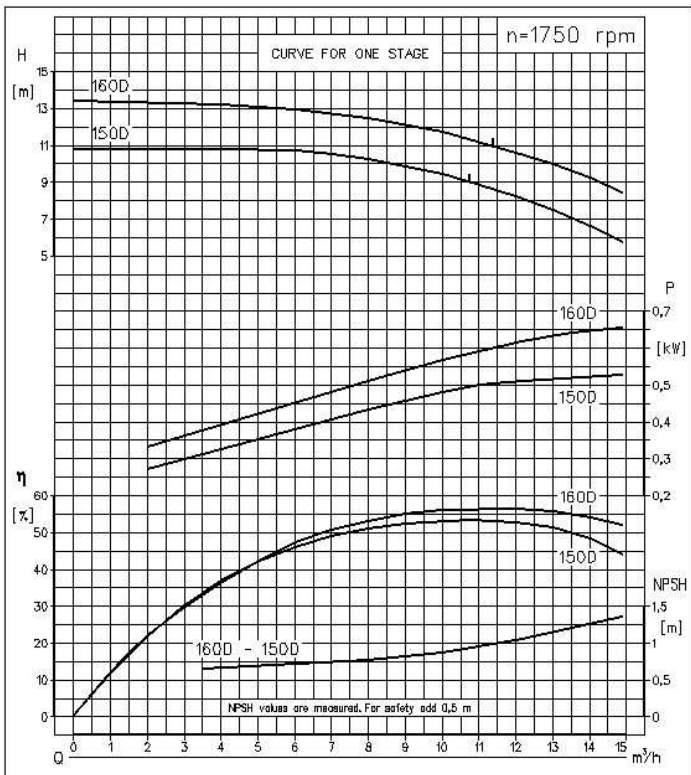
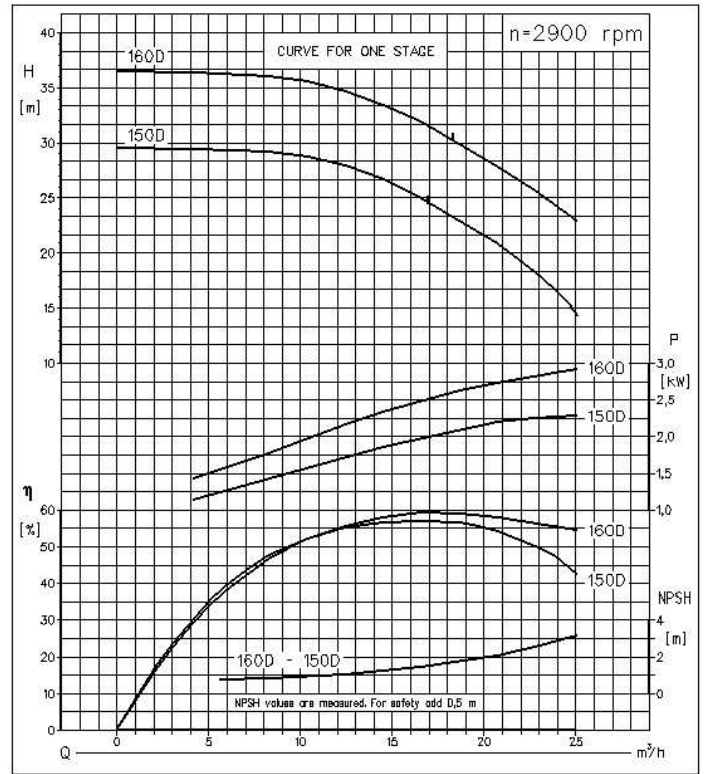
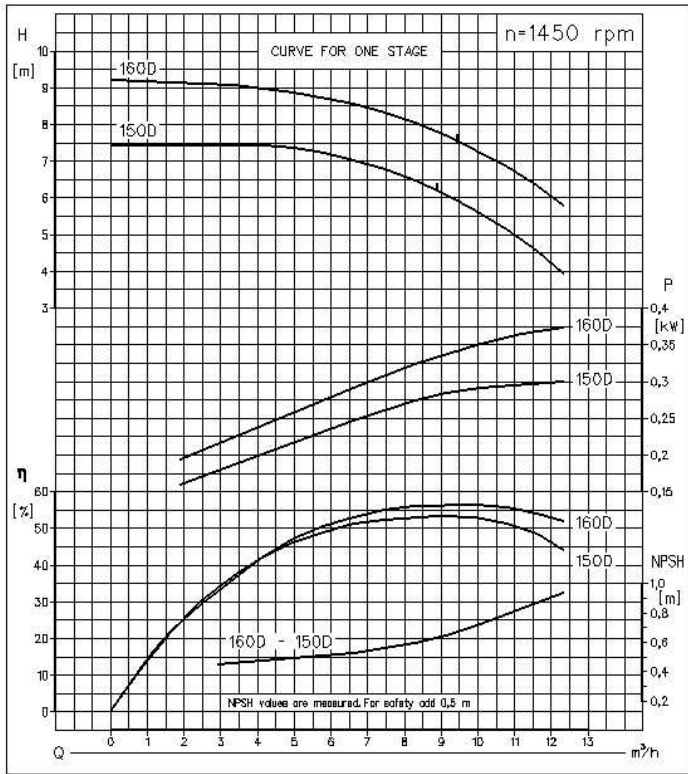
HEGA 25



- Not valid for materials of construction 4B (stainless steel). Please consult with the factory.
- Head or Power for more than one stage = Head or Power for one stage multiplied by number of the stages.

