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/cm^3, maximum allowed medium viscosity is 1,5 x 10-6 m^2/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.

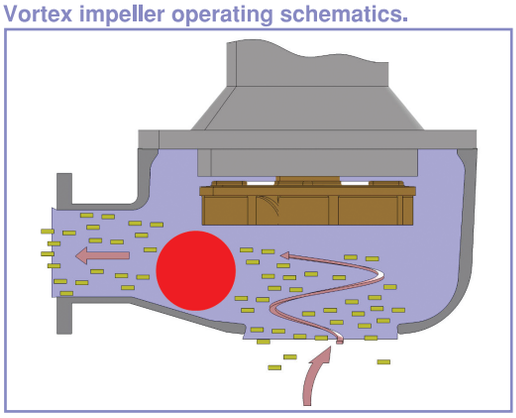
VOLUTE CASING: Volute casings are with concentric discharge and have large crossection. They are designed not to be clogged by the solid that can pass through impeller. In special applications Flush valve can be fitted to the pump. Pumps can be manufactured with different material types if requested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

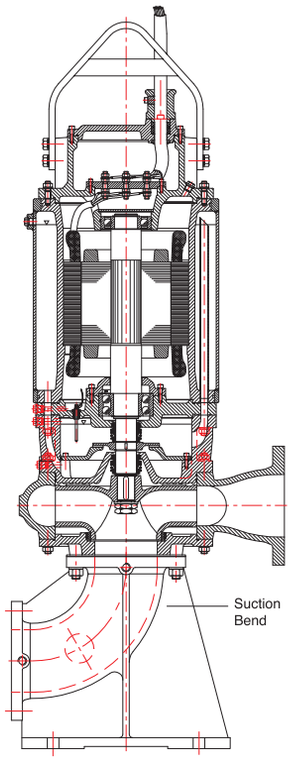
CAUTION: If the submersible pump will be stored without operation for long time, it must be operated for short of time every 25-30 days. Submersible pumps manufactured according to CE directive.

Vortex impeller operating schematics.



SUBMERSIBLE PUMP DESIGNS

Turbosan submersible waste water pumps manufactured in 2 different design.
1- DAC- SC Series .....Cooling is by cooling jacket.
2- DAS series : .....Cooled by surrounding medium



1) Cooling jacket cooled

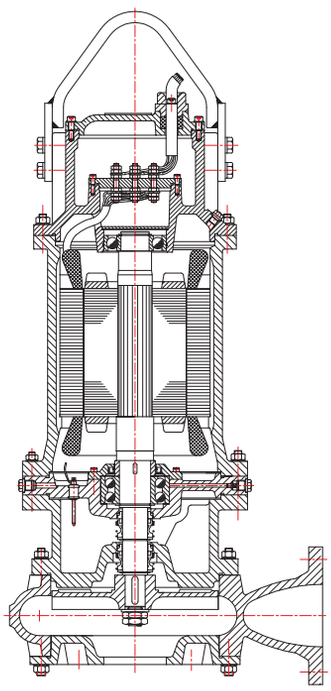
DAC-SC

1- DAC-SC pumps cooling system:

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

2- DAS pump cooling:

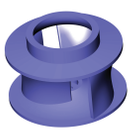
Das type pumps are cooled by surrounding medium in which the pump is submerged. In order to have appropriate cooling, the pump has to be submerged completely. These pumps do not operate in a dry installation.



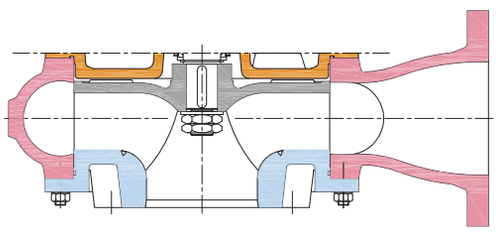
2) Surrounding medium cooled

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.

