

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.

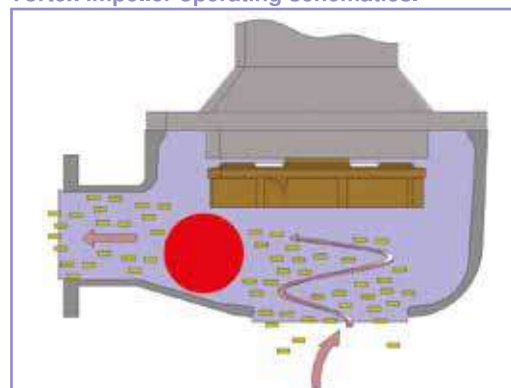
VOLUTE CASING: Volute casings are with concentric discharge and have large crossection. They are designed not to be clogged by the solid that can pass through impeller. In special applications Flush valve can be fitted to the pump. Pumps can be manufactured with different material types if requested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

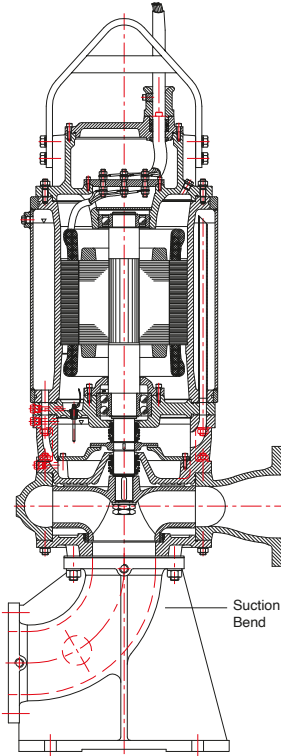


SUBMERSIBLE PUMP DESIGNS

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

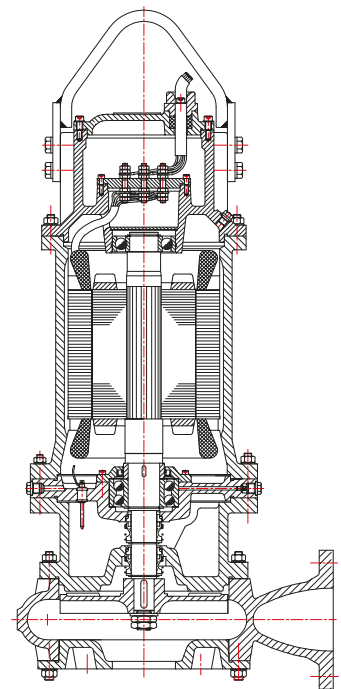
DAC-SC

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.

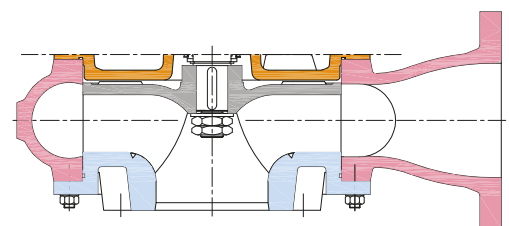


Vortex type impeller: This type of impellers do not have closed channels. Impeller located deep inside the volute casing. Pumping action is generated by vortex created within the fluid by rotation of the impeller. With this geometry they can tolerate large solids than other impeller types more specifically 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:

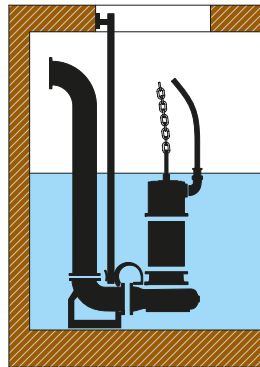
This installation form is for DAC- SC type pump with cooling jacket. DAC-SC type pumps can be operated out of water continuously by circulating the cooling liquid in the cooling jacket that surrounding electric motor which means it cools itself. The station works safer with vibration free pumps. These 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.



