



Project Name: Cooper City, FL

ALDEC 45 Decanter Centrifuge for Sludge Dewatering



Alfa Laval Reference No. 0330190 Rev 3
July 5, 2024
Quote Validity: 30 Days

Prepared by:

Brian Ayres
Applications Engineer
Brian.Ayres@alfalaval.com

Alfa Laval, Inc.
804-222-5300
5400 International Trade Drive
Richmond, VA 23231

Prepared for:

Cooper City, FL



July 5, 2024

Cooper City, FL
REF: 0330190 Rev. 3

To whom it may concern,

Thank you for your enquiry. We are pleased to enclose our Firm Quotation for **Two (2) ALDEC 45 Decanter Centrifuges** for the **Cooper City, Florida** project.

As part of Alfa Laval's dedication to continuous innovation, the ALDEC Decanter Centrifuge is the industry benchmark for dewatering and thickening in wastewater treatment. In summary...

- **ALDEC decanters deliver greater operational efficiency**, allowing for increased sludge treating capacity or dryer sludge cake for reducing sludge disposal costs.
- **Lowest energy consumption**, with optimized motors & drives, delivering the lowest installed power and energy consumption.
- **Low maintenance costs**, with reduced planned maintenance and easily replaceable wear parts.

Alfa Laval offers unrivalled **24-hour service agreements**, placing your needs as close as a phone call away! Our certified field service engineers are available for installation, commissioning, maintenance, repairs, and process optimization. Additionally, Alfa Laval provides original equipment manufacturer (OEM) parts direct from our US Distribution Center in Indianapolis.

As requested, we have included the scope of supply and applicable process guarantees based on the defined influent sludge parameters. Technical details along with dimensional drawing for the proposed centrifuge including weights, bowl diameter, speed, installed power, power consumption and G-Force are enclosed in the proposal.

Alfa Laval recommends the described equipment per the outlined technical specifications, and additional clarifications for greater understanding of the offer. We trust that we have interpreted your requirements correctly and shall be pleased to provide any additional information which may be required in support of our proposal.

Note: Kindly indicate our Quotation Reference in your Purchase Order/ Letter of Acceptance/ Sales Contract and all our correspondences if the order is confirmed to us.

Yours faithfully,
Mark Schlitzkus

Mark Schlitzkus
Regional Sales Manager
Alfa Laval

Cc: Eric Peters, PE | MTS Environmental



CONTENTS

1.	Alfa Laval	1.1	About Us
		1.2	Wastewater Separation Technologies
		1.3	Lab & Pilot Testing
		1.4	Always at Your Service
		1.5	Spare Parts
2.	ALDEC Decanter Centrifuge	2	General Description
3	Ancillaries	3.1	Feed Flexible Connector
		3.2	Polymer Flexible Connector
		3.3	Solids Discharge Flexible Connector
		3.4	Solids Discharge Chute
		3.5	Centrate Discharge Funnel
		3.6	Diverter Gate (Optional)
4.	Electrical Assembly and Controls	4.1	Electrical Assembly
		4.2	Controls
		4.3	Decanter Connect Controls
5.	Alfa Laval Service	5.1	360° Service Portfolio
		5.2	Your Local Service Center
		5.3	USA Service Centers
		5.4	Commissioning
		5.5	Preventive Maintenance
		5.6	Repair
		5.7	Equipment Upgrade
6.	Alfa Laval Support	6.1	Service Performance Agreement
		6.2	Connected Services
7	Process Details	7.1	General Data
		7.2	Sizing Data
8.	Scope of Supply	8.0	Scope of Supply
		8.1	Dimensional Dwg.
		8.2	Notes of Clarification
		8.3	Exclusions
		8.4	Service
9.	Commercial Terms	9.1	Pricing
		9.2	Payment Terms
		9.3	Delivery Time
		9.4	Terms & Conditions of Sale

1. ALFA LAVAL



1.1. About us

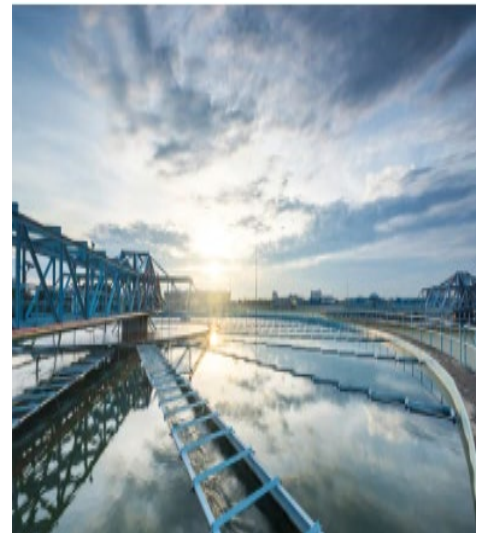
Alfa Laval is a leading global provider of separation, heat transfer, and fluid handling technology. Founded in 1883 and for more than 130 years, we have built a global presence with service centers and partners in nearly 100 countries. This offers local expertise, supported by the global breadth and depth of Alfa Laval. With these as its base, Alfa Laval aims to help enhance the productivity and competitiveness of its customers in various industries all over the world. [Alfa Laval – Our Company.](#)



1.2. Wastewater Separation Technologies

Alfa Laval has been manufacturing Municipal Water and Wastewater decanters centrifuges for over 50 years. There are 50,000+ units operating worldwide, with 5,000+ in the US. We remain committed to being the technology leader in design innovations, delivering reduced power & polymer consumption, increased cake dryness, and increased capacity within the same footprint. [Alfa Laval - Municipal wastewater treatment](#)

- Decanter Centrifuge
- Belt Filter Press
- Gravity Belt Thickener
- Rotary Drum Thickener
- Plate & Frame Press
- Tertiary Water Filtration
- SBR / MBR / Pkg. Plants



1.3. Lab & Pilot Testing

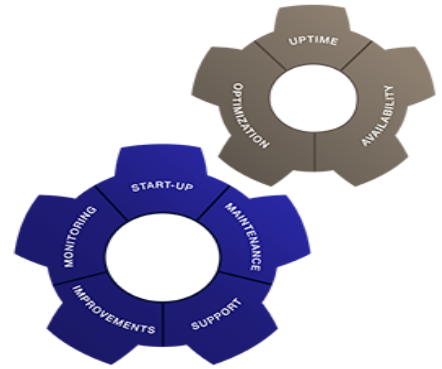


Alfa Laval's DNA is to continuously bring value to our customers. Our state-of-the-art wastewater laboratory, located in the Houston, TX service center; allows Alfa Laval to analyze the optimal technology for your specific separation requirements. Additionally, Alfa Laval provides separation equipment available for on-site field testing and demonstration. These include decanter centrifuge, rotary drum filter, and belt press.



1.4. Always at Your Service:

- 24/7 Support
 - 75+ Authorized Service Providers
 - 4 - USA Service Centers -
 - Indianapolis US Parts Distribution Center
 - OEM Parts – 450,000+ Spare Parts in Stock
 - 50+ Field Technicians
- [Alfa Laval - Service and support in the USA](#)



1.5. Spare Parts

A smart choice

Boost productivity and maximize uptime with quality genuine parts from Alfa Laval. With easy access to a broad range of long-lasting high-quality parts, you can lower your total cost of ownership and preserves the value of your equipment throughout its entire life cycle.

Available everywhere

Through our global service network, you have easy access to our extensive genuine spare parts inventory through 11 major Alfa Laval distribution centers.



Alfa Laval maintains an extensive inventory of spare parts that supports our current product range as well as some legacy parts, which are up to 100 years old. Our parts inventory system contains specific information, such as technical details and availability, for more than 450,000 parts, and we have more than 50,000 unique items in stock.

The Americas are conveniently served through the American Distribution Center (AMDC), which is centrally located in Greenwood, IN, USA.

Alfa Laval AMDC
200 South Park Blvd
Greenwood, IN 46143

Unmatched quality

Designed for durability, reliability and productivity, our parts deliver outstanding performance time and time again. Manufactured to precise specifications, Alfa Laval parts have proven performance in our material and test laboratories as well as in process lines around the world.

