Ambient BTEX Unit Family

In-Line: Series 1-4

A-Frame Series: A-32, A-48, A-64

Rev. C

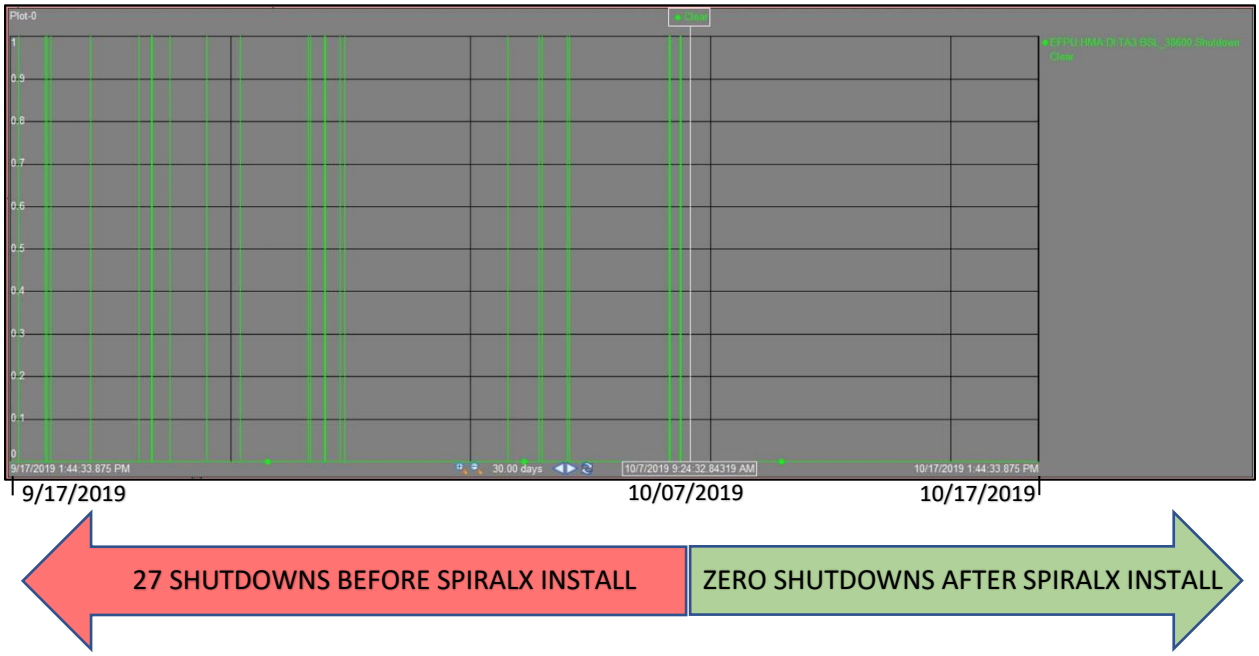
Brand J Replaced by SpiralX.

