



TÜRBOSAN

"PUMPS AND PUMPING SYSTEMS"

PRODUCT CATALOGUE

• INDUSTRIAL PROCESS • FIRE FIGHTING • WASTE WATER

www.turbosan.com



FOREWORD

Water is the basic natural resource for the life. Life can not exist without water. It is necessary to supply water and drain waste water from any habitat, house, field, industrial plant where people and the life exists. Pumps are invented centuries ago for this purpose. Since 1971 till today pumps manufactured by Turbosan are serving to discharge any liquids.

Turbosan is your loyal, reliable and strong partner who improves its product to meet client needs and expectations. Turbosan closely co-operates with customers and offers most suitable products to them. Turbosan is Turkey's leading pump and pumping equipment manufacturer with its worldwide reputed brand name.

With "Perfection in products and services" understanding, Turbosan manufactures and markets pumps for water supply, industrial process, agriculture, waste water handling, dewatering and supports clients with experienced sales team as well as with optimum cost effectiveness.



CONTENTS

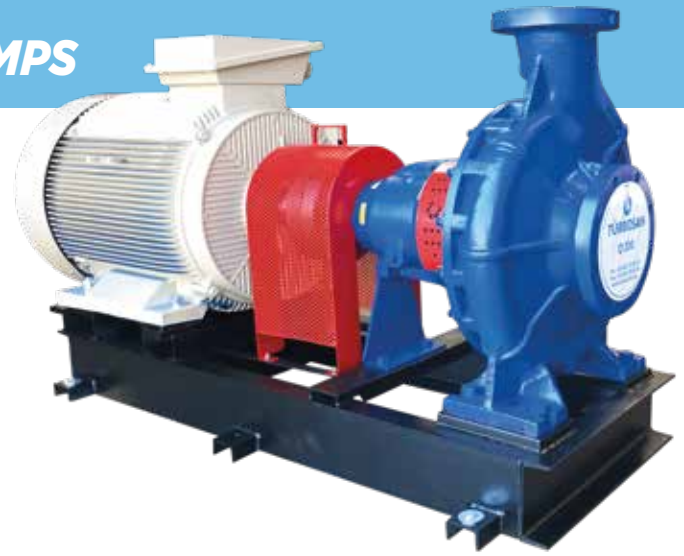
INDUSTRIAL PUMPS		PAGE
PART 1	NORM SERIES VOLUTE CASING / END SUCTION PUMPS	2-10
PART 2	CEP SERIES HORIZONTAL / VERTICAL SPLIT CASE PUMPS	11 - 19
PART 3	KAT SERIES HORIZONTAL MULTI STAGE PUMPS	20 - 23
PART 4	DAC-SC AND DAS SERIES SUBMERSIBLE WASTE WATER / SEWAGE PUMPS	24 - 28
PART 5	CAP SERIES WASTE WATER AND SEWAGE PUMPS	29 - 41
PART 6	DAC E/K SERIES SUBMERSIBLE AXIAL AND MIXED FLOW PUMPS WITH TUBE	42
PART 7	EKS E/K SERIES AXIAL AND MIXED FLOW PUMPS	43 - 44
PART 8	NORM HP SERIES HOT WATER AND THERMAL OIL PUMPS	45
PART 9	PROCESS SERIES PUMPS	46
PART 10	API 610 COMPLYING PETROCHEMICAL PUMPS	47 - 53
 DOMESTIC WASTE WATER PUMPS		
PART 11	PARPO SERIES SUBMERSIBLE GRINDER PUMPS	54 - 57
PART 12	DAS SERIES SUBMERSIBLE WASTE WATER AND SEWAGE PUMPS	58 - 64
 FIRE FIGHTING PUMPS		
PART 13	FIRE FIGHTING PUMPS AND FIRE FIGHTING PUMP SETS (UL & FM)	65 - 88
 CERTIFICATES & PICTURES		
PART 14	CERTIFICATES	89 - 90
PART 15	SOME PUMP PICTURES	91 - 93

ATTENTION : 1) PUMP DIMENSIONS ARE FOR INFORMATION ONLY, NOT INTENDED FOR CIVIL DESIGN OR PIPING DESING.
2) PUMP PERFORMANCE CURVES ARE FOR INFORMATION ONLY, CONSULT TURBOSAN FOR DETAILED INFORMATION.
3) TURBOSAN RESERVES THE RIGHT TO MAKE CHANGES IN THIS CATALOGUE WITHOUT PRIOR NOTICE.

NORM SERIES END SUCTION PUMPS

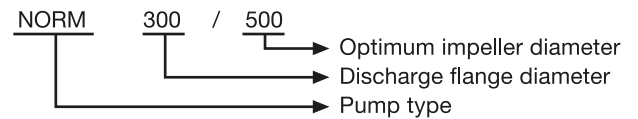
TECHNICAL DETAILS :

- The NORM series pumps are high efficiency low and medium pressure horizontal single stage (except for 3 two staged models), easy to maintain centrifugal pumps with volute casing, closed type impeller.
- In addition to 21 models complying with EN 733 (DIN 24255) and EN 22858 standards, Turbosan has developed 29 different models with larger sizes reaching 51 different models for this series.
- NORM series pumps are manufactured according to ISO 9905.
- Pump impellers are statically and dynamically balanced according to ISO 1940 class 6.3
- The discharge flange of the NORM series pumps is located on the top as standard optionally discharge flange on sides available. Suction and discharge flanges are manufactured according to PN 10 norm. Upon request other flange norms are available.
- Volute casings of NORM series pumps are fitted with renewable with wear rings on both impeller sides in order to prevent wear of volute casing
- Pumps have 6300 series ball bearings. Grease and oil lubrication are available options.
- Axial is trust balanced by balancing holes and two wear rings.
- NORM series pumps are manufactured with soft packing as a standard. Soft packing is located on shaft sleeves which are made of hardened stainless steel. Stuffing box lubrication is according to API PLAN 11 Mechanical seal is available optionally (EN 12756 / DIN 24250)
- All pumps tested according to ISO 9906



GENERAL INFORMATION:

- Suction flange diameter : Ø 50 ÷ 600
- Discharge flange diameter : Ø 32 ÷ 500
- Capacity range (Q) : 14-3100 m³/h
- Discharge head range (Hm): 5-90 mwc (1500 rpm)
- Operating temperature : -10°C ÷ 120°C



Double Stage End Suction Pump

TURBOSAN NORM TYPE EFF (HIGH EFFICIENCY) PUMPS:

After years of research work, Turbosan introduces new EFF series end suction pumps. New series pumps have much higher efficiency values compared to standard end suction pumps. High efficiencies are achieved by a new impeller and volute geometries which are designed using CFD modelling software will decrease the energy cost of pump operation.

- NORM pumps equipped with closed type impellers and curved vanes. With this type impellers cavitation free operation for high suction head applications obtained.

MATERIALS:

COMPONENT	MATERIALS	
	BRONZE / STAINLESS STEEL VERSION	CAST IRON VERSION
Volute casing	Cast iron (GJL 250) (EN-JL 1040)	Cast iron (GJL 250) (EN-JL 1040)
Impeller	Bronze / AISI 316	Cast iron (GJL 250) (EN-JL 1040)
Wear ring	Bronze	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)
Painting	RAL 5010	RAL 5010

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

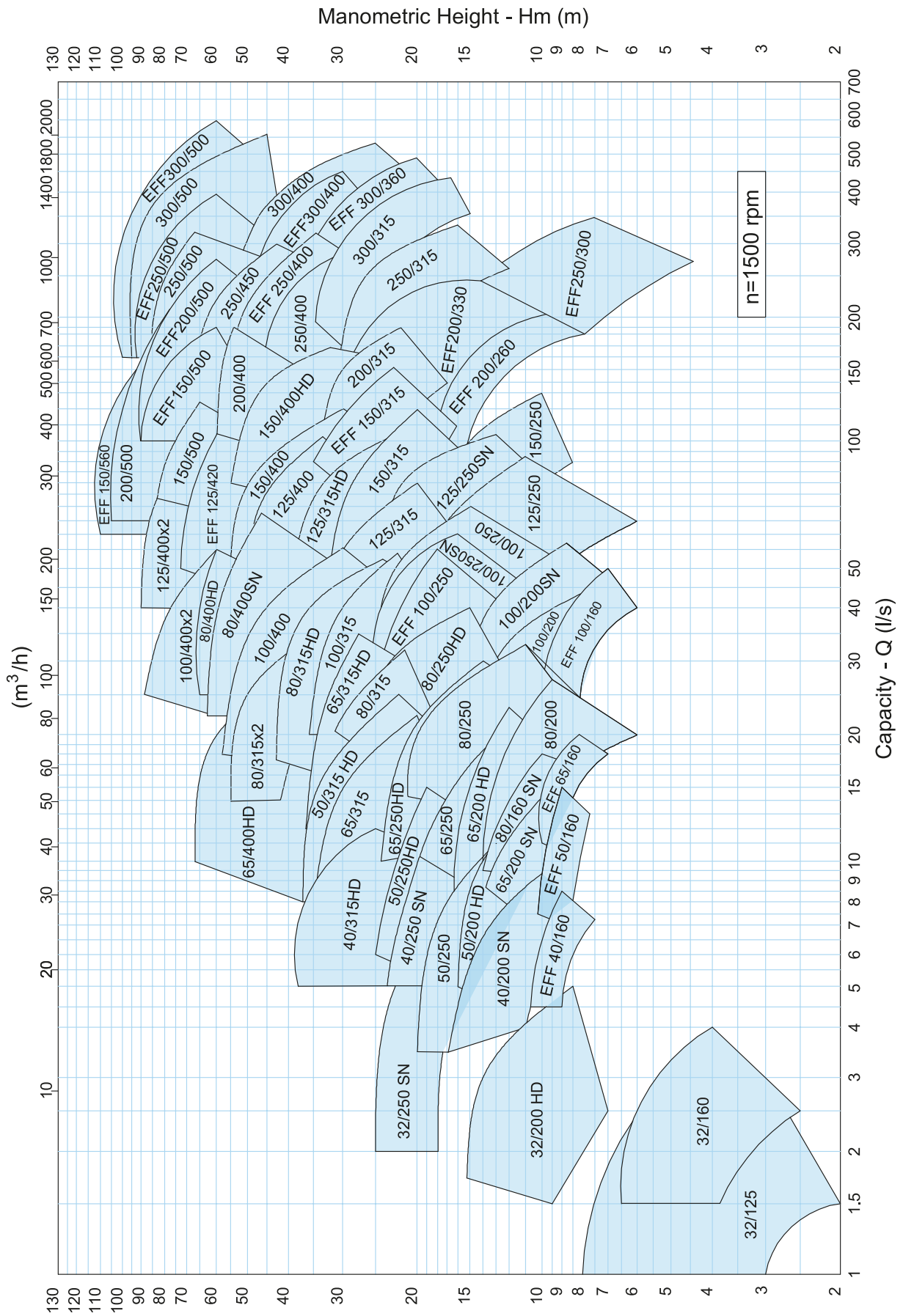
FIELDS OF APPLICATION

Turbo-NORM series pumps are suitable for

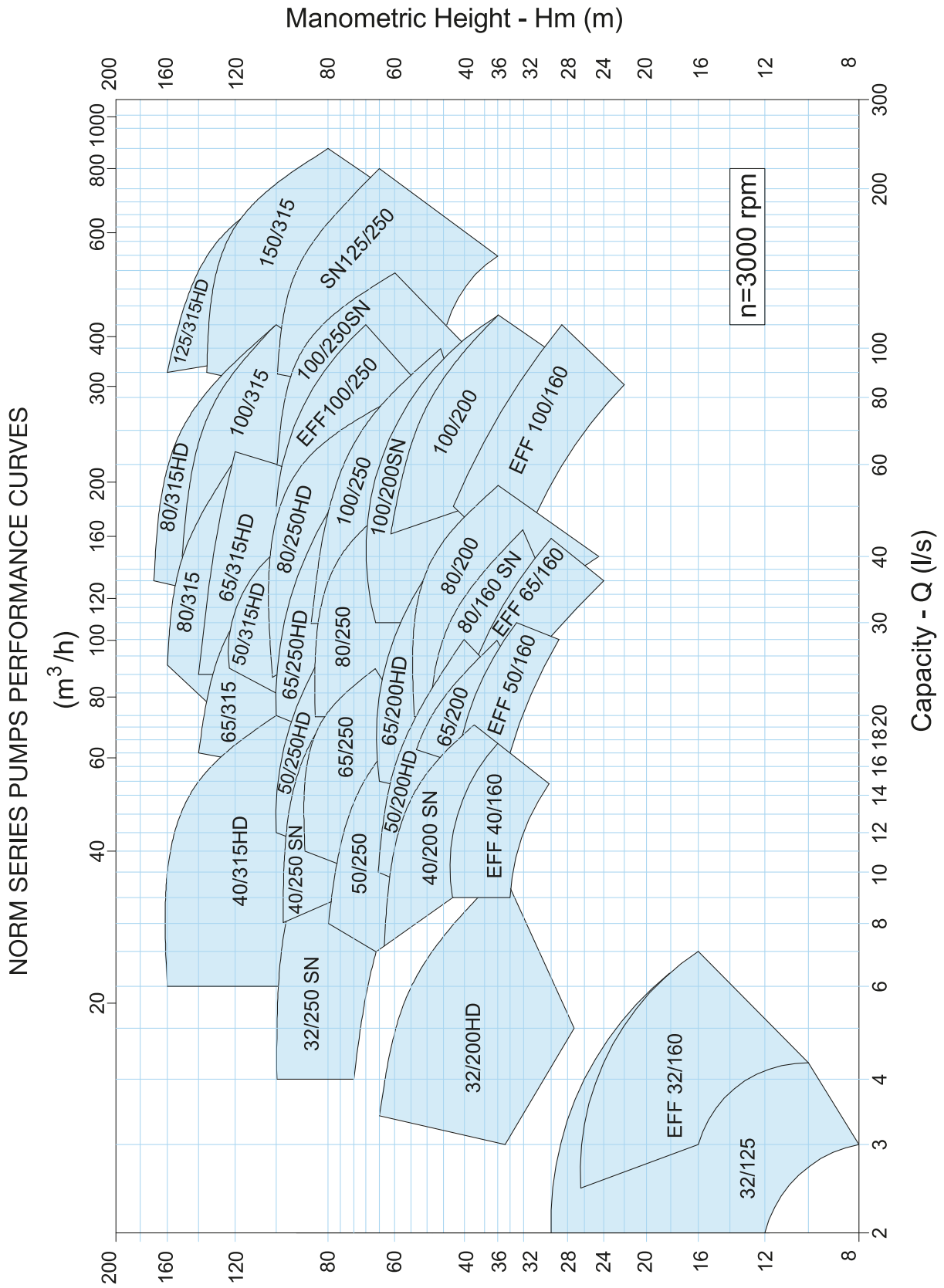
- ★ Water supply
- ★ Irrigation and spraying systems,
- ★ Drinking water supplies to buildings, communities and towns,
- ★ Pumping liquids with low viscosity (i.e gasoline, oil, acid base etc.) in industries,
- ★ Cooling water systems,
- ★ Industrial plants on duty 24 hours a day, like Iron & Steel works.
- ★ Food and beverages industries,
- ★ Paper and cellulose industries,
- ★ Swimming pool water.

NORM SERIES PUMPS GROUP **PERFORMANCE CURVES (n=1500 rpm)**

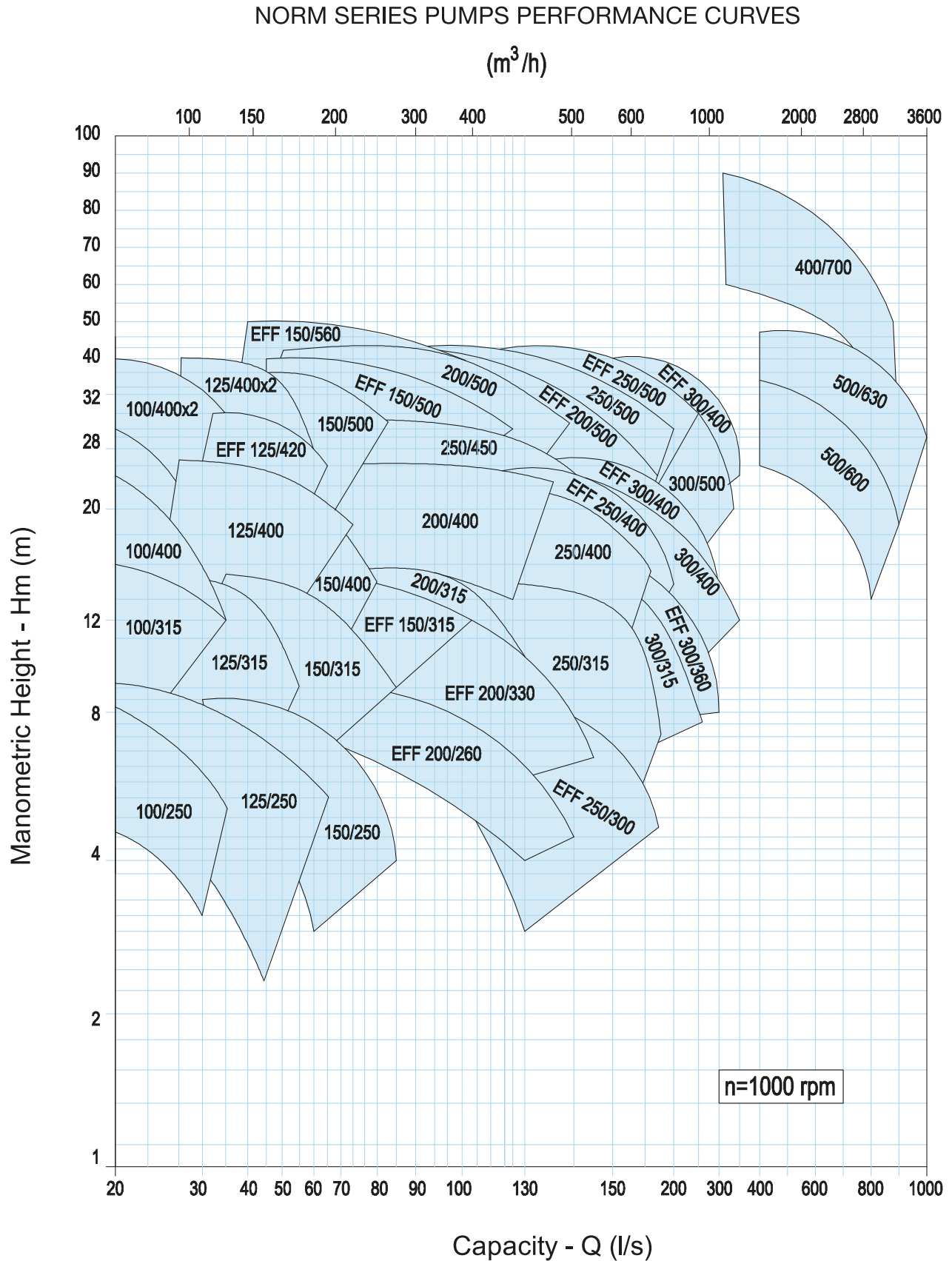
NORM SERIES PUMPS PERFORMANCE CURVES



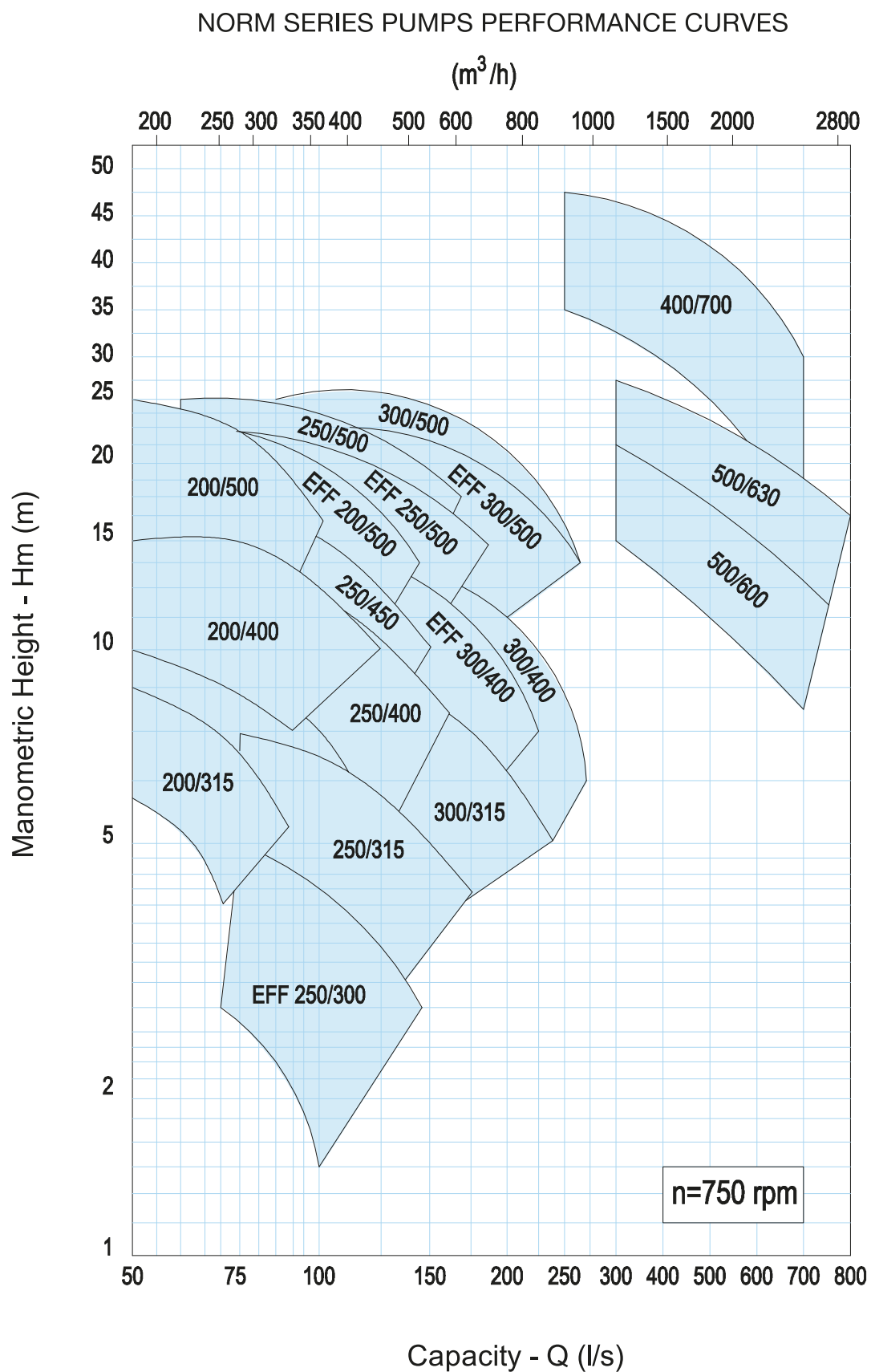
NORM SERIES PUMPS GROUP PERFORMANCE CURVES (n=3000 rpm)



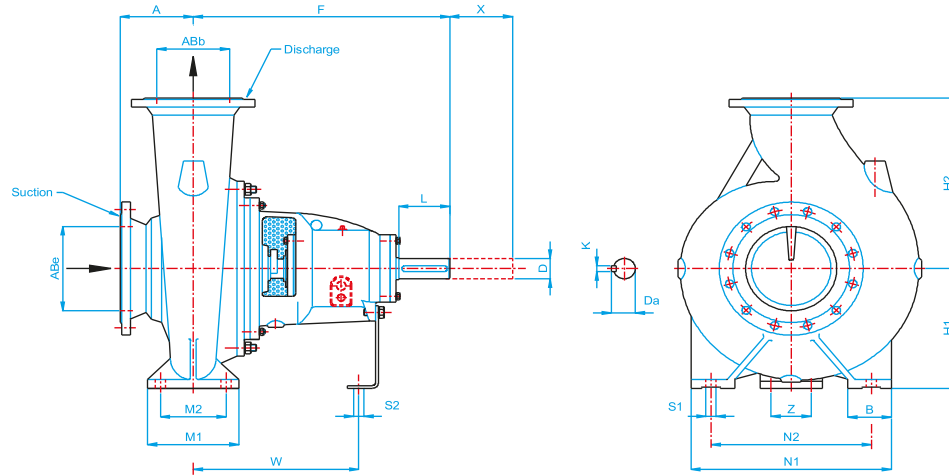
NORM SERIES PUMPS GROUP PERFORMANCE CURVES (n=1000 rpm)



NORM SERIES PUMPS GROUP PERFORMANCE CURVES (n=750 rpm)



NORM SERIES PUMPS DIMENSIONS TABLE



MODEL		ABb	ABa	A	F	H1	H2	B	M1	M2	N1	N2	S1	S2	D	Da	K	L	W	Z	Mechanical Seal Diameter	Weight -Kg	X
EN 733 (DIN 24255) MODELS	EXTENDED RANGE and EN 22858																						
Norm 32/125	-	32	50	80	360	112	140	50	100	70	190	140	M12						260	110	32		
Norm 32/160	-				360	132	160				240	190	M10							80	38		
Norm-HD 32/200	-				360	160	180																
-	Norm-SN 32/250			100		180	225	65	125	95	320	250			24	27	8	50		250	80	60	100
* Norm-EFF 40/160	-		65	80		132	160				240	190								110	40		
Norm-SN 40/200	-				160	180					265	212											
Norm-SN 40/250	-			100		180	225				320	250	M12							80	50		
-	Norm-HD 40/315			125	500	200	250				345	280											
* Norm-EFF 50/160	-		65	100		180	225	50	100	70	265	212			32	35	10	80	360	90	30	70	140
-	Norm-HD 50/200				160	200	53				265	212	M10		24	27	8	50		80	25	42	
Norm 50/250	-			50		180	225				320	250								80	42		
-	Norm-HD 50/250														24	27	8	50		90	25	57	
-	Norm-HD 50/315																			80	62		
* Norm-EFF 65/160	-			80		225	280	65	125		345	280	M12										
Norm-SN 65/200	-				360	160	200				280	212			32	35	10	80	310	100	30	92	140
-	Norm-HD 65/200			100		180	225				360	280			24	27	8	50	260	80	25	52	100
Norm 65/250	-																						
-	Norm-HD 65/250			65		200	250				360	280	M16		32	35	10	80	310	100	30	76	140
Norm 65/315	-					225	280	80	160	120	400	315											
-	Norm-HD 65/315												M18		42	45	12	110	345		110	100	
-	Norm-HD 65/400										435	355	M16	M20						350	150	40	163
Norm-SN 80/160	-			100		225	280	65	125	95	320	250	M12		24	27	8	50	260	80	25	64	100
Norm 80/200	-					180	225				345	280											
Norm 80/250	-																						
-	Norm-HD 80/250			80		200	280				400	315	M12		32	35	10	80	310	100	30	98	140
-	Norm-HD 80/315					225	315																
-	Norm 80/315x2														42	45	12	110	340		40	147	
-	Norm-SN 80/400														32	35	10	80	310		30	148	250
* Norm-EFF 100/160	-			100		280	355				435	355	M16	M20	42	45	12	110	345	150	40	158	
Norm 100/200	-					200		80	160	120	360	280	M16		32	35	10	80	310		30	78	140
Norm-SN 100/200	-																						
-	Norm-EFF 100/250														42	45	12	110	350	100	40	116	170
Norm 100/250	-					225																	
Norm-SN 100/250	-										400	315			32	35	10	80	310		30	104	140
Norm 100/315	-																						
Norm 100/400	-																						
-	Norm 100/400x2																						
Norm 125/250	-																						
-	Norm-SN 125/250																						
Norm 125/315	-																						
Norm-HD 125/315	-																						
Norm 125/400	-																						
Norm-EFF 125/420	-																						
-	Norm 125/400x2																						
* Norm-EFF 150/200	-			150		280	375																
Norm 150/250	-																						
* Norm-EFF 150/250	-																						
Norm 150/315	-																						
-	Norm-EFF 150/315																						
Norm 150/400	-																						
-	Norm 150/400																						
HD-N 150/400	-																						

NOTE:

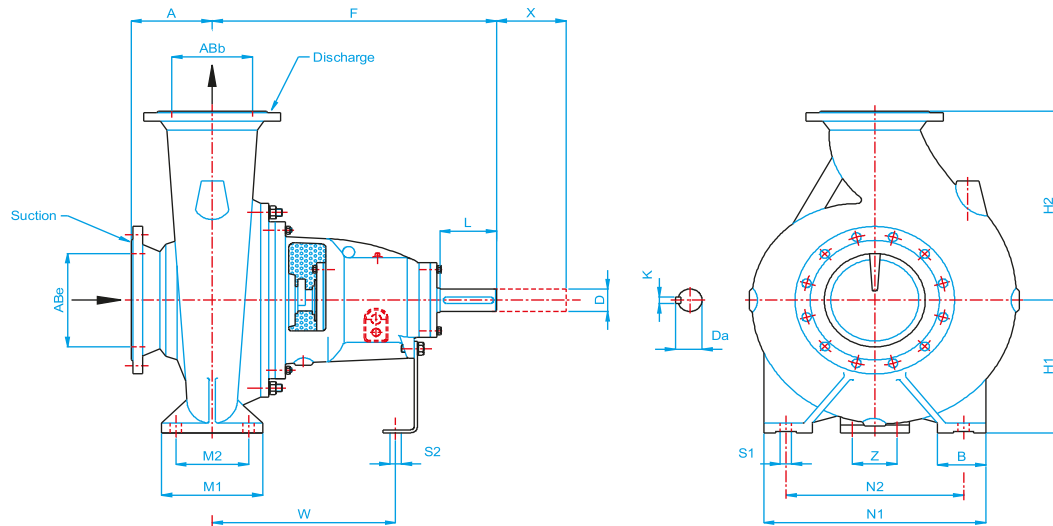
1) Dimensions "mm". Turbosan reserves right to make any changes in dimensions without giving prior notice.

2) Flanges conforming to DIN 2501 and TS EN 1092-2

3) "X" spacer length.

4) (*) These pumps are on the project stage.

NORM SERIES PUMPS DIMENSIONS TABLE



MODEL				ABb	ABe	A	F	H1	H2	B	M1	M2	N1	N2	S1	S2	D	Da	K	L	W	Z	Mechanical Seal Diameter	Weight ~Kg	x
EN 733 (DIN 24255) MODELS	EXTENDED RANGE and EN 22858																								
*	-	Norm-EFF 150/420	150	200	160	590	315	450	100	200	150	550			M20		52	56	16	110	380	150	50	295	170
	-	Norm-EFF 150/500			700	380	500														460		60	465	
	-	Norm 150/500			180	704	530	130			180	560					60	64	18	140	465	190	60	420	
	-	Norm-EFF 150/560			700	400	500														460			493	
	-	Norm-EFF 200/260			550	315	400			250	150						42	45	12		365	40	192	200	
	-	Norm 200/315			584		450	110				500	400				52	56	16	110	375	150	50	300	
	-	Norm-EFF 200/330	200	250	600	360					180										390			246	
	-	Norm 200/400			704	355	505	120				550	450				60	64	18		465	60	410		
	-	Norm-EFF 200/500			820		500	160				720	600				70	74,5	20		575	70	535		
	-	Norm 200/500			785					300	240										540		70	512	
	-	Norm-EFF 250/300			245	687		110				540	450								437		50	430	
	-	Norm 250/315			197	701		430									60	64	18		452			410	
	-	Norm-EFF 250/400			710							650	500								461	60	475		
	-	Norm 250/400	250	300	240			500	150	280	200										540			495	
	-	Norm 250/450			252	785		545													540			545	
	-	Norm-EFF 250/500			240	794	425	500	160	300	240	720	600								550	190		575	
	-	Norm 250/500			785		545														540			567	
	-	Norm 300/315			250	820	400	535			280	200	650	500							576			550	
	-	Norm-EFF 300/360			300						240						70	74,5	20				70	583	
	-	Norm-EFF 300/400			794	450	500														550			572	
	-	Norm 300/400	300	350	280	805	500		150	300	200	800	660								560			750	
	-	Norm-EFF 300/500			300	802	450	600													558			685	
	-	Norm 300/500			300	785	450				245										540			690	
	-	Norm 400/700	400							400	300	1150	1000											2070	
	-	Norm 500/600		500	350	1275	700	1000	250	440	340	1250			M36	M16	100	106	28	210	915	200	100	2130	375
	-	Norm 500/630A		500																				2150	
	-	Norm 500/630B		600																					

NOTE:
 1) Dimensions "mm". Turbosan reserves right to make any changes in dimensions without giving prior notice.
 2) Flanges conforming to DIN 2501 and TS EN 1092-2
 3) * "X" spacer length.
 4) (*) These pumps are on the project stage.

ECO DESIGN:

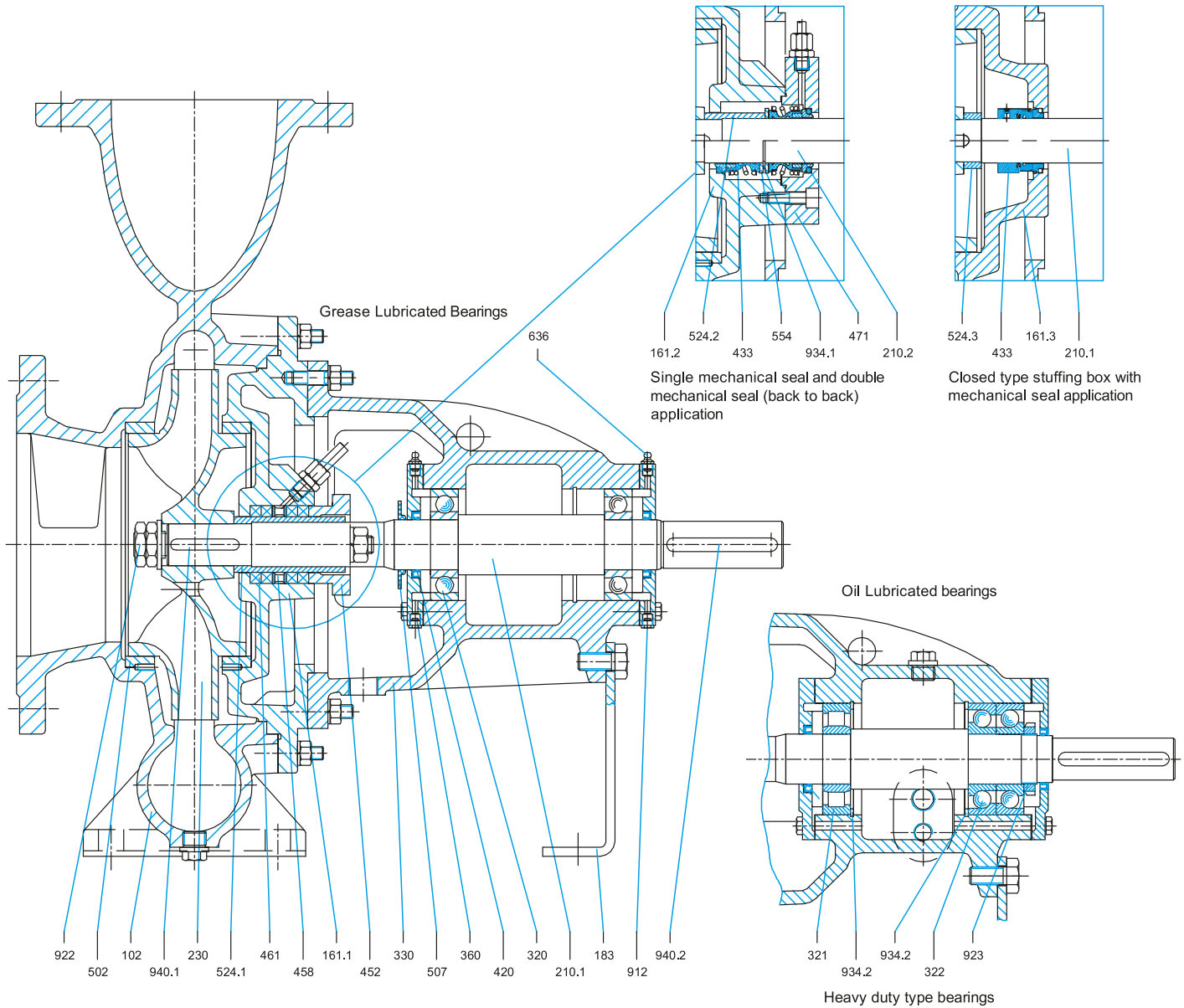
- Turbosan designs and manufactures pumps in accordance with ErP (Energy Related Products) 2009/125/Ec directive and EU 547/2012 directive by using upto date desing and manufacturing methods.

- Incase requested Turbosan pumps can be delivered with IE 3 efficiency class electric motors increasing overall system efficiency.



SECTIONAL DRAWING & PARTS LIST FOR STANDARD CONSTRUCTION

NORM PUMP SECTIONAL DRAWING AND PARTS LIST FOR STANDART CONSTRUCTION

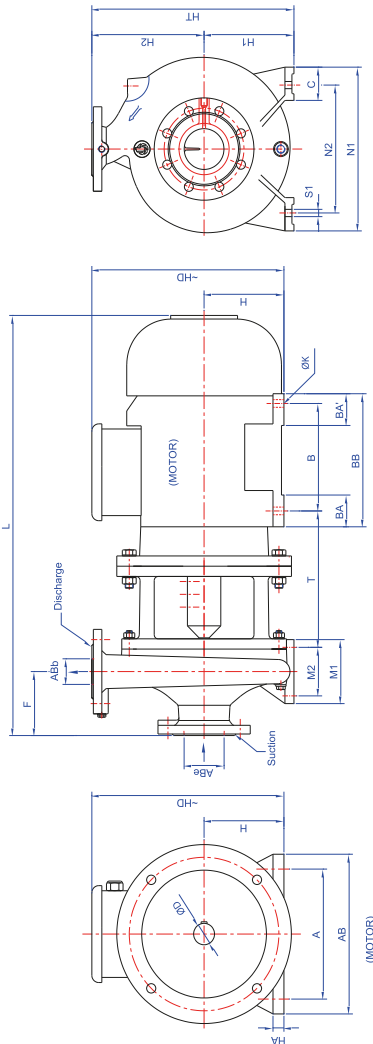
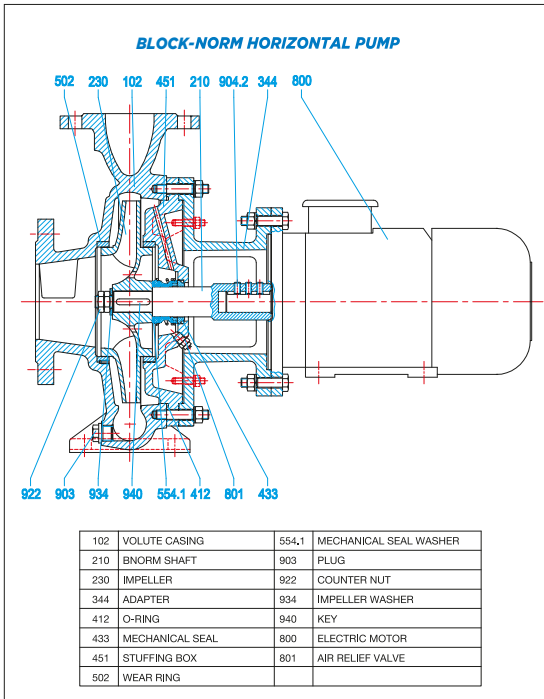


102- Volute Casing	330- Bearing Frame	524.2- Shaft Sleeve (Single mechanical seal arrangement)
161.1- Stuffing Box	360- Bearing Cover	524.3- Impeller Washer (for closed stuffing box)
161.2- Stuffing box (double mechanical seal type)	420- Oil Seal	554- Mechanical seal washer
161.3- Stuffing box (closed type)	433- Mechanical Seal	636- Grease Nipple
183- Support Foot	452- Gland	912- Draining valve
210.1- Shaft	458- Lantern Ring	922- Counter nut
210.2- Shaft (double mechanical seal type)	461- Soft Packing	923- KM Nut
230- Impeller	471- Mechanical Seal Cover	934.1- Circlip for shaft (Double Mechanical Seal)
320- Bearing (63....)	502- Wear Ring	934.2- Circlip for hole (Bearing) (Heavy duty)
321- Bearing (NU....) (Heavy Duty)	507- Water Thrower	940.1- Impeller key
322- Bearing (73....) (Heavy Duty)	524.1- Shaft Sleeve (soft packing version)	940.2- Coupling key

NOTE : Cross sectional drawing is for information, actual part list subject to change according to ordered type construction

BLOCK-NORM SERIES HORIZONTAL PUMPS

DIMENSIONS TABLE



PUMP TYPE		POWER (Kw)	RPM (d/d)	MOTOR	Abb	Abe	F	L	H1	H2	HT	C	M1	M2	N1	N2	ØS1	B	B'	BA	BA'	BB	ØK	H	HD	A	AB	HA	ØD	T	weight ~kg			
BNORM-SN 40/200	BNORM-HD 50/250	15	3000	160M2b	40	65	100	802	160	180	340	50	100	70	265	212		210	-	-	-	260		160	385	254	312	22	42	285	186			
		15		160M2b				821											-	62	-	304	15						267	201				
		18.5		160L2				865											254	-											223			
		22	3000	180M2	50	80		863						95				241	279	57	85	319		180	421	279	354	24	48	264	258			
		30		200L2a																									298					
		37		200L2b																										328				
		45		225M2																									308	431				
		BNORM-SN 65/200	BNORM-HD 65/250	3	1500	100L4b				611						85				311	-	76	-	371		225	510	356	438	30	308	431		
				18.5	3000	160L2					873					95				140	-	39	-	175	12	100	234	160	200	13	28	180	100	
				22	3000	180M2					889									254		62	-	304	15	160	385	254	312	22	42	300	209	
3	1500			100L4b				659										241	279	57	85	319		180	421	279	354	24	48	313	244			
5.5				132S4															140	-	39	-	175	12	100	234	160	200	13	28	191	134		
7.5				132M4															178	-	46	84	218	12	132	300	216	260	15	38	231	167		
BNORM-HD 65/250				BNORM-HD 65/250	18.5		160L2				886	200	250	450	80	160	120	360	280		254	-	62	-	304	15	160	385	254	312	22	42	275	246
	22				180M2					902										241	279	57	85	319		180	421	279	354	24	48	288	281	
	30				3000	200L2a				997										305	-	68	-	355	19	200	477	318	398	26	55	308	322	
	37					200L2b																									352			
	45	225M2																	311	-	76	-	371		225	510	356	438	30	324	455			
	4	BNORM 80/200							125	674	180								14		-	39	-	175		112	257	190	230	13	28	210	123	
	BNORM-HD 80/250	BNORM-HD 80/250	5.5		1500	132S4				745	225									140	-	-	46	84	218	12	132	300	216	260	15	38	231	175
			7.5			132M4														178	-	46	84										186	
			45		3000	225M2					1040									311	-	76	-	371	19	225	510	356	438	30	55	324	463	
			5.5			BNORM 100/200					125	748	200	280							140	-	46	84	218	12	132	300	216	260	15	38	231	175
11			160M4																210	-	-	260									274			
15			BNORM-EFF 100/250						140	898	225	505	80	160	120				254	-	62	-	304		160	385	254	312	22	42	316	285		
BNORM-SN 100/200			BNORM-HD 100/250	11	1500	160M4				841	200									210	-	-	-	260	15	180	421	279	354	24	48	274	244	
				18.5	BNORM-SN 100/250					125	917	225	505							241	279	57	85	319	15	180	421	279	354	24	48	288	459	
				11	1500	160M4					898	250	605							210	-	-	62	-			160	385	254	312	22	42	316	271
				15		BNORM-SN 125/250					140	958										-	-	-	304		160	385	254	312	22	42	316	282
	18.5	BNORM-HD 125/315																	241	279	57	85	319	15	180	421	279	354	24	48	285	321		
		BNORM-HD 125/315																	23													304		

NOT:

1) Dimensions "mm". Turbosan reserves right to make any changes in dimensions without giving prior notice.

2) Flanges conforming to DIN 2501 and TS EN 1092-2

CEP SERIES DOUBLE SUCTION
SPLIT CASE PUMPS

TECHNICAL DETAILS:

- The Turbo-CEP series pumps designed for general purposes are made of double entry, single stage with casings axially split.
 - Mounting arrangements are available in both horizontal and vertical forms.
 - Removal of upper half of the casings allows easy pump inspection, maintenance and removal of entire rotating elements without disturbing piping or motor and pump alignment.
 - Turbo-CEP series are fitted with casing wear rings with impeller wear rings provided on request.
 - Turbo-CEP series pumps cover the range from 15 up to 3000 litres/sec with manometric head from 8 to 175 meters.
 - Pumps are assembled for clockwise rotation when seen from drive end. Direction of rotation can be changed optionally.
 - Operating temperature: -10°C up to +120°C
 - Shafts of CEP series pumps are supported by 3 heavy duty type bearings which are greas lubricated as standard, oil lubrication available optionally.
-
- CEP series pumps have specially designed high efficiency (EFF)double suction, closed type impellers with curved vanes.



CEP SERIES PUMPS OPERATION RANGE : Qmax : 9500 m3/h Hmax : 180 m

COMPONENT	MATERIAL	
	BRONZE / STAINLESS STEEL VERSION	CAST IRON VERSION
Casing	Cast iron (GJL 250) (EN-JL 1040)	Cast iron (GJL 250) (EN-JL 1040)
Impeller	Bronze / AISI 316	Cast iron (GJL 250) (EN-JL 1040)
Wear ring	Bronze	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 (1.4021)
Shaft sealing	Soft packing / Mechanical seal	Soft packing / Mechanical seal
Painting	RAL 5010	RAL 5010

- Different materials (Duplex Steel, AINi Bronze, AISI 316, Cast Steel, etc.) are available according to fluid specifications.

FIELDS OF APPLICATION

Turbo-CEP series pumps are suitable for

- Water Supply
- Irrigation and spraying systems,
- Drinking water supplies to buildings, communities and towns,
- Pumping liquids with low viscosity (i.e gasoline, oil, acid base etc.) in industries,
- Cooling water systems,
- Industrial plants on duty 24 hours a day, like Iron & Steel works.
- Paper and cellulose industries.

CEP V DOUBLE SUCTION VERTICAL SPLIT CASE PUMPS:

- The hydraulic characteristics and available sizes are same as Turbosan CEP series horizontal split case pumps.
- Vertical mounting arrangement allows drive motor to be mounted vertically, this is an advantage in installations where effective use of space is crucial.
- Drive motors can be mounted on CEP V series pumps by means of motor stool, or motor and pump can be connected by cardan shaft.
- Pump bases are of cast iron or sheet metal construction depending on pump size, where as motor stools are of sheet metal construction.

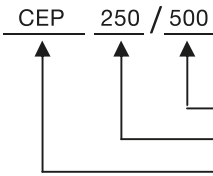


Vertical execution

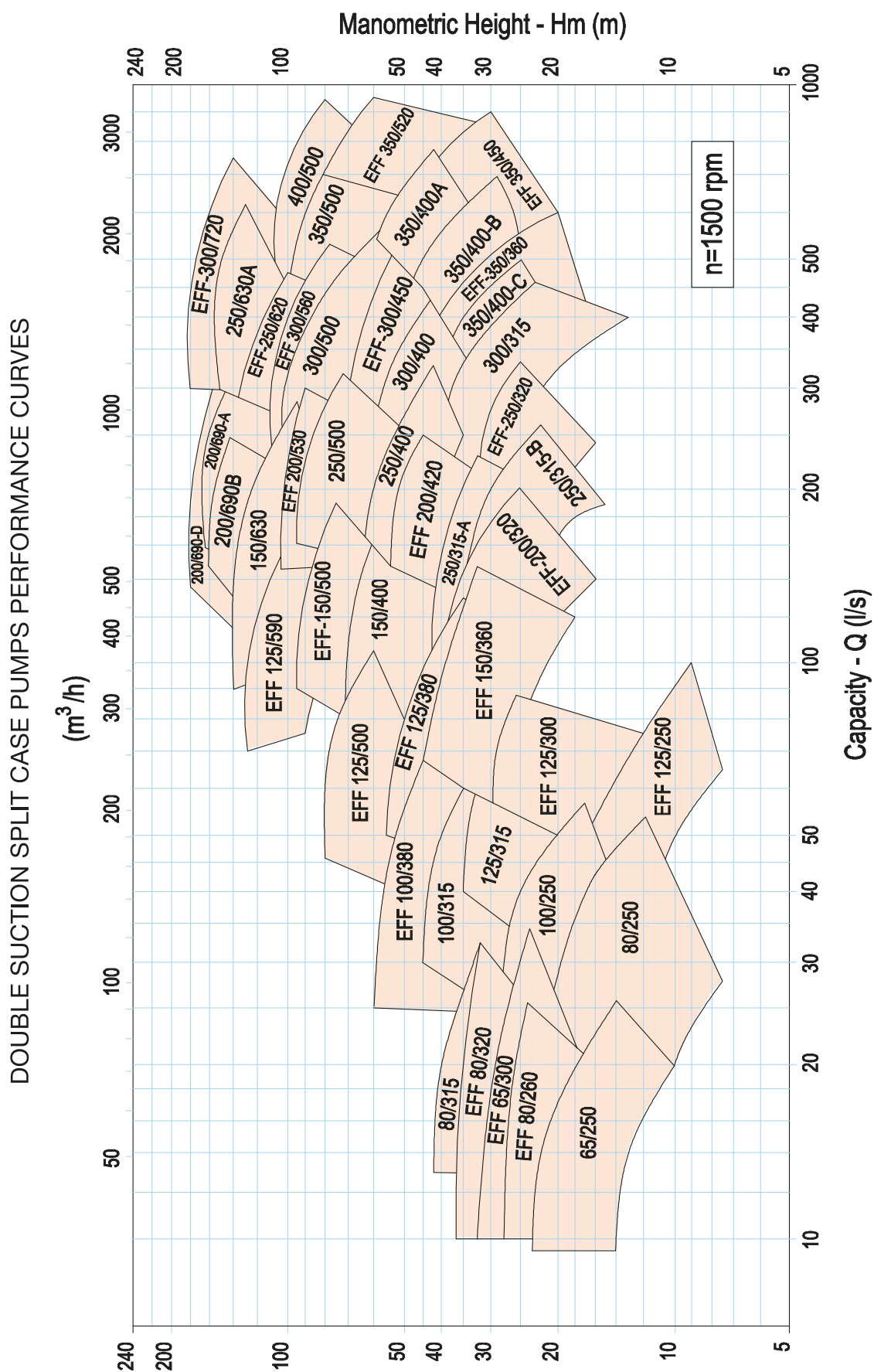
IMPELLER

- Due to the impeller being of double suction: No axial thrust exerted on bearings
Pump can be operated at relatively unfavourable suction conditions.
- Every impeller is balanced statically and dynamically, according to ISO 1940 class 6,3.

