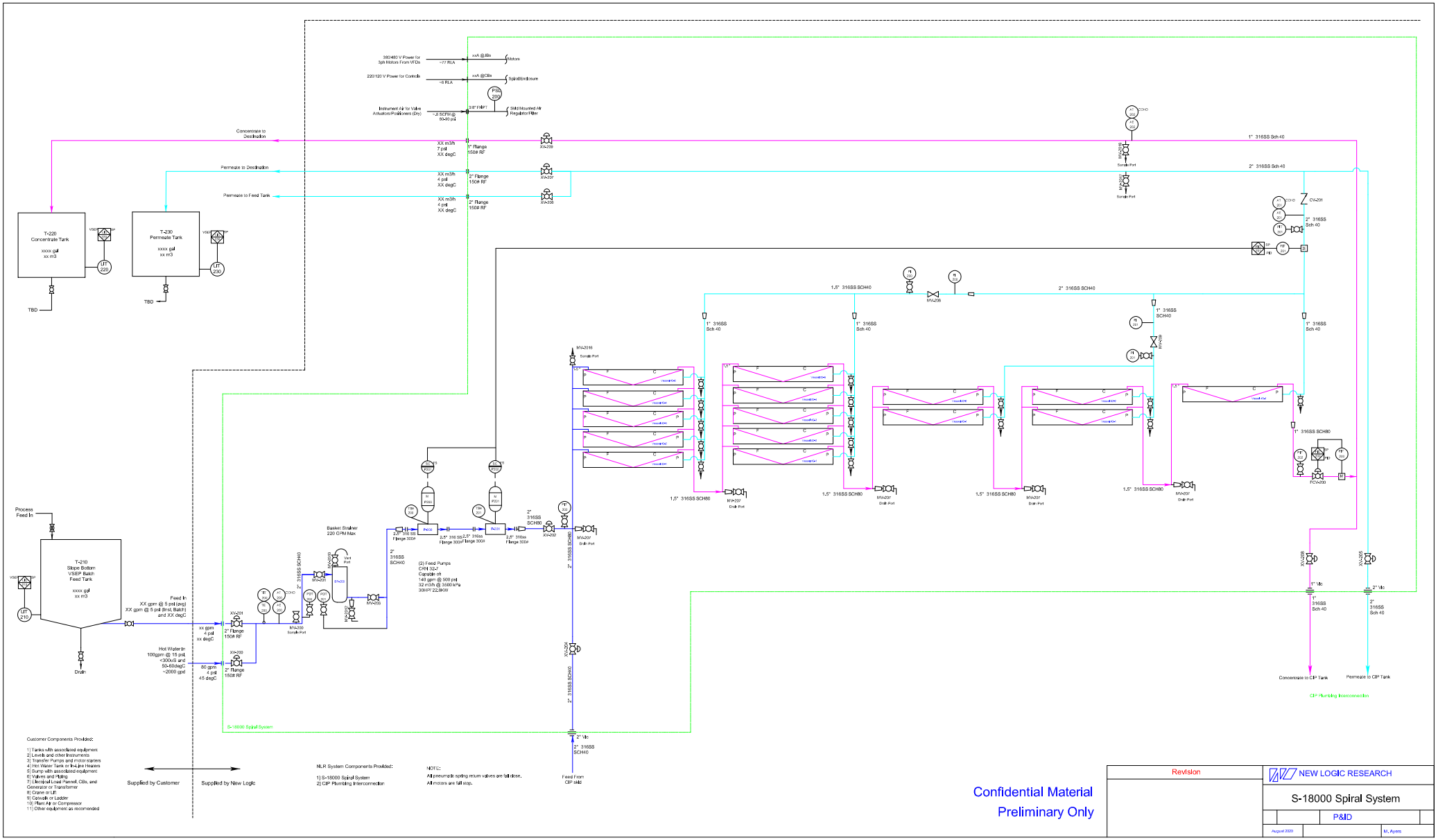
