



Experience Industrial Innovation



The odorant added to natural gas before it's used acts as a last line of defense, allowing people to smell even the smallest of leaks, before they cause an incident.

INDUSTRY APPLICATIONS

Natural Gas Odourization Solutions

Discover Spartan Controls' turnkey engineered, integrated, and fabricated natural gas solutions that leverage all of Emerson's leading technologies.

Expand Insight & Optimize Performance

Natural gas brings vital energy to homes and businesses in your community. With Spartan's Industrial Odorization Technologies and Applications (IOTA) series, you can rest assured it's being delivered responsibly. The simple mechanical design ensures consistent concentration of odorant, even when flow rates vary, for an exceptionally reliable performance.

Maintenance is simple, and operation is worry-free, so those who rely on natural gas can focus on more important things. After all, your natural gas odorizer system doesn't have to be the center of attention, but it must work efficiently. Improving productivity, managing emissions, and ensuring no leaks are daily challenges for operators and areas of focus for regulators. Changes in processes, regulations, and workforce are pushing engineers, specialists, and technicians in every industry to seek out powerful but easy-to-use technologies that reduce the burden of gas odorization and improve overall operations.

What if you could...

Improve control of your odorization process with fast, reliable, real-time data

- Real time measurements for greater and faster insight into the process.
- Remote connectivity options to enable state-based alarming and improve visibility.
- Fewer components and unique device package offer unmatched measurement reliability and increased up-time.

Lower cost with easy installation, operation, and maintenance

- Modular, simplified design improves reliability, enables easy upgrades, reduces plant maintenance, and simplifies the technician's procedures.
- Installation and commissioning ease including one-day technician training and startup.
- Turnkey shelters and enclosures to reduce install cost and avoid additional field maintenance.

Ensure safety and compliance with superior reliability

- Fail-safe design to ensure reliable dosing.
- Emissions-free operation to align compliance with ESG targets and government regulations.
- Compact and rugged design and field-tested devices for extreme operating environments in regulated industrial markets.

IOTA Odorant Injection Solutions

Spartan's advanced IOTA Series Odorizers incorporate both active and passive technology to deliver the most sophisticated industrial mercaptan for natural gas & propane solutions.

Features	Benefits
Emission free operation	Ensure compliance with your corporate ESG goals and all governmental regulations with our emissions-free dosing architecture.
Inherent redundancy built-in to the design	IOTA series odorizers incorporate redundant "passive" odorization to ensure that gas is continually dosed—even in loss of power situations.
Solenoid-based dosing system	The solenoid-based dosing architecture employed by IOTA series odorizers allows for accurate dosing levels across a wide range of operating temperatures and even in low flow conditions.
Reliable operation	Improve up-time with rugged design for extreme environments, and remote connectivity to enable your maintenance activities.
Modular construction	The modular design of the IOTA series of odorization solutions allows for easy maintenance when required.
Remote connectivity	Enable visibility to your real-time values, and state-based alarming from your IOTA series odorization skid.
24/7/365 support	All odorization solutions are backed up by Spartan's industry-leading support services to ensure reliable operation for the lifetime of the asset.

Process Industries

- Gas Utilities
- Power Plant
- Industrial Energy
- Gas Processing
- Marine
- Research & Development

Typical Applications

- Low Flow IOTA-ab100
- Pressure Drop IOTA-dp100
- High Pressure IOTA-pi100
- Constant Flow IOTA-pt100

Expand Insight & Optimize Performance



Bio-methane injection into the grid is helping to contribute towards meeting North American renewable energy targets and is showing the highest level of growth of any gas market in the world. New bio-methane projects need to be brought online on time and within budget. Gas must then be produced safely and to the required standard.