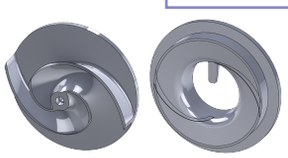


Double vane impeller: In general they are used in large sized pumps. Rotational symmetry lets them operate without vibration and stable. They are with high efficiency and they do not strain motor with excessive load in case of low discharge head. Large channels between vanes allows pumping of solids.



Non clogging type p-impeller

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).

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 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.

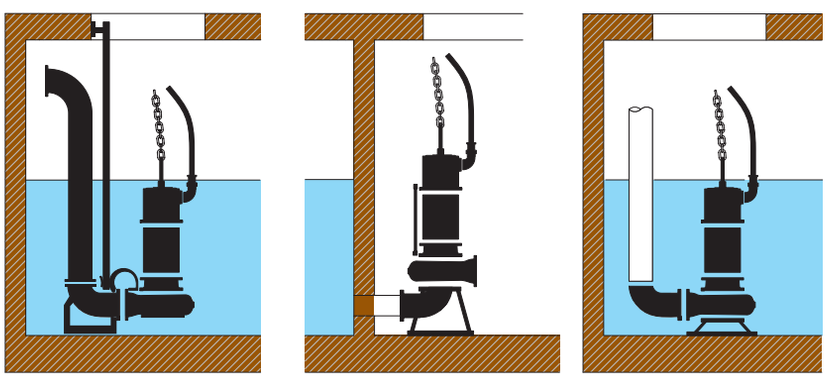
2) Dry Installation:

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 seperated 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.



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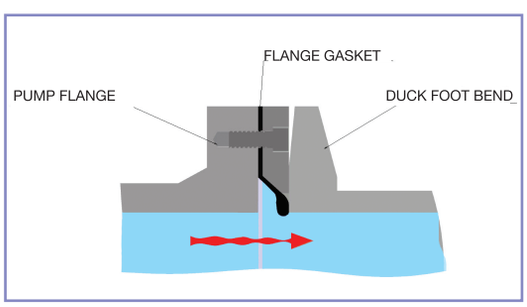
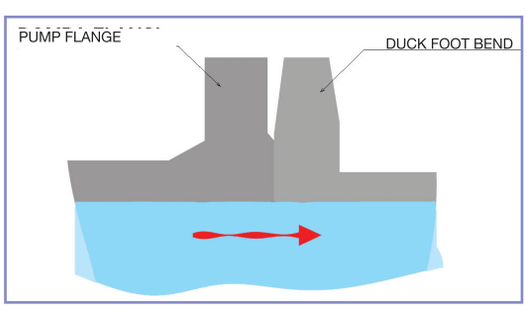




Sealing in Automatic coupling

a) Sealing with gasket :

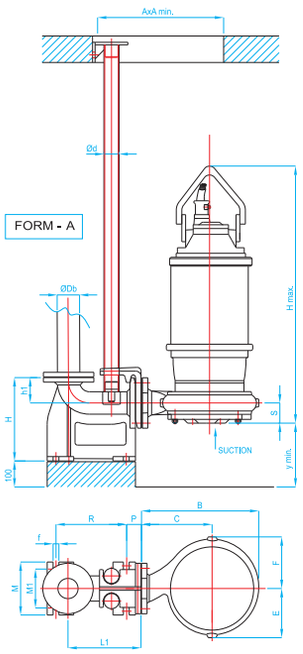
A gasket with special design is fitted between guide flange and pump flange. When the pump operates, pressure on discharge of the pump forces the gasket to expand on guide flange. 100 % sealing achieved with gasket. This is the sealing used by Turbosan as standard.