Performance curves

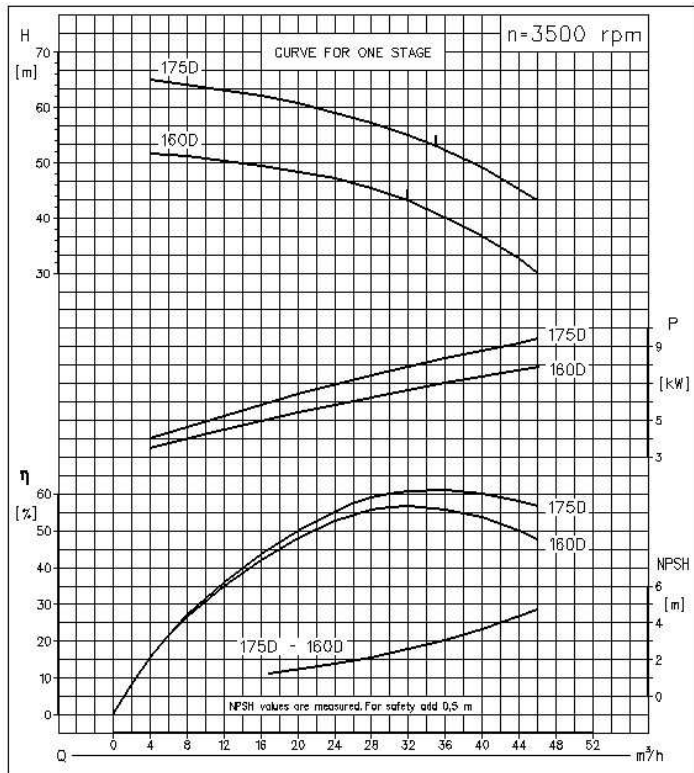
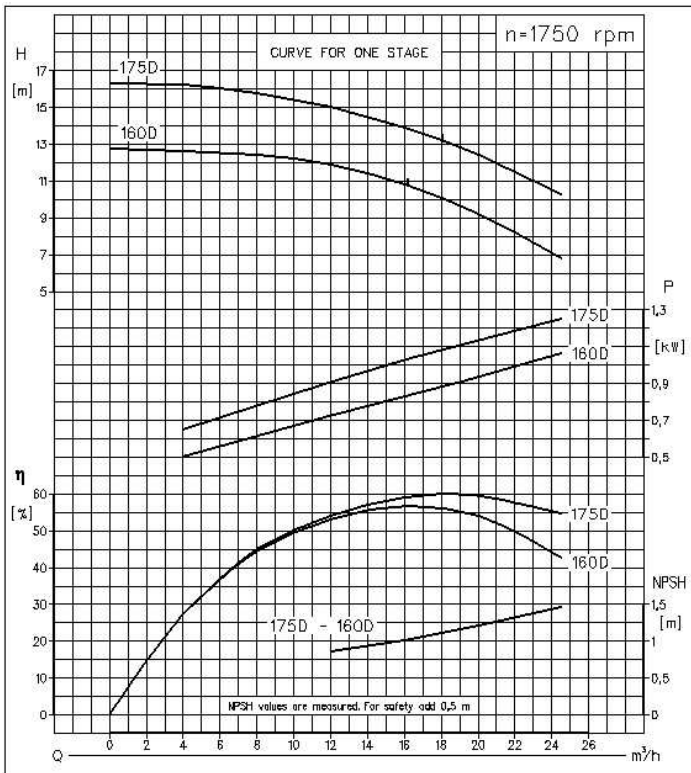
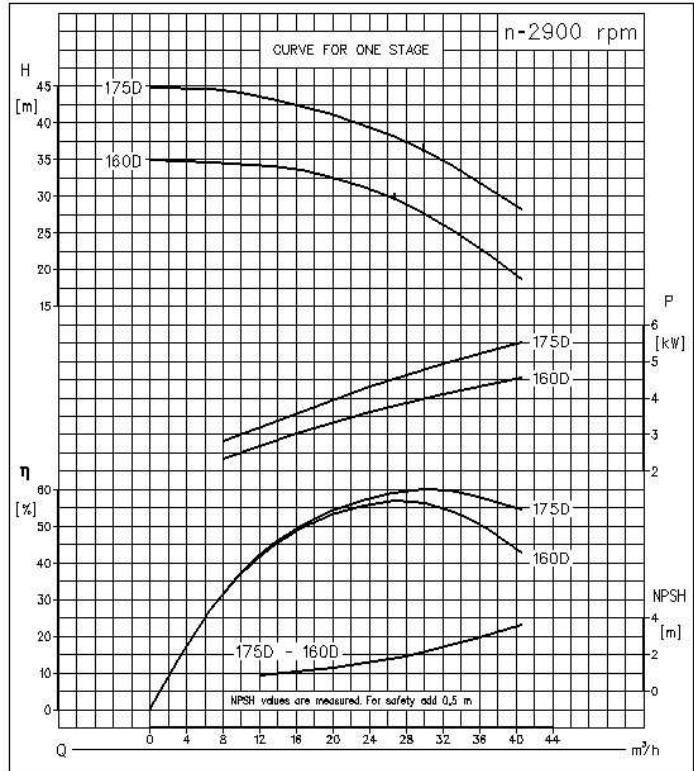
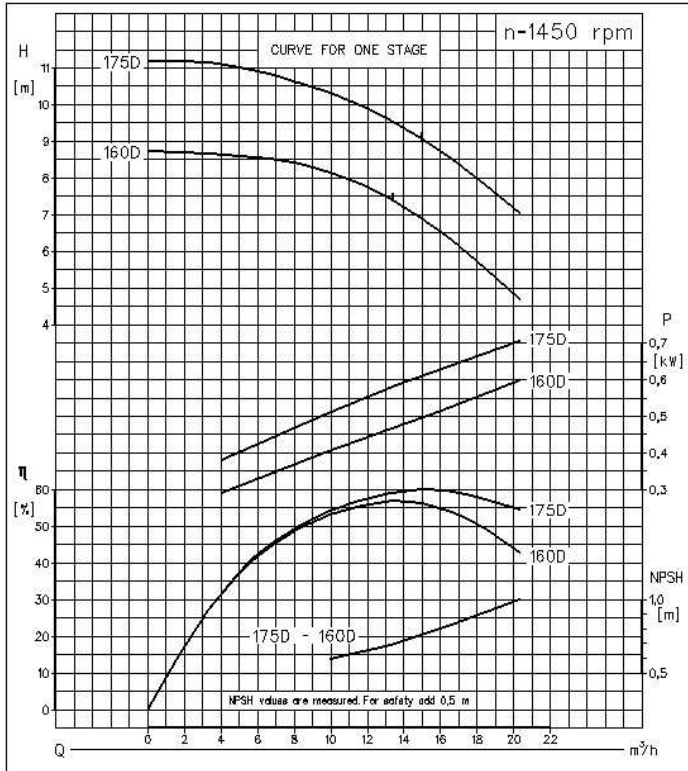
HEGA 32



- Not valid for materials of construction 4B (stainless steel). Please consult with the factory.
- Head or Power for more than one stage = Head or Power for one stage multiplied by number of the stages.