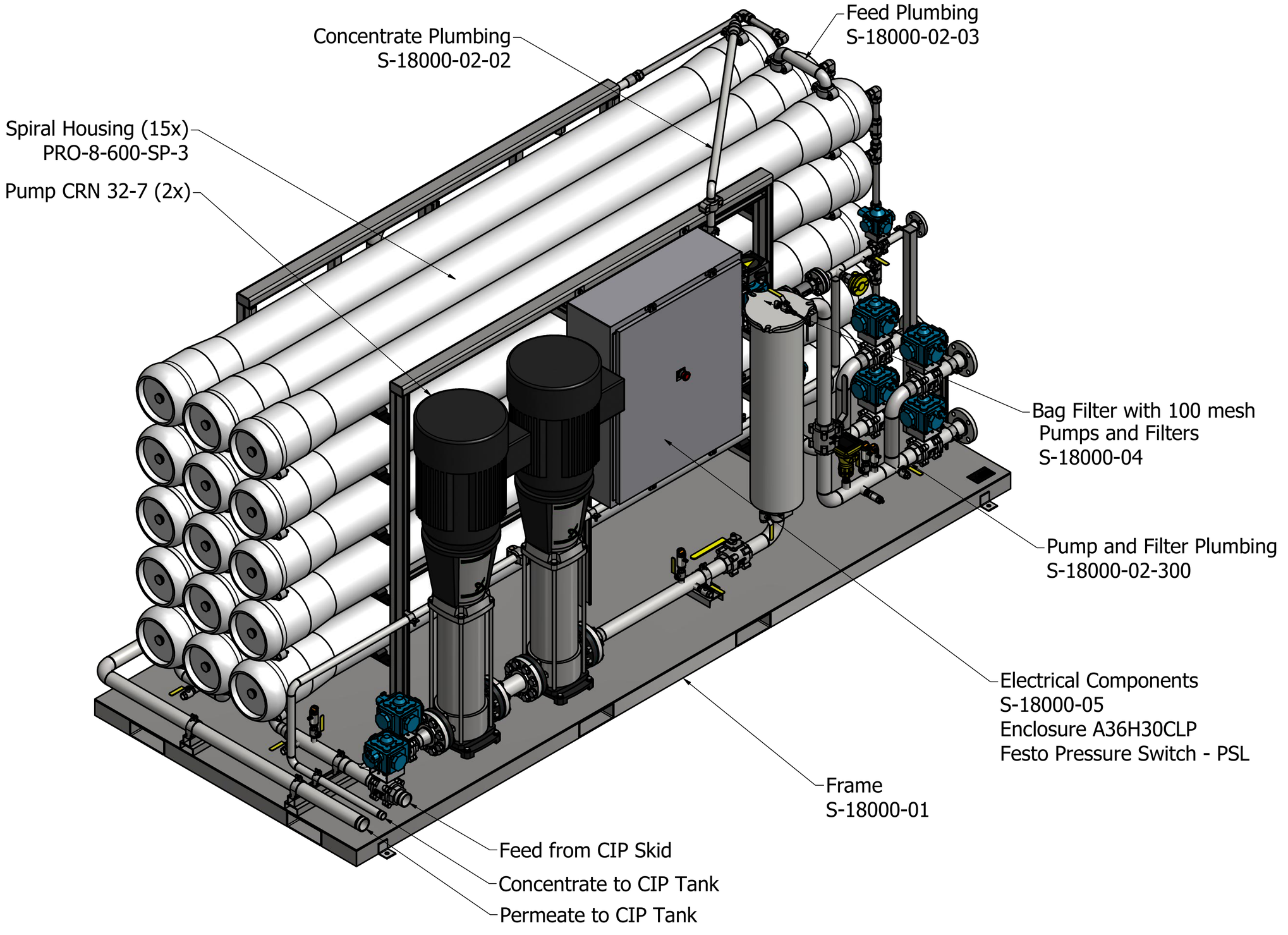