COMMISSIONED UNIT

Brand J
RETIRED UNIT

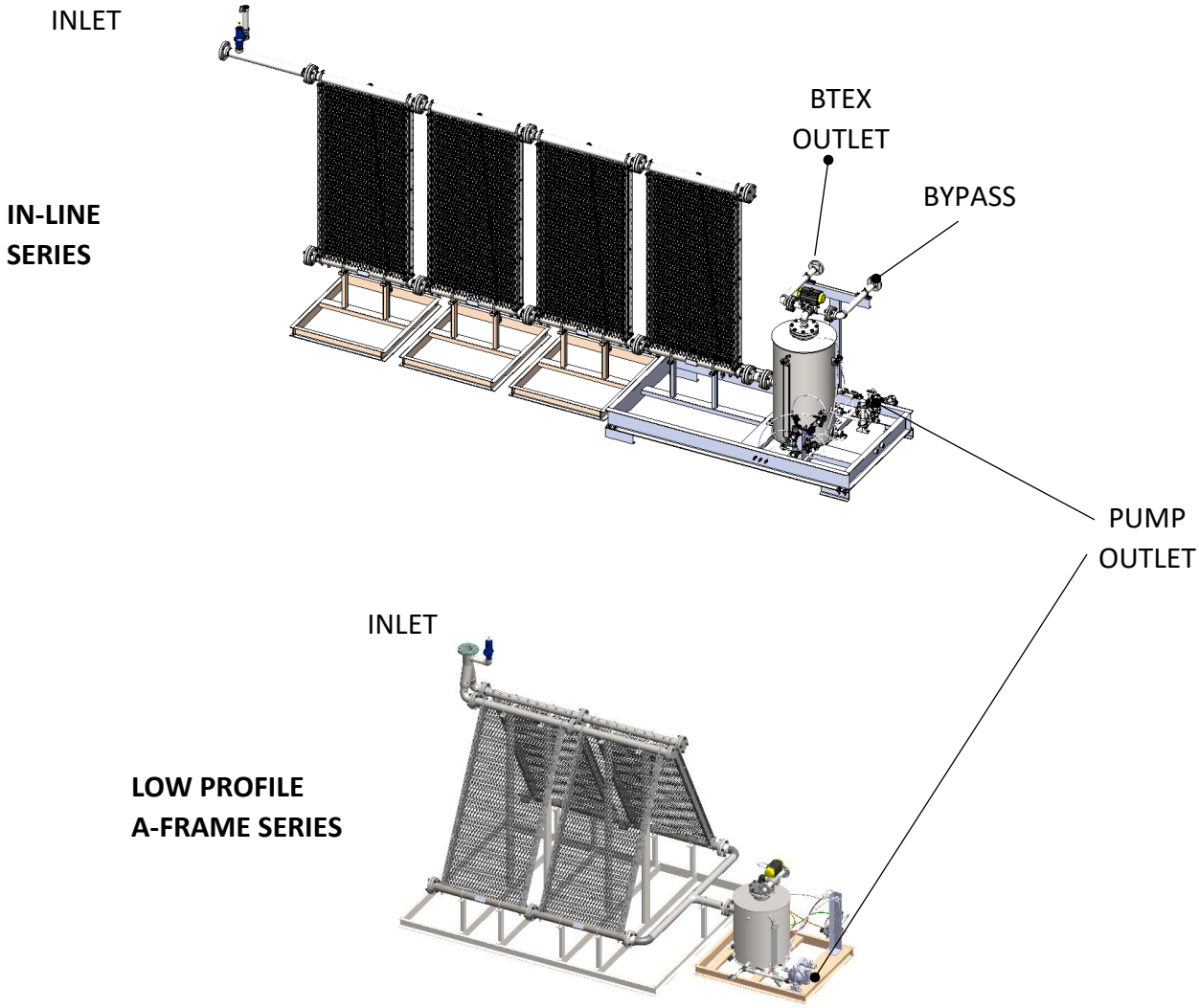
Here are the results…

"Each spike represents a shutdown due to high liquid level of BTEX after scrubber. Installation took place on the 7th, zero shutdown since we changed out the other unit. Since then we have been able to push 160-170MMSCFD across this dehy train with zero issue. Before replacement, we could hardly push 100MM." -- Plant Manager



SpiralX Unit Benefits

SpiralX Ambient Unit	Other Brands
ASME code, removeable coils	Non-ASME coils welded to frame
American made, in-house fabrication	Generic, imported components
24” diameter separator	4” diameter separator
30 GPM diaphragm pump	4 GPM blowcase
Assembled and tested	Field erected
Minimized emissions	Liquid handling method emissions
No backpressure on the system	PSV’s pop regularly, bypass engages



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1 | INTRODUCTION

The SpiralX Ambient series units are natural draft emissions systems designed for use with Triethylene glycol dehydration units. They use all the steps necessary to separate and destroy BTEX efficiently and safely. The Ambient BTEX series is designed for 50% efficiency when paired with a fuel ring kit and >95% when paired with an enclosed combustor, as defined by the 2015 Texas Air Quality act that applies to BTEX systems.

The Ambient BTEX series is designed on the basic footprint of the SpiralX Forced Draft units, which are designed for 99% BTEX removal and high levels of condensables with the use of a combustor

These systems use the ASME Code, removable, all stainless condensers designed and built by SpiralX, a reliable system bypass for safety, and are assembled and tested for leaks and function prior to shipment.

With only the best pneumatic instruments, you can count on years of reliable operation in the field. Setting up the system for the first time is an educational process. You should take this time to familiarize yourself with the unit and how it works. Installation is quick, and operation is simple, so let's get started.

1.1 | Important Safety Information

This document is not intended to be a detailed owner's manual. Any details / instructions contained in this document are for informational purposes only. Positions of components shown within this manual may differ slightly from your actual unit.

Because the entire system is gravity dependent, the skid must sit on a level surface for correct operation.

All pneumatic vents must be sent to a safe location. Instrument gas collection in unsafe areas can be an explosion hazard.

