

## CAP SERIES SEWAGE AND WASTE WATER PUMPS

### TECHNICAL SPECIFICATIONS :

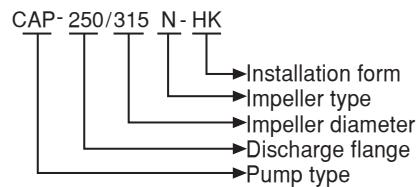
- Turbosan CAP series consists of centrifugal sewage and waste water pumps. They are used for pumping muddy liquids like sewage and other solid – water mixtures, with high viscosity.
- For the vertical column pipe types 1500 m and 1000 mm long standard pipes used. Required length can be adjusted between 1000 mm and 8000 mm by using standard parts.
- Axial thrust force balanced by vanes located behind the impellers. In column pipe models thrust force impeller and shaft weight balanced by oil or grease lubricated thrust bearing fitted on base plate.
- In dry installed models Teflon packing or mechanical seals suitable for pumped fluid can be used.
- Pump impellers statically and dynamically balanced according to ISO 1940 class 6.3
- Direction of rotation of the pumps is clockwise seen from drive end..
- All pumps tested according to ISO 9906
- CAP series pumps do not have suction ability, ther must be positive pressure on suction side.

### FIELDS OF APPLICATIONS :

- Domestic and industrial raw sewage water pumping
- Waste water handling plants
- Factory waste waters
- Pumping of fluid with high viscosity and suspensions.
- Pumping liquids in paint plants
- Pumping industrial and chemical waste water.
- Iron and steel industry
- Paper pulp cellulose plants
- Pumping of cooling water
- Draining, deterring

### General details:

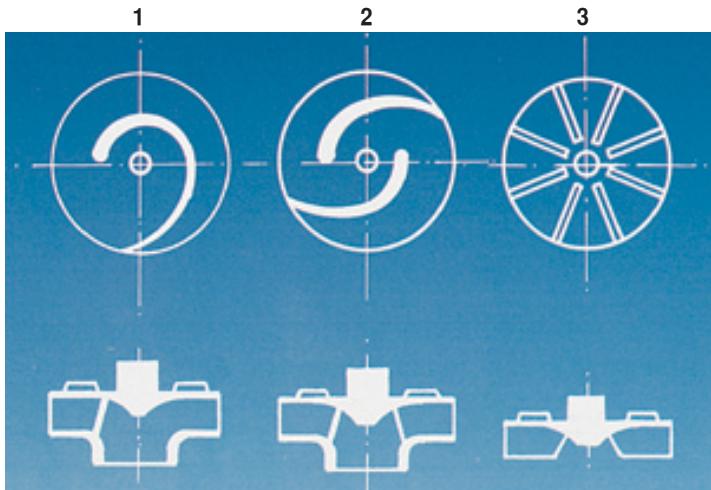
- Suction flange sizes : DN 50 – DN 600
- Discharge flange sizes : DN 50 – DN 600
- Capacity : 10 – 3000 m<sup>3</sup>/h
- Discharge head : 5 – 60 m
- Operating temperature : - 10°C + 75°C



### FLUID TYPES:

- Unscreened sewage and other waste water types with high solids concentration Pumps are designed to tolerate large solids ( $\varnothing$  30  $\varnothing$  - 200 mm diameter) without clogging.
- Water with sand content. Maximum grain size (20 - 30 mm). Liquid, sand ratio can be maximum % 6. For higher sand concentration preventive provisions must be taken aganist wear.
- Maximum allowed fluid temperature is 40 °C
- Maximum allowed medium density is 1,2 gr/cm<sup>3</sup>, maximum allowed medium viscosity is 1,5 x 10<sup>-6</sup> m<sup>2</sup>/s. Measures must be taken to lower these values.

### PUMP IMPELLER TYPE



#### SB - SINGLE BLADE (NON - CLOG) IMPELLERS

These types of impellers are designed to handle large solids. They do not overload the motor at low heads.

#### DB - DOUBLE BLADE IMPELLERS

These types of impellers are usually used in large size pumps. Because of rotational symmetry they operate in balance and vibration free. They can pass solids as wide as impeller channels.

#### V - VORTEX IMPELLERS

These types of impellers do not have closed channels. The impeller is placed behind the volute. Due to the rotation of the mass of fluid by the impeller, free vortex motion occurs, providing the pumping effect. As a result of this special design they can easily pump long fibrous matter.

### MATERIALS

PART	MATERIALS	
	BRONZ FITTED	CAST IRON
Casing	Cast iron (GJL 250) (EN-JL 1040) Bronze	Cast iron (GJL 250) (EN-JL 1040) Cast iron (GJL 250) (EN-JL 1040)
Impeller	Cast iron (GJL 250) (EN-JL 1040) Bronze	Cast iron (GJL 250) (EN-JL 1040) Cast iron (GJL 250) (EN-JL 1040)
Diffusor	Cast iron (GJL 250) (EN-JL 1040) Bronze	Cast iron (GJL 250) (EN-JL 1040) Cast iron (GJL 250) (EN-JL 1040)
Wear ring		Cast iron (GJL 250) (EN-JL 1040)
Shaft	Stainless steel (AISI 420) (1.4021)	Carbon steel (1.0501)
Shaft sleeve	Stainless steel (AISI 420) (1.4021)	Stainless steel (AISI 420) (1.4021)
Column pipes	(1.0120) welding construction	(1.0120) welding construction

NOTE: All pump components can be manufactured in different materials optionally according to the properties of the liquid to be pumped.



## CAP SERIES SEWAGE PUMPS MOUNTING ARRANGEMENTS

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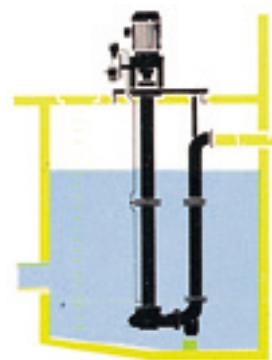
- 1) VY Vertical wet-pit sewage pump with suspension pipe
- 2) VK Vertical dry-pit sewage pump with suspension pipe
- 3) VS Vertical dry-pit sewage pump with universal joint shaft

- 4) VM Vertical dry-pit monoblock sewage pump
- 5) HK Horizontal dry-pit sewage pump

#### 1) Form VY

##### Vertical wet-pit sewage pump with suspension pipe:

The pump bearings and intermediate bearings are designed and manufactured to run in a wet-pit. The pump is suspended by use of a support plate. The discharge pipe is also attached to the support plate. The discharge outlet can be either above or bellow the plate level. Lubrication of the bearings is either carried out by a manual grease gun or by means of an automatic greaser. For VY type pump it is necessary to build a pump station over the pit as well as a crane system with lifting height of at least 3 metres. Form VY is manufactured for branch sizes up to 500 mm and for depths up to 8 metres.



#### 2) Form VK

##### Vertical dry-pit sewage pump with suspension pipe:

VK type pumps are manufactured to run in dry-pit. The pump bearings and intermediate bearings are grease lubricated ball bearings. The shaft can either be sealed off with mechanical seals or through a soft packed stuffing box. Form VK permits inspection and maintenance without disturbing suction and discharge piping. From VK is especially suitable for installation into dry-pits which may be subject to flooding . In this case, the level of the motor support plate must be above the flooding level.

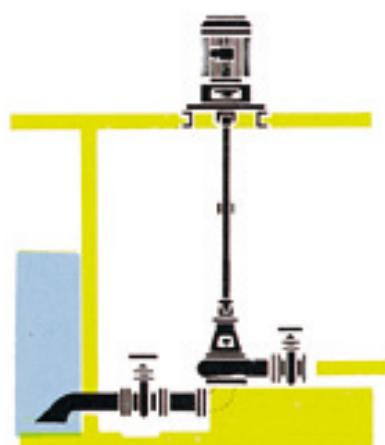
Form VK is manufactured for branch sizes up to 500 mm and for depths up to 10 metres.



#### 3) Form VS

##### Vertical dry-pit sewage pump with universal joint shaft:

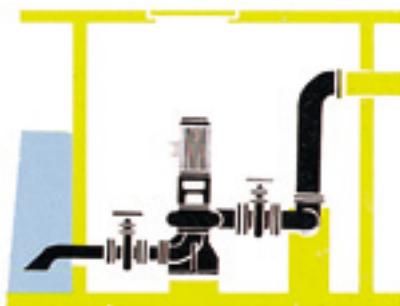
Form VS is especially suitable for installation into deep and dry-pits and for large discharge. The pump unit is supported by foot and is connected to the motor by an exposed vertical shaft. It has all the properties of form VK. Form VS is manufactured for branch sizes of 200 mm and over. Mounting lengths between the pump and the motor up to 10 meters is possible.