Confidential Material
Preliminary Only

Revision	NEW LOGIC RESEARCH
	S-18000 Spiral System
	P&ID
	August 2020 — M. Ayers

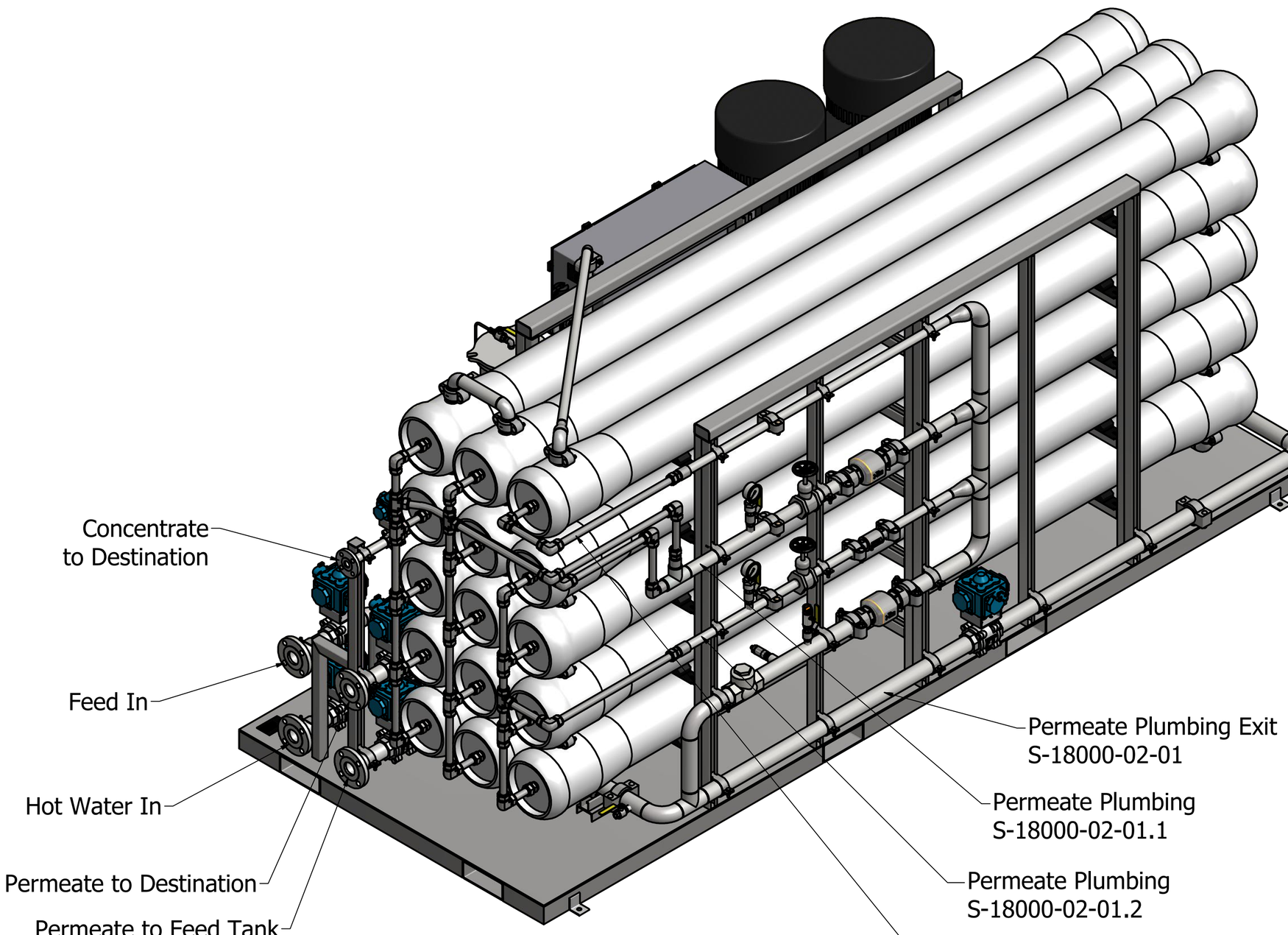
FRONT ISO VIEW



NOTES:
1. New Logic Research confidential material.
2. Slight differences between drawings and actual system may be attributed to New Logic Research Continuously evolving and improving its technology.
3. All dimensions are shown in inches [mm] and for reference only.