Performance curves

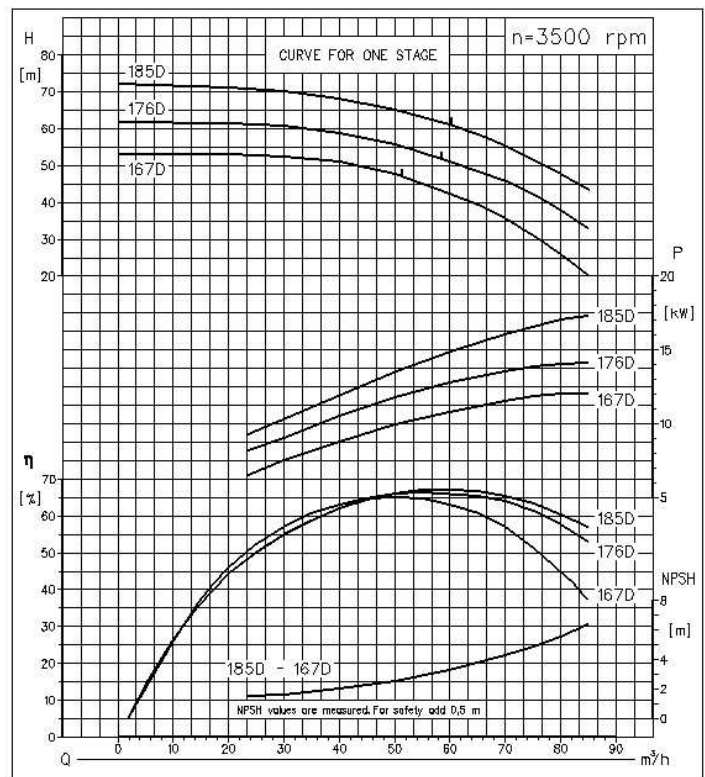
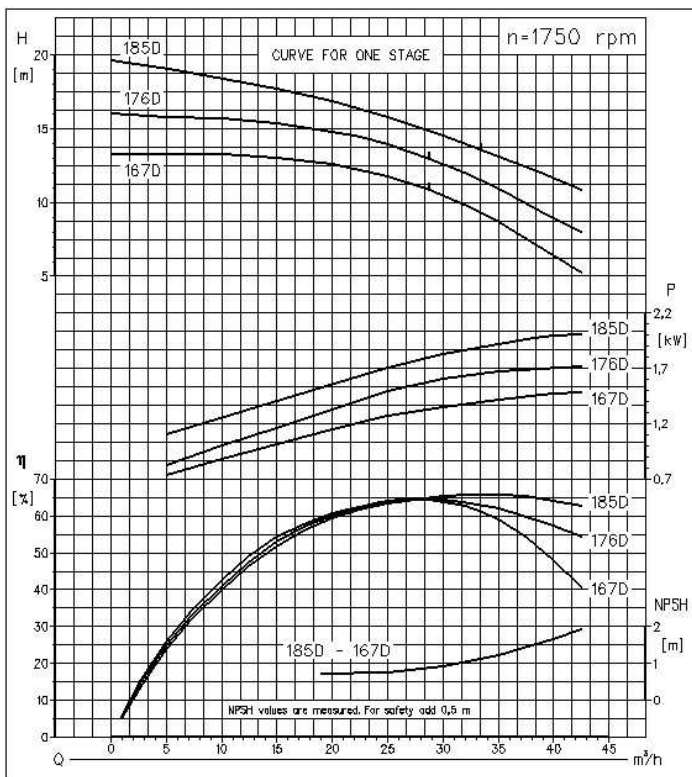
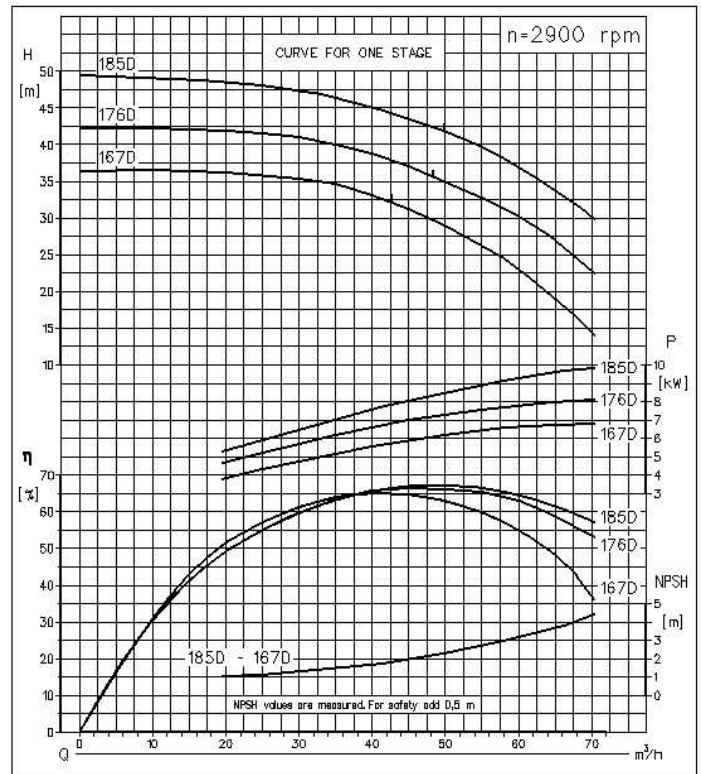
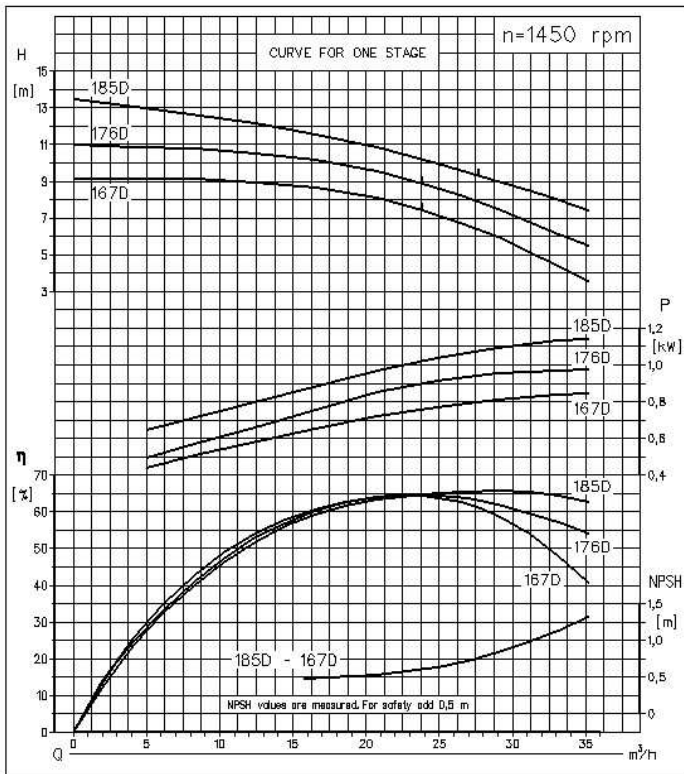
HEGA 40



- Not valid for materials of construction 4B (stainless steel). Please consult with the factory.
- Head or Power for more than one stage = Head or Power for one stage multiplied by number of the stages.