#### 4) Form VM

##### Vertical dry-pit monoblock sewage pump:

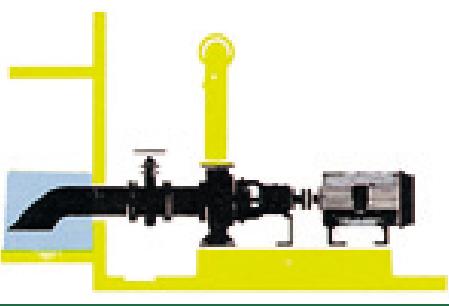
This pump is suitable for installation into dry-pits which are not subject to flooding and for installation on the ground level. Pump and motor form a compact unit. Form VM permits inspection and maintenance without disturbing suction and discharge piping and casing. The shaft can either be sealed off with mechanical seals or through a soft packed stuffing box and is supported by two grease lubricated ball bearings. VM form pumps are manufactured for all branch sizes shown in this booklet.



#### 5) Form HK

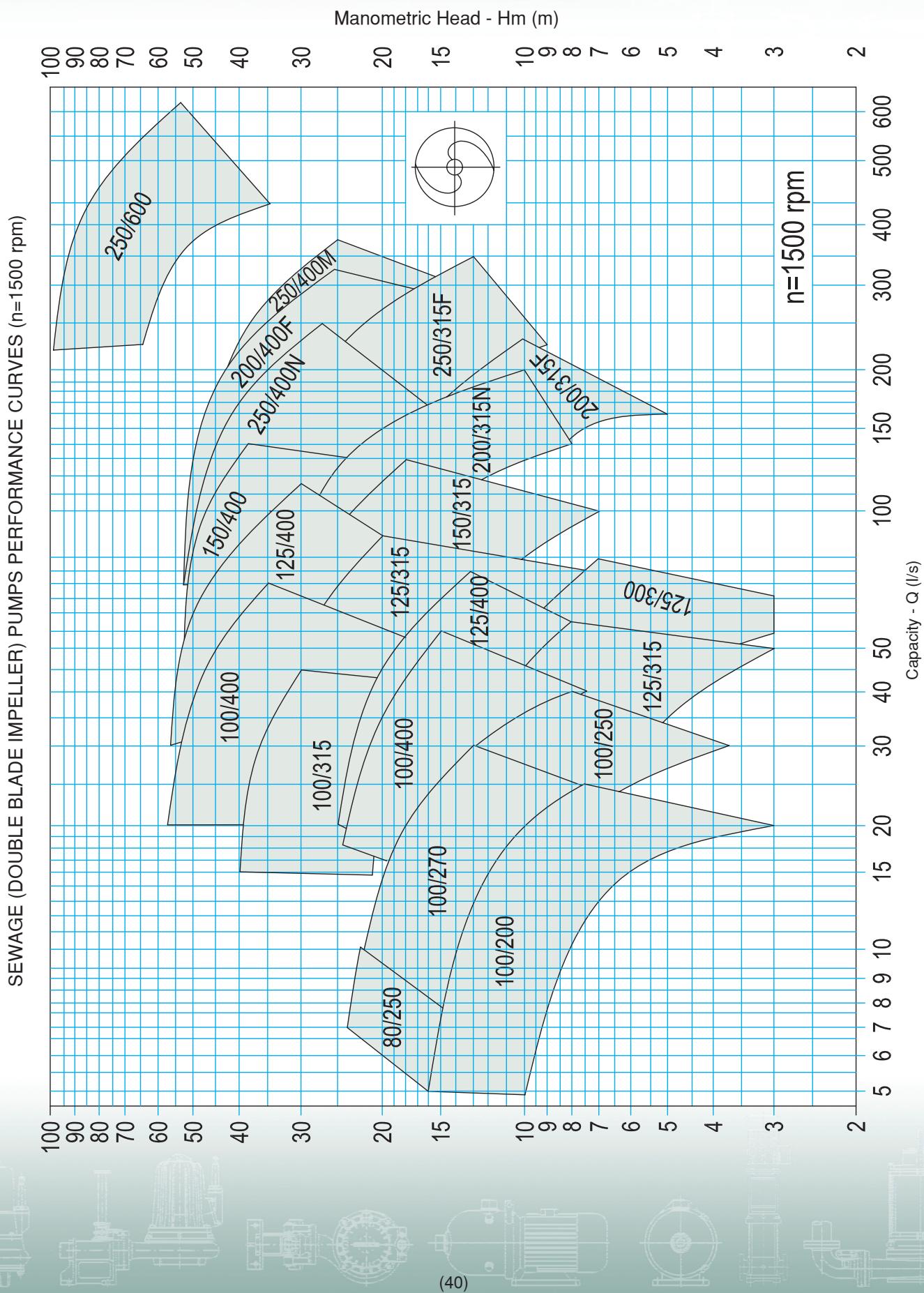
##### Horizontal dry-pit sewage pump:

This pump is suitable for installation wherever there is no danger of flooding. It has all the properties of horizontal pumps. Pump and motor are mounted on a steel base plate and connected by a flexible coupling. The shaft can either be sealed off with mechanical seals or by means of a soft packed stuffing box. Form HK can be equipped with a fly-wheel to avoid water hammer in the system. The pump shaft is supported by two ball bearings with oil or grease lubrication. HK form pumps are manufactured for all branch sizes shown in this booklet.



