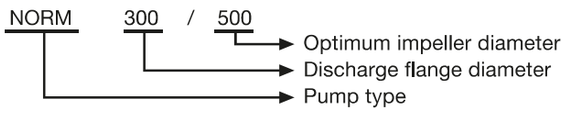
NORM SERIES END SUCTION PUMPS

TECHNICAL DETAILS :

- The NORM series pumps are high efficiency low and medium pressure horizontal single stage (expect 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 m^3/h
- Discharge head range (Hm): 5-90 mwc (1500 rpm)
- Operating temperature : -10°C ÷ 120°C



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.

Duble Stage End Suction Pump

MATERIALS:

COMPONENT	MATERIALS	
	BRONZ 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

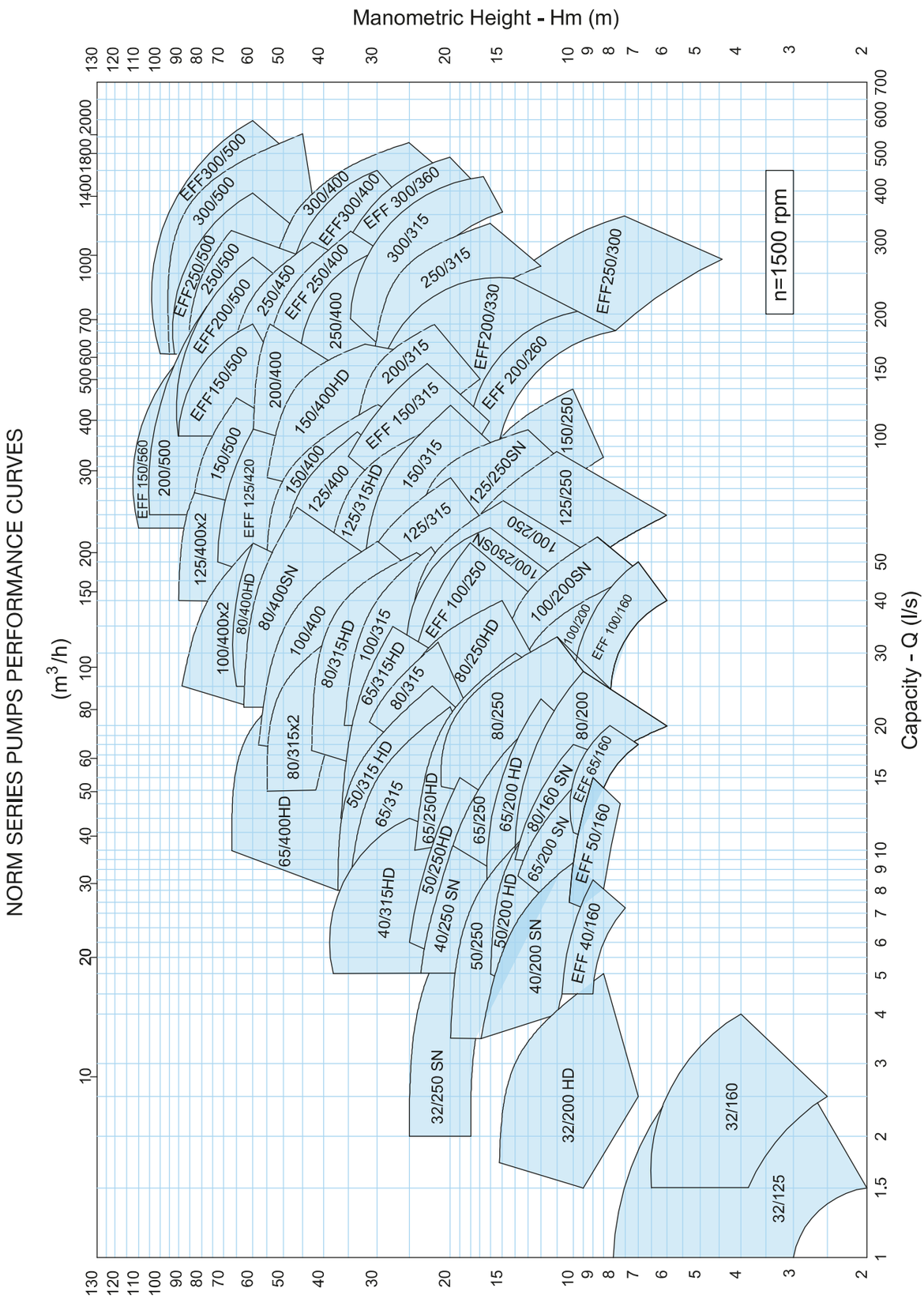
NOTE : All pump components can be manufactured in different materials optionally according to the properties of the liquid to be pumped.

