

## 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.

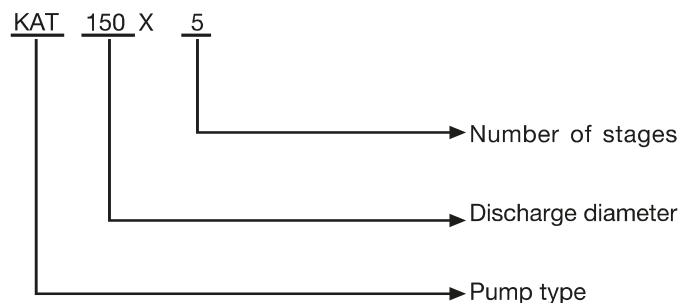


**BALANCE DISC:** Axial thrust force is a very important issue for multi stage pumps. Axial thrust force is compensated by a balance disc. The balance disc is located inside a chamber which is between bearing housing and the last stage impeller. Surface of the balance disc is coated with special hardened 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	
	BRONZ VERSION	CAST IRON VERSION
Casing	Cast iron ( GJL 250) (EN-JL 1040)	Cast iron ( GJL 250) (EN-JL 1040)
Impeller	Bronze	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 TÜRBOSAN 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.

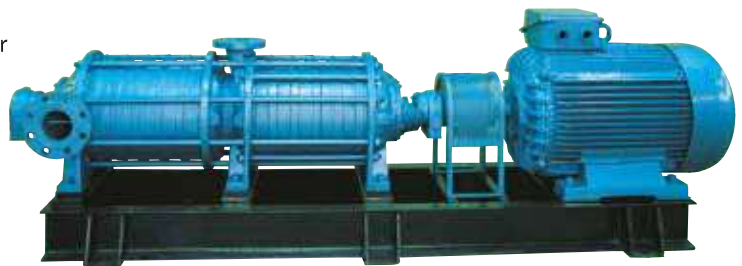
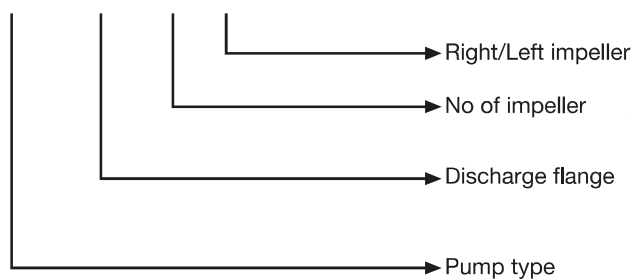
Split casing design allows pump to be splitted axially. This allows rotating elements of the pump to be dismantled or fixed without disturbing suction and discharge flange connections, by just opening the casing cover.