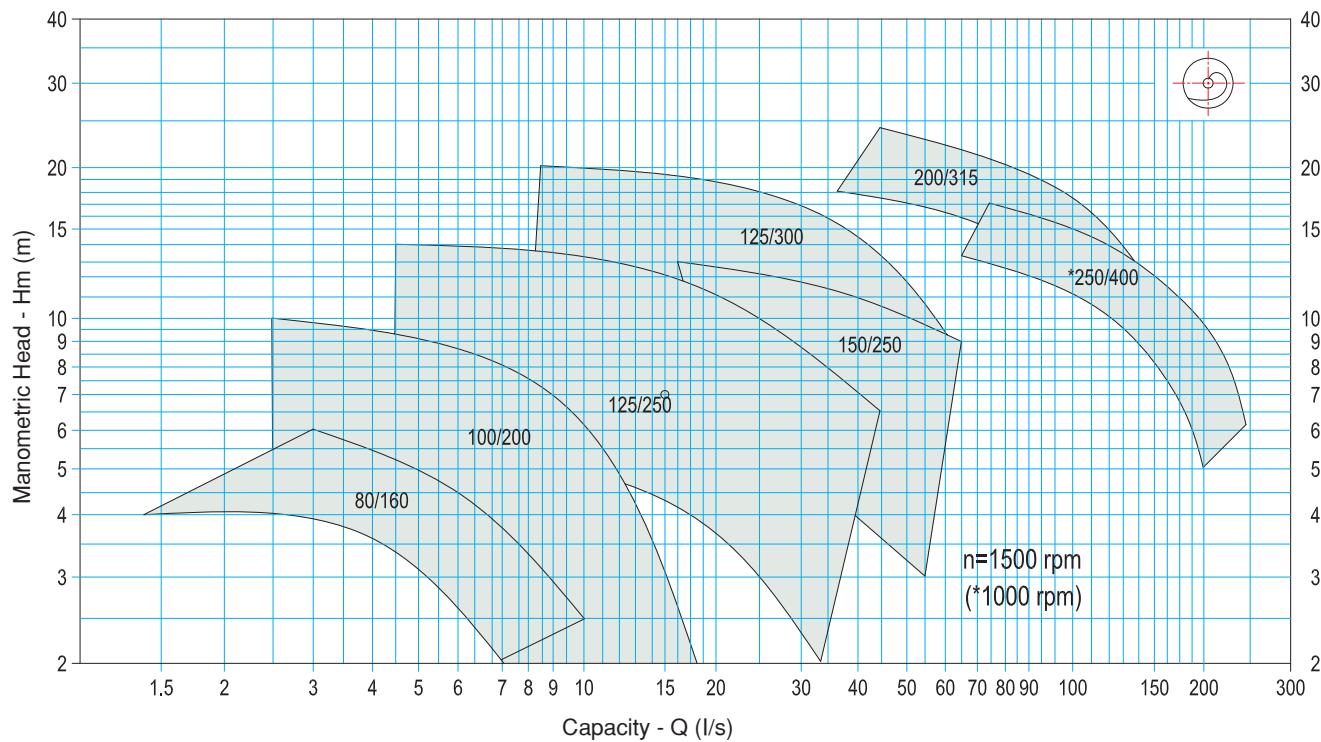


## CAP SERIES PUMPS GROUP PERFORMANCE CURVES (DOUBLE VANE IMPELLERS)

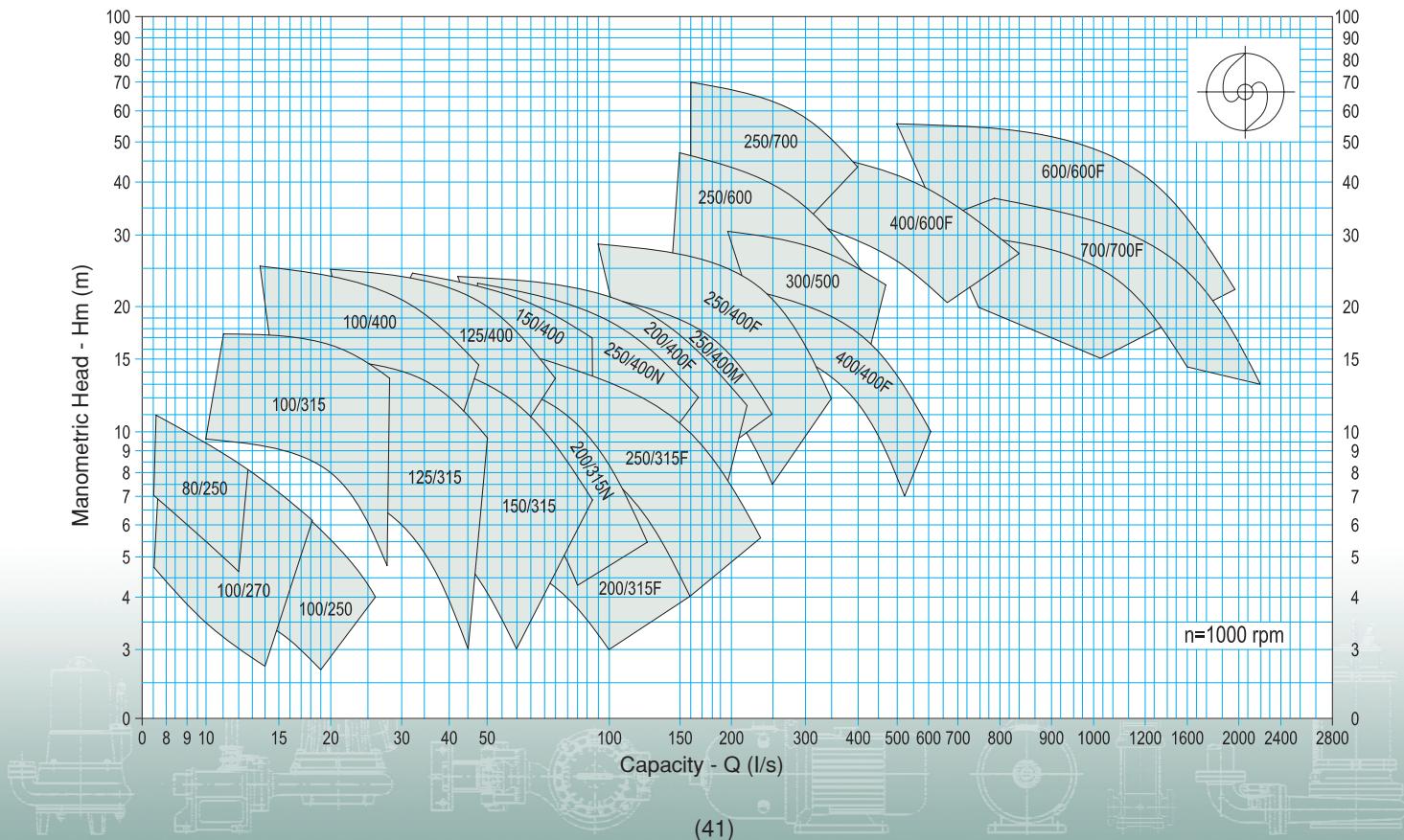


## CAP SERIES PUMPS GROUP PERFORMANCE CURVES

CAP SERIES PUMPS GROUP PERFORMANCE CURVES (SINGLE BLADE IMPELLER) (n = 1500 rpm)

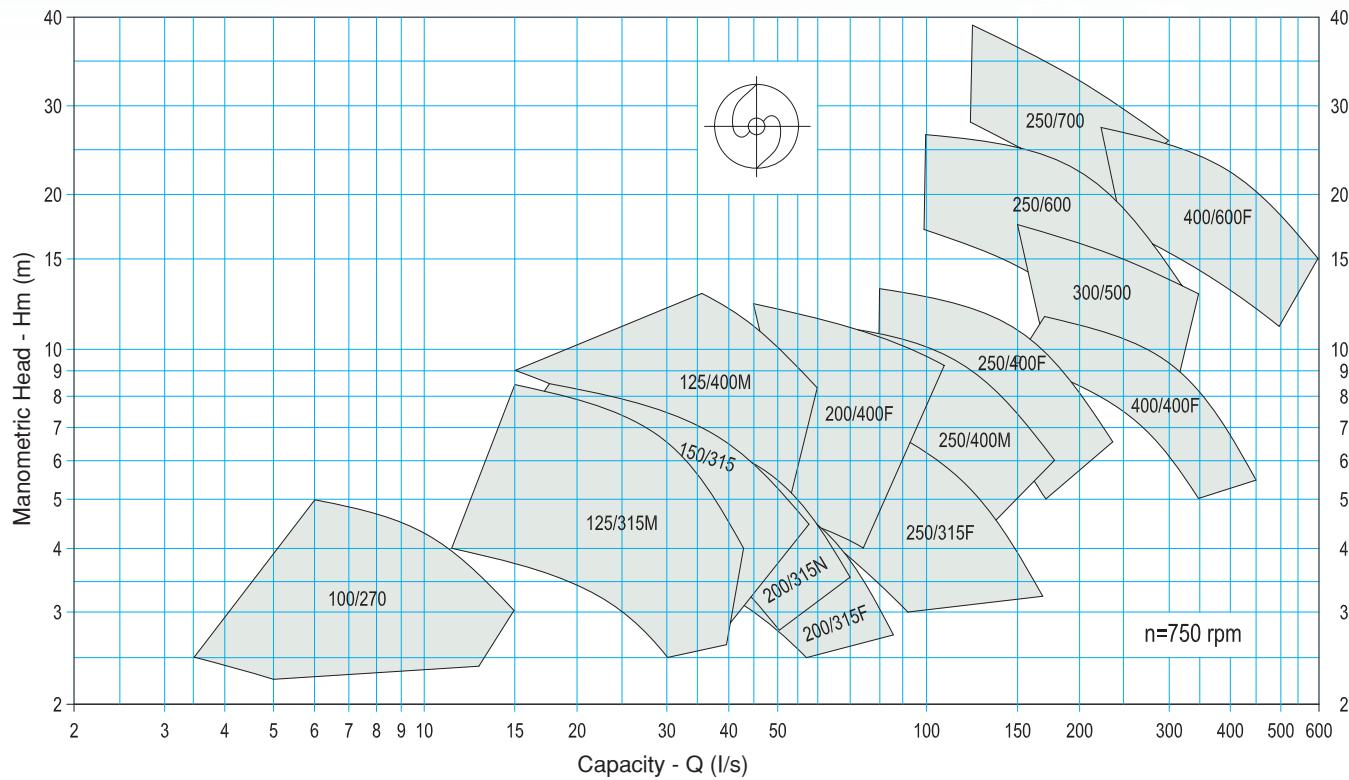


CAP SERIES PUMPS GROUP PERFORMANCE CURVES (DOUBLE BLADE IMPELLER) (n = 1000 rpm)