DESIGNATION

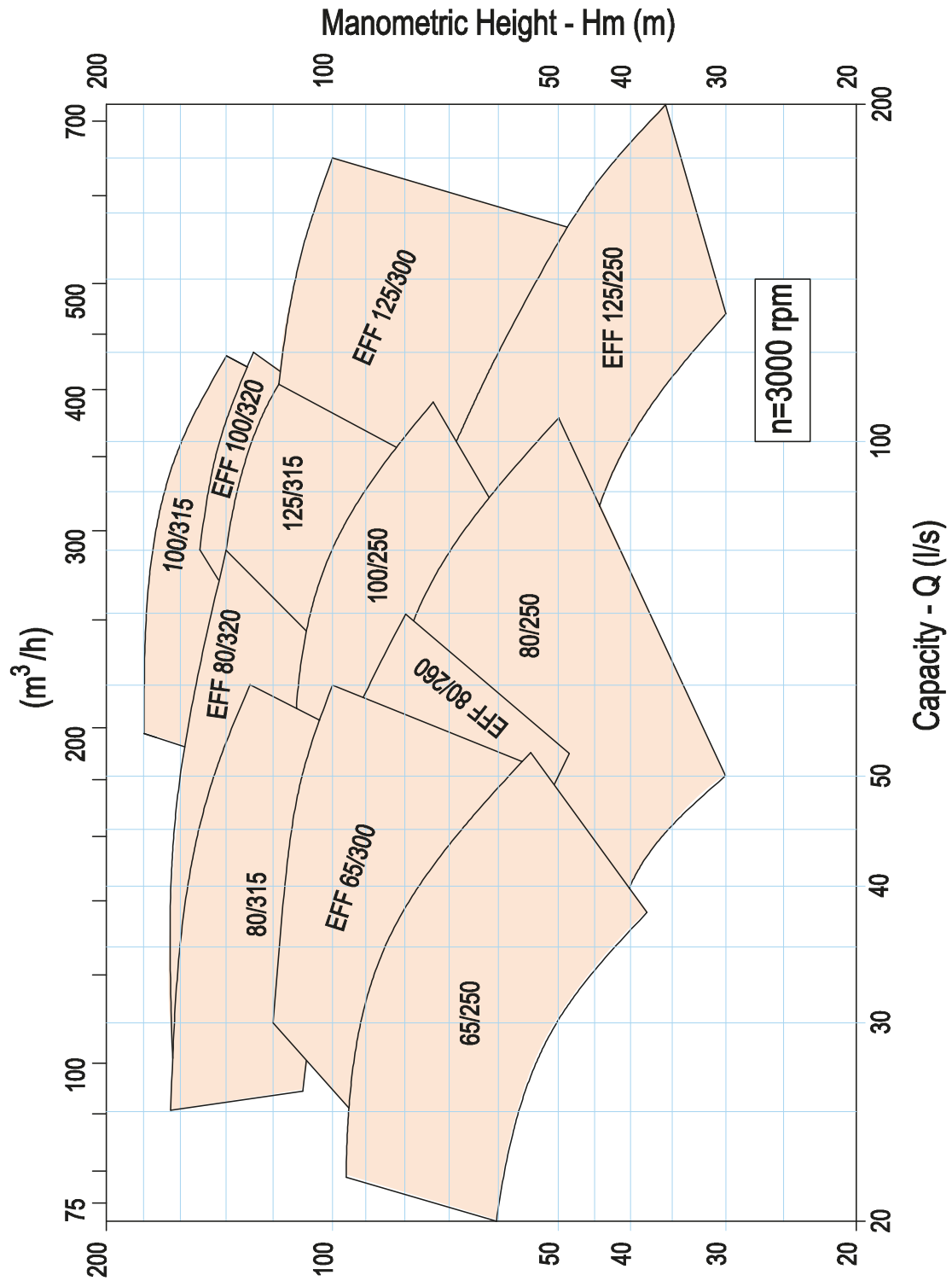


Impeller diameter
Discharge diameter
Pump type



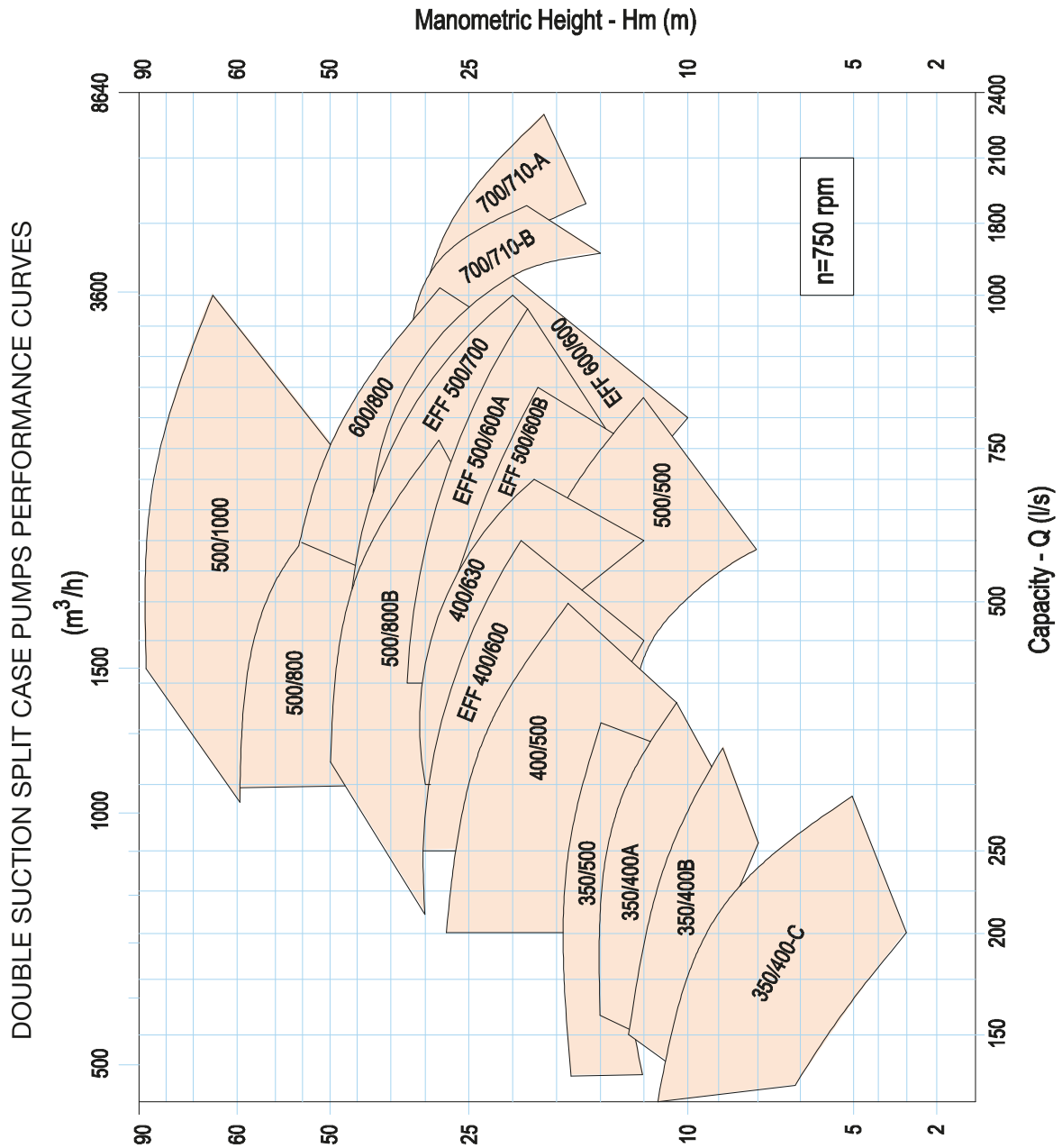
CEP SERIES PUMPS GROUP PERFORMANCE CURVES

DOUBLE SUCTION SPLIT CASE PUMPS PERFORMANCE CURVES



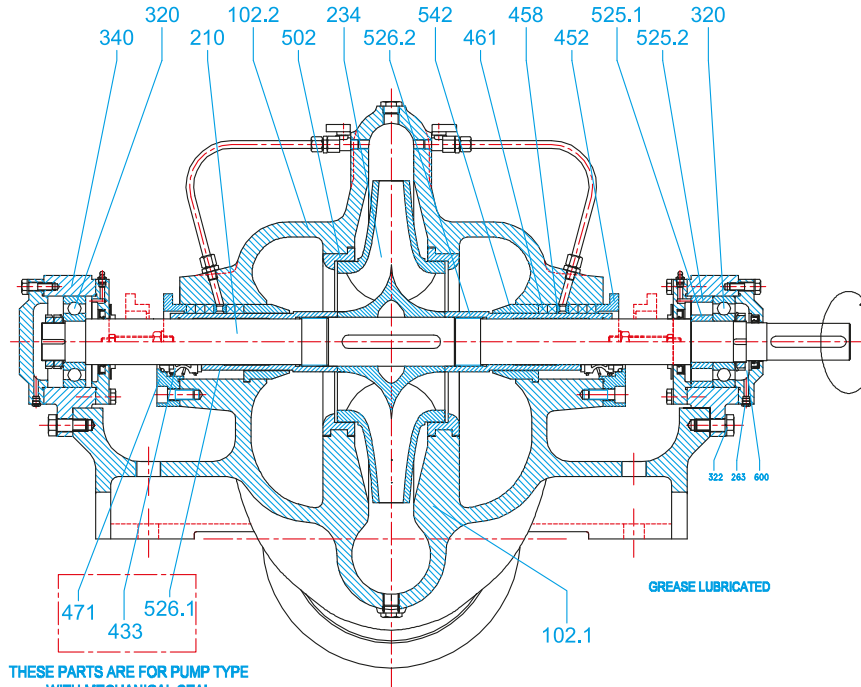


CEP SERIES PUMPS GROUP PERFORMANCE CURVES



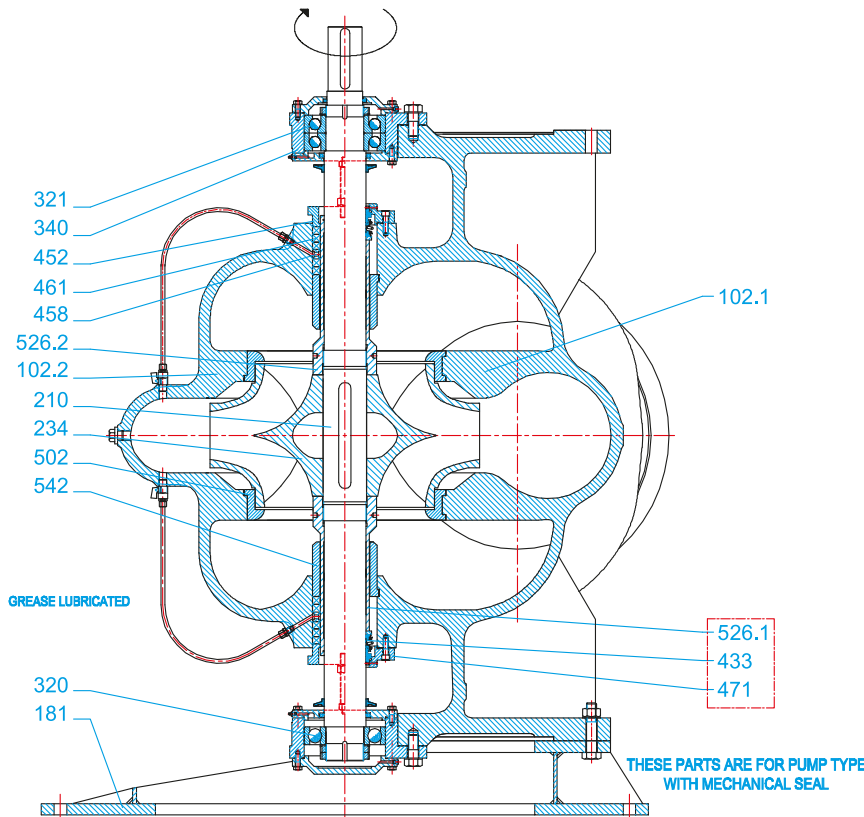
CEP SERIES PUMPS CROSS SECTIONAL DRAWING & PARTS LIST

CEP SERIES HORIZONTAL PUMPS CROSS SECTIONAL DRAWING AND PARTS LIST



- 102.1 Casing
- 102.2 Casing (Upper)
- 210 Shaft
- 234 Impeller
- 320 Bearing (63....)
- 340 Bearing Housing
- 433 Mechanical Seal
- 452 Gland
- 458 Lantern Ring
- 461 Packing Seal
- 471 Mechanical Seal Cover
- 502 Wear Ring
- 525.1 Bearing Bushing - Inside
- 525.2 Bearing Bushing - Outside
- 526.1 Shaft Sleeve (Mech.Seal)
- 526.2 Shaft Sleeve (Packing Seal)
- 542 Stuffing Box Bushing

CEP - V SERIES VERTICAL PUMPS CROSS SECTIONAL DRAWING AND PARTS LIST

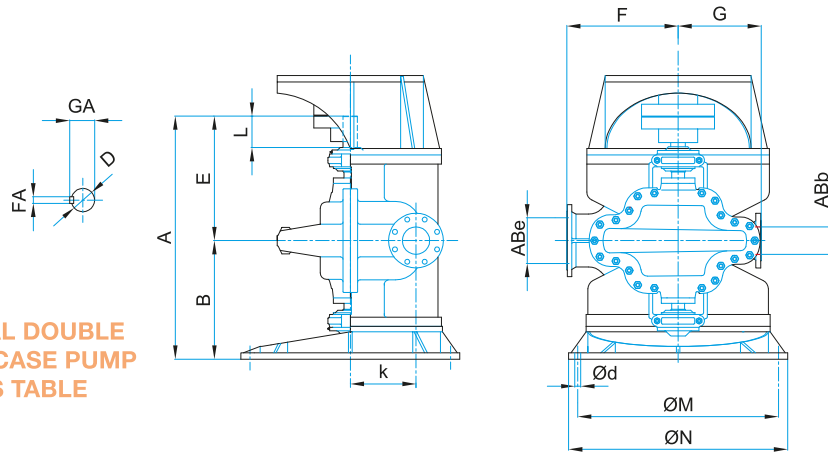


- 102.1 Casing
- 102.2 Casing Cover
- 181 Pump Base
- 210 Shaft
- 234 Impeller
- 320 Bearing (63....)
- 321 Bearing (73....)
- 340 Bearing Housing
- 433 Mechanical Seal
- 452 Gland
- 458 Lantern Ring
- 461 Packing Seal
- 471 Mechanical Seal Cover
- 502 Wear Ring
- 525.1 Bearing Bushing - Inside
- 525.2 Bearing Bushing - Outside
- 526.1 Shaft Sleeve (Mech.Seal)
- 526.2 Shaft Sleeve (Packing Seal)
- 542 Stuffing Box Bushing

NOTE : Cross sectional drawing is for information, actual part list subject to change according to ordered type construction

VERTICAL SPLIT CASE CEP-V PUMPS DIMENSIONS TABLE

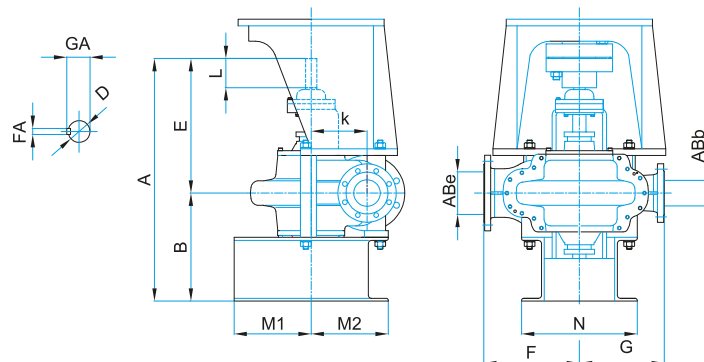
**CEP-V, VERTICAL DOUBLE
SUCTION SPLIT CASE PUMP
DIMENSIONS TABLE**



PUMP TYPE	Discharge	Suction	A	B	E	F	G	N	M	Ød	Piece	k	L	D	GA	FA	GROUP
	ABb	ABe															
CEP 125/315	125	200	975	490	485	370	370					200	110	48	51.5	14	A
CEP 150/400			1095	545	550	455	395					230					
CEP 150/630	150	250	1305	575	685	600	450					245	140	64	68	18	
CEP 200/690	200		1455	595	705	700	550	1200	1100	33	8	250	150	70	74.5	20	
CEP 250/315		300	1170	535	635	450	400										
CEP 250/400	250		1160	530	630	550	450					225	140	64	68	18	
CEP 250/500						500											
CEP 250/630	250	400	1770	875	895	695	510					390	210	95	100	25	B
CEP 300/315			1450	750	700	585	508					315	140	64	68	18	
CEP 300/400	300	350	1385	730	655	505	500					250	150				
CEP 300/500			1430		695	580	550					315					
CEP 350/400		400	1520	785	735	600	500	1625	1520	33	8		140	70	74.5	20	
CEP 350/500	350					650	550										
CEP 400/400			1670	855	815	705	505					355	150				
CEP 400/500	400	500				680	550										
CEP 400/630			1750	885	865	800	650					450	170	90	95	25	
CEP 500/500	500	600	1825	910	915												
CEP 500/800	500	600	2005	1010	995	905	805					545					C
CEP 600/800	600	700	2255	1110	1145	875	875	2200	2000	33	8	695	210	105	111	28	
CEP 700/700	700	800	2650	1330	1320	1400	800					620					

NOTE :

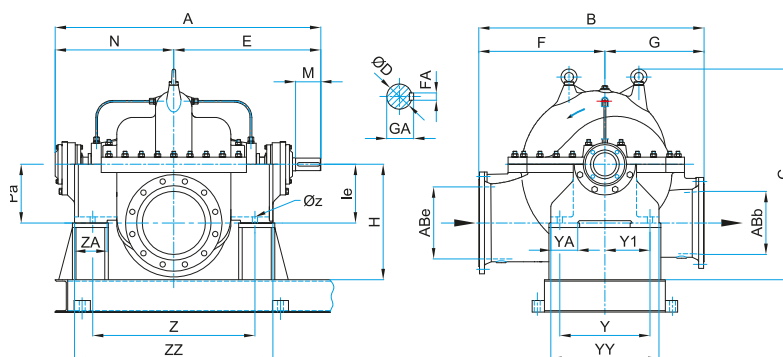
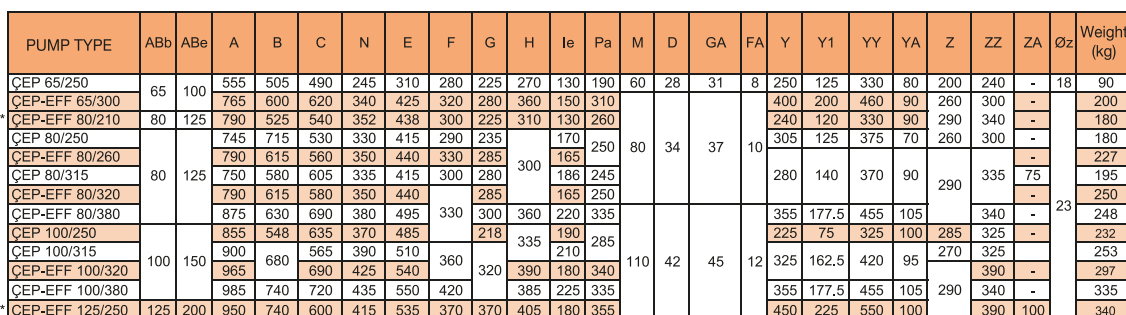
- 1) Dimensions "mm". Turbosan reserves right to make any changes in dimensions without giving prior notice.
- 2) Flanges conforming to DIN 2501 and TS EN 1092-2
- 3) Please consult Turbosan for other pumps size.



PUMP TYPE	ABb	ABe	A	B	E	M1	M2	F	G	N	k	L	D	GA	FA
CEP 65/250	65	100	575	260	315	190	190	280	225	330	130		28	31	8
CEP 80/250	80	125	685	370	250	250		300	280	380	165	60	34	37	10
CEP 80/315			810		340	240	240	310	300	370	185	100	42	45	12
CEP 100/250		150	760	350	410	285	285	310	300	325	210				
CEP 100/315	100		905	405	500	300	300	360	320	435	210	110			

NOTE :

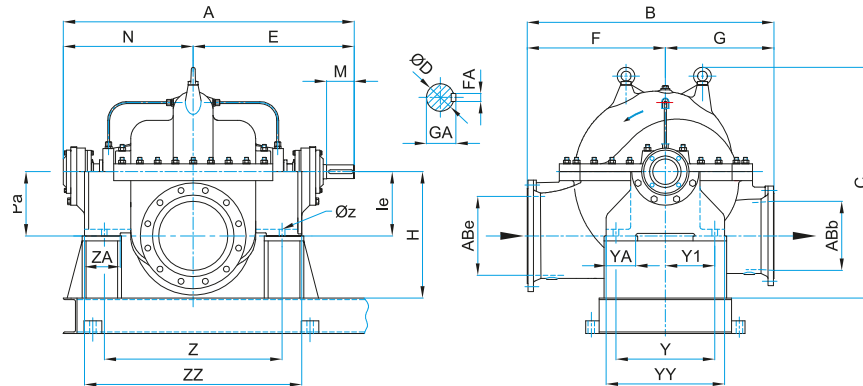
- 1) Dimensions "mm". Turbosan reserves right to make any changes in dimensions without giving prior notice.
- 2) Flanges conforming to DIN 2501 and TS EN 1092-2
- 3) Please consult Turbosan for other pumps size.



PUMP TYPE	ABb	ABe	A	B	C	N	E	F	G	H	Ie	Pa	M	D	GA	FA	Y	Y1	YY	YA	Z	ZZ	ZA	Øz	Weight (kg)												
CeP-EFF 125/300	125	200	1015	680	740	450	565	370	310	400	200	200	110	42	45	12	410	205	475	100	570	730	140	23	350												
CeP 125/315			925	740	700	405	520	370	435	235	235	480					100	620	105	365																	
CeP-EFF 125/380			1015	850	810	450	565	450	435	235	235	480					100	620	730	495																	
CeP-EFF 125/500			960	850	870	425	535	450	450	295	250	500					110	650	650	130	760																
CeP 125/590			1175	950	980	515	660	525	425	530	330	140					62	66	18	410	205	475	100		570	730	140	500									
CeP-EFF 150/300	150	200	1075	900	730		595	500	400	400	200	200	110	42	45	12	400	200				790	140	28	466												
CeP-EFF 150/360			860			460													465	100						525											
CeP 150/400			250	1055	850	850	470	585	455	395	480	230					230	140	62	66	18	360	180				590	750	135	560							
CeP-EFF 150/410			200	1095	900		490	495	450	450	460	260					260					140	62		66	18	360	180	465	100	640	785	140	595			
CeP-EFF 150/500			1235	1030	1020	545	690	600	430	560	315	315					450										222.5	525	125	680	880	195	825				
CeP 150/630	1260	1050	1010	555	705	600	450	550	305	245	420	210	500	115	710	865	170							880													
CeP-EFF 150/320	250	1115	900	850	500	615	450	450	490	240	240	110	42	45	12	400	200							465			100	690	830	140	600						
CeP-EFF 200/420	200	300	1225	930	900	540	685	500	430	505	255	255	140	62	66	18	420	210	500	110	670			820				28	690								
CeP-EFF 200/530			1325	1100	1020	585	740	600	500	560	310	310					510	255	610	120	800	970	190	1060													
CeP 200/690			1265	1250		560	705	700	550	650	400	250					500	250	600	150	700	890	160	1280													
CeP EFF 200/700			1393	1220	1190	618	775	650	550	640	350	350					620		620		880	1060	190	1280													
CeP 250/315			1143	850	850	500	643	450	400	480	225	225					420	210	500	110	620	750	130	870													
CeP-EFF 250/320	250	400	1320	1100	690	585	735	600	500	530	260	260	140	62	66	18	500	250	600	150	800	970	190	33	890												
CeP 250/400			1170	1000	910	510	660	550	450	480	225	225					420	210	500	110	620	770	140		705												
CeP-EFF 250/490			1320	1150	1010	580	740	600	550	560	300	300					500	250	600	150	780	930	160		738												
CeP 250/500			1170	1050	940	510	660	550	500	480	240	240					420	210	500	110	620	775	140		800												
CeP-EFF 250/620			1425	1200	1215	635	790	650	550	670	370	370					70	74.5	20	500	250	600	150		910	1090	180	1330									
CeP 250/630	300	400	1515	1205	1200	670	895	695	510	670	390	390	210	95	100.4	25	590	295	715	175	876	1075	235	33	1500												
CeP 300/315			1290	1095	1020	570	720	585	610	315	315	62	66	18	450	225	550	125	780	910	140	180	580														
CeP 300/400			1250	1005	940	550	700	505	500	530	250	250	140		20	490	250		160	880	860	160	850														
CeP-EFF 300/450			400	1425	1200	1115	635	790	650	550	590	310	310	170	90	95	25	20	490	245	610	180	880		1060	190	1200										
CeP 300/500			350	1345	1130	1060	600	745	580	550	600	320	320					70	74.5	20	500	250			165	780	950	165	1065								
CeP-EFF 300/560	400	1705	1350	1170	760	945	700	650	670	350	350	170	90					95	25	640	320	760	180	1000	1250	220	1850										
CeP-EFF 300/720	400	1715	1400	1320	765	950	750	650	720	400	400									225	104	110	28	590	295	715	175	1070	1270	190	2200						
CeP-EFF 300/820	500	2080	1700	1700	920	1160	1000	700	950	525	525													680	340	800	200	1320	1540					4030			
CeP-EFF 350/360	350	400	1445	1250	1120	645	800	700	550	640	325			325	140	70	74.5							20	500	250	600	150	900	1100	180	28	1280				
CeP 350/400			1325	1100	1060	590	735	600	500	630	315			315											170	90	95	25	640	320	760		180	1060	1310	190	2200
CeP-EFF 350/450			500	1635	1500	1440	740	895	850	650	750	400	400	225				104	110										28	500	250		600	150	800	965	
CeP 350/500			400	1320	1200	1140	585	735	650	550	670	355	355							500	250	600	150							800	965						1295
CeP-EFF 350/520			500	1865	1500	1340	840		1025	850	650	770	400							400	170	90	95							25	640		320	760	180	1180	1420
CeP-EFF 350/580	500	1870	1550	1370	845			850	700	780			170		90	95	25			640	320	760	180	1180						1420	235	1303					

3) (*) These pumps are on the project stage.

HORIZONTAL SPLIT CASE PUMP DIMENSIONS TABLE



PUMP TYPE	ABb	ABe	A	B	C	N	E	F	G	H	le	Pa	M	D	GA	FA	Y	Y1	YY	YA	Z	ZZ	ZA	Øz	Weight (kg)
ÇEP 400/400	400	500	1475	1210	1180	660	815	705	505	720	355	355	140	70	74.5	20	550	275	680	160	950	1120	180	28	1740
ÇEP 400/500				1230	1200			680	550												930	1110			2150
* ÇEP-EFF 400/520			1895	1550	1380	855	1040	850	700	780	400	400					640	320	760		1260	1450	190		2185
ÇEP-EFF 400/600	500	600	1820	1550	1375	780	1000	800	750	775	395	395									1100	1380	240		3060
ÇEP 400/630			1560	1450	1400	690	870	800	650	820							600	300	770	180	910	1085	180		1900
ÇEP 500/500			1675	1455	1410	745	930	800	655	800	450	450	170	90	95	25	640	320	760		1000	1200	180		2260
ÇEP-EFF 500/600			1895	1900	1600	855	1040	1100	800	920							680	340	800		1260	1450	190		3580
ÇEP-EFF 500/700			1975	2100	1540	895	1080	1200	900	870										200	1350	1550	200		4800
ÇEP 500/800			1840	1710	1520	790	1050	905	805	960	545	545	250	125	132	32	800	400	1000	270	1000	1250	220	33	3800
ÇEP 500/800B																									3800
ÇEP 500/1000			1950	1970	1775	845	1105	1070	900	1065	650	650					900	450	1200	370	1120	1360	235		4860
ÇEP-EFF 600/600	600	700	2055	2100	1900	935	1120	1200	900	1100	500	500	170	90	95	25	680	340	800	200	1430	1630			3900
ÇEP 600/800	600	700	1940	1750	1720	850	1090	875	875	975	695	695	250	125	132	32	920	460	1220	300	970	1120	180		4950
ÇEP 700/710	700	800	2550	2200	1940	1155	1395	1400	800	1100	620	620	225	105	111	28	800	400	1000	270	1630	1890	240		6635

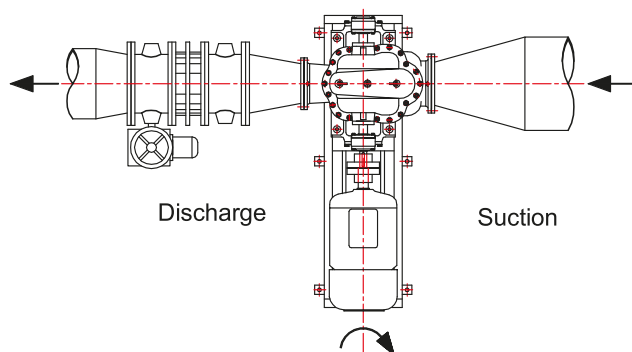
PUMP TYPE	ABb	ABe	A	B	C	N	E	F	G	H	le	Pa	M	D	GA	FA	Y	Y1	YY	YA	Z	ZZ	ZA	Øz	Weight (kg)
* ÇEP-EFF 150/600	150	250	1220	1050	1030	535	685		450	550	315	315				18	500	250	600	150	670	820	140	28	870
* ÇEP-EFF 150/650					1130			600		600	350	350	140	62	66										915
* ÇEP-EFF 250/360	250	300	1300	1100	1040	575	725		500	550	275	275					420	210	500	140	800	950	150		645
** ÇEP-EFF 250/800			1640	1500	1420	730	910	800	700	720	425	425	170	90	95	25	590	295	715	175	980	1195	190		1830
* ÇEP-EFF 350/720	350	500	1770	1600	1430	795	975	850	750	810	405	405					680	340	800		1290	1080			2640
** ÇEP-EFF 400/700	400		2000	1750	1520	900	1100	1000	750	870	405	405					640	320	760		1150	1400	240		2950
** ÇEP-EFF 500/860	500	600	2160		1870	950	1210	1200	900	950	520	520	250	125	132	32	800	400	1000	270	1400	1640	200	33	4300
** ÇEP-EFF 600/720	600	700	2255		1740	1010	1245		480	480	225	225	105	111	28	680	340	800	190	1470	1720	240			4450
** ÇEP-EFF 600/900			2400	2050	1130	1420	1300	1100	1100				300	140	149	36	1100	500	1300	290		1990			5240
** ÇEP-EFF 700/720	700	800	2550	2300	2010	1160	1395	1400	900	1160	600	600	225	105	111	28	800	400	1000	270	1700	1980	280		6540

NOTE :

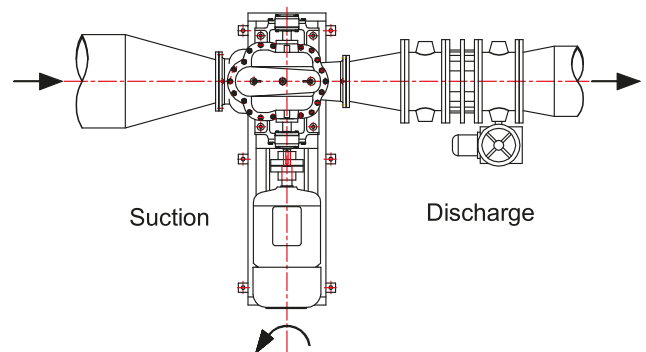
1) Dimensions "mm". Turbosan reserves right to make any changes in dimensions without giving prior notice.

2) Flanges conforming to DIN 2501 and TS EN 1092-2

3) (*) These pumps are on the project stage.



CEP SERIES PUMPS CLOCKWISE
ROTATION DIRECTION
(Standard production)



CEP SERIES PUMPS
COUNTER-CLOCKWISE ROTATION
DIRECTION
(Special manufacturing)

CENTRIFUGAL MULTI STAGE PUMPS

TECHNICAL DETAILS :

- Turbosan KAT series pumps are medium and high pressure, multi stage pumps with closed type impellers and diffusers suitable for pumping clean water and slight solids content water with low viscosity.
- Turbosan KAT series pumps have closed type impellers with curved vanes (FRANCIS type) which generates high manometric head.
- Pump impellers are statically and dynamically balanced according to ISO 1940 class 6.3, allowing vibration free and long life operation.
- As standard suction flange is located on the right hand side on drive end discharge flange is located on top on non drive end. Upon request different flange locations are available.
- The bearings housings of Turbosan KAT series pumps are designed to support maximum number of stages reliably. Stages which are consisting of impellers and diffusers are designed for lowest loss and highest efficiency.



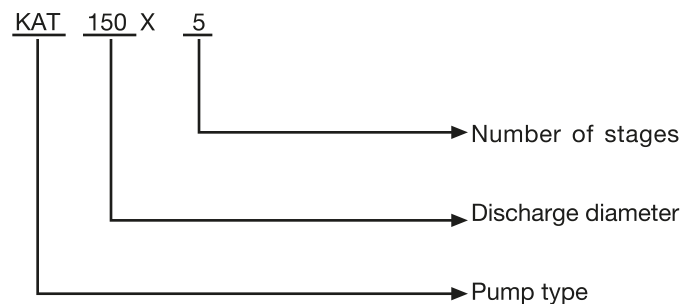
- **Direction of rotation** : Clockwise as seen from drive end.
- In order to reduce leakage loss renewable wear rings are fitted to the impellers.
- Axial thrust which is an important concern for multi stage pumps, is balanced by means of a balance disc.
- Pump shafts are supported by heavy duty type bearings on both sides. As standard, bearings are grease lubricated. Oil lubrication is available on request, if needed oil lubricated bearing housings can be fitted with heat dissipation fins for additional cooling.
- KAT series pumps are manufactured with soft packing as a standard. Soft packing is located on shaft sleeves which are made of hardened stainless steel.
- Mechanical seal is available optionally.

BALANCE DISC: Axial thrust force is a very important issue for multi stage pumps. Axial thrust force is compensated by a balance disc. The balance disc is located inside a chamber which is between bearing housing and the last stage impeller. Surface of the balance disc is coated with special hardened steel, stationary piece is coated with hard Chromium. Both faces are machined.

FIELDS OF APPLICATIONS

Turbo - KAT series pumps are suitable for

- Public and industrial water supply
- Booster systems
- Boiler feeds
- Fire fighting units
- Marine industries
- Mining industries
- Sprinkler systems
- Chemical and Petrochemical plants
- Power plants
- Irrigation



CENTRIFUGAL MULTI STAGE PUMPS

TECHNICAL INFORMATION

- Discharge flange sizes : DN 50 – DN 200
- Operating temperature : -10°C + 110°C
- Ambient temperature : 40°C
- Casing pressure : Max. 30 Bar (**)
- Discharge pressure : Max. 300 m (**)
- Speed : Max. 3600 rpm

** (Depending on pump model)

Suction flanges : ISO 7005 – 2/PN 10

* Discharge flanges : ISO 7005 – 2/PN 16 – 25 upto 40

- Upon operation conditions suitable flange norm can be used.



PARTS	MATERIALS	
	BRONZE / STAINLESS STEEL VERSION	CAST IRON VERSION
Casing	Cast iron (GJL 250) (EN-JL 1040)	Cast iron (GJL 250) (EN-JL 1040)
Impeller	Bronze / AISI 316	Cast iron (GJL 250) (EN-JL 1040)
Diffusor	Cast iron (GJL 250) (EN-JL 1040)	Cast iron (GJL 250) (EN-JL 1040)
Wear ring	Bronze	Cast iron (GJL 250) (EN-JL 1040)
Shaft	Stainless steel (AISI 420) (1.4021)	Stainless steel (AISI 420) (1.4021)
Shaft sleeve	Stainless steel (AISI 420) (1.4021)	Stainless steel (AISI 420) (1.4021)
Balance disc	Hardened steel filling + Chromium plated	Hardened steel filling + Chromium plated
Shaft sealing	Soft packing / Mechanical Seal	Soft packing/ Mechanical Seal
Painting	RAL 5010	RAL 5010

- Upon request different materials suitable for pumped fluids properties available

ADDITION TO CLASSIC MULTI STAGE DESIGN TURBOSAN HAS TWO OTHER MULTI STAGE PUMP DESIGNS

1) KAC SERIES MULTI STAGE SPLIT CASE PUMPS

This series has been developed for heavy industry applications.

Equal number of impellers with counter rotation directions used. By this design axial load generated within pump, get balanced without need for balance disc or impeller balance holes.

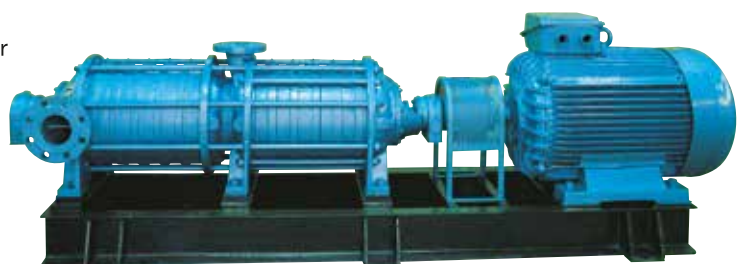
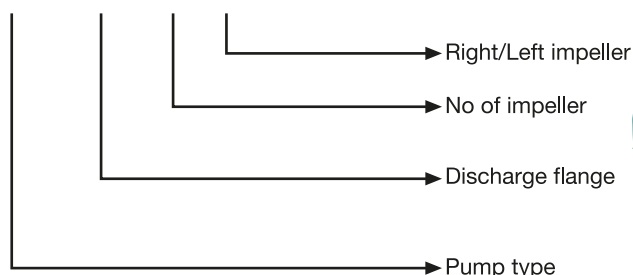
Split casing design allows pump to be splitted axially. This allows rotating elements of the pump to be dismantled or fixed without disturbing suction and discharge flange connections, by just opening the casing cover.



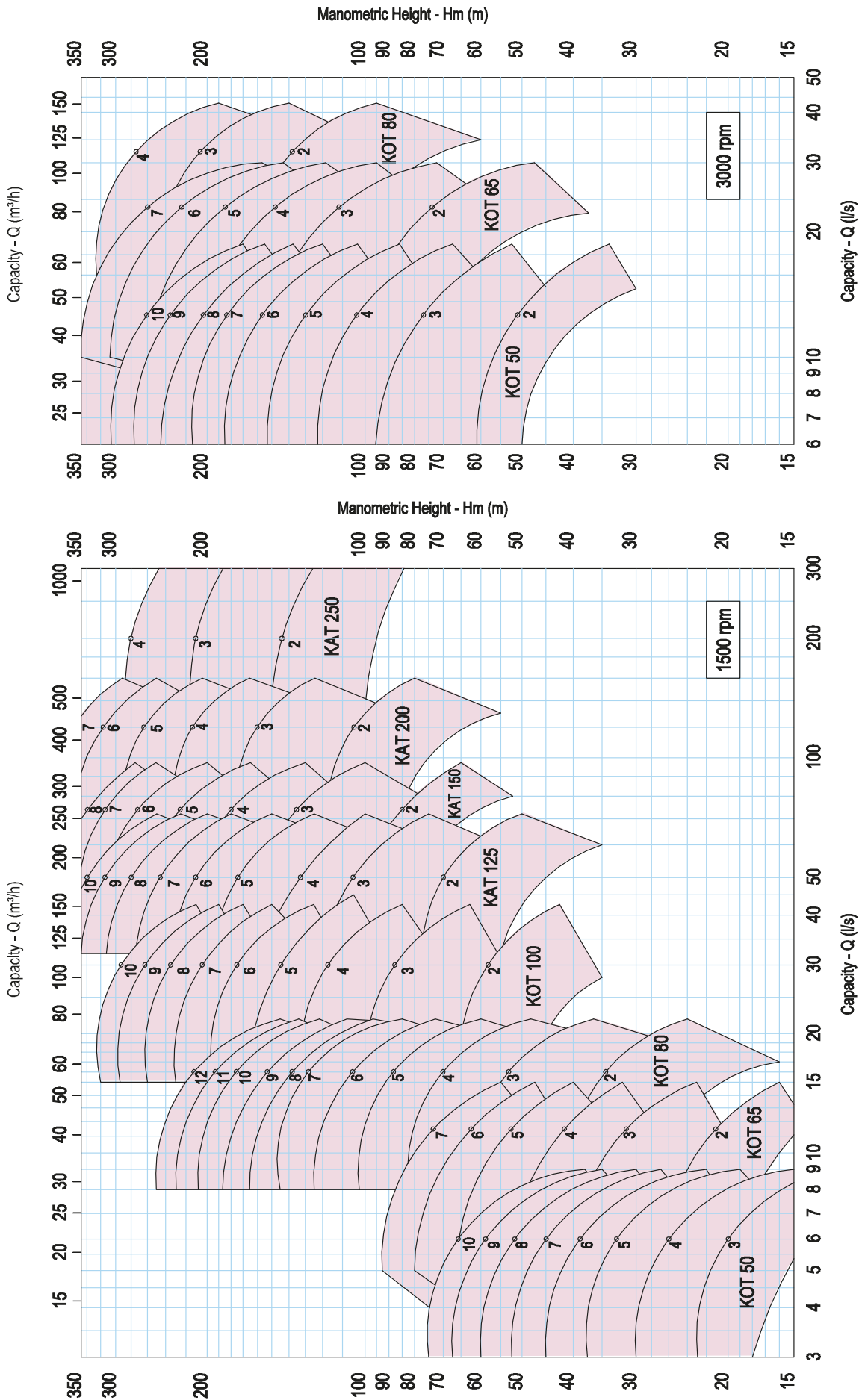
2) MULTI STAGE PUMP WITH OPPOSITE IMPELLERS :

These pumps are for high discharge pressures. Axial thrust force is compensated by back to back fitted impellers. In this design there is no need for balance disc. In special applications they used for fluids with small solid particles content.

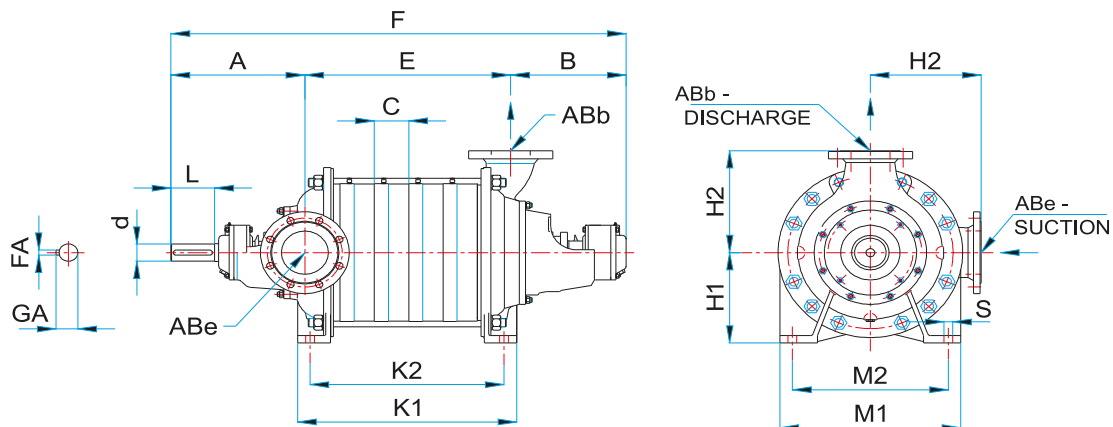
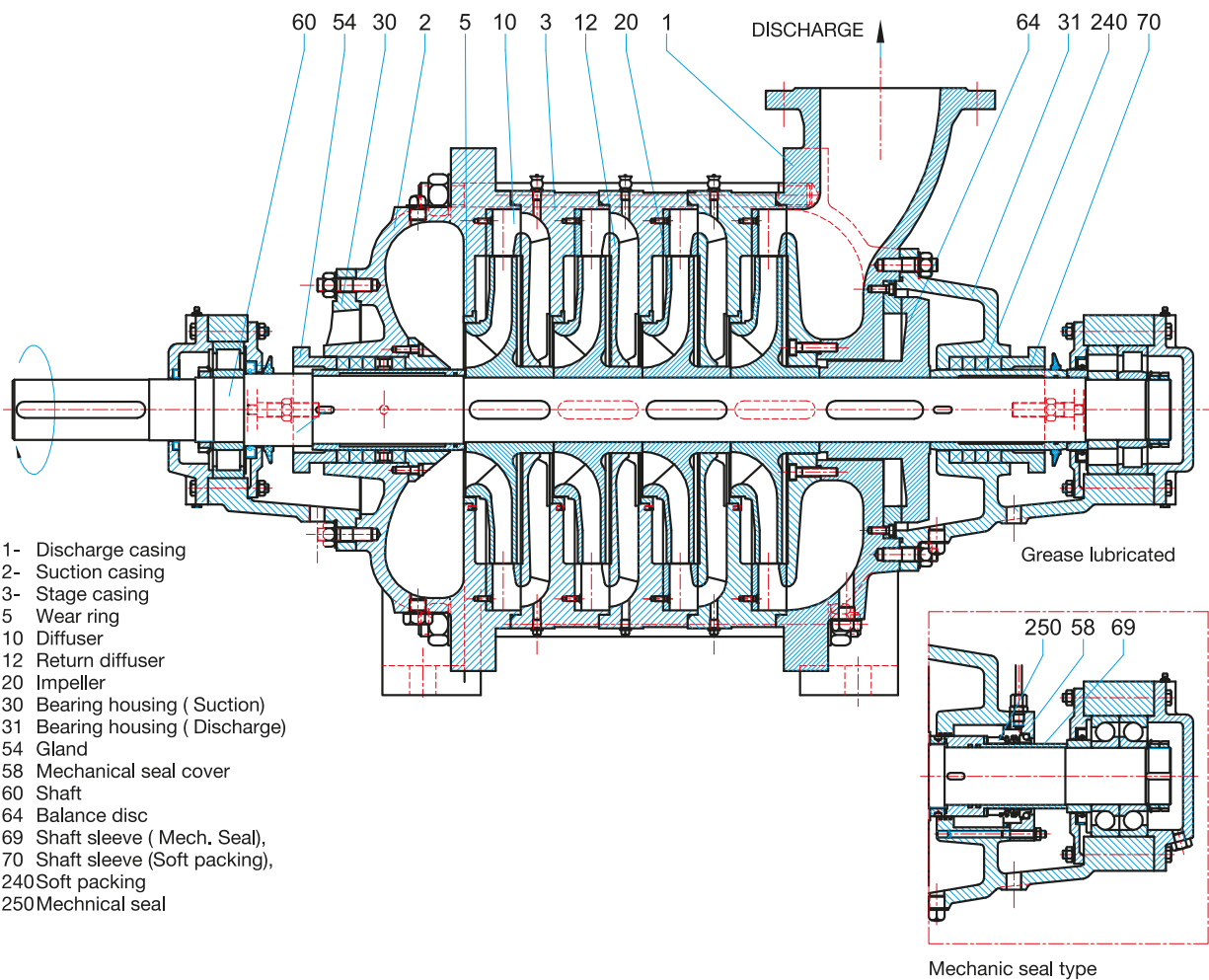
KAT 125 X 8 / 2



MULTI STAGE PUMP PERFORMANCE GROUP CURVES



MULTISTAGE PUMPS CROSS SECTIONAL DRAWING AND PARTS LIST



PUMP TYPE	Abe	Abb	A	FOR TWO STAGES						FOR EACH ADDITIONAL STAGES	H1	H2	M1	M2	S	L	d	GA	FA	WEIGHT	
				B	E	K1	K2	F	C											FOR TWO STAGES	FOR EACH ADDITIONAL STAGES
50	65	50	302	280	150	212	162	732	55	180	200	330	260	18	80	38	41	10	115	21	
65	80	65	300	265	192	231	181	635	70	200	230	370	300	23	80	38	41	10	160	35	
80	100	80	320	285	228	276	215	685	80	250	265	430	350	23	80	38	41	10	315	42	
100	125	100	365	330	270	316	245	785	90	280	310	510	430	28	110	50	53.5	14	372	60	
125	150	125	430	370	330	382	291	910	110	315	355	580	500	28	140	60	64	18	435	108	
EFF125	150	125	541	475	341	435	335	1357	146	300	365	580	500	28	140	60	64	18	522	186	
150	200	150	470	390	388	418	318	970	110	355	400	640	540	33	170	75	79.5	20	625	126	
EFF150	200	150	600	520	367	410	350	1487	154	355	400	640	540	33	170	75	79.5	20	812	218	
200	250	200	490	435	481	465	365	1060	135	425	480	720	620	33	170	85	90	22	820	180	
EFF200	250	200	635	515	423	700	560	1573	170	425	500	780	680	33	170	85	90	22	1270	310	
EFF250	300	250	690	602	548	750	610	1840	219	500	600	850	750	33	210	100	106	28	1895	390	

NOTE:

- 1) Dimensions "mm". Turbosan reserves right to make any changes in dimensions without giving prior notice.
- 2) Flanges conforming to DIN 2501 and TS EN 1092-2

DAC- SC AND DAS TYPE SUBMERSIBLE WASTE WATER AND SEWAGE PUMPS

MAIN SPECIFICIATIONS :

Turbosan DAC-SC and DAS series pumps designed for pumping fluids which contents large solids. They have large range of capacities range and are available with large range of powers. Capacity range is 3 - 800 l/s discharge head range is 5 - 80 m and power range is 3 kW 500 kW. There are several models and sizes.

FIELDS OF APPLICATION :

- Domestic and industrial raw sewage water pumping
- Waste water handling plants
- In biological cleaning plants for pumping active sludge.
- Pumping of floating solids in settlement pools.
- Pumping waste water to active screens
- Pumping industrial and chemical waste water.
- Draining rain water
- All kinds of drainage and dewatering
- Pumping miscallenous waters in industrial plants

FLUID TYPES :

- Unscreened sewage and other waste water types with high solids concentration Pumps are designed to tolerate large solids (Ø 30 Ø - 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 against wear.
- Maximum allowed fluid temperature is 40°C
- Maximum allowed medium density is 1,2 gr/cm³, maximum allowed medium viscosity is 1,5 x 10-6 m²/s. Measures must be taken to lower these values.



TECHNICAL DETAILS :

SUBMERSIBLE ELECTRIC MOTOR: Turbosan DAC series pumps have submersible electric motors which operate with 3 phase 380 V power supply. Insulation class of motors is F, protection class is IP 68. Upon request H class insulation is available so as different power supply options like diffrent frequency or voltage (60 Hz).

SHAFT SEALING: Between motor and pumped fluid a high quality double mechanical seal is used, which operate in oil chamber. (Up to 11 kW single mechanical seal)

BEARINGS: Rotor is supported by means of two heavy duty ball bearings on upper and lower sides. These bearings are selected to support axial and radial loads. In DAC-Y type the bearings operate in cooling oil as a result they do not overheat . In DAS ad DAC-SC types bearings are grease lubricated.

MOTOR OVER HEAT PROTECTION SYSTEM: Stator windings are protected against over heat by 120 °C termistors. Two thermistor contacts are connected to cable and and must be connected to the thermistor relay.

WATER LEAKAGE WARNING SYSTEM: An electrode system is used which generates a warning signal in case of water leakage caused by worn out mechanical seal or any other reason. In order to have this system operational it must be connected to the Turbosan STR-1 protection relay.

CABLE CONNECTION: H07RN-F type rubber coated cables with flexible cores used. They are durable against corrosiveness of sewage water. Pumps supplied with 10 m cable as standard. Do not transport pump by pulling the cable.

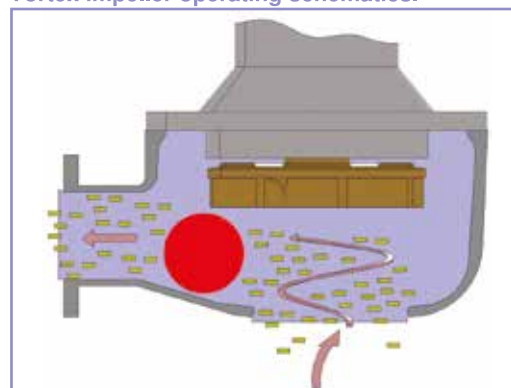
VOLUTE CASING: Volute casings are with concentric discharge and have large crossection. They are designed not to be clogged by the solid that can pass through impeller. In special applications Flush valve can be fitted to the pump. Pumps can be manufactured with different material types if requested by client or it is needed because of liquid properties.

MATERIAL

PUMP COMPONENT		MATERIAL
Motor casing - volute casing		Cast iron GG-25 (EN-JL 1040)
Impeller		Cast iron GG-25 (EN-JL 1040)
Shaft		Stainless steel (1.4021)
Bolts - Nuts		Stainless steel
Mechanical seal		SIC/SIC
Cable		H07RN-f
Coating	Primer	Epoxy primer
	Final coat	Coal tar epoxy paint over
	Inner surfaces	Rapid primer

CAUTION: If the submersible pump will be stored without operation for long time, it must be operated for short of time every 25-30 days. Submersible pumps manufactured according to CE directive.

Vortex impeller operating schematics.

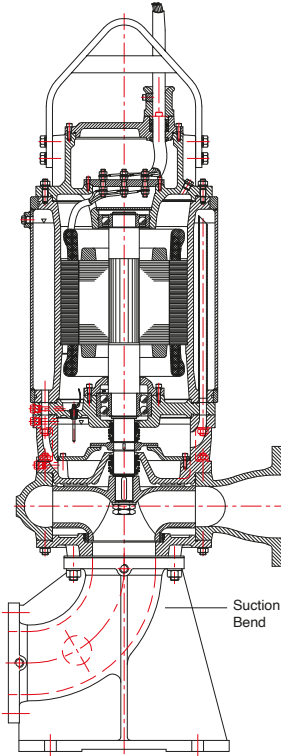


SUBMERSIBLE PUMP DESIGNS

Turbosan submersible waste water pumps manufactured in 2 different design.

1- DAC- SC SeriesCooling is by cooling jacket.

2- DAS series :Cooled by surrounding medium



1) Cooling jacket cooled

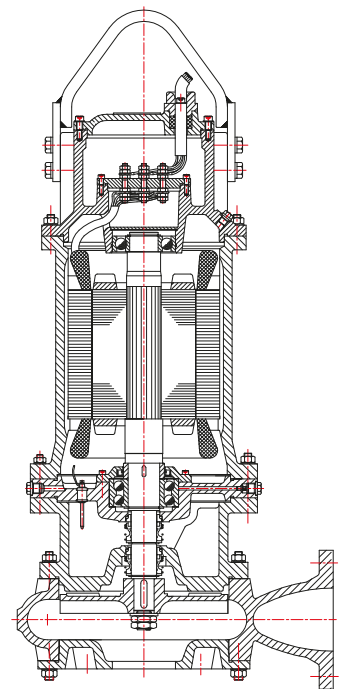
DAC-SC

1- DAC-SC pumps cooling system:

Around the motor of the submersible pump a cooling jacket is fitted. Coolant liquid circulates within this jacket by an impeller inside the oil chamber. Liquid circulating in the jacket dissipates the heat regardless of installation type and cools the motor. Oil chamber behind the pump impeller cools the coolant fluid.

2- DAS pump cooling:

Das type pumps are cooled by surrounding medium in which the pump is submerged. In order to have appropriate cooling, the pump has to be submerged completely. These pumps do not operate in a dry installation.



2) Surrounding medium cooled

DAS



Single vane double angled non clogging impeller: These impellers have large solid passages, high efficiencies and they do not strain motor power at low discharge head values.



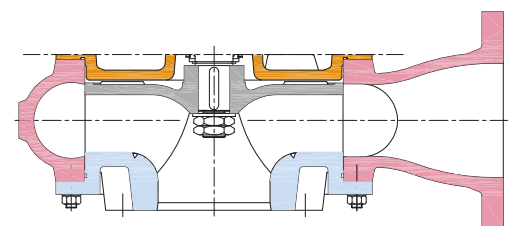
Double vane impeller: In general they are used in large sized pumps. Rotational symmetry lets them operate without vibration and stable. They are with high efficiency and they do not strain motor with excessive load in case of low discharge head. Large channels between vanes allows pumping of solids.



Vortex type impeller: This type of impellers do not have closed channels. Impeller located deep inside the volute casing. Pumping action is generated by vortex created within the fluid by rotation of the impeller. With this geometry they can tolerate large solids than other impeller types more specifically they tolerate fibrous materials in the pumped liquid. Disadvantage of this impeller type is lower efficiencies
Pump impellers statically and dynamically balanced according to ISO 1940 class 6.3



P-Impeller: The open non-clogging type impeller works by rubbing to the front wear plate (suction mouth).



Non clogging type p-impeller

INSTALLATION TYPES

1) AUTOMATIC COUPLING (DUCK FOOT BEND)

It is an economic and practical installation form for stationary systems.. The automatic coupling system consists of duck foot bend fixed on sump floor, guide rail (2 galvanised pipes fixed together) and fixing flange which is fitted to the pump. The automatic coupling set components and discharge piping have to be installed before sump get filled with the medium.

Operating principle: The fixing flange which is fitted to the pump slides through the guide rails and the pump is lowered to the sump by means of a chain. To take the pump out of the sump by pulling pump by chain is enough, no dismantling or bolt removal is required.

