

Item.	Qty.	Technical description	Price per unit	Amount
		Agitator for retention tank and sludge mixing Task The agitator has to mix the municipal sludge evenly. Sedimentation of solids and floating layers must be avoided. It should be possible to increase the agitator efficiency up to 10% with a jet ring. Technical details of the basins Number of basins: X The shape of the basin: XXXXX Length: X m + Width: X m / * Diameter = X m Minimum mud level = X m Maximum mud level = X m Volume per basin: approx. XXX m³ Mud Type: XXXXX Dry matter (by weight): max. X % (DS) Dewatering mode: static * / mechanically * Number of agitators: X unit per basin Max. propeller diameter: 600mm The supplier must guarantee the following performance. Max. Propeller speed: 500 min⁻¹ Guaranteed thrust: XXXX N : Max. Power consumption: XX kW (P1) Specif. Thrust vs. power: XXX N / kW (F / P1) according to ISO 21630 Specif. Energy consumption per m³: XX W / m³ (P1 total / V)		
1.01	X	Submersible Agitator The Agitator shall be capable to mix biological sludge. It shall be possible to easily raise and lower the mixer on a 100x100 mm guide bar system without the need for personnel to enter the tank. The Agitator shall be equipped with an extended lifting handle. The agitator, with its appurtenances and cable, shall be capable of continuous submergence without loss of watertight integrity to a depth of 20 m. The required distance between propeller centre and the tank floor shall not be more than 700 mm. If the Agitator is equipped with a vortex protection shield and a jet ring, it shall perform without limitation when the water level is just 600 mm above the propeller. Rated Power P2: >= 5,5 kW Operating voltage: 400 V 50 Hz Starting method: D.O.L. The motor shall be induction type with a squirrel cage rotor, housed in an air filled watertight chamber. The stator	X,-	X,-