Performance curves

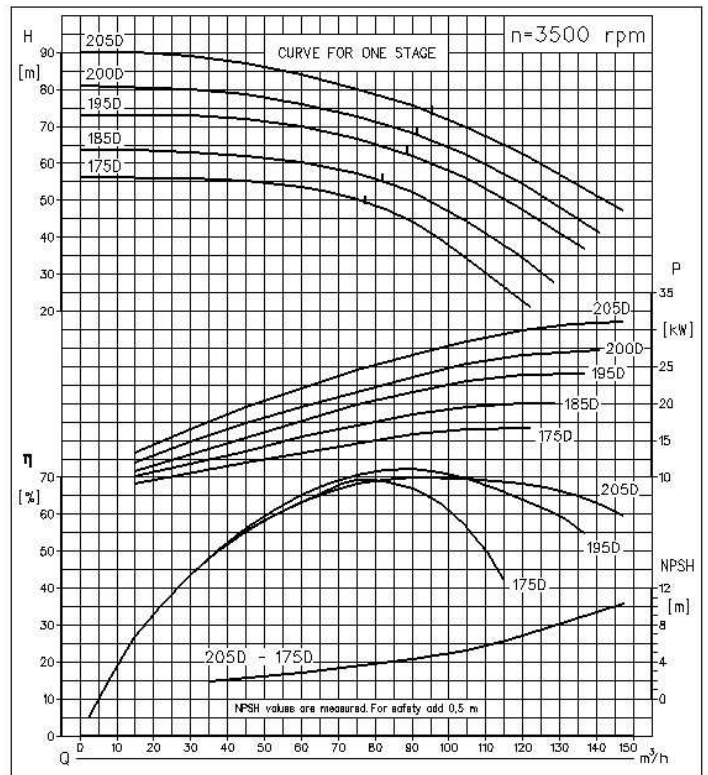
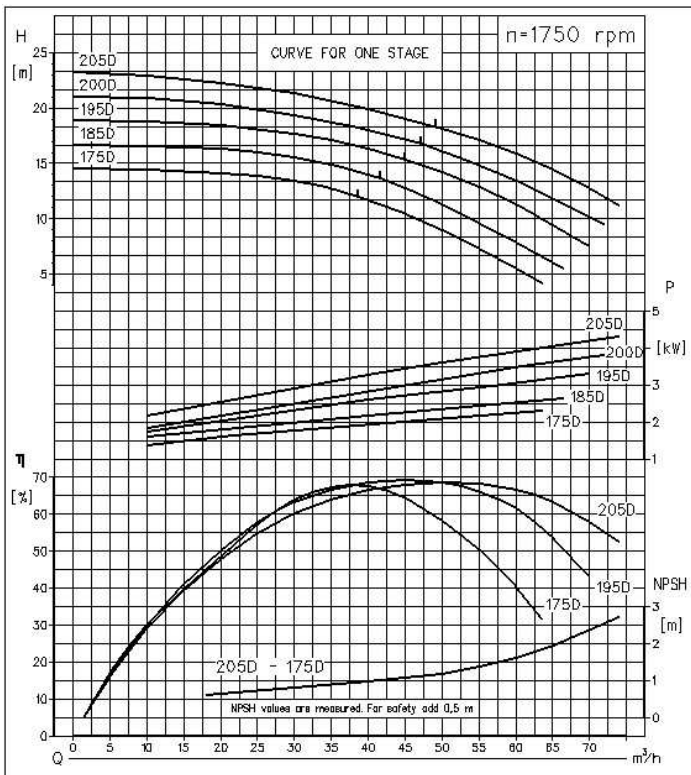
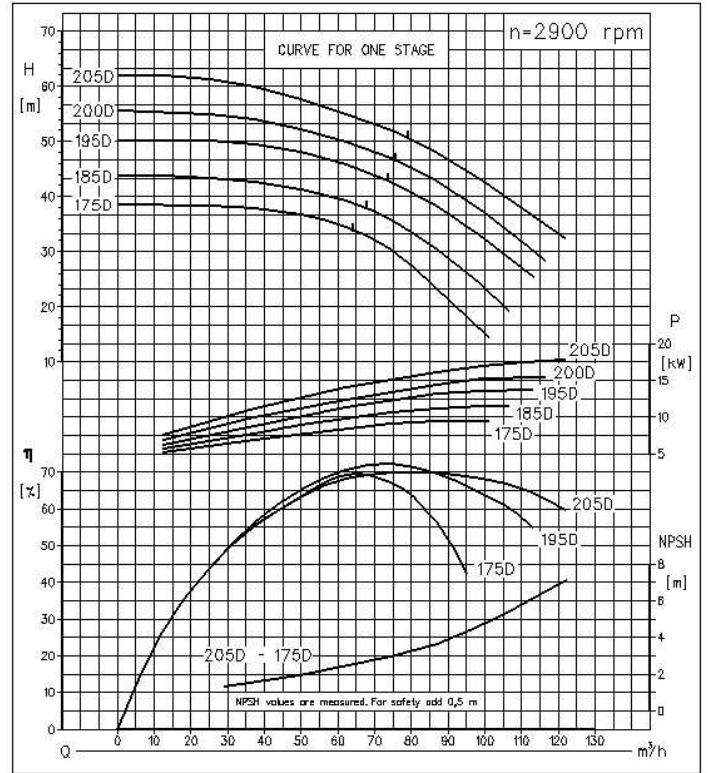
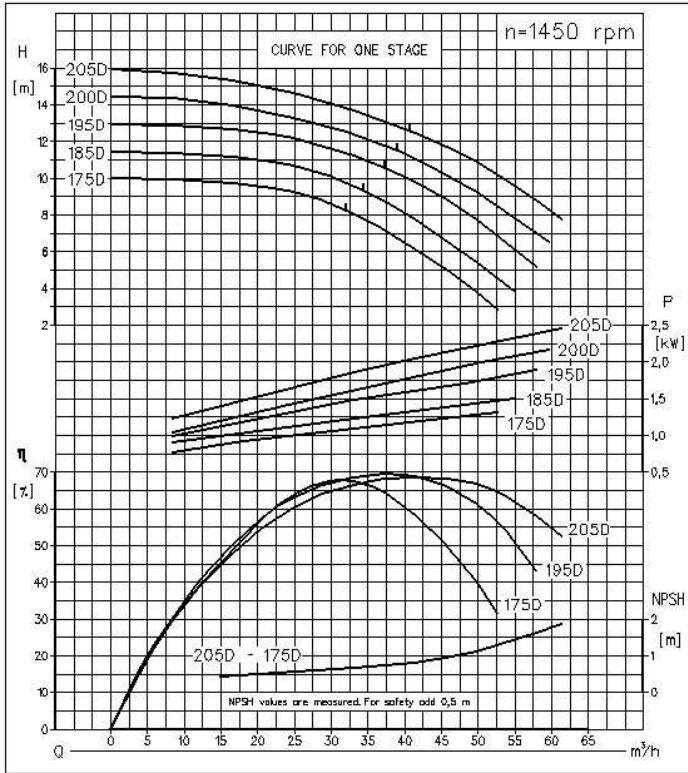
HEGA 50