S-18000 Spiral System

BACK ISO VIEW



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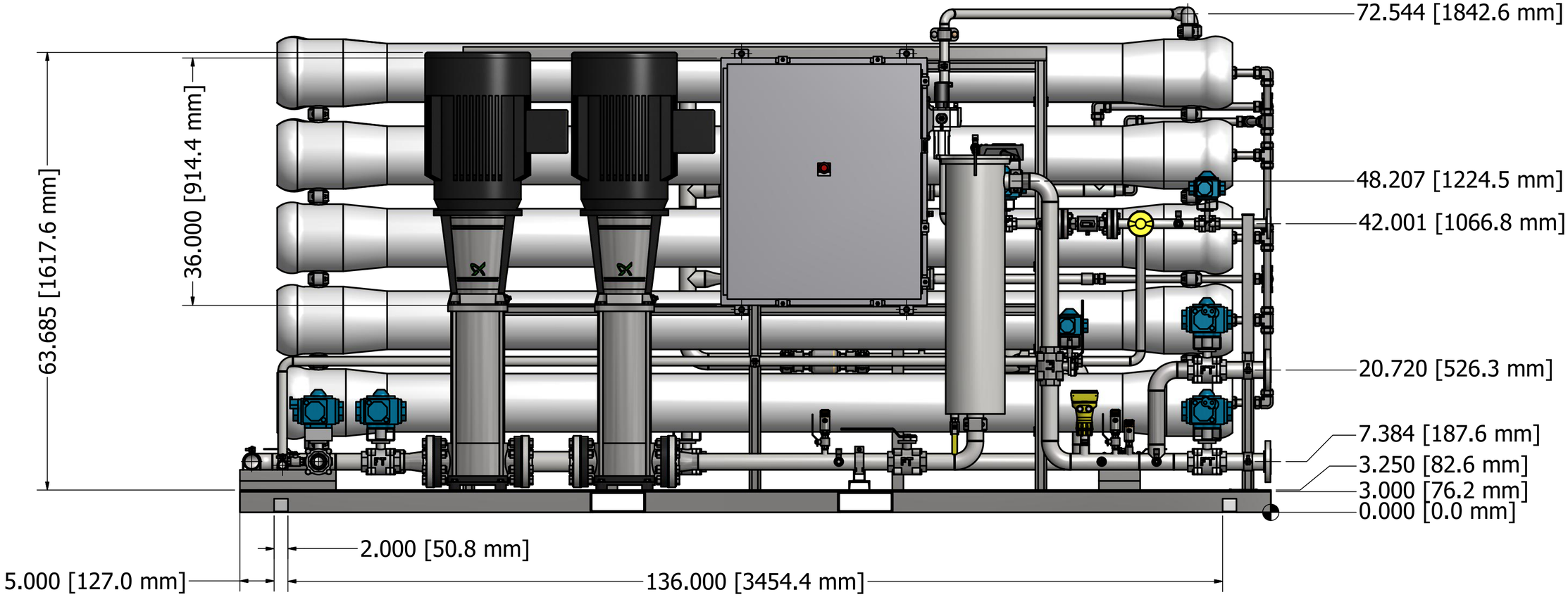
S-18000 Spiral System