2) Dry Installation:

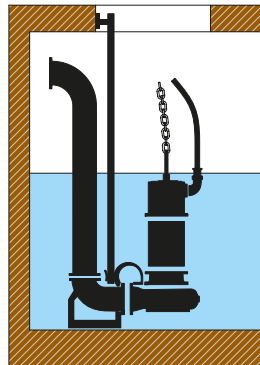
This installation form is for DAC- SC type pump with cooling jacket. DAC-SC type pumps can be operated out of water continuously by circulating the cooling liquid in the cooling jacket that surrounding electric motor which means it cools itself. The station works safer with vibration free pumps. These pumps have advantages of dry operation which are maintenance and operational advantages and advantages of submerged operation which are less space requirement and handling tough operation conditions. Sump and pump are separated by a wall in dry installation. The pump room's floor is dry so maintenance and repair can be done easily in the pump room. When pumps are fixed on concrete basement firmly, pumps works is vibration free, and station is safer. Pumps have suction bends. On the suction side of the pump there is one non return valve and one dismantling piece. A small drainage pump must be installed in the pump room for leakage water.



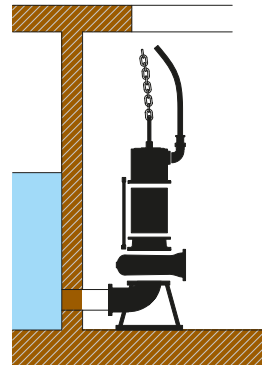
3) VERTICAL FREE STANDING HOSE CONNECTION

This installation form is suitable for pumps with smooth and flat floors. The pump must stay on the floor freely. The pump can be removed from the sump by pulling out by chain. Can be used for small pumps.

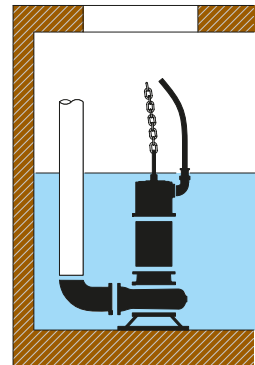
- In all installation forms discharge lines must be fitted with, valve, non return valve, dismantling piece and expansion joint.



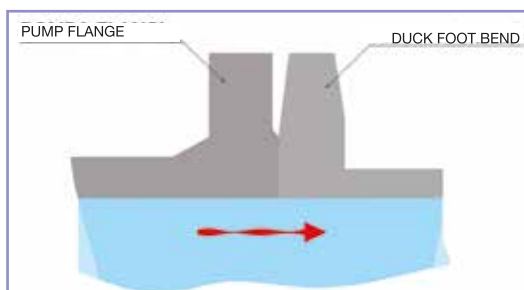
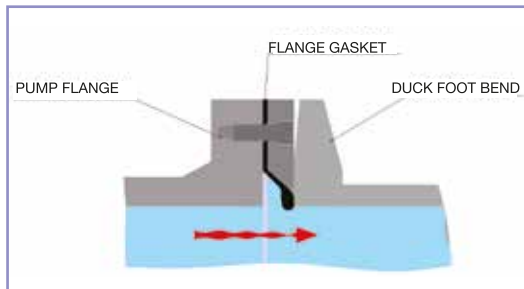
(1)



(2)



(3)



Sealing in Automatic coupling

a) Sealing with gasket :

A gasket with special design is fitted between guide flange and pump flange. When the pump operates, pressure on discharge of the pump forces the gasket to expand on guide flange. 100 % sealing achieved with gasket. This is the sealing used by Turbosan as standard.

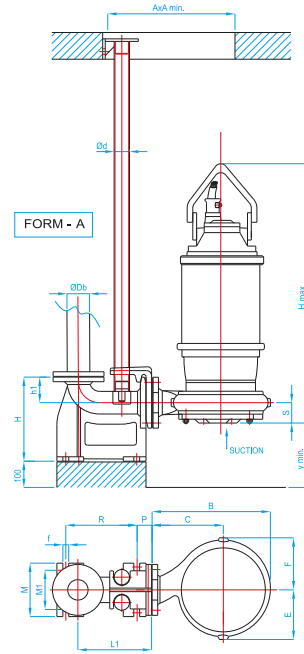
b) Metal on Metal sealing

The sealing between pump discharge flange and duck foot bend flange achieved by a very smoothly machined pump flange surface. and duck foot bend flange surface. This sealing used in special applications.

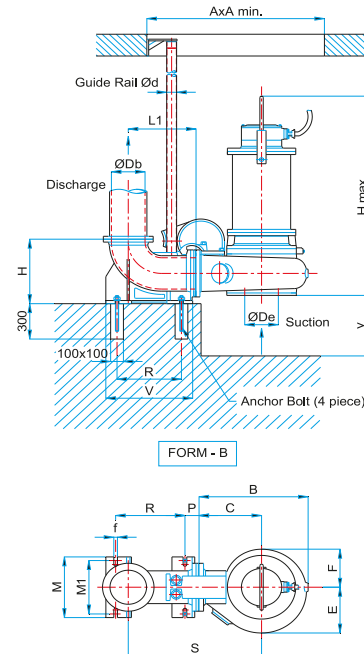


DAC-SC AND DAS TYPE SUBMERSIBLE PUMPS AND DUCK FOOT BEND DIMENSIONS TABLE

DAC-SC and DAS TYPE SUBMERSIBLE PUMP AND AUTOMATIC COUPLING INSTALLATION DIMENSIONS



Ø80, Ø100, Ø125, Ø150 Automatic Coupling



Ø200, Ø250, Ø300, Ø400 Automatic Coupling

PUMP TYPE	DIMENSIONS																			FORM
	Ød	Suction Øde	Discharge ØDb PN10	C	B	E	F	S	L1	P	R	M1	f	Anchor Bolt	V	M	H	H1	Ymin.	
DAS 80/250	80			280	475	175	150	65									265	140	180	A
DAS 80/250V	80			280	475	175	150	65									265	140	180	
DAS-EFF 80/260	125	80		280	490	220	190	65	234	64	220	140			290	210	265	140	180	
DAS 80/270 / V	80			315	540	218	200	65									265	140	180	
DAS 80/315 / V	80			340	585	255	235	65									265	140	180	
DAS-EFF 80/320	125			300	545	245	220	65							352	250	265	140	180	
DAS 100/200	100			246	440	173	158	80					23	M20x250					200	
DAS 100/250 / V	100			300	500	220	180	80											200	
DAS-EFF 100/260	150			300	540	260	210	80											200	
DAS 100/270 / V	100			315	515	198	197	80	270		240	150			320	220	300	140	200	
DAS 100/315 / V	100			315	515	198	197	80		80									200	B
DAS-EFF 100/320	150			340	590	265	225	80												
DAS 100/400	100			625	300	270	80													
DAS 125/315 / V	125	125		315	570	267	235	120	293		270	180	25	M22x250	352	250	355	170	165	
DAS 125/400	150	150 (125)		370	670	315	280	120												
DAS-EFF 125/500	150			450	790	385	335	120												
DAS 150/315	150			380	635	280	240	130	396	96	360	240			480	330	390	200	175	
DAS-EFF 150/315	150	150		400	650	280	220	130												
DAS 150/400	150			400	700	325	300	130												
DAS-EFF 150/500	150			500	840	365	305	130												
DAS 200/315 N	200			370	670	335	275	127												A
DAS 200/315 F	200			370	670	335	275	127												
DAS-EFF 200/320	250	200		500	860	395	290	200	442	112	420	300			540	400	450	200	220	
DAS 200/400 F	200			530	895	375	355	180												
DAS-EFF 200/410	250			500	845	385	305	180												
DAS-EFF 200/500	250			560	960	425	355	200												
DAS 250/315 F	250			440	780	355	290	180												
DAS 250/400 N	200																			
DAS 250/400 M	250			480	836	387	336	120	542	107	532	375			682	500	665	665	250	
DAS 250/400 F	300																			
DAS-EFF 250/420	250			600	1000	445	330	120												B
DAS 250/600	300			650	1176	555	485	130												
DAS 250/700	300			750	1330	620	540	141												
DAS-EFF 300/400	350	300		600	1030	475	325	225	604	129	575	425			775	565	618	618	400	
DAS 300/500 F	300			585	1060	525	430	225												
DAS-EFF 350/420	350	350		1310	560	400														
DAS-EFF 350/520	350			1380	640	475														
DAS-EFF 350/630	350			1385	640	490	255													
DAS 400/400 F	400			1090	620	476			875	180	825	550			925	700	1245	1245	450	
DAS-EFF 400/500	400			1355	630	430														
DAS 400/600 F	500			700	1215	570	471	285												A
DAS 400/700	500			1000	1625	685	576	285												

NOT:

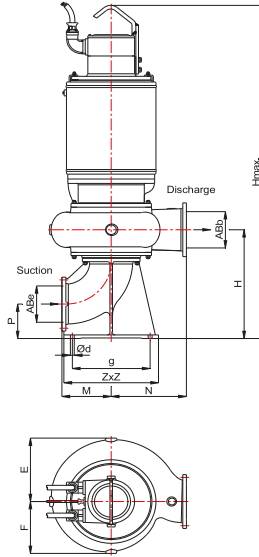
1) Dimensions "mm". Turbosan reserves right to make any changes in dimensions without giving prior notice.

2) Flanges conforming to DIN 2501 and TS EN 1092-2

3) For pump weight information in accordance with motor power please consult to Turbosan.

4) * Turbosan reserves the right to make any changes in dimensions without giving prior notice.

DAC-SC TYPE SUBMERSIBLE PUMP DIMENSIONS TABLE



PUMP TYPE	Suction Øde	Discharge ØDb PN10	E	F	H	H max.	M	N	P	z x z	g x g	Ød	Anchor Bolt					
DAC-SC 80/250	80	80	175	150	408	980	190	280	150	350X350	250X250	23	M20x200					
DAC-SC 80/250V						980												
* DAC-SC EFF 80/260	125		220	190	528	1040	215	185	440X440	345X345								
DAC-SC 80/270 / V	80										218			200	410	1010	190	315
DAC-SC 80/315 / V	125		255	235	418	1080	340	300	185	440X440	345X345							
* DAC-SC EFF 80/320			245	220	528	1140	215	300	185	440X440	345X345							
DAC-SC 100/200	100		100	173	158	429	1080	195	246	190	390X390			295x295	28	M24x250		
DAC-SC 100/250 / V																	220	180
* DAC-SC EFF 100/260	150			260	210	613	1140	275	300	210	500X500			350X350				
DAC-SC 100/270 / V	100			198	197	448	1040	195	315	190	390X390			295x295				
DAC-SC 100/315 / V		248		220	468	1090												
* DAC-SC EFF 100/320	150	265		225	603	1130	275	340	210	500X500	350X350							
DAC-SC 100/400	100	300		270	474	1300	195	190	390X390	295x295								
DAC-SC 125/315 / V	125	125		267	235	512	1300	215	315	185	440X440	345X345	23	M20x200				
DAC-SC 125/400				315	280		1495											
DAC-SC EFF 125/500	150	150 (125)		385	335	623	1555	275	450	210	500X500	350X350	28	M24x250				
DAC-SC 150/315			280	240	581	1280	380											
DAC-SC EFF 150/315			280	220	643	1350	400											
DAC-SC 150/400			325	300	574	1315												
DAC-SC EFF 150/500	200	200	365	305	733	1385	325	500	225	600X600	500x500	30	M27x300					
DAC-SC 200/315 N			335	275	702	1335		370										
DAC-SC 200/315 F			250	395	290	804		1390						350	500	250	650X650	
* DAC-SC EFF 200/320				375	355	724		1715						325	530	225	600X600	
DAC-SC 200/400 F	250	250	385	305	784	1910	350	500	250	650X650	500x500	36	M33X300					
DAC-SC EFF 200/410			425	355	804	2700		560										
DAC-SC EFF 200/500			355	290	784	1750		440										
DAC-SC 250/315 F			250	250	387	336		694						2030	325	480	225	600X600
DAC-SC 250/400 M	764	2050					350	250	650X650									
DAC-SC 250/400 F	857	2080					380	285	730X730	600X600								
* DAC-SC EFF 250/420	445	330					814	2100	600	250	650X650	500x500						
DAC-SC 250/600N	300	300	555	485	767	2210	350	650	250	650X650	500x500	36	M33X300					
DAC-SC 250/700			620	540	990	2830		380		750				285	730X730	600X600		
DAC-SC EFF 300/400			475	325	959	2100		445		600				330	850X850	700X700		
DAC-SC 300/500 F			525	430	900	2170		380		585				285	730X730	600X600		
DAC-SC EFF 350/420	350	350	560	400	979	2300	445	510	800	380	1000X1000	800X800	36	M33X300				
* DAC-SC EFF 350/520	400	400	640	475	1154	3255	635								700	470	1200X1200	1000X1000
* DAC-SC EFF 350/630				490	1189	3285												
DAC-SC 400/400 F			620	476	1132	3235												
* DAC-SC EFF 400/500			500	500	630	430		1404	3940	1000								
DAC-SC 400/600 F	570	471			1536	4050												
DAC-SC 400/700	685	576			1454	-												
DAC-SC 500/600	747	600			1850	960												
DAC-SC 500/630B	600	500	785	1850	960	1850X1850	1650X1650											

NOT:

- 1) Dimensions (mm) subject to change without prior notice!
- 2) For pump weight information in accordance with motor power please consult to Turbosan.
- 3) For flange dimensions refer to flange standards.
- 4) * Turbosan reserves the right to make any changes in dimensions without giving prior notice.

CAP SERIES SEWAGE AND WASTE WATER PUMPS

TECHNICAL SPECIFICATIONS :

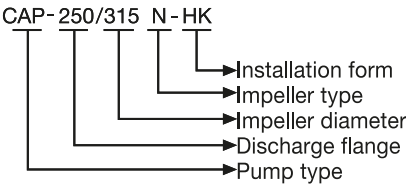
- Turbosan CAP series consists of centrifugal sewage and waste water pumps. They are used for pumping muddy liquids like sewage and other solid – water mixtures, with high viscosity.
- For the vertical column pipe types 1500 m and 1000 mm long standard pipes used. The required length can be adjusted between 1000 mm and 8000 mm by using standard parts.
- Axial thrust force is balanced by vanes located behind the impellers. In column pipe models thrust force impeller and shaft weight are 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 are 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 are tested according to ISO 9906
- CAP series pumps do not have suction ability, there 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:

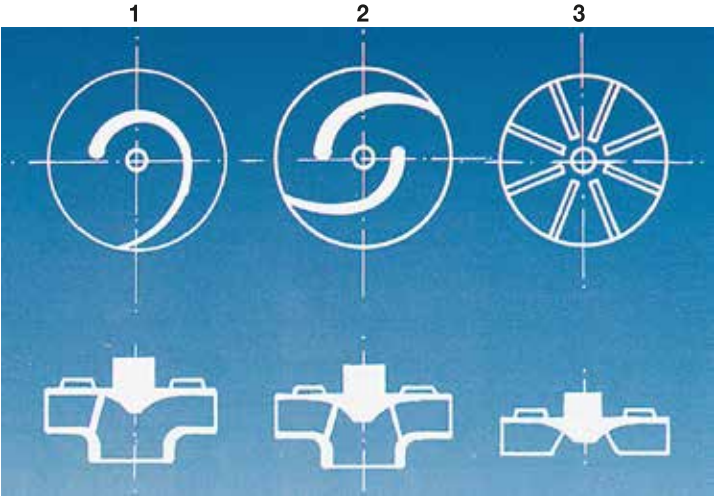
- Suction flange sizes : DN 50 – DN 600
- Discharge flange sizes : DN 50 – DN 600
- Capacity : 10 – 3000 m³/h
- Discharge head : 5 – 80 m
- Operating temperature : - 10°C - + 75°C



FLUID TYPES:

- Unscreened sewage and other waste water types with high solids concentration Pumps are designed to tolerate large solids (Ø 30 Ø - 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 against wear.
- Maximum allowed fluid temperature is 40 °C
- Maximum allowed medium density is 1,2 gr/cm³, maximum allowed medium viscosity is 1,5 x 10-6 m²/s. Measures must be taken to lower these values.

PUMP IMPELLER TYPE



MATERIALS

PART	MATERIALS	
	BRONZE / STAINLESS STEEL VERSION	CAST IRON VERSION
Casing	Cast iron (GJL 250) (EN-JL 1040)	Cast iron (GJL 250) (EN-JL 1040)
Impeller	Bronze / AISI 316	Cast iron (GJL 250) (EN-JL 1040)
Diffusor	Cast iron (GJL 250) (EN-JL 1040)	Cast iron (GJL 250) (EN-JL 1040)
Wear ring	Bronze	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.

SB - SINGLE VANE (NON - CLOG) IMPELLERS

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

DB - DOUBLE VANE IMPELLERS

These types of impellers are usually used in large size pumps. Because of rotational symetry 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.

CAP SERIES SEWAGE PUMPS MOUNTING ARRANGEMENTS

CAP SERIES SEWAGE PUMPS MOUNTING ARRANGEMENTS

- 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 below the plate level. Lubrication of the bearings is below 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/Type VK permits inspection and maintenance without disturbing suction and discharge piping. Form 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.

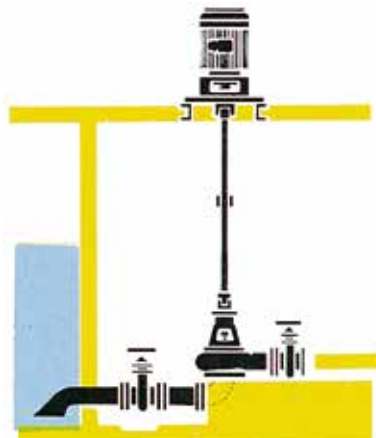
Form VK is manufactured for branch sizes up to 500 mm and for depths up to 10 metres.



3) Form VS

Vertical dry-pit sewage pump with universal joint shaft:

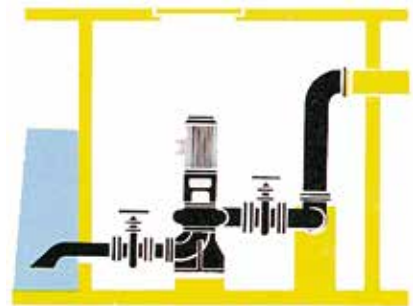
Form VS is especially suitable for installation into deep and dry-pits and for large discharge. The pump unit is supported by foot and is connected to the motor by an exposed vertical shaft. It has all the properties of form VK. Form VS is manufactured for branch sizes of 200 mm and over. Mounting lengths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



4) Form VM

Vertical dry-pit monoblock sewage pump:

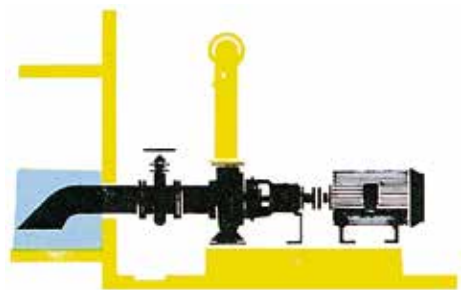
This pump is suitable for installation into dry-pits which are not subject to flooding and for installation on the ground level. Pump and motor form a compact unit. Form VM permits inspection and maintenance without disturbing suction and discharge piping and casing. The shaft can either be sealed off 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.



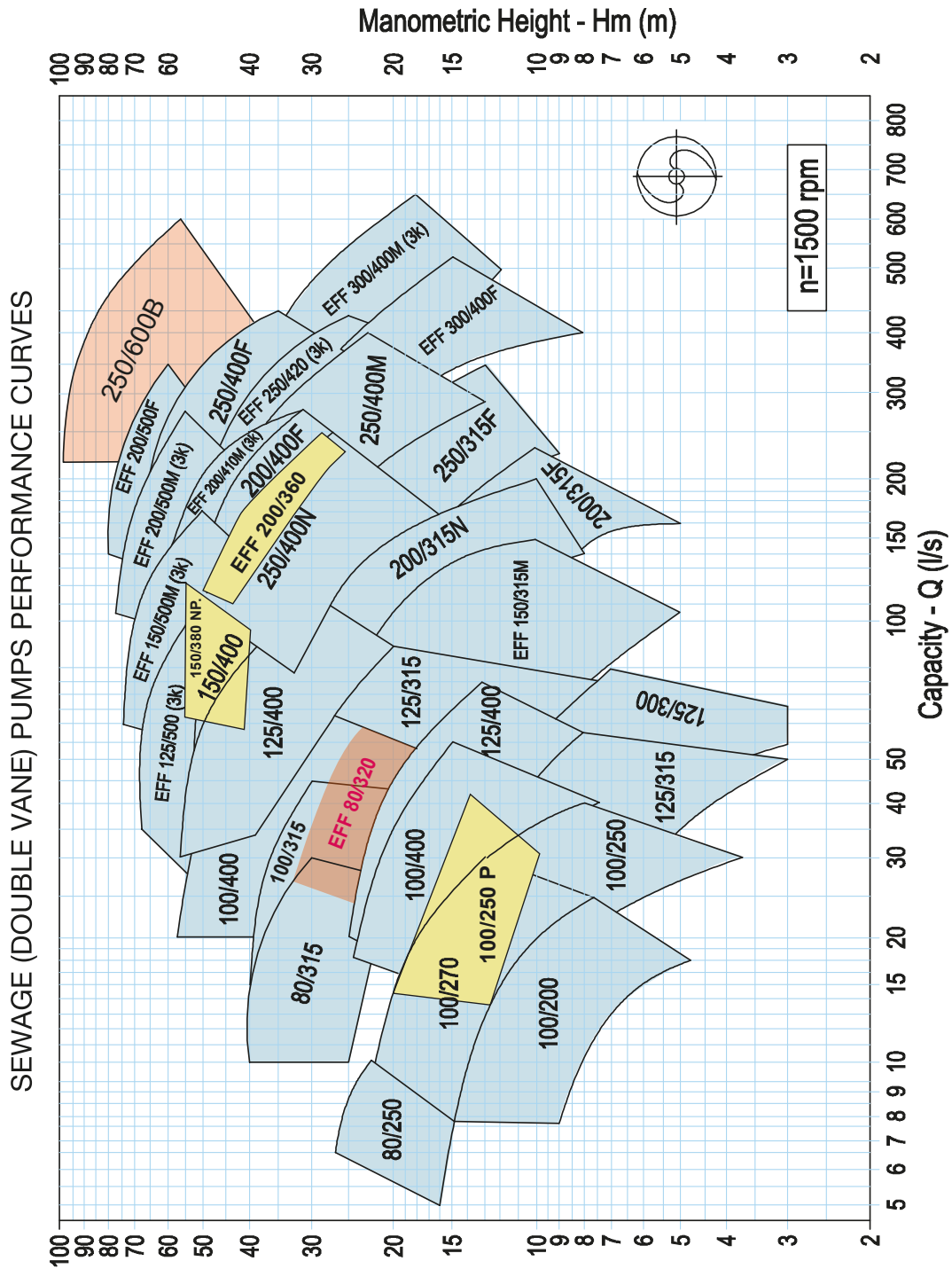
5) Form HK

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 to avoid water. 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.



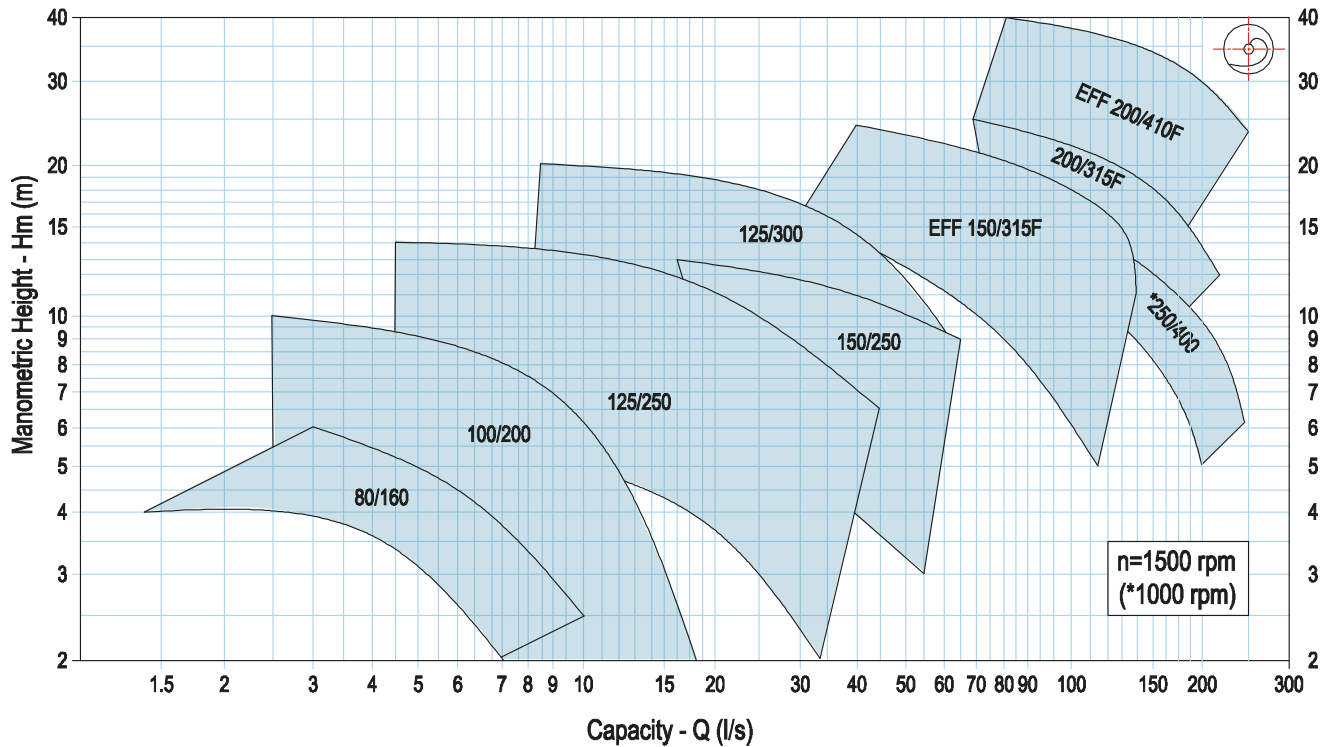
CAP / DAC-SC / DAS SERIES PUMPS GROUP PERFORMANCE CURVES (DOUBLE VANE IMPELLERS)



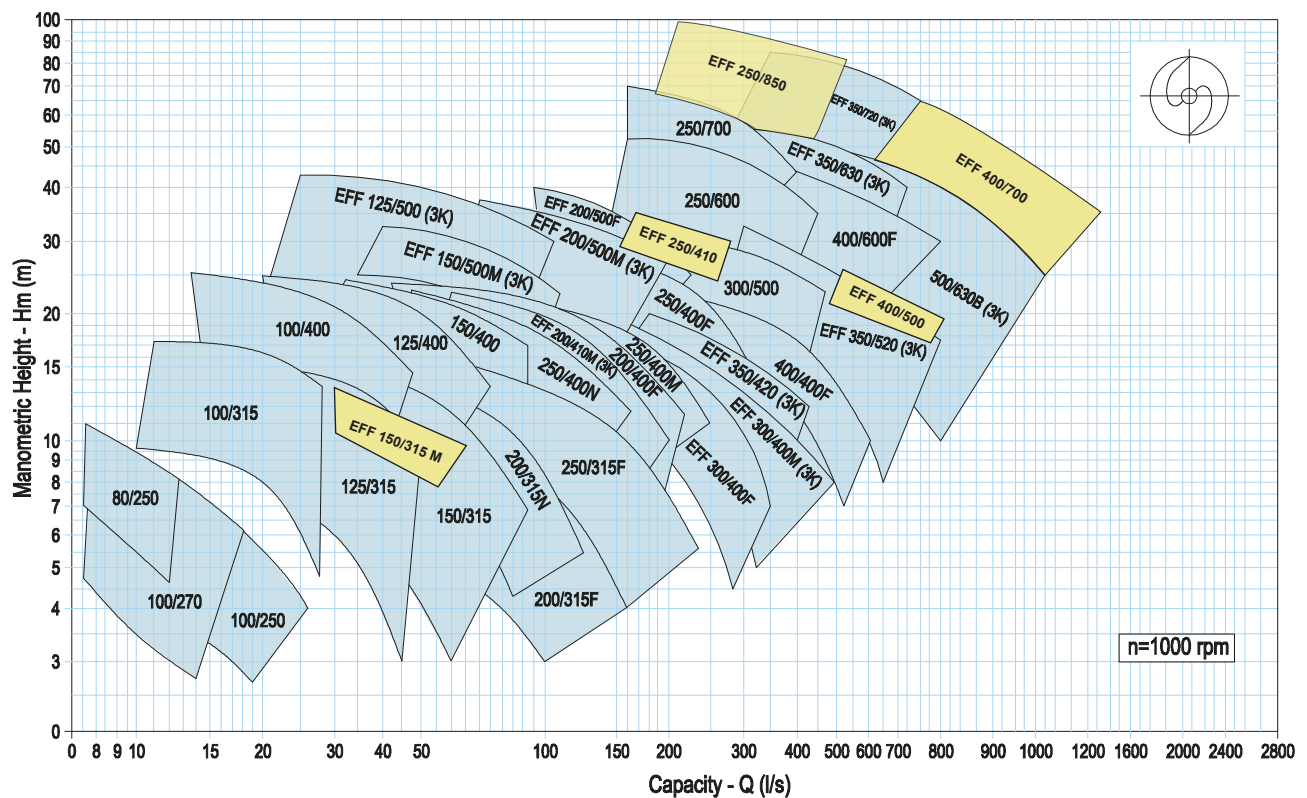
NOTE:
Group performance charts for 2 vane impellers. 3 vane impellers indicated with "3K"

CAP / DAC-SC / DAS SERIES PUMPS GROUP PERFORMANCE CURVES

SEWAGE (SINGLE VANE) PUMPS PERFORMANCE CURVES



SEWAGE (DOUBLE VANE) PUMPS PERFORMANCE CURVES

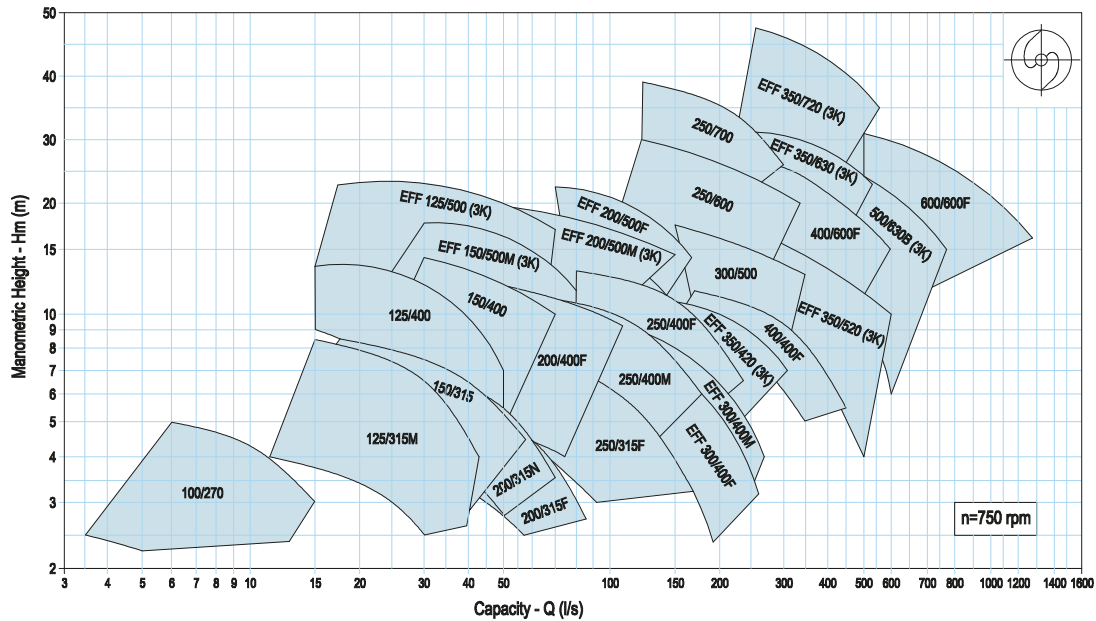


NOTE:

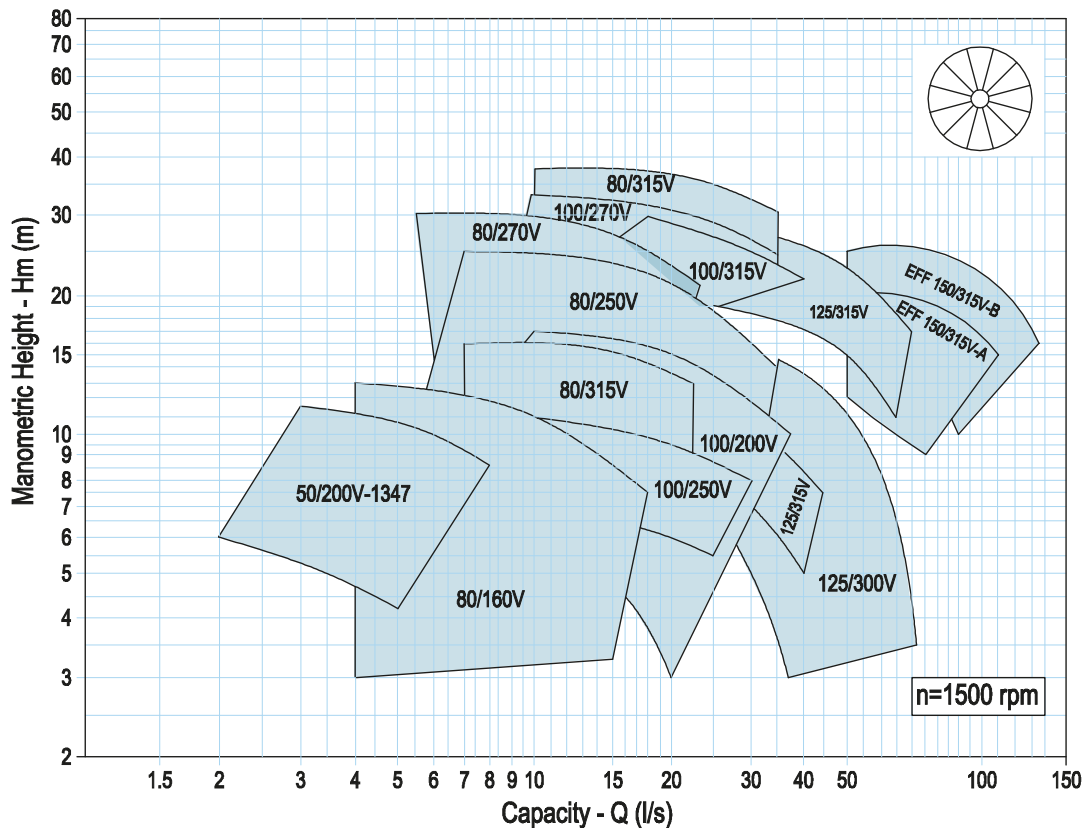
Group performance charts for 2 vane impellers, 3 vane impellers indicated with (3K).

CAP / DAC-SC / DAS SERIES PUMPS GROUP PERFORMANCE CURVES

SEWAGE (DOUBLE VANE) PUMPS PERFORMANCE CURVES



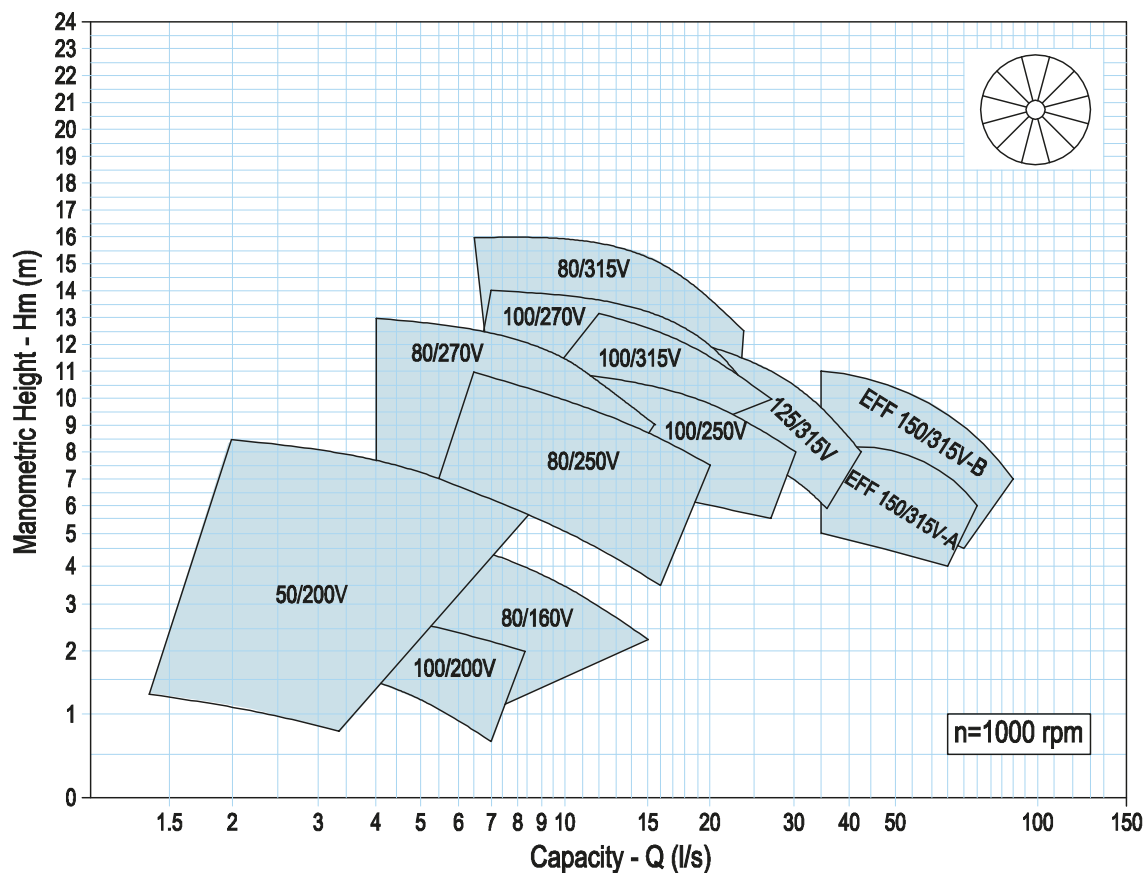
SEWAGE (VORTEX) PUMPS PERFORMANCE CURVES



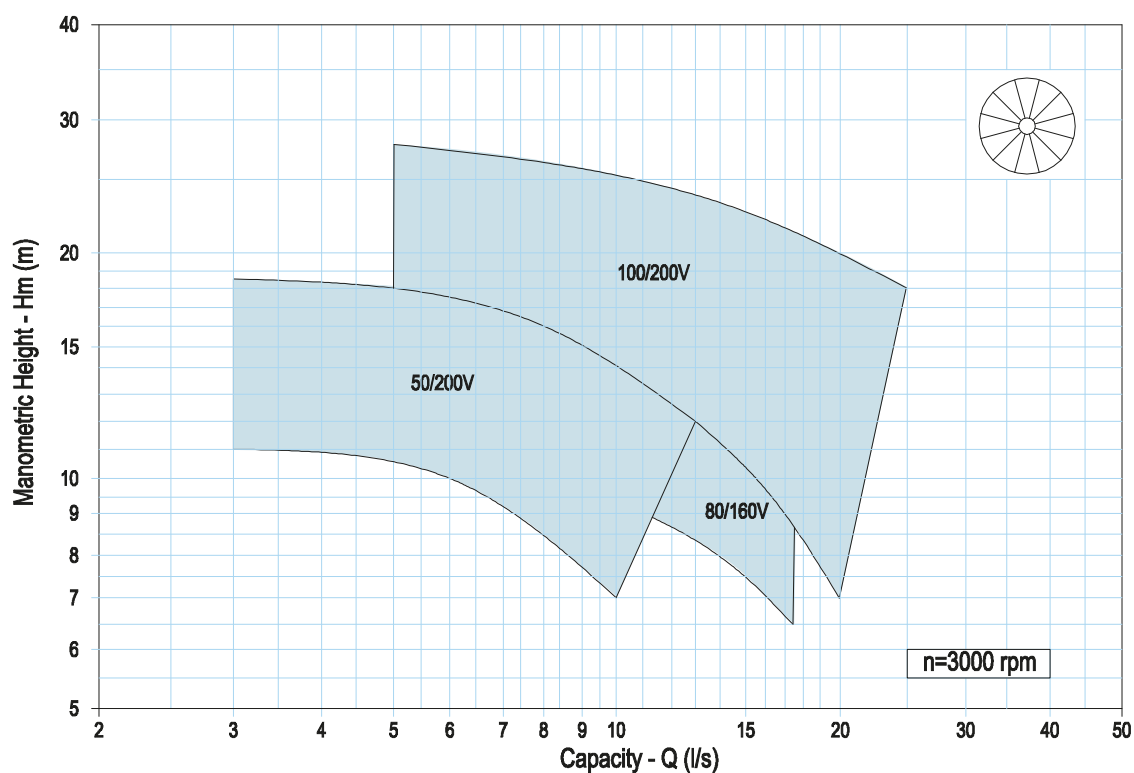
NOTE:
Group performance charts for 2 vane impellers. 3 vane impellers indicated with "3K"

CAP / DAC-SC / DAS SERIES PUMPS GROUP PERFORMANCE CURVES

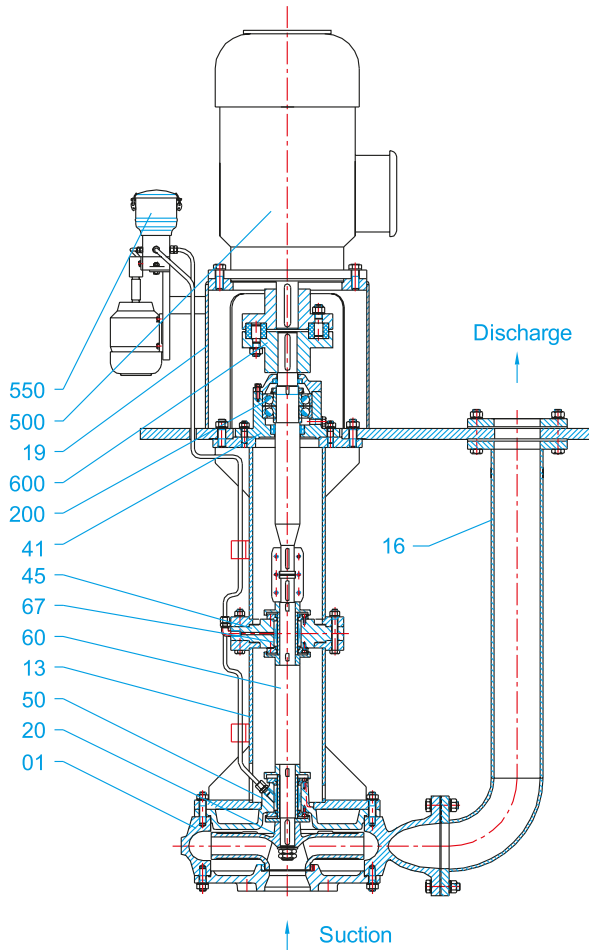
SEWAGE (VORTEX) PUMPS PERFORMANCE CURVES (n=1000 rpm)



SEWAGE (VORTEX) PUMPS PERFORMANCE CURVES (n=3000 rpm)



CAP - VY SERIES PUMPS SECTIONAL DRAWING AND PARTS LIST

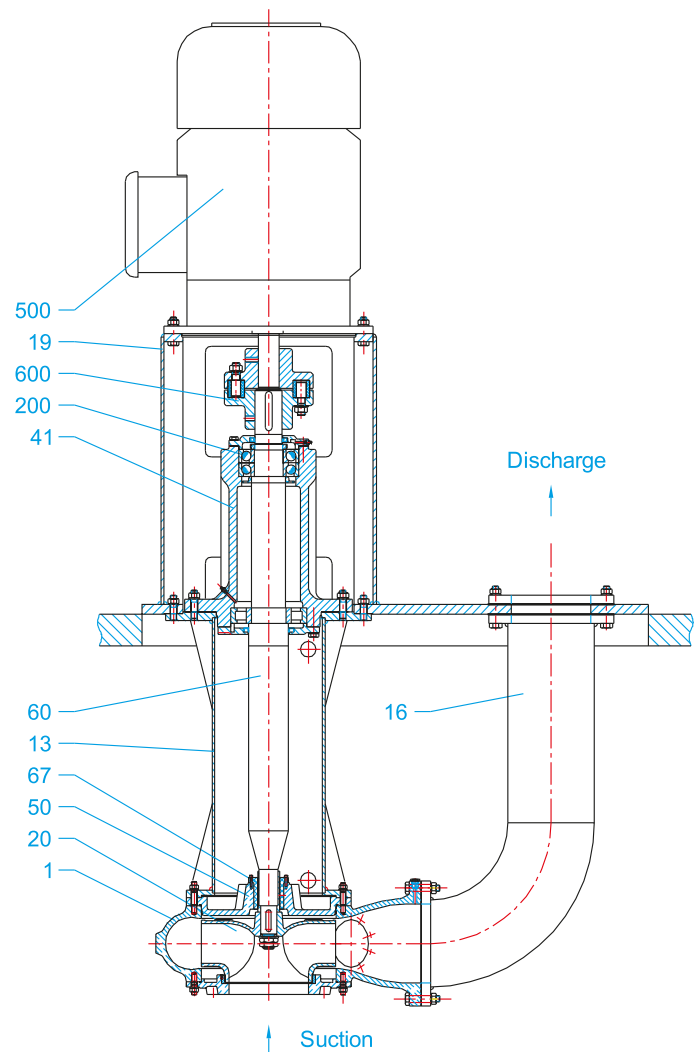


PUMP WITH GREASE LUBRICATED SLEEVE BEARING



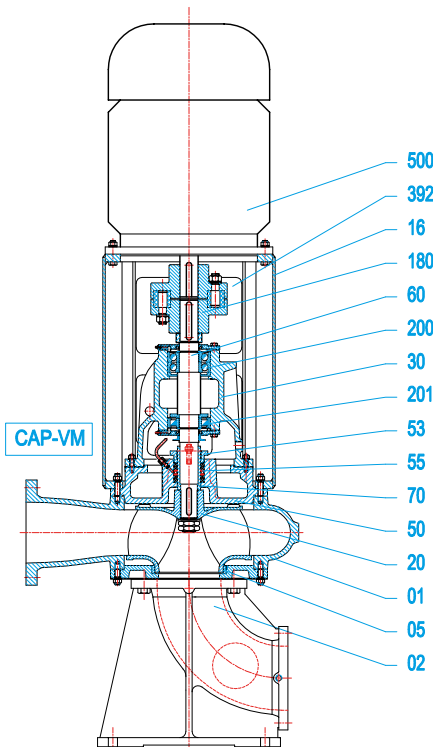
CAP-VY SERIES PUMP PARTS LIST

01	Volute
13	Column Pipe
16	Discharge Pipe
19	Motor Stool
20	Impeller
41	Thrust Bearing
45	Intermediate Bearing
50	Stuffing Box
60	Shaft
67	Bearing Sleeve
200	Bearing
500	Electrical Motor
550	Grease Pump
600	Coupling



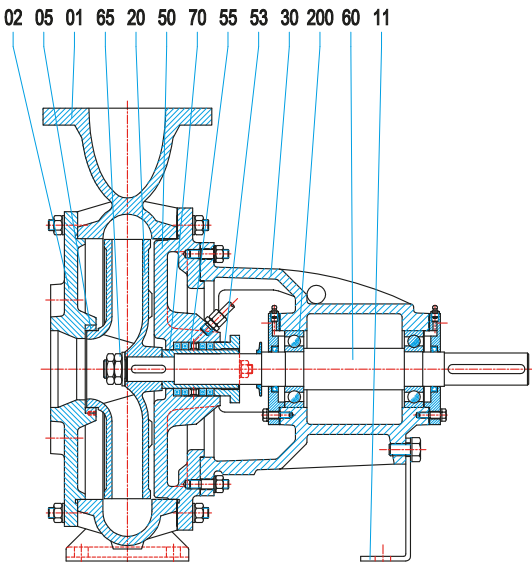
PUMP WITH SELF LUBRICATED RUBBER SLEEVE BEARING

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



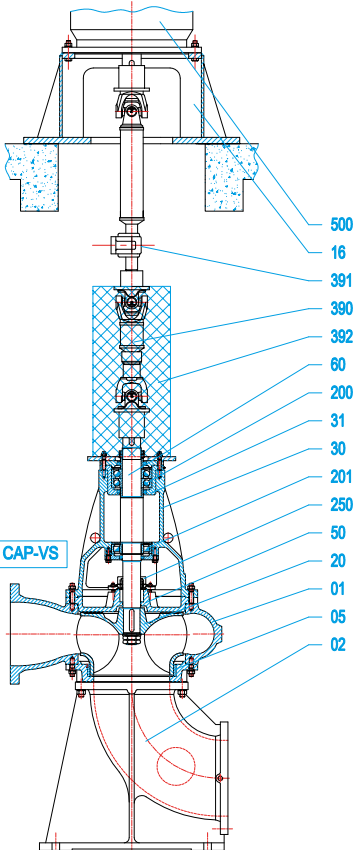
CAP-VM VERTICAL MONOBLOCK
FORM (A)

CAP-VM & CAP-VS SERIES PUMP PARTS LIST	
01	Volute
02	Suction Bend
05	Wear Ring
16	Motor Stool
20	Impeller
30	Bearing Frame
31	Bearing Housing
50	Stuffing Box
53	Gland
55	Lantern Ring
60	Shaft
70	Shaft Sleeve
180	Coupling (CAP-VM)
200	Bearing (73....)
201	Bearing (NU....)
250	Mechanical Seal
390	Cardan Shaft (CAP-VS)
391	Intermediate Bearing (CAP-VS)
392	Safety Guard
500	Electric Motor

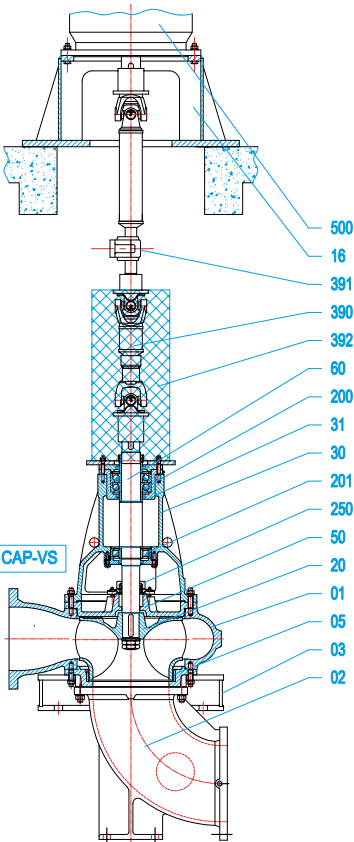


CAP-HK HORIZONTAL PUMP
CAP-HK

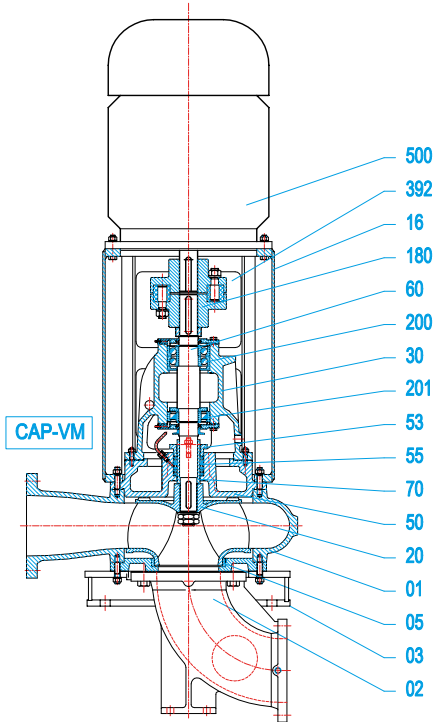
CAP-VM & CAP-VS SERIES PUMP PARTS LIST	
01	Volute
02	Suction Elbow
03	Pump Stool
05	Wear Ring
16	Motor Stool
20	Impeller
30	Bearing Frame
31	Bearing Housing
50	Stuffing Box
53	Gland
55	Lantern Ring
60	Shaft
70	Shaft Sleeve
180	Coupling (CAP-VM)
200	Bearing (73....)
201	Bearing (NU....)
250	Mechanical Seal
390	Cardan Shaft (CAP-VS)
391	Intermediate Bearing (CAP-VS)
392	Safety Guard
500	Electric Motor



CAP-VS VERTICAL CARDAN SHAFT DRIVEN
FORM (A)

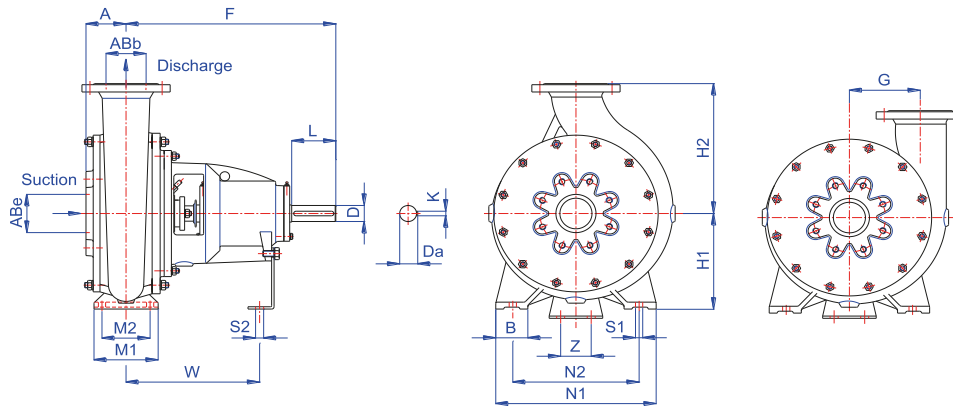


CAP-VS VERTICAL CARDAN SHAFT DRIVEN
FORM (B)



CAP-VM VERTICAL MONOBLOCK
FORM (B)

CAP - HK SERIES HORIZONTAL DRY INSTALLATION SEWAGE PUMPS DIMENSIONS TABLE



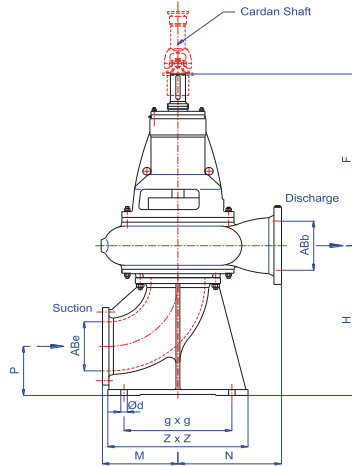
PUMP TYPE	Discharge ABb-PN10	Suction ABe-PN10	A	F	H1	H2	B	M1	M2	N1	N2	S1	D	Da	K	L	W	Z	S2	G		
80/250	80	80	80	487	200	280	80	125	85	360	280	M16	32	35	10	80	305	100	M12	-		
EFF 80/260		125	125	555	250			160	100		315	M12	42	45	12	110	371	150		-		
80/270		80	61	472	225	235		125	85	400		320		32	35	10	80	312		160	-	
80/315			73	555		340		85	120	475	400	M16		42	45	12	110	370			-	
EFF 80/320	125	125	555		250	300	80	160	100	320	160	M12		42	45	12	110	370	150		-	
100/250	100	78	493	225			120								32	35	10	80			330	-
100/250NP	125	100	500	190	290	240	80	160								32	35	10		80	340	-
EFF 100/260	150	150	550		300	80	160		120							42	45	12		110	365	-
100/315	100	100	523		340		200						M16	42	45	12	110	333	-			
EFF 100/320	150	140	580	275										M12	42	45	12	110	395	150	-	
100/400	100	104	553	315	367			120		150	550	400	M20	42	45	12	110	369	150	-		
EFF 100/400	150	170	562	315	400	120			150	550	400	M20								-		
EFF 100/400NP	150	170	562	315	400	120		150	550	400	M20	38	41	10	110	378	150	-				
125/250	125	120	475	250	315		160	120	400	315		M16	32	35	10	80	335	100		M12	-	
125/300		116	529	288	335												369		-			
125/315		83	557	280	315		200		500	400				42	45	12	110	398	150	-		
125/400		107	559	315	370													373		-		
EFF 125/500	150	150	160	720	355	450	100	250	150	550	450	M20	60	64	18	140	480	190		-		
150/250		200	159	577	280	355			500	400			42	45	12		385	100	-			
150/315		118	569	255	380		200		550	450			52	56	16		420	150	-			
EFF 150/315		180	570	315	400														-			
150/400	200	112	630										52	56	16		420	150	-			
150/380NP		200	130	550	315	450	100	150	100	500	415		38	41	10	110	370	120	-			
EFF 150/410		200	175	640	350	450	100	200	150	550	450	M20	52	56	16	110	430	150	-			
EFF 150/500		180	715	380	500	130	250	180	560	450			60	64	18	140	475	190	-			
200/315N	200	127	565	315	360	100		250	180	500	400		42	45	12	110	381	150	-			
200/315F		144	585	330	370	150	240	160	600	500			42	45	12	110	401		-			
EFF200/360		250	167	713	380	480	150	250	200	650	500		60	64	18	125	464	190	-			
EFF 200/320		250	200	565	375	500	100	220	140	550	450		42	45	12	110	380		-			
200/400	250	200	148	764	380	530	150	280	200	650	500	M24					515		-			
EFF 200/410		250	180	740	355	500	120	250	150	550	450	M20	60	64	18		490		-			
200/500		200	210	874		160	280	200	720		600	M27					630		-			
EFF 200/500		250	200	820	425	560	120		210	700		M20				140	575	190	-			
250/400N	250	250	140	850									70	75	20		605		-			
250/400M		250	160		380	480	140		180	600	500	M27							-			
250/400F		300	295	855			250												-			
250/400F		350	295	855															-			
EFF 250/410	300	250	165	756	400	525	130		200	650	590		60	65	18	135	517		-			
EFF 250/420		250	210	720	400	600	130		170	800	670	M24	60	64	18	140	480		-			
250/600		300																	-			
250/600		350	280	1213	550	650	160	350	250	900	740		100	106	28	210	847	200	M24	-		
250/600B	350	350																	-			
250/700		300	321	1159	650	750	180	400	280	1100	940						743	400	-			
EFF 300/400		350	170	860		600		350		800		650					605		-			
300/500		300	335	882		580	160		250			660		70	75	20	140	638		-		
EFF 350/420	350	350	200	836	560												592		-			
EFF 350/520		265	835	680		800	225	400		1080	860	M24					590		-			
EFF 350/630		300	1275	670				300						100	106	28	210	915	190	M20	-	
400/400		243	850	580																-		
400/402	400	388	858	573	565		150	350	270	800	660	M30	70	75	20	116	606		-			
EFF 400/500		300	1375	600	800	250	400	300	1000	750	M36	100	106	28	210	1010		-				
400/600		417	1035	550		160		400	300	1150	1000	M27	80	85	22	150	900	240	-			
400/700								440	340	1250	1100								-			
500/600	500	350	1275	700	700	250	440	340	1250	1100		M36	100	106	28	210	915	200	M20	-		
500/630B																			-			
600/600		422	1202	800		325	500	400	1300	1000						210	814	400	M24	500		
600/600		600																		-		

NOTE:

1) Turbosan reserves right to make any changes in dimensions without giving prior notice.