- Not valid for materials of construction 4B (stainless steel). Please consult with the factory.
- Head or Power for more than one stage = Head or Power for one stage multiplied by number of the stages.

Performance curves

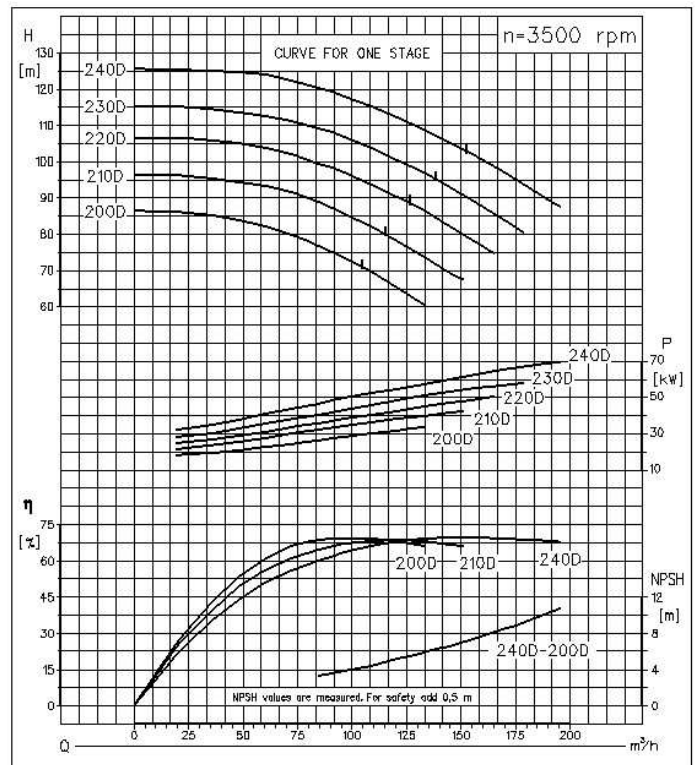
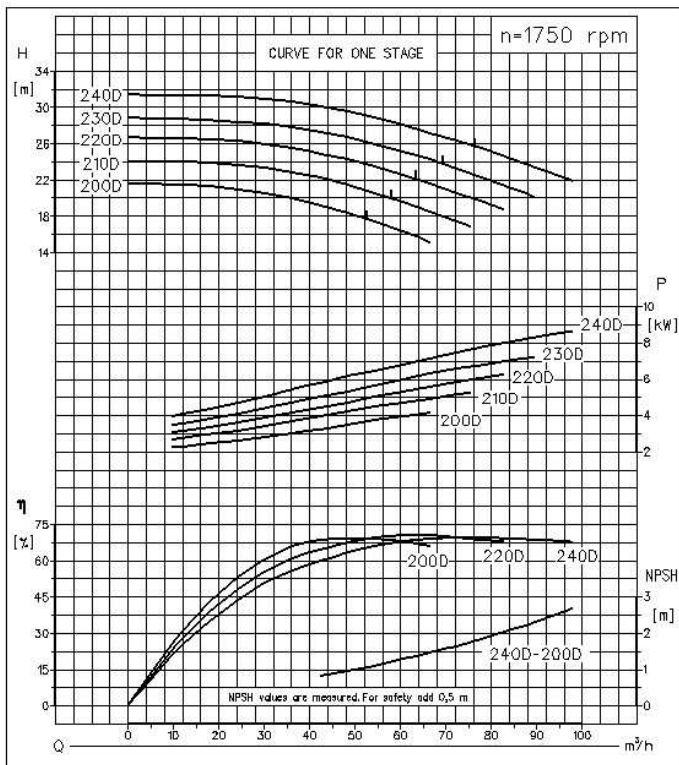
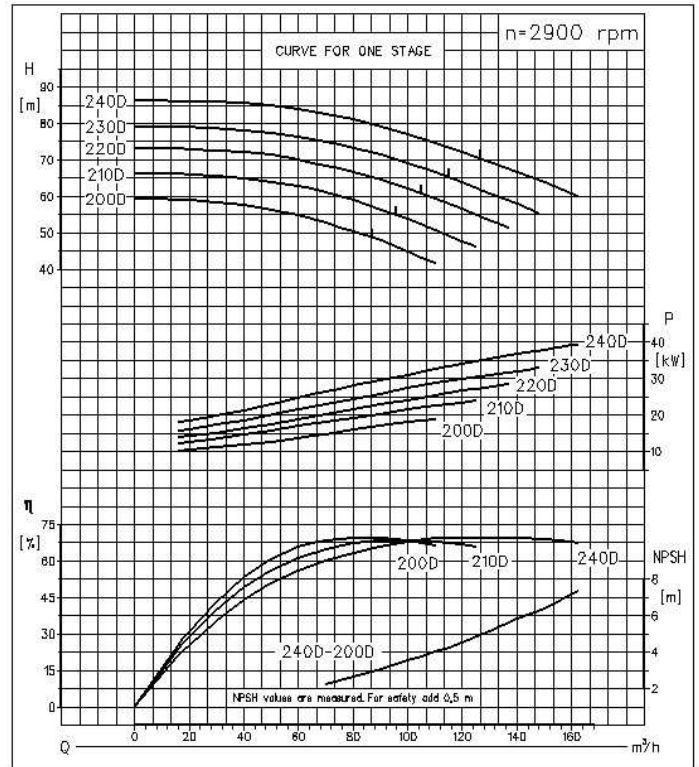
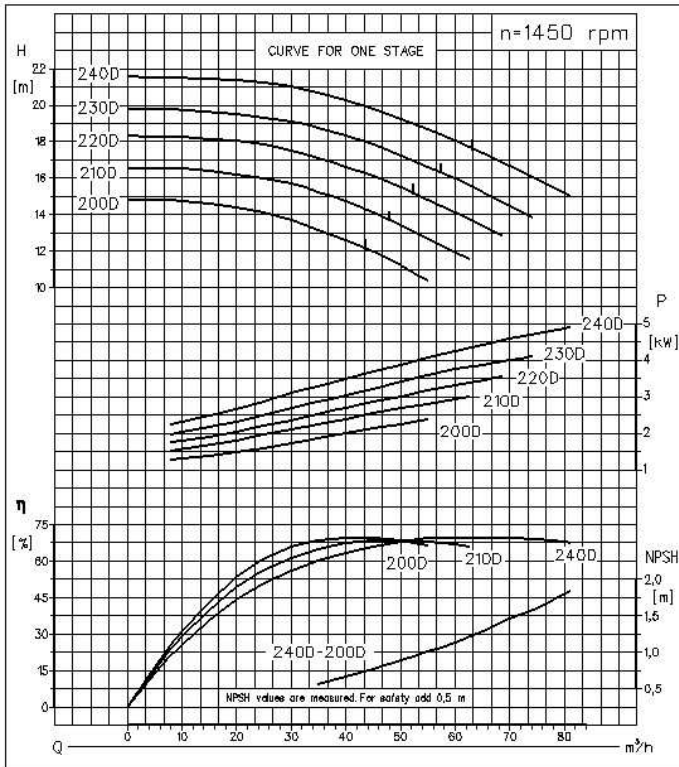
HEGA 65