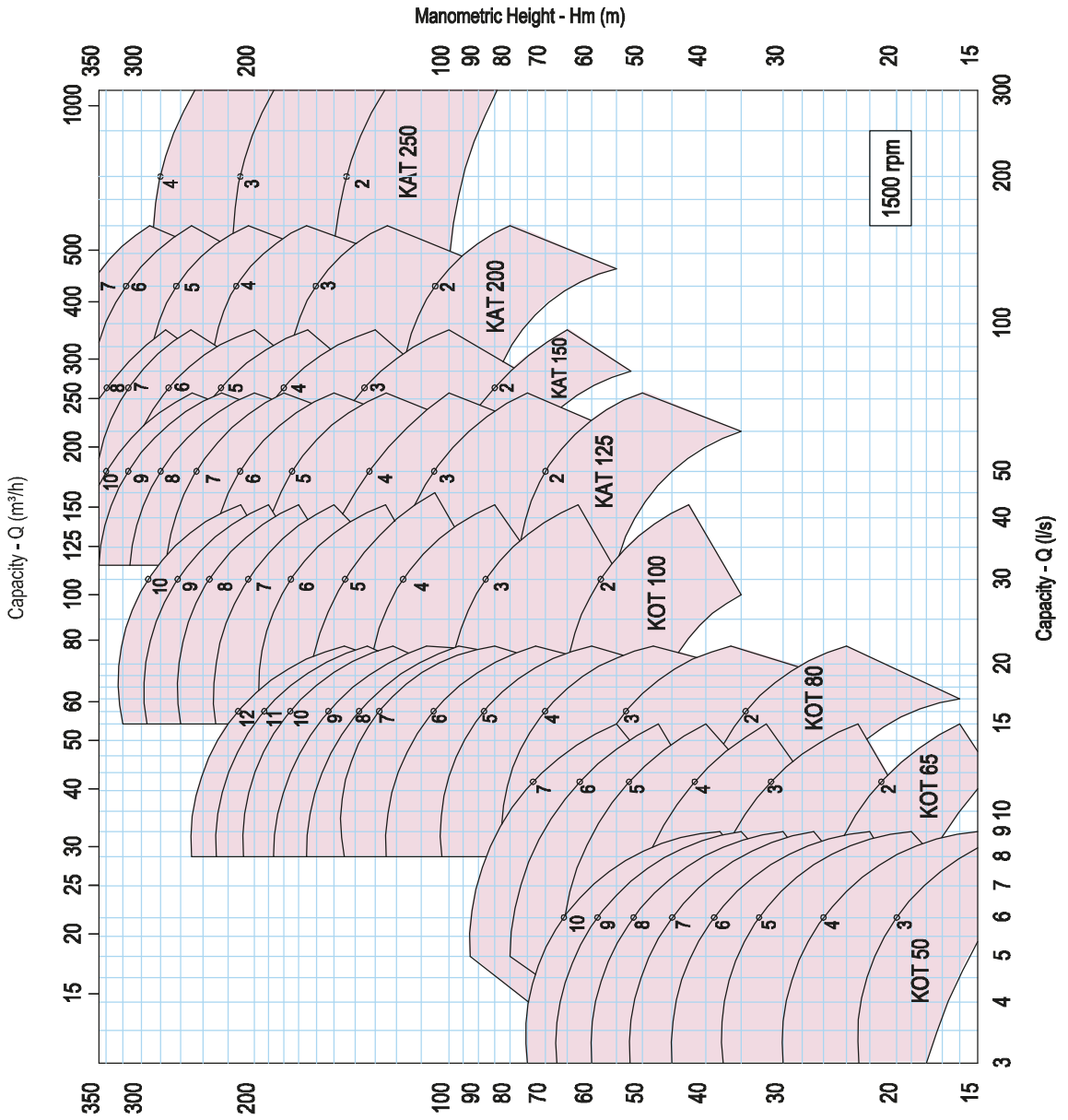
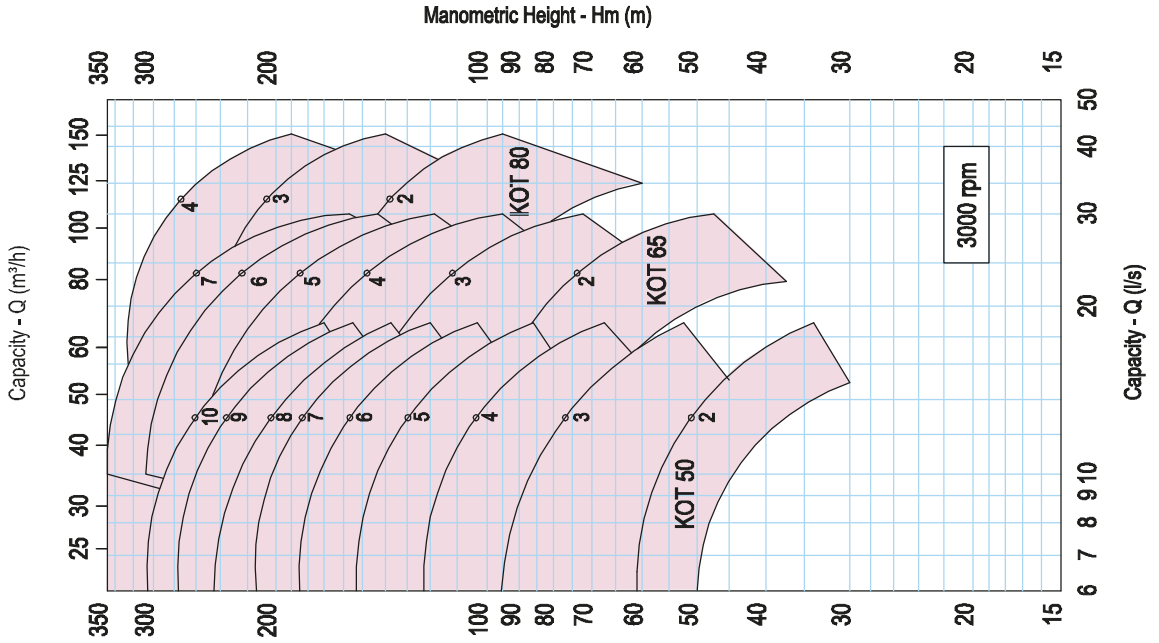
### 2) MULTI STAGE PUMP WITH OPPOSITE IMPELLERS :