2) For flange dimensions refer to flange standards.

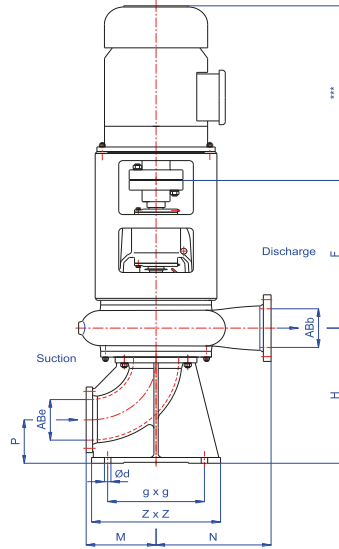
CAP - VS SERIES VERTICAL DRY INSTALLATION CARDAN SHAFT DRIVE SEWAGE PUMPS DIMENSIONS TABLE



PUMP TYPE	Discharge ABb-PN10	Suction ABe-PN10	F	H	M	N	P	Z x Z	g x g	Ød	Anchor Bol				
50/200V	50	65	440	294	145	200	125	270X270	200X200	20	M18x200				
80/160	80	80	480	408	190	280	150	350X350	250X250	23	M20x200				
80/250			454	405			185	440X440	345X345						
EFF 80/260		125	555	528	215	315	150	350X350	350X350						
80/270		80	454	405	190	340									
80/315	80		555	528	215	300	185	440X440	345X345	23	M20x200				
EFF 80/320		125	555	528	215	300	185	440X440	345X345						
100/200		100		498	435	246									
100/250				465	446	195	300	190	390x390			295x295			
EFF 100/250NP			500	456	290										
EFF 100/260	100	150	550	613	275	300	210	500x500	350X350	28	M24x250				
100/270		100	448	440	195	315	190	390X390	295x295	23	M20x200				
100/315				523	468	340	210	500X500	350X350	28	M24x250				
EFF 100/320		150	580	603	275	340	210	500X500	350X350	28	M24x250				
100/400		100	553	472	195	340	190	390X390	295X295	23	M20x200				
EFF 100/400		150	562	472											
EFF 100/400NP	150	562	472												
125/250	125	125	475	543	215	315	185	440X440	345X345	28	M24x250				
125/300		150	529	589	275	335	210	500x500	350X350						
125/315		125	561	485	215	315	185	440X440	345X345						
125/400				559	510	275	370	210	500x500			350X350			
EFF 125/500	125	150	720	620	275	450	210	500x500	350X350	28	M24x250				
150/250		200	577	712	325	355	225	600x 600	500x500	30	M27x300				
150/315		150	150	570	581	275	380	210	500x500	350X350	28	M24x250			
EFF 150/315					643										
150/400			644	575	400										
EFF 150/410	200		640			450									
150/380NP	200	550													
EFF 150/500	200	200	715	733	325	500	225	600x 600	500x500	30	M27x300				
200/315N			565	680		370									
200/315F			585	697		370									
EFF 200/320		250	565	803	350	500	250	650x650							
EFF 200/360			713	813											
200/400			200	779								703	325	530	225
EFF 200/410		250	740	780	350	500	250	650x650							
200/500		200	874	763	325	225	600X600								
EFF 200/500		250	820	803	350	560	250	650x650							
250/315F		250	702	784	350							440			
250/400N		200	757	770	325							480	285	730X705	600X600
250/400M		250	875	763	350										
250/400F	300	882	850	380											
250/400F	250	350	756	784	350	525	650x650	500X500							
EFF 250/410		250							720	813	350	600	250	650x650	500X500
EFF 250/420		300							1213	948	380	650	285	730X705	600X600
250/600		350													
250/600	350														
250/600B	300	300	1159	853	380	750	205	730X705	700X700						
250/700		350	850	948	445	600	330	850X850							
EFF 300/400		300	882	1000	380	585	285	730X705		600X600					
EFF 350/420		350	836	978	445	330	850X850	700X700							
EFF 350/520	400	880	1155	510	800				380	1000x1000	800X800				
EFF 350/630		915	1180												
400/400		1130													
400/402		858	1276												
EFF 400/500	400	500	1375	1403	635	700	470	1200X1200	1000X1000						
400/600		500	1259	1520	635		470	1200X1200	1000X1000						
400/700		500	1275	1454	635		1000	470	1200X1200	1000X1000					
EFF 400/800		500	1506	1350	550		930	430	500X500	320X320					
500/600	500	500	1275	1454	635	1000	470	1200X1200	1000X1000	30	M27x300				
500/630B	500	600	1202	1850	960	1000	470	1850X1850	1650X1650						
600/600	600	600	1202	1850	960	700	470	1850X1850	1650X1650						

1) Dimensions "mm". Turbosan reserves right to make any changes in dimensions without giving prior notice.
2) For flange dimensions refer to flange standards.

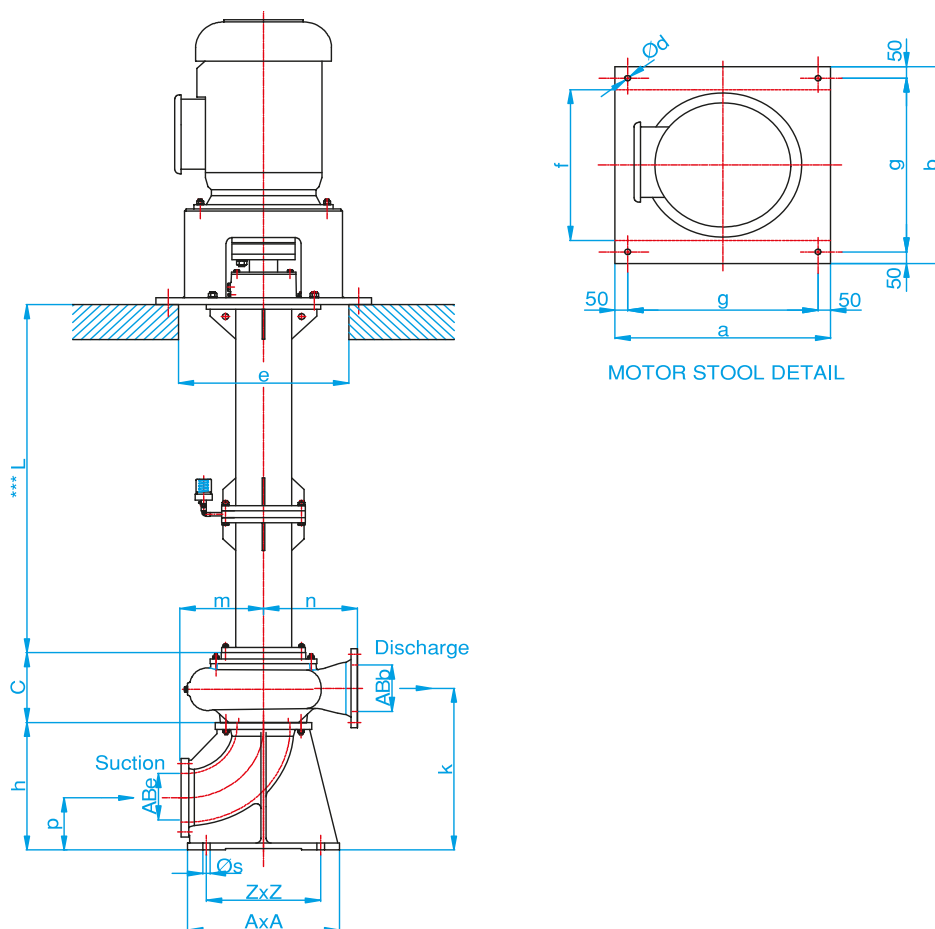
CAP - VM SERIES VERTICAL DRY INSTALLATION MONOBLOCK SEWAGE PUMPS DIMENSIONS TABLE



PUMP TYPE	Discharge ABb-PN10	Suction ABb-PN10	F	H	M	N	P	Z x Z	g x g	Ød	Anchor Bolt
50/200V	50	65	440	294	145	200	125	270X270	200X200	20	M18x200
80/160	80	80	480	408	190	280	150	350X350	250X250	23	M20x200
80/250		125	555	528	215		185	440X440	345X345		
EFF 80/260		80	454	405	190		150	350X350	350X350		
80/270		125	555	528	215		185	440X440	345X345		
80/315	80	125	555	528	215	300	185	440X440	345X345	23	M20x200
EFF 80/320		100	498	435	195	300	190	390x390	295x295		
100/200		150	550	613	275	300	210	500x500	350X350		
100/250		100	448	440	195	315	190	390X390	295x295		
EFF 100/250NP	100	150	580	603	275	340	210	500X500	350X350	28	M24x250
EFF 100/260		100	553	472	195	340	190	390X390	295x295		
100/270		150	562	472	195	340	190	390X390	295x295		
100/315		150	562	472	195	340	190	390X390	295x295		
EFF 100/320	100	125	475	543	215	315	185	440X440	345X345	28	M24x250
100/400		150	529	589	275	335	210	500x500	350X350		
EFF 100/400		125	561	485	215	315	185	440X440	345X345		
EFF 100/400NP		125	559	510	215	370	185	440X440	345X345		
125/250	125	150	720	620	275	450	210	500x500	350X350	28	M24x250
125/300		200	577	712	325	355	225	600x 600	500x500		
125/315		150	570	581	275	400	210	500x500	350X350		
125/400		200	644	643	275	450	210	500x500	350X350		
EFF 125/500	150	200	640	575	275	450	210	500x500	350X350	28	M24x250
150/250		200	550	550	275	450	210	500x500	350X350		
150/315		200	715	733	325	500	225	600x 600	500x500		
EFF 150/315		200	565	680	325	370	225	600x 600	500x500		
150/400	200	250	585	697	350	500	250	650x650	500x500	30	M27x300
EFF 150/410		250	565	803	350	500	250	650x650	500x500		
150/380NP		250	713	813	350	560	225	600X600	500x500		
EFF 150/500		250	779	703	325	530	225	600X600	500x500		
200/315N	250	250	740	780	350	500	250	650x650	500x500	30	M27x300
200/315F		250	874	763	325	560	225	600X600	500x500		
EFF 200/320		250	820	803	350	440	250	650x650	500x500		
EFF 200/360		300	702	784	350	480	285	730X705	600X600		
200/400	300	200	757	770	325	480	285	730X705	600X600	30	M27x300
EFF 200/410		300	875	763	350	480	285	730X705	600X600		
200/500		300	882	850	380	525	285	730X705	600X600		
EFF 200/500		350	756	784	350	525	285	730X705	600X600		
250/315F	350	250	720	813	350	600	250	650x650	500X500	30	M27x300
250/400N		250	720	813	350	600	250	650x650	500X500		
250/400M		250	720	813	350	600	250	650x650	500X500		
250/400F		250	720	813	350	600	250	650x650	500X500		
250/400F	400	250	720	813	350	600	250	650x650	500X500	30	M27x300
EFF 250/410		250	720	813	350	600	250	650x650	500X500		
EFF 250/420		250	720	813	350	600	250	650x650	500X500		
250/600		250	720	813	350	600	250	650x650	500X500		
250/600B	500	250	720	813	350	600	250	650x650	500X500	30	M27x300
250/700		250	720	813	350	600	250	650x650	500X500		
EFF 300/400		250	720	813	350	600	250	650x650	500X500		
300/500		250	720	813	350	600	250	650x650	500X500		
EFF 350/420	500	250	720	813	350	600	250	650x650	500X500	30	M27x300
EFF 350/520		250	720	813	350	600	250	650x650	500X500		
EFF 350/630		250	720	813	350	600	250	650x650	500X500		
400/400		250	720	813	350	600	250	650x650	500X500		
400/402	600	250	720	813	350	600	250	650x650	500X500	30	M27x300
EFF 400/500		250	720	813	350	600	250	650x650	500X500		
400/600		250	720	813	350	600	250	650x650	500X500		
400/700		250	720	813	350	600	250	650x650	500X500		
EFF 400/800	600	250	720	813	350	600	250	650x650	500X500	30	M27x300
500/600		250	720	813	350	600	250	650x650	500X500		
500/630B		250	720	813	350	600	250	650x650	500X500		
600/600		250	720	813	350	600	250	650x650	500X500		

1) Dimensions "mm". Turbosan reserves right to make any changes in dimensions without giving prior notice.
2) For flange dimensions refer to flange standards.

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



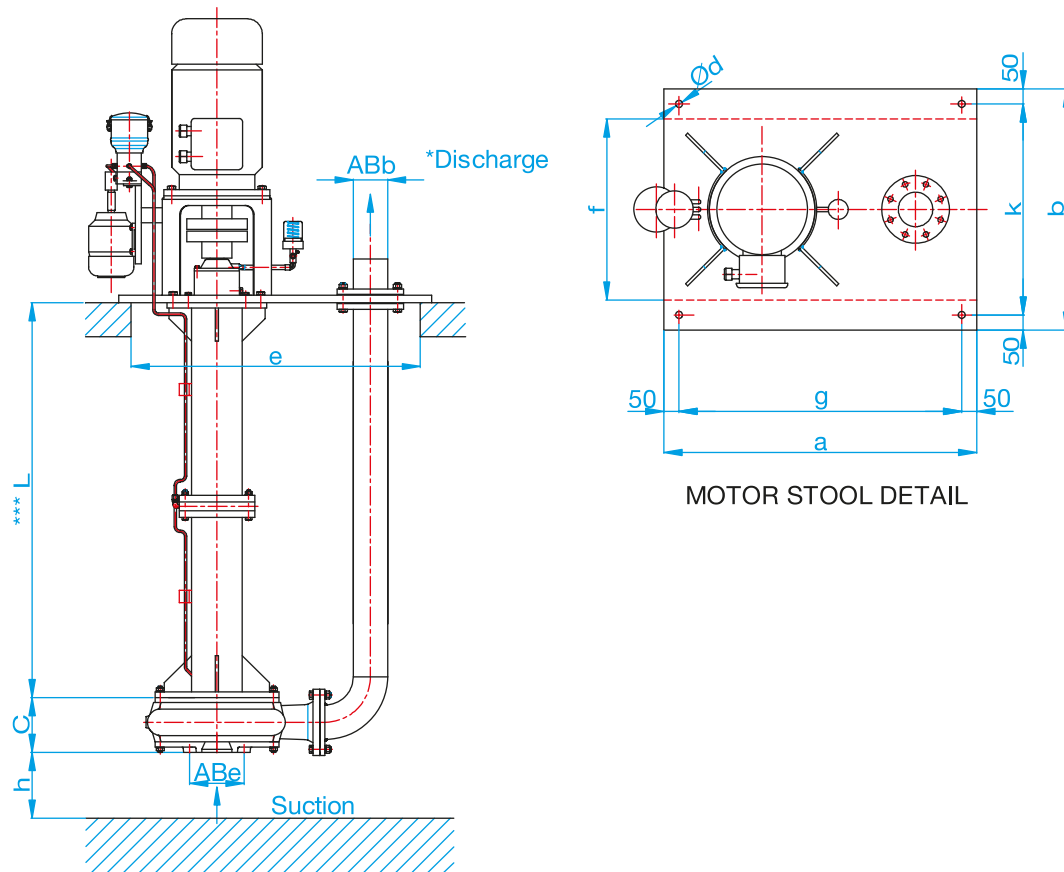
PUMP TYPE	Discharge ABb-PN10	Suction ABe-PN10	a	b	g	Ød	e	f	p	h	C	k	m	n	AXA	ZxZ	Øs	Anchor Bolt
50/200V	50	65	400	450	350	20	400	300	125	240	95	290	145	200	250x250	200x200	20	M18X200
80/160	80	80	700	700	600	23	450	500	150	340	135	405	190	280	350x350	250x250	23	M20x200
80/250							600				118	400		267				
80/270							500				128	410		340				
80/315							750				152	410		340				
100/250	100	100	700	700	600	28	600	500	195	375	170	465	200	300	400x400	300x300	28	M24x250
100/270							500				132	447		235				
100/315							600				195	475		340				
100/400							600				230	480		367				
125/250N-F	125	125	800	800	700	28	650	550	185	400	210	540	215	315	450x450	350x350	28	M24x250
125/315N-F											215	485		370				
125/400M											240	510		370				
150/315M	150	150	900	900	800	28	750	640	210	460	260	580	275	300	500x500		30	M27x300
150/400M											276	472		400				
200/315N	200	200									282	682		340	600x600	450x450		
200/315F											302	700		370				
200/400M											366	690		535				
250/400N	250	250	1000	1000	900		850	760			335	690		480	650x650	500x500		
250/400M											250	600		350				
250/400F											300	285		665				

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	80	80	135	200				500	400	350	23	M20x200
80/250			118		700	600	500					
80/270			128		750	650	700	600	500			
80/315			152		900	900	800	750	650	550		
100/250	100	100	170	250	800	800	700	700	600	500	28	M24x250
100/270			132									
100/315			195									
100/400			230									
125/250N-F	125	125	210	300	800	800	700	700	600	500		
125/315N-F			215									
125/400M			240									
150/315M	150	150	260	400	1250	1250	1150	800	700	600		
150/400M			276						700	600		
200/315N			282						750	650		
200/315F	200	200	315	450	1250	1250	1150	1000	900	800		
200/400M			366									
250/400N			335									
250/400M	250	250	304	500	1400	1500	1400	1000	900	800		
250/400F		300	332									

- 1) Dimensions (mm) subject to change without prior notice!
2) For flange dimensions refer to flange standards.
L = Total column pipe length

DAC-E/K

SERIES SUBMERSIBLE PUMPS WITH TUBE

APPLICATIONS:

DAC - E / K series pumps are axial and mixed flow submersible pumps with tube operating submerged. They are for high capacity and low head values.

- De-watering
- High capacity agricultural irrigation systems
- Cooling water pumping
- Circulation water pumping for fish farming

MATERIALS:

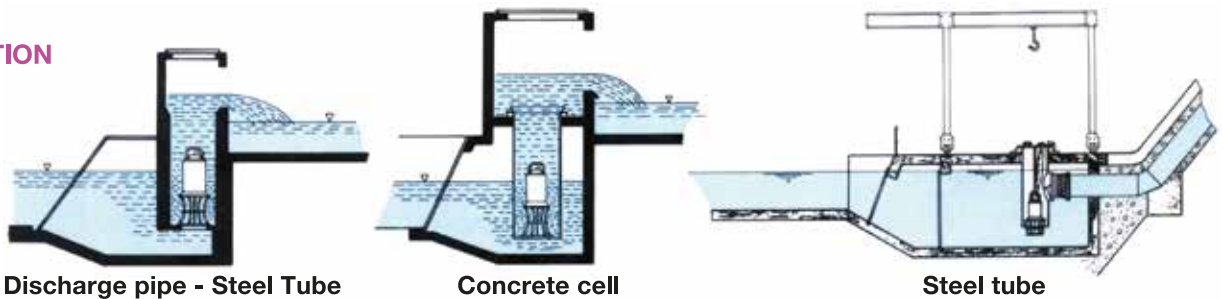
- Casing, Diffuser : Cast iron (EN-JL 1040)
- Impeller : Stainless steel
- Shaft : Stainless steel
- Shaft sealing : Mechanical seal
- Tube : (1.0120) sheet metal construction
- Cable : H07RN -F Rubber coated
- Paint : Epoxy coal tar
- Motor : 380 V 50 Hz F insulation IP 68 Thermistor protected.
- Impeller type : Axial or mixed flow open type impeller.
- Max. fluid temperature : 40 °C



PERFORMANCE DATA

Capacity (L/s)	140 - 4000
Discharge Head (mwc)	2 - 20
Tube Diameter (mm)	700 - 1500
Motor Power (KW)	22 - 315

INSTALLATION



IMPELLER

DAC-E
Open axial type



DAC-K
Mixed flow type

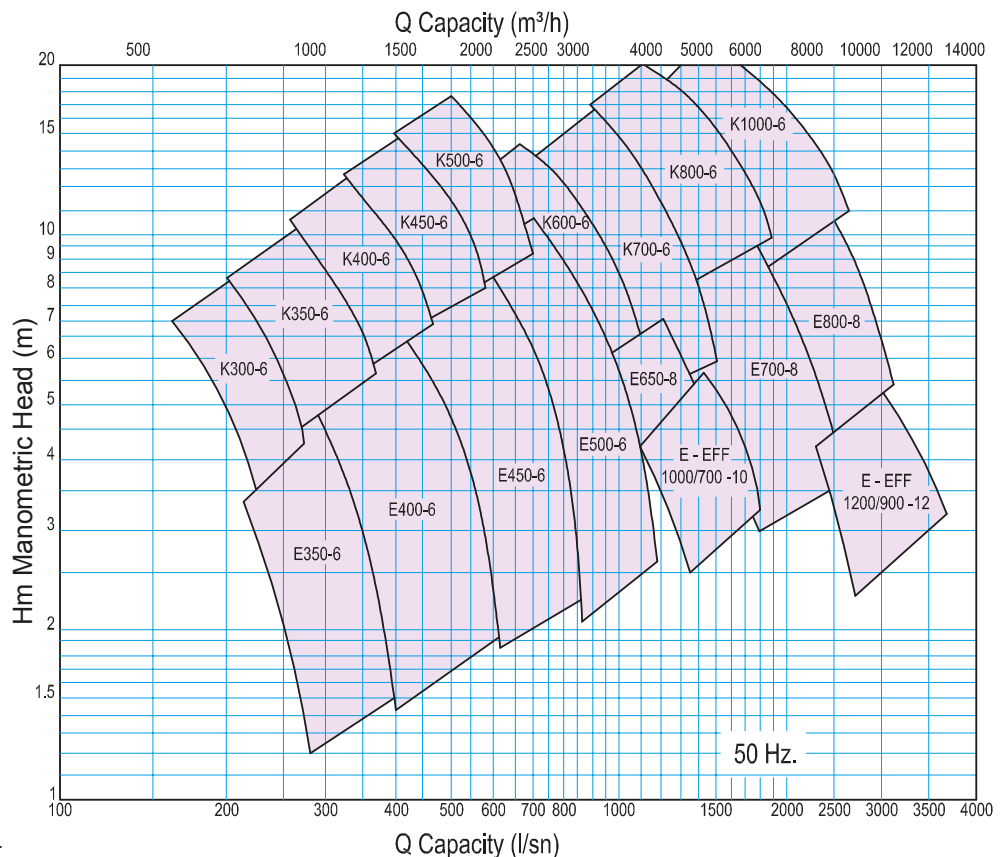


DAC - E/K 400 - 6

Number of pole

Discharge diameter

Impeller type



NOTE:
Pump performance curves are for information only, consult TÜRBOSAN for detailed information.
Not to be used to select pump.

EKS SERIES AXIAL and MIXED FLOW PUMPS

TECHNICAL SPECIFICATIONS:

EKS - E/K series pumps are axial and mixed flow pumps with high capacities and low discharge heads, they are vertical suspended and in column pipe construction

APPLICATIONS:

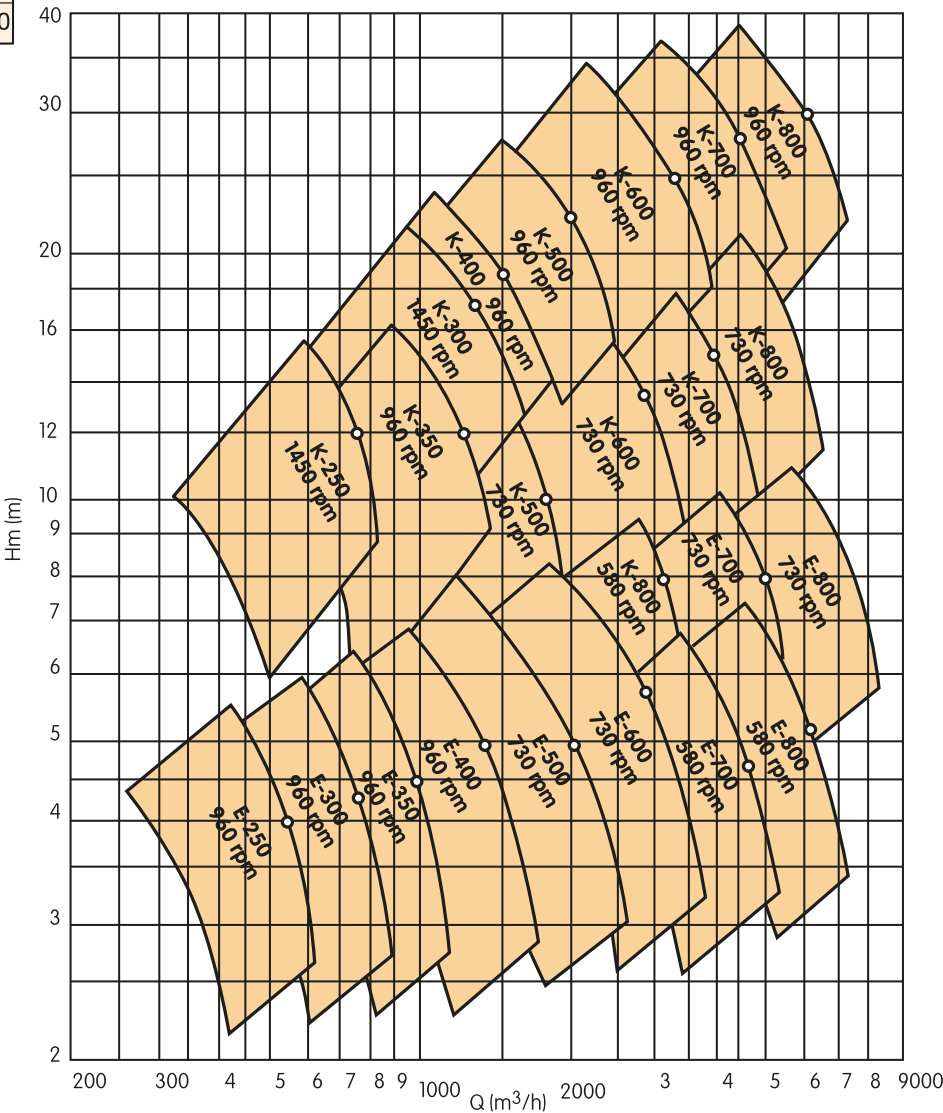
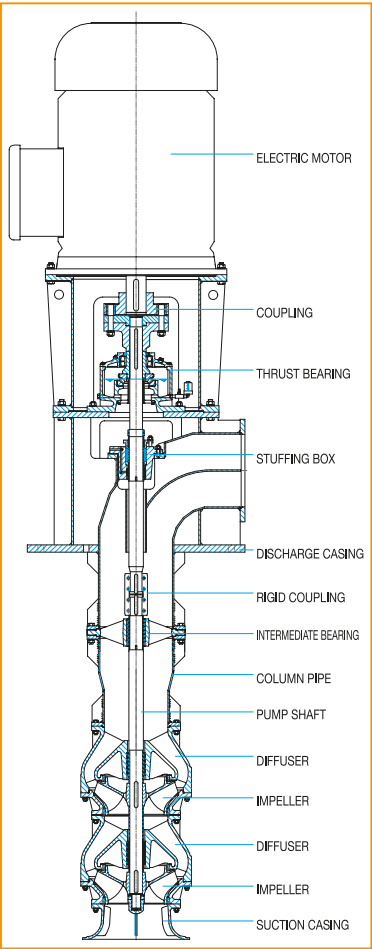
Potable water supply
Large scale irrigation systems with high flow rates and cooling water pumping in industrial plants.
De-watering

MATERIALS:

- Casing, Diffuser : Cast iron (EN-JL 1040)
- Impeller : Stainless steel
- Shaft : Carbon steel (1.0501)
- Column pipe : (1.0120) sheet metal construction
- Intermediate bearings : Grease lubricated bronze or clean water lubricated rubber sleeve bearing



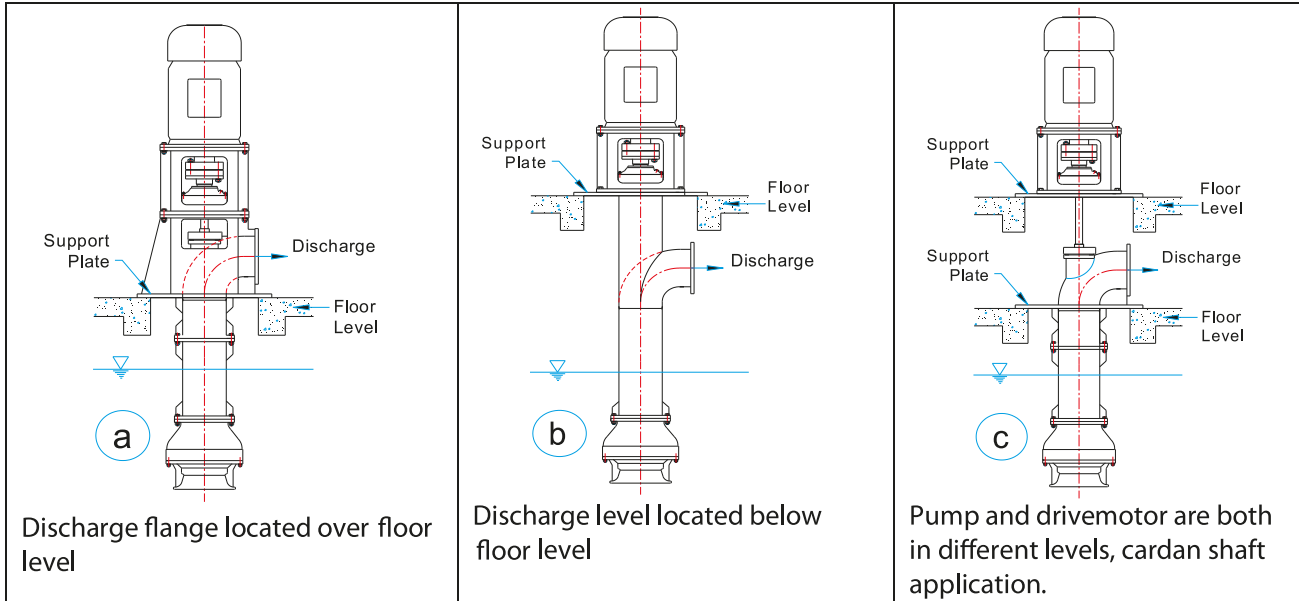
Capacity (L/s)	140 - 6000
Discharge Head (m)	1 - 100
Column Pipe Diameter (mm)	250 - 1500



NOTE:
Pump performance curves are for information only, consult TÜRBOSAN for detailed information.
Not to be used to select pump.

EKS SERIES AXIAL AND MIXED FLOW PUMPS

MOUNTING FORMS OF EKS SERIES AXIAL AND MIXED FLOW PUMPS:



CONSTRUCTION DETAILS:

- Most common installation form is vertical installation impeller and diffuser continuously operates under water. In order to obtain cavitation free operation pump should not be operated at minimum water level.
- EKS E/K type pumps consists of four component groups
 - 1- Hydraulic group : Impeller, Diffuser, Suction bell
 - 2- Column group : Shaft, Column pipes, intermediate bearings
 - 3- Discharge piece : Bend and stuffing box
 - 4- Thrust bearing group : Bearings and coupling
- Shaft group transmits motor power to shaft, column pipes carries water to discharge level
- Pumps with vertical shafts have ball bearing type upper thrust bearings with oil lubrication. Bearings are heavy duty type.
- Intermediate bearings of EKS pumps are rubber sleeve type if clean water is pumped. If pumped water contents considerable amount of sand grease lubricated bearings used. Grease pumped into the bearings by a grease pump. Grease will push sand away from bearings. In case grease lubrication is not desired, other lubrication methods available upon request.
- Column pipe length depends on application.
- Shaft sealing is done by means of soft packing.
- Pump shafts are in two parts, coupled together by means of rigid coupling. They operated in both rotation directions.
- Pump materials are selected according to pumped medium.
- EKS-K type pumps designed to provide high flow rate at high heads, to obtain high discharge heads multiple impellers are used.
- EKS – E type pumps are designed to provide higher flow rates at lower discharge heads.
- EKS series pumps are used instead of horizontal pumps in case of negative suction head exists.
- Installation is relatively easy.
- Convenient for use in lakes and rivers where water level is variable.
- Direction of rotation of the pumps is clockwise seen from drive end.

NORM-HP SERIES HOT WATER PUMPS

TECHNICAL SPECIFICATIONS:

Norm-HP series pumps cover/are high efficiency low and medium pressure end suction horizontal single stage, closed type impeller,easy to maintain centrifugal pumps with volute casing.

Pump impellers statically and dnamicly balanced accordng to ISO 1940 (TS 2567) Class 6,3.

Discharge of the NORM-HP series pumps are located on the top as Standard. Suction and discharge flanges are manufactured according to TS EN 1092-2 or ANSI standard. Pumps have oil lubricated heavy duty ball bearings.

All pumps are tested according to TS EN ISO 9906 / 2B.

Suitable mechanical seals are used accoring to specification of the medium. API plans which is selected suitable process are applied and mechanical seal are cooled with water or special medium externally.

Stuffing box are cooled externally (with cooling jacket) according to medium temperature.

FIELDS OF APPLICATION

Hot water facilities,
Heating Systems,
Power plants,
Pumping of the thermal oils,
Thermal energy conversion systems,
Pumping of low viscous mediums (fuel, oil e.t.c) in various industries.



GENERAL INFORMATION:

Suction Flange Diameter : Ø65 - Ø350
Discharge Flange Diameter : Ø40 - Ø300
Capacity Range (Q) : 20 -1900 m³/h
Manometric head range (Hm): 10 100 mws
Operating Temperature : * 230 °C max.
Casing Pressure (Pmax) : *25 bar (40 bar)

$P_{max} = \text{Suction Pressure} + \text{Shut off pressure}$

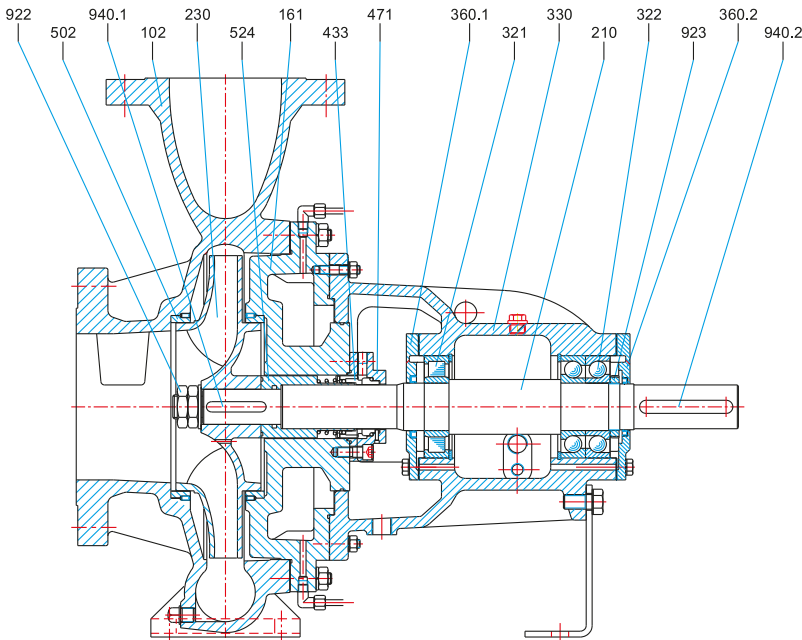
Pump Materials:

Suitable material of the pump parts are seleceted according to specification of medium, operating temperature and operating pressure.

Pump Feet:

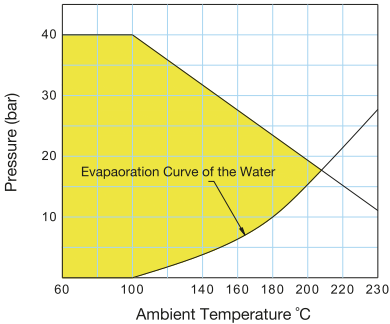
Feets of the pump are located under the volute or centralized on the volute according to pressure and medium temperature.

NORM HP SECTIONAL DRAWING AND PUMP PARTS LIST



102- Volute	230- Impeller	360.1 Bearing housing cover (Front Side)	524- Shaft Sleeve
161- Stuffing box	321- Ball bearing (NU &)	360.2 Bearing housing cover (Coupling Side)	922- Impeller Nut
183 Support foot	322- Ball bearing (73..)	433-Mechanical seal	923- KM nut
210- Shaft	330- Bearing Housing	471- Mechaniel seal cover	940.1- Impeller key
		502- Wear ring	940.2-Coupling key

Pressure and Temperature Limits:



PROCESS SERIES PUMPS

TECHICAL SPECIFICATIONS;

- Process series pumps are centrifugal end suction pumps with open type impeller and they are for medium and low discharge heads
- Process series pumps have adjustable wear plates which are machined to suit geometry of open type impeller. The clearance between impeller and wear plate can be adjusted without dismantling the volute casing.
- Pump shafts supported by 6300 series Z type grease lubricated bearings with single cover.
- According to the type of the pumped fluid and operating conditions heavy duty oil lubricated bearings arrangement is available as option.
- Direction of rotation of the pumps is clockwise seen from drive end.
- Process series pumps manufactured with mechanical seals upon request of client which are chosen according to the properties of the pumped fluid. Standard pumps are manufactured with soft packing seal lubricated according to API plan 1
- Pump impellers statically and dynamically balanced according to ISO 1940 class 6.3
- Axial trust balanced by balancing vanes on the back of impeller and balancing holes
- They coupled with standard electric motors and Ex-proof motors.

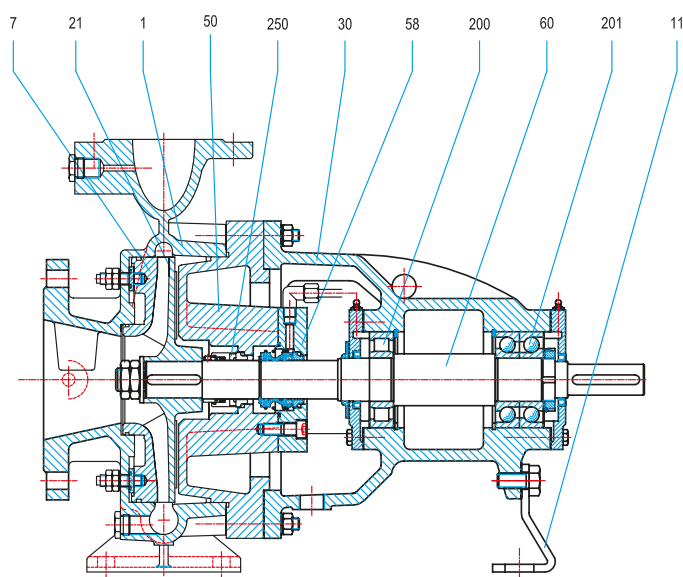
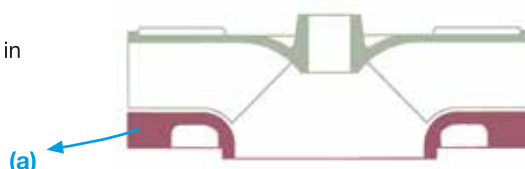


APPLICATIONS:

- Industrial water systems
- Chemical plants
- Refineries
- Food process
- Petrochemical process
- Paper pulp industry.
- Pumping fluids with low viscosity.
- Industrial process water containing solids with limited dimensions.

IMPELLER TYPE:

- Open and closed type impellers used in process series pumps.
- Open impeller types have wear plates suitable to the impeller profile.



PERFORMANCE DATA

Capacity (l/s)	8 ÷ 600
Discharge Head (mwc)	5 ÷ 90
Discharge Diameter (mm)	Ø40 ÷ Ø150
Operating Temperature	-20 °C + 140 °C

PROCESS PUMPS PART LIST

01	Volute
07	Wear Plate
11	Support Foot
21	Impeller
30	Bearing Housing
50	Stuffing Box
58	Mechanical Seal Cover
60	Shaft
200	Bearing
201	Bearing
250	Mechanical Seal

MATERIALS

PART	MATERIALS	
	CAST IRON VERSION	STAINLESS STEEL VERSION
Volute casing	Cast iron (GJL 250) (EN-JL 1040)	AISI 316 (1.4401)
Impeller	Cast iron (GJL 250) (EN-JL 1040)	AISI 316 (1.4401)
Wear plate	Cast iron (GJL 250) (EN-JL 1040)	AISI 316 (1.4401)
Bearing housing	Cast iron (GJL 250) (EN-JL 1040)	Cast iron (GJL 250) (EN-JL 1040)
Shaft	Carbon steel (1.0501)	AISI 316 (1.4401)
Shaft sleeve	Stainless steel (AISI 420) (1.4021)	AISI 316 (1.4401)
Painting	RAL 5010	RAL 5010
Shaft sealing	soft packing	Mechanical / Cartex

NOTE: Different materials for all pump components are available upon request.

API-610 PROCESS PUMPS

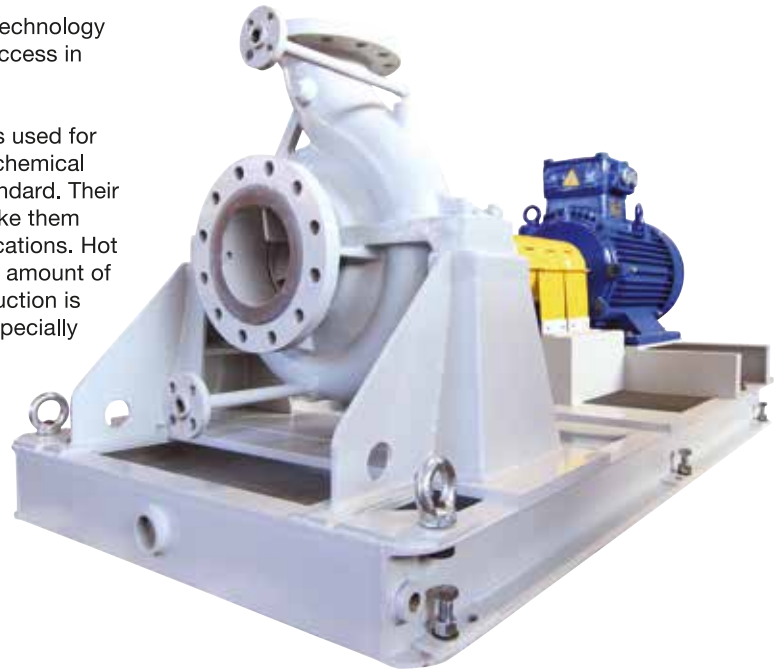
A broad range of products and sophisticated materials technology combined with application know-how are the keys to success in industrial plants .

Türbosan API-Process pumps are special type of pumps used for pumping fluids in complicated processes such as petrochemical processes. They manufactured according to API-610 standard. Their long endurance life, reliable and robust construction make them suitable to meet requirements of most demanding applications. Hot or cold fluids, fluids without particles or fluids with small amount of particles pumped with these pumps. Mechanical construction is different than that of conventional pumps and they are specially designed

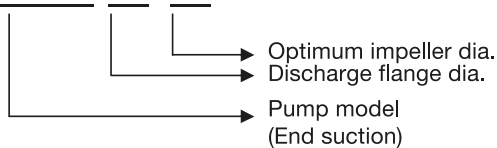
Applications :

- Petrochemical plants
- Chemical industry
- Paper industry
- Power plants
- Oil refineries
- Iron and steel industry

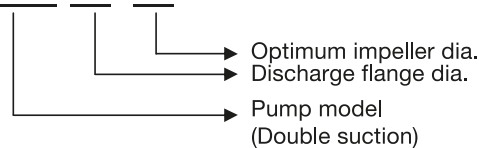
Pump designation :



API-NORM 150 / 400



API-CEP 300 / 400



DEFINITIONS PUMP	API-NORM PUMPS	API-CEP PUMPS
Discharge flange diameter (mm)	Ø50 ÷ Ø200	Ø125 ÷ Ø500
Capacity (Q) (m ³ /h)	Max. 750	Max. 3600
Discharge head (m)	Max. 150	Max. 160
Operating temperature (°C)	-30 ÷ +300	-30 ÷ +300
Speed (rpm)	Max. 3000	Max. 1500

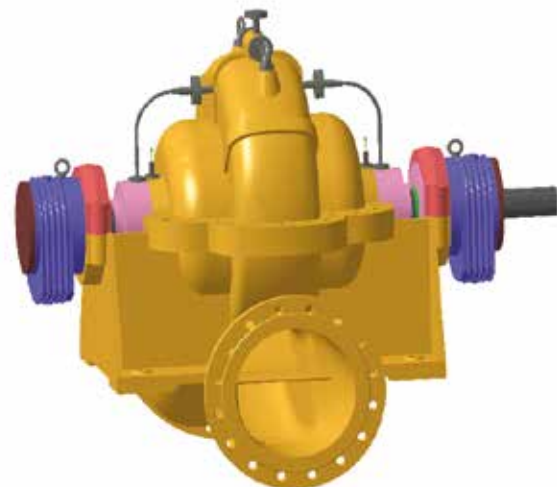
DESIGN SPECIFICATIONS OF API PUMPS :

CASINGS :

- Long life, wear resistant
- Complies with API 610 standart.
- For low capacity values end suction type, for higher capacities double suction type.
- Pump flanges according to ANSI or DIN norms.

IMPELLERS :

- High efficiency, closed type.
- Wide operating range.
- Statically and dynamically balanced according to ISO 1940 class 2.5 .



API-610 PROCESS PUMPS

MECHANICAL SEALS :

- According to API 682 (ISO 21049) single or double cartridge type or special double cartridge type mechanical seals are used.
- Various API / ISO shaft seal cooling systems applicable.

WEAR RINGS:

- Casing and impeller can be fitted with wear rings. Impeller wear ring is optionally available upon request.
- Wear rings are replaceable.
- Made of durable, surface hardened material.

SHAFTS :

- Heavy duty type shafts are used.
- Large shaft diameters for achieving low deflection.
- Available in different material grades.

BEARINGS:

- Heavy duty type two off 7300 series bearings with 40° angle of contact.
- Norm series pumps have 1 off NU 300 series bearing on impeller side, Cep series pumps have 1 off 6300 C3 series heavy duty type bearing on non drive end.
- Bearing housings are heavy duty type, stable and designed according to API 610.
- Bearings are oil lubricated. For high temperature applications additional cooling systems applied.
- Bearing frame material of split case pumps is same as pump casing material.



BASE PLATES :

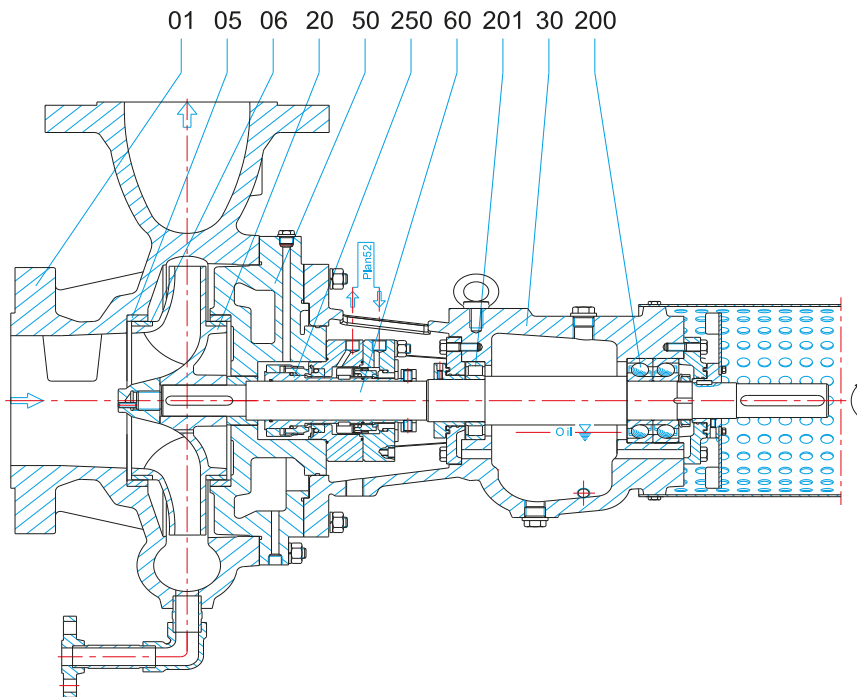
- Base plates are heavy duty type and have leakage collection reservoirs and lifting rings according to API specifications. They are of sheet metal construction.