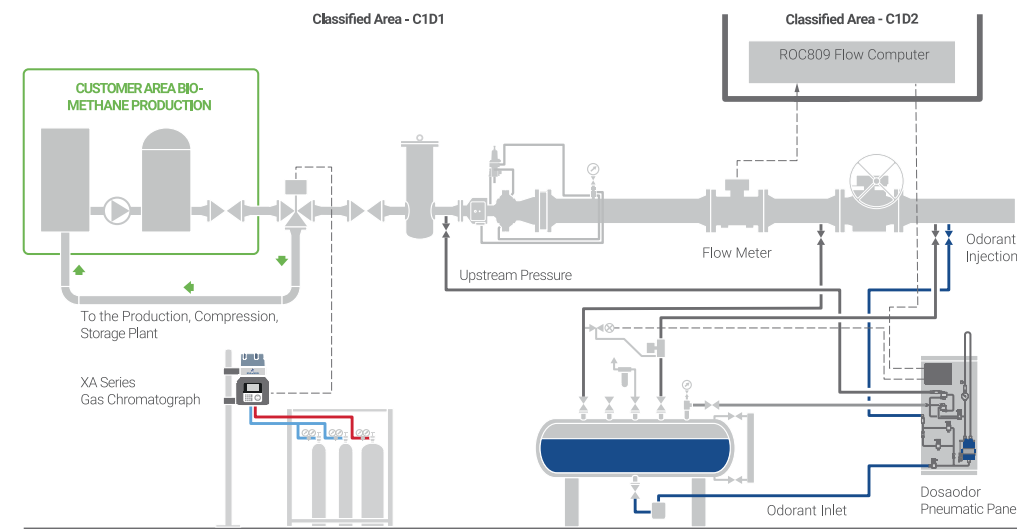
What's your challenge?

The goal of a bio-methane injection station is to contribute a priority flow while the traditional grid is kept inactive. When injecting into local utility grids the safety of the consumer is of the utmost importance. To detect leaks without specialized equipment the gas must be accurately odorized.

What's your opportunity?

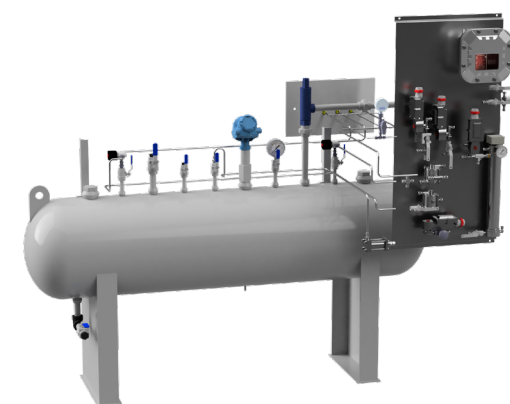
What if you could have increased certainty that your odorization solution was properly dosing the gas stream while also minimizing excess odorant consumption and minimizing maintenance?

Application Typical RNG Process



The Spartan Solution

IOTA-09100 Differential Pressure Odorization System



- Uniform distribution of odorant due to frequent smaller injections and enhanced absorption from the wick insertion.
- High turn-down ratio. For example, one specific configuration would evenly distribute odorant at flow rates from 2000 to 1,200,000 SCFH / 53.6 to 32,160 Nm³/h without mechanical adjustment.
- Automatic calibration of injection system during normal operation ensuring consistent odorization.
- Environmentally friendly with no venting of gas or odorant while operating.
- Variety of redundancy and backup options for reliable odorization.
- User friendly configuration software.

Dramatically Lower Operational & Maintenance Costs

- Real-time validation on process samples guarantees performance and minimizes field maintenance intervention
- Minimal moving parts
- Interchangeable modular components for easy field service and configuration
- Remote factory support is available, either by direct connection or by secure file exchange

Community Regulator Station



Community regulator stations reduce the pressure of natural gas in transmission lines to levels that are needed for safe delivery to our homes. A key requirement in community regulator stations is the need to add odorant to the unodorized gas from the transmission line before it is sent to the distribution system.