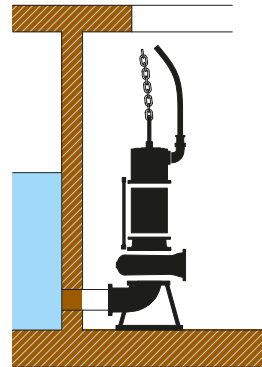
3) VERTICAL FREE STANDING HOSE CONNECTION

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.

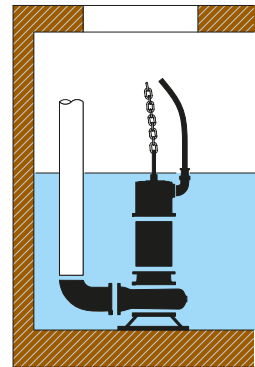
- In all installation forms discharge lines must be fitted with, valve, non return valve, dismantling piece and expansion joint.



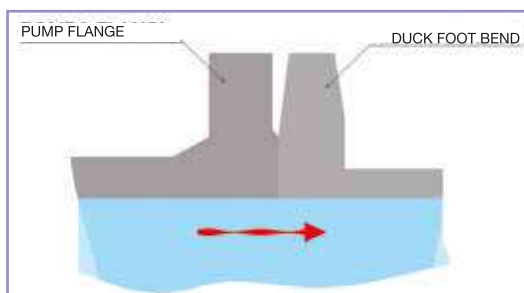
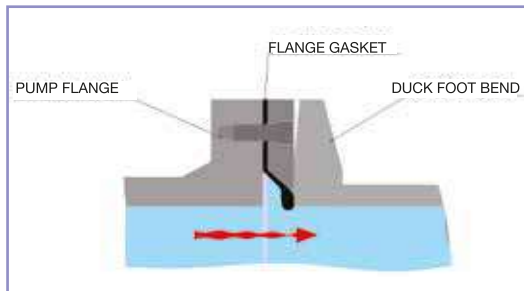
(1)



(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.

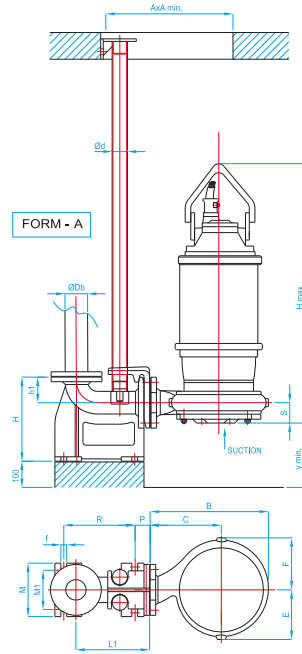
b) Metal on Metal sealing

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.

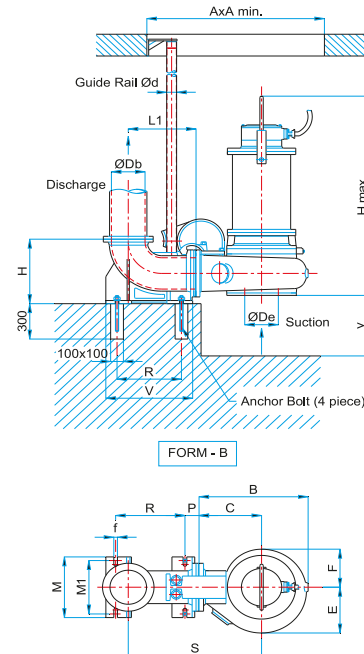


DAC-SC AND DAS TYPE SUBMERSIBLE PUMPS AND DUCK FOOT BEND DIMENSIONS TABLE

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



Ø80, Ø100, Ø125, Ø150 Automatic Coupling



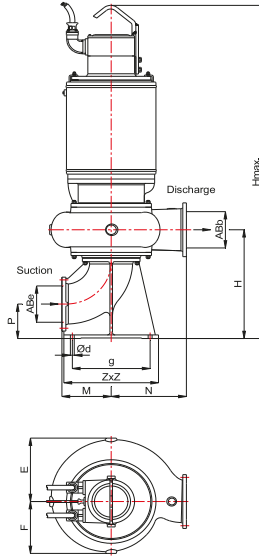
Ø200, Ø250, Ø300, Ø400 Automatic Coupling