FRONT VIEW



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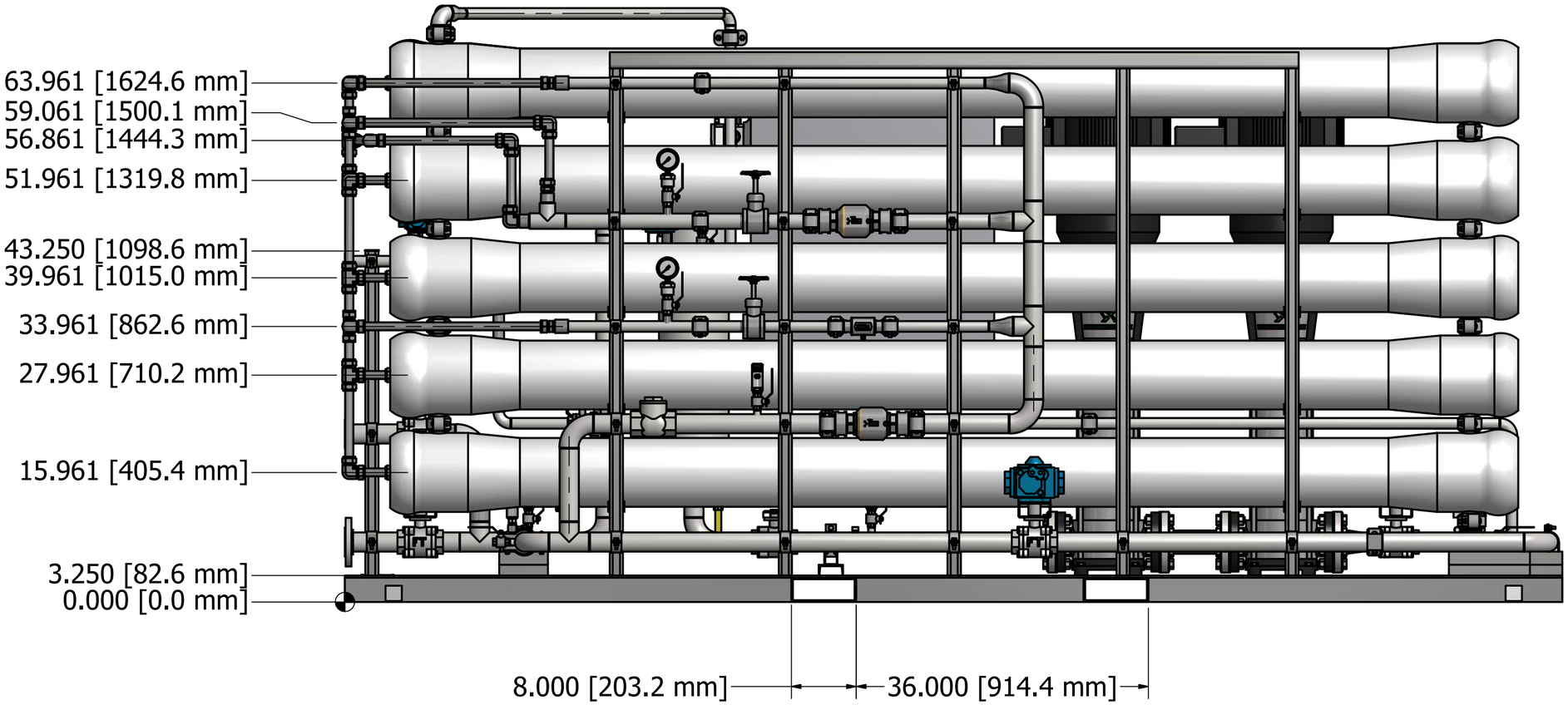
S-18000 Spiral System

