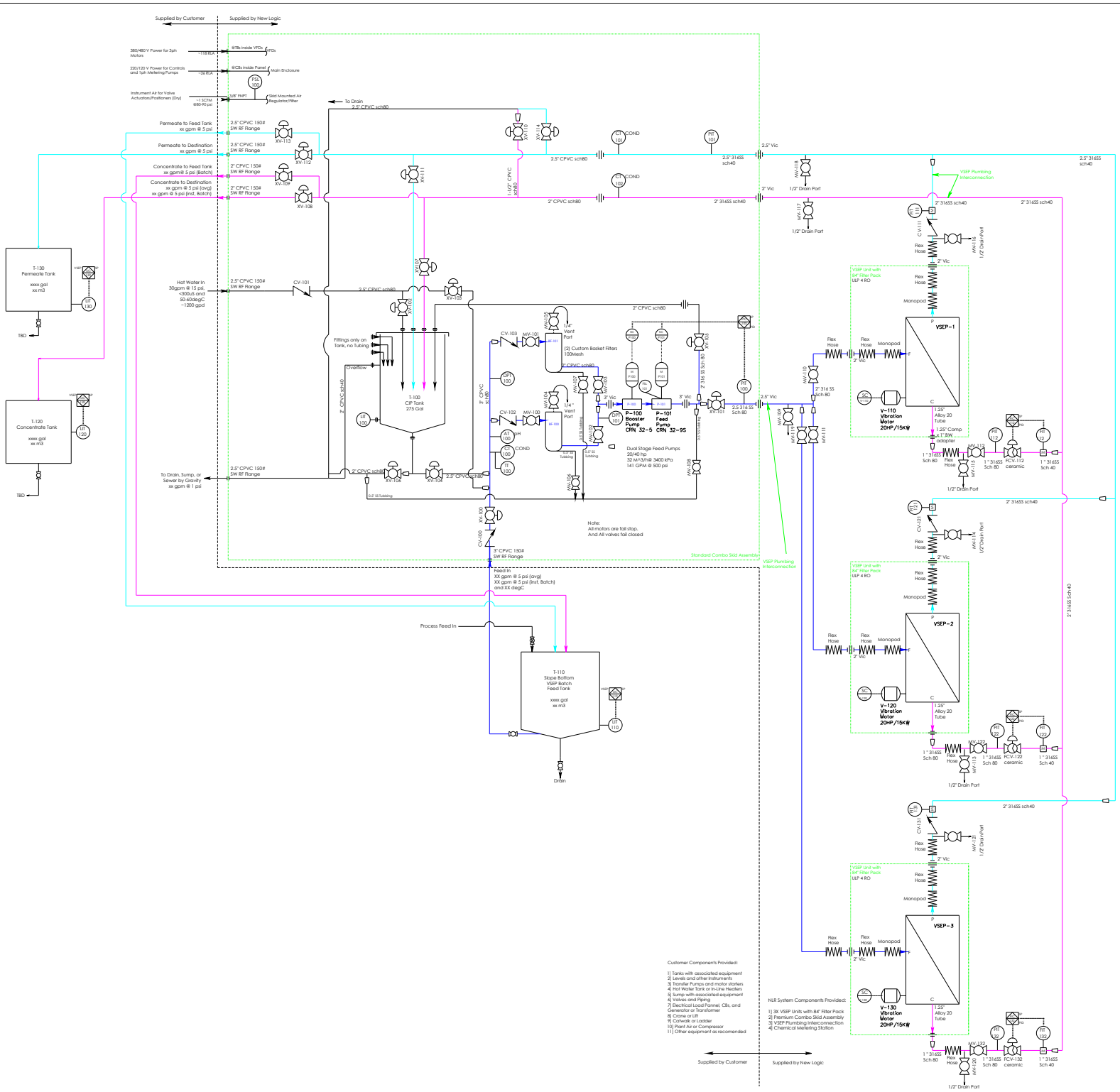