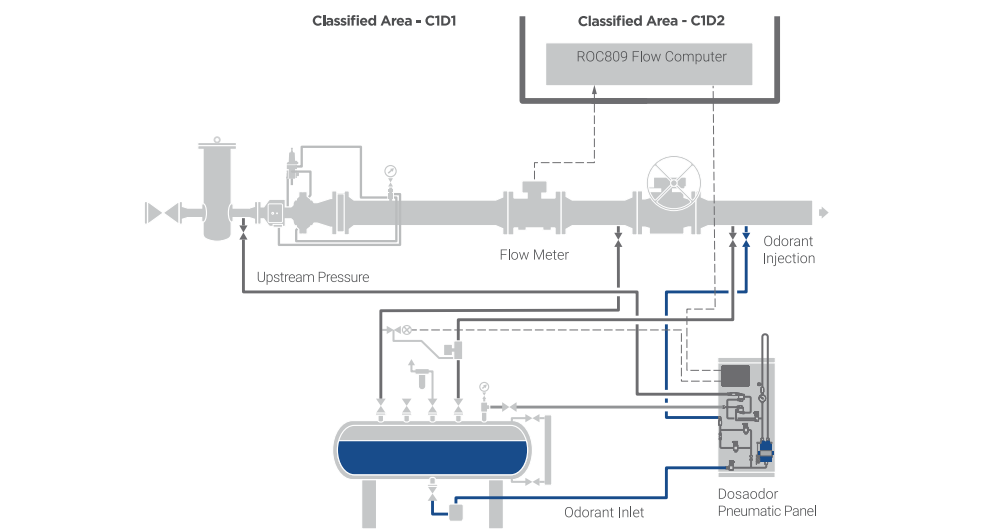
What's your challenge?

Natural gas streams must have consistent odorant injection rates to prevent over-odorizing as it can impact downstream consumers. Additionally, consumers want reliability and fail-safe performance to ensure an uninterrupted supply of safe natural gas to their homes.

What's your opportunity?

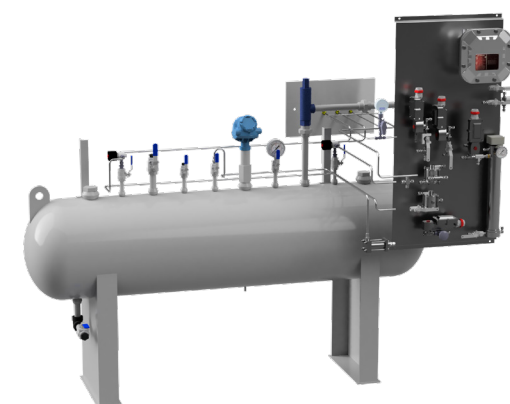
What if you could have a simple, reliable, emissions free odorization solution that provides fail-safe operations, minimizes over-odorization incidents, and which requires minimal maintenance? What if it also provided full visibility in the past and current performance of the odorization system?

Application Typical Regulator Station Process



The Spartan Solution

IOTA-dp100 Differential Pressure Odorization System



- The simple mechanical design utilizes frequent small injections and a wick distribution system to ensure consistent concentration of odorant for exceptionally reliable performance
- Extremely low maintenance costs
- Automatic calibration of injection system
- High turn-down ratio
- Environmentally friendly, ZERO vent unit
- Reduced installation costs
- Default to sweep back-up for complete redundancy
- Real time and historical data available remotely

Proportional Injection System

- Minimal moving parts for operational safety, extreme reliability, with low maintenance requirements
- Easy to use
- Reliability of results with consistent odorization throughout the flow range

Farm Tap



Farms in rural areas need natural gas to heat buildings on the property. These farms do not have access to pre-odorized, low-pressure natural gas distribution pipelines, and are forced to access un-odorized, high-pressure gas transmission lines that run nearby. This gas must be regulated down to safe distribution pressure, and accurately odorized to safely deliver the gas to the farm.

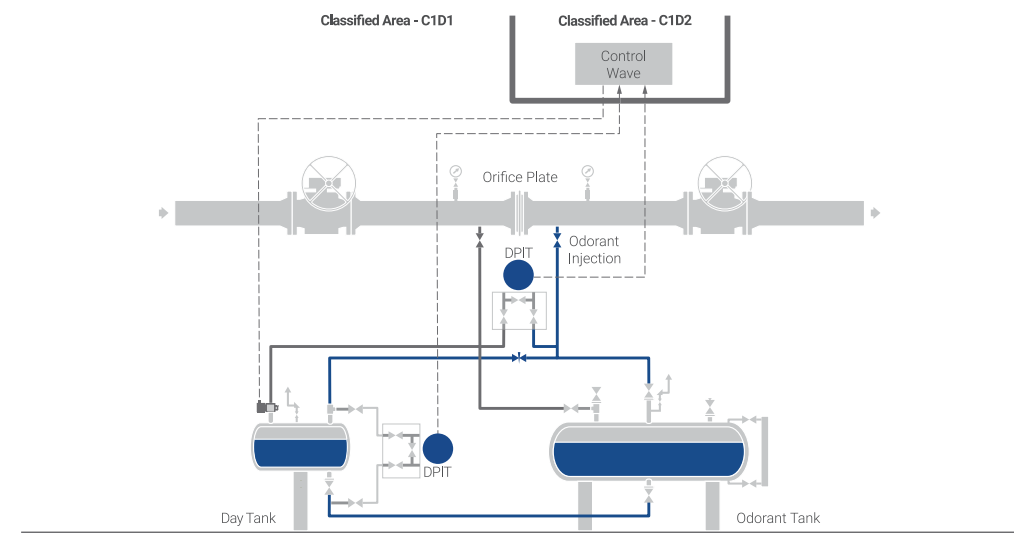
What's your challenge?