BACK VIEW



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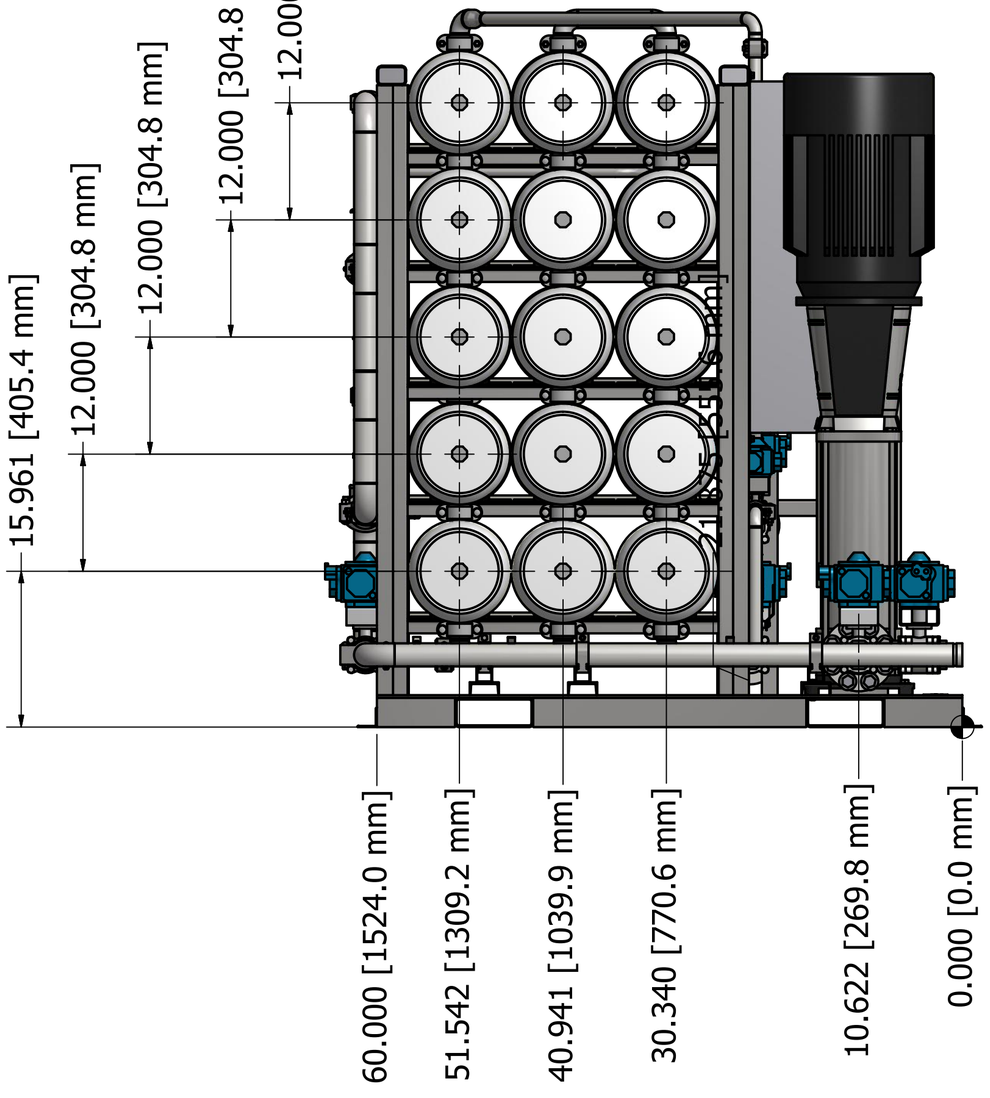
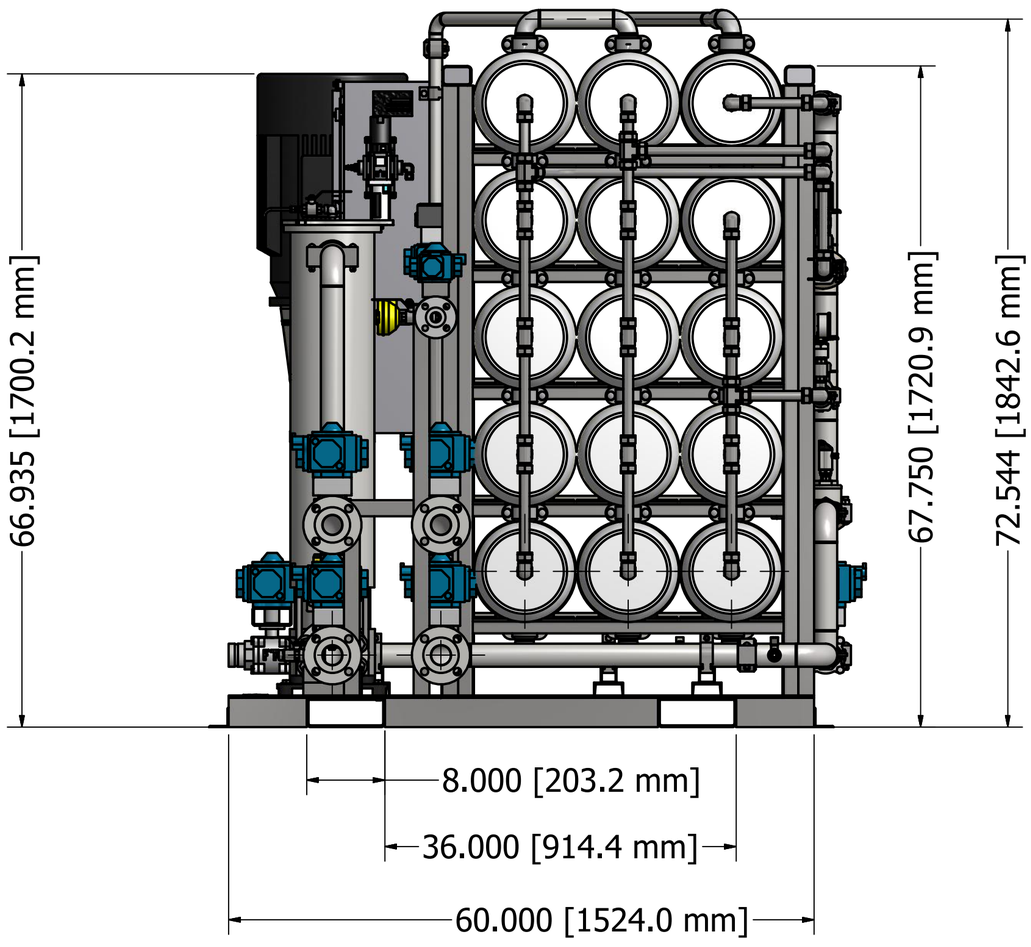
S-18000 Spiral System