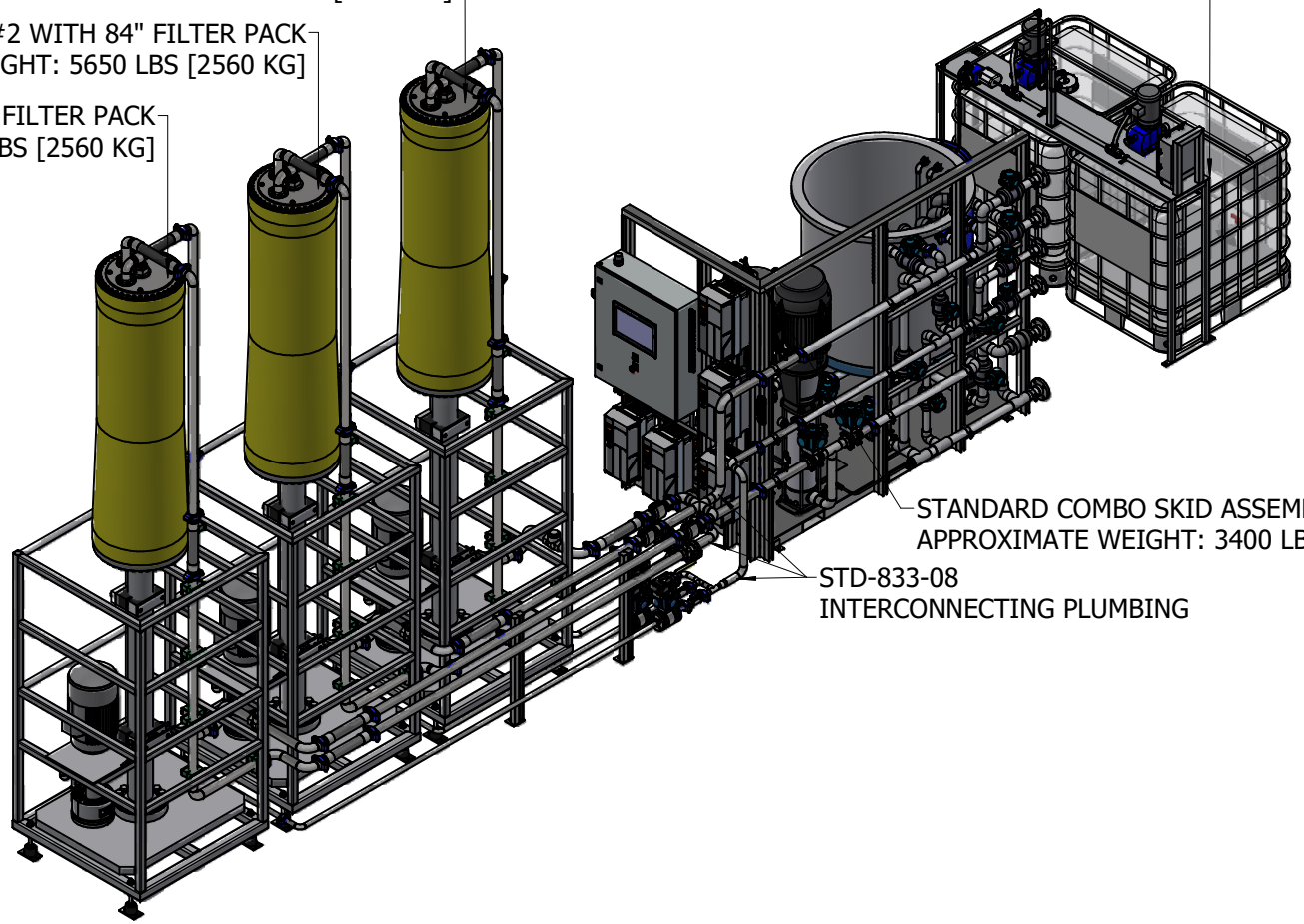