Accurately odorizing small, intermittent natural gas flow rates is a challenge for current manual systems that require constant ambient temperatures to maintain accuracy. The remote nature of these sites can pose challenges for the maintenance teams tasked with ensuring the proper operation of these units.

What's your opportunity?

A solution that does not use regulators or needle valves to dose the natural gas stream, and which provides reliable, emission-free, failsafe operation. What if that solution also provided both real-time and historical insights into the operation of the odorization unit, in addition to alarming on certain parameters.

Application Typical Farm Tap Process



The Spartan Solution

IOTA-ab100 Automatic Bypass Odorization System



- Based on mainline gas flow rate, a controlled bypass gas stream is flowed over the liquid odorant in the odorant tank. The bypass stream is saturated with odorant and controlled to deliver the correct amount of odorant into the mainline.
- Automatic adjustment of odorization based on flow rate without the requirements of a meter.
- Remote tank level visibility with injection data and alarm history.
- Passive bypass mode on power failure, solar options available.
- Can be retrofitted or installed as a new package.
- Environmentally friendly with no venting of gas or odorant while operating.

Set It & Forget It

- The auto-bypass solution offers an improved control and monitoring capability compared to simple sweep systems.
- Real-time validation on process samples guarantees performance and minimizes field maintenance intervention.
- Minimal moving parts and interchangeable modular components for easy field service

Transmission Pipeline



Accurately odorizing high-pressure natural gas transmission lines requires an accurate ratio of odorant to gas. In these high-pressure conditions, the ambient temperature can change significantly, so the solution must be robust and reliable to reduce expensive trips to the site's location. Feeling confident that the system is odorizing correctly is of the utmost importance.

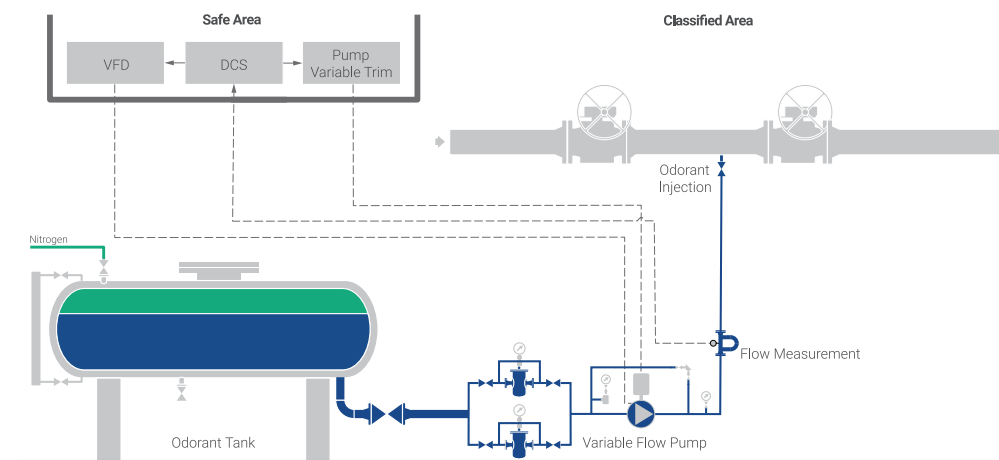
What's your challenge?