COMPONENT	API MATERIAL CLASSIFICATIONS				
	S1	S-8	C6	A-8	D1
Volute casing	EN-10213 A216GrWCB (1.0619)	EN-10213 (A216 WCB) (1.0619)	A743GrCA15 (1.4008)	A351GrF8M (1.4408)	Duplex 1.4517 EN 10213-4
Impeller	Cast iron EN-632-250 GG 25	AISI 316 (1.4401)	A743GrCA15 (1.4008)	A351GrF8M (1.4408)	Duplex 1.4517 EN 10213-4
Casing wear ring	Cast iron EN-632-250 GG 25	AISI 316 (1.4401)	AISI 420 (1.4021)	AISI 316 (1.4401)	Duplex 1.4517 EN 10213-4
Stuffing box	EN-10213 A216GrWCB (1.0619)	EN-10213 (A216 WCB) (1.0619)	A743GrCA15 (1.4008)	A351GrF8M (1.4408)	Duplex 1.4517 EN 10213-4
Shaft	AISI 420 (1.4021)	AISI 316 (1.4401)	AISI 420 (1.4021)	AISI 316 (1.4401)	AISI 316 (1.4401)
Bearing housing	Cast iron EN-632-250 GG 25	Ductile cast iron EN-GJL-400- 15 GGG-40	Ductile Cast iron EN-GJL-400-15 GGG-40	Ductile Cast iron EN-GJL-400-15 GGG-40	Ductile Cast iron EN-GJL-400-15 GGG-40
Casing studs	AISI 4140 (42CrMo4) 1.7225	AISI 4140 (42CrMo4) 1.7225	AISI 4140 (42CrMo4) 1.7225	AISI 4140 (42CrMo4) 1.7225	AISI 316 (1.4401)
Mechanical seals	API 682				

Other materials defined in API 610 available on request.

API-610 PROCESS PUMPS

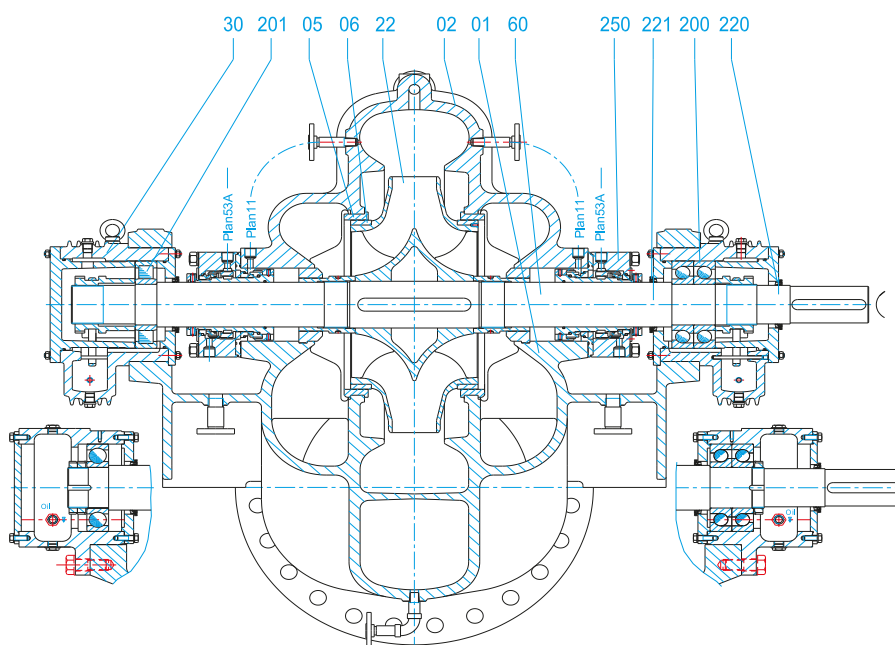
API NORM PUMPS:



API NORM PUMPS PARTS LIST

01	Volute
05	Wear ring (Casing)
06	Wear ring (Impeller)
20	Impeller
30	Bearing housing
50	Stuffing box
60	Pump shaft
200	Bearing 7300 series
201	Bearing NU300 series
250	Mechanical seal (API-682)

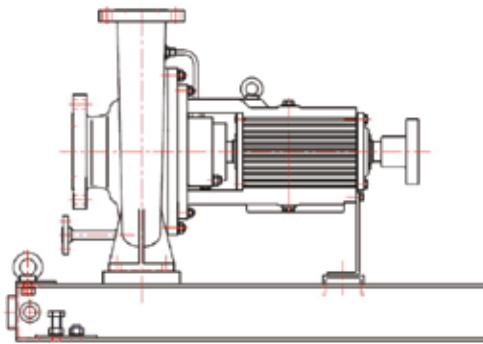
API CEP PUMPS:



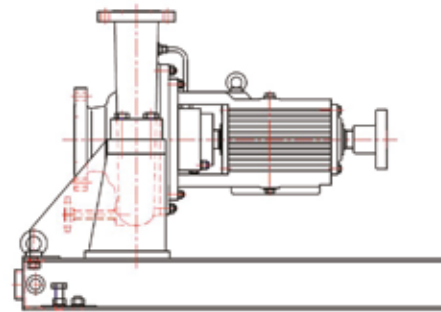
API CEP PUMPS PARTS LIST

01	Casing
02	Casing cover
05	Wear ring (Casing)
06	Wear ring (Impeller)
22	Impeller
30	Bearing housing
60	Pump shaft
200	Bearing 7300 series
201	Bearing NU300 series
220-21	Labtecta ring
250	Mechanical seal (API-682)

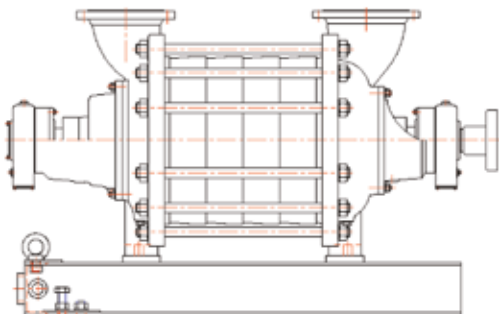
API-610 PROCESS PUMP DESIGNATIONS



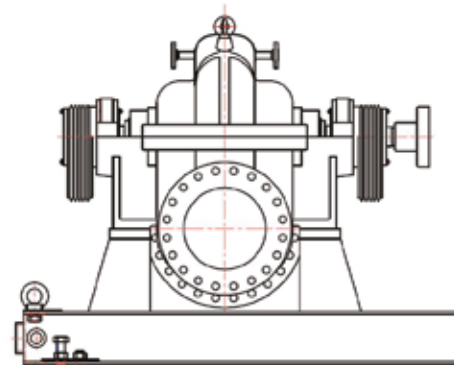
Pump type OH1



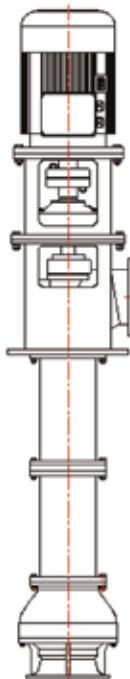
Pump type OH2



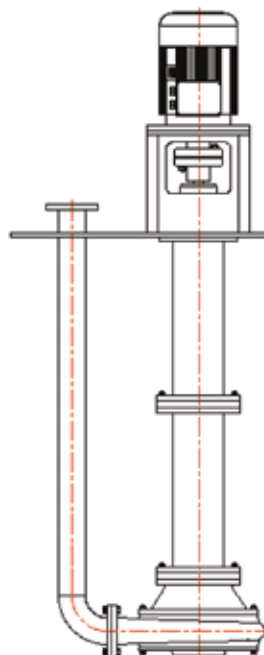
Pump type BB4



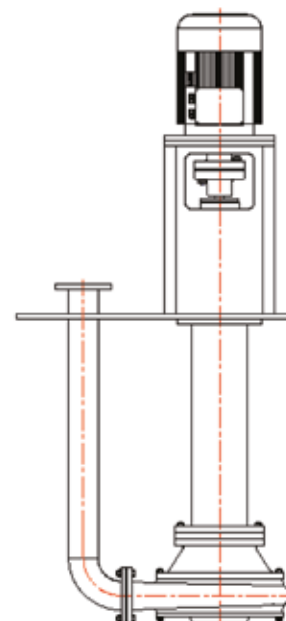
Pump type BB1



Pump type VS3



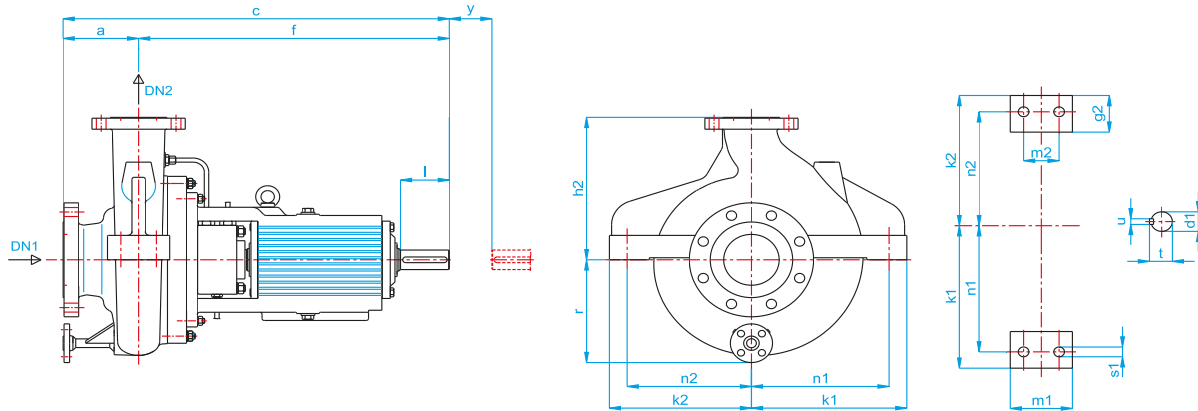
Pump type VS4



Pump type VS5

API-610 PROCESS PUMPS

API NORM SERIES DIMENSIONS TABLE



PUMP SIZE	Weight(kg)	BEARING BRACKET	DN1	DN2	a	f	c	h2	r	d1	l	t	u	y	k1	k2	n1	n2	m1	m2	g2	s1					
API- NORM-SN 40-250	190	B09	65	40	130	610	740	225	220	32	80	35	10	100	245	230	220	195	130	70	50	17.5					
API- NORM-HD 40/315	235							250	210					140	265	255	240	215									
API- NORM 50-250	280		80	50	140	750	850	225	220					100	230	225	205	180	150	80							
API- NORM-HD 50-250	285							280	220					140	245	230	22	195									
API- NORM-HD 50-315	295	B12	100	65	150	700	850	280	240	48	110	49	12	140	285	270	260	245	170	90	65	22					
API- NORM-HD 65-250	305							250	240					100	270	250	245	225									
API- NORM-HD 65-315	310		125	80	170	870	995	280	240					140	295	265	270	240	190	100	80						
API- NORM-HD 80-250	320							280	255					140	275	255	250	230									
API- NORM-HD 80-315	330	B15	100	175	820	995	1160	315	265	60	140	64	18	170	350	320	310	280	180	110	80	26					
API- NORM-EFF 100-250	340							280	255					140	290	260	265	235					190				
API- NORM 100-315	355		125	80	170	870	995	1160	315					255	140	315	300	285	270	360	340	330	310	180	110	80	26
API- NORM 100-400	370								290					290	320	285	295	260	270								
API- NORM 125-250	365	B12	150	125	190	700	890	355	275	48	110	49	12	170	320	285	295	260	190	100	80	26					
API- NORM-SN 125-250	375														340	295	315	270					270				
API- NORM 125-315	390		200	150	200	820	1020	400	280					315	60	140	64	18	345	315	315	285	180	110	80	26	
API- NORM-HD 125-315	395								355					325					325	295	395	370					360
API- NORM 125-400	405	B15	250	200	230	930	1160	400	320	70	140	67.5	20	180	410	360	380	330	200	110	80	26					
API- NORM 150-315	420							320	315					410	360	380	330	330									
API- NORM-EFF 150-315	425		300	250	250	930	1180	415	380					425	445	435	400	395	220	120	90						
API- NORM 150-400	495							450	335					480	440	445	415	450				405	405	360	405	415	
API- NORM-HD 150-400	510	B17	250	200	250	930	1180	450	335	95	170	100	25	280	480	445	445	415	250	130	36						
API- NORM 150-500	595							500	390						500	380	500	420				475	420	430	375	375	
API- NORM-EFF 150-500	595		300	250	250	930	1180	505	380						500	450	455	405	415	250	130	36					
API- NORM 200-400	750							500	420						475	420	430	375	375								
API- NORM 200-500	790	B24	350	300	300	1100	1400	500	420	95	170	100	25	280	500	440	455	395	310	200	100						
API- NORM-EFF 200-500	795							545	430						500	440	455	395				395					
API- NORM 250-400	730		350	300	300	1100	1400	545	430						515	470	470	425	425								
API- NORM-EFF 250-400	735							500	450						540	475	495	430	430								
API- NORM 250-450	890	B24	350	300	300	1100	1400	600	500	95	170	100	25	280	610	540	565	495	310	200	100						
API- NORM 250-500	910							500	430						540	460	495	415				415					
API- NORM-EFF 250-500	905		350	300	300	1100	1400	600	470						575	505	530	460				460					
API- NORM 300-400	890							575	505						530	460	460										
API- NORM-EFF 300-400	885	B24	350	300	300	1100	1400	600	470						575	505	530	460				460					
API- NORM 300-500	920							575	505						530	460	460										
API- NORM-EFF 300-500	925	B24	350	300	300	1100	1400	600	470	575	505	530	460	460													
API- NORM 300-500	920							575	505	530	460	460															

NOTE:

The weights are approximate. It is for general information. Weight varies according to application and material.

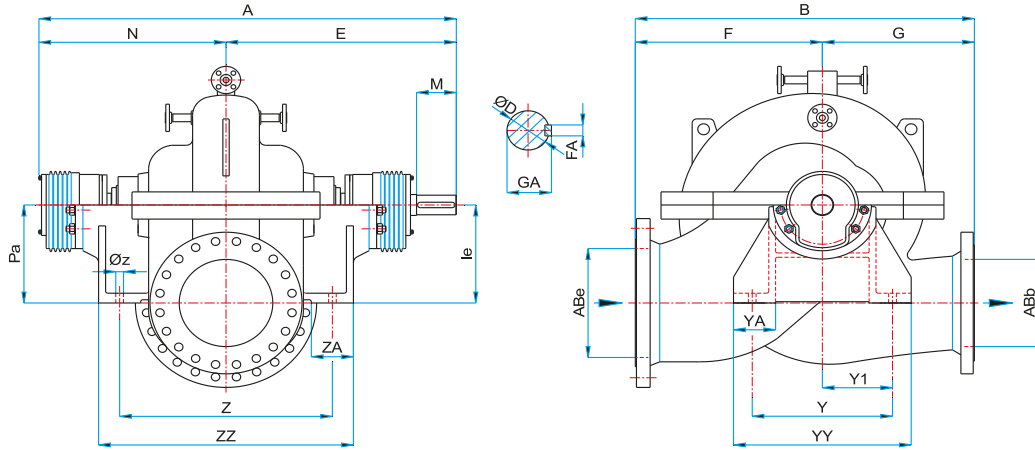
Flanges conforming to ANSI B 16.5

Türbosan reserves the right to make any changes in dimensions without giving prior notice.



API-610 PROCESS PUMPS

API CEP SERIES DIMENSIONS TABLE



PUMP TYPE	ABb	ABe	A	B	N	E	F	G	Ie	Pa	M	D	GA	FA	Y	Y1	YY	YA	Z	ZZ	ZA	Øz	Weight (kg)							
ÇEP-EFF 125/300	125	200	1245	680	565	680	370	310	200	200	110	42	45	12	410	205	475	100	570	730	140	23	405							
ÇEP 125/315			1165	740	525	640		370							95	480		620	105	420										
ÇEP-EFF 125/380			1245	850	565	680	450	400	235	235					400	200	480	100	620	730	105		570							
ÇEP-EFF 125/500			1165		525	640		295	250								500	120	530	650	130		645							
ÇEP 125/590			1305	950	580	725	525	425	330	330					140	62	66	18	410	205	110			795	150		805			
ÇEP-EFF 150/300	150	200	1320	900	605	715	500	400	200	200	110	42	45	12	400	200	465	100	650	750	140	23	535							
ÇEP-EFF 150/360			1305	860	595	710	460																						600	
ÇEP 150/400			250	1275	850	580	695	455	395	230					230	48				51.5	14		360	180		590	750	135	650	
ÇEP-EFF 150/410			200	1305	900	595	710	450	450	260					260								400			640	780	130	665	
ÇEP-EFF 150/500				1385	1030	620	765		430	315					315								445	222.5	525	125	680	880	195	950
ÇEP-EFF 150/600		250		1355	1050	605	750	600	450	315	315	140	62	66	18	500	250	600	150	670	820	140	1000							
ÇEP 150/630				1365		615	760			350	245					420	210	500	115	710	865	170	1015							
ÇEP-EFF 150/650				1355		605	750			350	350					500	250	600	150	670	820		1055							
ÇEP-EFF 200/320				1345		900	615			730	450					240	240	110	42	45	12	400	200	465	100	690	830	140	690	
ÇEP-EFF 200/420				1345		930	600			745	500					430	255	255	140	62	66	18	420	210	500	110	670	820		795
ÇEP-EFF 200/530	200		1500	1100	680	820	600	500	310	310	150	70	74.5	20	510	255	610	120	800	970	190	1220								
ÇEP 200/690			1435	1250	645	790	700	550	400	250					600	700	890	160	1475											
ÇEP EFF 200/700			1565	1200	710	855	650	350	350	500					250	620	150	880	1060	190	1475									
ÇEP 250/315			1320	850	585	835	450	400	225	225								420	210	500	110	620	750	130	1000					
ÇEP-EFF 250/320			1465	1100	660	805	600	500	260	260					500	250	600	150	800	970	190	1025								
ÇEP-EFF 250/360	1465		660		805	600	275	275				140	800	950	150	745														
ÇEP 250/400	1320	1000	585		735	550	450	225	225	420	210	500	110	620	770	140	810													
ÇEP-EFF 250/490	1465	1150	660		805	600	550	300	300	500	250	600	150	780	930	160	850													
ÇEP 250/500	1320	1050	585		735	550	500	240	240	420	210	500	110	620	775	140	920													
ÇEP-EFF 250/620	250	300	1595	1200	725	870	650	550	370	370	140	62	66	18																
ÇEP 250/630			400	1755	1205	785	970	695	510	390					390	210	95	100.4	25	590	295	715	175	876	1075	235	1725			
ÇEP-EFF 250/800			300	1880	1500	850	1030	800	700	425					425	170	90	95				980	1195	190		2105				
ÇEP 300/315			300	350	1425	1095	640	785	585	510					315	315	140	62	66	18	450	225	550	125	780	910	140	1130		
ÇEP 300/400					1425	1005	640	785	505	500					250	250					500	250		160	680	860	160	980		
ÇEP-EFF 300/450	400	1570			1200	715	855	650	550	310	310	70	74.5	20	490	245					610	180	880	1060	190	1380				
ÇEP 300/500	350	1495			1130	675	820	580		320	320				500	250						165	780	950	165	1225				
ÇEP-EFF 300/560		1935			1350	875	1060	700	650	350	350	640	320	760	180	1000					1250	220	2130							
ÇEP-EFF 300/720	350	400	1950	1400	885	1065	750		400	400	170	90	95	25	590	295	715	175	1070	1270	190	2530								
ÇEP-EFF 350/360			400	1625	1250	740	885	700	550	325					325				500	250	600	150	900	1100	180	1475				
ÇEP 350/400				1505	1100	680	825	600	500	315					315	140	70	74.5	20				800	970		1545				
ÇEP-EFF 350/450			500	1805	1500	830	975	850	650	400					400				640	320	760	180	1060	1310	190	2530				
ÇEP 350/500			400	1505	1200	680	825	650	550	355					355				500	250	600	150	800	965		1490				
ÇEP-EFF 350/520	400	500	2095	1500	955	1140	850	650	400	400	170	90	95	25	640	320	760	180	1180	1420	235	28	1470							
ÇEP-EFF 350/580			2100	1550	960	1140		700																				1500		
ÇEP-EFF 350/720			2010	1600	915	1095	850	750	405	405					680	340	800	175	1290	1080	190		33	3035						
ÇEP 400/500			400	500	1645	1230	750	895	680	550					355	355	140	70	74.5	20					160	930	1110	180	28	2475
ÇEP-EFF 400/520					2130	1550	975	1155	850	700					400	400					640		320	760		1260	1450	190	2515	
ÇEP-EFF 400/600	2060	1550			940	1120	800	750	395	395									1100	1380	240		3520							
ÇEP 400/630	1785	1450			800	985	800	650	450	450	600	300	770		910	1085	180		910	1085	180		2185							
ÇEP-EFF 400/700	2090	1750			955	1135	1000	750	405	405	170	90	95	25	640	320	760		1150	1400	240	33	3395							
ÇEP 500/500	500	600	1910	1455	865	1045	800	655	450	450									1000	1200	180		2600							
ÇEP-EFF 500/600			2130	1900	975	1155	1100	800											1260	1450	190		4120							
ÇEP-EFF 500/700			2205	2100	1015	1090	1200	900	455	455								680	340	800	200	1350	1550	200		5520				

NOTE:

The weights are approximate. It is for general information. Weight varies according to application and material.

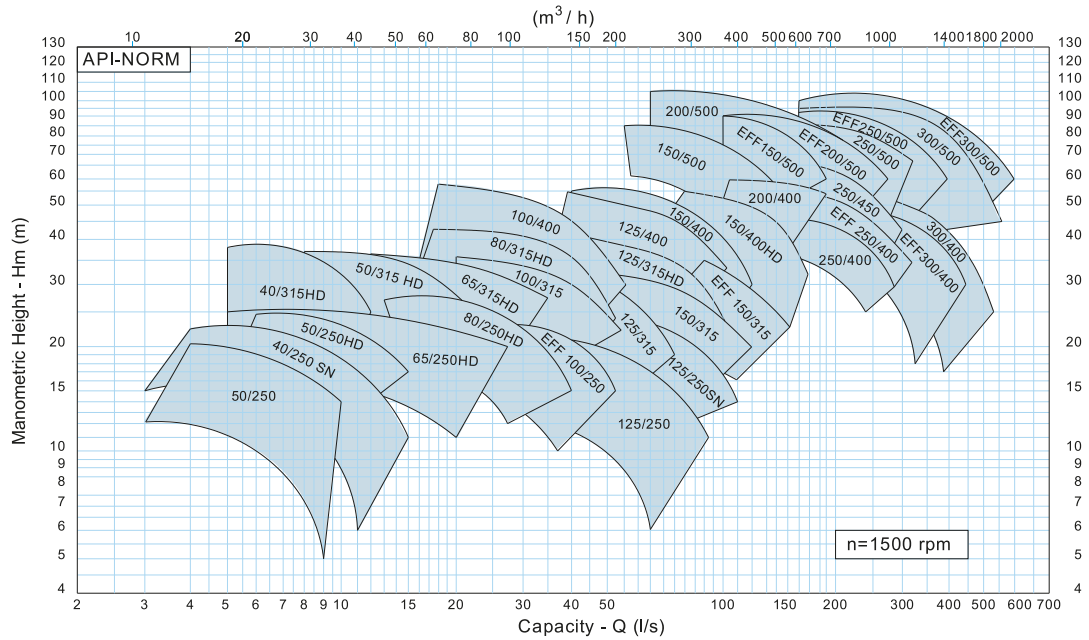
Flanges conforming to ANSI B 16.5

(*) Pumps in project phase

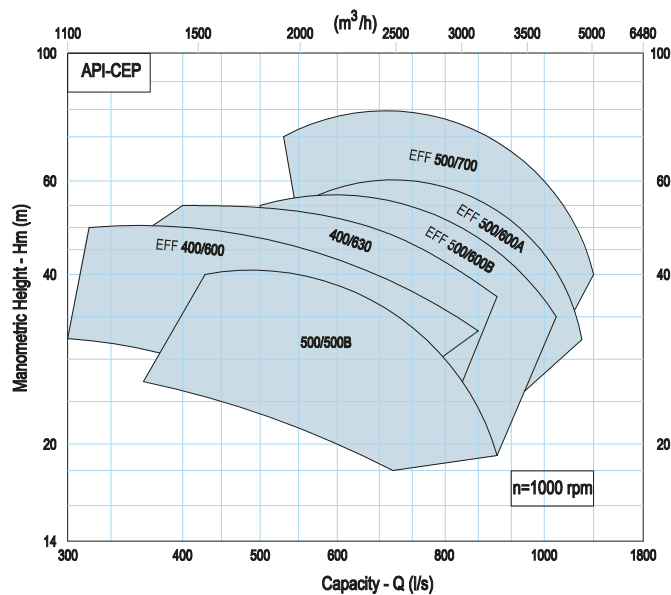
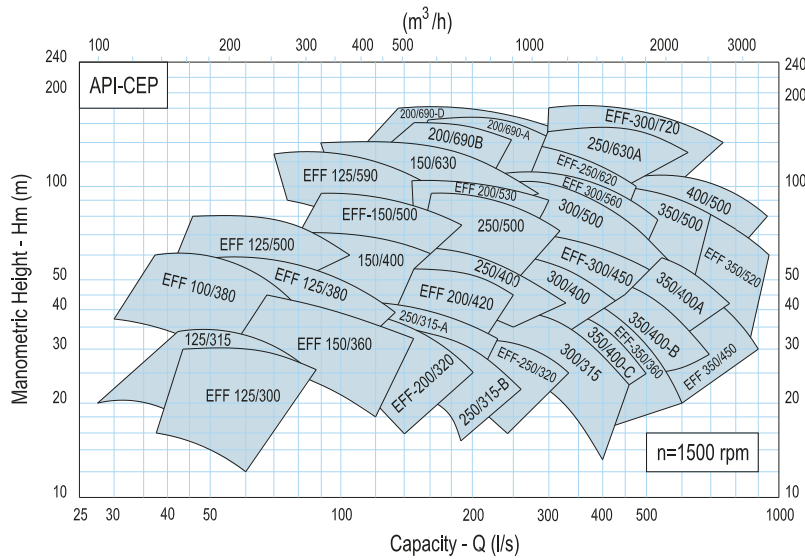
Türbosan reserves the right to make any changes in dimensions without giving prior notice.

API-610 PROCESS PUMPS

API - NORM SERIES PUMPS PERFORMANCE CURVES



API - DOUBLE SUCTION SPLIT CASE PUMPS PERFORMANCE CURVES



PARPO Series Submersible Pumps With Grinder Blade

APPLICATION:

- For removal of sewage from premises, small houses and buildings located at a distance and below the main sewer system.
- Removal of sewage from basements.
- Removal of sewage from hotels, motels, restaurants, holiday villages and seaside premises.
- For petrol stations, garages and motorway service stations.
- For drainage purposes.
- Removal of fibrous waste from purifying plants.
- For slaughter houses, paper plants, food processing plants, agricultural and similar fields.

FLUID TYPES:

- Unscreened sewage and other waste water types with high solids concentration. Feces, food remnants, tissue paper, plastic solids and other organic solids, hair and alike fibrous material, fabrics in these water types shredded into small dimensions to prevent clogging of pipes.
- Can not be used for water with hard solid contaminants like bone.
- Water with sand content (Maximum grain size 3-4 mm) can be pumped with Parpo series pumps. Abrasiveness of sand may reduce the lifetime of the pump, in order to reduce the abrasive affect sand filters must be used.
- Maximum allowed medium temperature is 40 l'C, maximum allowed medium density is 1,2 gr/cm3, maximum allowed medium viscosity is 1,5 x 10-6 m²/s.
- Parpo series pumps can not be used for pumping flammable and explosive fluids.
- Like all Turbosan submersible pumps Parpo series pumps must be connected to Turbosan STR-1 protection relay. If relay is not connected Turbosan warranty is not valid.

ADVANTAGES:

- Parpo** series submersible pumps grinds large solids in the water in to smaller pieces by cutters located in front of impeller preventing pipe clogging.
- Reduced pipe and fitting installation cost
 - Reduced flow rate and absorbed power results in lower operation costs.
 - Flow velocity within smaller diameter pipe is higher which eliminates solid settlement and consequent clogging.

TECHNICAL DETAILS:

Parpo series pumps like other submersible pumps consists of two main components : Motor and hydraulic group. They can operate fully or partially submerged.

SUBMERSIBLE ELECTRIC MOTOR :Turbosan DEM type submersible electric motor operates with 3 phase 380 V (+/- % 5) power supply. Parpo 40 N-140 M is suitable for single phase 220 V power supply. Insulation class of motors is F, protection class is IP 68. Cooling : External cooling by surrounding medium. Stator windings protected against over heating by 120 °C thermistors.

BEARINGS : Rotor is supported by means of two heavy duty ball bearings. Bearings are grease lubricated, no need for maintenance for 2 years of operation time.

SHAFT SEALING: Between motor and pumped fluid high quality mechanical seal is used, seals operate in oil chamber. Water leakage electrode in this oil chamber is for leakage warning.

MOTOR OVER HEAT PROTECTION SYSTEM : Stator windings protected against over heat by 120 l'C thermistors. Two thermistor contacts are connected to cable and and must be connected to the thermistor relay.



Shredder Blade

PUMP IMPELLER AND SHREDDER BLADE SYSTEM :

Shredder blade system which is made of high quality hardened steel is located in front of the pump impeller. Stationary blade has several sharp waved edges and catches which grab solids. Rotating blade is fixed just in the center of impeller, it rotates together with impeller and sharp edges shreds the solids grabbed by stationary blade. Any solid has to pass through cutter blades two times before reaching impeller. As a result solids reaches impeller after being shredded in to smaller pieces. Pump impeller is semi-open type, the clearance between impeller and suction piece can be adjusted.

WATER LEAKAGE WARNING SYSTEM:

An electrode system is used which generates a warning signal in case of water leakage caused by worn out mechanical seal or any other reason. In order to have this system operational it must be connected to the Turbosan STR-1 protection relay.

CABLE CONNECTION :

Parpo series pumps have 4x2,5 + 3x1,5 rubber coated, H07RN-F type cables with flexible cores. Cable entry to the terminal box protected by rubber sleeves.

PUMP MATERIALS:

PUMP COMPONENTS:	MATERIAL:
Motor Stool - Volute Casing	Cast Iron GG-25
Rotor	Stainless Steel AISI-420
Impeller (Vortex)	Cast Iron GG-25
Bolts - Nuts	Stainless Steel
Stationary and Rotating Blade	Hardened machined special steel
Mechanical Seal	SIC/SIC - Q1Q1PGG
Cable	H07RN-f
Coating	Coal tar epoxy paint over Epoxy primer

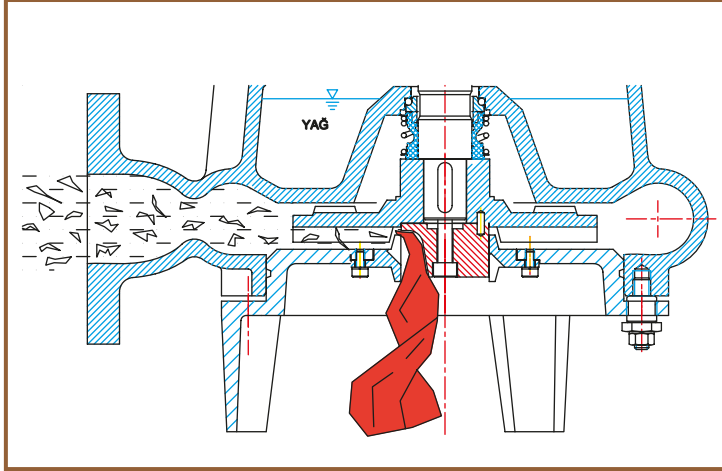
IMPORTANT NOTICE ABOUT PARPO SERIES PUMPS

- Submersible pump start-stop frequency should not be more than 12 times per hour.
- If submersible pump will be stored for long period time without operation, it must be operated for short period of time every 20-25 days.
- Turbosan warranty is not valid if pump is not connected to STR-1 protection relay.

PARPO 40 - 50

PARPO 50 SUBMERSIBLE PUMP

OPERATING PRINCIPLE OF SHREDDER BLADE SYSTEM



PARPO 40 - PARPO 50 SERIES PERFORMANCE AND TECHNICAL DETAILS TABLE

Pump Model		Hm Manometric Head [mwc] 2.5 5 7.5 10 12.5 15 17.5 20 22.5 25										Motor Power kW	Speed rpm	WEIGHT KG.	Discharge Diameter	
PARPO-40	N - 140	Capacity (m³/h)		18.8	17.8	17	15	13.2	11	8	5		2.2	2800	48	1½R
	N - 130			17	16	14	12	9.4	6.6	2.8		1.5	44			
	N - 120		16	15	13	11	8.4	5.5	2				1400	47		
	F - 170		25	20	10											
	F - 150		19.5	11												

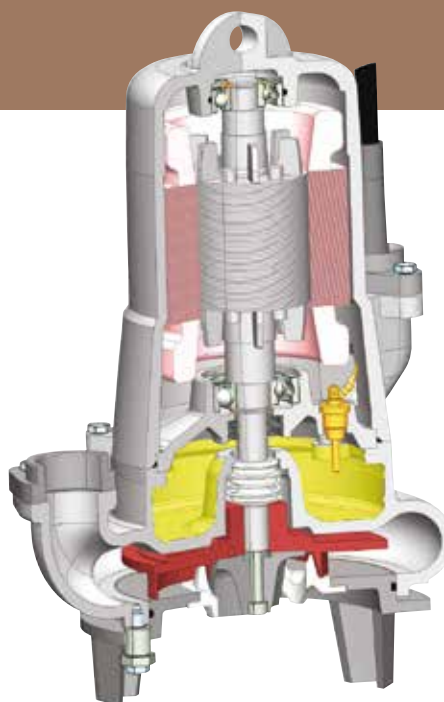
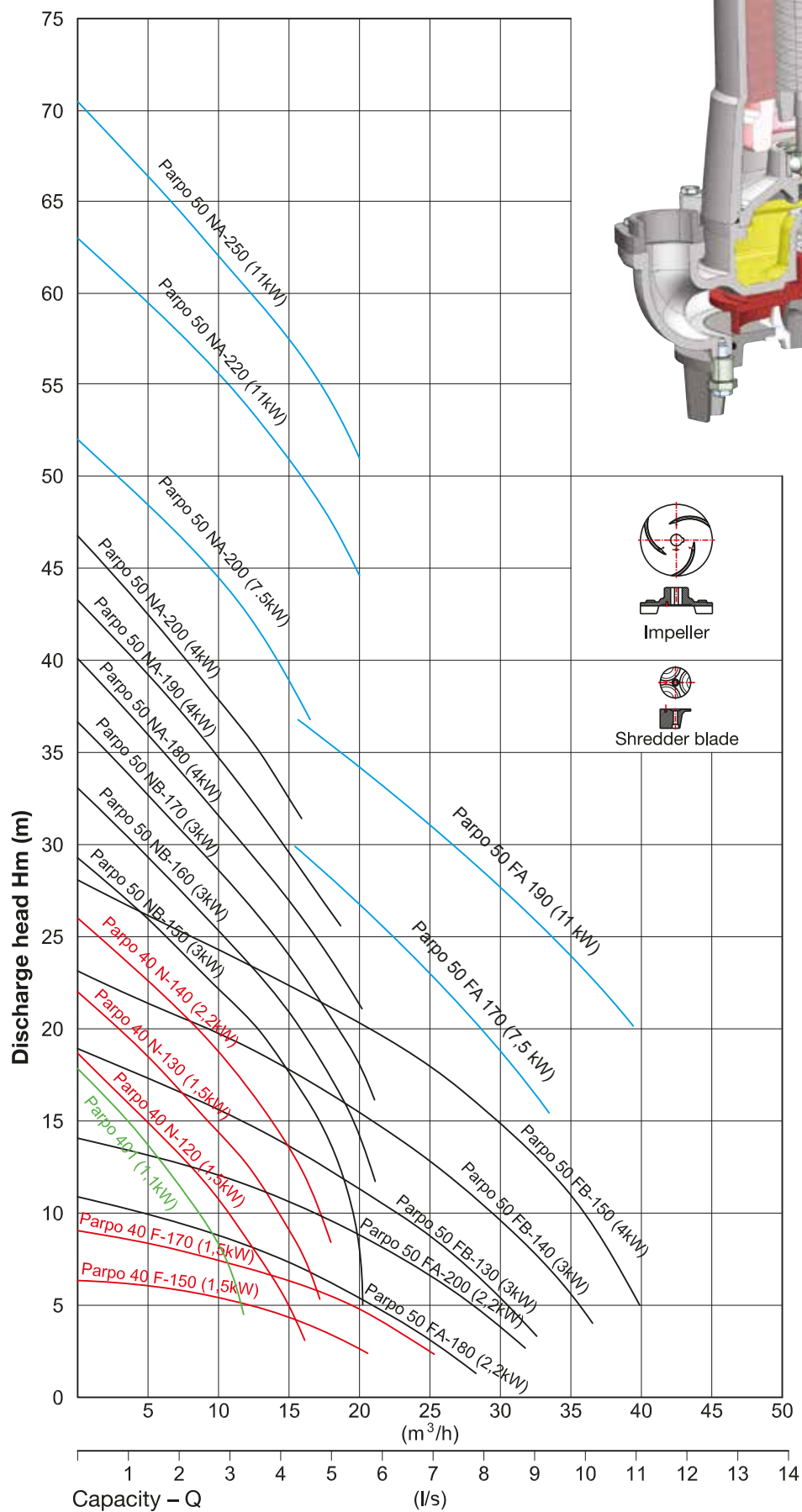
Pump Model		Hm Manometric Head [mwc] 4 8 12 16 17					Motor Power kW	Speed rpm	WEIGHT KG.	Discharge Diameter
PARPO 401	Debi Q m³/h	11.8	10	6.8	2.7	0	1.1	2850	28	Ø40

Pump Model		Hm Manometric Head [mwc]																		Motor Power kW	Speed rpm	WEIGHT KG.	Discharge Diameter			
		2.5	5	7.5	10	12.5	15	17.5	20	22.5	25	27.5	30	32.5	35	37.5	40	42.5	45							
PARPO-50	NA -200															12.6	10.5	8	5	2	4	2850	69	Ø50		
	NA -190															16.5	14.8	12.5	9.5	7					4	1
	NA -180															18.5	16.8	14.2	11.6	9					6.2	2.8
	NB -170								20.3	18.5	16.5	14	11	8.5	5.1	2					3	2850	68			
	NB -160					20.6	19.5	18	15.8	13	10.4	7.5	4	1												
	NB -150	20.3	20	19.5	18.5	17	15	12.5	9.5	6.5	2.5															
	FB -150		40	38	36.2	33	30	26	20.3	15	7.5	1									4	2850	67			
	FB -140		36	33	29	26	21	16	9.1	0.8																
	FB -130		31	27	22.5	17.5	11.4	4																		
	FA -200		32	28	22.5	16.5	8														2.2	1400	67			
FA -180		27	21	15	4.8																					

PARPO-50	Pump Model		Hm Manometric Head [mwc]										Motor Power kW	Speed rpm	WEIGHT KG.	Discharge Diameter	
			40	45	50	55	60	65	70	75							
	NA - 250	Capacity-(m³/h)			21.6	21	17	12	6.84					11	2850	132	Ø50
	NA - 220			23	20	15	10	4.7									
	NA - 200			14	9	3							7,5	2850	128		
	FA - 190	Hm[mwc]	37	34	31	27	24	20					11	2850	132		
	Q m³/h	15	20	25	30	35	38										
	FA - 170	Hm[mwc]	30	27	24	18	16						7,5	2850	128		
	Q m³/h	15	20	25	30	32											

PARPO 40 - 50

PERFORMANCE CURVES

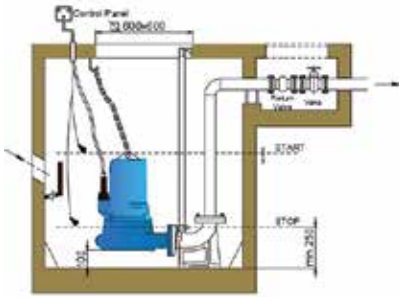


PARPO / INSTALLATION FORMS AND DIMENSIONS

1- AUTOMATIC COUPLING (DUCK FOOT BEND)

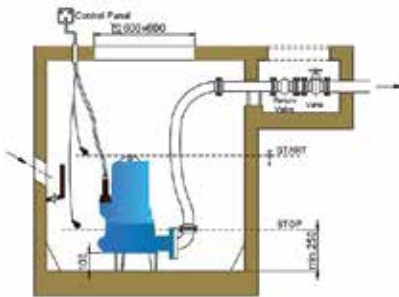
(Only for PARPO 50 series)

It is an economic and practical installation for stationary systems. The automatic coupling system consists of a duck foot bend fixed on sump floor, guide rail (rectangular cross-section) and fixing flange which is fitted to the pump. The automatic coupling set components and discharge piping have to be installed before the sump get filled with a medium. Fixing flange which is fitted to the pump slides through the guide rails and pump lowered to the sump by means of chain. To take the pump out of the sump by pulling the pump by chain is enough, no dismantling or bolt removal is required.



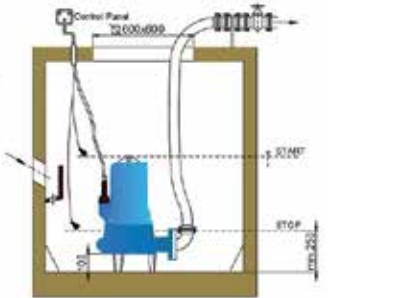
2- VERTICAL FREE STANDING INSTALLATION WITH HOSE CONNECTION

This installation can be applied to sumps with smooth, not inclined and clean floor. Threaded, clamped or dovetail type discharge unions are available hose connection options.

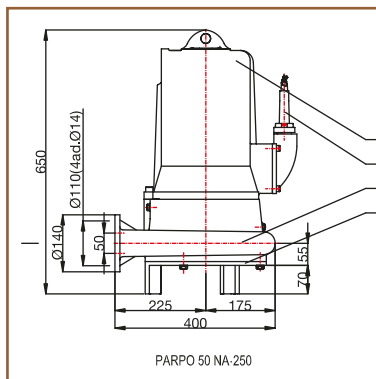
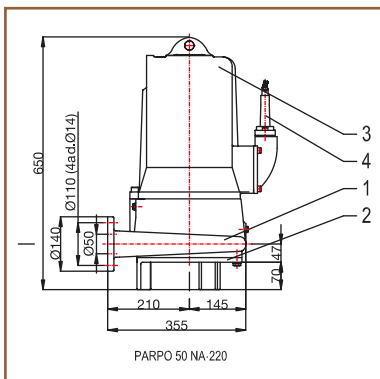
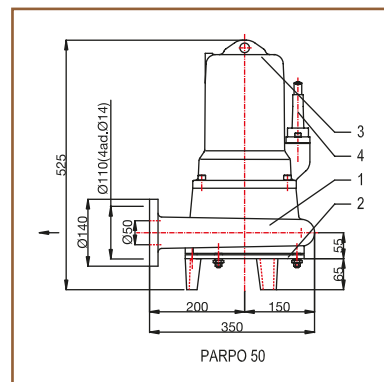
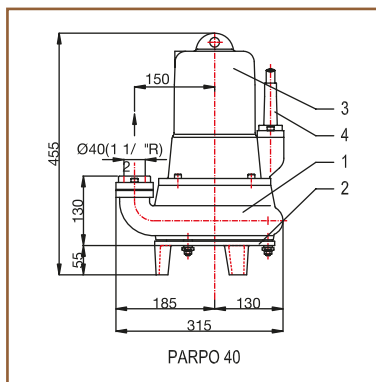
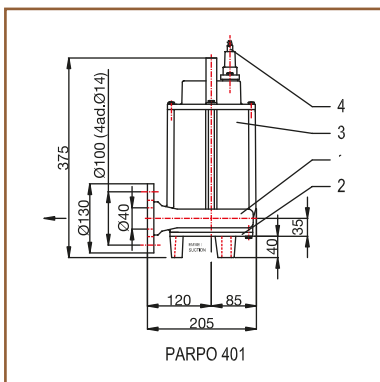


3- VERTICAL SUSPENDED PIPE CONNECTION

In this type of connection, all the mechanical components in the sump can be removed from the top opening of the sump. Flanged coupling bend is fixed to the side wall of the sump. The pump lowered sump with the support of discharge pipe and fixed to the flange of the pipe by means of bolts and nuts. The pump can be suspended in the sump without its feet touching the floor of the sump. This allows fitting of the pump to the sump filled with medium or sump with inclined and/or non smooth floor.



PARPO PUMPS EXTERIOR DIMENSIONS



PART LIST	
1	VOLUTE CASING
2	SUCTION PIECE
3	MOTOR CASING
4	CABLE

DAS SERIES SUBMERSIBLE WASTE WATER AND SEWAGE PUMPS

APPLICATIONS:

- Pumping of domestic and industrial sewage.
- At sewage treatment plants.
- Pumping of chemical and industrial waste water.
- Pumping of rain water
- All kinds of drainage and dewatering work.
- Pumping of difficult liquids of industrial processes.

FLUID TYPES:

- Unscreened sewage and other waste water types with high solids concentration.
- 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 against wear.
- Maximum allowed fluid temperature is 50°C
- Maximum allowed medium density is 1,2 gr/cm³, maximum allowed medium viscosity is 1,5 x 10⁻⁶ m²/s. Measures must be taken to lower these values.
- DAS series pumps cannot be used for pumping flammable and explosive fluids.

TECHNICAL DETAILS:

SUBMERSIBLE ELECTRIC MOTOR Turbosan DEM type submersible electric motor operates with 3 phase 380 V AC (+/- % 5) power supply. Insulation class of motors is F, protection class is IP 68. H class insulation available upon request.

Motor Cooling : DEM type submersible motors are cooled externally by surrounding medium. In order to have sufficient cooling the motor must be submerged up to the top.

BEARINGS : The rotor is supported by means of two heavy duty ball bearings. Bearings are grease lubricated, no need for maintenance for 2 years of operation time.

SHAFT SEALING: Between the motor and the pumped fluid high quality (Silicon carbide – Silicon carbide) mechanical seal is used, seals operate in the oil chamber. (DIN 2450 / EN 12756)

STR-1 PROTECTION RELAY:

A special relay manufactured by Turbosan is a very important part of submersible pumps and has to be fitted to the control system.

MOTOR OVER HEAT PROTECTION SYSTEM : Stator windings protected against over heat by 120°C thermistors. Over is heat usually caused by dry operation of the pump, excessive start stop frequency, or faulty electrical connection in case of over heating, the pump is tripped by a relay and will not operate.

WATER LEAKAGE WARNING SYSTEM:

Motor does not operate in case water leaks in to the motor.

PUMP IMPELLER:



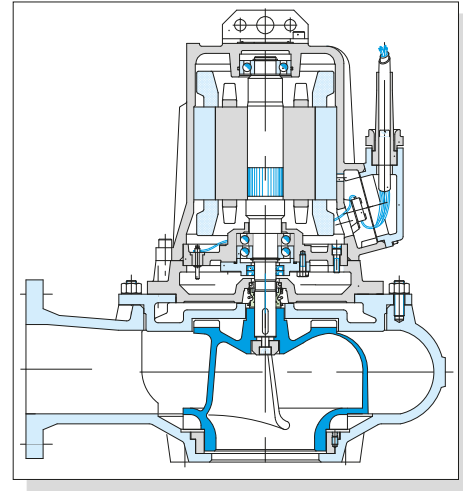
Single vane double angled non clogging impeller: These impellers have large solid passages, high efficiencies and they do not strain motor power at low discharge head values.



Double vane impeller : For discharge head values that cannot attained with single vane impellers. They have smaller solid passages than single vane impellers. In some cases water must be screened.

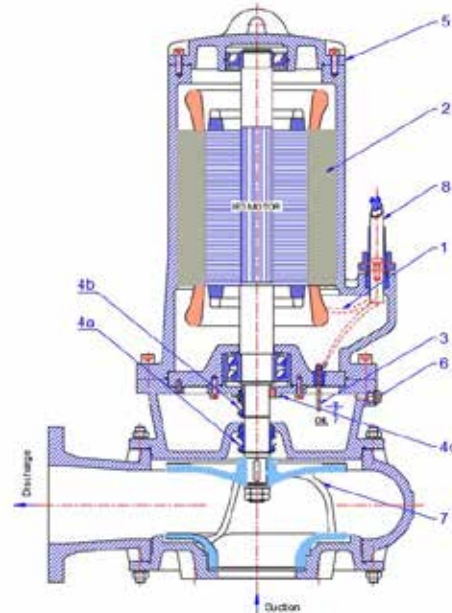


Vortex type impeller : This type of impellers do not have closed channels. Impeller is located deep inside the volute casing. Pumping action is generated by a vortex created within the fluid by rotation of the impeller. With this geometry they can tolerate larger solids than other impeller types more specifically they tolerate fibrous materials in the pumped liquid. The disadvantage of this impeller type is lower efficiencies.



Pump Materials :

Pump component	Material
Motor casing – volute casing	Cast iron GG-20 (EN-JL 1030)
Shaft	AISI 420
Pump impeller	Cast iron GG-25 (EN-JL 1040)
Bolts – Nuts	Stainless steel
Mechanical seal	SIC/SIC – NBR
Cable	H07RN-f
Coating	Coal tar epoxy paint over Epoxy primer



NEW GENERATION HIGH EFFICIENCY SUBMERSIBLE PUMP

Specification:

- 1- F or H insulated motor winding for winding for overheating safety **Thermistor 155°C**
- 2- High efficiency **IE3** electric motor
- 3- **Water leakage electrode** which generates signals when liquid enters the oil chamber
- 4a- **1. Mechanical seal** which is working in the pumped liquid
- 4b- **2. Mechanical seal** which is working in oil the chamber (optional).
- 4c- Oil seal (standard application).
- 5- Removable motor cover
- 6- Oil filling and control plug
- 7- Specially designed pump **impeller**
- 8- Power cable **H07RN-F**

DAS SERIES SUBMERSIBLE SEWAGE PUMPS

DAS SERIES PERFORMANCE AND TECHNICAL DETAILS TABLE

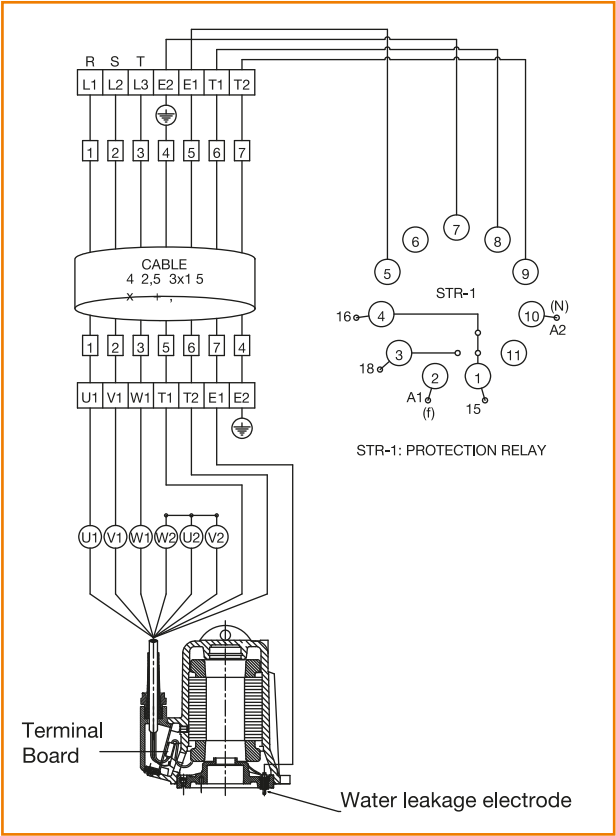
PUMP TYPE	DISCHARGE FLANGE	CURVE NO.	IMPELLER TYPE	Pump Weight kg	Max. Fre Passage	Capacity m ³ /h (Q)			Manometric Head mWc (Hm)			POWER kW	SPEED rpm
DAS 50/200V	DN 50 PN-6	1347	Vortex	52	35	10	20	36	11	10	7	1,5	1500
DAS 50/200V		1327	Vortex	62	35	15	28	50	18	16	11	4	3000
DAS 50/200V		1328	Vortex	87	35	15	30	54	23	21	14	5,5	3000
DAS 80/160V	DN 80 PN-10	3226-S	Vortex	95	80	18	40	70	11	9	6	4	3000
DAS 80/160V		3247-S	Vortex	85	80	18	40	75	8,5	7	5	3	1500
DAS 80/160		3223	Single vane	75	42	10	36	60	17	10	5	3	3000
DAS 80/160		3221	Single vane	80	42	10	40	60	24	15	9	4	3000
DAS 80/160		3220	Single vane	90	42	18	40	60	26	20	10	5,5	3000
DAS 80/160V		3226	Vortex	80	48	18	40	60	17	13	9	4	3000
DAS 80/160V		3247	Vortex	75	48	18	40	75	12	10	5	3	1500
DAS 80/250V		3247	Vortex	75	48	18	40	75	12	10	5	3	1500
DAS 80/250V	DN 80 PN-10	3441 V	Vortex	115	40	36	70	100	11	9	6	5,5	1500
DAS 80/250V		3442 V	Vortex	120	40	36	70	100	18	15	11	7,5	1500
DAS 80/250V		3443 V	Vortex	180	40	36	70	110	24	21	15	11	1500
DAS 80/200N		3321	Double vane	185	35	20	60	100	28	22	15	7,5	3000
DAS 80/200N		3324	Double vane	190	35	20	60	100	34	28	21	11	3000
DAS 80/250		3441	Double vane	125	38	36	70	100	14	10	4	5,5	1500
DAS 80/250		3442	Double vane	125	38	36	70	100	17	14	9	7,5	1500
DAS 80/250		3443	Double vane	185	38	36	70	110	23	18	11	11	1500
DAS 100/200V	DN 100 PN-10	4346-BS	Vortex	145	90	20	65	100	13	10	7	5,5	1500
DAS 100/200V		4346-AS	Vortex	150	90	30	80	120	15	11	7	7,5	1500
DAS 100/200V		4346-S	Vortex	155	90	36	100	140	17	14	10	11	1500
DAS 100/200		4321-B, 4322-B	Double/Single vane	130	35/44	20	60	95	24	15	6	5,5	3000
DAS 100/200		4321-A, 4322-A	Double/Single vane	135	35/44	20	60	110	28	20	8	7,5	3000
DAS 100/200		4321, 4322	Double/Single vane	140	35/44	20	60	110	32	25	12	11	3000
DAS 100/200P		4321-P	Non-clogging	150	40	40	90	120	29	20	13	11	3000
DAS 100/200V		4327-B	Vortex	130	50	20	50	75	17	11	5	5,5	3000
DAS 100/200V		4327-A	Vortex	135	50	20	50	80	21	17	10	7,5	3000
DAS 100/200V		4327	Vortex	140	50	20	50	90	29	23	18	11	3000
DAS 100/200		4340	Double vane	115	35	30	50	90	12	10	5	4	1500
DAS 125/250	DN 125 PN-10	5441	Single vane	150	100	30	80	150	11	8	5	4	1500
DAS 125/250		5442	Single vane	165	100	30	80	150	13	11	7	5,5	1500
DAS 125/300V		5544	Vortex	195	40	70	110	160	12	8	4	7,5	1500
DAS 125/300V		5545	Vortex	205	40	70	150	200	18	12	6	11	1500
DAS 125/300 D		5540-D	Double vane	200	70	70	140	220	12	9	5	7,5	1500
DAS 125/300 D		5542-D	Double vane	210	70	70	140	250	15	13	8	11	1500
DAS 150/250	DN 150 PN-10	6441	Single vane	210	120	70	150	230	9	8	6	7,5	1500
DAS 150/250		6440	Single vane	220	120	70	150	230	13	11	9	11	1500
DAS EFF 150/250P			Non-clogging	250	75	120	200	250	14	11	8	11	1500

*DAS PUMP PRICE INCLUDED 5 M CHAIN, 10 M CABLE, STRI PROTECTION RELAY AND SUCTION BEND.