- Not valid for materials of construction 4B (stainless steel). Please consult with the factory.
- Head or Power for more than one stage = Head or Power for one stage multiplied by number of the stages.

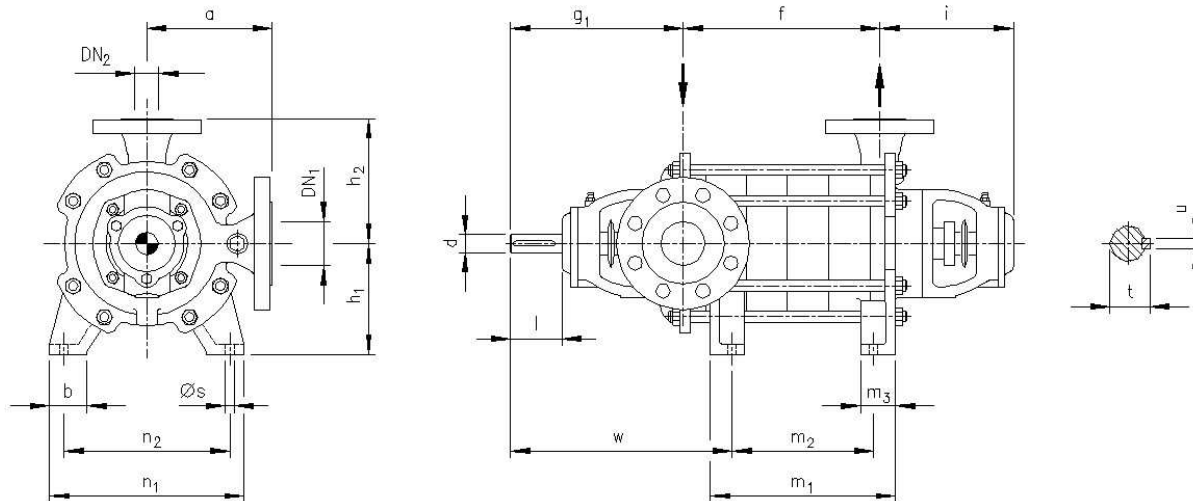
Performance curves

HEGA 80



- Not valid for materials of construction 4B (stainless steel). Please consult with the factory.
- Head or Power for more than one stage = Head or Power for one stage multiplied by number of the stages.

Table of dimensions – shaft seal 001, BK3, BKS, BKU



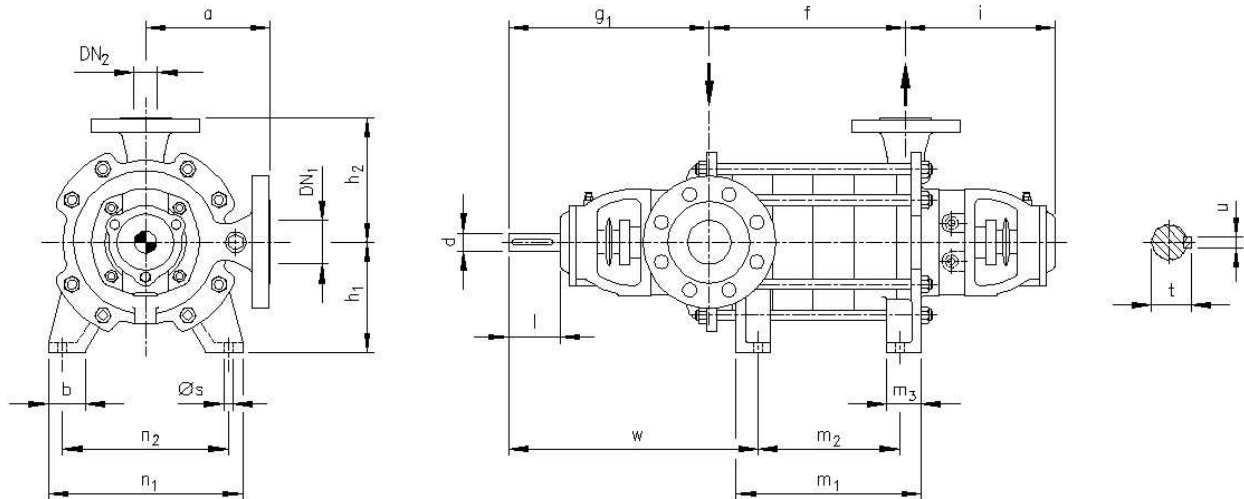
Pump size	DN ₂	DN ₁	Pump dimensions						Foot dimensions							Shaft end					
			a	f	g ₁	h ₁	h ₂	i	b	c	m ₁	m ₂	m ₃	n ₁	n ₂	s	w	d _{k6}	l	t	u
2500	32	40	160	According to Nr. of stages	243	132	160	173	45	12	According to Nr. of stages	45	250	216	15	293	28	60	30,9	8	
3200		50	180		230	180	295														
4000	40	65	180		265	160	180	193				55	14	50	280	245	345	32	80		35,3
5000	50	80	200		275	200	216	55				14	55	320	280	405	38	41,3			
6500	65	100	220		300	180	220	216				55	14	60	320	280	405	38	41,3		
8000	80	100	250		320	225	250	235				60	16	70	370	320	20	440			