Transmission lines use high volumes of gas at high pressures, meaning that overodorization can have significant impacts to utility profitability. In addition, given the high-pressure nature of the gas and proximity of workers, under-odorization events can pose a significant risk to worker safety should a leak occur.

What's your opportunity?

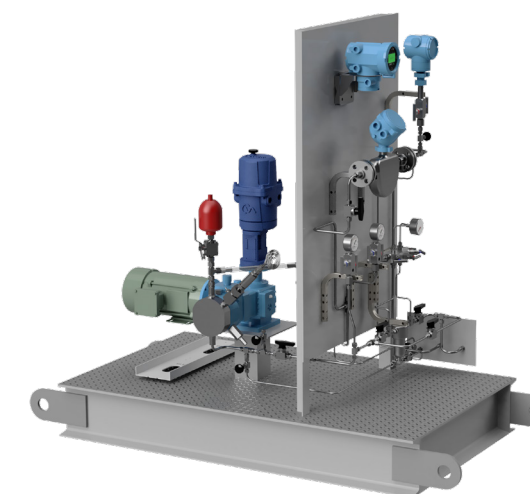
Accurate odorant injection into high-pressure natural gas streams, while providing fail-safe operation should powerloss occur. Minimize over/under odorization events and empower staff with real-time and historical data. Keep staff safe and reduce the likely hood of a small leak turning into a catastrophic event.

Application Typical Transmission Injection Process



The Spartan Solution

IOTA-pi100 Injection Pump Odorization System



- The Pump Inject Odorant System offers precise injection of odorant into high pressure systems. Mainline gas flow and odorant flow are measured, and odorant flow is adjusted to meet the required odorant rate.
- This system can be used on high pressure & high flow systems.
- Precise mass metering with Coriolis flow meter.
- Continuous modulating injection system suitable for high pressure, higher volume applications.
- Flow computer/controller with injection data history (injection amount from previous hour/day/month) and alarm history.
- Remote connectivity.

The Right Equipment

- Adjust pump speed & stroke adjustment to meet odorant requirements
- Controller: Emerson Controlwave
- Flow Measurement: Micro Motion Coriolis Meter
- Flow Adjustment: LEWA diaphragm pump w/ stroke adjustment & Yaskawa VFD
- Non-venting

Gas Power Plant



Gas power plants use extremely large amounts of high-pressure natural gas in their operation, sourced directly from unodorized high-pressure natural gas transmission lines. Gas must be odorized before it can be safely used, and with the high flow rates in these applications and costs of odorant, any over-odorization can lead to significant impacts on overall profitability.

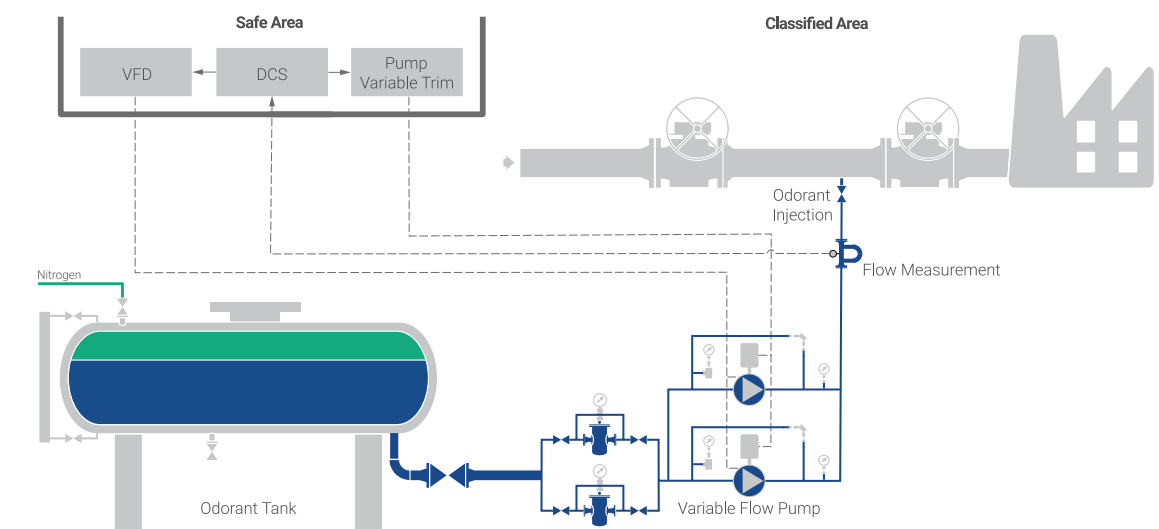
What's your challenge?