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											200	
DAS 100/400	100			625	300	270	80												80	
DAS 125/315 / V	125	125		315	570	267	235	120	293		180	25		M22x250	352	250	355	170	165	
DAS 125/400	150	150 (125)		370	670	315	280	120			270								165	
DAS-EFF 125/500	150			450	790	385	335	120											175	
DAS 150/315	150			380	635	280	240	130	396	96	360	240			480	330	390	200	175	
DAS-EFF 150/315	150			400	650	280	220	130											175	
DAS 150/400	150			400	700	325	300	130											175	
DAS-EFF 150/500	150			500	840	365	305	130											175	
DAS 200/315 N	200			370	670	335	275	127											220	A
DAS 200/315 F	200			530	895	375	355	180	442	112	420	300			540	400	450	200	220	
DAS-EFF 200/320	250	200		500	860	395	290	200											220	
DAS 200/400 F	200			500	845	385	305	180											220	
DAS-EFF 200/410	250			560	960	425	355	200											220	
DAS-EFF 200/500	250			560	960	425	355	200											220	
DAS 250/315 F	200			440	780	355	290	180											250	
DAS 250/400 N	250			480	836	387	336	120	542	107	532	375			682	500	665	665	300	
DAS 250/400 F	300			600	1000	445	330	120											350	
DAS-EFF 250/420	250			650	1176	555	485	130											350	
DAS 250/600	300			750	1330	620	540	141											400	B
DAS 250/700	350			800	1385	640	490	255											400	
DAS-EFF 300/400	300	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											350	
DAS-EFF 350/420	350	350		1310	560	400													400	
DAS-EFF 350/520	350			1380	640	475													450	
DAS-EFF 350/630	350			1385	640	490	255												450	
DAS 400/400 F	400			1090	620	476			875	180	825	550			925	700	1245	1245	550	
DAS-EFF 400/500	400			1355	630	430													550	
DAS 400/600 F	500			700	1215	570	471	285											550	
DAS 400/700	500			1000	1625	685	576	285											550	

NOT:

- Dimensions "mm". Turbosan reserves right to make any changes in dimensions without giving prior notice.
- Flanges conforming to DIN 2501 and TS EN 1092-2
- For pump weight information in accordance with motor power please consult to Turbosan.
- * 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 Bol
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		
DAC-SC 80/315 / V	255		235	418	1080	340	190	315	150	350X350	250X250		
* 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	28	M24x250
DAC-SC 100/250 / V						220							
* 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	23	M20x200		
DAC-SC 125/315 / V	125	125	267	235	1300	215	315	185	440X440			345X345	
DAC-SC 125/400			315	280	512					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		500					
DAC-SC EFF 150/500			365	305	733	1385							
DAC-SC 200/315 N	200	200	335	275	680	1300	325	370	225	600X600	500x500	30	M27x300
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	500						
DAC-SC EFF 200/500			425	355	804	2700	350	560	250	650X650			
DAC-SC 250/315 F		355	290	784	1750	440							
DAC-SC 250/400 N	200	250	387	336	694	2030	325	480	225	600X600	500x500	36	M27x300
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			
DAC-SC 250/600N			555	485	767	2210		650	650X650				
DAC-SC 250/700	300		620	540	990	2830	380	750	285	730X730			
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	330	850X850	700X700	36	M33X300	
* DAC-SC EFF 350/520	400	400	640	475	1154	3255	510						800
* DAC-SC EFF 350/630				490	1189	3285							
DAC-SC 400/400 F			620	476	1132	3235							
* DAC-SC EFF 400/500	500		400	630	430	1404	3940	635	700	470	1200X1200	1000X1000	
DAC-SC 400/600 F				570	471	1536	4050						
DAC-SC 400/700				685	576	-	-						
DAC-SC 500/600		747		600	1454	3900	1000						
DAC-SC 500/630B		600		500	785	600							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.