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)



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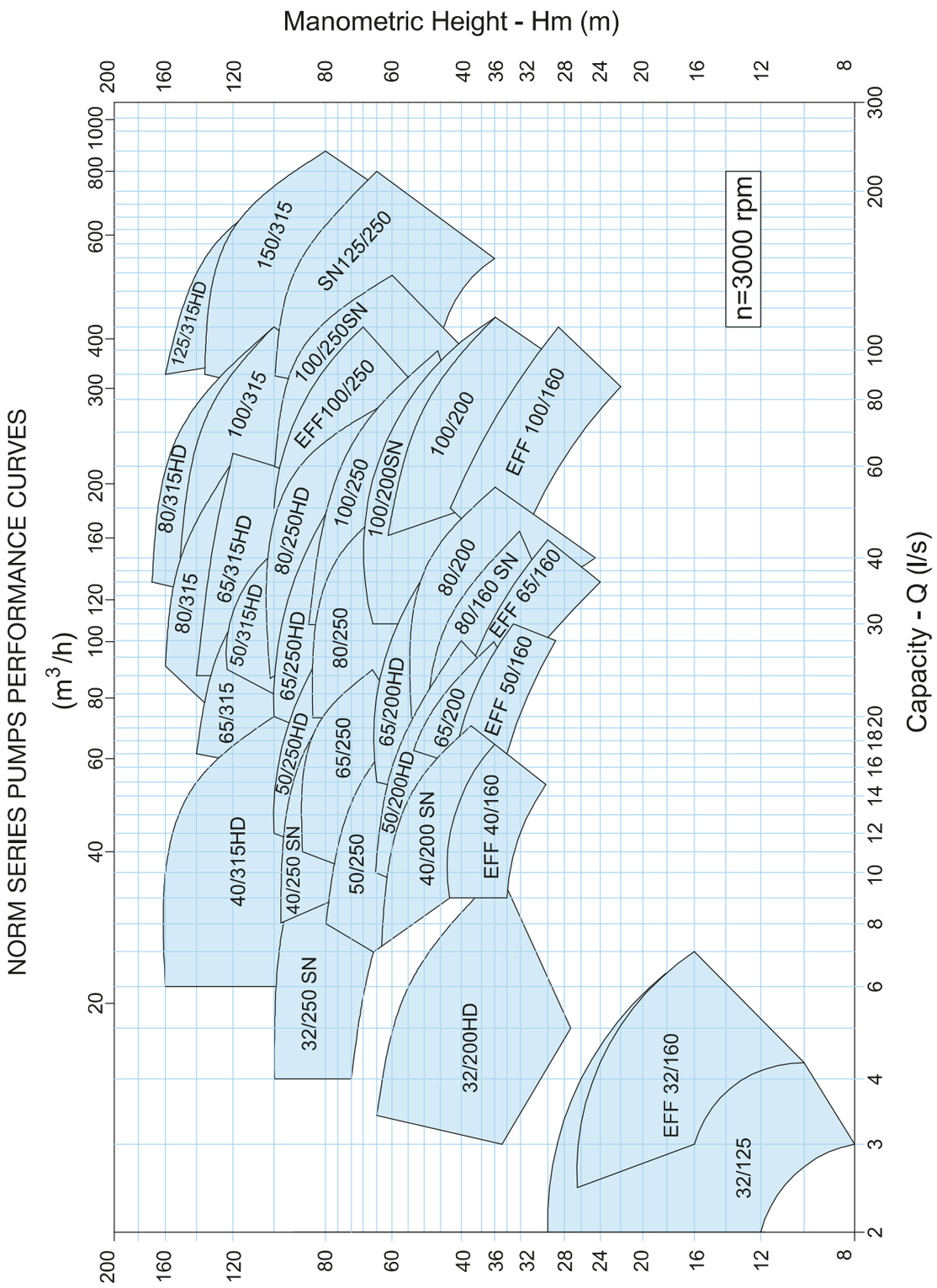