Condensate fluid is extremely flammable; all safety precautions must be used when operating this system. All outlet piping of BTEX exhaust must slope upward towards method of destruction/collection to allow condensate to fall back into accumulator tank.

EXPLOSION HAZARD 

Do not attempt to service or open ignition panel when energized unless area is known to be non-hazardous.

FOR QUESTIONS, PLEASE CALL US AT 469-480-8802

1.2 | Included Components (In-Line Design)

ITEM	DESCRIPTION	QTY.
1	Primary condenser skid with accumulator tank and bypass	1
2	Modular Expandable Ambient Skid (SXA0V00-02-LB)	1-3
3	Diaphragm pump	1-2
4	BTEX kit portion for burner set (OPTIONAL)	1
	- Mist eliminator	1
	- Valve assembly with 3-way actuator valve and PGR-30	1
	- Glow coil	1
	- Bulkhead kit	1
	- Inline flame arrestor	1

1.3 | Included Components (Low Profile A-Frame Design)

ITEM	DESCRIPTION	QTY.
1	Primary condenser skid	1
2	Stand-alone accumulator tank skid with bypass	1
3	Diaphragm pump	1-2
4	BTEX kit portion for burner set (OPTIONAL)	1
	- Mist eliminator	1
	- Valve assembly with 3-way actuator valve and PGR-30	1
	- Glow coil	1
	- Bulkhead kit	1
	- Inline flame arrestor	1

1.4 | Included Components for Compound Injector Burner Set (1.5”, 2”, 3”, 4”)

ITEM	DESCRIPTION	QTY.
1	Compound injector sleeve*	1
2	Compound injector barrel	1
3	Bell nozzle with close nipple	1
4	SpiralX fuel ring mixer adapter	1
5	¾” Lock collar with all thread	1

*Injector sleeve for 1.5” burner set will have 1.5” X 2” reducer to fit 2” bell nozzle.

1.5 | Paint Coating & Material Standards

Spiral X LLC uses the following paint materials:

- Process Skids

  [PPG] AMERCOAT 370 PRIMER

  [PPG] PITTHANE ULTRA URETHANE 95-812 TOPCOAT

  **Alternatives include the Sherwin Williams Macropoxy 646 Epoxy Primer B58(A) & hardener B58(B), and HI-SOLID Polyurethane gloss top coat B56(S) & hardener B60(T).

- Combustor (high temperature) components

  HEATCOTE HC335 - FLAT BLACK. 1000°F resistant.

  **Alternatives include the Tufcote™ 3.5 Hi-Heat paint 982. 1200°F resistant. Silicone Alkyd COLOR – BLACK

Spiral X LLC adheres to the following paint spec from the Society for Protective Coatings (SSPC):

- SSPC-SP1

  SOLVENT CLEANING – Using various solvents with approved/verifiable safety data sheets to remove all visible oil, grease, soil, drawing and cutting compounds, and all other soluble contaminants from steel surfaces.

- SSPC-SP2

  HAND TOOL CLEANING – Using various non-powered hand tools to remove loose mill scale, loose rust, loose paint, and other loose detrimental foreign matter from surfaces to be painted.

- SSPC-SP3

  POWER TOOL CLEANING – Using various power-assisted tools (rotary, impact, or power brushing tools and power abrading tools) to remove loose mill scale, loose rust, loose paint, and other loose detrimental foreign matter from surfaces to be painted. Power tools must not be used in a manner that can create burrs, sharp ridges, and sharp cuts.

  **Sand blasting (SSPC 6) can be performed as an upgrade option if specified by customer.

Spiral X LLC Standard Colors

Spiral X LLC standard colors are listed below.

- Carlsbad Canyon Tan*
- Shale Green*
- Ansi Gray
- Flat Black (Combustors)

*Taken from the Bureau of Land Management (BLM) approved colors.

To request a new color, please provide Spiral X LLC with the corresponding color code, preferably RAL code, but Sherwin Williams color code is also acceptable.

Material Specifications

GENERAL NOTES
NDE not required
Pneumatic connections: Teflon line JIC hose - or - 304 Stainless tubing.