b) Metal on Metal sealing

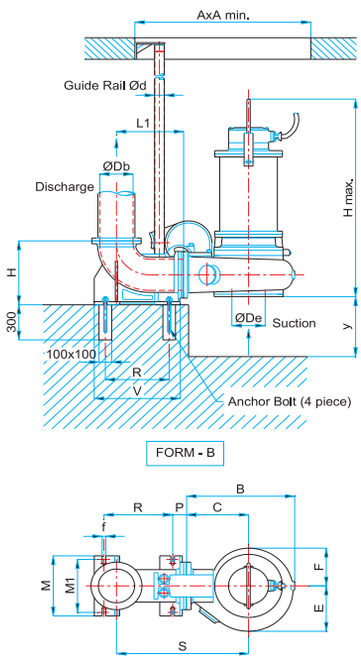
The sealing between pump discharge flange and duck foot bend flange achieved by a very smoothly machined pump flange surface. and duck foot bend flange surface. This sealing used in special applications.

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

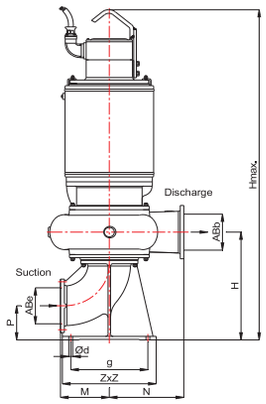


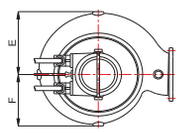
Ø200, Ø250, Ø300, Ø400 Automatic Coupling

PUMP TYPE	DIMENSIONS																			
	Ød	Suction Øde	Discharge ØDb PN10	C	B	E	F	S	L1	P	R	M1	f	Anchor Bold	V	M	H	H1	Ymin.	AxA min.	FORM
DAS 80/250	2"	80	80	280	475	175	150	65	234	64	220	140	23	M20x250	290	210	265	140	180	725x725	A
DAS 80/250V								65													
DAS-EFF 80/260		125		280	490	220	190	65									265	140	180		
DAS 80/270 / V		80		315	540	218	200	65									265	140	180		
DAS 80/315 / V				340	585	255	235	65													
DAS-EFF 80/320		125		300	545	245	220	65							352	250	265	140	180		
DAS 100/200		100	100	246	440	173	158	80	270	80	240	150			320	220	300	140	200	775x775	
DAS 100/250 / V				300	500	220	180	80													
DAS-EFF 100/260		150		300	540	260	210	80											200		
DAS 100/270 / V		100		315	515	198	197	80											200	850x850	
DAS 100/315 / V				340	575	248	220	80													
DAS-EFF 100/320		150			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	1000x1000	
DAS 125/400				370	670	315	280	120													
DAS-EFF 125/500		150	150 (125)	450	790	385	335	120	396	96	360	240	28	M24X250	480	330	390	200	175		B
DAS 150/315		150	150	380	635	280	240	130													A
DAS-EFF 150/315				400	650	280	220	130													
DAS 150/400				400	700	325	300	130													
DAS-EFF 150/500		200		500	840	365	305	130											175		B
DAS 200/315 N			200	370	670	335	275	127	442	112	420	300			540	400	450	200	220	1200x1200	
DAS 200/315 F																					
DAS-EFF 200/320		250		500	860	395	290	200													
DAS EFF 200/360		250		480	805	350	283	167	443	108	420	300									
DAS 200/400 F		200		530	895	375	355	180	442	112	420	300									
DAS-EFF 200/410				500	845	385	305	180													
DAS-EFF 200/500		250		560	960	425	355	200											220		
DAS 250/315 F	3"	200	250	440	760	355	290	180	542	107	532	375			682	500	665	665	250	1400x1400	
DAS 250/400 N																					
DAS 250/400 M		250		480	836	387	336	120											300		
DAS 250/400 F		300																	350		
DAS-EFF 250/420		250		600	1000	445	330	120													
DAS 250/600		300		650	1176	555	485	130													
DAS 250/700				750	1330	620	540	141													
DAS-EFF 300/400		350	300	600	1030	475	325	225	604	129	575	425	36	M33x300	775	565	618	618	400		
DAS 300/500 F		300		585	1060	525	430	225											350		
DAS-EFF 350/420		350	350	800	1310	560	400	255	875	180	825	550			925	700	1245	1245	400	1500x1500	
DAS-EFF 350/520		350	400		1380	640	475												450		
DAS-EFF 350/630		350			1385		490														
DAS 400/400 F		400			1090	620	476														
DAS-EFF 400/500					1355	630	430												550		
DAS 400/600 F		500		700	1215	570	471	285											550		
DAS 400/700				1000	1625	685	576	285											550		