Traceability and certification

Parts are continuously improved to meet the highest standards and comply with various certification requirements and regulations, such as REACH.

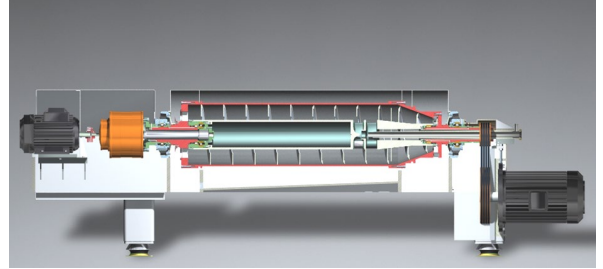
[Alfa Laval - Spare parts](#)



2. ALDEC CENTRIFUGE GENERAL DESCRIPTION

See how it work in less than 2 min [Decanter Animation Dewatering](#)

The ALDEC Decanter Centrifuge is an open, non-pressured horizontal decanter centrifuge. It features a solid horizontal bowl and scroll type conveyor, with counter current flow design. The centrifuge is designed and built to operate continuously at a maximum g-force. All parts of the centrifuge in contact with the process material are made of type Duplex stainless steel or AISI 316 stainless steel except O-rings, seals, feed tube and abrasion resistant materials. Process seals and other O-rings and seals are made of nitrile rubber, unless otherwise specified. The feed tube is fabricated from AISI 316 stainless steel. [Alfa Laval - ALDEC](#)



Frame and Casing Assembly

- The frame and casing are a box beam profile type with integral casing with or without hinges.
- The material of the casing and cover is AISI 316 stainless steel.
- The inside surface of the casing consists of stainless-steel liners in the discharge areas and a painted surface in the neutral compartment.
- Casing gaskets are of nitrile rubber. The material of the frame is painted mild steel.
- The cover is bolted in place

OPTIONAL: Hinged Cover

- Spring loaded hinges for ease of opening during maintenance or inspection (spring loading prevents cover from closing on its own).
- These can be located on the left or right side.
- The hinged cover provides the operator easy access **without the requirement of overhead crane and additional manpower** for routine inspections and maintenance.



Bowl Assembly

- Material: centrifugally cast duplex stainless steel, AISI 304 or AISI 316.
- End-hubs: centrifugally cast duplex stainless steel.
- All surfaces are examined for cracks, shrinkage, porosity, or other defects.
- The pool depth adjustable using plate dams at the large diameter end of the bowl.

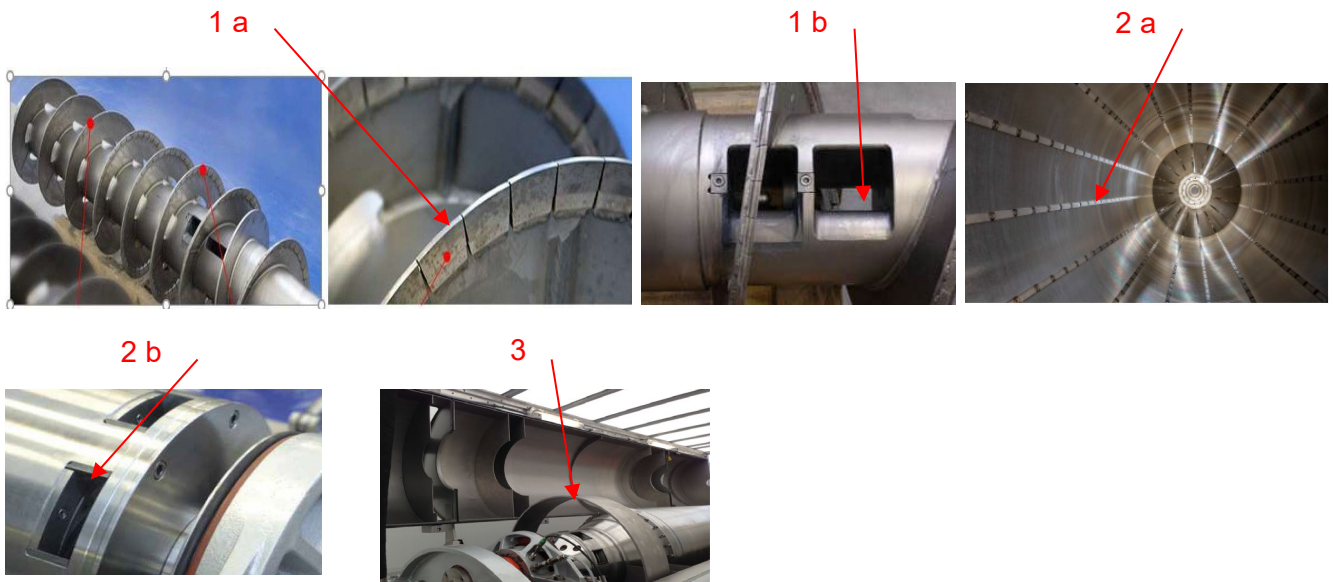
Conveyor Assembly

- Material: AISI 316 stainless steel.
- Feed zone of a high-capacity design.
- Flights:
 - Windowed quasi-axial.
 - Material
 - Tiles-length: duplex stainless steel.
 - Remaining section: AISI 316.



Wear Protection

1. Conveyor
 - a. Flights: With a series of welded-on sintered tungsten carbide (TC) tile assemblies and from two wraps beyond the feed zone through the solids discharge end, and with flame sprayed tungsten carbide (TC) for the remaining section.
 - b. Feed zone wear liner
2. Bowl:
 - a. Stainless steel strips to secure against abrasion.
 - b. Solids discharge ports: field replaceable (TC) wear saddles, with 360° solids discharge to avoid blocking.
3. Replaceable stainless steel or urethane insert is available on certain decanters to protect the solids discharge casing.



Gearbox

- The gearbox is an Alfa Laval proprietary multi-stage planetary gear reducer unit.
- Controls the maximum differential speed between the centrifuge bowl and conveyor.
- Torque capacity: 2.5 kNm with a gear ratio of 1:159.5

Bearings

- Alfa Laval decanters have standardized grease lubricated bearings.
- These highly reliable bearings provide easier maintenance, greater reliability and lower power consumption.



Centrifuge Electrical Equipment

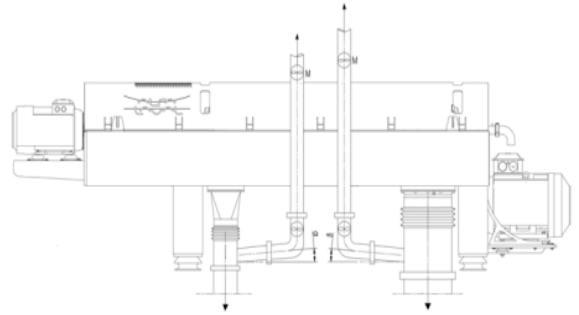
- Vibration Sensors
- Bearing Temperature
- Speed Sensors
- Main and Back motors' thermistors/thermostats/RDT



Other Requirements

Venting

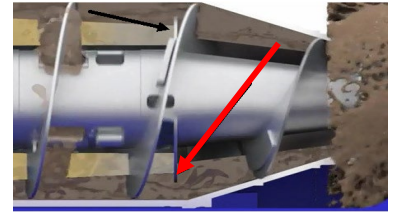
- Venting of outlets reduces the pressure impact created by air suction from the bowl rotation. Alleviating this small pressure inside the casing reduces the possibility of bearing contamination, as well as excess bowl wear.



Other Features

Bowl configuration

- Baffle disc provides higher processing capacity and drier cake solids.



Cone configuration

- Steep or shallow cone configuration for optimum separation of any type of slurry.



Figure 1. Steep cone configuration

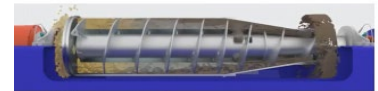


Figure 2. Shallow cone configuration

Safety Features

- Cover Switch: Cover switch protection, to prevent the operation or shut down of the system if the cover switch is activated.
- E-Stop: Emergency Stop button to shut the system down.



3. Ancillaries

3.1. Feed Flexible Connector

150# ANSI flange with suction discharge hose and 24" long.