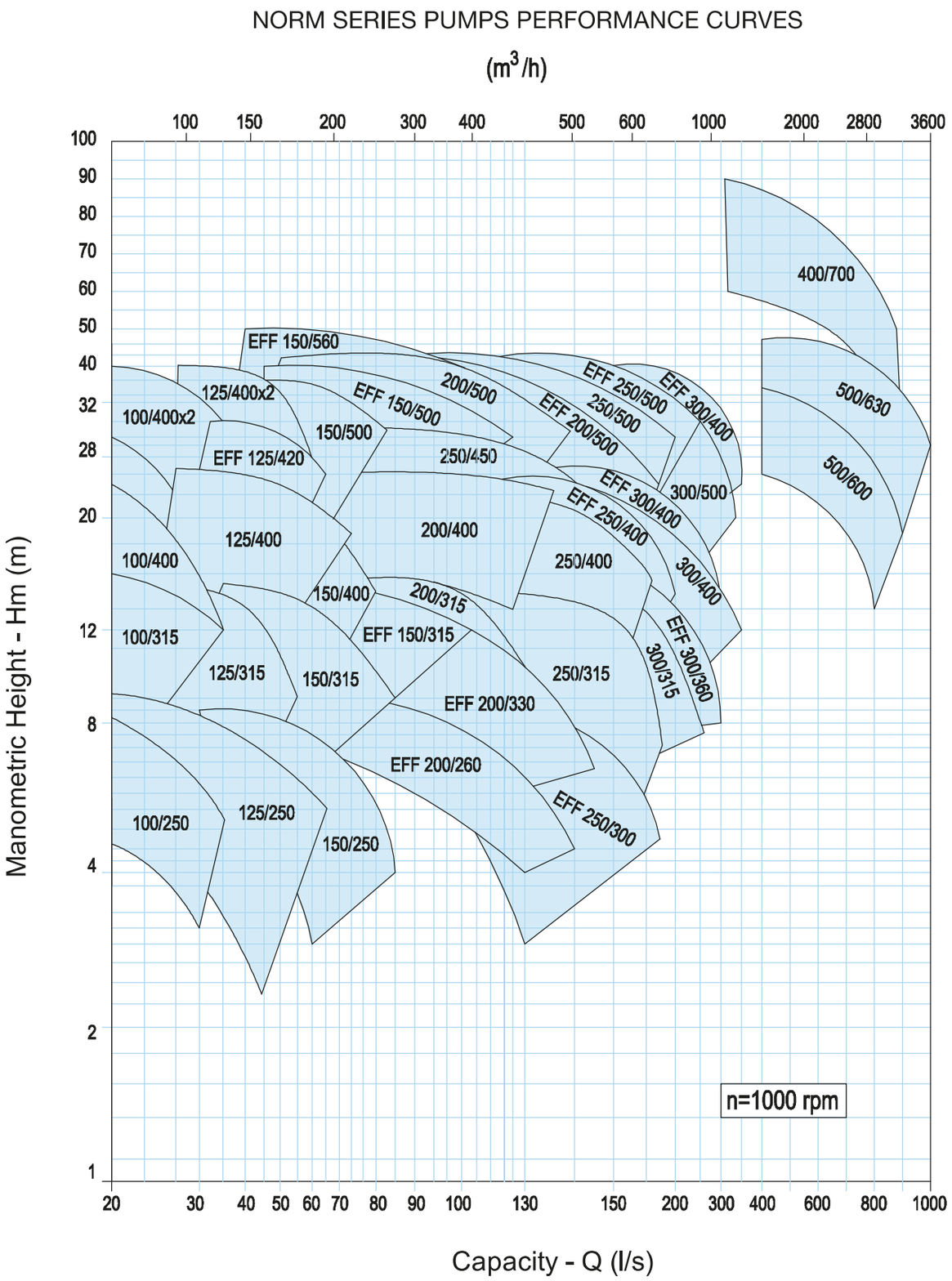
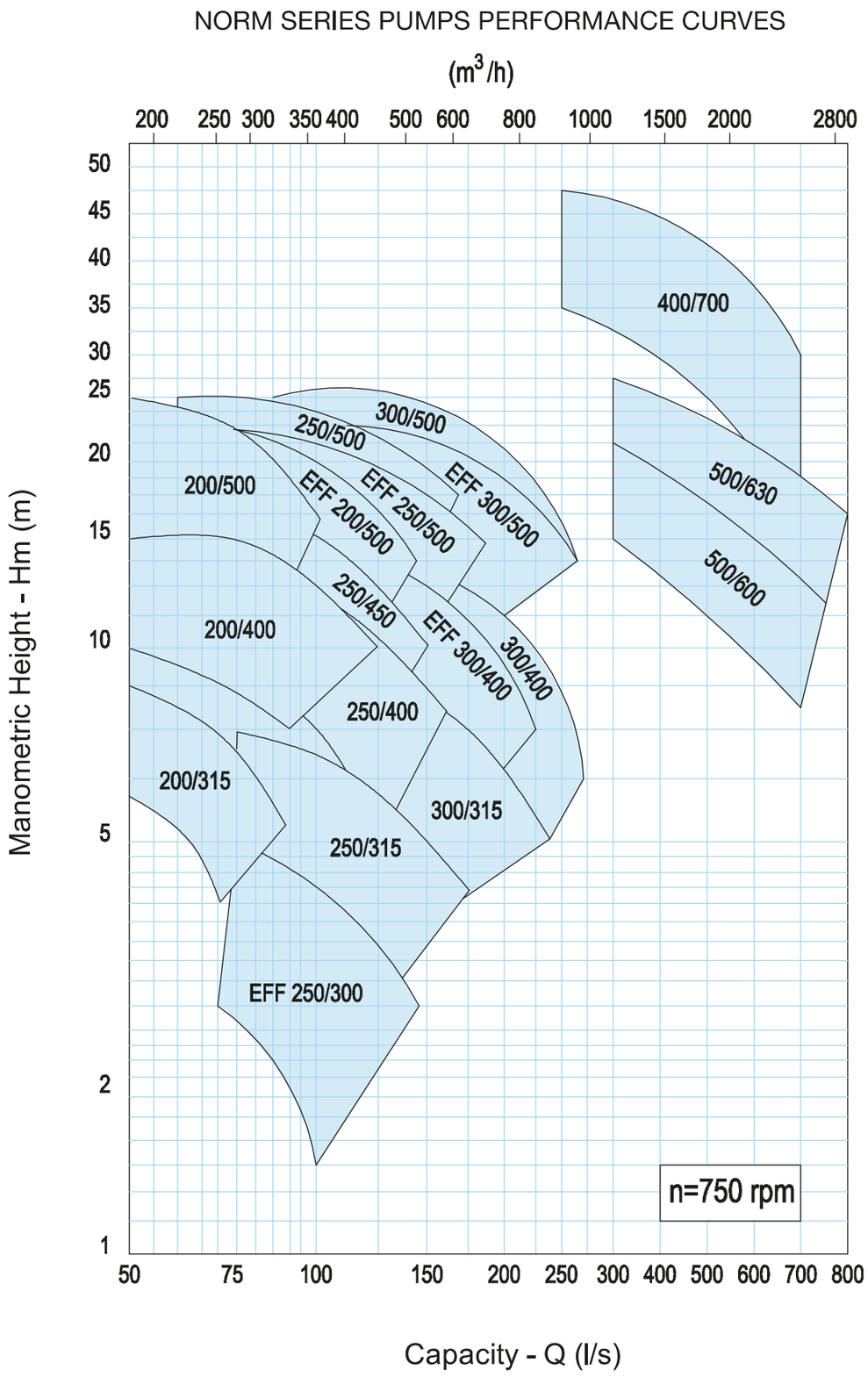
NORM SERIES PUMPS GROUP PERFORMANCE CURVES (n=3000 rpm)