Gas power plants use high volumes of gas at high pressures, any over odorization can have significant impacts on profitability. In addition, given the high-pressure nature of the gas and proximity of plant workers, under-odorization events can pose a significant risk to worker safety should a leak occur.

What's your opportunity?

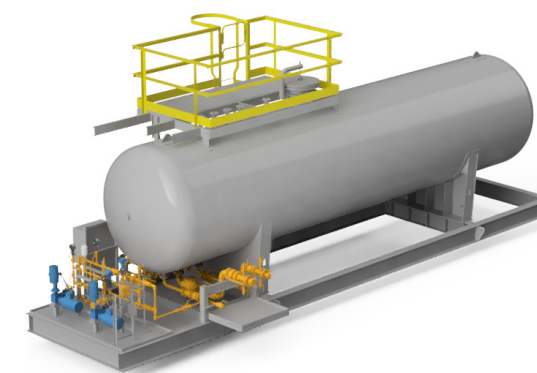
What if you could have accurate odorant injected into your high-pressure natural gas streams, while also providing fail-safe operation should a loss of power occur. What if you could have both real-time and historical data, state-based alarming on the operation of your odorization solution?

Application Typical Gas Power Plant Process



The Spartan Solution

IOTA-pi800 Injection Pump Odorization System



- The Pump Inject Odorant System offers precise injection of odorant into high pressure systems. Mainline gas flow and odorant flow are measured, and odorant flow is adjusted to meet the required odorant rate.
- This system can be used on high pressure & high flow systems.
- Precise mass metering with Coriolis flow meter.
- Continuous modulating injection system suitable for high pressure, higher volume applications.
- Flow computer/controller with injection data history (injection amount from previous hour/day/month) and alarm history.
- Optional backup pump available.

Dramatically Lower Operational & Maintenance Costs

- Real-time validation on process samples guarantees performance and minimizes field maintenance intervention
- Easy flow adjustment
- Interchangeable modular components for easy field service and configuration
- Closed system with remote connectivity

Pipeline & Truck Loading



Biomethane/RNG injection into the grid is contributing towards meeting North American renewable energy targets and is showing the highest level of growth of any gas market in the world. As RNG producing assets come online, odorization solutions need to accurately odorize the RNG before it is transported to the nearest natural gas pipeline injection station.

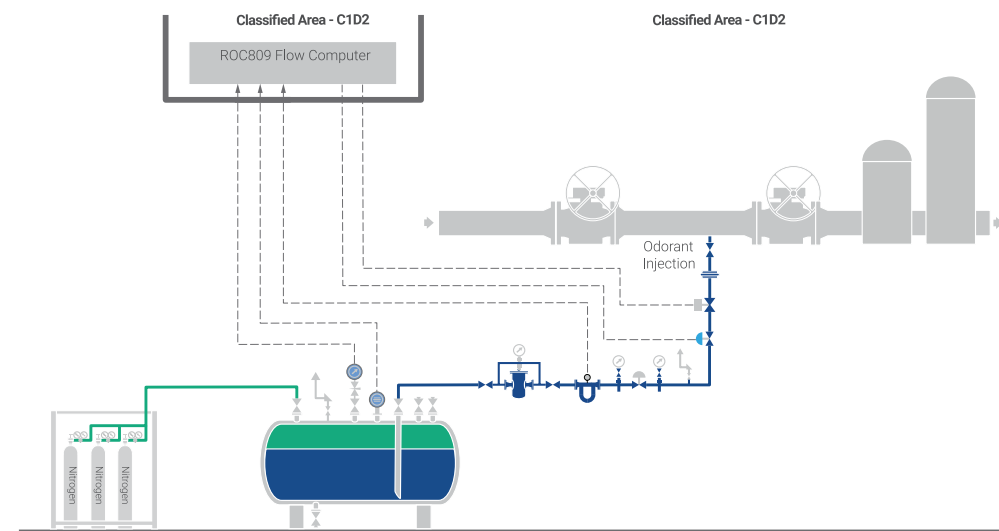
What's your challenge?