3.2. Polymer Flexible Connector

PTFE Lined SS braided, 24" long with crimped fittings.

3.3. Solids Discharge Flexible Connector

8" Tall rubber boot, flanged top & bottom, including 2 sets of Backer bar frames, and 304SS fasteners.

3.4. Solids Discharge Chute

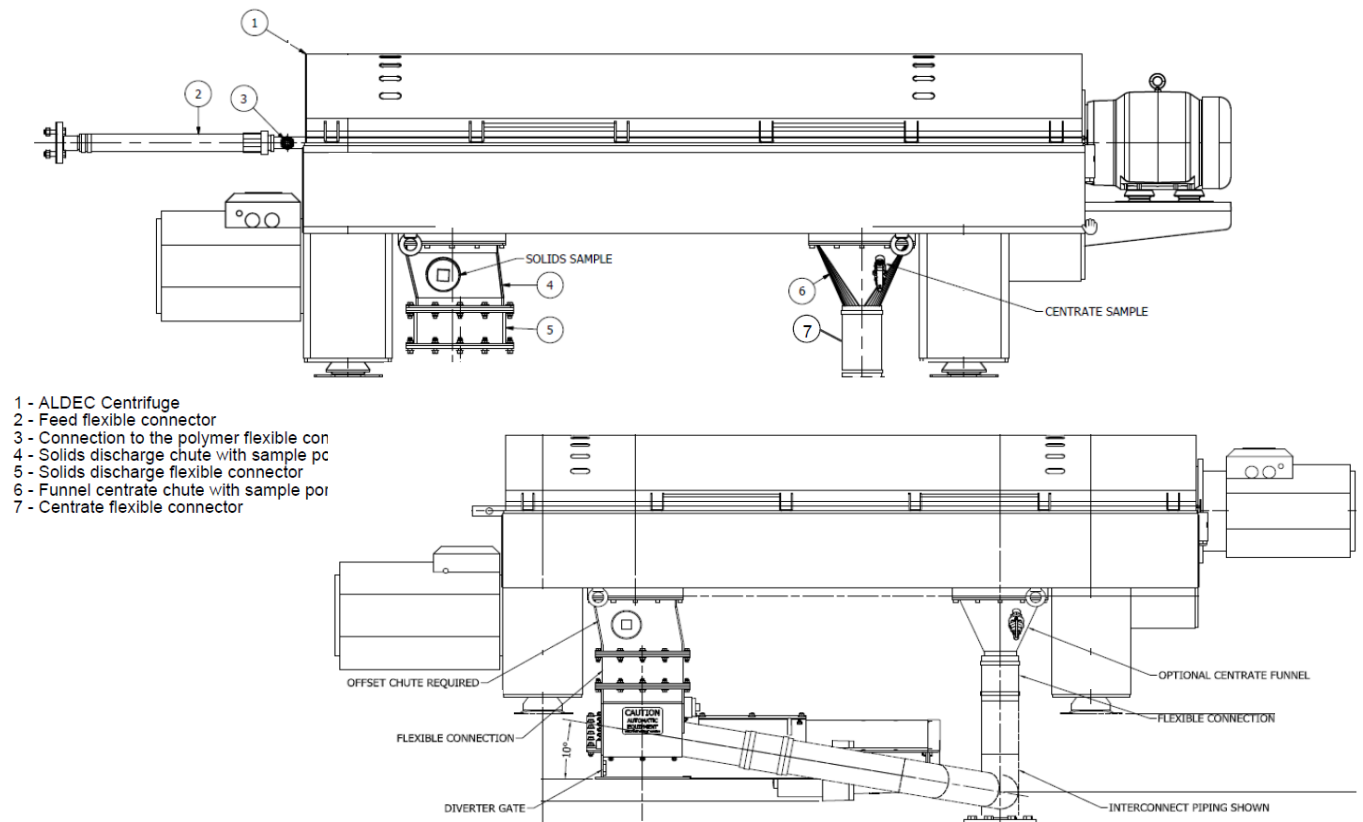
Flange gasket, 2 1/2" sample port with plug, and 304SS fastener. Flanged chute top & bottom.

3.5. Centrate Discharge Funnel

Flange gasket, top flange to match centrifuge outlet, transition to 4" OD for hose connection. 1/2" Valved sample port, 4" 125# plate flange with a 12" long discharge hose and 304SS fastener.

3.6. Diverter Gate (Optional)

The diverter/slide gate is of the knife/gate type with an electric actuator, limit switches and position feedback relays specifically designed for diverting liquid flow, as specified and/or wastewater sludge. 110V Linear actuator, 2" inspection port, 24VDC position sensors, 4" pipe coupling, 1/2" flush nozzle, 316SS nameplate and caution labels. Diverter piping: 4" Sch40 welded piping, 4" 125# plate flange.



3.7. ALSYS – Centrifuge Skid System (Optional)

The ALSYS module is a compact, reliable and efficient solution for reducing the liquid content of sludge. It is specially configured for dewatering many of the sludge types normally encountered in industry and in smaller-scale municipal and potable water treatment plants.

It is a self-contained system that includes all the equipment required for on-site dewatering. This includes a progressing cavity feed pump, flow meters, polymer dosing pump and all the necessary piping and valves, along with a screw conveyor for the dewatered sludge.

- Plug-and-play” design that ensures rapid, easy installation on site
- Compact layout reduces floor space requirements and ensures easy maintenance
- Automatic operation does away with the need for continuous attendance
- Factory-tested modular construction paves the way for rapid commissioning by Alfa Laval field service personnel.

The ALSYS module is based on the ALDEC / ALDEC G3 decanter centrifuge and is available with Alfa Laval Decanter Connect System (DCS) technology, designed to make both installation and operation more efficient, simple and cheap. The very efficient DCS ensures trouble-free operation, with excellent levels of safety built in.