Notes:
NLR Confidential Material
Preliminary - For Reference Only.

Revision	NEW LOGIC RESEARCH
	84" Three VSEP Combo System
	P&ID
	August 2006 — Matt Ayers

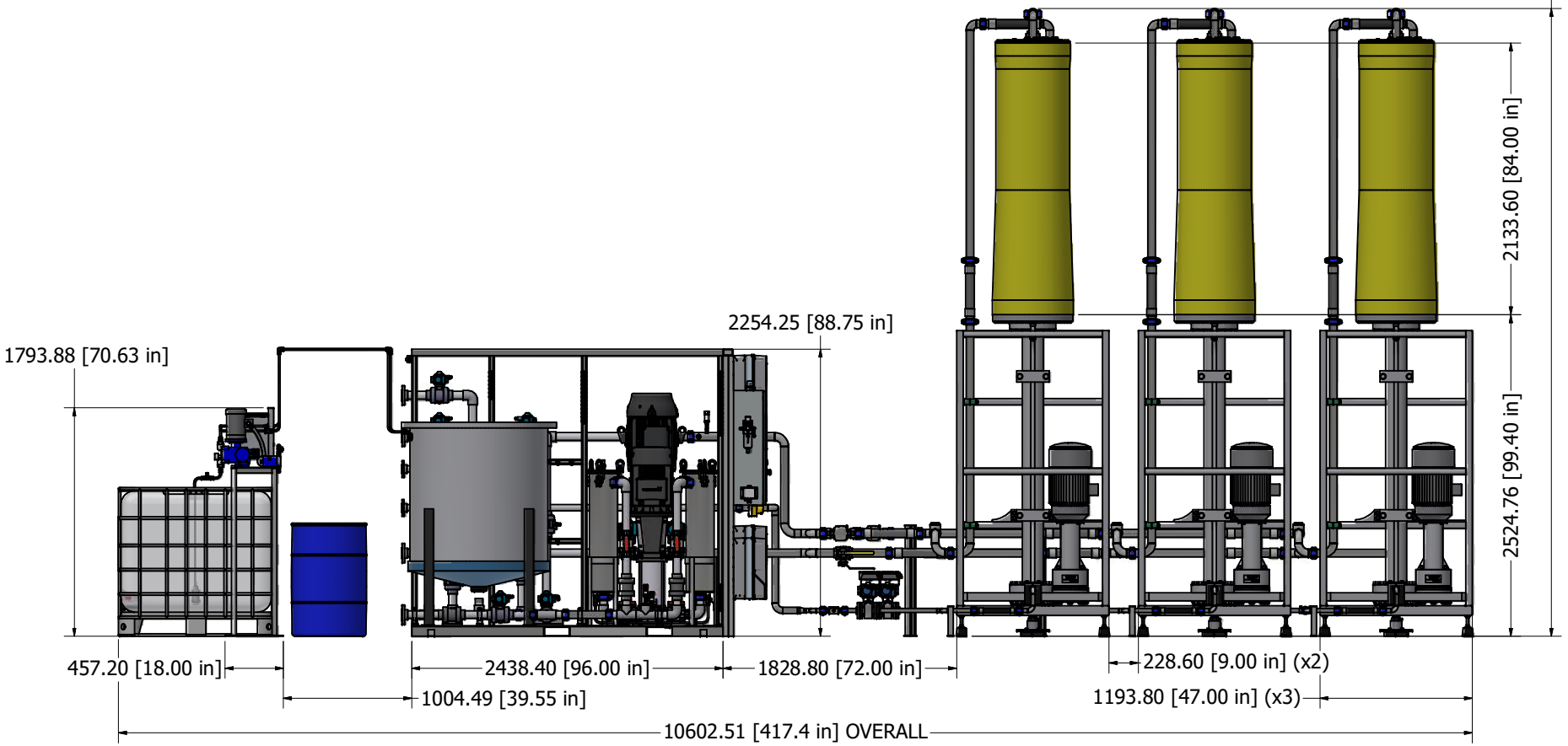
ISO VIEW



NOTES:
1. NEW LOGIC RESEARCH CONFIDENTIAL MATERIAL
2. ALL DIMENSIONS ARE SHOWN IN MM [INCHES] AND FOR REFERENCE ONLY
3. PRELIMINARY ONLY