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



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



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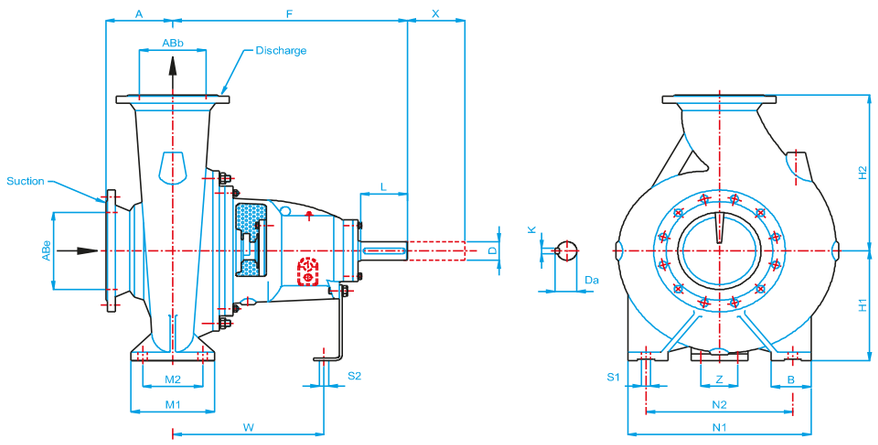
NORM SERIES PUMPS DIMENSIONS TABLE