4. Electrical Assembly and Controls

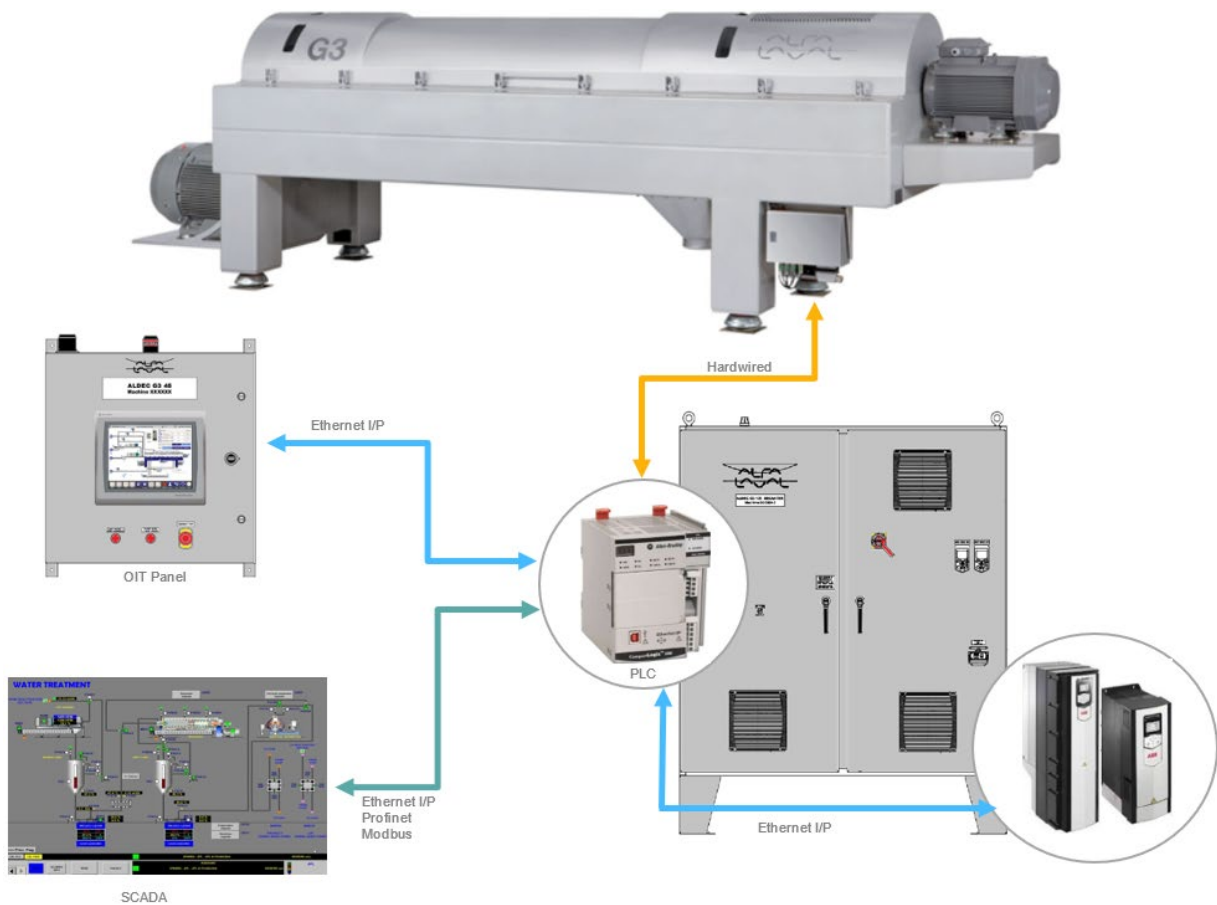
4.1. Electrical Assembly

- Main-drive motor: 30 HP
- Back-drive motor: 7.5 HP
- The selected main-drive motor and the back-drive motor are both VFD control, 460 Volt, 60 Hz, 3 phase power supply.

4.2. Controls

- Alfa Laval's standard design: **Alfa Laval's Decanter Connect Control Package**
 - Regulation of the conveying torque or differential speed between the conveyor and the bowl via the VFD-controlled back-drive motor
 - Control of associated equipment (e.g. sludge macerator, sludge feed pump, diverter-gate, cake-conveyor, flushing valve, etc., starter-panels of these to be provided by others).
- Centrifuge vibration sensor control and PT 100 for main bearings temperature control are incorporated for added safety of the machine.

[Alfa Laval Decanter-Connect Controls](#)

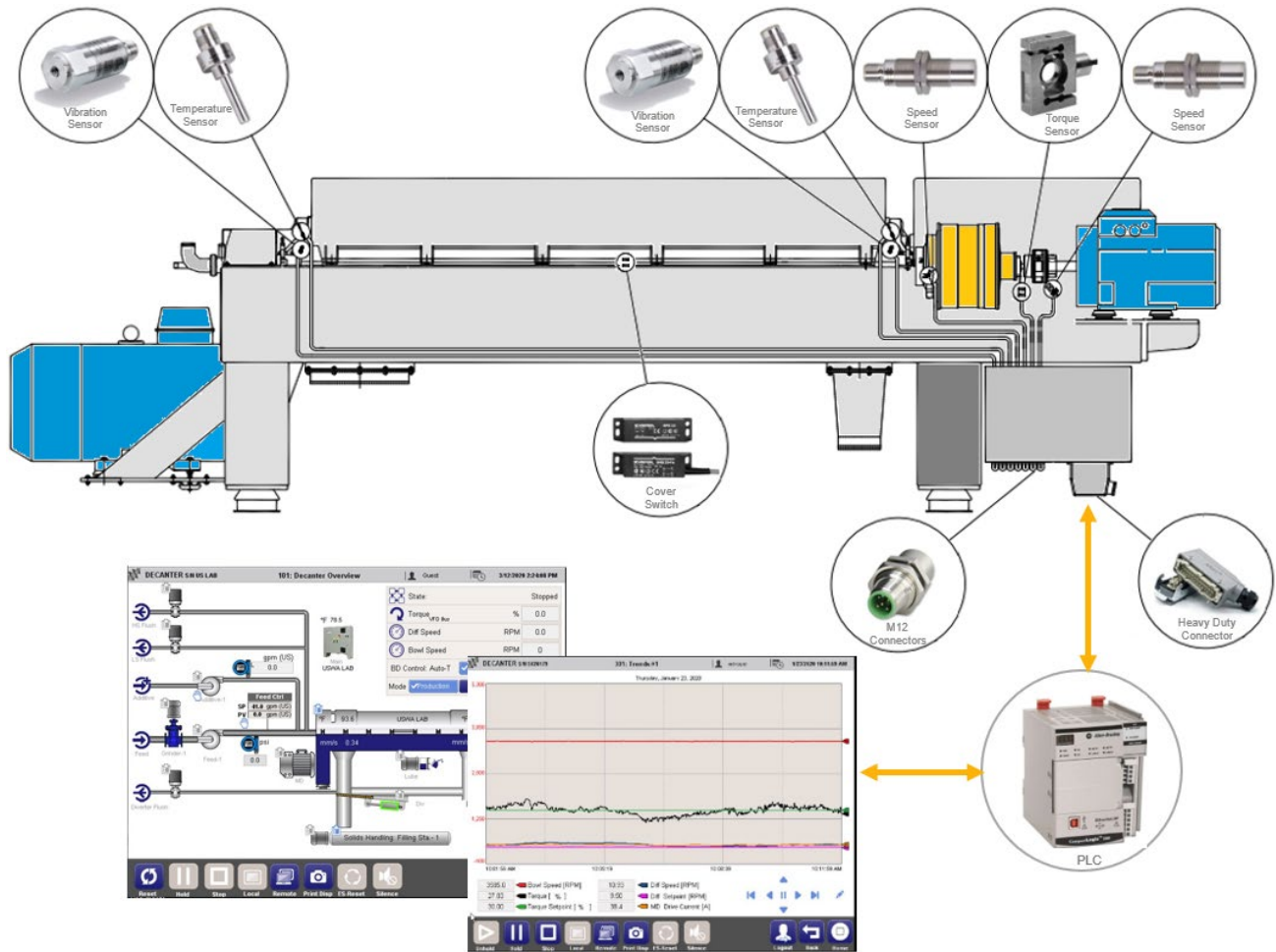




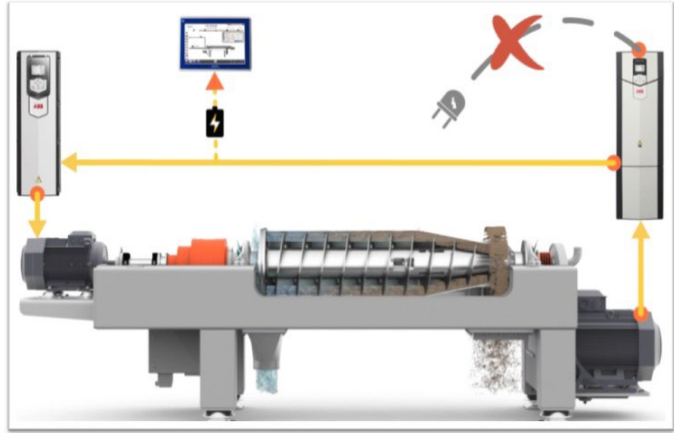
4.3. Alfa Laval Connect Control System

Key Features

- a) Allen Bradley CompactLogix PLC
- b) ABB ACS 880 series VFDs
- c) PanelView 7 Performance HMI – 10” (or optional 15”)
- d) SCADA Communication to Allen Bradley, Delta V, ProfiNet, or Modbus TCP protocols
- e) Fully assembled & wired to centrifuge instrumentation
- f) Pre-wired and tested with all core centrifuge instrumentation: Speed sensors, backdrive torque sensor, main bearing vibration sensors, and main bearing PT-100 temperature sensors
- g) Touch-screen 10” HMI-Display (or optional 15”)
 - o Easy Navigation
 - o Machine animated overview screen
 - o Analog, Digital and Multi centrifuges data display
 - o Alarms
 - o Trend curves



- h. **POWER LOSS-** The control of centrifuge during power loss or outage will allow the centrifuge to run through a short duration power blip, generally defined as 3-5 seconds. If the power outage extends past the 3-5 seconds the system will shut down the feed and polymer pumps and put the centrifuge into the production standby mode for a programmed set time. If power is restored during this time the feed pump and polymer pump will automatically restart and production will resume. Should the power not be restored, the control system will allow the centrifuge to be brought to a stop in a normal shutdown mode (as if it had power) maintaining the differential speed during the coast down period. This system will allow the centrifuge to scroll the solids out and be available for an immediate restart once power is restored. [Click on the image to see how it works](#)



- i. Control Panel Optional Configurations
- Different configurations for Local and Starter panels
 - NEMA 12 or NEMA 4X
 - VFD ABB Type ACS800 for Main Motor
 - VFD ABB Type ACS800 for Back-drive Motor
 - Power supply Source: 460 V / 60 Hz / 3 Ph
 - For locating within "safe" non-hazardous area,





5. ALFA LAVAL SERVICE

5.1. 360° Service Portfolio

Alfa Laval partners with you for the entire life cycle of your equipment – from start-up, through operation, monitoring and maintenance, all the way to reconditioning and eventual redesign. Our goal is to ensure that our equipment continuously gives you optimized process performance.