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 accor dance with motor power please consult to Turbosan.
4) * Türbosan 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	150	350X350	250X250		
DAC-SC 80/315 / V			255	235	418	1080		340					
* DAC-SC EFF 80/320	125		245	220	528	1140	215	300	185	440X440	345X345		
DAC-SC 100/200	100	100	173	158	429	1080	195	246	190	390X390	295x295		
DAC-SC 100/250 / V			220	180	429	1060		300					
* DAC-SC EFF 100/260	150		260	210	613	1140	275	300	210	500X500	350X350	28	M24x250
DAC-SC 100/270 / V	100		198	197	448	1040	195	315	190	390X390	295x295	23	M20x200
DAC-SC 100/315 / V			248	220	468	1090		340					
* DAC-SC EFF 100/320	150		265	225	603	1130	275		210	500X500	350X350	28	M24x250
DAC-SC 100/400	100		300	270	474	1300	195		190	390X390	295x295	23	M20x200
DAC-SC 125/315 / V	125	125	267	235	512	1300	215	315	185	440X440	345X345		
DAC-SC 125/400			315	280		1495		370					
DAC-SC EFF 125/500	150	150 (125)	385	335	623	1555	275	450	210	500X500	350X350	28	M24x250
DAC-SC 150/315		150	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	680	1300		370					
DAC-SC 200/315 F					702	1335							
* DAC-SC EFF 200/320	250		395	290	804	1390	350	500	250	650X650			
DAC-SC 200/400 F	200		375	355	724	1715	325	530	225	600X600			
DAC-SC EFF 200/410	250		385	305	784	1910	350	500	250	650X650			
DAC-SC EFF 200/500			425	355	804	2700		560					
DAC-SC 250/315 F		250	355	290	784	1750		440					
DAC-SC 250/400 N	200		387	336	694	2030	325	480	225	600X600			
DAC-SC 250/400 M	250				764	2050	350		250	650X650			
DAC-SC 250/400 F	300				857	2080	380		285	730X730	600X600		
* DAC-SC EFF 250/420	250		445	330	814	2100	350	600	250	650X650	500x500		
DAC-SC 250/600N			555	485	767	2210		650		650X650			
DAC-SC 250/700	300		620	540	990	2830	380	750	285	730X730	600X600		
DAC-SC EFF 300/400	350	300	475	325	959	2100	445	600	330	850X850	700X700		
DAC-SC 300/500 F	300		525	430	900	2170	380	585	285	730X730	600X600		
DAC-SC EFF 350/420	350	350	560	400	979	2300	445	800	330	850X850	700X700	36	M33X300
* DAC-SC EFF 350/520	400	400	640	475	1154	3255	510		380	1000X1000	800X800		
* DAC-SC EFF 350/630				490	1189	3285							
DAC-SC 400/400 F			620	476	1132	3235							
* DAC-SC EFF 400/500	500		630	430	1404	3940	635		470	1200X1200	1000X1000		
DAC-SC 400/600 F			570	471	1536	4050		700					
DAC-SC 400/700			685	576	1454	-		1000					
DAC-SC 500/600		500	747	600		3900							
DAC-SC 500/630B	600	500	785		1850		960			1850X1850	1650X1650		

NOT:

1) Dimensions (mm) subject to change whitout 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) * Türbosan reserves the right to make any changes in dimensions without giving prior notice.