Pump	2500			3200			4000			5000			6500			8000		
Nr.stg.	f	m ₁	m ₂	f	m ₁	m ₂	f	m ₁	m ₂	f	m ₁	m ₂	f	m ₁	m ₂	f	m ₁	m ₂
2 ⁽¹⁾	105	115	75	118	103	53	135	115	55	153	133	63	190	145	65	218	173	83
3	160	170	130	173	158	108	195	175	115	218	198	128	270	225	145	313	268	178
4	215	225	185	228	213	163	255	235	175	283	263	193	350	305	225	408	363	273
5	270	280	240	283	268	218	315	295	235	348	328	258	430	385	305	503	458	368
6	325	335	295	338	323	273	375	355	295	413	393	323	510	465	385	598	553	463
7	380	390	350	393	378	328	435	415	355	478	458	388	590	545	465	693	648	558
8	435	445	405	448	433	383	495	475	415	543	523	453	670	625	545	788	743	653
9	490	500	460	503	488	438	555	535	475	608	588	518	750	705	625	883	838	748
10	545	555	515	558	543	493	615	595	535	673	653	583	830	785	705			
11	600	610	570	613	598	548	675	655	595	738	718	648						
12	655	665	625	668	653	603	735	715	655									
13	710	720	680															

Flange dimensions according to DIN 2501						
DN ₂ / DN ₁	32	40	50	65	80	100
Ø D	140	150	165	185	200	220
Ø k	100	110	125	145	160	180
d ₂ x cant.	PN 16	18 x 4	18 x 4	18 x 4	18 x 4	18 x 8
	PN 40				18 x 8	
Flange drilled according to ANSI B16.1 cl. 250						
DN ₂ / DN ₁	1,1/4"	1,1/2"	2"	2,1/2"	3"	4"
Ø k	98	114	127	149	168	200
d ₂ x cant.	19 x 4	22 x 4	19 x 8	22 x 8	22 x 8	22 x 8

(1) Suction flange vertically upwards only from three stages onward.

Table of dimensions – shaft seal 022⁽¹⁾, 511, BX3, BXS, BXU



Pump size	DN ₂	DN ₁	Pump dimensions						Foot dimensions							Shaft end				
			a	f	g ₁	h ₁	h ₂	i	b	c	m ₁	m ₂	m ₃	n ₁	n ₂	s	w	d _{k6}	l	t
2500	32	40	160	According to Nr. of stages	298	132	160	228	45	12	According to Nr. of stages	45	250	216	15	348	28	60	30,9	8
3200		50	180		285	180	253						350							
4000	40	65	180		160	253	253	405				32	80	35,3						
5000	50	80	200		340	200	258	430												
6500	65	100	220		380	180	220	296				55	14	60	320	280	485	38	41,3	
8000	80	100	250		415	225	250	330				60	16	70	370	320	20			

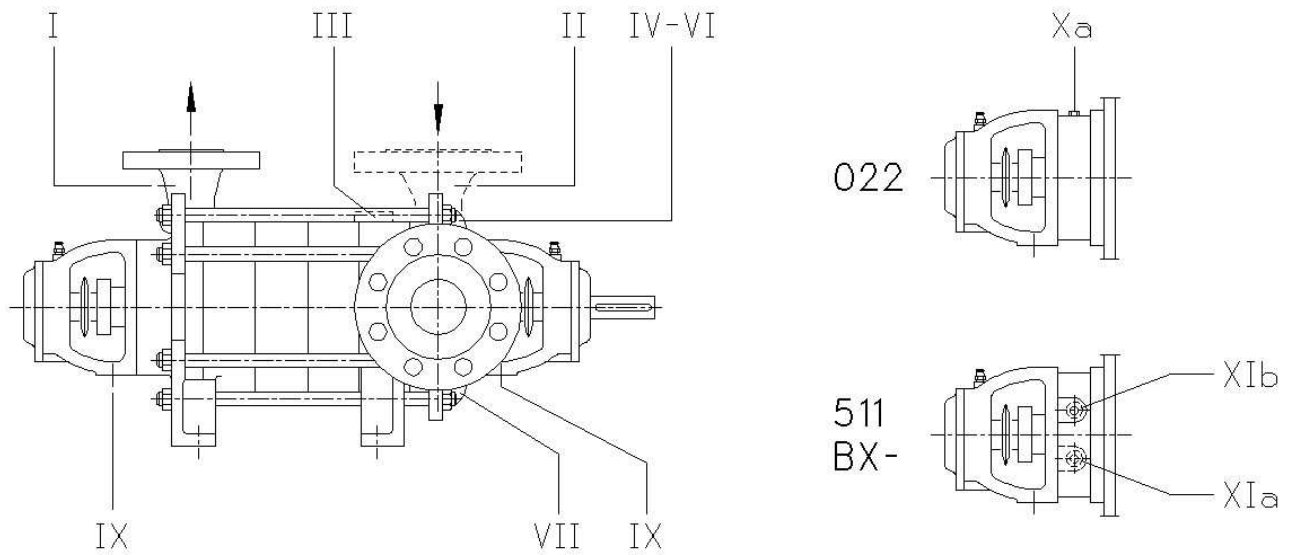
Pump	2500			3200			4000			5000			6500			8000		
Nr.stg.	f	m ₁	m ₂	f	m ₁	m ₂	f	m ₁	m ₂	f	m ₁	m ₂	f	m ₁	m ₂	f	m ₁	m ₂
2 ⁽²⁾	105	115	75	118	103	53	135	115	55	153	133	63	190	145	65	218	173	83
3	160	170	130	173	158	108	195	175	115	218	198	128	270	225	145	313	268	178
4	215	225	185	228	213	163	255	235	175	283	263	193	350	305	225	408	363	273
5	270	280	240	283	268	218	315	295	235	348	328	258	430	385	305	503	458	368
6	325	335	295	338	323	273	375	355	295	413	393	323	510	465	385	598	553	463
7	380	390	350	393	378	328	435	415	355	478	458	388	590	545	465	693	648	558
8	435	445	405	448	433	383	495	475	415	543	523	453	670	625	545	788	743	653
9	490	500	460	503	488	438	555	535	475	608	588	518	750	705	625	883	838	748
10	545	555	515	558	543	493	615	595	535	673	653	583	830	785	705			
11	600	610	570	613	598	548	675	655	595	738	718	648						
12	655	665	625	668	653	603	735	715	655									
13	710	720	680															