5.2. Alfa Laval Service Centers:

You can trust Alfa Laval service technicians to maintain your decanter centrifuges in peak performance and minimize the risk of unscheduled production stops. Our local service centers are equipped with the tools and expertise to improve the performance of your decanters. Join us on a virtual tour of our state-of-the-art facilities.



Learn more about Alfa Laval Decanter Service

[Alfa Laval - Decanter centrifuge service](#)

[Alfa Laval - Chesapeake service center](#)

[Alfa Laval - Greenwood service center](#)

[Alfa Laval - Houston service center](#)

[Alfa Laval - Fresno service center](#)





5.3. Commissioning

Services consist of:

- installation review,
- performance checks,
- process optimization,
- operator training.

The commissioning process ends with a handover or acceptance certificate and is often the first day of warranty.

The commissioning:

- Enables trouble-free start-up and process fine-tuning.
- Advice on optimizing process conditions.
- Checks on surrounding components, systems and controls and optimization recommendations.
- Help to reduce maintenance costs with a customized proposal to optimize maintenance.

5.4. Preventive Maintenance

- Highly experienced Alfa Laval specialists can formulate and implement an optimal maintenance plan for your equipment.
- Service intervals are determined by various factors, including type of application as well as the usage and condition of the equipment.
- The service can be performed on site or in one of the local Alfa Laval Service Centers located near you.

The preventive maintenance:

- Delivers peace of mind and operational reliability
- Secures maximum throughput
- Increases overall equipment lifetime and provides good cost control
- Maintains safe equipment operation

5.5. Repair

Alfa Laval specialists repair the equipment according to your needs, replacing unsafe or worn parts as required, and then reassemble the equipment.

- Minimizes downtime
- Maximizes production performance
- Extends the lifetime of equipment
- Prevents equipment from consequential damage and accidents

5.6. Equipment Upgrades

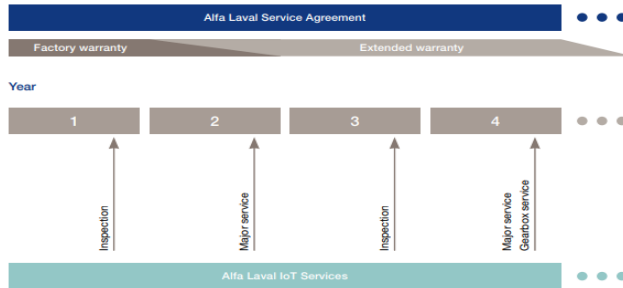
- There is a wide range of upgrade solutions available to ensure your Alfa Laval equipment features the latest technical developments.
- As operating conditions change over time, new challenges can call for a review of the current installations.
- Equipment Upgrades can also include control upgrades that improve equipment automation.



6. ALFA LAVAL SUPPORT

6.1. Service Performance Agreements

Example



Technical Helpdesk.

With an Alfa Laval Service Agreement, you ensure outstanding performance from your Alfa Laval decanter and minimal total cost of ownership. Tailored to your priorities and requirements, a service agreement is the ideal maintenance solution from the original manufacturer of your equipment. Alfa Laval offers Service Performance Agreements which include premium customer discount levels on parts, preferential scheduling for field service and free unlimited access to Alfa Laval's

A quotation for a Service Agreement tailored to your requirements can be provided upon request. For more information on Service Performance Agreements, and our local service organization which includes 11 service centers, over 50 factory-trained field technicians, a centrally located parts distribution center, and our 24/7 365 Days Technical Helpdesk, visit our website link below

[Alfa Laval - Performance Agreements](#)

6.2. Connected Services



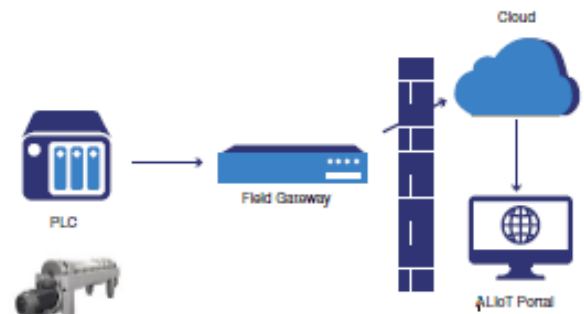
Imagine the possibilities if you could have an eagle eye's view of your equipment. At Alfa Laval, our top priority is ensuring that customers get outstanding and reliable performance from their equipment throughout its long lifetime. That's why we're investing heavily in R&D for IoT (internet of things) services to interconnect your production and control systems. You'll have vital information at your fingertips to truly get the most from your equipment – each and every day!

Alfa Laval IoT Services add new possibilities to your Alfa Laval wastewater decanter such as remote support and monitoring, condition monitoring, predictive maintenance and process optimization. The results are lower service costs, maximum operating reliability, higher process efficiency and more uptime. Learn more about Alfa Laval's IoT Services for decanters in wastewater plants in the sections below or contact us for a discussion on the best combination for your plant.

[Alfa Laval - IoT Connected Services](#)

6.2.1. Remote Monitoring & Support

Remote Monitoring helps assure you that your decanter is running as expected. Access data like bowl speed and torque in the Alfa Laval IoT portal via your laptop, tablet or phone. Alarm notifications can be sent by e-mail or SMS/text message to let you know about anomalies.

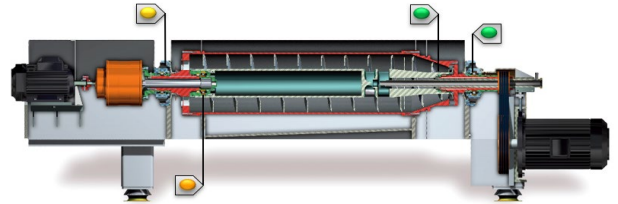




Remote Support allows our experts insight to live and historic data to identify the problem more quickly and accurately when you call for support.

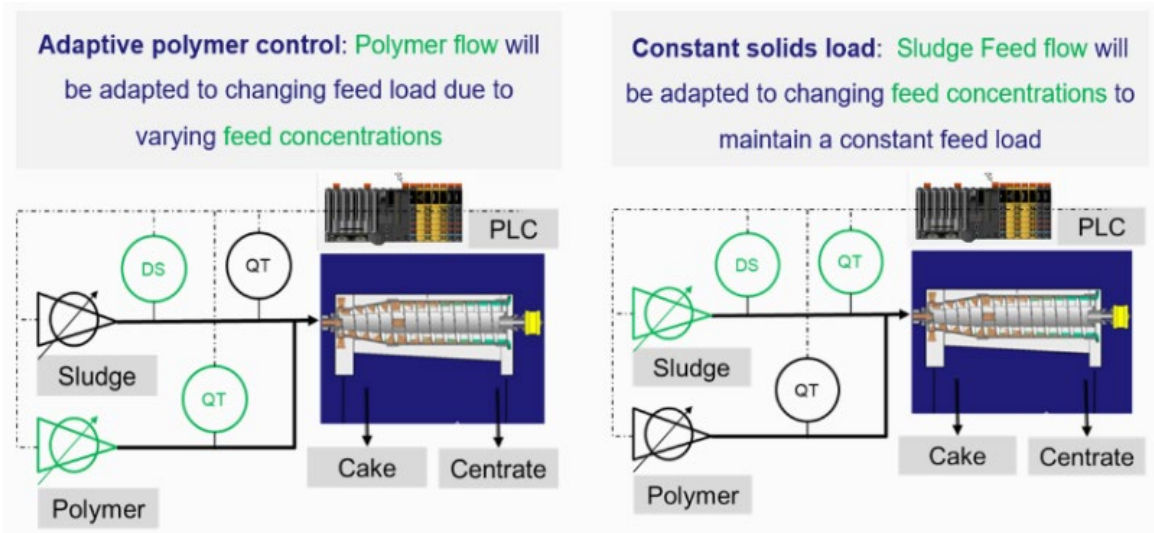
6.2.2. Predictive Maintenance

The Predictive Maintenance area of Connected Services develops services that help our customers improve reliability and avoid risk. The long-term objective is to develop a predictive maintenance solution that predicts failures before they ever happen. The first service in this area, is ConditionAlert™; based on vibration measurements and frequency analyses which can identify the source of abnormal vibration levels and suggest remedies. The customer is notified by Alfa Laval with a plan for service.