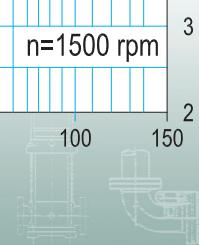
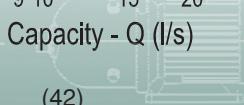
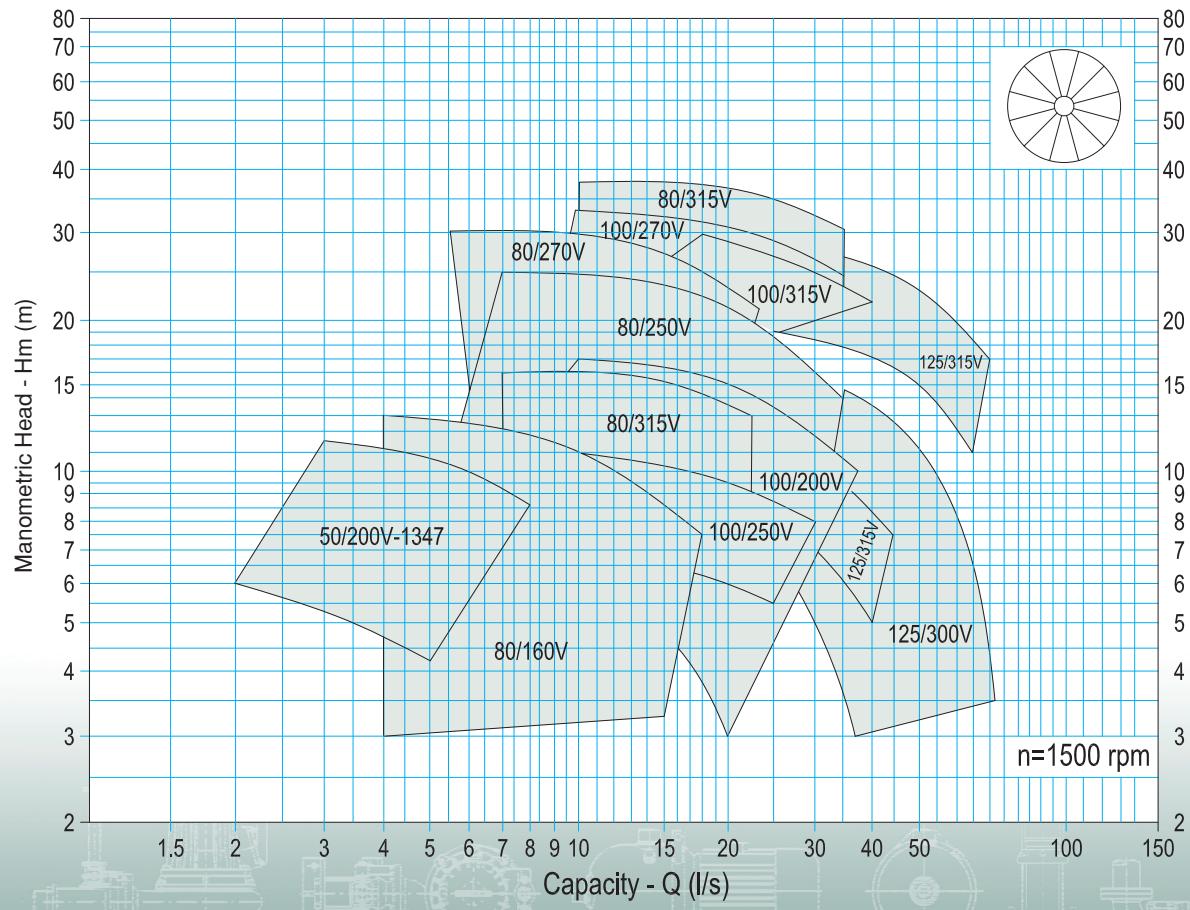


## CAP SERIES PUMPS GROUP PERFORMANCE CURVES

CAP SERIES PUMPS GROUP PERFORMANCE CURVES (DOUBLE BLADE IMPELLER) (  $n = 750$  rpm)

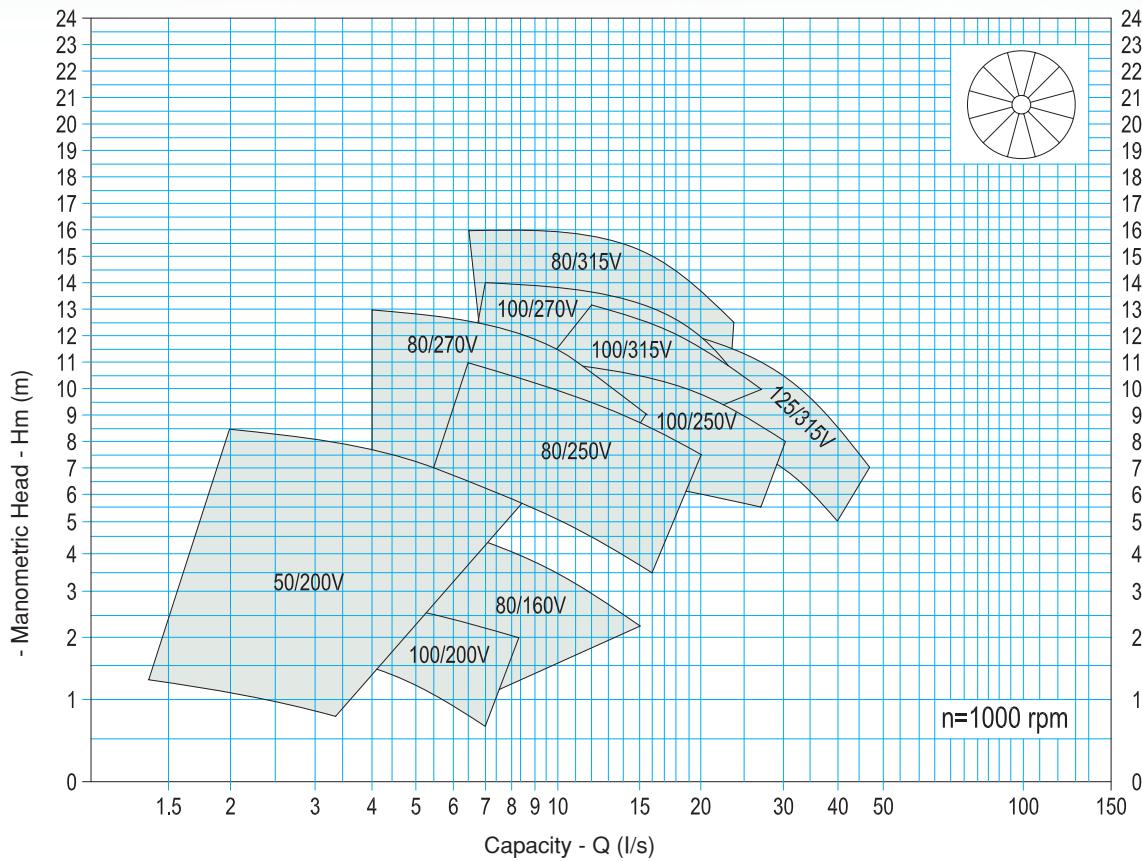


CAP SERIES PUMPS GROUP PERFORMANCE CURVES (VORTEX IMPELLER) (  $n = 1500$  rpm)