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.

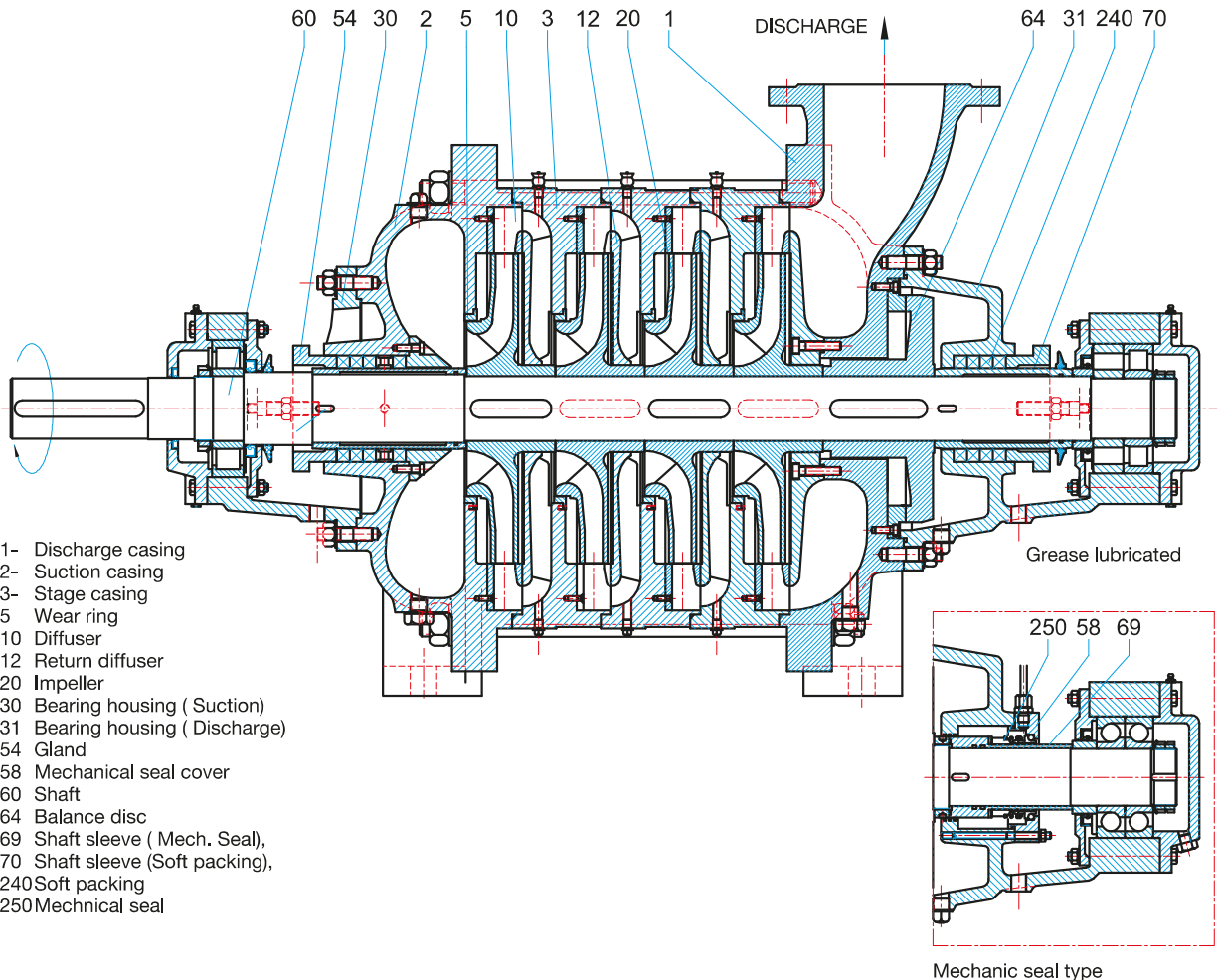
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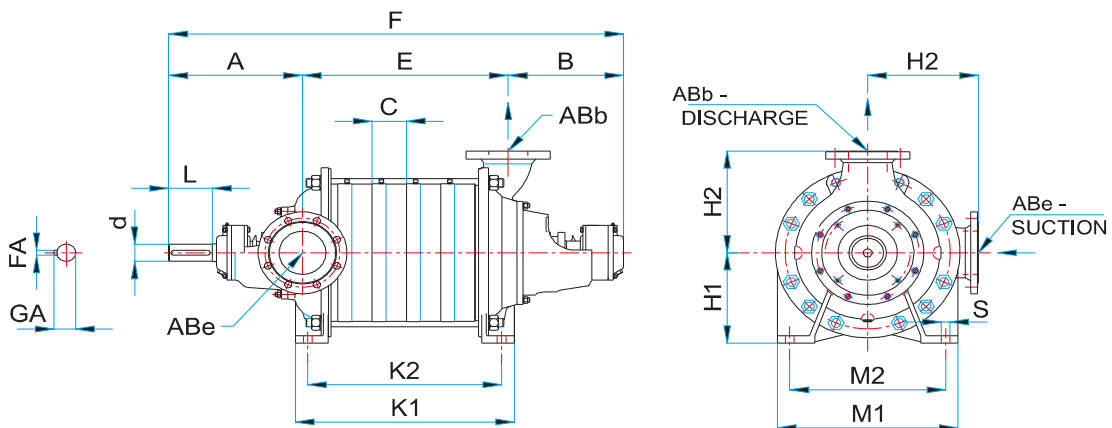
**MULTI STAGE PUMP PERFORMANCE GROUP CURVES**



## MULTISTAGE PUMPS CROSS SECTIONAL DRAWING AND PARTS LIST



- 1- Discharge casing
- 2- Suction casing
- 3- Stage casing
- 5- Wear ring
- 10- Diffuser
- 12- Return diffuser
- 20- Impeller
- 30- Bearing housing ( Suction)
- 31- Bearing housing ( Discharge)
- 54- Gland
- 58- Mechanical seal cover
- 60- Shaft
- 64- Balance disc
- 69- Shaft sleeve ( Mech. Seal),
- 70- Shaft sleeve (Soft packing),
- 240-Soft packing
- 250-Mechanical seal



PUMP TYPE	Abe	Abb	FOR TWO STAGES							FOR EACH ADDITIONAL STAGES											WEIGHT	
			A	B	E	K1	K2	F	C		H1	H2	M1	M2	S	L	d	GA	FA	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