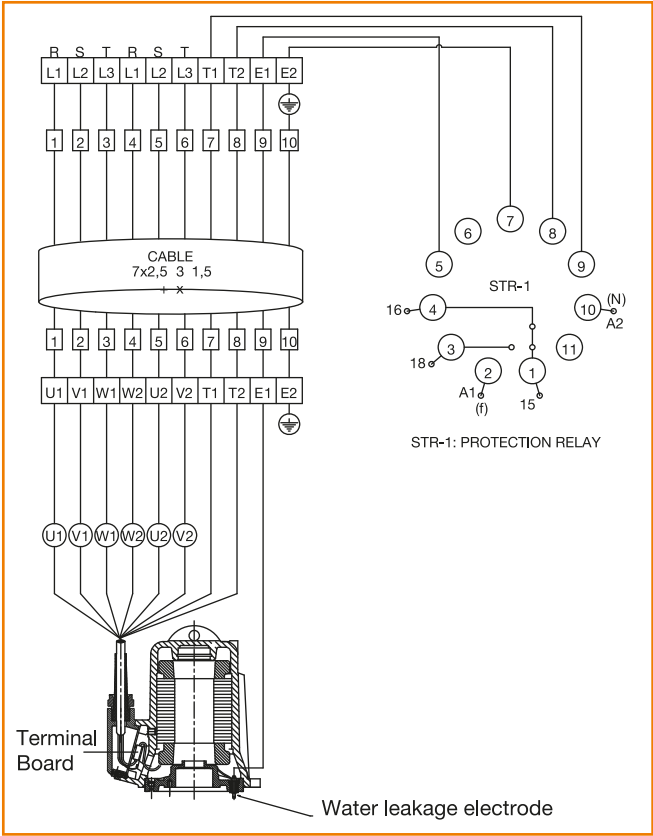
*HOSE CONNECTION PORTS FOR VERTICAL HOSE CONNECTION SYSTEM WILLBE PROVIDED ACCORDING TO DEMAND.

DAS / CABLE CONNECTION DIAGRAMS

DAS – PARPO SERIES PUMPS
DIRECT ONLINE STARTING
CABLE CONNECTION DIAGRAM
(1,5 – 5,5 Kw)



DAS SERIES PUMPS
(Y/Δ) STAR / DELTA STARTING
CABLE CONNECTION DIAGRAM
(7,5 – 11 kW)



CABLE LEAD NO	MAIN CABLE		TERMINAL BOX
1	R	L1	U1
2	S	L2	V1
3	T	L3	W1
4			E2 ⚡
5			T1
6			T2
7			E

STR-1 RELAY CONNECTION LEADS	
E	Water leakage
T1	Termistor contacts
T2	
15	Relay contact leads
16	
18	
A1 (F)	Relay coil connections 220V
A2 (N)	

CABLE LEAD NO	MAIN CABLE		TERMINAL BOX
1	R	L1	U1
2	S	L2	V1
3	T	L3	W1
4	R	L1	W2
5	S	L2	U2
6	T	L3	V2
7			E2 ⚡
8			T1
9			T2
10			E

CAUTION :
Turbosan warranty is not valid,
if pump operates without being
connected to STR-1 relay



STR-1 PROTECTION RELAY

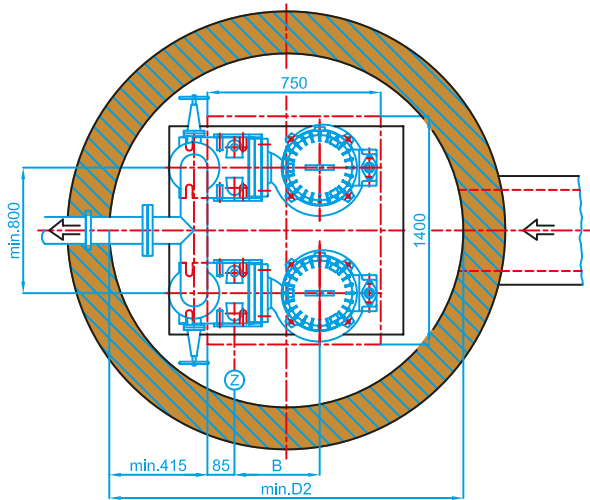
DAS SERIES PUMPS INSTALLATION FORMS

1) AUTOMATIC COUPLING (DUCK FOOT BEND)

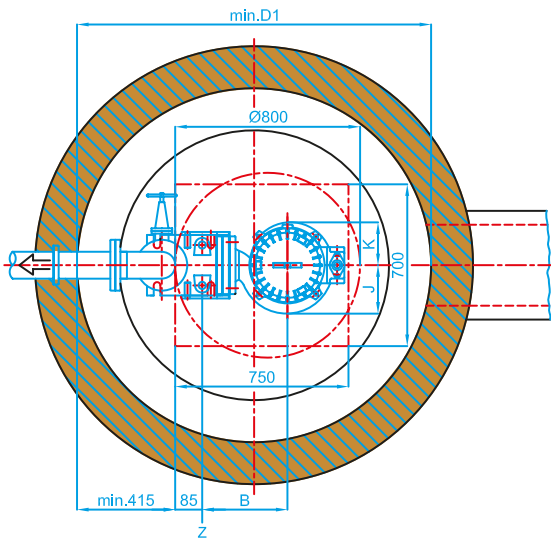
It is an economic and practical installation for stationary systems. Automatic coupling system consists of a duck foot bend fixed on sump floor, guide rail (consists of two galvanized pipes connected in parallel) and fixing flange which is fitted to the pump. Automatic coupling set components and discharge piping have to be installed before the sump gets filled with medium.

The fixing flange which is fitted to the pump slides through the guide rails and the pump is lowered to the sump by means of a chain. To take the pump out of the sump by pulling pump by chain is enough, no dismantling or bolt removal required.

Sealing is done by special gasket.



Note: D1 and D2 are minimum well diameters.

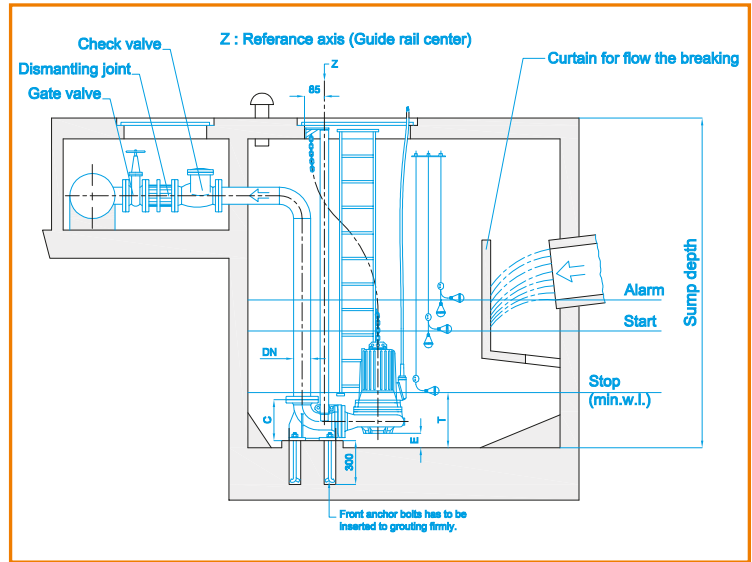


2) VERTICAL FREE STANDING HOSE CONNECTION

This installation for is suitable for sumps with smooth and flat floors. Pump must stay on floor freely. Pump can be removed from sump by pulling out by chain.

CAUTION :

Pumps should never be pulled from the electric cables.

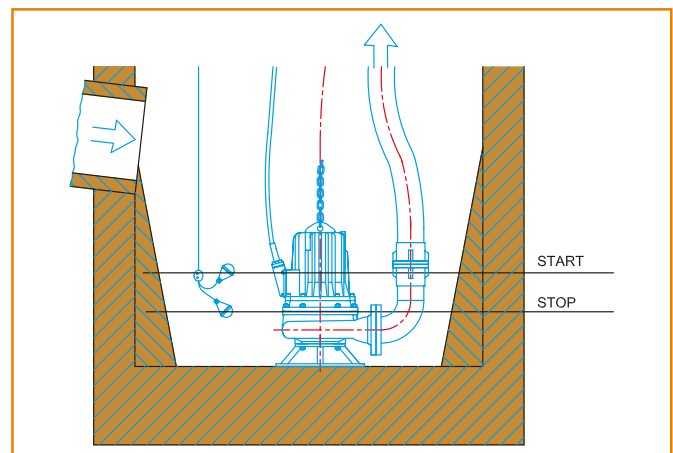


PUMP MODEL	DIMENSIONS						
	DN mm	B mm	D1 mm	D2 mm	E mm	T mm	C mm
DAS-50/200-V	50	227	1200	1400	100	300	245
DAS-80/160	80	280	1200	1400	100	400	250
DAS-80/250	80	380	1200	1500	100	420	250
DAS-100/200	100	330	1200	1500	120	420	280
DAS-125/250	125	415	1300	1600	140	520	348
DAS-125/300	125	455	1400	1600	140	520	348
DAS-150/250	150	470	1400	1600	150	550	450

Note: D1 and D2 are minimum well diameters.

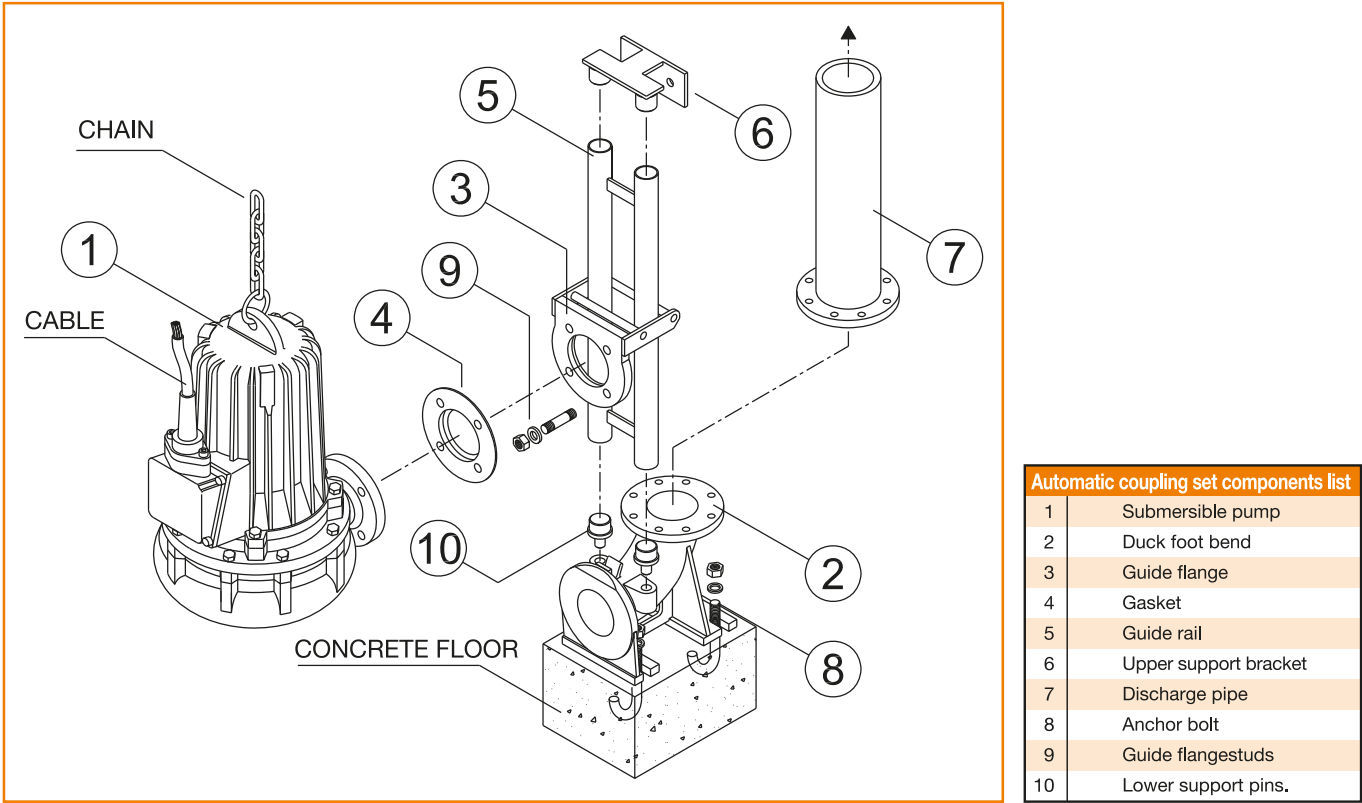
CAUTION :

In flow to the well might cause flow and vortex inside the sump this improper suction condition must be prevented.

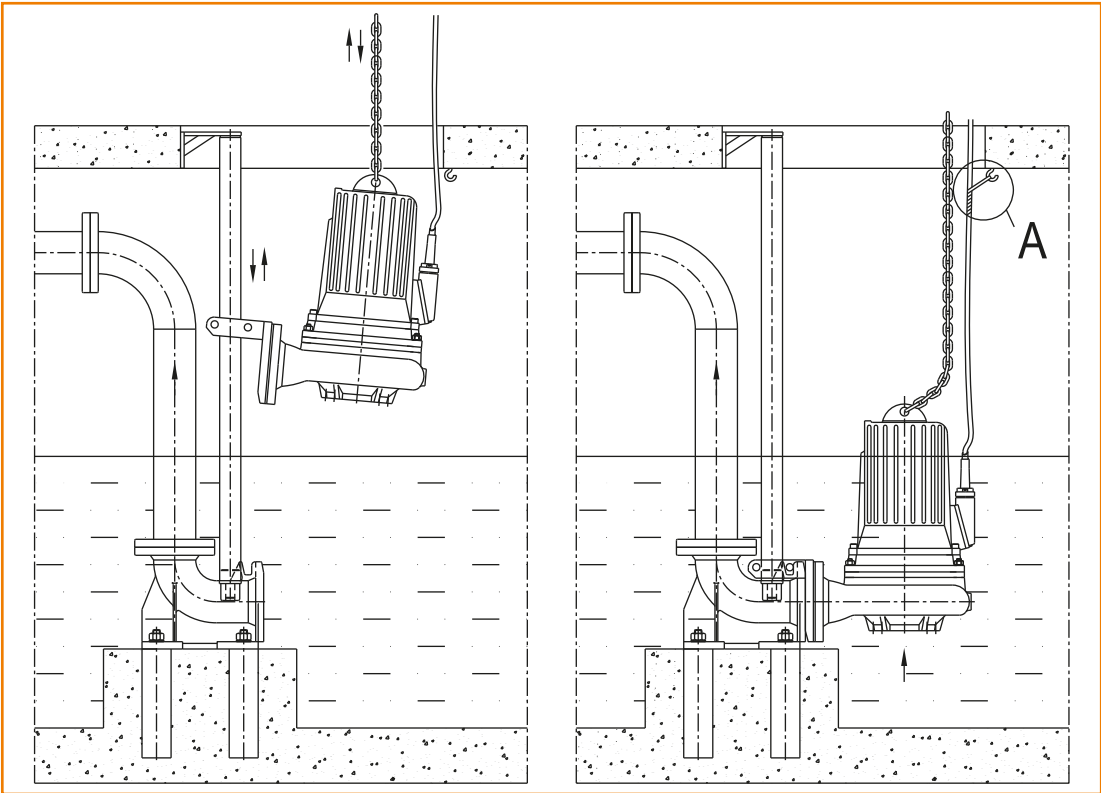


DAS SERIES AUTOMATIC COUPLING SET

AUTOMATIC COUPLING SET COMPONENTS



OPERATION OF AUTOMATIC COUPLING SET

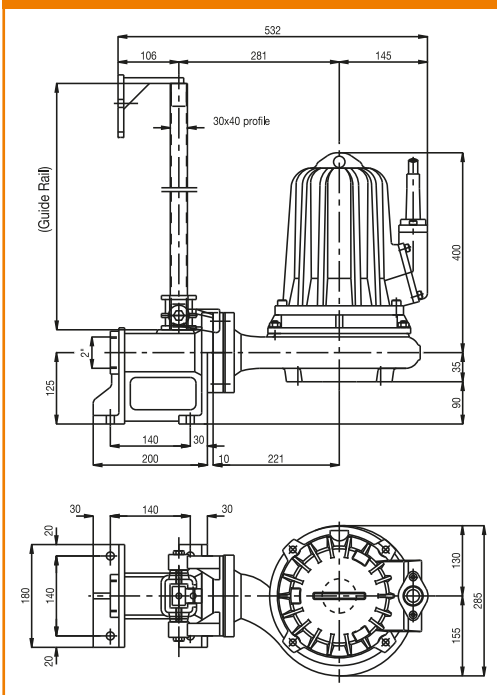


CAUTION : *Never use cable when lowering or rising the pump. Use chain supplied with pump for this purpose.*

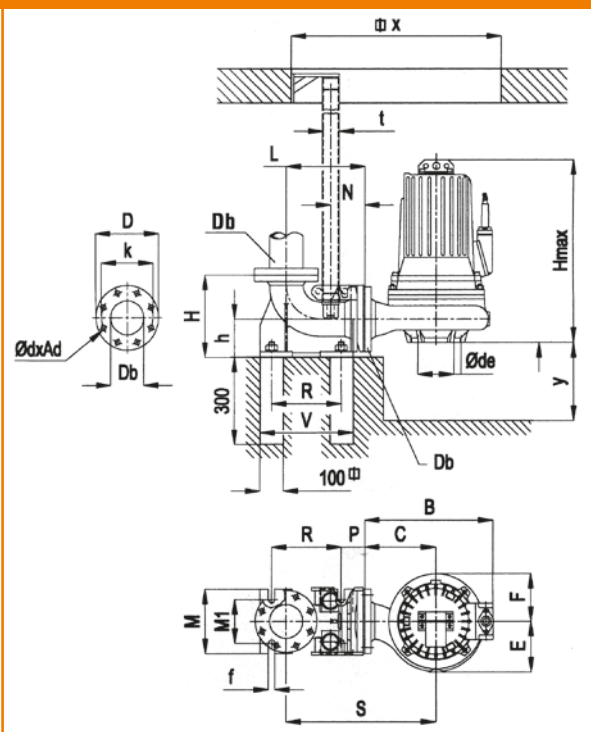
DAS SERIES INSTALLATION FORMS

DAS DUCK FOOT BEND & PUMP DIMENSIONS

* DAS 50/200 AUTOMATIC COUPLING



DAS 80/100/125/150 AUTOMATIC COUPLING

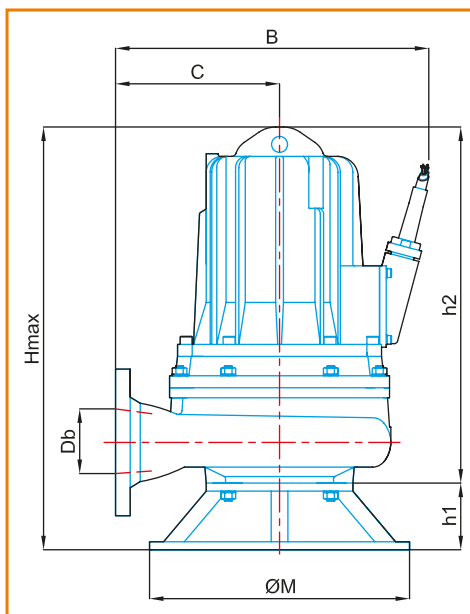


DISCHARGE FLANGE SUCTION FLANGE

PUMP MODEL	ØDb	Øk	pcs xØd	ØD	Øde	t	C	B	E	F	S	N	L	P	R	M1	f	Anchor bolt size	V	M	h	H	Hmax	y	Φ x min
DAS 50/200	50	110	4x14	140	60	30x40		345									14	4xm12x200	290	210	130	250	435	100	650
DAS 80/160	80	160	8x18	200	80	2"	200	340	152	130	434	99	234	64	220	140	23	4xm20x200	290	210	130	250	514	100	650
DAS 80/160V-S	80	160	8x18	200	80	2"	200	340	152	130	434	99	234	64	220	140	23	4xm20x200	290	210	130	250	519	100	650
DAS 80/250	80	160	8x18	200	80	2"	280	500	205	195	515	99	234	64	220	140	23	4xm20x200	290	210	130	250	585	100	720
DAS 100/200	100	180	8x18	220	100	2"	246	470	173	158	516	117	270	80	240	150	23	4xm20x200	320	220	130	280	589	125	720
DAS 100/200V-S	100	180	8x18	220	100	2"	246	470	173	158	516	117	270	80	240	150	23	4xm20x200	320	220	130	280	619	125	720
DAS 125/250	125	210	8x18	250	125	2"	315	540	222	185	608	123	293	80	270	180	25	4xm22x250	352	250	160	348	623	150	850
DAS 125/300	125	210	8x18	250	150	2"	355	607	265	220	648	123	293	80	270	180	25	4xm22x250	352	250	160	348	698	150	920
DAS 150/250	150	240	8x23	285	200	2"	355	590	255	205	751	134	396	96	360	240	27	4xm24x250	480	330	206	450	725	200	1000

PUMP FOOT DIMENSIONS							
PUMP MODEL	Db Ø	Hmax	h1	h2 max.	M Ø	B	C
DAS 50/200V	50	485	50	435	220	345	200
DAS 80/160	80	614	100	514	390	340	200
DAS 80/160V-S	80	619	100	519	390	340	200
DAS 80/250	80	685	100	585	390	500	280
DAS 100/200	100	689	100	589	390	470	246
DAS 100/200V-S	100	719	100	619	390	470	246
DAS 125/250	125	723	100	623	390	540	315
DAS 125/300	125	798	100	698	390	607	355
DAS 150/250	150	875	150	725	420	590	355

NOTE : DAS 50/200 V Model pump has foot integrated to the volute casing.



Note : Turbosan reserves to make any changes in dimensions without prior notice.

TURBOSAN PACKAGED SEWAGE PUMPING STATIONS

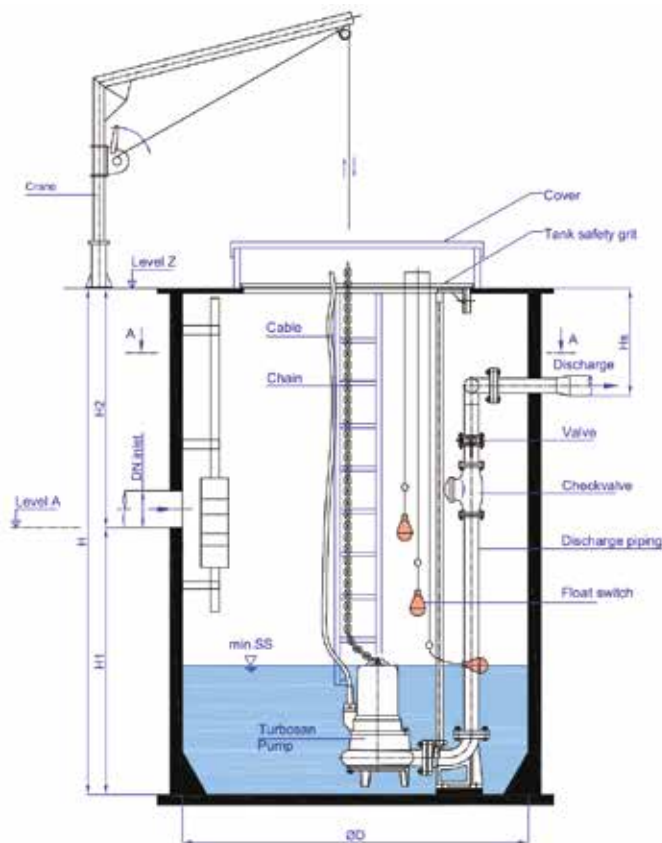
Before pumping them to treatment plant waste and drainage water collected in concrete made storage facilities. For small settlements to avoid large civil work costs, " Packaged sewage pumping stations are used. Using these stations minimizes excavation and construction costs . Stations get manufactured and delivered as a complete single unit along with all necessary accessories. They get manufactured by using high density polyethylene STP, PEHD.

Stations are easy to install, corrosion resistant and leak free.

Available up to 2400 mm diameter and 6 m height can be equipped with 1 – 3 pumps. Lowering pumps into the tanks done by means of guide rail – duck foot bend system. In the centre of station a platform is provided for accessibility to equipment in the station such as pumps, valves, pipes.

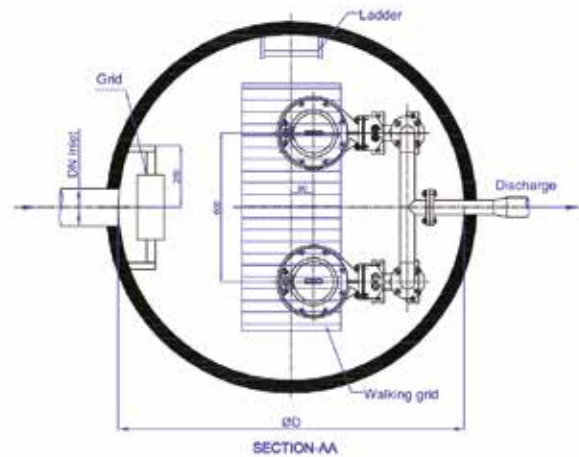
Pumps used in stations are with following specifications :

Capacity : 20 – 400 m³/h Discharge head : 10 – 30 m, Discharge diameters : 50 – 150 mm



APPLICATIONS :

- Waste water treatment plants
- Drainage systems
- Rain water surface water collection and discharge



Packaged pump station components :

- | | |
|---|---------------------|
| 1- Submersible pump | 8- Ladder |
| 2- Discharge bend and guide rails | 9- Tank safety grit |
| 3- Discharge piping | 10- Crane |
| 4- Ball type waste water non return valve | 11- Walking grid |
| 5- Gate valve or Butterfly valve | 12- Control panel |
| 6- Float switch or level transmitter | 13- Grid |
| 7- CTP, PEHD main tank | |

FIRE PUMPS AND FIRE PUMP SETS

Turbosan designs and manufactures various types of pumps according to needs of industry. We also build fire fighting sets with the pumps in our product range complying with **NFPA 20** and **TS EN 12845**.

As main pump of the fire fighting sets different types of pumps are used. According to the required capacity and head values most suitable pumps are selected and delivered to the user as installed on base frame coupled with electric motors and / or diesel engines.

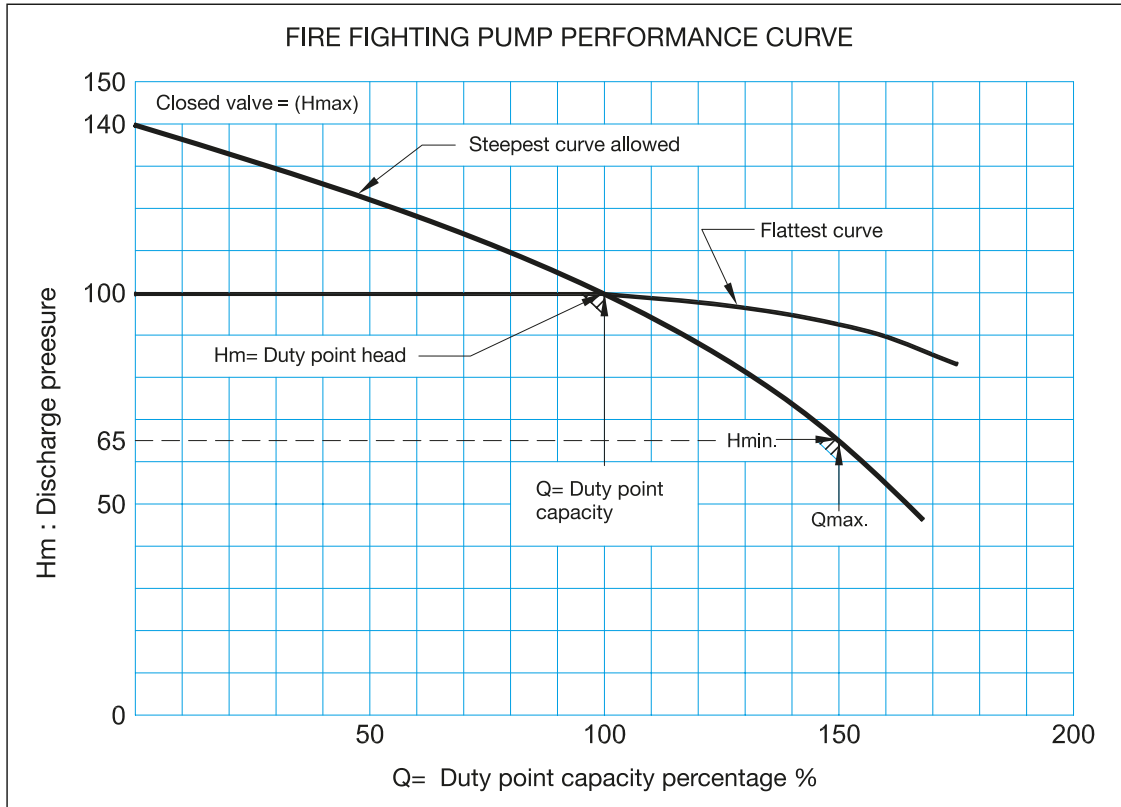
**Turbosan fire fighting pumps complying with NFPA 20 and TS EN 12845**

- Horizontal end suction pumps (NORM series)
- Horizontal split casing pumps (CEP series)
- Jockey pumps (Vertical)

FIRE PUMPS AND FIRE PUMP SETS

NFPA 20 (National Fire protection Association) is standard which defines fire pump groups and installations for fire protection. Pumps used in Turbosan fire fighting sets complies with NFPA 20.

Q/H curve for fire fighting pumps must be flat as much as possible. Thanks to this flatness when need for higher capacity increases pressure drop will be minimum and pressure required at sprinkler will be stable for larger flow rates. On the performance curve Qmax value should not be less than 150 % of operating capacity. Closed valve pressure Hmax value should be less than % 140 of operation point Hm value.



PUMPS GROUP

NORM, CEP and KAT series pumps and diesel engines and electric motors used for building fire fighting sets. They get combined in different installations according to the operation conditions.

- 1) Fire fighting sets with one pump or multiple pumps with electric motor
- 2) Fire fighting sets with one electric motor driven and one diesel engine driven pump.
- 3) Fire fighting sets with one electric motor driven and one diesel engine driven pump and one jockey Pump.

- The main goal of the use of multiple pumps is to have standby pump or in case of capacity increase it is not needed to change the fire fighting set. Pumps in fire fighting sets with 2 or 3 pumps must be fully complying with each other.

- The goal of Jockey pump use is to sustain pressure value in the piping installation in case of pressure leaks, without operating the main pumps. Vertical multi stage pump used as jockey pumps.

- Capacity (Q) of the jockey pumps must be 1 % of main pump's capacity and discharge head of the jockey pump must be 10 m more than that of main pump.

Example : If discharge capacity head of the main pump is 170 m³/h and discharge head of the main pump is 60 m, discharge capacity of the jockey pump must be 1,7 m³/h and discharge head of the jockey pump must be 60+10= 70 m.

FIRE PUMPS AND FIRE PUMP SETS

FIRE FIGHTING PUMP CAPACITIES:

Capacity values of the fire fighting pumps shall be as below list according to NFPA 20 standard.

Discharge values are variable according to the fire fighting system so that they are not listed in the table.

- Water source or water tank specifications has the first priority in the fire fighting systems. Quantity of the water in the tank must be enough to supply water requirement completely and it should be suitable for easy re-filling. Suction line should be designed such that flow velocity is not more than 2,5 m/s. Suction pipe length must be 7 x De.
- Adequate ventilation must be available for diesel engine driven pumps and ambient temperature must be more than 10 °C.

DIAMETER TABLE FOR FIRE FIGHTING SYSTEM PIPING INSTALLATION

Capacity		Suction Pipe Diameter (*)	Discharge Pipe Diameter (*)	Safety Valve Diameter	Safety Valve Discharge Pipe Diameter	Flow Meter Diameter
m ³ /h	GPM					
5.7	25	1" - DN 25	1" - DN 25	3/4" - DN 15	1" - DN 15	1 1/4" - DN 32
11.4	50	1 1/2" - DN 40	1 1/4" - DN 32	1 1/4" - DN 32	1 1/2" - DN 40	2" - DN 50
22.7	100	2" - DN 50	2" - DN 50	1 1/2" - DN 40	2" - DN 50	2 1/2" - DN 65
34.1	150	2 1/2" - DN 65	2 1/2" - DN 65	2" - DN 50	2 1/2" - DN 65	3" - DN 80
45.4	200	3" - DN 80	3" - DN 80	2" - DN 50	2 1/2" - DN 65	3" - DN 80
56.8	250	3 1/2" - DN 100	3" - DN 80	2" - DN 50	2 1/2" - DN 65	4" - DN 100
68.1	300	4" - DN 100	4" - DN 100	2 1/2" - DN 65	3 1/2" - DN 100	4" - DN 100
91	400	4" - DN 100	4" - DN 100	3" - DN 80	5" - DN 125	4" - DN 100
102	450	5" - DN 125	5" - DN 125	3" - DN 80	5" - DN 125	4" - DN 100
114	500	5" - DN 125	5" - DN 125	3" - DN 80	5" - DN 125	5" - DN 125
170	750	6" - DN 150	6" - DN 150	4" - DN 100	6" - DN 150	5" - DN 125
227	1000	8" - DN 200	6" - DN 150	4" - DN 100	8" - DN 200	6" - DN 150
284	1250	8" - DN 200	8" - DN 200	6" - DN 150	8" - DN 200	6" - DN 150
341	1500	8" - DN 200	8" - DN 200	6" - DN 150	8" - DN 200	8" - DN 200
454	2000	10" - DN 250	10" - DN 250	6" - DN 150	10" - DN 250	8" - DN 200
568	2500	10" - DN 250	10" - DN 250	6" - DN 150	10" - DN 250	8" - DN 200
681	3000	12" - DN 300	12" - DN 300	8" - DN 200	12" - DN 300	8" - DN 200
795	3500	12" - DN 300	12" - DN 300	8" - DN 200	12" - DN 300	10" - DN 250
908	4000	14" - DN 350	12" - DN 300	8" - DN 200	14" - DN 350	10" - DN 250
1022	4500	16" - DN 400	14" - DN 350	8" - DN 200	14" - DN 350	10" - DN 250
1136	5000	16" - DN 400	14" - DN 350	8" - DN 200	14" - DN 350	10" - DN 250

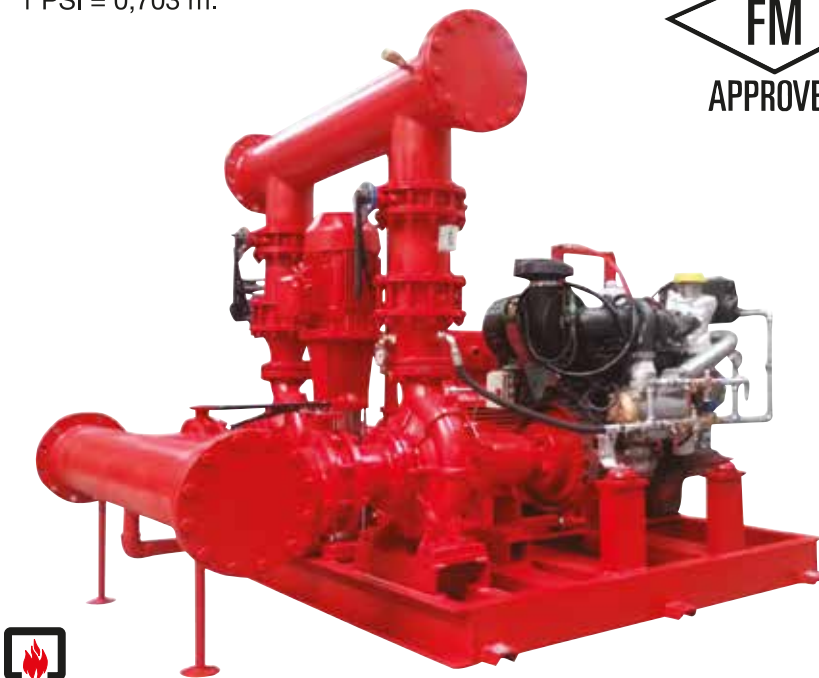
* NFPA standard table 2-20

(*) Pump flange can be different than pipe diameter.

Minimum suction pipe length must be 10 x suction pipe diameter.

100 GPM= 22,71 m³/h= 6,3 lt/s.

1 PSI = 0,703 m.



TÜRBOSAN FIRE FIGHTING PUMPS ARE UL LISTED



OPERATING PRINCIPLE OF FIRE FIGHTING SET:

- Each pump of the fire fighting set operates by manually pressing of button on control panel or they operate automaticly.
- Pumps shut down by pressing on stop button on control panel manually.
- Automatic systems operates by means of pressure switch. When pressure goes down lower than a specific value jockey pump starts operating. If the jockey pump can not supply enough pressure to support pressure leak main pumps starts to supply pressure to the fire fighting installation. If pressure supply of the jockey pump is enough it stops and main pumps do not start.

System can be set to start for certain intervals in a week, to start and stop

FIRE PUMPS AND FIRE PUMP SETS

FIRE FIGHTING SET CONTROL SYSTEM :

- Separate control panels used for jockey pumps and for main pumps.
- Main pumps can operate as standby pump for each other or they can operate together .
- Control panels have available connections terminals for building automation.
- Electric motor of main pump has star delta connection.
- There are 2 batteries and battery charge system for diesel engine
- There is no thermal protection for main pump control panel
- Controls on electric motor driven pump on control panel door :
 - Manual start - stop button • Energy signal lamp • Test operation signal lamp



- Panel equipped with alarm signal buzzer and lamp
- Control panel supply voltage is 24 V
- Diesel engine control panel has following items on panel door:
 - Diesel engine operating lamp
 - Diesel engine failure signal lamp
 - Low battery warning signal
 - Minimum fuel signal lamp
- Panels have IP 54 protection
- Panels do not have a protection system which do not allow the system to operate in case of any failure.
- In case of electric supply cut diesel engine operates automatically.

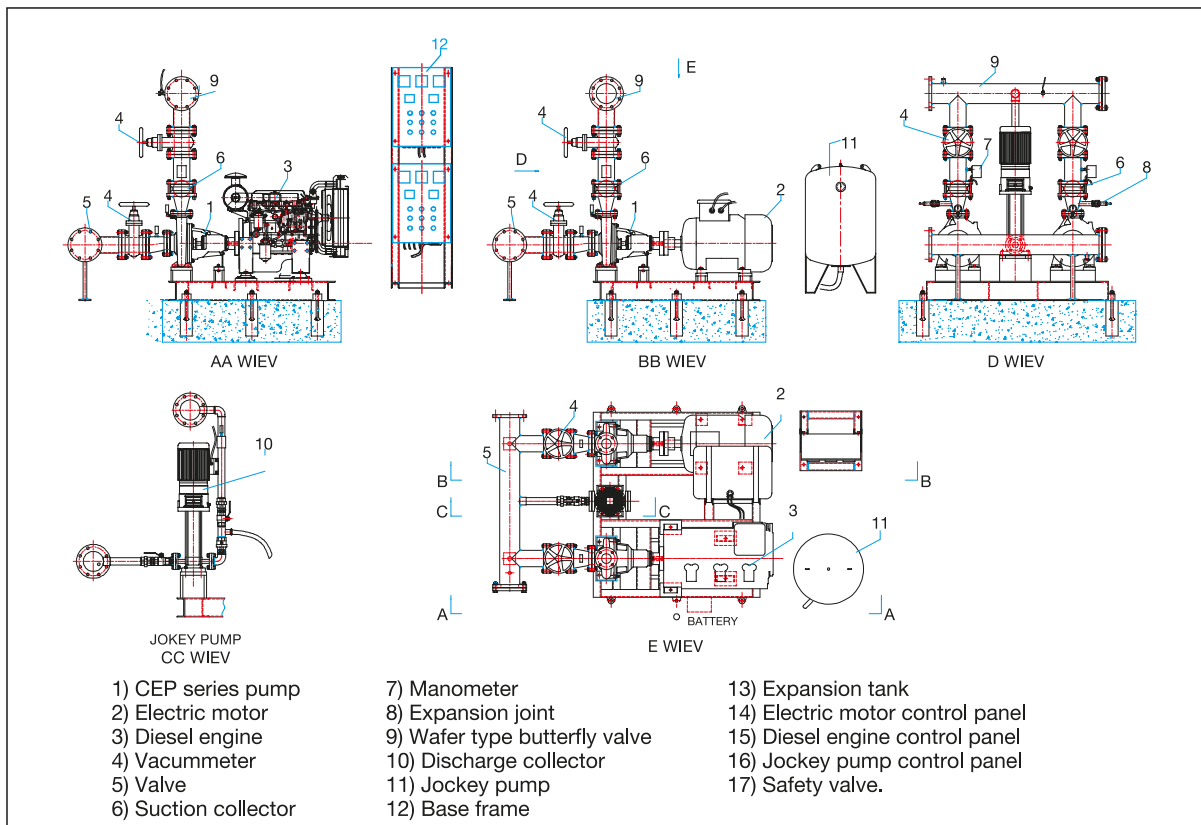
DIESEL ENGINE DRIVEN PUMP COMPONENTS:

Diesel engine is for keeping fire fighting systems in case of electric supply cut.

- 1) Pump complying with NFPA 20 standart
- 2) Diesel engine
- 3) Control panel
- 4) Base frame and coupling
- 5) Battery
- 6) Pressure switch
- 7) Manometer
- 8) Fuel tank
- 9) Exhaust silencer.

ELECTRIC MOTOR DRIVEN PUMP COMPONENTS:

- 1) Pump complying with NFPA 20 standart
- 2) Electric motor
- 3) Control panel
- 4) Base frame and coupling
- 5) Pressure switch
- 6) Manometer



FIRE PUMPS AND FIRE PUMP SETS

UL LISTED and FM APPROVED FIRE FIGHTING PUMPS

UL LISTING : DEFINITION AND BENEFITS

- UL (Underwriters Laboratories Inc.) Is a worldwide independent safety consulting company established in 1894.
- UL engineers control, test and certify various equipment used in fire fighting systems. UL listing is a verification of fire fighting equipment.
- Turbosan's fire fighting pumps are UL listed. Turbosan's UL listed and related test reports are available at UL web site.
- Pumps have been tested according to UL 448, engineering files have been checked, mechanical and performance tests conducted by UL engineers.
- Materials of UL listed pumps are in accordance with UL 448 specifications.
- UL listed pumps are checked and tested regularly by UL engineers.
- Performance characteristics of UL listed pumps are selected to suit performance demand of fire fighting applications.
- Use of UL listing fire fighting equipment results in lower insurance fees.
- Periodical controls (daily, weekly, monthly, annual) of the fire fighting pumps done regularly.
- Turbosan fire fighting pump UL listing numbers;

NORM pumps : EX 26604

CEP pumps : EX 26605

END SUCTION NORM PUMP MATERIAL LIST			
PARTS NO:	COMPONENT DESCRIPTION	MATERIAL TYPE 1	MATERIAL TYPE 2
102	VOLUTE	GGG40	GGG40
161	STUFFING BOX	GGG40	GGG40
183	SUPPORT FOOT	SHEET METAL	SHEET METAL
210	SHAFT	AISI420	AISI420
230	IMPELLER	AISI316	G-CuSn10
330	BEARING FRAME	GG25	GG25
360	BEARING COVER	GG25	GG25
452	GLAND	AISI316	G-CuSn10
458	LANTERN RING	G-CuSn10	G-CuSn10
502	WEAR RING	Rg 5	G-CuSn10
507	WATER THROWER	RUBBER	RUBBER
524.1	SHAFT SLEEVE	AISI316	AISI316
591	GUARD PLATE	STEEL	STEEL
970	PUMP LABEL	AISI304	AISI304
	PAINTING	RAL 3020	RAL 3020

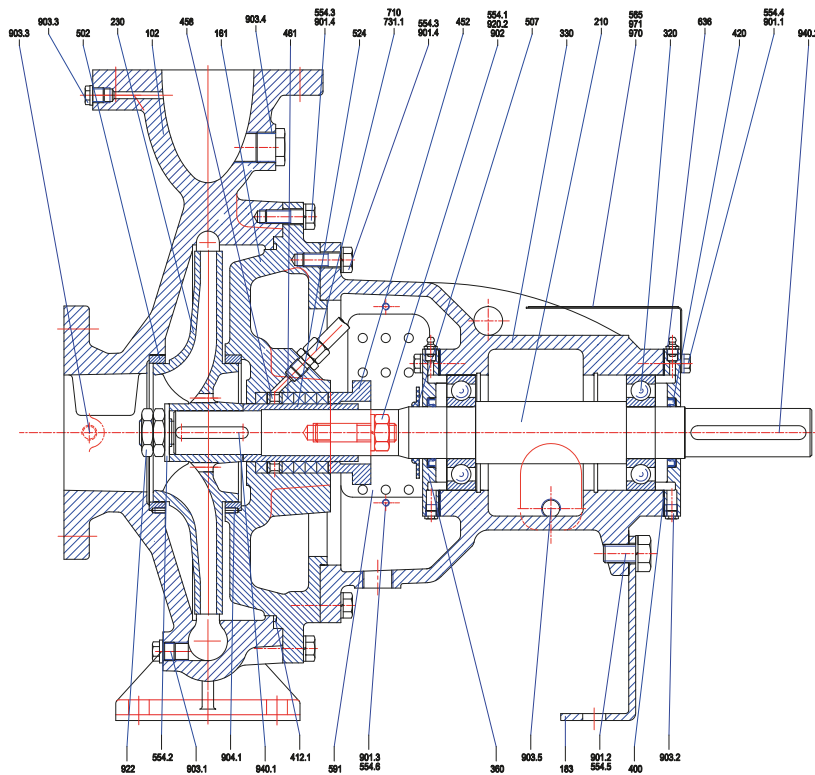
SPLIT CASE CEP PUMP MATERIAL LIST			
PARTS NO:	COMPONENT DESCRIPTION	MATERIAL TYPE 1	MATERIAL TYPE 2
102.1	CASING	GGG40	GGG40
102.2	COVER	GGG40	GGG40
210	SHAFT	AISI420	AISI420
225.1	BEARING RING INTERNAL	GG25	GG25
225.2	BEARING RING EXTERNAL	GG25	GG25
234	IMPELLER	AISI316	G-CuSn10
340.1	BEARING HOUSING	GGG40	GGG40
360.1	BEARING COVER-MOTOR SIDE	GG25	GG25
360.2	BEARING COVER-CLOSED SIDE	GG25	GG25
360.3	BEARING COVER-INSIDE	GG25	GG25
452	GLAND	AISI316	G-CuSn10
458	LANTERN RING	G-CuSn10	G-CuSn10
502	WEAR RING	Rg 5	G-CuSn10
507	WATER THROWER	RUBBER	RUBBER
526	SHAFT SLEEVE	AISI316	AISI316
542	STUFFING BOX BUSHING	GGG40	GGG40
560	CENTERING TAPER PIN	AISI304	AISI304
591	GUARD PLATE	STEEL	STEEL
970	PUMP LABEL	AISI304	AISI304
	PAINTING	RAL 3020	RAL 3020

Explanation:

Material Type 1 and Material Type 2 for NORM - CEP pumps are UL Listed.

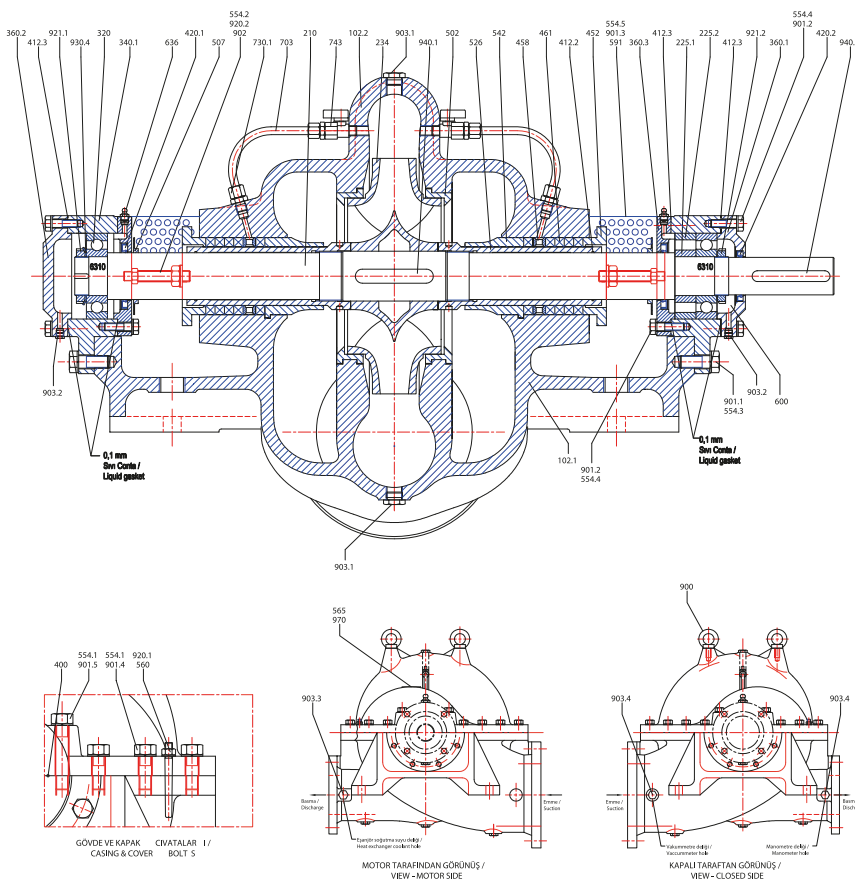
Material Type 1 is "Standard Material Construction" for all applications,

NORM PUMP SECTIONAL DRAWING



Part No:	Part Name:
971	Pump Label
970	Pump Label
940.2	Key
940.1	Key
922	Lock Nut
920.2	Nut
904.1	Set screw
903.5	Plug
903.4	Plug
903.3	Plug
903.2	Plug
903.1	Plug
902	Stud
901.4	Bolt
901.3	Bolt
901.2	Bolt
901.1	Bolt
731.2	Elbow
731.1	Nipple
710	Pipe
636	Grease Nipple
591	Guard Plate
565	Rivet
554.6	Washer
554.5	Spring Washer
554.4	Spring Washer
554.3	Spring Washer
554.2	Washer
554.1	Washer
524	Shaft Sleeve
507	Water Thrower
502	Wear Ring
461	Packing Seal
458	Lantern Ring
452	Gland
420	Oil Seal
412.1	O-Ring
400	Bearing Cover Gasket
380	Bearing Cover
330	Bearing Frame
320	Bearing
230	Impeller
210	Shaft
183	Support Foot
161	Stuffing Box
102	Volute

SPLIT CASE PUMP SECTIONAL DRAWING



Part No.:	Part Name:
970	Pump Label
940.2	Key
940.1	Key
930.4	Washer
921.2	Nut KM (Left Thread)
921.1	Nut KM (Right Thread)
920.2	Nut
920.1	Nut
903.4	Plug
903.3	Plug
903.2	Plug
903.1	Plug
902	Gland Stud
901.5	Bolt
901.4	Bolt
901.3	Bolt
901.2	Bolt
901.1	Bolt
900	Lifting Eye
743	Globe Valve
730.1	Nipple
703	Pipe (for pacing seal)
636	Grease Nipple
591	Guard Plate
565	Rivet
560	Centering Taper Pin
554.5	Washer
554.4	Spring Washer
554.3	Spring Washer
554.2	Washer (Gland)
554.1	Washer
542	Stuffing Box Bushing
526	Shaft Sleeve
507	Water Thrower
502	Wear Ring
461	Packing Seal
458	Lantern Ring
452	Gland
420.2	Oil Seal
420.1	Oil Seal
412.3	O-Ring
412.2	O-Ring
412.1	Liquid Gasket
360.3	Bearing Cover-Inner Side
360.2	Bearing Cover-Closed Side
360.1	Bearing Cover-Motor Side
340.1	Bearing Housing
320	Bearing
234	Impeller
225.2	Bearing Ring-External
225.1	Bearing Ring-Internal
210	Shaft
102.2	Cover
102.1	Casing

FIRE PUMPS AND FIRE PUMP SETS

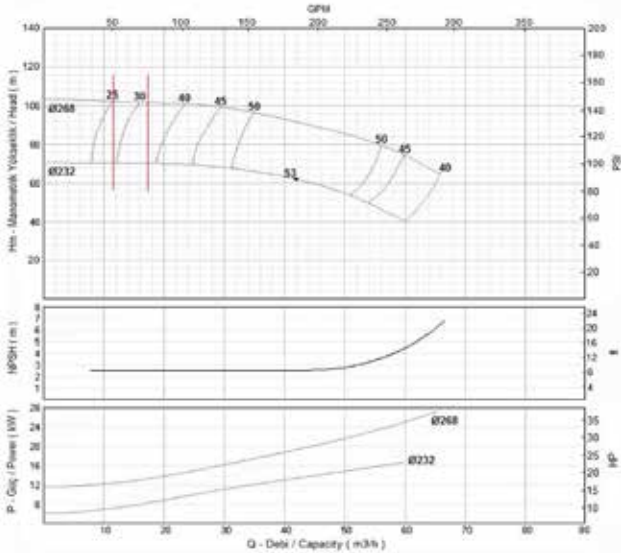
SN-NORM 32/250 (50 GPM)

POMPA KARAKTERİSTİK EĞRİSİ / PUMP CHARACTERISTIC CURVES

$n = 3000 \text{ min}^{-1}$

Emme / Suction: Ø50

Basma / Discharge: Ø32



Pompa performans testleri TS EN ISO 9906 Class 2B'ye göre. /
Pump performance tests according to TS EN ISO 9906 CLASS 2.