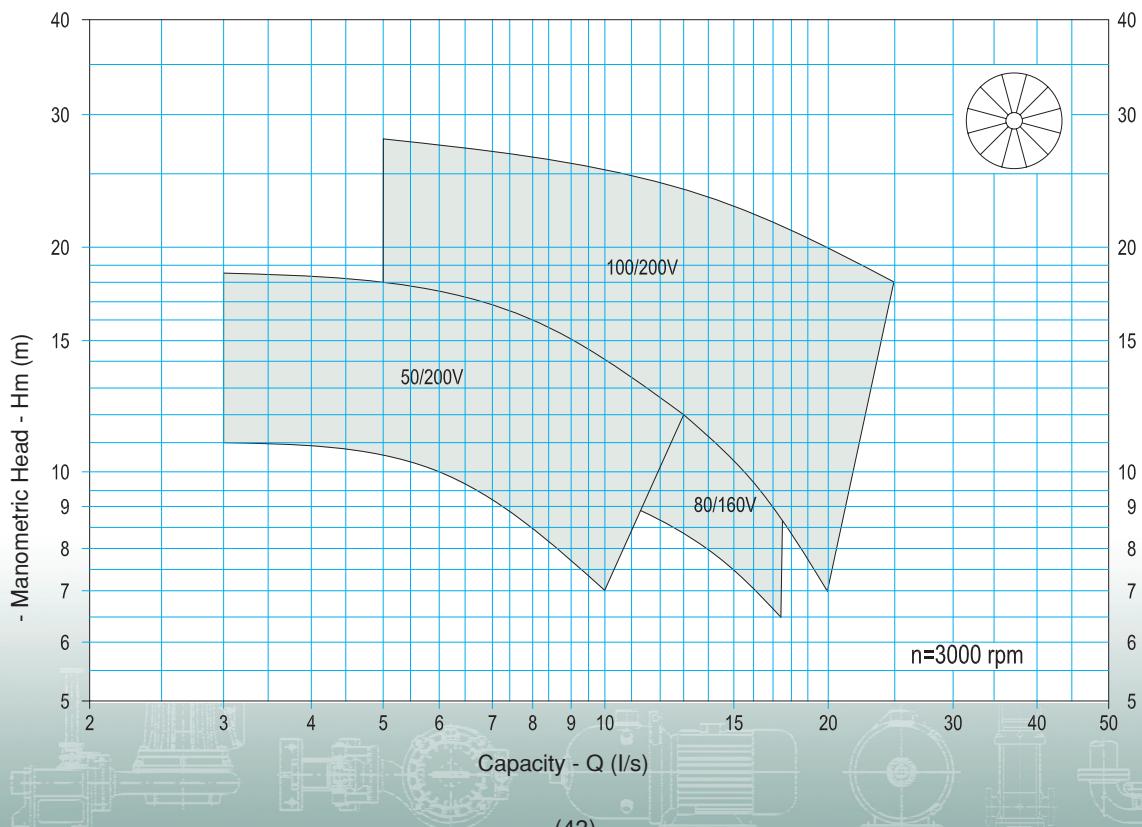


## CAP SERIES PUMPS GROUP PERFORMANCE CURVES

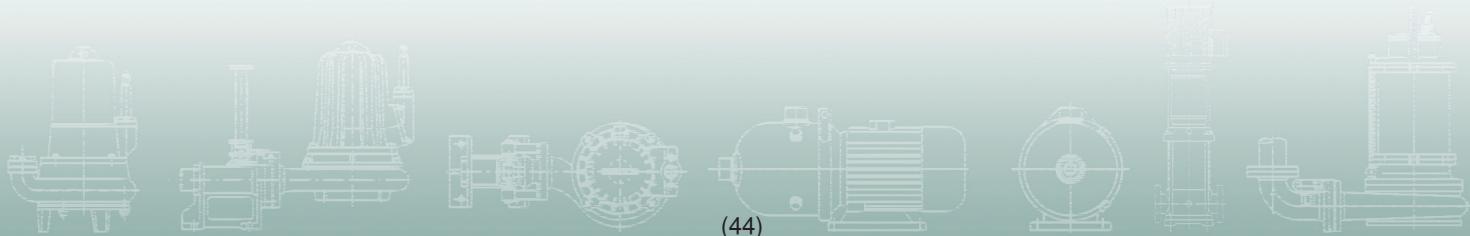
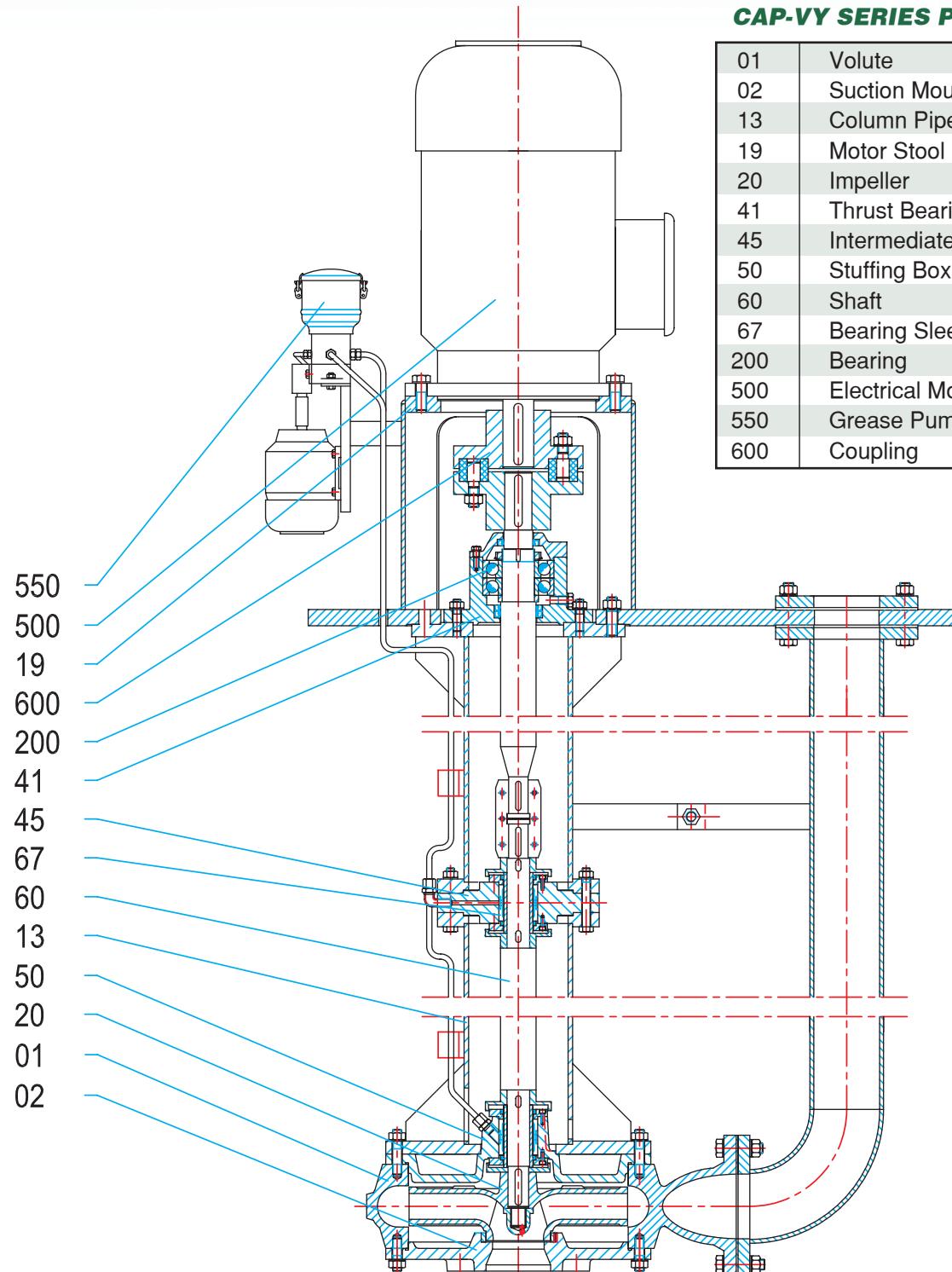
CAP SERIES PUMPS GROUP PERFORMANCE CURVES (VORTEX IMPELLER) (  $n = 1000$  rpm)



CAP SERIES PUMPS GROUP PERFORMANCE CURVES (VORTEX IMPELLER) (  $n = 3000$  rpm)

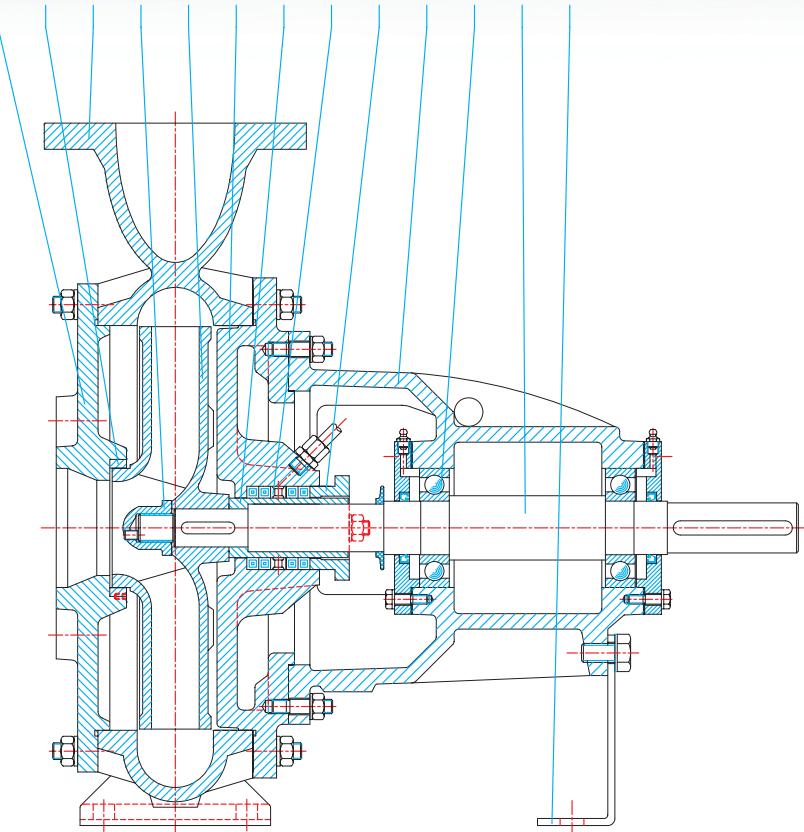


## CAP - VY SERIES PUMPS SECTIONAL DRAWING AND PARTS LIST



## CAP - HK AND VM SERIES PUMPS SECTIONAL DRAWINGS AND PARTS LIST

02 05 01 65 20 50 70 55 53 30 200 60 11



### CAP HK SERIES PARTS LIST

01	Volute
02	Suction Mouth
05	Wear Ring
11	Support Foot
20	Impeller
30	Bearing Housing
50	Stuffing Box
53	Gland
55	Lantern Ring
60	Shaft
65	Impeller Nut
70	Shaft Sleeve
200	Bearing