6.2.3. Process Optimization

The Process Optimization area of Connected Services develops services that help our customers optimize their decanter process, thereby reducing cost and increasing savings. Focused on the Wastewater Treatment industry, we offer Constant Solids Load & Adaptive Polymer Control, with the long-term objective of developing a self-optimizing decanter.





7. PROCESS DETAILS AND SIZING

7.1. General Data

Sludge Origin:	Wastewater
Duty:	Dewatering

7.2. Sizing Data

Operating Times

Days per Week:	3-4
Hours per Days:	10

Capacity per Machine

Hydraulic (gpm):	50 - 60
Solids (lbs./hr.):	300 - 450

Number of units

Operating:	2
Standby:	0

Feed Solids

Range (%):	1.2 – 1.5
Design (%):	1.5

Centrifuge Performance

Cake Solids (%):	12 – 15 requested
Expected Recovery (%)	95

Bowl Diameter (in)	14.17
--------------------	-------

Maximum Bowl Speed (rpm)	4,200
--------------------------	-------

Installed Power (HP)	37.5
----------------------	------

G-Force (x g)	3,549
---------------	-------



8. SCOPE OF SUPPLY

Two (2) ALDEC 45 Centrifuges will come complete and include the following scope of supply:

- Modular frame with process contact areas in 316 SS
- Vibration isolators
- Singular cover in 316 SS (covers belts, rotating assembly and gearbox)
- Abrasion protection (Tungsten Carbide on wear surfaces)
- Rotating assembly complete with 2.5 kNm Planetary gearbox and pillow block bearings
- All bearings grease lubricated
- Vibration and temperature sensors in main bearing housings
- Main drive Motor: 15-50 Hp AC VFD
- Back drive Motor: 7.5 Hp AC VFD
- Starter Panel: NEMA 12 Free-Standing
- Local Control Panel: NEMA 4 X (304 SS) Wall mounted
- PLC: Allen Bradley CompactLogix
- HMI: Allen Bradley – 10 inch
- Main Drive VFD: ABB ACS880
- Back drive VFD: ABB ACS880
- Control of centrifuge during power loss or outage
- Flexible connectors
- Solids discharge chute
- Centrate discharge chute
- Factory Paint System
- One (1) set required lubricants
- One (1) set of required spares
- One (1) set of anchor bolts for centrifuge

Also included with pricing:

- Required Tools including bowl lifter and conveyor lifter
- Electronic Submittal and O&M Manual
- Alfa Laval Service tech for up to twenty (20) days on site and four (4) trips for installation inspection, start-up, testing and training.

Two (2) VeloBlend Model VM-10P-1200-Dx-0-A-2 Liquid Polymer Blending Systems, each will come with the following scope:

- Polymer Mixing Chamber Assembly
- Neat Polymer Metering Pump Assembly (Progressive Cavity)
- Dilution Water Inlet Assembly
- Solution Discharge Assembly
- Control Panel
- System Skid
- Capabilities
 - Polymer Flow Range: 0.5 to 10 GPH
 - Dilution Water Flow Range: 2 to 20 GPM



One (1) Lot Turnkey Installation with scope listed below:

Scope Summary:

- Replace 2 existing centrifuges in place
- Replace existing poly feed/mix tanks with 2 new neat poly skids (no new mix tanks)
- Remove/replace 2 existing centrifuge control panels
- New Poly systems connected to new centrifuge control panels for control
- NO SCADA – all control will be local to the centrifuge panels.

1. General Requirements

- a. Mobilization & Demobilization to the jobsite
- b. Temporary Facilities; office/tool trailer, port-o-lets, etc. (as required)
- c. Coordination and Phasing of work with the Owner's Personnel
 - i. The work will require two-phases. Only one polymer system and one centrifuge system will be removed from service at any given time.
- d. Project Management & Field Supervision of the work (OSHA 30-Hr Certified)
- e. Start-up of equipment with assistance of manufacturer's representative
- f. General clean-up of the work area and site restoration (as required)

2. Scope of Work:

a. Polymer System:

- i. Removal and disposal of the existing polymer system. Cap existing piping that will not be used.
- ii. Offload and Install MTS provided polymer system (NO mixing or day tanks standard neat polymer feed systems). Tie-into existing process piping.
- iii. Modify existing concrete equipment pads (as required)
- iv. Paint and label new process piping

b. Centrifuge System:

- i. Temporarily remove translucent panels and awing for access to centrifuge system area. Reinstall upon completion of the project.
- ii. Removal and disposal of the existing centrifuge system. Cap existing piping that will not be used.
- iii. Offload and Install MTS provided centrifuge system. Tie-into existing process piping.
- iv. Modify existing concrete equipment pads (as required)
- v. Modify existing discharge chutes to provide more accurate loading for the truck drivers
- vi. Paint and label new process piping

c. Electrical Systems:

- i. Supply and install galvanized rigid conduit, wire, supports, and enclosures required to connect polymer system and centrifuge system. To included power, control, instrumentation and ethernet cabling. Terminations.
- ii. Installation of polymer and centrifuge LCPs and operator interface panels
- iii. Install new breakers as needed
- iv. Install GRC conduit and wire for discreet controls from machine to control panel, analog controls from machine to control panel, and data from machine to control panel.

8.1. **DIMENSIONED DRAWING** ALDEC 45 Dimension Drawing No. 4099899039.

(See Appendix A)



8.2. NOTES OF CLARIFICATION

Scope of supply is per Alfa Laval standard centrifuge configuration, and in accordance with typical specifications and drawings. Any additional items not explicitly stated in this proposal or standard to Alfa Laval's typical specifications are not included in this quotation. The specified equipment is intended for installation within a **non-hazardous** safe area.

Equipment to be supplied by Alfa Laval (and /or sub-supplier), as specified in this quotation, are standard machines. Any modifications / additions other than those expressly specified in the quotation shall incur extra engineering cost, material cost and delivery time.

Technical submittal documentation shall be per Alfa Laval's (and /or sub-supplier) standards, delivered electronically, in English language. Additional documentation requirements shall incur extra engineering cost, material cost and delivery time.

All scope of supply modifications / additions requires prior agreement by both parties and written acknowledgement by Alfa Laval.

Escalation Charges:

- This proposal is based on equipment delivery within two years from the date of this proposal. Alfa Laval reserves the right to add escalation charges for delivery beyond this time.

8.3. Exclusions from this quotation:

- All building / electrical permits and required inspections, plant is to be responsible for securing these.
- Modifications to the building needed to install equipment described above.
- Structural engineering analysis.
- Field wiring, conduit and electrical flexible connections...etc.; contractor shall remain responsible for meeting all relevant electrical codes unless otherwise specified above.
- Pipes, valves, and fittings...etc. unless otherwise specified above
- Associated equipment, i.e., sludge macerators, feed pumps, polymer preparation & dosing unit, cake conveyors, centrate tanks and pumps...etc unless otherwise specified above.
- Measuring instruments between centrifuges and associated equipment
- Noise abatement enclosures
- Odor control equipment
- Inspection and access platforms or ladders
- Utilities and consumables (polymer, power, water and other consumables required during testing, start-up and commissioning
- Detailed or project specific related engineering
- Duties, taxes, bonds...etc.