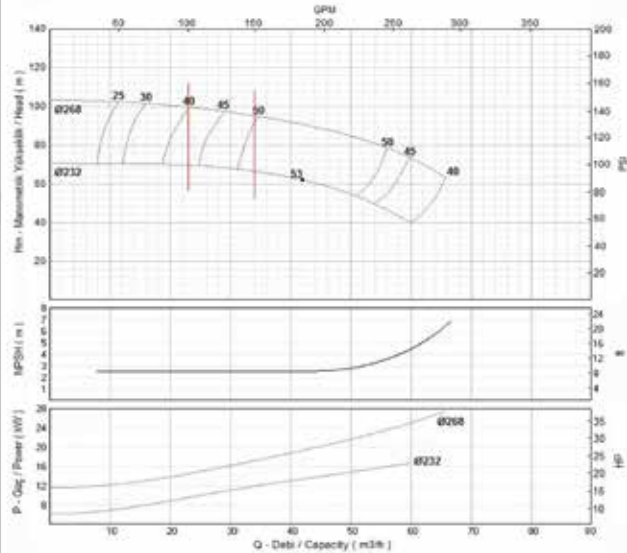
SN-NORM 32/250 (100 GPM)

POMPA KARAKTERİSTİK EĞRİSİ / PUMP CHARACTERISTIC CURVES

$n = 3000 \text{ min}^{-1}$

Emme / Suction: Ø50

Basma / Discharge: Ø32



Pompa performans testleri TS EN ISO 9906 Class 2B'ye göre. /
Pump performance tests according to TS EN ISO 9906 CLASS 2.

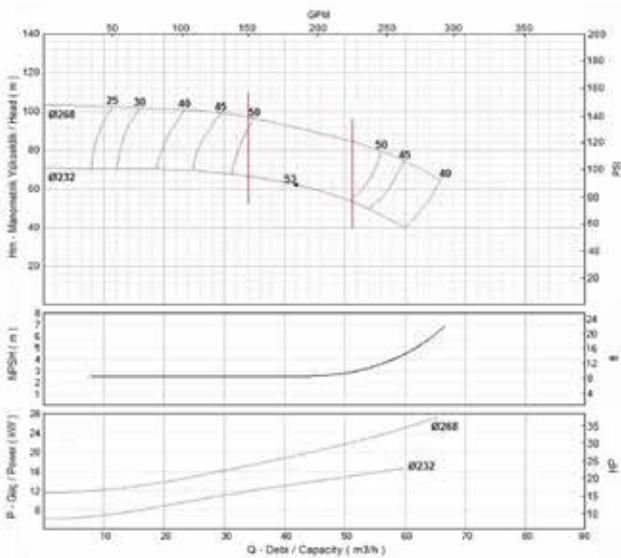
SN-NORM 32/250 (150 GPM)

POMPA KARAKTERİSTİK EĞRİSİ / PUMP CHARACTERISTIC CURVES

$n = 3000 \text{ min}^{-1}$

Emme / Suction: Ø50

Basma / Discharge: Ø32



Pompa performans testleri TS EN ISO 9906 Class 2B'ye göre. /
Pump performance tests according to TS EN ISO 9906 CLASS 2.

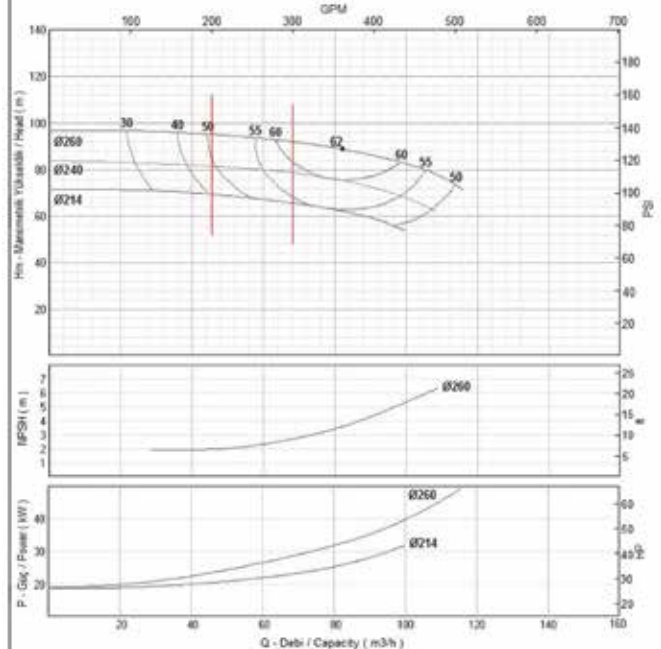
HD-NORM 50/250 (200 GPM)

POMPA KARAKTERİSTİK EĞRİSİ / PUMP CHARACTERISTIC CURVES

$n = 3000 \text{ min}^{-1}$

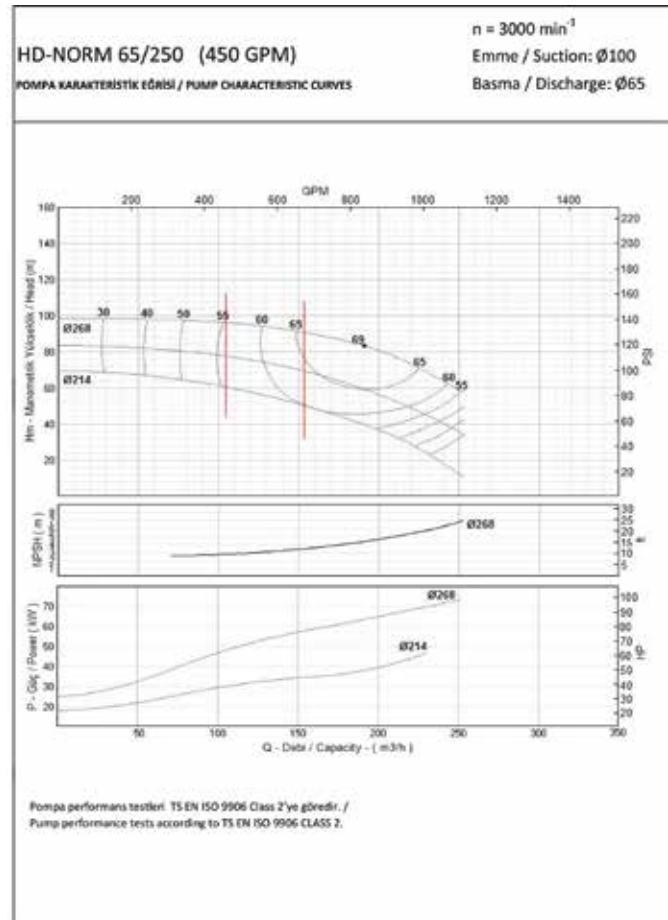
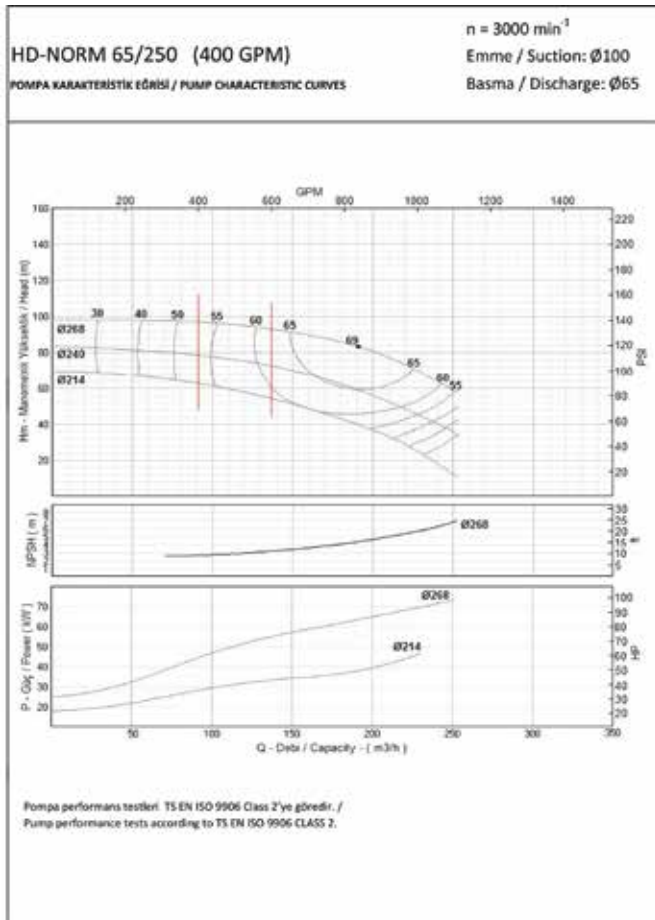
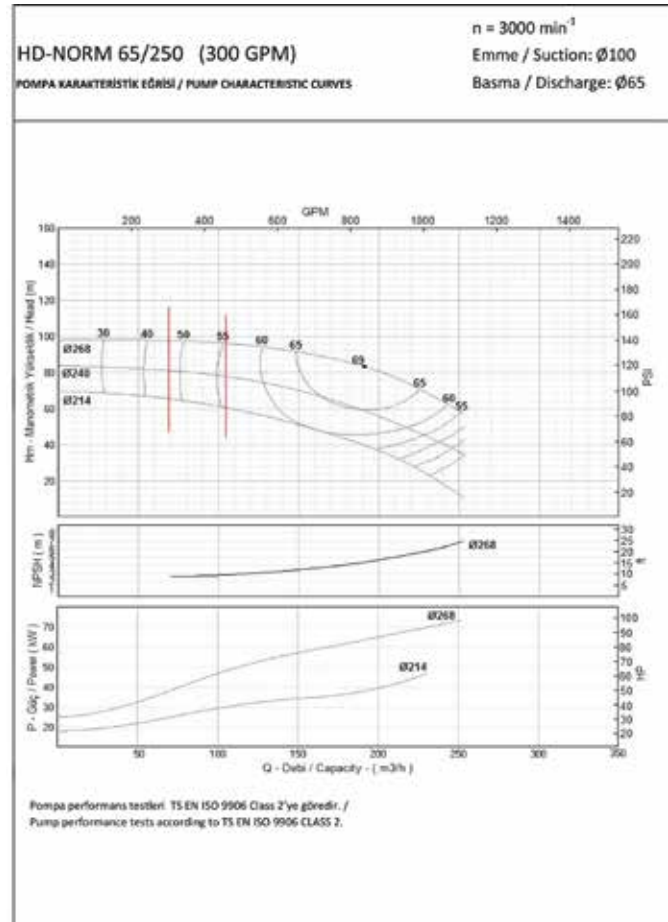
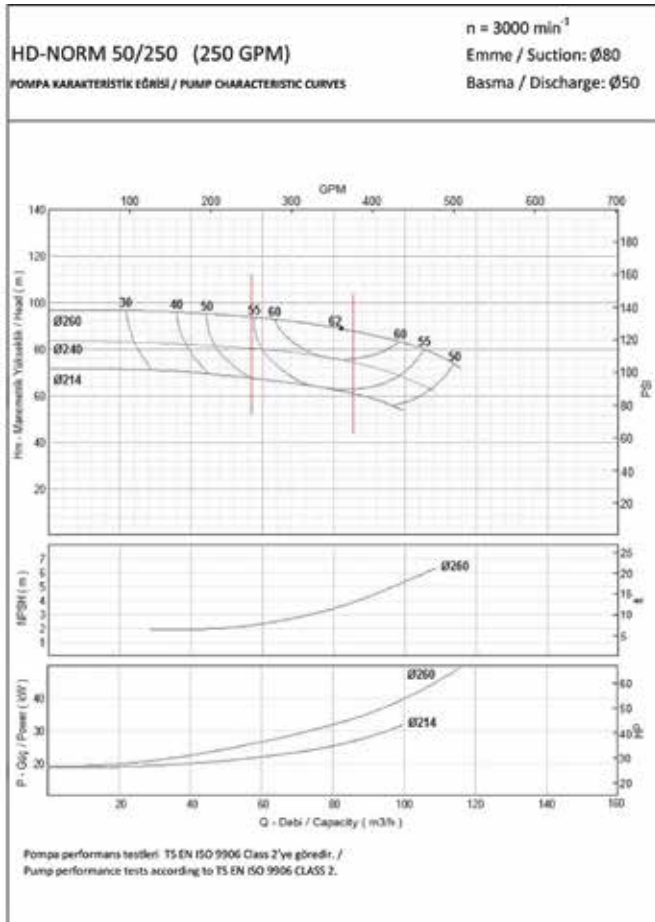
Emme / Suction: Ø80

Basma / Discharge: Ø50

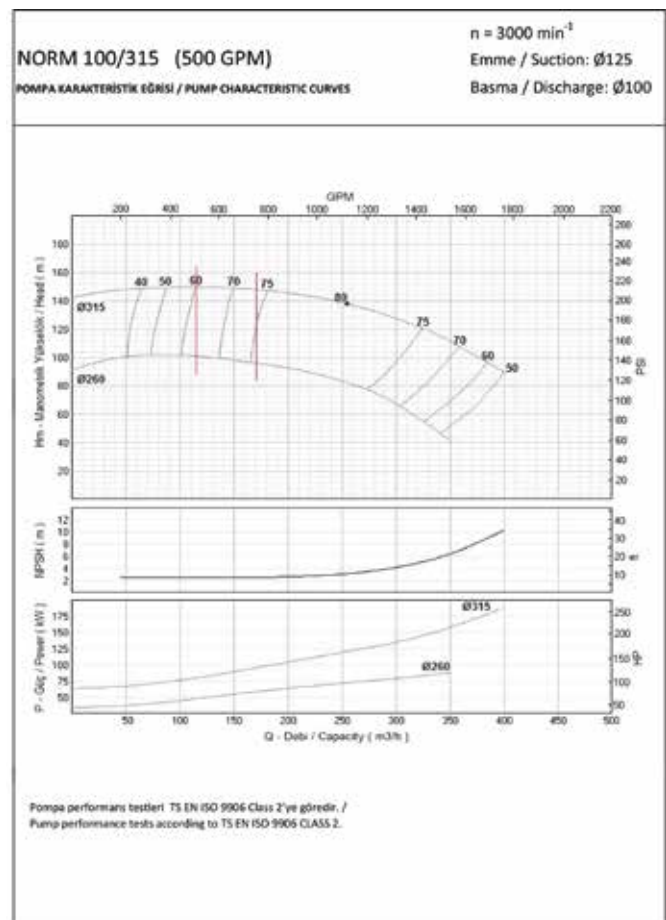
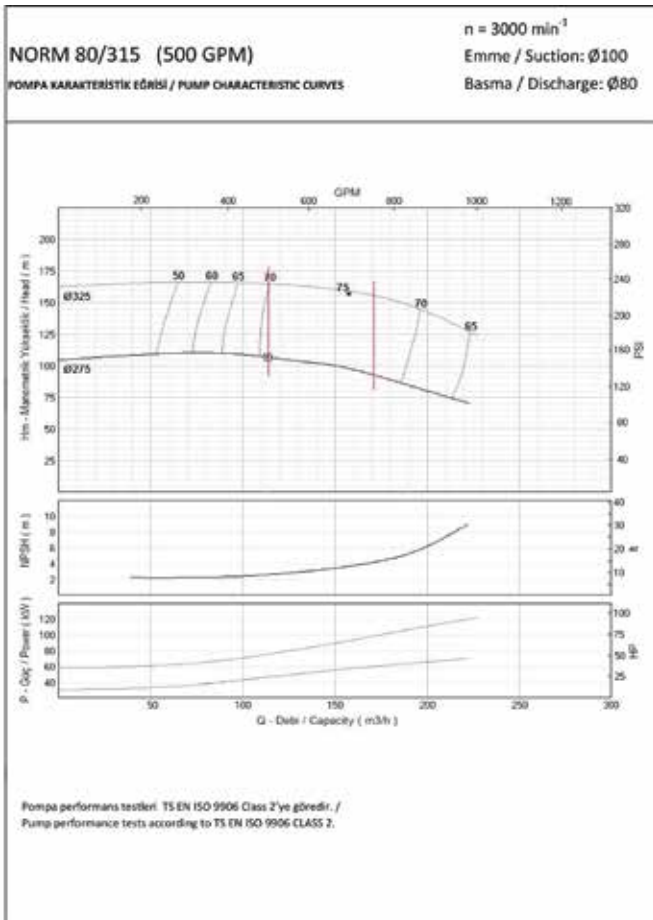
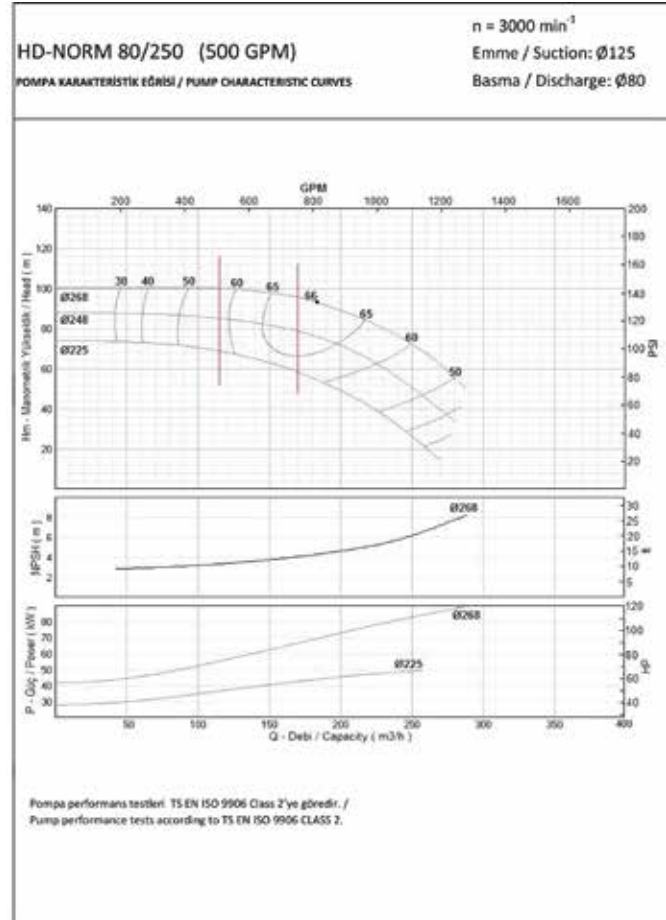
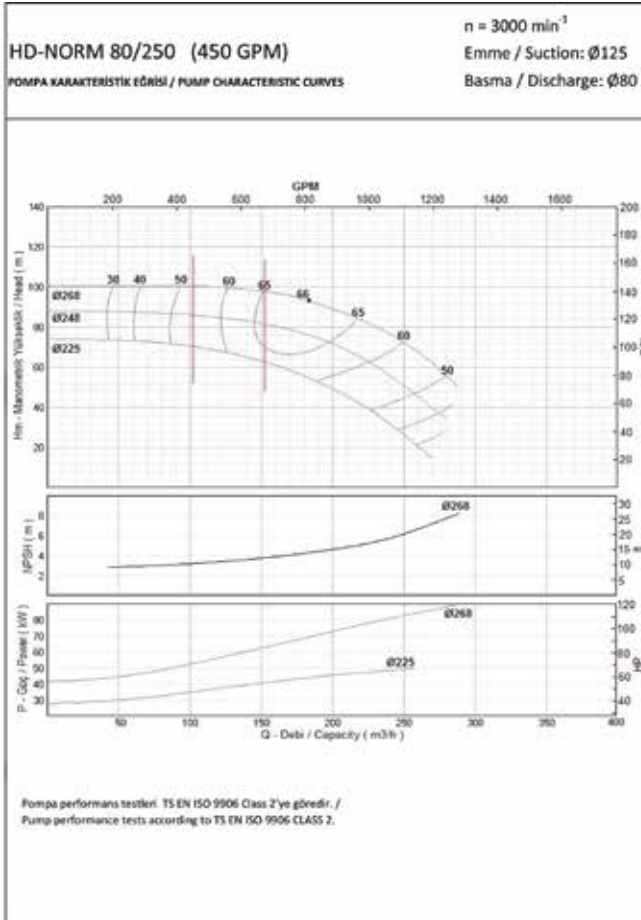


Pompa performans testleri TS EN ISO 9906 Class 2'ye göre. /
Pump performance tests according to TS EN ISO 9906 CLASS 2.

FIRE PUMPS AND FIRE PUMP SETS



FIRE PUMPS AND FIRE PUMP SETS



FIRE PUMPS AND FIRE PUMP SETS

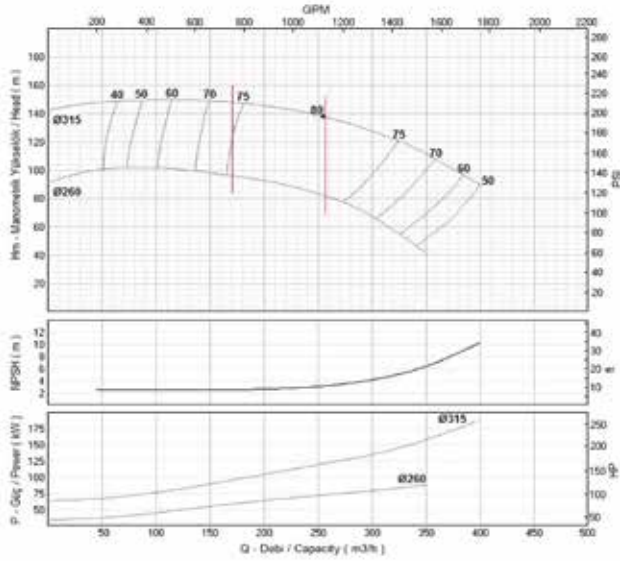
NORM 100/315 (750 GPM)

POMPA KARAKTERİSTİK EĞRİSİ / PUMP CHARACTERISTIC CURVES

$n = 3000 \text{ min}^{-1}$

Emme / Suction: Ø125

Basma / Discharge: Ø100



Pompa performans testleri TS EN ISO 9906 Class 2'ye göre, /
Pump performance tests according to TS EN ISO 9906 CLASS 2.

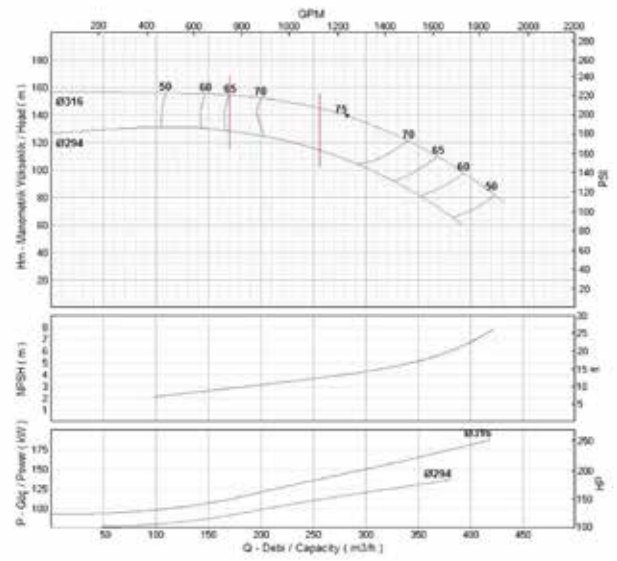
HD-NORM 100/315 (750 GPM)

POMPA KARAKTERİSTİK EĞRİSİ / PUMP CHARACTERISTIC CURVES

$n = 3000 \text{ min}^{-1}$

Emme / Suction: Ø150

Basma / Discharge: Ø100



Pompa performans testleri TS EN ISO 9906 Class 2'ye göre, /
Pump performance tests according to TS EN ISO 9906 CLASS 2.

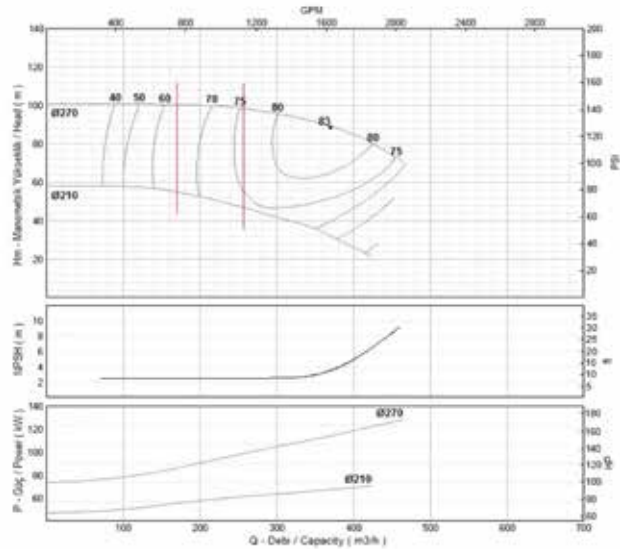
SN-NORM 100/250 (750 GPM)

POMPA KARAKTERİSTİK EĞRİSİ / PUMP CHARACTERISTIC CURVES

$n = 3000 \text{ min}^{-1}$

Emme / Suction: Ø125

Basma / Discharge: Ø100



Pompa performans testleri TS EN ISO 9906 Class 2'ye göre, /
Pump performance tests according to TS EN ISO 9906 CLASS 2.

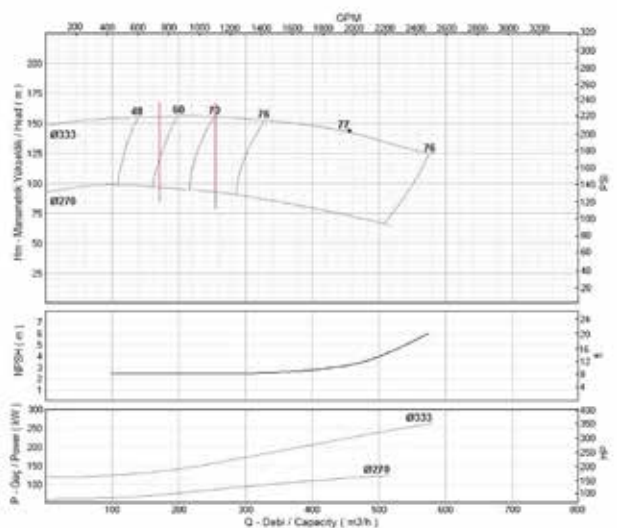
HD-NORM 125/315 (750 GPM)

POMPA KARAKTERİSTİK EĞRİSİ / PUMP CHARACTERISTIC CURVES

$n = 3000 \text{ min}^{-1}$

Emme / Suction: Ø150

Basma / Discharge: Ø125



Pompa performans testleri TS EN ISO 9906 Class 2'ye göre, /
Pump performance tests according to TS EN ISO 9906 CLASS 2.

FIRE PUMPS AND FIRE PUMP SETS

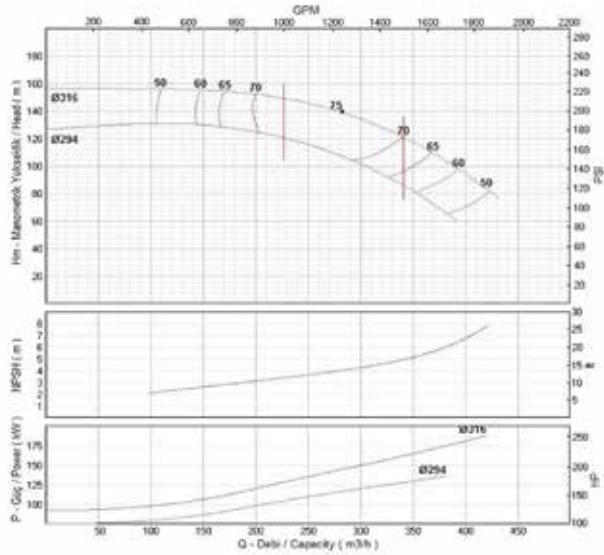
HD-NORM 100/315 (1000 GPM)

POMPA KARAKTERİSTİK EĞRİSİ / PUMP CHARACTERISTIC CURVES

$n = 3000 \text{ min}^{-1}$

Emme / Suction: Ø150

Basma / Discharge: Ø100



Pompa performans testleri TS EN ISO 9906 Class 2'ye göredir. /
Pump performance tests according to TS EN ISO 9906 CLASS 2.

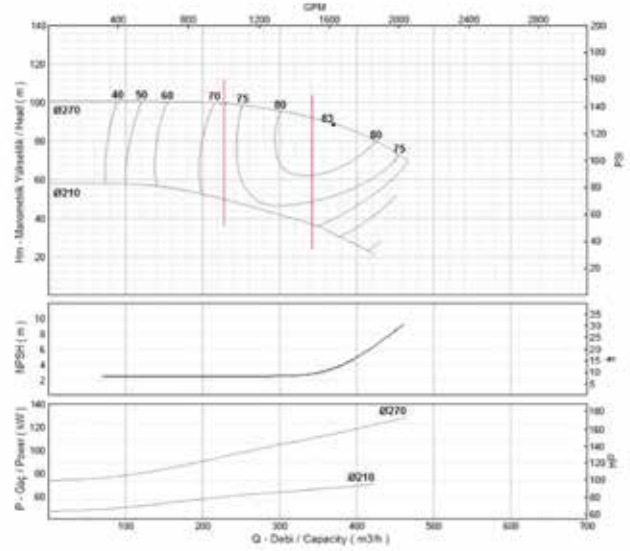
SN-NORM 100/250 (1000 GPM)

POMPA KARAKTERİSTİK EĞRİSİ / PUMP CHARACTERISTIC CURVES

$n = 3000 \text{ min}^{-1}$

Emme / Suction: Ø125

Basma / Discharge: Ø100



Pompa performans testleri TS EN ISO 9906 Class 2'ye göredir. /
Pump performance tests according to TS EN ISO 9906 CLASS 2.

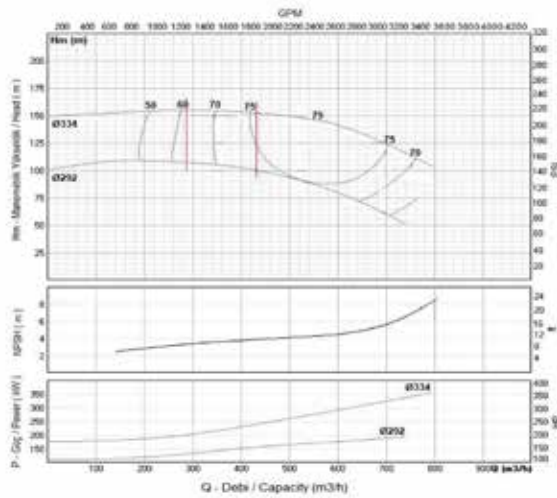
HD-NORM 125/315B (1250 GPM)

POMPA KARAKTERİSTİK EĞRİSİ / PUMP CHARACTERISTIC CURVES

$n = 3000 \text{ min}^{-1}$

Emme / Suction: Ø200

Basma / Discharge: Ø125



Pompa performans testleri TS EN ISO 9906 Class 2B'ye göredir. /
Pump performance tests according to TS EN ISO 9906 CLASS 2B.

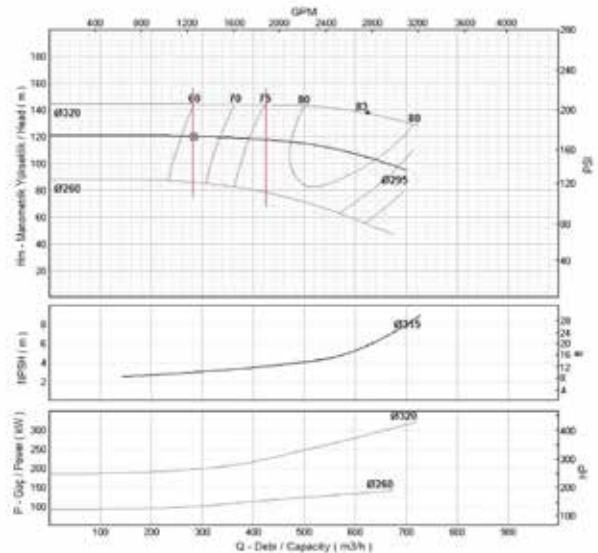
NORM 150/315 (1250 GPM)

POMPA KARAKTERİSTİK EĞRİSİ / PUMP CHARACTERISTIC CURVES

$n = 3000 \text{ min}^{-1}$

Emme / Suction: Ø200

Basma / Discharge: Ø150



Pompa performans testleri TS EN ISO 9906 Class 2'ye göredir. /
Pump performance tests according to TS EN ISO 9906 CLASS 2.

FIRE PUMPS AND FIRE PUMP SETS

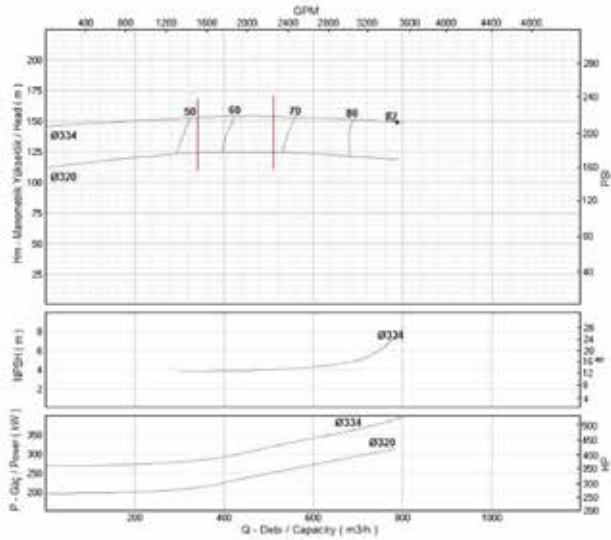
NORM EFF 150/315B (1500 GPM)

POMPA KARAKTERİSTİK EĞRİSİ / PUMP CHARACTERISTIC CURVES

$n = 3000 \text{ min}^{-1}$

Emme / Suction: Ø200

Basma / Discharge: Ø150



Pompa performans testleri TS EN ISO 9906 Class 2'ye göre, /
Pump performance tests according to TS EN ISO 9906 CLASS 2.

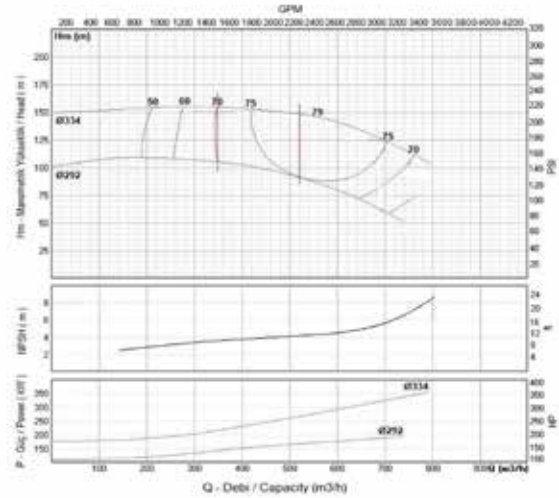
HD-NORM 125/315B (1500 GPM)

POMPA KARAKTERİSTİK EĞRİSİ / PUMP CHARACTERISTIC CURVES

$n = 3000 \text{ min}^{-1}$

Emme / Suction: Ø200

Basma / Discharge: Ø125



Pompa performans testleri TS EN ISO 9906 Class 2B'ye göre, /
Pump performance tests according to TS EN ISO 9906 CLASS 2B.

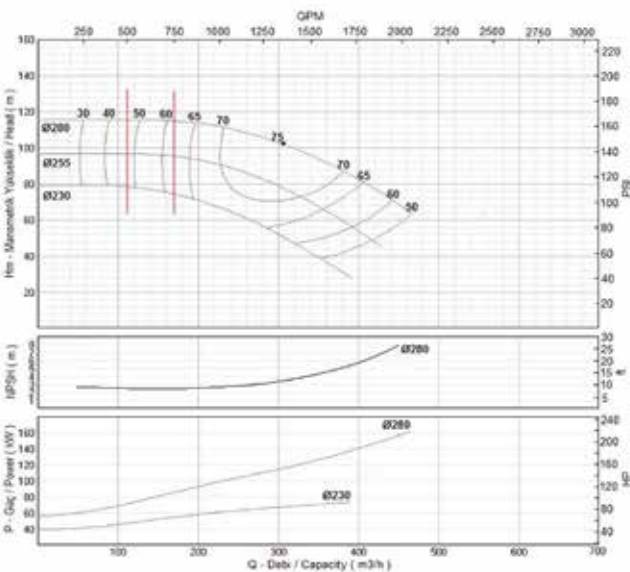
CEP 100/250 (500 GPM)

POMPA KARAKTERİSTİK EĞRİSİ / PUMP CHARACTERISTIC CURVES

$n = 3000 \text{ min}^{-1}$

Emme / Suction: Ø150

Basma / Discharge: Ø100



Pompa performans testleri TS EN ISO 9906 Class 2'ye göre, /
Pump performance tests according to TS EN ISO 9906 CLASS 2.

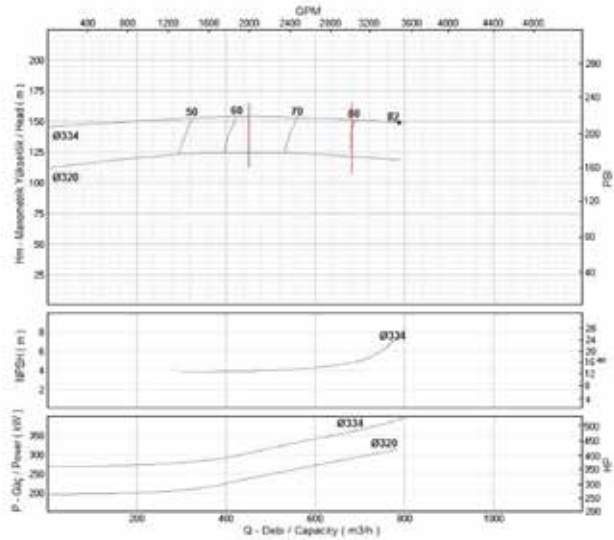
NORM EFF 150/315B (2000 GPM)

POMPA KARAKTERİSTİK EĞRİSİ / PUMP CHARACTERISTIC CURVES

$n = 3000 \text{ min}^{-1}$

Emme / Suction: Ø200

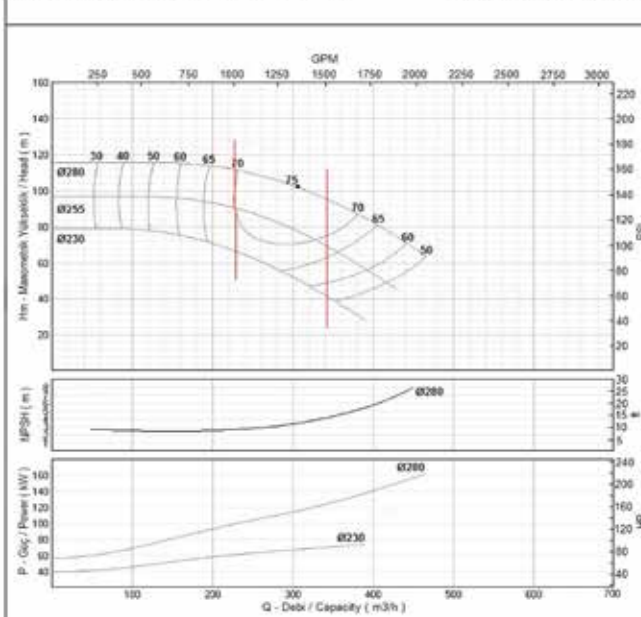
Basma / Discharge: Ø150



Pompa performans testleri TS EN ISO 9906 Class 2'ye göre, /
Pump performance tests according to TS EN ISO 9906 CLASS 2.

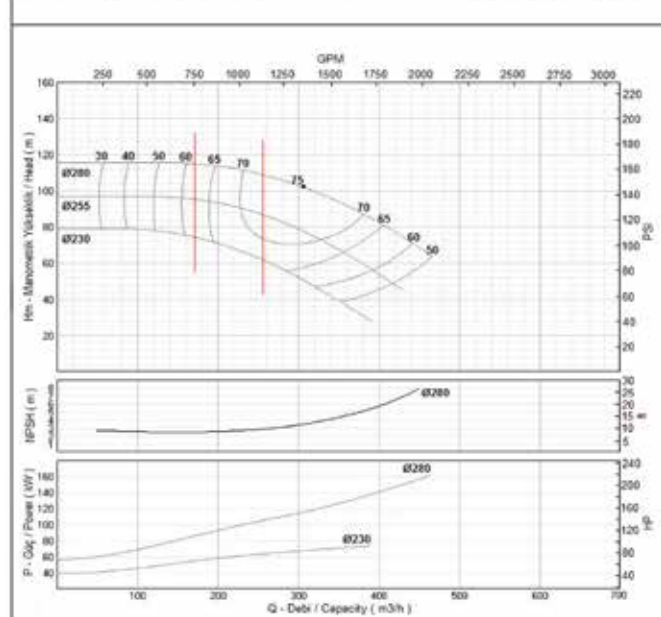
FIRE PUMPS AND FIRE PUMP SETS

CEP 100/250 (1000 GPM) $n = 3000 \text{ min}^{-1}$
Emme / Suction: Ø150
Basma / Discharge: Ø100



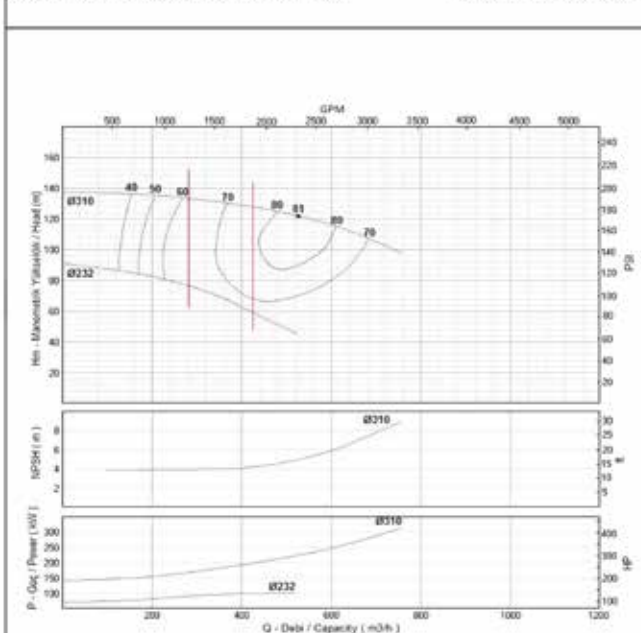
Pompa performans testleri TS EN ISO 9906 Class 2'ye göre /
Pump performance tests according to TS EN ISO 9906 CLASS 2.

CEP 100/250 (750 GPM) $n = 3000 \text{ min}^{-1}$
Emme / Suction: Ø150
Basma / Discharge: Ø100



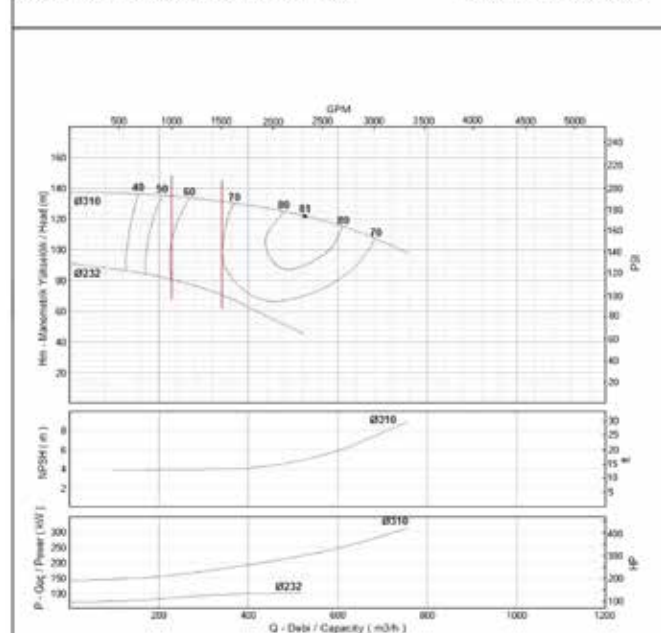
Pompa performans testleri TS EN ISO 9906 Class 2'ye göre /
Pump performance tests according to TS EN ISO 9906 CLASS 2.

CEP-EFF 125/300B (1250 GPM) $n = 3000 \text{ min}^{-1}$
Emme / Suction: Ø200
Basma / Discharge: Ø125



Pompa performans testleri TS EN ISO 9906 Class 2'ye göre /
Pump performance tests according to TS EN ISO 9906 CLASS 2.

CEP-EFF 125/300B (1000 GPM) $n = 3000 \text{ min}^{-1}$
Emme / Suction: Ø200
Basma / Discharge: Ø125



Pompa performans testleri TS EN ISO 9906 Class 2'ye göre /
Pump performance tests according to TS EN ISO 9906 CLASS 2.

FIRE PUMPS AND FIRE PUMP SETS

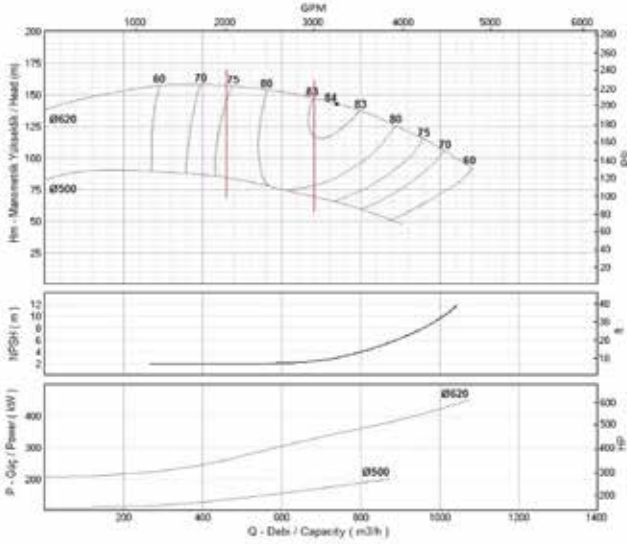
CEP 150/630 (2000 GPM)

POMPA KARAKTERİSTİK EĞRİSİ / PUMP CHARACTERISTIC CURVES

$n = 1500 \text{ min}^{-1}$

Emme / Suction: Ø250

Basma / Discharge: Ø150



Pompa performansı testleri TS EN ISO 9906 Class 2'ye göre yapılır. /
Pump performance tests according to TS EN ISO 9906 CLASS 2.

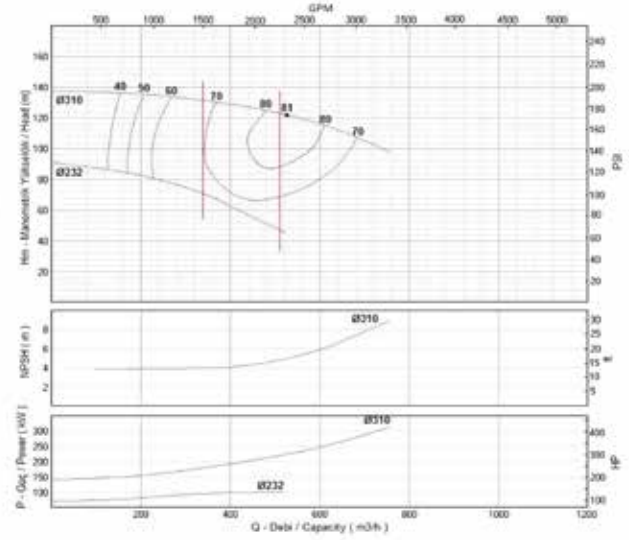
CEP-EFF 125/300B (1500 GPM)

POMPA KARAKTERİSTİK EĞRİSİ / PUMP CHARACTERISTIC CURVES

$n = 3000 \text{ min}^{-1}$

Emme / Suction: Ø200

Basma / Discharge: Ø125



Pompa performansı testleri TS EN ISO 9906 Class 2'ye göre yapılır. /
Pump performance tests according to TS EN ISO 9906 CLASS 2.

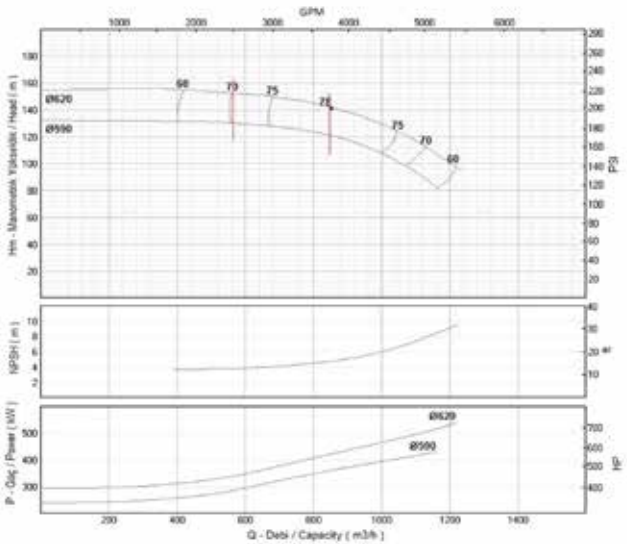
CEP 150/630F (3000 GPM)

POMPA KARAKTERİSTİK EĞRİSİ / PUMP CHARACTERISTIC CURVES

$n = 1500 \text{ min}^{-1}$

Emme / Suction: Ø250

Basma / Discharge: Ø150



Pompa performansı testleri TS EN ISO 9906 Class 2'ye göre yapılır. /
Pump performance tests according to TS EN ISO 9906 CLASS 2.

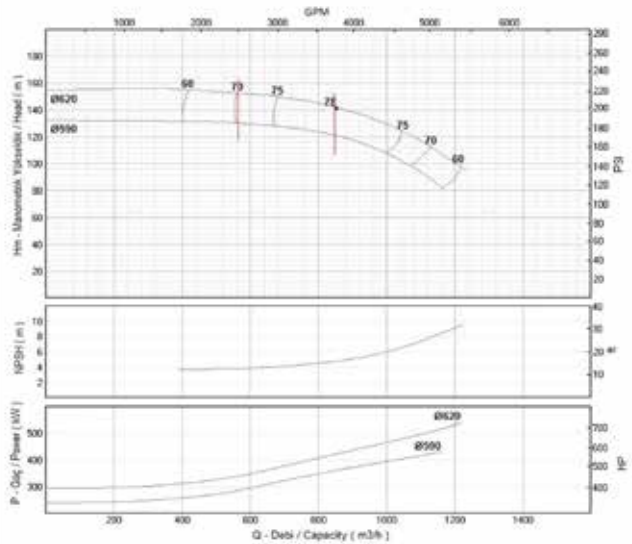
CEP 150/630F (2500 GPM)

POMPA KARAKTERİSTİK EĞRİSİ / PUMP CHARACTERISTIC CURVES

$n = 1500 \text{ min}^{-1}$

Emme / Suction: Ø250

Basma / Discharge: Ø150



Pompa performansı testleri TS EN ISO 9906 Class 2'ye göre yapılır. /
Pump performance tests according to TS EN ISO 9906 CLASS 2.