	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 ve EN 22858																						
	Norm 32/125	-	32	50	80	360	112	140	50	100	70	190	140	M12	M12	24	27	8	50	260	110	25	32	100
	Norm 32/160	-				360	132	160				240	190	M10									38	
	Norm-HD 32/200	-				360	160	180													80		37	
	-	Norm-SN 32/250			100	360	180	225	65	125	95	320	250							250	80		60	
*	Norm-EFF 40/160	-	40	65	80		132	160	50	100	70	240	190	M12		24	27	8	50	260	110		40	
	Norm-SN 40/200	-			100		160	180				265	212								80		50	
	Norm-SN 40/250	-					180	225	65	125	95	320	250										56	
	-	Norm-HD 40/315			125	500	200	250				345	280			32	35	10	80	360	90	30	70	140
*	Norm-EFF 50/160	-	50	65	100	360	160	180	50	100	70	265	212	M10		24	27	8	50	260	80	25	42	100
	-	Norm-HD 50/200		80	100			200	53			265	212			24	27	8	50		80	25	42	
	Norm 50/250	-		65			180	225	65	125	95	320	250	M12							90		57	
		Norm-HD 50/250		80	125																80		62	
	-	Norm-HD 50/315				470	225	280	65	125		345	280	M12		32	35	10	80	310	100	30	92	140
*	Norm-EFF 65/160		65		100	360	160	200			95	280	212			24	27	8	50	260	80	25	52	100
	Norm-SN 65/200	-				360	180	225			85	320	250										54	
		NORM-HD 65/200		100		475	180	225	65	125	95	320	250			32	35	10	80	315	100	30	100	100
	Norm 65/250	-		80		470	200	250	80	160	120	360	280	M16		32	35	10	80	310		30	76	140
	-	Norm-HD 65/250		100																			110	100
	Norm 65/315	-		80			225	280				400	315										110	140
	-	Norm-HD 65/315		100		530								M18		42	45	12	110	345			141	
	-	Norm-HD 65/400				535	275	355				435	355	M16	M20					350	150	40	163	
	Norm-SN 80/160	-	80		125	360	180	225	65	125	95	320	250	M12	M12	24	27	8	50	260	80	25	64	100
	Norm 80/200	-				470		250				345	280			32	35	10	80	310	100	30	74	140
	Norm 80/250	-					200	280	80	160	120	400	315	M16									98	
		Norm-HD 80/250		125			225																105	
	Norm 80/315	-		100			250	315															95	
	-	Norm-HD 80/315		125		530										42	45	12	110	340		40	147	
	-	Norm 80/315x2		100	228	470										32	35	10	80	310		30	148	250
	-	Norm-SN 80/400			125	530	280	355				435	355	M16	M16	42	45	12	110	345	150	40	158	
*	Norm-EFF 100/160		100	125		470	200	280	80	160	120	360	280	M16	M12	32	35	10	80	310	100	30	78	140
	Norm 100/200	-	100	125	125																		90	
	Norm-SN 100/200	-																					116	
	-	Norm-EFF 100/250				530	225					400	315			42	45	12	110	350		40	148	170
	Norm 100/250	-			140	470										32	35	10	80	310		30	104	140
	Norm-SN 100/250	-																					129	
	Norm 100/315	-					250	315															127	
	Norm 100/400	-				530	280	355	100	200	150	500	400	M20	M20	42	45	12	110	345	150	40	185	
	-	Norm 100/400x2			270																		260	280
	Norm 125/250	-	125	150	140	470	250	355	80	160	120	400	315	M16	M12	32	35	10	80	310	100	30	110	170
	-	Norm-SN 125/250				530									M20	42	45	12	110	340	150	40	154	
	Norm 125/315	-					280		100	200	150	500	400	M20						345			179	
	Norm-HD 125/315	-																					195	
	Norm 125/400	-					315	400															210	
	Norm-EFF 125/420	-				530																	207	
	-	Norm 125/400x2			280	580										52	56	16		375		50	318	300
*	-	Norm-EFF 150/200	150	200	160	470	280	375	100	200	150	550	450	M20		32	35	10	110	310	100	30	120	170
	-	Norm 150/250	150	200	160	530	280	355				500	400			42	45	12		345	150	40	185	250
*	-	Norm-EFF 150/250				530	280	400															190	170
	-	Norm-EFF 150/315				545	315													360			192	180
	Norm 150/315	-				530	280					550	450							345			205	
	-	Norm 150/400			180	584	315									52	56	16		375		50	275	170
	-	HD-N 150/400			160	590		450												380			282	

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.

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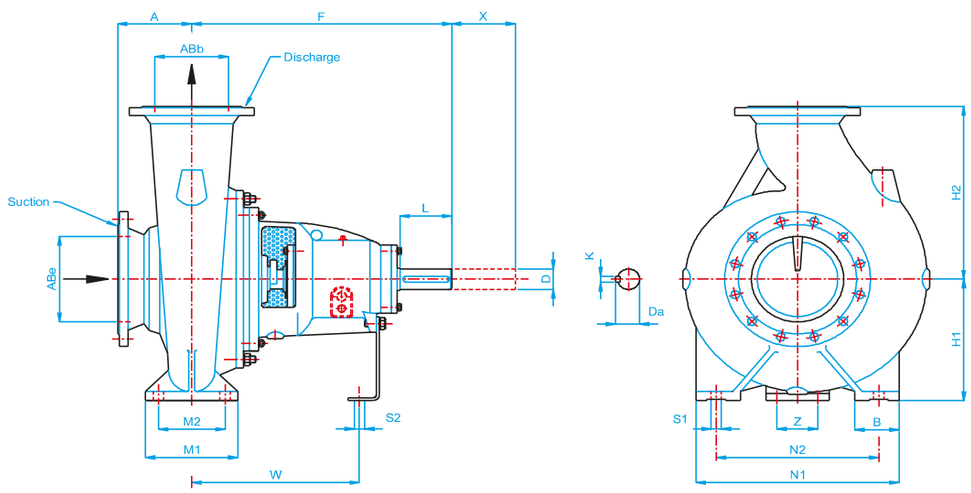
NORM SERIES PUMPS DIMENSIONS TABLE