### CAP HK SERIES PARTS LIST

01	Volute
02	Suction Bend
16	Motor Stool
20	Impeller
30	Bearing Housing
50	Stuffing Box
53	Gland
55	Lantern Ring
60	Shaft
70	Shaft Sleeve
180	Coupling
200	Bearing
201	Bearing
500	Electric Motor

500

16

180

60

200

30

201

53

55

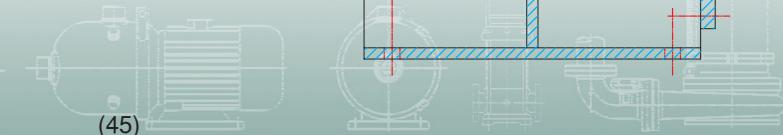
70

50

20

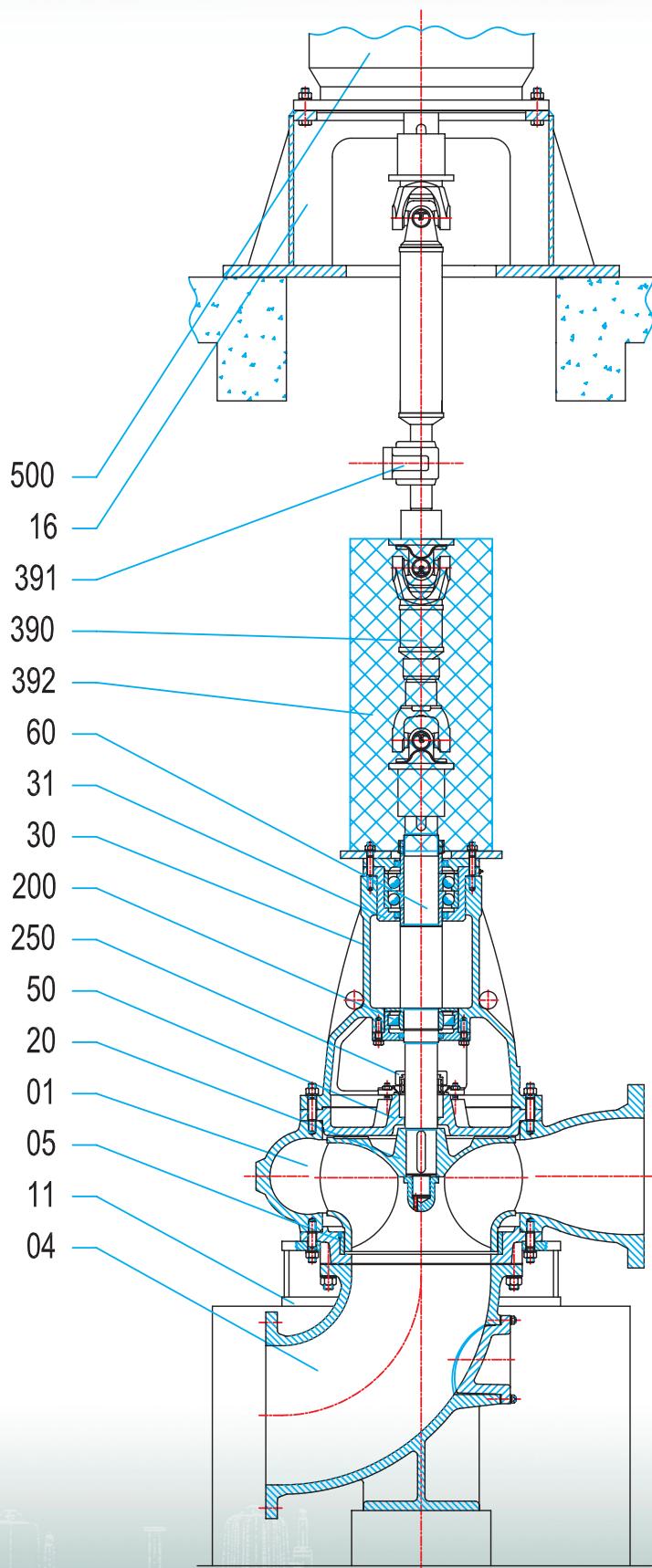
01

02



(45)

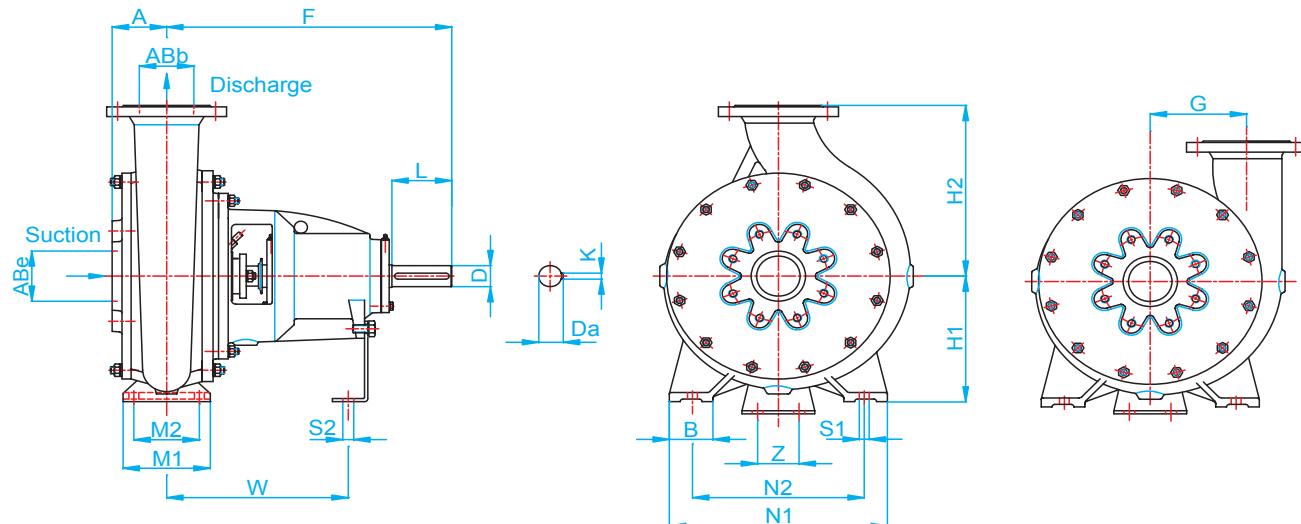
## CAP - VS SERIES PUMPS SECTIONAL DRAWING AND PARTS LIST



### CAP - VS SERIES PUMPS PARTS LIST

01	Volute
04	Suction Bendh
05	Wear Ring
11	Support Foot
16	Motor Stool
20	Impeller
30	Bearing Housing
31	Bearing Housing
50	Stuffing Box
60	Shaft
200	Bearing
250	Mechanical Seal
390	Cardan Shaft
391	Intermadiate Bearing
392	Safety Guard
500	Electric Motor