SIDE VIEWS

LEFT



RIGHT



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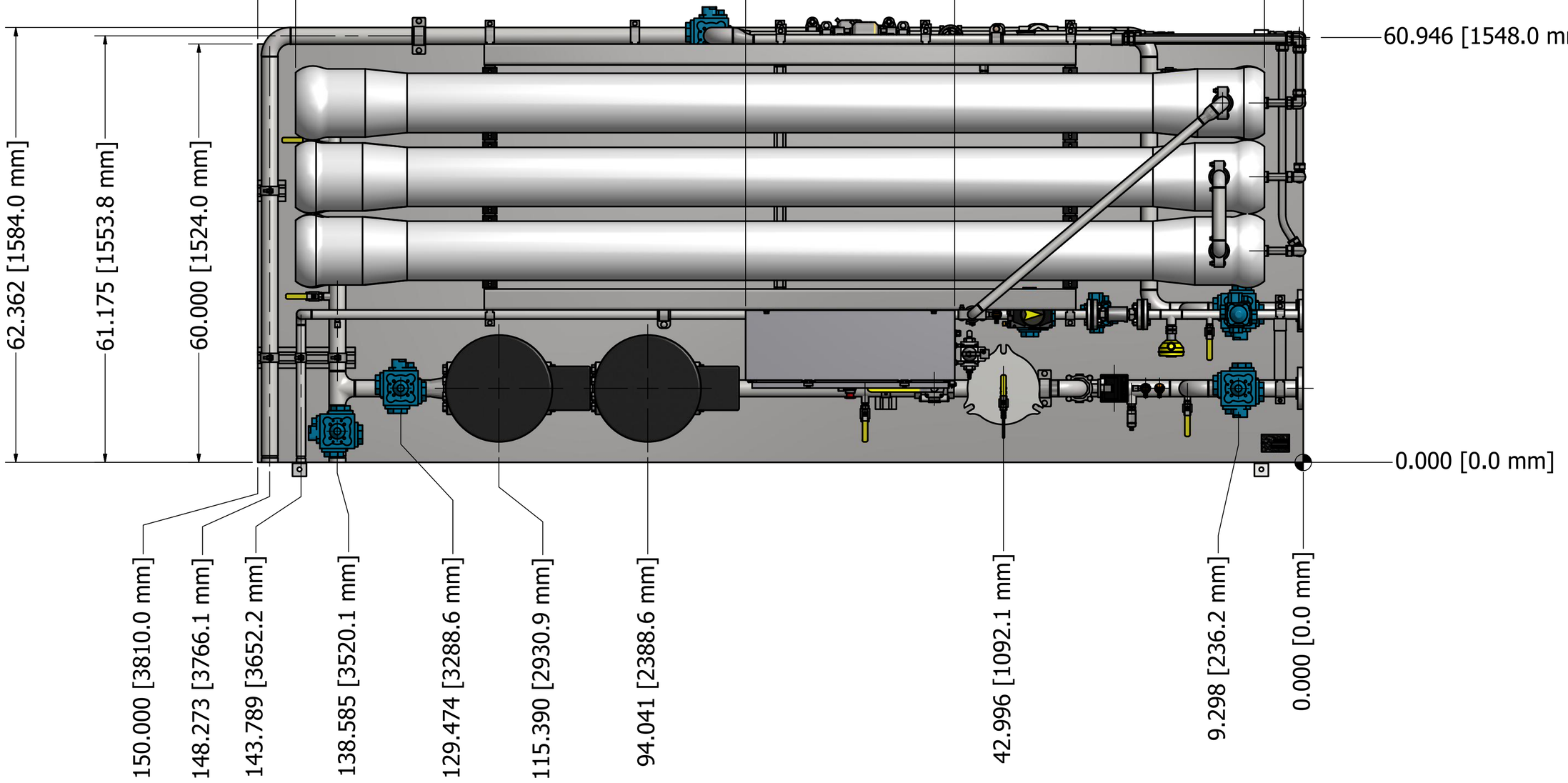
S-18000 Spiral System