FIRE PUMPS AND FIRE PUMP SETS

UL LISTED END SUCTION PUMPS FOR 3000 rpm				
NORM Pump Size	Rated Pressure	Electric Motor Rated Power	Diesel Engine	Diesel Engine Rated Power
	(Hm) mwc	(kW)	Model	(kW)
Rated capacity	50 GPM (11,4 m3/h)			
NORM SN 32/250 2" x 1 1/4"	72	11	KA4H-UFKA24	33.5
	80	11	KA4H-UFKA24	33.5
	85	15	KA4H-UFKA24	33.5
	90	15	KA4H-UFKA24	33.5
	95	15	KA4H-UFKA24	33.5
	100	15	KA4H-UFKA24	33.5
Rated capacity	100 GPM (22,7 m3/h)			
NORM SN 32/250 2" x 1 1/4"	72	15	KA4H-UFKA24	33.5
	80	15	KA4H-UFKA24	33.5
	85	18.5	KA4H-UFKA24	33.5
	90	18.5	KA4H-UFKA24	33.5
	95	18.5	KA4H-UFKA24	33.5
	98	18.5	KA4H-UFKA24	33.5
Rated capacity	150 GPM (34,1 m3/h)			
NORM SN 32/250 2" x 1 1/4"	70	18.5	KA4H-UFKA24	33.5
	75	18.5	KA4H-UFKA24	33.5
	80	18.5	KA4H-UFKA24	33.5
	85	22	KA4H-UFKA24	33.5
	90	22	KA4H-UFKA24	33.5
	96	30	KA4H-UFKA24	33.5
Rated capacity	200 GPM (45,4 m3/h)			
HD-NORM 50/250 3" x 2"	70	30	KA4H-UFKA24	33.5
	80	30	KA4H-UFKA24	33.5
	90	30	KA4H-UFKA24	33.5
	95	30	KA4H-UFKA24	33.5
Rated capacity	250 GPM (56,8 m3/h)			
HD-NORM 50/250 3" x 2"	70	30	KA4H-UFKA24	33.5
	80	30	KA4H-UFKA24	33.5
	90	37	KA4H-UFKA24	33.5
	93	37	KA4H-UFKA24	33.5
Rated capacity	300 GPM (68,1 m3/h)			
HD-NORM 65/250 4" x 2 1/2"	65	37	KA4H-UFKA24	33.5
	70	37	KA4H-UFKA24	33.5
	80	45	JU4H-UF04	45
	90	45	JU4H-UF04	45
	95	55	JU4H-UF14	53
Rated capacity	400 GPM (91 m3/h)			
HD-NORM 65/250 4" x 2 1/2"	65	37	JU4H-UF04	45
	70	45	JU4H-UF04	45
	80	45	JU4H-UF04	45
	90	55	JU4H-UF14	53
	95	55	JU4H-UF24	62
Rated capacity	450 GPM (102 m3/h)			
HD-NORM 65/250 4" x 2 1/2"	65	45	JU4H-UF04	45
	70	45	JU4H-UF04	45
	80	55	JU4H-UF14	53
	90	55	JU4H-UF14	53
Rated capacity	450 GPM (102 m3/h)			
HD-NORM 80/250 5" x 3"	72	45	JU4H-UF04	45
	80	45	JU4H-UF04	45
	90	55	JU4H-UF14	53
	100	75	JU4H-UF24	62
Rated capacity	500 GPM (114 m3/h)			
HD-NORM 80/250 5" x 3"	70	45	JU4H-UF04	45
	80	45	JU4H-UF14	53
	90	55	JU4H-UF14	53
	100	75	JU4H-UF24	62
Rated capacity	500 GPM (114 m3/h)			
NORM 80/315 4" x 3"	107	75	JU4H-UF24	62
	110	75	JU4H-UF34	86
	115	75	JU4H-UF34	86
	120	75	JU4H-UF34	86
	125	75	JU4H-UF34	86
	130	75	JU4H-UF34	86
	140	90	JU4H-UF34	86
	150	90	JU4H-UF54	108
	155	110	JU4H-UF54	108
	160	110	JU4H-UF54	108

FIRE PUMPS AND FIRE PUMP SETS

UL LISTED END SUCTION PUMPS FOR 3000 rpm				
NORM Pump Size	Rated Pressure	Electric Motor Rated Power	Diesel Engine	Diesel Engine Rated Power
	(Hm) mwc	(kW)	Model	(kW)
Rated capacity	500 GPM (114 m3/h)			
NORM 100/315 5" x 4"	102	75	JU4H-UF24	62
	110	75	JU4H-UF34	86
	120	75	JU4H-UF34	86
	125	75	JU4H-UF34	86
	130	90	JU4H-UF34	86
	140	90	JU4H-UF34	86
	149	110	JU4H-UF54	108
Rated capacity	750 GPM (170 m3/h)			
NORM SN 100/250 5" x 4"	56	45	JU4H-UF04	45
	65	55	JU4H-UF24	62
	70	75	JU4H-UF24	62
	80	75	JU4H-UF34	86
	90	90	JU4H-UF34	86
	99	90	JU4H-UF54	108
Rated capacity	750 GPM (170 m3/h)			
NORM 100/315 5" x 4"	100	90	JU4H-UF34	86
	110	90	JU4H-UF54	108
	120	110	JU4H-UF54	108
	130	110	JU4H-UF54	108
	140	132	JU6H-UF34	131
	147	132	JU6H-UF34	131
Rated capacity	750 GPM (170 m3/h)			
HD NORM 100/315 6" x 4"	132	132	JU6H-UF34	131
	140	132	JU6H-UF34	131
	150	132	JU6H-UF34	131
Rated capacity	750 GPM (170 m3/h)			
HD-NORM 125/315 6" x 5"	100	110	JU4H-UF54	108
	110	110	JU4H-UF54	108
	120	132	JU6H-UF34	131
	130	132	JU6H-UF34	131
	140	160	JU6H-UF54	161
	150	160	JU6H-UF54	161
Rated capacity	1000 GPM (227 m3/h)			
NORM SN 100/250 5" x 4"	50	55	JU4H-UF14	53
	65	75	JU4H-UF34	86
	70	75	JU4H-UF34	86
	80	90	JU4H-UF34	86
	90	90	JU4H-UF54	108
	98	110	JU4H-UF54	108
Rated capacity	1000 GPM (227 m3/h)			
HD NORM 100/315 6" x 4"	125	160	JU6H-UF54	161
	130	160	JU6H-UF54	161
	140	160	JU6H-UF54	161
	149	160	JU6H-UF54	161
Rated capacity	1250 GPM (284 m3/h)			
HD NORM 125/315B 8" x 5"	111	160	JU6H-UF84	205
	120	200	JU6H-UF84	205
	130	200	JU6H-UF84	205
	140	250		
	150	250		
Rated capacity	1250 GPM (284 m3/h)			
NORM 150/315 8" x 6"	86	132	JU6H-UF34	131
	90	132	JU6H-UF34	131
	100	160	JU6H-UF54	161
	110	160	JU6H-UF54	161
	120	200	JU6H-UF84	205
	130	200	JU6H-UF84	205
	140	250		
Rated capacity	1500 GPM (341 m3/h)			
HD NORM 125/315B 8" x 5"	110	200	JU6H-UF84	205
	120	200	JU6H-UF84	205
	130	250		
	140	250		
	150	250		
Rated capacity	1500 GPM (341 m3/h)			
NORM EFF 150/315B 8" x 6"	130	315		
	140	315		
	150	315		
Rated capacity	2000 GPM (454 m3/h)			
NORM EFF 150/315B 8" x 6"	130	315		
	140	315		
	150	355		

FIRE PUMPS AND FIRE PUMP SETS

UL LISTED SPLIT CASE PUMPS FOR 3000 rpm				
CEP Pump Size	Rated Pressure	Electric Motor Rated Power	Diesel Engine	Diesel Engine Rated Power
	(Hm) mwc	(kW)	Model	(kW)
Rated capacity	500 GPM (114 m3/h)			
CEP 100/250 6" x 4"	80	75	JU4H-UF24	62
	90	75	JU4H-UF34	86
	100	75	JU4H-UF34	86
	110	90	JU4H-UF34	86
Rated capacity	750 GPM (170 m3/h)			
CEP 100/250 6" x 4"	75	75	JU4H-UF34	86
	80	75	JU4H-UF34	86
	90	90	JU4H-UF34	86
	100	90	JU4H-UF54	108
	110	110	JU4H-UF54	108
Rated capacity	1000 GPM (227m3/h)			
CEP 100/250 6" x 4"	70	75	JU4H-UF34	86
	80	90	JU4H-UF54	108
	90	110	JU4H-UF54	108
	100	110	JU4H-UF54	108
	110	132	JU6H-UF34	131
Rated capacity	1000 GPM (227m3/h)			
CEP EFF 125/300B 8" x 5"	80	110	JU4H-UF54	108
	90	110	JU6H-UF34	131
	100	132	JU6H-UF34	131
	110	160	JU6H-UF54	161
	120	160	JU6H-UF54	161
	130	200	JU6H-UF84	205
Rated capacity	1250 GPM (284 m3/h)			
CEP EFF 125/300B 8" x 5"	80	110	JU6H-UF34	131
	90	132	JU6H-UF34	131
	100	160	JU6H-UF54	161
	110	160	JU6H-UF54	161
	120	200	JU6H-UF84	205
	130	200	JU6H-UF84	205
Rated capacity	1500 GPM (341 m3/h)			
CEP EFF 125/300B 8" x 5"	71	110	JU4H-UF54	108
	80	132	JU6H-UF34	131
	90	160	JU6H-UF54	161
	100	160	JU6H-UF54	161
	110	200	JU6H-UF84	205
	125	200	JU6H-UF84	205
UL LISTED SPLIT CASE PUMPS FOR 1500 rpm				
Rated capacity	2000 GPM (454 m3/h)			
CEP 150/630 10" x 6"	90	200	DP6H-UFKAx8	179
	100	200	DQ6H-UFKA98	224
	110	250	DQ6H-UFKA98	224
	120	250	DR8H-UFKA40	287
	130	315	DR8H-UFKA40	287
	140	315	DR8H-UFKA40	287
	150	315	DR8H-UFKA5G	336
Rated capacity	2000 GPM (454 m3/h)			
CEP 150/630 F 10" x 6"	138	355	DR8H-UFKA5G	336
	140	355	DR8H-UFKA5G	336
	149	355	DS0H-UFKA68	389
Rated capacity	2500 GPM (568 m3/h)			
CEP 150/630 F 10" x 6"	136	400	DS0H-UFKA68	389
	140	400	DT2H-UFAA58	522
	148	400	DT2H-UFAA58	522
Rated capacity	3000 GPM (681 m3/h)			
CEP 150/630 F 10" x 6"	135	450	DT2H-UFAA58	522
	140	450	DT2H-UFAA58	522
	149	500	DT2H-UFAA58	522

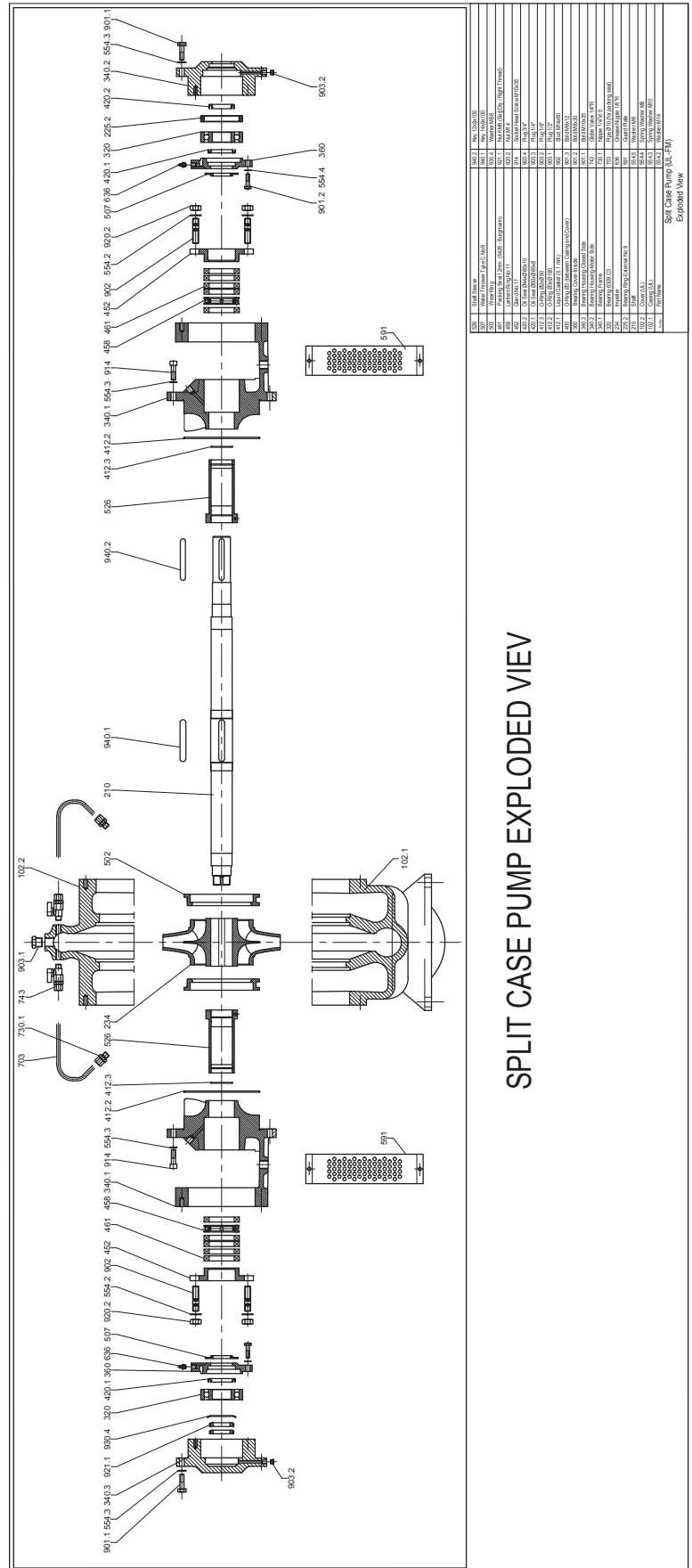
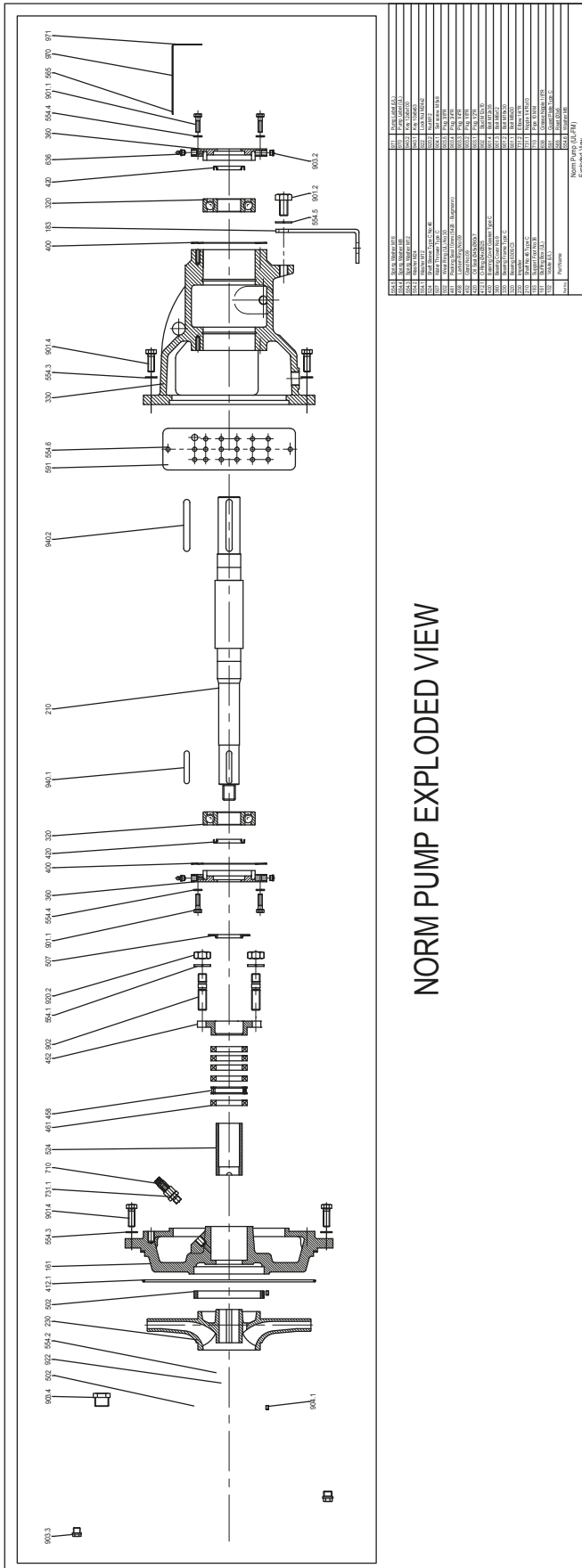
FIRE PUMPS AND FIRE PUMP SETS

QWZU.EX26604 - Centrifugal Fire Pumps, End Suction

Rated Capacity GPM	Size In.	Model Dsg	Rated Net Pressure Range psi	Approx Speed RPM	Max Working Pressure psi
50	1.2x2	NORM SN 32/250	102-145	3000	204
100	1.2x2	NORM SN 32/250	101-142	3000	204
150	1.2x2	NORM SN 32/250	97-137	3000	204
200	2x3	HD-NORM 50/250	99-138	3000	217
250	2x3	HD-NORM 50/250	95-135	3000	217
300	2.5x4	HD-NORM 65/250	92-139	3000	232
400	2.5x4	HD-NORM 65/250	90-138	3000	232
450	2.5x4	HD-NORM 65/250	87-135	3000	232
450	3x5	HD-NORM 80/250	101-146	3000	203
500	3x5	HD-NORM 80/250	99-146	3000	203
500	3x4	NORM 80/315	152-234	3000	270
500	4x5	NORM 100/315	144-213	3000	247
750	4x5	NORM 100/315	137-210	3000	247
750	6x4	NORM HD 100/315	186-217	3000	290
750	4x5	NORM SN 100/250	79-142	3000	189
750	5x6	HD-NORM 125/315	139-222	3000	260
1000	6x4	NORM HD 100/315	177 - 212	3000	290
1000	4x5	NORM SN 100/250	71-140	3000	189
1250	8x6	NORM 150/315	122-204	3000	246
1250	8x5	NORM HD 125/315-B	157-220	3000	259
1500	8x6	NORM EFF 150/315-B	184-217	3000	321
1500	8x5	NORM HD 125/315-B	153-219	3000	259
2000	8x6	NORM EFF 150/315-B	183-216	3000	321

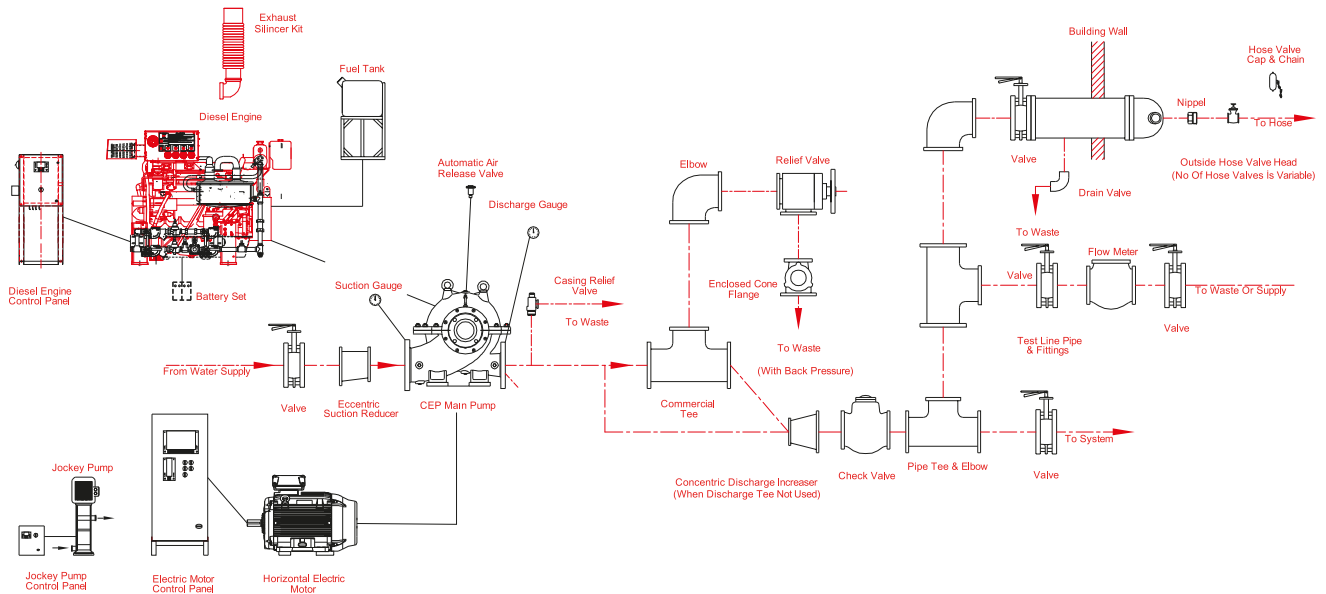
QXJY.EX26605 - Centrifugal Fire Pumps, Split Case

Rated Capacity (gpm)	Size (in.)	Model Dsg	Rated Net Pressure Range (psi)	Approx Speed (rpm)	Max Working Pressure (psi)
500	4x6	CEP 100/250	112-167	3000	232
750	4x6	CEP 100/250	106-167	3000	232
1000	4x6	CEP 100/250	98-162	3000	232
1000	5x8	CEP-EFF 125/300B	110-190	3000	290
1250	5x8	CEP-EFF 125/300B	107-189	3000	290
1500	5x8	CEP-EFF 125/300B	101-185	3000	290
2000	6x10	CEP 150/630	124-222	1500	246
2000	10x6	CEP 150-630-F	195-213	1500	290
2500	10x6	CEP 150-630-F	188-211	1500	290
3000	10x6	CEP 150-630-F	182-213	1500	290

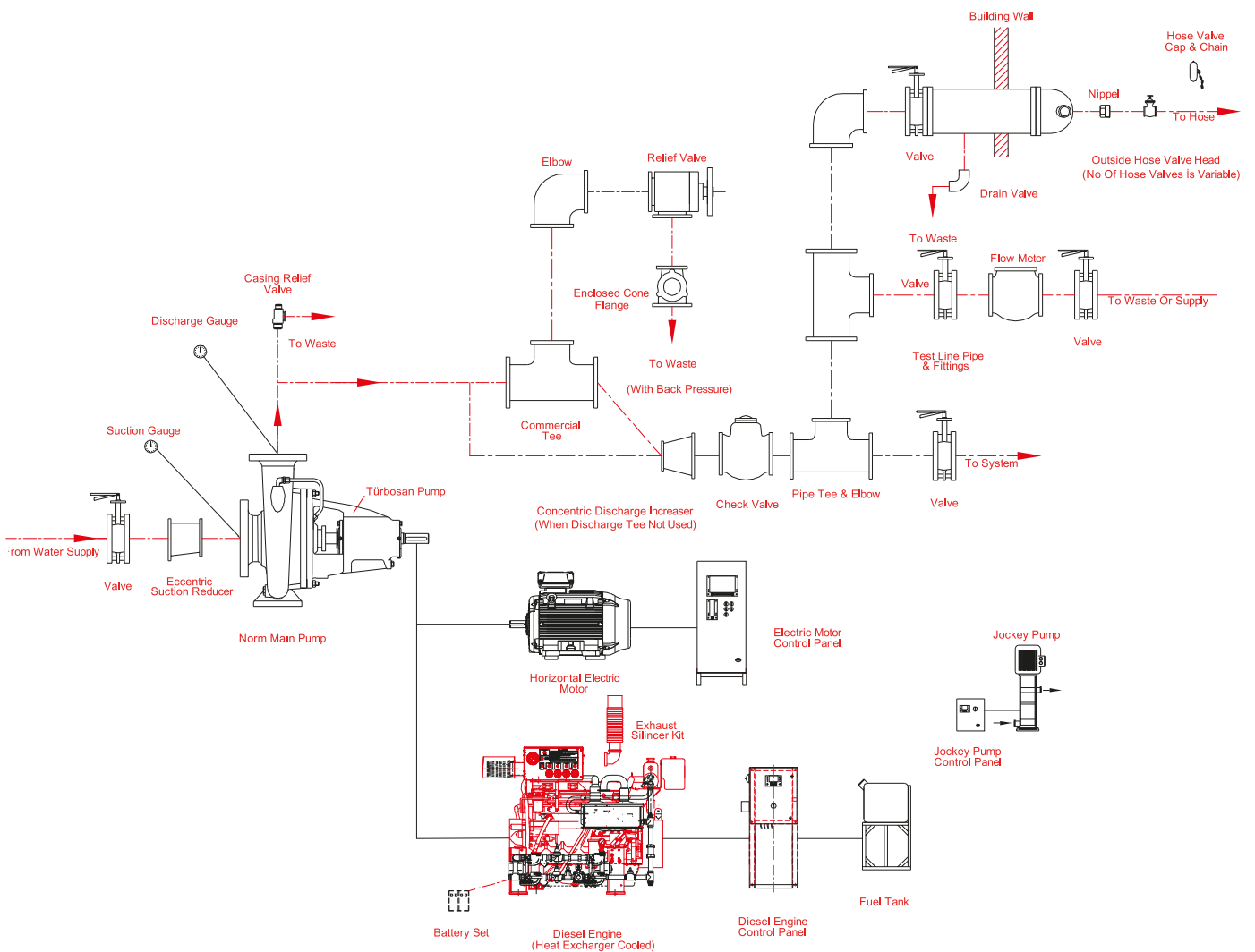


FIRE PUMPS AND FIRE PUMP SETS

CEP Split Case Fire Fighting Pump System Accessories

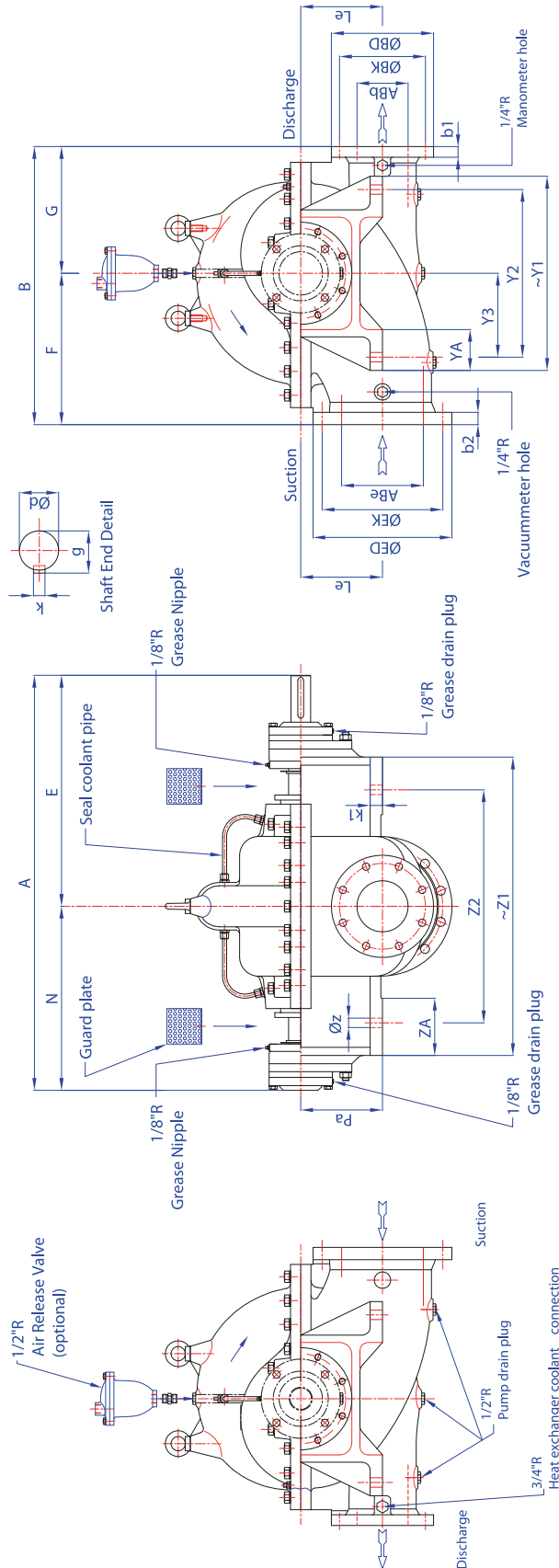


* Norm End Suction Fire Fighting Pump System Accessories



FIRE PUMPS AND FIRE PUMP SETS

UL LISTED CEP PUMPS DIMENSION TABLE



		Basma Flanşı / Discharge Flange														Emme Flanşı / Suction Flange					Mil ucu / Shaft End											
		ABb	ABe	N	E	A	F	G	B	Pa	Le	Z1	Z2	ZA	Y1	Y2	Y3	YA	k1	Øz			ØBD	ØBK	Delik / Hole Adet x Ø / Piece x Ø	b1	ØED	ØEK	Delik / Hole Adet x Ø / Piece x Ø	b2	Ød	k
POMPA MODELİ / PUMP MODEL																																
CEP 100/250	100	150	370	485	855	330	218	548	285	190	325	285	-	325	225	150	95	16	23	279.4	234.95	8xØ22	26	342.9	298.45	8xØ22	30	42	12	45		
CEP-EFF 125/300B	125	200	450	565	1015	370	310	680	200	200	730	570	140	475	410	205	100	30	23	279.4	234.95	8xØ22	26	342.9	298.45	8xØ22	30	48	14	51.5		
CEP 150/630	150	250	555	705	1260	600	450	1050	245	350	864	710	170	500	420	210	115	35	28	318	270	12xØ22	37	406.4	362	12xØ26	30	62	18	66		
CEP 150/630F	150	250	555	705	1260	600	450	1050	245	350	864	710	170	500	420	210	115	35	28	318	270	12xØ22	37	406.4	362	12xØ26	30	65	18	69		

NOT: CEP 100/250, CEP -EFF 125/300B Pompaların emme flanşı ANSI/ASME 16.1 Class 125, basma flanşı ANSI/ASME 16.1 Class 250'e göre imal edilir.

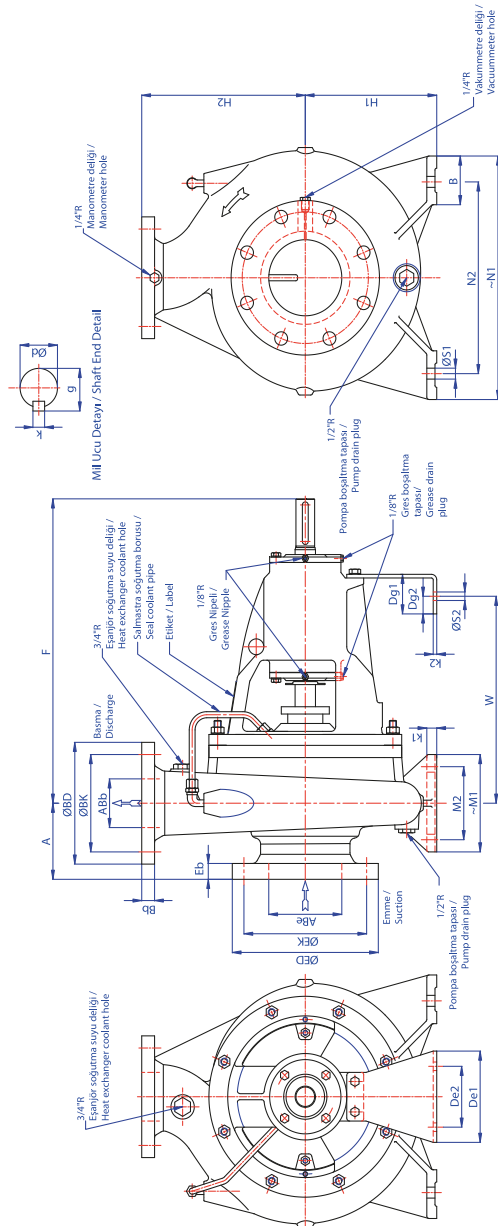
CEP 150/630, CEP 150/630F Pompaların emme flanşı ANSI/ASME 16.1 Class 150, basma flanşı ANSI/ASME 16.1 Class 300'e göre imal edilir.

NOTE: Suction flange of Cep 100/250, Cep-EFF 125/300B pumps are according to ANSI/ASME 16.1 Class 125 , discharge flange are according to ANSI/ASME 16.1 Class 250.

Suction flange of Cep 150/630, Cep 150/630F pumps are according to ANSI/ASME 16.1 Class 150 , discharge flange is according to ANSI/ASME 16.1 Class 300.

FIRE PUMPS AND FIRE PUMP SETS

UL LISTED NORM PUMPS DIMENSIONS TABLE



	Basma Flanşı / Discharge Flange																	Emme Flanşı / Suction Flange						Mil Ucu / Shaft End							
	ABb	ABe	A	F	H1	H2	M1	M2	N1	N2	k1	ØS1	De1	De2	Dg1	k2	ØS2	ØBD	ØBK	Delik Hole	AdetxØ / Piece x Ø	Bb	ØED		ØEK	Delik Hole	AdetxØ / Piece x Ø	Eb	Ød	k	g
POMPA MODELİ / PUMP MODEL																															
NORM SN 32/250	32	50	100	470	180	225	125	95	320	250	18	12	130	100	65	29	6	14	117	89	4xØ16	13	152.4	120	4xØ20	16	32	10	35		
HD-NORM 50/250	80	50	125	360	180	225	125	95	320	250	18	14	110	80	50	24	6	14	152.4	120	4xØ20	16	190.5	152.4	4xØ20	20	24	8	27		
HD-NORM 65/250	65	100	125	470	200	250	160	120	360	280	18	18	150	100	65	35	6	14	177.8	139.7	4xØ20	20	228.6	190.5	8xØ20	22	32	10	35		
HD-NORM 80/250	80	125	125	500	225	280	160	120	400	315	17	18	150	100	65	35	6	14	190.5	152.4	4xØ20	22	254	215.9	8xØ20	24	32	10	35		
NORM 80/315	80	100	125	525	250	315	160	120	400	315	19	18	150	100	65	29	6	14	210	168.5	8xØ22	29	228.6	190.5	8xØ20	24	42	12	45		
SN-NORM 100/250	100	125	140	530	225	280	160	120	400	315	20	18	150	100	65	29	6	14	228.6	190.5	8xØ20	24	254	215.9	8xØ22	24	38	10	41		
NORM 100/315	100	125	140	530	250	315	160	120	400	315	18	18	150	100	65	29	6	14	254	200	8xØ22	32	255	216	8xØ22	24	38	10	41		
HD NORM 100/315	100	150	140	530	250	315	160	120	400	315	18	18	150	100	65	29	6	14	254	200	8xØ22	32	279.4	241.3	8xØ22	25	38	10	41		
HD-NORM 125/315	125	150	140	580	280	355	200	150	500	400	24	23	150	100	65	29	6	14	279.4	235	8xØ22	35	279.4	241.3	8xØ22	25	48	14	51.5		
HD-NORM 125/315B	125	200	160	580	280	355	200	150	500	400	24	23	150	100	65	29	6	14	279.4	235	8xØ22	35	343	298.5	8xØ22	26	48	14	51.5		
NORM 150/315	150	200	160	580	280	400	200	150	550	450	24	23	150	100	65	29	6	14	317.5	270	12xØ22	37	343	298.5	8xØ22	26	48	14	51.5		
NORM EFF 150/315B	150	215	160	595	315	400	200	150	550	450	24	23	200	150	85	42	8	23	317.5	270	12xØ22	37	343	298.5	8xØ22	26	48	14	51.5		

NOT: HD-NORM 50/250, HD-NORM 65/250, HD-NORM 80/250 pompaların emme ve basma flanşları ANSI/ASME 16.1 Class 125'e göre imal edilmektedir.

SN-NORM 32/250, SN-NORM 100/250 pompaların emme ve basma flanşları ANSI/ASME 16.1 Class 150'e göre imal edilmektedir.

SN-NORM 32/250, SN-NORM 100/250 pompaların emme ve basma traşları ANSI/ASME 16.1 Class 150 e göre imal edilmiştir.

Emme flanşları ANSI/ASME 16.1 Class 150 ve basma flanşları ANSI/ASME 16.1 Class 300'e göre imal edilmektedir.

NOTE: Suction and Discharge flanges of HD-NORM 50/250, HD-NORM 65/250, HD-NORM 80/250 pumps are according to ANSI/ASME 16.1 Class 125.

Suction and Discharge flanges of SN-NORM 32/250, SN-NORM 100/250 pumps are according to ANSI/ASME 16.1 Class 150. Suction and Discharge flanges of HD-NORM 50/250, HD-NORM 65/250, HD-NORM 80/250 pumps are according to ANSI/ASME 16.1 Class 150.

Suction and discharge flanges of 316-NORM 52/250, 316-NORM 100/250 pumps are according to ANSI/ASME B6.1 Class 150.

Suction flanges of NORM 80/315, NORM 100/315, HD-NORM 100/315, HD-NORM 125/315, HD-NORM 125/315B, NORM 150/315, NORM EFF 150/315

Compu-mats are according to ANSI/ASME 16.1 Class 150 and Discharge flanges are according to ANSI/ASME 16.1 Class 300.

FIRE PUMPS AND FIRE PUMP SETS



TURBOSAN FM APPROVED FIRE PUMP SETS



FM Approved pumps cannot be delivered as bare-shaft pumps. Pump, diesel engine, electric motor and controller should be delivered as a fire fighting pump set.

The controller and the diesel engine have to be FM Approved, the rest of the components of the set can be either FM Approved or not. FM does not have a standard for electric motors used in fire pumps, therefore there is no FM Approved electric motor.



TURBOSAN Model End Suction Pump		Q (Capacity)		Hm (Head)			Speed n	Max Working Pressure	Impeller Diameter Maximum / Minimum		Suction Inlet Diameter		Discharge Outlet Diameter	
	Product	GPM	m3/h	psi	min. mwc	max. mwc	rpm	psi	mm	mm	inc	mm	inc	mm
1	HD-NORM 65/250	300	68,1	79-139	55,5	97,7	2980	232	Ø268	Ø214	Ø4	Ø100	Ø2,5	Ø65
2	HD-NORM 65/250	400	91	75-137	52,7	96,3	2980	232	Ø268	Ø214	Ø4	Ø100	Ø2,5	Ø65
3	HD-NORM 65/250	450	102	73-136	51,3	95,6	2980	232	Ø268	Ø214	Ø4	Ø100	Ø2,5	Ø65
4	HD-NORM 80/250	400	91	95-149	66,8	104,7	2980	203	Ø268	Ø225	Ø5	Ø125	Ø3	Ø80
5	HD-NORM 80/250	450	102	95-148	66,8	104	2980	203	Ø268	Ø225	Ø5	Ø125	Ø3	Ø80
6	HD-NORM 80/250	500	114	94-148	66,1	104	2980	203	Ø268	Ø225	Ø5	Ø125	Ø3	Ø80
7	NORM SN 100/250	500	114	87-144	61,2	101,2	2980	189	Ø270	Ø220	Ø5	Ø125	Ø4	Ø100
8	NORM SN 100/250	750	170	83-144	58,3	101,2	2980	189	Ø270	Ø220	Ø5	Ø125	Ø4	Ø100
9	NORM SN 100/250	1000	227	79-141	55,5	99,1	2980	189	Ø270	Ø220	Ø5	Ø125	Ø4	Ø100

TURBOSAN FUEL TANKS

FUEL TANKS;

Turbosan diesel fuel tanks are authorized as UL Listed under File number MH63963.

SPECIFICATIONS:

- In compliance with UL 142 and NFPA 30 standards.
- Sized as specified by NFPA 20 for fire pump applications.
- Designed and manufactured in accordance with UL 142 (Steel Aboveground Tanks for Flammable and Combustible Liquids) standard.
- Manufactured, inspected and tested against leakage before the shipment.
- Top quality fittings and fabrication materials.
- Sturdy lifting lug and support legs.
- Carbon steel body
- Carbon steel tanks with RAL 3020 painted surface.
- High grade of welding process to sustain the quality of each tank.
- Fuel level can be viewed with tank level indicator.
- Vent opening to prevent build-up of pressure or vacuum inside the tank during filling, emptying or due to atmospheric temperature changes.



TANK DIMENSIONS			
CAPACITY (LITERS)	DIA (D) mm	LENGTH (L) mm	WIDTH (W) mm
300	600	1120	430
610	800	1270	560
910	1000	1220	750
1260	1000	1650	750

ACCESORIES			
ITEM	DESCRIPTION	MATERIAL	QTY
1	1 1/2" TANK LEVEL INDICATOR	PLASTIC	1
2	2 1/4" FILLING COVER	CARBON STEEL	1
3	1" AIR VENTILLATION COVER	CARBON STEEL	1
4	1/4" FUEL RETURN PIPE CONNECTION JOINT	CARBON STEEL	1
5	3/8" NPT BALL VALVE	BRASS	1
6	1/2" NPT PLUG	CARBON STEEL	1

CERTIFICATES





KALİTE YÖNETİM SİSTEMİ BELGESİ

QUALITY MANAGEMENT SYSTEM CERTIFICATE

TÜRK STANDARDLARI ENSTİTÜSÜ
bu belge ile

TÜRODAN TÜRBO MAKİNALAR SAN. VE TİC. A.Ş.
MACHINE HİTİTAS ÜSRİ 5. CAD. NO:33 DİLOVASI
KOCATEPE / TÜRKİYE



TURKISH STANDARDS INSTITUTION
hereby certifies that the organization

TÜRODAN TÜRBO MAKİNALAR SAN. VE TİC. A.Ş.
MACHINE HİTİTAS ÜSRİ 5. CAD. NO:33 DİLOVASI
KOCATEPE / TURKEY

kuruluşunun TS EN 9001:2015 şartlarına uygun bir KALİTE YÖNETİM SİSTEMİNE sahip olduğunu onaylar.

has a QUALITY MANAGEMENT SYSTEM which fulfills the requirements of the TS EN ISO 9001:2015

Belge No / Certificate No
KY-150-03KRC-94009-R-16

Belge Tarihi / Date of Certificate
20.09.2021

Geçerlilik Süresi / Valid Until
24.10.2024

Renkleyen Tarafı / Date of Renovation
19.05.1994

Scope of the certificate is given in annex

TÜRK STANDARDLARI ENSTİTÜSÜ
TURKISH STANDARDS INSTITUTION

İstanbul Belgelendirme Müdürlüğü
İstanbul Certification Manager

Ahmet Kurt Kurt

Belge kapsamı Ek'te verilmiştir

Türk Standardları Enstitüsü, Türk Akademi Kurumu TÜRKAK tarafından akredite edilmiştir.
Turkish Standards Institution, has been accredited by the Turkish Accreditation Agency TÜRKAK.

Belge kapsamı Ek'te verilmiştir

Türk Standardları Enstitüsü, Türk Akademi Kurumu TÜRKAK tarafından akredite edilmiştir.
Turkish Standards Institution, has been accredited by the Turkish Accreditation Agency TÜRKAK.




KALİTE YÖNETİM SİSTEMİ BELGESİ
QUALITY MANAGEMENT SYSTEM CERTIFICATE
EX / APPENDIX

Belge No / Certificate No: KY-134-03/KG-94/09-1115

Belget Kurulu Adı, Adresi:

Name and Address of the Certified Organization:

Belge Tarihi / Date of Certificate: 30.09.2021

TÜRKİSAN TÜRBO MAKİNALAR SAN. VE TİC. A.Ş.

MAKİNE İHTİSAS ÜSB 5. CAD. NO:33 DİLOVAŞI KOCATEPE / TÜRKİYE



Scope of the Certificate:
TS EN ISO 9001:2015

DESIGN AND PRODUCTION OF

- CENTRIFUGAL PUMPS FOR CLEAN/WASTE WATER, HORIZONTAL/VERTICAL AXLE, SINGLE/MULTI STAGE, SINGLE/DOUBLE SUCTION
- SUBMERSIBLE PUMPS FOR CLEAN/WASTE WATER, HORIZONTAL/VERTICAL AXLE
- PUMP ASSEMBLY
- HORIZONTAL EKS (EKS) SERIES AXIAL/MIXED FLOW PUMPS
- CHEMICAL PROCESS SERIES PUMPS
- API 610 COMPLYING PETROCHEMICAL PUMPS
- HOT WATER PUMPS
- UL LISTED FIRE PUMPS

SINCE 26.12.2019;

UL LISTED FIRE PUMPS

Belge Kapsamı:

TS EN ISO 9001:2015

- SANTRİFÜL POMPALAR (TEMİZ/PSİ SU İÇİN, YATAY/DİŞEY MİLLİ, TEK/ÇOK KADEMELİ, TEK/ÇİFT EMİSLİ)

- DALGİÇ POMPALAR (TEMİZ/PSİ SU İÇİN, YATAY/DİŞEY MİLLİ)

- BÜRGÜLLÜ POMPALAR

- 26.12.2019 TARIHİNDEN İTİBAREN;

- UL LISTED FİRE PUMPS (EKS) KOLON BÜKÜLLÜ POMPALAR

- KİMYASAL PROSES POMPALAR

- API 610A UYGUN POMPALAR

- SICAK SU POMPALARI

- UL LISTED YANGIN POMPA GRUPLARI

- TASARIM VE ÜRETİMİ



TÜRK STANDARLARINA UYGUNLUK BELGESİ TURKISH STANDARDS INSTITUTION CERTIFICATE OF CONFORMANCE TO TURKISH STANDARDS	
Markanın Tanıtma TSE	Description of the Mark TSE
BELGE NUMARASI REFERENCE NUMBER OF LICENCE BELGENİN İLK YERİLİŞ TARİHİ DATE OF FIRST ISSUE OF LICENCE BELGENİN SON GEÇERLİLİK TARİHİ LICENCE VALID UNTIL BELGE SAHİBİ KURULUŞUN ADI NAME OF THE LICENCE HOLDER BELGE SAHİBİ KURULUŞUN ADRESİ ADDRESS OF THE LICENCE HOLDER ÜRETİM YERİ ADI NAME OF THE MANUFACTURING PLACE ÜRETİM YERİ ADRESİ ADDRESS OF THE MANUFACTURING PLACE İPTAL EDİLEN BELGE NUMARASI (Varsa) INDICATION OF SUPERSEDED LICENCE (if any) İLGİLİ TİCARİ MARKASI REGISTERED TRADE MARK İLGİLİ TÜRK STANDARDI RELATED TURKISH STANDARD BELGE KAPSAMI SCOPE OF LICENCE	003960-TSE-03/02 24.04.2005 11.11.2022 TURBOSAN TURBOMAKİNALARI SANAYİ VE TİCARİET ANONİM ŞİRKETİ MAKİNE İHTİŞAS O.S.B. 5. CADDE NO-33 DİLOVAŞI KOCAELİ/TURKİYE TURBOSAN TURBO MAKİNALARI SAN. VE TİC. A.Ş. MAKİNE İHTİŞAS ORGANİZE SANAYİ BÖLGESİ 5 CADDE NO-33 DİLOVAŞI 41455 KOCAELİ / TURKİYE 003960-TSE-03/01 Şekil + TurboSan TS 12599 / 12.04.1999

e-imzalı-signed

08.10.2021

Belgeİmleme Merkezi Başkanı Adına
AHMET NURSI KARTAL

TSE İSTANBUL BELGEİMDİRME MÜDÜRÜ

*Bu belge, belge sahiplerine, sadece verilen belgelerin kullanılmasını amaçlayan bir araçtır ve diğer amaçlarla kullanılması yasaktır.

*This licence is for specific stated addresses. It is not valid for other addresses without prior approval. It is not valid for other purposes.

*TSE İSTANBUL BELGEİMDİRME MERKEZİ BAŞKANLIĞI Adres: Necatibey Cad. No:112/06100 Beşiktaş/İSTANBUL - Telefon: 0 312 416 68 11 / 416 68 27 - Faks:0 312 416 66 17 - E-posta: tse@tse.org.tr - Web: www.tse.org.tr

*TSE BELGEİMDİRME MERKEZİ BAŞKANLIĞI Adres: Necatibey Cad. No:112/06100 Beşiktaş/İSTANBUL - Telefon: 0 312 416 68 11 / 416 68 27 - Faks:0 312 416 66 17 - E-posta: tse@tse.org.tr - Web: www.tse.org.tr



Certificate

TÜRBOSAN TÜRBOMAKİNALAR SANAYİ VE TİCARET ANONİM ŞİRKETİ

MAKİNE İHTİSAS ORG. SAN. BÖL. 5. CAD. NO:33
DİLOVASI / KOCAELİ / TÜRKİYE

Has been assessed and found to Comply with the Requirements of:

ISO 17025:2017

The General Requirements For The Competence Of Testing And Calibration Laboratories Is Applicable To:

**DESIGN, MANUFACTURING, SALES, SERVICE, PROJECT AND ENGINEERING
SERVICES OF HORIZONTAL AND VERTICAL PUMPS, SINGLE AND MULTI STAGE
PUMPS, HORIZONTAL AND VERTICAL DOUBLE SUCTION CENTRIFUGAL PUMPS,
SUBMERSIBLE PUMPS, NON-CLOGGING SUBMERSIBLE PUMPS, HORIZONTAL AND
VERTICAL SEWAGE AND DRAINAGE PUMPS, AXIAL AND MIXED CURRENT PUMPS,
TWIST PUMPS, TURBINE, FIRE PUMPS AND FIRE PUMP SYSTEMS, BOOSTER PUMPS,
AND BOOSTER SYSTEMS**

Certificate No: ISO/22614 Date of Issue: 30.11.2020 1st Surveillance Audit : November 2021 2nd Surveillance Audit : November 2022	Date of Certification Audit: 23.11.2020 Date of Expiry: 29.11.2021
---	--



OCs International Certifications Services Pte. Ltd
Certificate of Validity Information: E-mail: info@ocscert.com
mail to: cert@ocscert.com





THE INTERNATIONAL CERTIFICATION NETWORK

CERTIFICATE

TSE has issued an IQNet recognized certificate that the organization:
TÜRBOSAN TÜRBO MAKİNALAR SAN. VE TİC. A.Ş.

MAKİNE İHTİSAS OSB 5. CAD. NO:33 DİLOVASI -
KOCAELİ / TÜRKİYE

has implemented and maintains a
QUALITY MANAGEMENT SYSTEM
which fulfills the requirements of the following standard:

TS EN ISO 9001:2015

Issued on: 30-09-2021
Expires on: 25-10-2024

This attestation is directly linked to the IQNet Partner's original certificate and shall not be used as a stand-alone document

Registration Number : TR-KY-120-03/KG-94/09-R15




Alex Stoichitoiu
President of IQNet


Ahmet Nursi Kartal
İstanbul Certification Manager



IQNet Partners:
AENOR Spain AFNOR Certification France APCER Portugal CIRS Italy
CQC China CQM China CQS Czech Republic CRO Cert Croatia DQS Holding GmbH Germany FCAV Brazil
FONDOFORMA Venezuela ICONTEC Colombia Inspecta Sertifikatit Oy Finland INTECO Costa Rica
IRAM Argentina JQA Japan KPV Korea MKTEC Greece MSET Hungary Nemko AS Norway NSAI Ireland
NYCE - SGS Mexico PCBC Poland Quality Austria Austria SRI Russia SII Israel SRI Slovenia
SIRM QAS International Malaysia SGS Switzerland SRAC Romania TEST St Petersburg Russia TSE Turkey YUQS Serbia
IQNet is represented in the USA by: APQR Certification, CIRS, DQS Holding GmbH and NSAI Inc.

* The list of IQNet partners is valid at the time of issue of this certificate. Updated information is available under www.iqnet-certification.com

34071020112292104



THE INTERNATIONAL CERTIFICATION NETWORK

Annex to IQNET Certificate Number :TR-KY-120-03/KG-94/09-R15

Name and Address of the certified organization

TÜRBOSAN TÜRBO MAKİNALAR SAN. VE TİC. A.Ş.

MAKİNE İHTİSAS OSB 5. CAD. NO:33 DİLOVASI - KOCAELİ / TÜRKİYE

Scope of the Certificate

DESIGN AND PRODUCTION OF

- CENTRIFUGAL PUMPS (FOR CLEAN/WASTE WATER, HORIZONTAL/VERTICAL AXLE, SINGLE/MULTI STAGE, SINGLE/DOUBLE SUCTION)
- SUBMERSIBLE PUMPS (FOR CLEAN/WASTE WATER, HORIZONTAL/VERTICAL AXLE)
- SCREW PUMPS
- SINCE 26.12.2019:
- HORIZONTAL EKS (E/K) SERIES AXIAL/MIXED FLOW PUMPS
- CHEMICAL PROCESS SERIES PUMPS
- API 610 COMPLYING PETROCHEMICAL PUMPS
- HOT WATER PUMPS
- UL LISTED FIRE PUMPS

This annex is only valid in connection with the above-mentioned certificate



TURKISH STANDARDS INSTITUTION



34071020112292104

CERTIFICATE OF COMPLIANCE

Certificate Number: 20141105- EX26605
Report Reference: EX26605-20141031
Issue Date: 2014-NOVEMBER-05

Issued to: TÜRBOSAN TÜRBO MAKİNALAR SAN. VE TİC.A.S
MAKİNE İHTİSAS ORG.SAN.BÖLGESİ 5.CD. NO:33 TURKEY

This is to certify that representative samples of CENTRIFUGAL FIRE PUMPS, SPLIT CASE Centrifugal Fire Pumps, Split Case, Model CEP 100/250, CEP 100/250, CEP 100/250, CEP-EFF 125/300B, CEP-EFF 125/300B, CEP-EFF 125/300B.

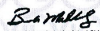
Have been investigated by UL in accordance with the Standard(s) indicated on this Certificate.

Standard(s) for Safety: UL 448, Standard For Safety For Centrifugal Stationary Pumps for Fire-Protection Service.

Additional Information: See the UL Online Certifications Directory at www.ul.com/database for additional information

Only those products bearing the UL Certification Mark should be considered as being covered by UL's Certification and Follow-Up Service.

Look for the UL Certification Mark on the product.


Bruce Mahrenholz, Assistant Chief Engineer, Global Inspection and Field Services

UL LLC

Any information and documentation involving UL Mark services are provided on behalf of UL LLC (USA) or any authorized licensee of UL. For questions, please contact a local UL Customer Service Representative at www.ul.com/customer-service



CERTIFICATE OF COMPLIANCE

Certificate Number: 20141105- EX26604
Report Reference: EX26604-20141031
Issue Date: 2014-NOVEMBER-05

Issued to: TÜRBOSAN TÜRBO MAKİNALAR SAN. VE TİC.A.S
MAKİNE İHTİSAS ORG.SAN.BÖLGESİ 5.CD. NO:33 TURKEY

This is to certify that representative samples of CENTRIFUGAL FIRE PUMPS, END SUCTION Centrifugal Fire Pumps, End Suction, Model HD-NORM 50/250, HD-NORM 50/250, HD-NORM 65/250, HD-NORM 65/250, HD-NORM 65/250, HD-NORM 80/250, HD-NORM 80/250.

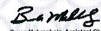
Have been investigated by UL in accordance with the Standard(s) indicated on this Certificate.

Standard(s) for Safety: UL 448, Standard For Safety For Centrifugal Stationary Pumps for Fire-Protection Service.

Additional Information: See the UL Online Certifications Directory at www.ul.com/database for additional information

Only those products bearing the UL Certification Mark should be considered as being covered by UL's Certification and Follow-Up Service.

Look for the UL Certification Mark on the product.


Bruce Mahrenholz, Assistant Chief Engineer, Global Inspection and Field Services

UL LLC

Any information and documentation involving UL Mark services are provided on behalf of UL LLC (USA) or any authorized licensee of UL. For questions, please contact a local UL Customer Service Representative at www.ul.com/customer-service











TÜRBOSAN TÜRBOMAKİNALAR SAN. ve TİC. A.Ş.

Makine İhtisas Organize Sanayi Bölgesi 5. Cad. No:33 Dilovası 41455 Kocaeli / TURKEY

Tel: (+90 262) 722 95 40 pbx • Fax: (+90 262) 722 95 39

e-mail: exporttbs@turbosan.com • sp@turbosan.com • servis@turbosan.com

www.turbosan.com

November 2021