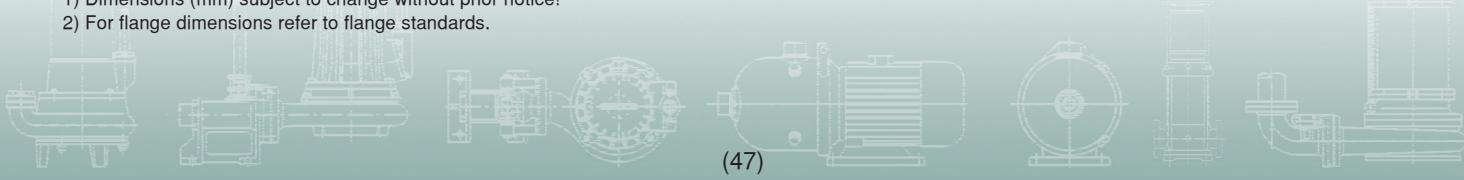
# CAP - HK SERIES HORIZONTAL DRY INSTALLATION SEWAGE PUMPS DIMENSIONS TABLE



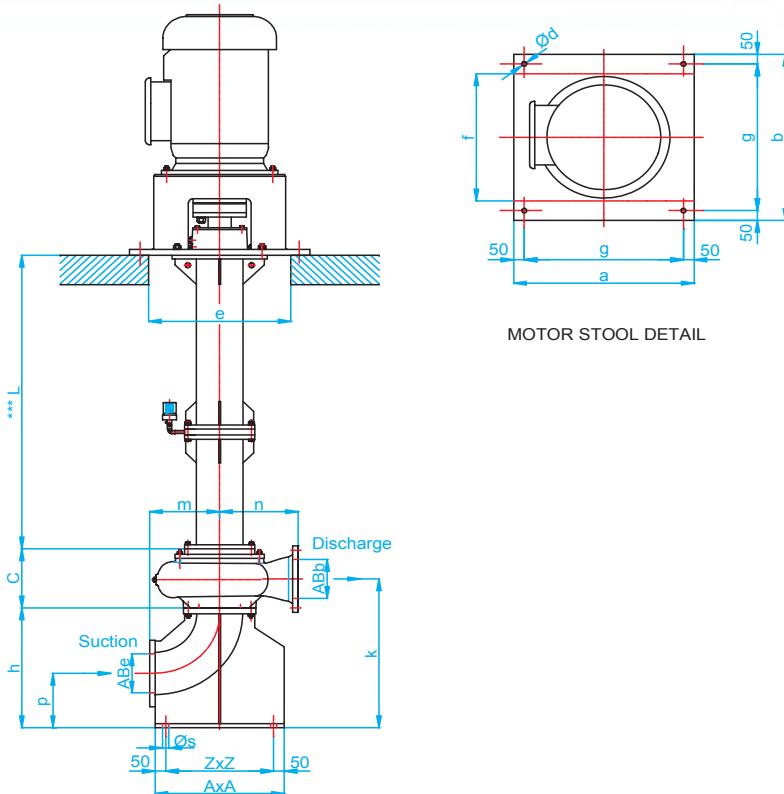
PUMP TYPE	Discharge A <sub>Bb</sub> -PN10	Suction A <sub>Be</sub> -PN10	A	F	H1	H2	B	M1	M2	N1	N2	S1	D	Da	K	L	W	Z	S2	G
50/200V	50	65	80	440	188	200	-	-	-	-	-	-	32	35	10	70	-	190	-	
80/160			65	463	-	-	-	-	-	-	-	-	80	-	-	-	-	326	-	
80/250			60	487	200	280	80	125	85	360	280	-	M16	-	-	80	312	100	135	
80/270			61	472	225	235	-	-	-	400	320	-	-	-	-	-	-	-	-	
80/315			70	555	250	340	85	160	120	175	400	-	42	45	12	110	365	M12	-	
100/250			78	465	-	300	-	-	-	-	-	-	-	-	-	-	-	-	-	
100/270V			72	448	188	235	-	-	-	-	-	-	32	35	10	70	-	190	-	
100/270M			164	448	-	-	-	-	-	-	-	-	-	-	-	-	-	135	-	
100/315			100	523	250	340	80	160	120	400	315	M16	42	45	12	110	333	140	-	
100/400			104	553	315	367	120	200	150	500	400	M20	32	35	10	70	369	150	M20	
125/250			120	496	250	315	-	160	120	400	315	M16	32	35	10	80	335	100	M12	
125/315			103	558	280	315	-	-	-	-	-	-	-	-	-	-	398	-	-	
125/400					370	100	200	150	-	500	400	-	-	-	-	-	373	-	-	
150/315			118	569	255	380	-	-	-	-	-	-	-	-	-	-	385	-	-	
150/400			112	630	400	315	-	-	-	550	450	M20	52	56	16	110	420	150	-	
200/315N			127	617	360	315	250	180	500	400	-	-	42	45	12	-	433	-	-	
200/315F			148	630	330	370	150	240	160	600	-	-	-	-	-	-	445	-	-	
250/400N			140															M20	-	
250/400M			160	864	380	480	140	280	200	650	500	M27	60	64	18	140	619	-	-	
250/400F			188															190	-	
250/600			280	741	550	650	160	350	250	800	660	-	-	-	-	-	665	-	-	
300/500			211	886	500	585	-	-	-	-	-	-	70	75	20	-	778	-	-	
400/400			243	850	580	800	150	270	-	-	-	M30	-	-	-	-	116	606	-	
400/600			500	417	1035	550	700	160	400	300	900	M27	80	85	22	150	900	240	-	
600/600			600	422	1202	800	700	325	500	400	1300	M36	100	106	28	210	814	400	M24	
																		500	-	

1) Dimensions (mm) subject to change without prior notice!

2) For flange dimensions refer to flange standards.



## CAP - VK SERIES VERTICAL DRY INSTALLATION SUSPENSION PIPE SEWAGE PUMPS DIMENSIONS TABLE

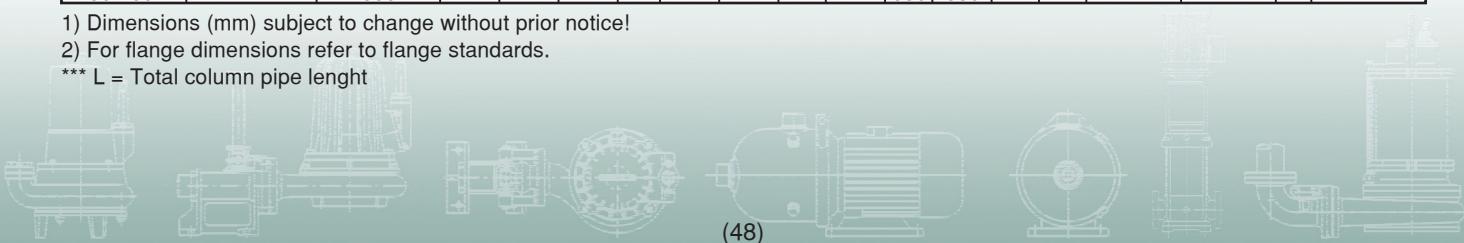


PUMP TYPE	Discharge ABb-PN10	Suction ABe-PN10	a	b	g	Ød	e	f	p	h	C	k	m	n	AXA	ZxZ	Øs	Anchor Bolt
50/200V	50	65	400	450	350	20	400	300	125	240	95	291	143		250x250	200x200	20	M18X200
80/160			450	500	400		450	350			135	403		200				
80/250			700	700	600	23	600	500	150	338	118	398	189	280				
80/270			750	750	650		500	550			121			267				
80/315			700	700	600		600	500			145	468		340				
100/250			800	800	700		500	500	195	375	150	453		300				
100/270								600			132	447	200	235				
100/315								650	450		224	539						
100/400								750	640	206	456		367					
125/250N-F								750	640	210	540	217	315					
125/315N-F	125	125							210	460	262	535	275	370	500x500	400x400		
125/400M									225	1100	282	682	326	300				
150/315M										315	700		400					
150/400M	150	150									335	690	325					
200/315N											360	820	400					
200/315F											380	856						
200/400M																		
250/400N																		
250/400M	250	250																
250/400F		300																