PIPING			
SIZE	MATERIAL	SCHEDULE (STD)	NOTES
≤1"	*A/SA312 TP304/304L	sch.40	
	ASTM A500 GR-B	sch. 80	
2" NPS	ASTM A500 GR-B	sch. 80	EXHAUST PIPING
HEX HEADER (3")	A/SA312 TP304/304L	sch. 10	per ASME Sect. VIII UM vessels
HEX FINNED TUBE	A/SA249 TP304/304L	16 GA	per ASME Sect. VIII UM vessels

*1" stainless tubing, 0.065" t w/ yorlok fittings also used. Upgrade: Swagelok fittings

FITTINGS			
SIZE	MATERIAL	SCHEDULE/CLASS	NOTES
≤1"	A/SA312 TP316/316L	CL3000	Per ASME B36.19
	A/SA-105	CL3000	
2"	A/SA312 TP316/316L	CL150	
	A/SA-105	CL150	
3"	N/A		

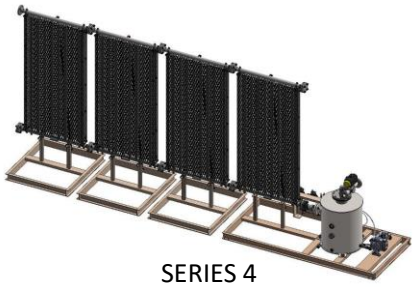
FLANGES			
SIZE	MATERIAL	SCHEDULE/CLASS	NOTES
≤1"	A/SA182 TP304/304L	CL150 RF	
	A/SA-105	CL150 RF	
2"	A/SA182 TP304/304L	CL150 RF	
	A/SA-105	CL150 RF	
3"	A/SA182 TP304/304L	CL150 RF	

GASKETS			
SPIRAL WOUND	CG AISI 316 W/ GRAPHITE	CL150	

1.6 | SpiralX Models

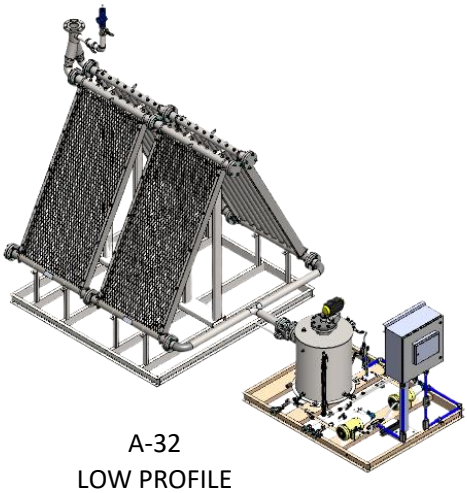
The Ambient in-line design goes up to a series 4 for a wide range of capacities from the still column. Increasing capacity is as easy as adding an additional condenser skid in line with the unit. Actual capacity of each system is determined by many factors. These units generally range from 125k – 750k BTU/hr.

IN-LINE SERIES

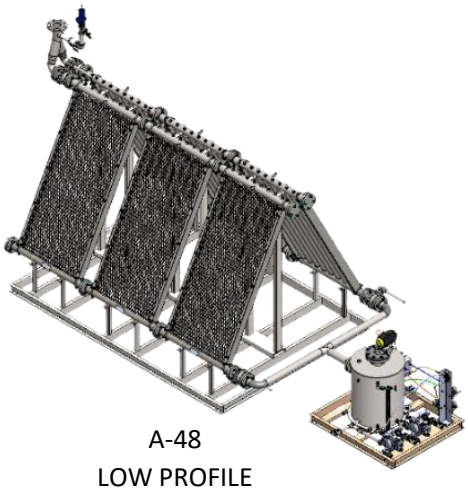


SERIES 4

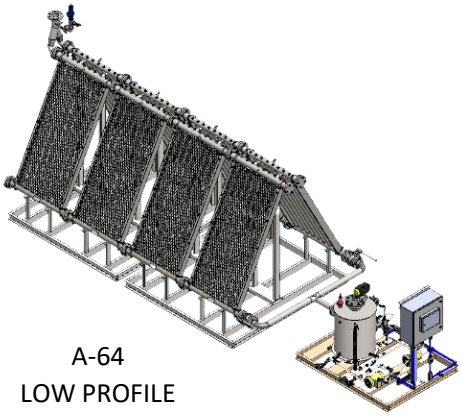
The A-frame design can further increase capacity while maintaining a low profile BTEX unit. **This allows the condenser portion to be shipped pre-assembled without a permit**. Actual capacity of each system is determined by many factors. These units generally range from 1MM – 3MM BTU/hr.