8.4. Service time is included in the quoted price based on the following: (1) x Field Service Engineer, - up to ten (10) days, @ 10 hr./day, with up to two (2) round trips, per unit for start-up, commissioning, and training. Any additional service time resulting from non- Alfa Laval -warranty delays, will be charged at the rate in effect at the time of service.

8.5. Warranty: Per the enclosed Alfa Laval's Standard Terms & Condition of Sale. Alfa Laval reserves the right to review operating and maintenance records to ensure compliance.



8.6. Process performance achieved by the centrifuge (cake solids, loading, hydraulic throughput, etc.) is verified through onsite analysis of representative sampling during equipment commissioning.

9. COMMERCIAL TERMS

9.1. Pricing

Item	Description	Qty.	Extended Price
1	ALDEC 45	2	
1.1	Control Panels	2	
1.2	Commissioning of centrifuges	2	
2	Polymer Systems	2	
3	Turn-key Installation	1	
TOTAL PRICE			\$1,450,000.00

9.2. Payment Terms

10% with PO, N10 days
 10% upon Alfa Laval Submittal Delivery, N30 days
 75% upon delivery or availability to deliver should owner encounter delays, N30 days
 5% upon acceptance or beneficial use, whichever comes first, N30 days, but not later than 120 days after shipment.

9.3. Sales Tax

Sales tax is excluded from quoted price and remains the customer's responsibility. Per state / federal legal obligation, Alfa Laval will pay applicable taxes; said taxes are charged and invoice to customer's account as actual.

9.4. Estimated Delivery Time

Submittals: 8 -12 weeks from fully executed PO
 Centrifuge: 26 – 30 weeks from release to manufacturing

9.5. Quote Validity

30 Days



10. TERMS AND CONDITIONS OF SALES

These Terms and Conditions of Sale ("Terms and Conditions") apply to all quotations, orders, and contracts for Alfa Laval Inc. products (hereafter "Equipment") and associated services ("Services") As used in these Terms and Conditions, the word "Equipment" includes all hardware, parts, components, software and options.

1. **ACCEPTANCE:** Our sale to you is limited to and expressly made conditional on your assent to these Terms and Conditions and, if applicable, on the attendant quotation, both of which form a part of the contract between us and which supersede and reject all prior agreements, representations, discussions or negotiations, whether written or oral, with respect to this sale and any conflicting terms and conditions of yours, whether or not signed by you. Any terms and conditions contained in your purchase order or request for quotation or other form which are different from, in addition to, or vary from these Terms and Conditions are expressly rejected, shall not be binding upon us, and are void and of no force or effect. These Terms and Conditions may not be changed except by the written agreement of both parties.

2. **PRICES:** Unless otherwise specified in writing, all quoted prices are in U.S. Dollars and are firm for thirty (30) days from the date of offer. Prices quoted are exclusive of taxes, freight and insurance, and you agree to pay any and all sales, revenue, excise or other taxes (exclusive of taxes based on our net income) applicable to the purchase of Equipment. If you claim an exemption from any such taxes you shall provide us with a tax exemption certificate acceptable to the taxing authorities.

3. **DELIVERY; FORCE MAJEURE:** Dates for the furnishing of Services and/or delivery or shipment of Equipment are approximate only and are subject to change. Quoted lead times are figured from the date of receipt of complete technical data and approved drawings as such may be necessary. We shall not be liable, directly or indirectly, for any delay in delivery or failure to deliver caused by carriers or by labor difficulties, shortages, strikes or stoppages of any sort, or difficulties in obtaining materials from ordinary sources and suppliers. In addition, we shall not be liable for any such delays or for any failure to perform our obligations under an order or contract due to any one or more of the following events, whether foreseeable or not: war, hostilities, military operations, terrorism, riots, disorder, accidents, floods, storms, natural disasters, fires, acts of God, epidemics and/or pandemics (and specifically in relation hereto and notwithstanding anything else stated herein, whether or not outbreak of such epidemic or pandemic has occurred prior to acceptance of this order or execution of a contract for the Services), governmental, judicial or administrative decisions, decrees or orders, embargoes or blockades, or any causes beyond our reasonable control. Unless otherwise specifically agreed in writing by us, in no event shall we be liable for any damages or penalties whatsoever, or however designated, resulting from our failure to perform or delay in performing due to any of the causes specified in this paragraph 3.

4. **SHIPMENT, RISK OF LOSS, TITLE:** All sales are made F.O.B. Alfa Laval shipping point, unless otherwise noted. Duty, brokerage fees, insurance, packing and handling as applicable are not included unless otherwise noted. Our liability for delivery ceases upon making delivery of Equipment to the carrier at the shipping point in good condition. The carrier shall be your agent. Risk of loss shall pass to you upon such delivery. Regardless of the delivery term specified, we shall retain title to the Equipment until final payment thereof has been made.

5. **CREDIT AND PAYMENT:** Payment terms are thirty (30) days net, unless agreed otherwise by us in writing. *Pro rata* payments shall become due with partial shipments. Any discount period which may be granted by us begins on the invoice date and all payments are due 30 days after the invoice date. All payments



shall be made without deduction, deferment, set-off, lien or counterclaim of any nature. All amounts due not paid within 30 days after the date such amounts are due and payable shall bear interest at the lesser of 1.5 percent per month or the maximum rate of interest allowed by law. We reserve the right at any time to suspend credit or to change credit terms provided herein, when, in our sole opinion, your financial condition so warrants. Failure to pay invoices when such invoices are due and payable, at our election, shall make all subsequent invoices immediately due and payable irrespective of terms, and we may withhold all subsequent deliveries until the full account is settled. We shall not, in such event, be liable for delay of performance or nonperformance of contract in whole or in part subsequent to such event. We shall have the right to deduct from or set off against sums due you any sums due and owing to us from you under any other order or contract between us.

6. **SECURITY AGREEMENT:** You hereby grant us a security interest in the Equipment, including a purchase money security interest, and in such materials, proceeds and accessories thereof, to secure payment of the purchase price of the Equipment. You authorize us to file or record a purchase order or copy thereof or any UCC financing statement showing our interest in the Equipment in all jurisdictions where we may determine filing to be appropriate, and you agree to sign all such documents reasonably related thereto promptly following our request. You will not encumber the Equipment with any mortgage, lien, pledge or other attachment prior to payment in full of the price therefor.

7. **CANCELLATIONS AND CHANGES:** Orders which have been accepted by us are not subject to cancellation or changes in specification except upon prior written agreement by us and upon terms that will indemnify us against all losses resulting from or arising out of such cancellation or change in specifications. In the absence of such indemnification, we shall be entitled to recover all damages and costs of whatever nature permitted by the Uniform Commercial Code.

8. **DEFERRED SHIPMENT:** If shipment is deferred at your request, payment of the contract price shall become due when you are notified that the Equipment is ready for shipment. If you fail to make payment or furnish shipping instructions we may either extend the time for so doing or cancel the contract. In case of deferred shipment at your request, storage and other reasonable expenses attributable to such delay shall be payable by you.

9. **EQUIPMENT WARRANTY AND REMEDY:**

(a) For new Equipment only, we warrant to you that the Equipment that is the subject of this sale is free from defects in design (provided that we have design responsibility), material and workmanship. The duration of this warranty is twelve (12) months from start-up or eighteen (18) months from delivery to you, whichever occurs first (the "Warranty Period"). If you discover within the Warranty Period a defect in design, material or workmanship, you must promptly notify us in writing. Within a reasonable time after such notification, we shall repair, replace, or, at our option, refund you the price of the defective Equipment or part thereof.

(b) For repairs, parts and Services provided by us, we warrant to you that the repairs, parts and Services we provide to you will be free from defects in material and workmanship. The duration of this warranty is ninety (90) days from as applicable (i) the date the Equipment which required the repairs, parts or Services is returned to you by us, (ii) the date of your receipt of the part, or (iii) the date of completion of the repair or other Services, if performed at your facility. If during this ninety day period you discover a defect in the repairs, parts or Services you must promptly notify us in writing and we shall correct such defect with either new or used replacement parts or reperform the Services as applicable. If we are unable to correct the defect after a



reasonable number of attempts, we will provide a refund of the price paid for the defective repair, parts or Services.