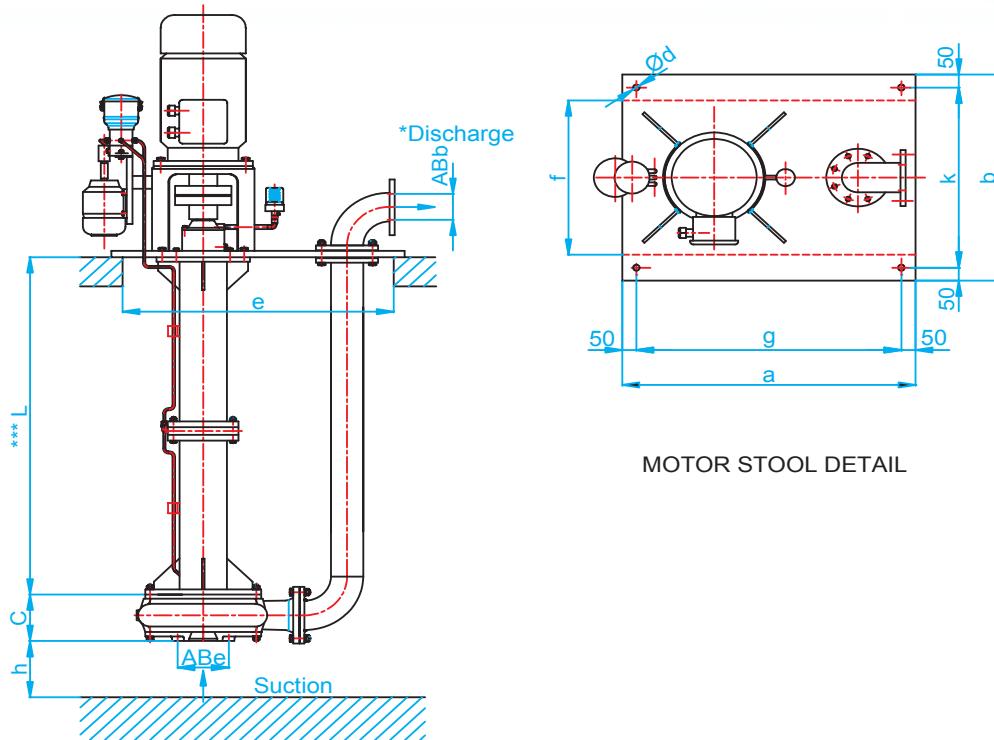
1) Dimensions (mm) subject to change without prior notice!

2) For flange dimensions refer to flange standards.

\*\*\* L = Total column pipe length



## CAP - VY SERIES VERTICAL WET INSTALLATION SUSPENSION PIPE SEWAGE PUMPS DIMENSIONS TABLE



PUMP TYPE	Discharge ABb-PN10	Suction ABe	C	h min.	e	a	g	b	k	f	Ød	Anchor Bolt
50/200V	50	65	95	150	600	600	500	450	350	300	20	M18x200
80/160V			135					500	400	350		
80/250	80	80	118	200	750	750	650	700	600	500	23	M20x200
80/270			121					750	650	550		
80/315			145		900	900	800	750	650	550		
100/250	100	100	150	250	800	800	700	700	600	500		
100/270			132					1000	1000	900		
100/315			224					800	700	600		
100/400			206					1000	1000	900		
125/250N-F	125	125	210	300	800	800	700	700	600	500		
125/315N-F			215					800	700	600		
125/400M											28	M24x250
150/315M	150	150	262	400	1000	1000	900					
150/400M								800	700	600		
200/315N			282									
200/315F	200		315	450	1100	1100	1000					
200/400M					335							
250/400N								1000	900	800		
250/400M	250	250	360	500	1400	1500	1400					
250/400F			380									

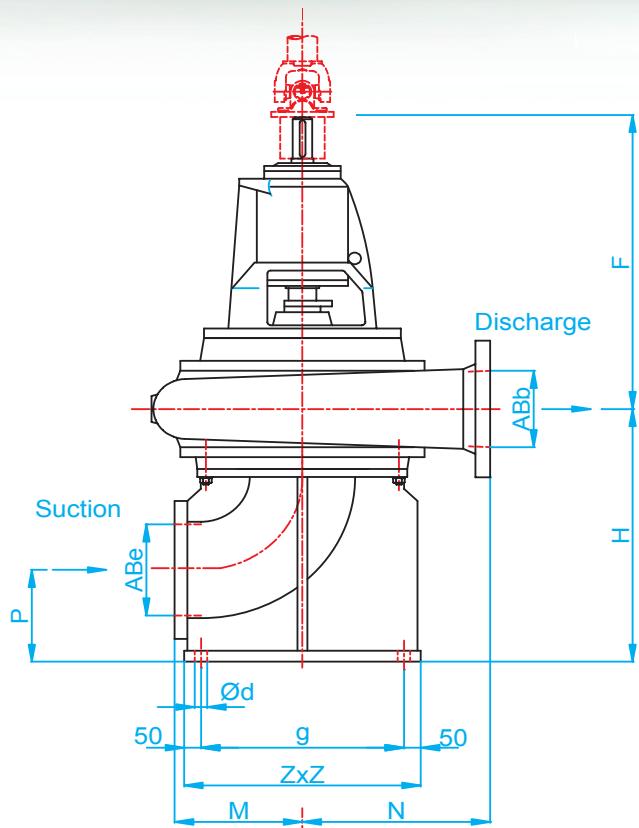
1) Dimensions (mm) subject to change without prior notice!

2) For flange dimensions refer to flange standards.

\*\*\* L = Total column pipe length



# CAP - VS SERIES VERTICAL DRY INSTALLATION CARDAN SHAFT DRIVE SEWAGE PUMPS DIMENSIONS TABLE

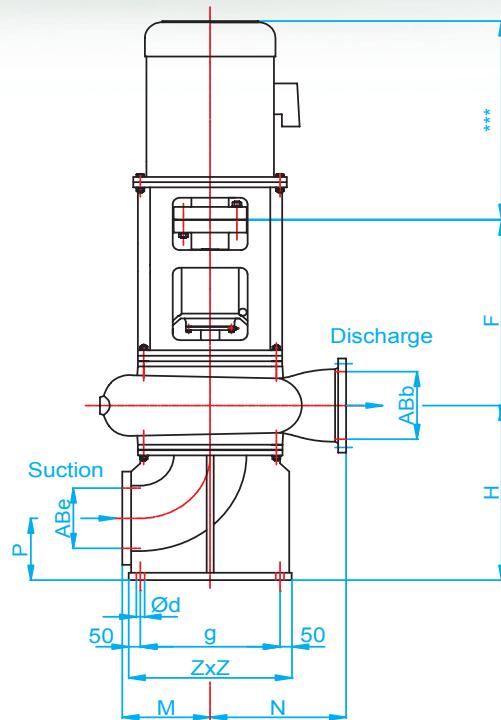


PUMP TYPE	Discharge Abb-PN10	Suction ABe-PN10	F	H	M	N	P	ZxZ	g	Ød	Anchor Bolt
50/200V	50	65		290	143	200	125	250x250	150x150		
80/160			456	403	200	280					
80/250		80		350	194	340	150			23	M20x200
80/270				375	235						
80/315			465								
100/250				450	300						
100/270V			488	448	200	235					
100/315		100			340						
100/400			550	450	367						
125/315	125	125	527	510	265	315	185				
125/400			557	520	370						
150/315	150	150	551	580	275	380	210				
200/315N			565	680	326	360					
200/315F	200	200	585	690	370	225					
250/400N											
250/400M			741	790	400	480	250				
250/400F				960	478		300	700*700	600*600		
250/600	250	300		930	400	650	250	600*600	500*500		
300/500	300			886	365	585	300	700*700	600*600		
400/400		400		850	540	540	288				
400/600				1035	1132		300	900*1200	800*1100	30	M27x300
600/600	600	600	1202	1522	600	700	500	1200*1200	1100*1100		

1) Dimensions (mm) subject to change without prior notice!

2) For flange dimensions refer to flange standards.

## CAP - VM SERIES VERTICAL DRY INSTALLATION MONOBLOCK SEWAGE PUMPS DIMENSIONS TABLE



PUMP TYPE	Discharge ABb-PN10	Suction ABe-PN10	F	H	M	N	P	ZxZ	g	Ød	Anchor Bolt
50/200V	50	65	473	290	143	200	125	250x250	150x150		
80/160			485	403	200						
80/250	80	80	456	350	280	150				23	M20x200
80/270				375	235						
80/315			465		340						
100/250	100	100	488	450	300	195	400x400	300x300			
100/270				448	235						
100/315			550	450	340						
100/400					367						
125/250	125	125	475	520		315					
125/315			527	510	265	185	500x500	400x400			
125/400				520	370						
150/315	150	150	551	580	275	300	210			28	M24x250
150/400			630	574	400						
200/315N	200	200	565	680	326	360					
200/315F			585	690	370	225	600x600	500x500			
200/400			768	700							
250/400N				690							
250/400M	250	250	790	400	480	250					
250/400F			960	478		300	700x700	600x600			
250/600		300	930	400	650	250	600X600	500X500			
300/500	300		886	835	365	585	700x700	600x600			
400/400	400		850	958	540	300	900*1200	800*1100		30	M27x300
400/600		500	1035	1132							
600/600	600	600	1202	1522	600	700	1200*1200	1100*1100			

1) Dimensions (mm) subject to change without prior notice!

2) For flange dimensions refer to flange standards.

\*\*\* Consult Turbosan A.S. for motor height.