DRAWN Danny G.	9/11/2026	NEW LOGIC RESEARCH
CHECKED		TITLE: 84" 3 VSEP COMBO
QA		
MFG		
APPROVED		SIZE C | DWG NO STD-833-000 | REV
		SCALE 1 / 25 | SHEET 1 OF 3

FRONT VIEW



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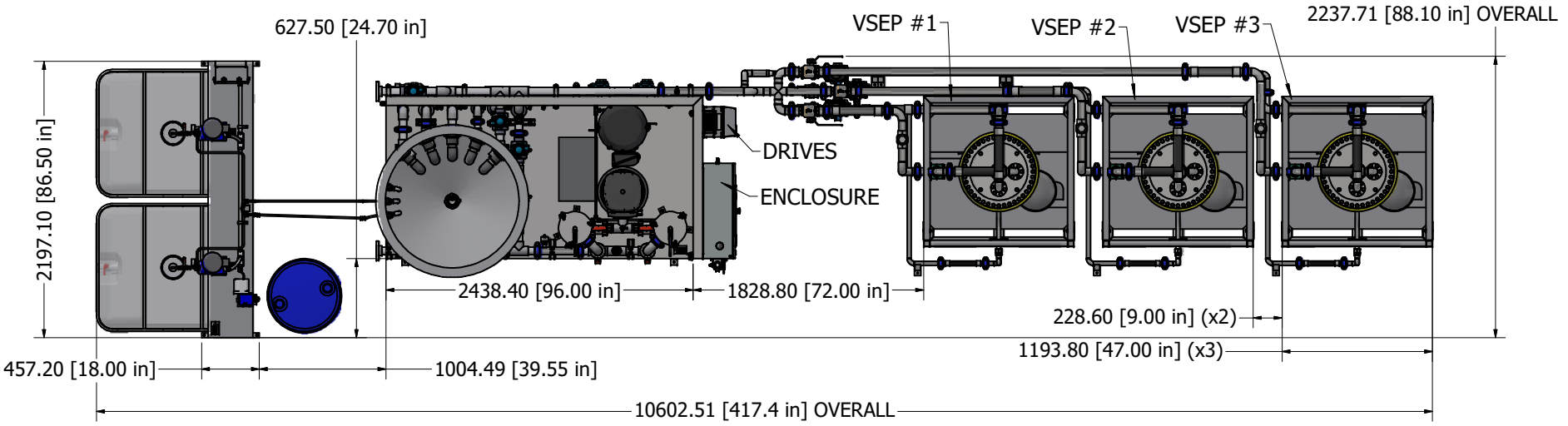
CHECKED		TITLE: 84" 3 VSEP COMBO
QA		
MFG		
APPROVED		SIZE C / DWG NO STD-833-000 / REV
		SCALE 1 / 25 / SHEET 2 OF 3

TOP VIEW



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DRAWN Danny G.	9/11/2026	NEW LOGIC RESEARCH
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QA		
MFG		
APPROVED		SIZE C | DWG NO STD-833-000 | REV
		SCALE 1 / 25 | SHEET 3 OF 3