	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 ve EN 22858																						
*	-	Norm-EFF 150/420	150	200	160	590	315	450	100	200	150	550	450	M20	M24	52	56	16	110	380	150	50	295	170
		Norm-EFF 150/500			180	700	380	500	130	250	180	560				60	64	18	140	460	190	60	465	
	-	Norm 150/500				704		530												465			420	
		Norm-EFF 150/560				700	400	500												460			493	
		Norm-EFF 200/260	200	250	200	550	315	400	110		150	500	400			42	45	12	110	365	150	40	192	200
	-	Norm 200/315				584		450			180					52	56	16		375		50	300	250
		Norm-EFF 200/330				600	360													390			246	
	-	Norm 200/400				704	355	505	120			550	450			60	64	18	140	465	190	60	410	
		Norm-EFF 200/500			210	820	400	500	160	300	240	720	600			70	74,5	20		575		70	535	
	-	Norm 200/500				785														540			512	
	-	Norm-EFF 250/300	250	300	245	687			110			540	450			60	64	18		437		50	430	
	-	Norm 250/315			197	701		430												452			410	
		Norm-EFF 250/400			240	710		500	150	280	200	650	500							461		60	475	
	-	Norm 250/400				785										70	74,5	20		540		70	495	
	-	Norm 250/450			252			545															545	
		Norm-EFF 250/500			240	794	425	500	160	300	240	720	600							550			575	
	-	Norm 250/500				785		545												540			567	
	-	Norm 300/315	300	350	250	820	400	535	150	280	200	650	500							576			550	280
	-	Norm-EFF 300/360			300					300	240	800	660										583	
	-	Norm-EFF 300/400				794	450	500			200									550			572	
		Norm 300/400			280	805	500	600												560			750	
	-	Norm-EFF 300/500			300	802	450				245									558			685	
	-	Norm 300/500			300	785	450													540			690	
	-	Norm 400/700	400	500	350	1275	700	1000	250	400	300	1150	1000	M36	M16	100	106	28	210	915	200	100	2070	375
	-	Norm 500/600	500							440	340	1250	1100										2130	
	-	Norm 500/630A																					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.

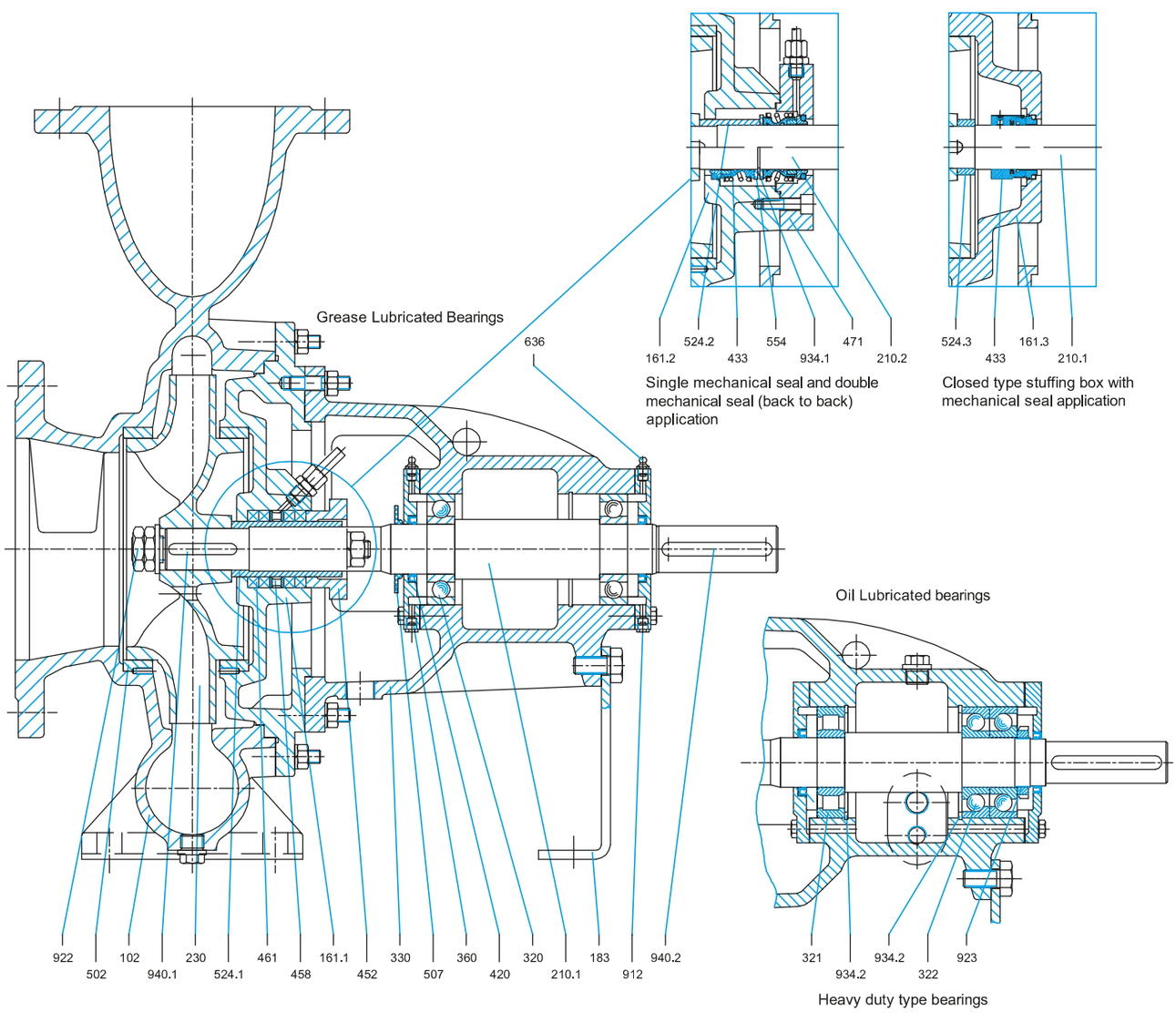
ECO DESIGN:

- Turbosan designs and manufactures pumps in accordance with ErP (Energy Related Producs) 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

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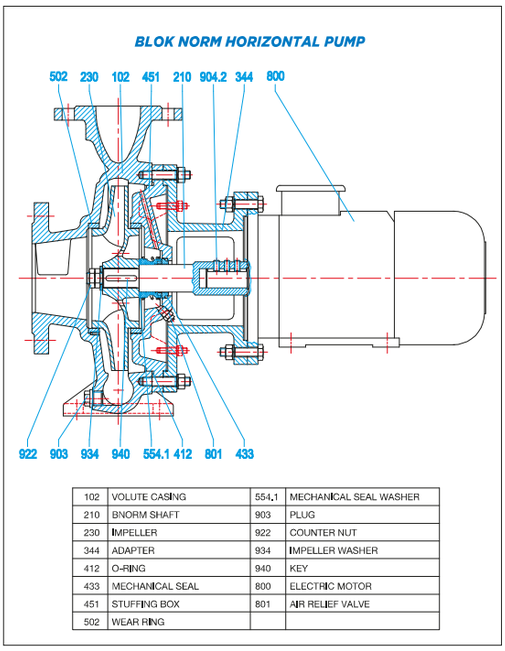
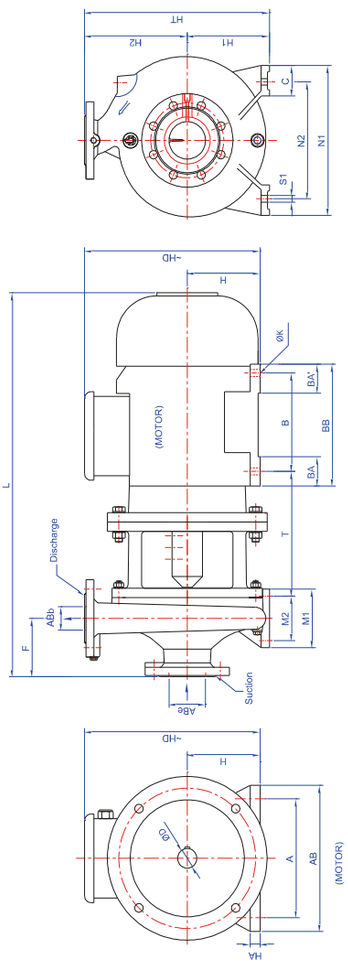
NORM SERIES HORIZONTAL PUMPS
DIMENSIONS TABLE



102	VOLUTE CASING	554,1	MECHANICAL SEAL WASHER
210	BNORM SHAFT	903	PLUG
230	IMPELLER	922	COUNTER NUT
344	ADAPTER	934	IMPELLER WASHER
412	O-RING	940	KEY
433	MECHANICAL SEAL	800	ELECTRIC MOTOR
451	STUFFING BOX	801	AIR RELIEF VALVE
502	WEAR RING		