A-32
LOW PROFILE



A-48
LOW PROFILE



A-64
LOW PROFILE

NOT TO SCALE

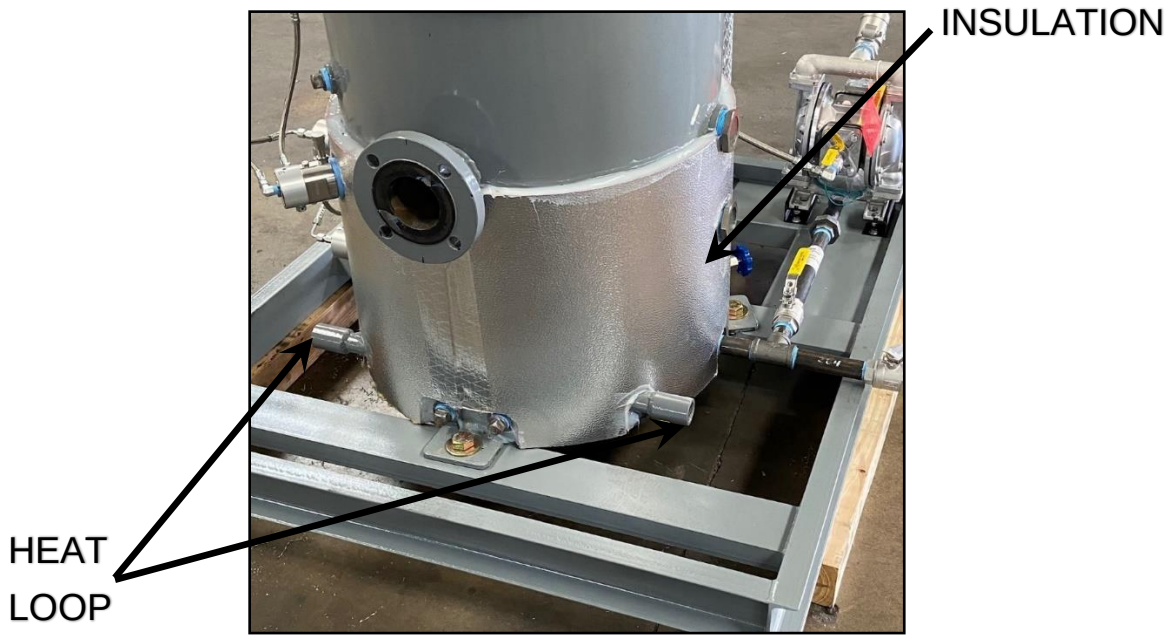
2 | FEATURES AND UPGRADE OPTIONS

2.1 | Pressure Safety Valve (PSV)

While the system flows at atmospheric pressure from the dehy to the accumulator tank, blockage can occur within the pipeline causing pressure to build. With a flat top and bottom, the atmospheric tank has a maximum pressure of 10 PSI, so the PSV is rated for only 16 OZ. of pressure. Restrictions from the dehy also limit pressure to 12 OZ. It will be attached to the connecting piping between the still column and BTEX inlet before shipping. The PSV connections are 2” MNPT inlet and 2” FNPT outlet. If requested the PSV can be shipped loose for the customer to install.

2.2 | Unit enclosures for consistent frigid temperatures.

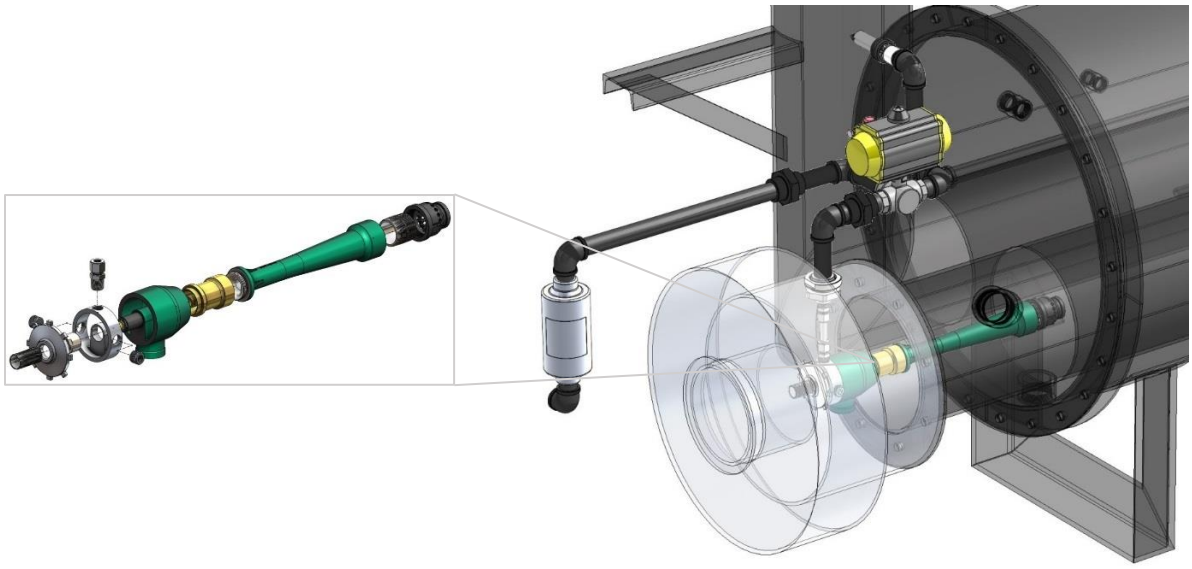
All SpiralX units have a cold weather upgrade available to further prevent freezing in cold areas.