Utility Summary					New Logic Research
VSEP System					
AIR COMPRESSOR SIZING INFORMATION					
	# of Valves	In^3 Air/stroke	Strokes/day	CFM	M3/hr
VSEP					
1.5" Pneumatic Valves	4	35	20	0.0011	0.0019
2" Pneumatic Valves	11	60	20	0.0053	0.009
1" Flow Control Valves	2	35	20	1.0006	1.701
System Air Totals			**System Totals**	**1.01**	**1.7119**
Supply instument grade dry air at 80-90 psi (560-630kPa)					
Supply air to enclosure mounted regulator/filter 3/8" NPT connection					
Totals do not include air for tools or other sources.					
HOT WATER SIZING INFORMATION					
	# /Day	Temp degC	Gallons/Day	GPM	M3/hr
VSEP					
Cleanings	1	50-60	2100	1.46	0.331
Rinse filter pack at 75gpm for 5mins	1	50-60	375	0.26	0.0591
Intermittent need of additional cleaning or flush of filter pack	0.14	50-60	52.5	0.04	0.0083
System Water Totals			**System Totals**	**1.76**	**0.3984**
Supply chlorine free water at >300 uS/cm					
Supply water at 50-60degC and 75gpm					
Supply water at 15 psi to 2" Hot Water flange connection on Combo Skid					
ELECTRICAL LOAD PANEL SIZING INFORMATION					
Circuit Breaker Sizing 1.25-2x Nameplate Current					
3-Phase Power Voltage VAC	400-460	50/60 Hz			
1-Phase Power Voltage VAC	220-120	50/60 Hz			
	# Motors	Rated Motor HP	Nameplate Current	Nameplate Current	Recommended CB Sizing
			400V	460V	
VSEP Drive Motor	3	20	26.3	24.0	40
VSEP Feed Pump	1	20	26.3	24.0	40
VSEP Feed Pump Booster	1	40	52	47.0	80
Totals	**5**				
Supply 3-Phase power from customer supplied load panel (with circuit breakers, disconnects, line filters, etc.) to the inlet of each VFD provided by New Logic.					
	# Connections	Rated Motor HP	Nameplate Current	Nameplate Current	Recommended CB Sizing
			220V	120V	
Main Control Enclosures	1	NA	10	8.0	20
Metering Pumps	3	0.75	9.2	4.6	20
Supply 1-phase power from customer supplied load panel (with circuit breakers, ups, etc.) to New Logic provided circuit breakers inside the Main VSEP control enclosure (PLC/HMI/24VDC Power Supply).					
Supply 1-phase power from customer supplied load panel (with circuit breakers) to New Logic provided circuit breakers inside the Main VSEP control enclosure (Contactors). Only one circuit breaker is required for all three metering pumps as only one will run at a time.					
Note: These are estimates only based on very preliminary data. These calculations are subject to change and do not include equipment offskid of VSEP system (ie: Transfer Pumps, Generators, Heaters, Lighting, Cranes, etc). For power consumption estimates refer to the operating cost spreadsheet.					

VSEP SYSTEM COMPONENT SPECIFICATIONS

84" VSEP Standard System

1] Filter Pack:

Membrane:	MF, UF, NF, RO (depends on application and pilot testing)
Allowable Process Temperature:	5º-60ºC (some membranes have higher limits up to 120ºC)
Max Process Pressure:	550 psi (3,800 kPa)
Allowable Feed Slurry pH Range:	2-12 (some membranes have different limits 1-13)
O-ring and Seal Material:	EPDM (option for Viton)
Filter Pack Housing:	Glass impregnated epoxy resin (FRP)
Wetted Steel Trays:	304 Stainless Steel (option for 316)
Wetted Plastic End Plates:	Polypropylene

2] Vibration System:

Vibration Drive Motor:	Baldor 460VAC, 3phase, 20HP, 3525 RPM
Motor Speed Controller:	Danfoss 20 HP 380-480VAC, NEMA 4 (or Equal)
Max. Vibration Amplitude:	3/4 inch (peak to peak measured at the Filter Pack)
Frequency Range:	43.0 Hz to 55.0 Hz (Approximate)
Maximum Decibels:	<85
Bearing RPM:	2800 to 3100
Bearing Oil:	Sullube ~750 ml Compressor Oil
Bearing O-rings:	2-263 & 2-270 Buna

