1.14.11 Category J: Decanter Centrifuge

1.14.11.1 Scope of Supply

General Data:

Below are the Specifications and Schedule of Particulars and Guarantees for the supply of one (1) dewatering centrifuge which will be located in the existing sludge treatment room. The design flow is 80 m³/h with 3.5% solids concentration.

Please note that the WWTP's controllers are of "Modicon". Any equipment that will be supplied to Ayalon WWTP shall fully comply with the plant's controllers.

Tag Numbers: M-800.

Component	Number of Units	Bidder Confirmation
Decanter centrifuge	1	
Service podest	1	
MCC	Excluded	
PLC	Included	
Solids Diverted Gate	Included	
Submittals		
Electrical drawings format dwg.	2D	
Machine drawing format rvt./ifc.	3D	

1.14.11.2 Specifications

Item	Minimum requirement	Guaranteed value
General		
Manufacturer	Flottweg, Alfa Laval, Andritz, GEA or approved equivalent	
Model	X7E or approved equivalent	
Flow Design, m³/hr	80	
Solids Load, kg/hr	2,800	
Working days/week	5.5	
Hours per Shift	8	
Sludge type	Anaerobic digested	
Feed Sludge Solids Concentration, %	3.5%	
Feed Sludge VSS/TSS	70%	
Dewatered sludge Solids Concentration @ design flow and solids load, %	22	

Item	Minimum requirement	Guaranteed value
Solids Capture rate @ design flow and solids load, %	97	
Counter or Co-current		
Working Point	Continuously at maximum speed	
Energy recovery	Flottweg "Recuvane" or equivalent.	
Bowl		
Bowl type	Super deep pond	
Bowl volume, lit	700	
Bowl Speed, rpm	2,920	
Operating G force, G	3,000	
G Volume m^3· rpm	2,730	
Bowl Material	Duplex	
Material long. bowl strips	SS316	
Bowl internal diameter, mm	700	
Diameter/length ratio	4	
Cone angle	18^o	
Scroll		
Scroll Speed, rpm		
Scroll Material	SS316 Ti/SS316L	
Range of Operating Diff. Speeds, RPM	0-10	
Wear Surfaces Material of:		
Tip edges of scroll	Tungsten Carbide	
Leading edges scroll		
Sludge feed ports	Replaceable bushings	
Sludge outlet ports	Replaceable bushings	
Guaranteed life of all wear surfaces (between rebuilds and/or replacements), h		
Nom. Scroll torque, Nm	40,000	
Other materials		
Wetted pars	SS316Ti/SS316L	
Non-wetted parts	Carbon steel, painted.	

Item	Minimum requirement	Guaranteed value
Bearings		
Main Bearings		
Type		
L-10 life, h		
Method of Lubrication	Automatic Grease	
Scroll Conveyor Bearings		
Type		
L-10 life, h		
Method of Lubrication		
Thrust Bearings		
Type		
L-10 life, h		
Method of Lubrication		
Backdrive System		
Electrical Motor		
Manufacturer		
Type or Model		
Explosion proof standard	Unclassified	
Motor Speed, RPM		
Motor Rating, HP		
Motor IP Rating	IP 55	
Service Factor		
Pwr Fctr Full Load		
Eff. at Full Load, %		
Current:		
Nominal AMP		
Locked Rotor AMP		
Insulation Class		
Temperature Rise @ Full load C°		
Net Weight Motor, kg		
Pump Type		
Reservoir Volume, l		
Insulation Class	F	

Item	Minimum requirement	Guaranteed value
Temp Rise Full Load C°		
Net Weight Motor, kg		
Protections		
Overload protection	Included	
Overheat protection	Included	
Vibration Protection	Included	
Reducing Gear		
Manufacturer		
Type or Model		
Reducing Ratio		
Eff. at Full Load, %		
Control		
Local Control Panel	Included	
Control Hierarchy	PLC is connected to CPLC of the WWTP	
Environment	Corrosive Atmosphere	
Material	SS316	
Ingress Protection	IP55	
Values to be sent to HMI	Centrifuge on/off	
	Bowl speed, RPM	
	Motors power consumption, kW	
	Motors current consumption, A	
	Motors Temperature, ℃	
	Feed flow rate, m3/hr, Optional	
	Polymer flow rate, m3/hr, Optional	
	Motors operation hours	
Alarms	Overheat	
	Overload	
	Vibrations	
Decanter Centrifuge VFD		
Manufacturer	ABB, Vacon or approved equivalent	
IP rating	IP 54	

Item	Minimum requirement	Guaranteed value
Operation conditions	Heavy Duty	

1.14.11.3 FAT (Factory Acceptance Test)

After complete manufacturing of the equipment, the contractor shall notify the client that all the scope of supply has been checked in accordance with the equipment at the factory, and add a signed document for the factory acceptance test.

1.14.11.4 Running

The running will be performed in the presence of the manufacturer representative according the following procedure:

1. Dry run
    i. The manufacturer representative shall approve the installation of the equipment and shall provide a signed installation report.
    ii. Dry run after electrical connection of the equipment in order to validate proper operation of the centrifuge and that there are no vibrations and irregular noises.
2. Trial run with digested sludge
    i. Running with digested sludge for 50%, 70% and 100% of the design load.
    ii. The trial run shall be carried out for three (3) days. During the trial run the proper operation of the centrifuge will be tested, synchronization with the control system and obtaining the demanded dewatered sludge dryness.
    iii. After the first trial run, the decanter shall be run by the WWTP staff for 60 days. The run will be complete after 60 days of continuous proper operation.