TOP VIEW



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S-18000 Spiral System

SPIRAL SYSTEM COMPONENT SPECIFICATIONS
S-18000 Spiral System

1] Filter Pack

Membrane:	MF, UF, NF, RO (depends on application and pilot testing)
Membrane Surface Area:	18000sf (1672m2) (45ea 8”Dia x 40”L)
Estimated Production:	62.5-125gpm (at 5-10GFD)
Maximum Operating Temperature:	120 ºF (49ºC) (Options for up to 80ºC)
Allowable Feed Slurry pH Range:	2-11 (Options for 1-14)
O-ring Material:	Ethylene Propylene
Filter Pack Housing:	Polyurethane Coated, Filament Wound, Epoxy FRP
Wetted Ports:	316L Stainless Steel
Wetted Plastic End Plates:	PVC Thermoplastic

2] Piping

Maximum Pressure:	550 psi (Options for up to 1200 psi)
Pressure Piping:	316L Stainless Steel Schedule 80
Atmospheric Piping:	316L Stainless Steel Schedule 40
Pipe Clamps:	Zero-Flex Victaulic Style 07 EPDM
On/Off Valves:	316 SS 3-piece ball valve
Flow Control Valves:	316 SS V-port ball valve
Check Valves:	316 SS swing check valve
Pneumatic Actuators:	Alpha Compact 4, Spring Return
Positioners:	BLX Linear Quarter Turn I/P
Skid Pipe Terminations:	150 lb 316 SS Raised Face Flange
Flange Gaskets:	150 lb Garlock Blue Guard

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)

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:	5 - 37°C
Storage Temperature:	2 - 70°C (Protect Filter Pack from Freezing)
Max Relative Humidity:	<95%, non-condensing
Elevation:	3300 ft maximum without derating

SPIRAL SYSTEM COMPONENT SPECIFICATIONS (continued)

6] Electrical Specifications:
(Note typically this is provided with a VSEP system, and the PLC/HMI is split with the spiral system. The controls are mounted on CIP 'Clean in Place' Skid that is also shared)

Controls Voltage:	120/220VAC, 1phase, 15A, 50/60Hz
Programmable Controller Type:	None (Control signals from CIP PLC)
Touch Screen Display Type:	None (Set Point change at CIP HMI)
Enclosures:	*Hoffman* NEMA 4 Powdercoat Finish 20x16x8
Switches, Relays, & Contactors:	Allen Bradley 120/220 Volt
IO Link Masters and Hubs:	IFM Efector AL1122
Pressure Sensors:	IFM Efector PN-2292
Mag Flow Tube and Transmitter:	IFM Efector SM2000, SM8000
Bag Filter DP Sensors:	IFM Efector PN-2294
Temperature Sensor:	IFM Efector TN-2511, UT0028
Conductivity Meter:	IFM Efector LDL-100
Solenoid Valves:	Festo Manifold Gang Mounted Dual 3/2 24 VDC, IO Link
VSEP and CIP Communication:	IO Link
VFD Communication:	Ethernet Com Card
DCS Communication:	Ethernet OPC Server (option for Modbus)

Utility Summary								New Logic Research	
VSEP System									
AIR COMPRESSOR SIZING INFORMATION									
	# of Valves		In^3 Air/stroke		Strokes/day		CFM		M3/hr
Spiral RO									
1" Pneumatic Valves	2		35		20		0.0006		0.001
2" Pneumatic Valves	6		60		20		0.0029		0.0049
1" Flow Control Valves	1		35		20		0.5003		0.8505
System Air Totals					**System Totals**		**0.50**		**0.8564**
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
Spiral RO									
Cleanings	0.14		45-50		196		0.14		0.0309
Rinse filter pack at 80gpm for 5mins	0.14		45-50		56		0.04		0.0088
Intermittent need of additional cleaning or flush of filter pack	0.033		45-50		13.2		0.01		0.0021
System Water Totals					**System Totals**		**0.18**		**0.0418**
Supply chlorine free water at >300 uS/cm									
Supply water at 45degC and 80gpm (18.2m3/hr)									
Supply water at 20 psi to 2" Hot Water flange connection on Spiral 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			
Spiral RO Feed Pumps	2	30		38.7		36.0		70	
Totals	**2**								
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	
Supply 1-phase power from customer supplied load panel (with circuit breakers, ups, etc.) to New Logic provided circuit breakers inside the Spiral RO enclosure.									
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.									