(c) All warranty service is subject to our prior examination and approval and will be performed by us at your facility or at service centers designated by us. All transportation to and from the designated service center will be at our expense. The remedies set forth above are your exclusive remedies for breach of warranty. Unless otherwise agreed in writing by us, our warranty extends only to you and is not assignable to or assumable by any subsequent purchaser, in whole or in part, and any such attempted transfer shall render all warranties provided hereunder null and void and of no further force or effect.

(d) The warranties set forth above are inapplicable to and exclude any product, components or parts not manufactured by us or covered by the warranty of another manufacturer. We shall have no responsibility for defects, loss or damage to the extent caused by (i) normal wear and tear, (ii) your failure to follow all installation and operation instructions or manuals or to provide normal maintenance, (iii) repairs or modifications by you or by others not under our direct supervision, or (iv) a product or component part which we did not design, manufacture, supply or repair.

(e) **DISCLAIMER OF IMPLIED WARRANTIES.** THE WARRANTIES SET FORTH ABOVE AND IN SECTION 12 BELOW ARE IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

10. **LIMITATION OF LIABILITY:** In no event shall we be liable, and you hereby waive any claims against us and release us from liability to you, for any indirect, special, punitive, incidental, or consequential damages whatsoever based upon breach of warranty, breach of contract, negligence, strict tort, or any other legal theory. In no circumstance, shall we be liable for, however such damages are characterized, loss of profits, loss of savings or revenue, loss of use of the Equipment or any associated equipment, cost of capital, cost of any substitute Equipment, facilities or services, downtime, or loss of prospective economic advantage. OUR AGGREGATE LIABILITY FOR FAILURE TO PERFORM, BREACH OF WARRANTY OR BREACH OF OTHER CONTRACTUAL OBLIGATIONS, NEGLIGENCE, STRICT TORT OR ANY OTHER LEGAL THEORY SHALL NOT EXCEED THE TOTAL PRICE PAID TO US FOR THE EQUIPMENT OR SERVICES THAT ARE THE SUBJECT OF ANY CLAIM BY YOU.

11. **OWNERSHIP:** All drawings, designs, specifications, data and other proprietary rights supplied by us (including without limitation in connection with the Equipment) have been prepared or assembled by us and are (and shall remain) exclusively our property, and upon our request you agree to execute any additional documents needed to give effect to the foregoing. Such drawings, designs and specifications have been furnished in order to provide full documentation and on the condition that they shall not be disclosed, reproduced or copied in any manner whatsoever, in whole or in part, except for your internal use as necessary, and upon the further condition that, as our sole property, they shall not be used for furnishing information and/or disclosed, in whole or in part, to others or otherwise for any purpose not specifically authorized in a writing signed by one of our corporate officers.

12. **PATENT INFRINGEMENT**

(a) We make no express or implied warranties of non-infringement with respect to the Equipment. We will, however, defend, indemnify and hold you harmless from any third party apparatus claims based upon an issued U.S. patent to the extent such claim relates to the Equipment supplied and sold



to you; provided, however, that we undertake no indemnification in respect of third-party rights (i) where the alleged patent infringement is based upon or related to any method, process or design claims in third-party U.S. patents, any combination of the Equipment with other equipment not supplied by us, or any modifications of the Equipment made by you and not approved by us, or (ii) to the extent the alleged infringement is directly attributable to the negligence or intentional misconduct of you or otherwise for which you are obligated to indemnify us for under paragraph 12(c).

(b) We shall assume defense of a claim at our expense in accordance with these Terms and Conditions, provided you shall notify us within 30 days of your receipt of notice of an alleged third-party claim that you believe would entitle you to patent infringement indemnification pursuant to paragraph 12(a). You acknowledge and agree that we shall have the sole right to settle or otherwise compromise such a third-party claim, including but not limited to the right to either (i) modify the Equipment to avoid infringement if you are agreeable to the modification, (ii) repurchase the Equipment from you at a price equal to the then-current fair market value of the Equipment, or (iii) secure rights by assignment or license to permit continued use of the Equipment.

(c) If a third party charges us with patent infringement relating to Equipment sold by us to you, we shall have the right to either (i) modify the Equipment to avoid infringement if you are agreeable to the modification, (ii) repurchase the Equipment from you at a price equal to the then-current fair market value of the Equipment, or (iii) secure rights by assignment or license to permit continued use of the Equipment. If a third party charges us with patent infringement on the bases set forth in paragraph 12(a)(i) or (ii), you shall indemnify and hold us harmless for all expenses as well as any awards of damage assessed against us, and, without limiting any of our other rights and remedies available at law or in equity, we shall also have the right to modify or repurchase the Equipment or to secure rights for continued use by way of assignment or license as set forth in this paragraph.

13. **INSPECTION:** Upon prior written notice, you may make reasonable inspections of Equipment at our facility. We reserve the right to determine the reasonableness of the request and to select an appropriate time and location for such inspection. You agree to execute appropriate confidentiality provisions upon our request prior to visiting our facility. All costs of inspection shall be solely determined by us and shall be payable by you. No inspection or expediting by you at the facilities of our suppliers is authorized.

14. **SOFTWARE PROVISIONS:** If software is provided hereunder (whether such is integrated into the Equipment or otherwise operates alongside the same), you are hereby granted a non-exclusive, non-sublicensable, non-transferable, royalty free license to access and use such software as provided and as intended with our Equipment. Without limiting the foregoing, under the foregoing license you may specifically: (i) use our software in machine readable object code only and only with the Equipment provided; (ii) copy our software into any machine readable object code form solely for back up purposes in support of your use of our software on the Equipment provided in accordance with these Terms and Conditions; and (iii) create one additional copy of the software for archival purposes only. This license may only be assigned, sublicensed or otherwise transferred by you with our prior written consent. You hereby recognize and acknowledge that the software provided to you hereunder comprises valuable trade secret and/or copyright property of Alfa Laval (or its licensors) and you covenant that you will take adequate precautions against access to the software by, or disclosure of the software to, anyone not authorized hereunder to use or have access to the software as contemplated herein. The software is subject to the confidentiality obligations set forth below in paragraph 15.



15. **CONFIDENTIALITY:** Subject to any non-disclosure or confidentiality agreement already in effect between us, any drawings, data, software or other information exchanged between us is proprietary or confidential to us and shall not be used or disclosed by you without our prior written consent. Confidential information shall not be any information that (i) is known previously to you under no obligation of secrecy; (ii) becomes known to the public through no breach of an obligation of secrecy by you; or (iii) is independently developed by you without use or reference to any of the confidential information or materials provided to you by us.

16. **INAPPLICABILITY OF CISG:** The parties specifically agree that the United Nations Convention on Contracts for the International Sale of Goods shall not apply to any sale or order or the contract between us.

17. **GOVERNING LAW & VENUE:** These Terms and Conditions and any dispute or claim arising out of or related to an order or the contract between us shall be finally decided in accordance with the laws of the Commonwealth of Virginia, without giving effect to the provisions thereof relating to conflict of laws. You agree that the venue for any such dispute shall lie in the United States District Court for the Eastern District of Virginia, Richmond Division. In the event that federal jurisdiction cannot be established pursuant to 28 U.S.C. §§ 1331 or 1332, the venue for any such dispute shall lie in the Circuit Court of Henrico County, Virginia. You expressly submit and waive any objection to the sole and exclusive jurisdiction of such courts.

18. **GENERAL:** All previous agreements or understandings between us, either oral or written, with regard to the subject order, with the exception of a pre-existing non-disclosure agreement between us, are void and these Terms and Conditions constitute the entire agreement between us with respect to the matters addressed herein. Neither of us shall assign an order or contract to which these Terms and Conditions apply without the prior written consent of the other party, which consent shall not be unreasonably withheld. If any provision of these Terms and Conditions is held to be invalid or unenforceable, such holding shall not affect the validity or enforceability of any other provision herein. No waiver by either of us of any default or breach by the other party will operate as or be deemed a waiver of any subsequent default or breach.