1-inch-thick Lamella insulation (rated to 1200°F) with an Aluminum jacket insulates the liquid retaining portion of the tank. Complies with ASTM C447, C1393, C585, C1335, C1338, & E84.

A heat loop also runs through the bottom portion of the tank. Warm media from location (heated air, warm glycol, etc.) can be cycled through these connections to keep liquid from freezing in colder seasons.

2.3 | Compound Injector Burner Set



With the SpiralX compound injector burner set, you can send the dry gases from the BTEX system back to the reboiler to be used as burner fuel. **Complete components listing for burner set can be seen in Tables 1.2 through 1.4 for all Ambient units**. The burner set includes a mixer ring which adapts onto the burner inside the fire tube. This allows BTEX gases to be sent to the burner and mixed in with the main burner fuel gas. When the reboiler has reached its operating temperature, the burner will cycle off. When the burner is off, the Apollo 3-way ball valve redirects the flow of BTEX gases into the burner stack on the reboiler where it hits the nickel chromium glow plug. The glow plug is manufactured in house at SpiralX, and is installed in the field by the customer into the burner stack of the reboiler. With the glow plug welded into the burner stack wall, the nickel chromium heating element is constantly heated. This allows the BTEX to burn as it passes by the glow plug. More information can be seen in Section 3.1.

2.4 | Stand-Alone Combustor

VOC DESTRUCTION EFFICIENCY OF SPIRALX ENCLOSED COMBUSTORS

SpiralX LLC combustors are designed for the destruction of volatile organic compounds (VOCs) in compliance with regulations governing upstream oil and gas facilities (40 CFR 60, Subpart OOOOa) and gas dehydration facilities (40 CFR 63, Subparts HH and HHH). Expect 0000a certified combustors by 2025. The reduction in the mass content of volatile organic compounds is a minimum of 95% as prescribed in 40 CFR 60.5412a(d)(iv).

This is an alternative option to the fuel ring kit, recommended for gases with a high BTU content, or for sites where more than 50% emission destruction is required.

2.5 | Governance Module

Key Features:

- OPC UA Server Integration
- Plug-and-Play Compatibility
- Data Integrity and Reliability
- EPA History

The Spiral X Governance Module, a standard feature of all units, is an interactive BTEX Unit monitoring system that stores and distributes Modbus information and all I/O data. The Module interface is accessed via an HMI screen, where users can control and monitor real time data from SpiralX emissions control BTEX systems.

You can collect Profire™ data and EPA History from your Dehy and combustors, both of which are equipped with Modbus RS-485, and input their signals into the governance module. Additionally, the module supports inlets and outlets such as temperature transmitters used for fan control. Data can be stored and transcribed from Modbus RS-485 to either TCP/IP or OPC UA, facilitating various distribution methods.

The Governance Module is designed to leverage OPC UA server communication, as it is compatible with customer SCADA systems. This system prioritizes security and optimizes the user experience, ensuring that the connection between the OPC UA client and SpiralX PLCs is both reliable and precise to maintain governance.

For detailed steps and guidelines, refer to our Control Panel manual's dedicated second on OPC UA client configuration and server interface interaction.

2.6 | Dual Pump Setup

A secondary pump can be added to switch between the current active pump. This reduces downtime by allowing for quick and convenient switching during pump maintenance / replacement while the unit can continue function. Function can be seen in the P&ID for a “2DP” setup in the drawing section of this document (pg.14).