PUMP TYPE	POWER (Kw)	RPM (d/d)	MOTOR TYPE	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	15	3000	160M2b	40	65	100	802	160	180	340	50	100	70	265	212	14	210	-	-	-	260	15	160	385	254	312	22	42	285	186
BNORM-HD 50/250	15	3000	160M2b	40	65	100	821	160	180	340	50	100	70	265	212	14	210	-	62	-	260	15	160	385	254	312	22	42	285	186
BNORM-HD 50/250	18.5	3000	160L2	40	65	100	865	160	180	340	50	100	70	265	212	14	254	-	-	-	304	15	160	385	254	312	22	42	285	201
BNORM-HD 50/250	22	3000	180M2	50	80	100	863	180	225	405	65	125	95	320	250	14	241	279	57	85	319	15	180	421	279	354	24	48	264	223
BNORM-HD 50/250	30	3000	200L2a	50	80	100	968	180	225	405	65	125	95	320	250	14	305	-	68	-	355	19	200	477	318	398	26	55	292	258
BNORM-HD 50/250	37	3000	200L2b	50	80	100	1011	180	225	405	65	125	95	320	250	14	311	-	76	-	371	19	225	510	356	438	30	55	308	298
BNORM-HD 50/250	45	3000	225M2	50	80	100	1011	180	225	405	65	125	95	320	250	14	311	-	76	-	371	19	225	510	356	438	30	55	308	328
BNORM-SN 65/200	3	1500	100L4b	65	100	100	611	180	225	405	65	125	85	320	250	14	140	-	39	-	175	12	100	234	160	200	13	28	180	100
BNORM-SN 65/200	18.5	3000	160L2	65	100	100	873	180	225	405	65	125	95	320	250	14	254	279	62	-	304	15	160	385	254	312	22	42	300	209
BNORM-SN 65/200	22	3000	180M2	65	100	100	889	180	225	405	65	125	95	320	250	14	241	279	57	85	319	15	180	421	279	354	24	48	313	244
BNORM-HD 65/250	3	1500	100L4b	65	100	100	659	180	225	450	80	160	120	360	280	18	140	-	39	-	175	12	100	234	160	200	13	28	191	134
BNORM-HD 65/250	5.5	1500	132S4	65	100	100	744	180	225	450	80	160	120	360	280	18	178	-	46	84	218	12	132	300	216	260	15	38	231	167
BNORM-HD 65/250	7.5	1500	132M4	65	100	100	744	180	225	450	80	160	120	360	280	18	178	-	-	84	218	12	132	300	216	260	15	38	231	178
BNORM-HD 65/250	18.5	1500	160L2	65	100	100	886	200	250	450	80	160	120	360	280	18	254	-	62	-	304	15	160	385	254	312	22	42	275	246
BNORM-HD 65/250	22	3000	180M2	65	100	100	902	200	250	450	80	160	120	360	280	18	241	279	57	85	319	15	180	421	279	354	24	48	288	281
BNORM-HD 65/250	30	3000	200L2a	65	100	100	997	200	250	450	80	160	120	360	280	18	305	-	68	-	355	19	200	477	318	398	26	55	308	322
BNORM-HD 65/250	37	3000	200L2b	65	100	100	1040	200	250	450	80	160	120	360	280	18	311	-	76	-	371	19	225	510	356	438	30	55	324	352
BNORM-HD 65/250	45	3000	225M2	65	100	100	1040	200	250	450	80	160	120	360	280	18	311	-	76	-	371	19	225	510	356	438	30	55	324	455
BNORM 80/200	4	1500	112M4	80	125	125	674	180	250	430	65	125	95	345	315	14	140	-	39	-	175	12	112	257	190	230	13	28	210	123
BNORM-HD 80/250	5.5	1500	132S4	80	125	125	745	225	280	505	80	160	120	400	315	18	178	-	46	84	218	12	132	300	216	260	15	38	231	175
BNORM-HD 80/250	7.5	1500	132M4	80	125	125	745	225	280	505	80	160	120	400	315	18	178	-	-	84	218	12	132	300	216	260	15	38	231	186
BNORM-HD 80/250	45	3000	225M2	80	125	125	1040	225	280	505	80	160	120	400	315	18	311	-	76	-	371	19	225	510	356	438	30	55	324	463
BNORM 100/200	5.5	1500	132S4	100	150	140	748	200	280	480	80	160	120	360	280	18	140	-	46	84	218	12	132	300	216	260	15	38	231	175
BNORM-EFF 100/250	11	1500	160M4	100	150	140	898	225	280	505	80	160	120	400	315	18	210	-	-	-	260	12	160	385	254	312	22	42	316	274
BNORM-EFF 100/250	15	1500	160L4	100	150	140	942	225	280	505	80	160	120	400	315	18	254	-	62	-	304	15	160	385	254	312	22	42	316	285
BNORM-SN 100/200	11	1500	160M4	100	150	140	841	200	280	480	80	160	120	360	280	18	210	-	-	-	260	15	160	385	254	312	22	42	316	274
BNORM-SN 100/250	18.5	1500	180M4	100	150	140	917	225	280	505	80	160	120	400	315	18	241	279	57	85	319	15	180	421	279	354	24	48	288	459
BNORM-SN 125/250	11	1500	160M4	125	150	140	898	250	355	605	100	160	120	400	315	23	210	-	62	-	304	15	160	385	254	312	22	42	316	271
BNORM-SN 125/250	15	1500	180M4	125	150	140	958	250	355	605	100	160	120	400	315	23	210	-	-	-	304	15	160	385	254	312	22	42	316	282
BNORM-SN 125/250	18.5	1500	180M4	125	150	140	958	250	355	605	100	160	120	400	315	23	241	279	57	85	319	15	180	421	279	354	24	48	329	321
BNORM-HD 125/315	18.5	1500	180M4	125	150	140	954	280	355	635	100	150	200	500	400	23	241	279	57	85	319	15	180	421	279	354	24	48	329	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