3] Pump Specifications:

Feed Pump Type:	Grundfos 316SS Vertical Multi-stage Centrifugal
Feed Pump Motor:	Grundfos ML 3500 rpm TEFC 460VAC, 3phase
Motor Speed Controller:	Danfoss 380-480VAC, NEMA 4 (or Equal)
Chemical Metering Pump:	Greenline Diaphragm pump with manual stroke adjust
Metering Pump Motor:	Baldor 1 HP TEFC 120/220V, 1phase, 15A, 60/50Hz
Dosing Solenoid Pump:	Chemtech Series 100

4] Pre-Screen Basket Strainer:

Filter Housing Type:	NLR Custom Made 316 SS
Basket Strainer:	100 Mesh 316 SS (Optional Felt Bag Filters)
Capacity:	120 GPM, 4.6 sqft
Elastomers (Seals):	EPDM (option for Viton)

5] Operating Site Conditions:

Equipment Rating:	NEMA 4, Indoor/Outdoor protect from sunlight & rain.
Ambient Temperature:	5º - 37°C
Storage Temperature:	2º - 70°C (Protect Filter Pack from Freezing)
Max Relative Humidity:	<95%, non-condensing
Elevation:	3300 ft maximum without derating VFD/Motor

VSEP SYSTEM COMPONENT SPECIFICATIONS (continued)

6] Piping:

High Pressure Piping:	Schedule 80 316 SS
Low Pressure Piping:	Schedule 80 CPVC
Special VSEP Concentrate Pipe:	1-1/4” OD 904L Stainless Steel Tubing .065 wall
Flexible Hoses:	SBR/NBR Nitrile Lined Reinforced Flex
Hose Pipe Clamps:	Zero-Flex Victaulic Style 07 EPDM
Pneumatic Air Supply:	90lb Instrument Grade Air (3/8" connection)
Tubing Fittings:	DKlok 316 SS
Clean in Place Tank:	200 Gallon Sloped Cross Linked Polypropylene (36” ø x 54”)
On/Off Valves:	316 SS and CPVC 3-piece ball valve
Manual Valves:	CPVC 3-piece ball valve
Flow Control Valves:	316 SS V-port ball valve
Check Valves:	CPVC Ball check valve
Pneumatic Actuators:	Compact 4, Spring Return
Positioners:	BLX Linear Quarter Turn I/P
Skid Pipe Terminations:	150 lb CPVC Raised Face Flange
Flange Gaskets:	150 lb Garlock Blue Guard

4] Electrical:

Controls Voltage:	120/220VAC, 1phase, 20A, 50/60Hz
Enclosures:	Rittal NEMA 4 Powdercoat Finish 48x30x10, 24x30x8
Switches, Relays, & Contactors:	Allen Bradley 120/220 Volt
Remote Access:	Weintek Easy Access 2.0
Programmable Controller:	AB CompactLogix 5069
Operator Display:	Weintek cMT3162X
IO Link Masters and Hubs:	IFM Efector AL1422
Beacon and Siren:	IFM Efector DV2130
DC Power Supply:	IFM Efector DN4014
Pressure Sensors:	IFM Efector PN-2292
Mag Flow Tube and Transmitter:	IFM Efector SM2000, SM8000
Bag Filter DP Sensors:	IFM Efector PN-2294
Level Sensors:	IFM Efector PN-2298
Conductivity Meters:	IFM Efector LDL-100, LDL-220
pH Meter:	GF Signet 3-2734-00, 3-2751-1
Maintenance Receptacle:	Grace Port P-P22R2-F2RO
Solenoid Valves:	SMC Manifold Gang Mounted Dual 3/2 24 VDC, IO Link