		windings and stator leads shall be insulated with moisture resistant Class H insulation rated for 180 degree C (355 degree F). Protection class IP 68 according to IEC 60034 and suitable for continuous operation (S1) and a submergence of 20m. Protection and monitoring of motor by - 3 bi-metal Thermal switches for thermal control of the stator (1 switch per winding) - 1 float switch in separate leakage chamber to monitor leakage in the stator housing. Motor sealing The cable entry shall consist of dual cylindrical elastomer sleeves, flanked by washers, all having a close tolerance fit against the cable and the cable entry. Epoxies, silicones, or other secondary sealing systems shall not be considered acceptable. The shaft seal shall be a positively driven dual, tandem mechanical shaft seal system consisting of two seals, each having an independent spring system. Material of construction Motor casing: Stainless steel ASTM 316L Jet ring: Stainless steel ASTM 316L Motor housing: EN-GJL 250 Propeller: Stainless steel ASTM 316L Oil housing: Vinyl ester based SMC Shaft: 1.4057 or AISI 431 Shaft seal: - Pump side: - Corrosion resistant Tungsten carbide WCCR - Motor side: - Corrosion resistant Tungsten carbide WCCR The agitator shall be supplied with 10m screened cable and a cable support grip. Factory testing The manufacturer shall have the capability of acceptance testing the mixer regarding thrust and power according to ISO 21630:2007, on request. The supplier shall present an assembly control plan according to ISO 9001, which confirms the execution of the following tests. 1. Tightness test of the assembled mixer using a vacuum method. 2. Dry-run test to establish mechanical integrity and correct rotation. Model: FLYGT SR 4650 or equivalent		
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1.02		CFD (Computational Fluid Dynamics) Analysis The Contractor shall submit the following information for review and approval: License and Software Proof of the employed CAD, CFD or any additional CFD Pre/Postprocessing software shall be shown on demand. This can include a copy of a paid license receipt or any other document supporting the claim. Finite volume based CFD software capable of multiphase modelling shall be used. CFD model When applicable, turbulence effects shall be represented with the help of realizable k-e (or other) model that provides an improved prediction for the spreading rate of both planar and round jets. Submersible mixer shall be modelled appropriately and correctly account for generated thrust, torque and radial forces. Jet mixer/aerator shall be modelled as a mass flow inlet. Non-Newtonian liquid shall be modelled with the help of appropriate model. Yield stress, flow index and consistency factor shall be justified, based on the given DS %, type of the sludge and thickening method. Computational mesh shall adequately represent relevant internal obstacle and tank geometry with 0.1 m as a maximum size of the computational element. Wall effects shall be well resolved with the corresponding y+ value below 100. Reported results shall correspond to a converged numerical solution. Proof of convergence in a form of residual plot and volume average velocity magnitude shall be presented. The volume average velocity shall be proven converged. The total mass imbalance for net through flow cases shall be maximum 3%. CFD results The report shall describe problem at hand, agreed work scope and analysed scenarios. This shall include setup for each scenario, corresponding running conditions, flow rates, chosen mixer equipment and other relevant information.		
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1.03	X	Installation set for permanent installation of Submersible agitator. The installation set shall contain: 1 guide bar 100x100 mm for floor and wall mounting including anchor bolts. The guide bar shall be applicable for an installation depth up to 6 m The guide bar shall have a support for the agitator. During operation, the wire shall not suspend the agitator. The guide bar and anchor bolts shall be made of AISI 316 (1.4571) The supplier of the agitator shall provide an installation drawing with detailed instruction about the position and orientation of the Agitator based on CFD report specified in item 1.02	X,-	X,-
1.03A		Installation set for permanent installation of Submersible agitator. The installation set shall contain: 1 guide bar 100x100 mm for floor and wall mounting including anchor bolts. The guide bar shall be applicable for an installation depth up to 6 m The guide bar shall have a support for the agitator. During operation, the wire shall not suspend the agitator. The guide bar and anchor bolts shall be made of AISI 304 The supplier of the agitator shall provide an installation drawing with detailed instruction about the position and orientation of the Agitator.	X,-	X,-
1.04.	1	Mobile Lifting davit for Agitator or pump Adjustable for reach and height , Reach 650 - 1200 mm, Including Winch with bracket and 15-meter wire. Max. lifting load: 320 kg Material: David : Stainless steel EN 1.4301 or AISI 304	X,-	X,-

		Winch: Stainless steel or Aluminium Hook & Lifting wire: Stainless steel AISI 316 Model: FLYGT SK 320 or equivalent		
1.04A		Mobile Lifting davit for Agitator or pump Adjustable for reach and height , Reach 1600 - 2000 mm, Including Winch with bracket and 15-meter wire. Max. lifting load: 300 kg Material: David : Stainless steel EN 1.4301 or AISI 304 Winch: Stainless steel or Aluminium Hook & Lifting wire: Stainless steel AISI 316 Model: FLYGT SK 300 or equivalent	X,-	X,-
1.05	1	Lifting device with automatic hook Shall enable the operator to catch, lift, lower and release the Agitator below water level. Material : Stainless steel 1.4436 Model: FLYGT AVR 834126 or equivalent	X,-	X,-
1.06	X	Floor mounted David holder including anchor bolts Material: Stainless steel AISI 316	X,-	X,-
1.06A		Option: Wall mounted David holder including anchor bolts. Material: Stainless steel AISI 316	X,-	X,-
1.07	X	Alarm unit to control thermal and leakage sensors. Power supply: 24V AC / DC + / -10% (45-65Hz) Protection base unit: IP20 Model: Flygt Mini CAS II or equivalent	X,-	X,-
2.01	1	Delivery of described pump (s) and accessories according incoterm DAP to <u>XXXXXXXXXXXXXXXXXX</u>		X,-
2.02	1	Installation of described pumps, valves and accessories Under the condition that that the pump station is accessible with a truck and that lifting gear is available. Place of Installation: XXXXXXXXXXXXXXXXXXXX		X,-