Flange dimensions according to DIN 2501						
DN ₂ / DN ₁	32	40	50	65	80	100
Ø D	140	150	165	185	200	220
Ø k	100	110	125	145	160	180
d ₂ x cant.	PN 16	18 x 4	18 x 4	18 x 4	18 x 4	18 x 8
	PN 40				18 x 8	
Flange drilled according to ANSI B16.1 cl. 250						
DN ₂ / DN ₁	1,1/4"	1,1/2"	2"	2,1/2"	3"	4"
Ø k	98	114	127	149	168	200
d ₂ x cant.	19 x 4	22 x 4	19 x 8	22 x 8	22 x 8	22 x 8

(1) Non available for sizes 25 and 32

(2) Suction flange vertically upwards only from three stages onward

Connections



Code	Connections	Shaft seal	Position of connections	Dimensions	
				2500 - 5000	6500 - 8000
I	Pressure gauge connection	001 022 511 BK- BX-	Discharge flange	G1/2"	G1/2"
II	Pressure / vacuum gauge connection		Suction flange	G1/2"	G1/2"
III	Vent		First stage casing	G1/4"	G3/8"
IV ⁽¹⁾	Vent		Suction casing	G1/4"	G3/8"
VI ⁽¹⁾	Filler connection		Suction casing	G1/4"	G3/8"
VII	Drain		Suction casing	G1/4"	G3/8"
IX	Drip and leakage connection		Bearing suction (suction and discharge side)	G3/8"	G1/2"
Xa	Connection for sealing liquid	022	Stuffing box housing (suction and discharge side)	G3/8"	G1/2"
XIa	Inlet connection for shaft seal cooling	511 BX-	Stuffing box housing (suction and discharge side)	G3/8"	G1/2"
XIb	Outlet connection for shaft seal cooling		Stuffing box housing (suction and discharge side)	G3/8"	G1/2"

(1) When suction flange position is horizontal, to right or to left.

Denomination – Instructions for ordering

The table describes the codification for the pump denomination according to its execution.

Type, size and number of stages	Impeller combination	Hydraulic and shaft support	Shaft sealing	Materials of construction	Casing gasket	Drive, standard and orientation of the flanges (always seen from shaft end)
HEGA 02502 - 02513 03202 - 03212 04002 - 04012 05002 - 05011 06502 - 06510 08002 - 08009	0-4 0-4 0-4 0-7 0/9 0/9	A • Hydraulic A	001 Uncooled stuffing box.	0B Main parts of cast iron	P O-rings of NBR ⁽³⁾ (Perbunan)	DRIVE ON SUCTION SIDE: 0 DIN/EN flanges, discharge vertical up, suction horizontal right. 1 Same as 0, but suction horizontal left. 2 Same as 0, but suction vertical up. (only for more than 3 stages) A Same as 0, but flanges drilled according to ANSI. B Same as 1, but flanges drilled according to ANSI. C Same as 2, but flanges drilled according to ANSI. DRIVE ON DISCHARGE SIDE (only for sizes 25, 32 and 40): 3 DIN/EN flanges, discharge vertical up, suction horizontal left. 4 Same as 3, but suction horizontal right. 5 Same as 3, but suction vertical up. (only for more than 3 stages) D Same as 3, but flanges drilled according to ANSI. E Same as 4, but flanges drilled according to ANSI. F Same as 5, but flanges drilled according to ANSI.
		B • Hydraulic B ⁽¹⁾	022 Externally flushed, uncooled, lengthened stuffing box (only for sizes 40, 50 and 65).	0C Same as 0B but impellers in bronze	V O-rings of FKM ⁽³⁾ (Viton ®)	
		• B One cylindrical roller bearing (DIN 5412) on the suction side and one deep-groove ball bearing (DIN 625) on the discharge side; both lubricated by grease.	511 Cooled stuffing box.	0D Same as 0C but diffusers and wear rings in bronze		
		• M One cylindrical roller bearing (DIN 5412) on the suction side and two single row angular contact ball bearings mounted in X arrangement on the discharge side; both lubricated by grease.	BK • Unbalanced mechanical seal with rubber bellows. Material code of mechanical seal ⁽²⁾ ••3 AQ1EGG ••U AQ1VGG ••S Q1Q1VGG	0E Same as 0B but impellers in stainless steel		
			BX3 Equivalent to BK3/BKS/BKU plus refrigeration or heating chamber BXU BXS	0R Same as 0B but shaft in stainless steel		
				0S Same as 0C but shaft in stainless steel		
				0U Same as 0E but shaft in stainless steel		
				1B Main parts of spheroidal graphite cast iron		
				4B Main parts of stainless steel		

(1) Only size 3200

(2) Material code according to EN 12756

(3) Shortway according to ISO 1629

ATTENTION: Letter "Y" at the end of designation on sizes 6500 and 8000 is used to identify pumps without wear rings. As standard, HEGA pumps do not have wear rings.

Example for order:

For pump size HEGA 32 of 6 stages with 2 trimmed impellers, strengthened shaft support, cooled stuffing box shaft sealing,

bronze impellers, Viton o-rings and DIN/EN flanges vertical up: **HEGA 03206 2BM 511 0C V2**



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