Odorizing a pressurized tank containing RNG or propane requires power to inject the odorant into the vessel. In addition, the odorant must be precisely controlled to avoid either over or under odorizing.

What's your opportunity?

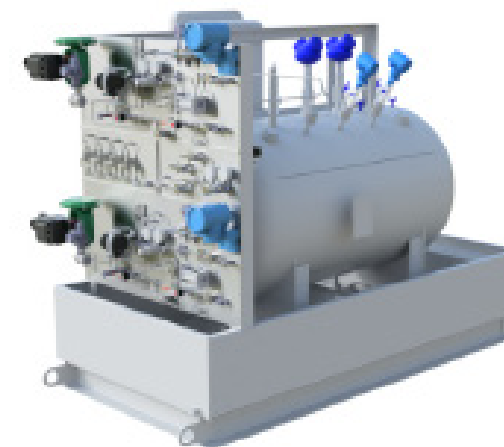
What if you could have high accuracy odorant injection into your renewable natural gas streams, while also eliminating the need for an odorant pump and the associated servicing costs.

Application Typical Pipeline for Truck Loading Process



The Spartan Solution

IOTA-pt100 Pressurized Tank Odorization System





- Solenoid pulse injection system or continuous modulating injection system
- Eliminates pump and associated servicing
- Precise mass metering with Coriolis flow meter
- Bypass mode
- Flow computer/controller with injection data history and alarm history
- Options include remote communications/alarming, DCS integration, analyzer composition feedback

Dramatically Lower Operational & Maintenance Costs

- Real-time validation on process samples guarantees performance and minimizes field maintenance intervention
- Minimal moving parts
- Interchangeable modular components for easy field service and configuration
- Remote factory support is available, either by direct connection or by secure file exchange

Specifications

Property	IOTA-ab100	IOTA-dp100	IOTA-pi100	IOTA-pt100
For a complete list of product specifications, please refer to the individual product data sheets.				
Area Certification	Class I, Division 1 and 2 - Groups C, D Class I, Zone 1 and 2 - Groups IIB, IIA	Class I, Division 1 and 2 - Groups C, D Class I, Zone 1 and 2 - Groups IIB, IIA	Class I, Division 1 and 2 - Groups C, D Class I, Zone 1 and 2 - Groups IIB, IIA	Class I, Division 1 and 2 - Groups C, D Class I, Zone 1 and 2 - Groups IIB, IIA
Performance				
Odorant Flow Rate	Up to 100,000 SCFH	0.5-14 L/hr (0.13 to 3.70gph)	0.1-2.92 L/hr (0.023-0.77gph)	1.5 lb odorant / 10,000 USG
Pressure Rating	6.9 bar (100 PSIG)	10.3 bar (150 PSIG) Vessel	100 bar (1450 PSIG)	38 bar (550 PSIG)
Maximum Injection Pressure	Passive Sweep System	38 bar (550 PSIG)	100 bar (1450 PSIG)	24 bar (350 PSIG)
Environmental				
Ambient Temperature	-20°C to 54°C (-4°F to 129°F)	-10°C to 54°C (14°F to 129°F)	-10°C to 54°C (14°F to 129°F)	-10°C to 54°C (14°F to 129°F)
Cold Temperature Option	-40°C to 54°C (-40°F to 129°F)	-	-	-
Maximum Injection Pressure	Passive Sweep System	38 bar (550 PSIG)	100 bar (1450 PSIG)	24 bar (350 PSIG)
Communications				
LOI (Local Operator Interface)	-	(1)	-	-
RS-232 Serial	(1)	(1)	(1)	(1)
100/10 Ethernet w/ RJ45 Connector	(1)	-	(1)	(1)
Utilities				
Power Supply	24 VDC	120 VAC, 50/60 Hz	120 / 600 VAC, 50/60 Hz	120 VAC, 50/60 Hz
Solar Option	12 VDC	-	-	-
Utilities				
External Dimensions (Nominal)	31 5/8"H x 26"W x 16"D	84"H x 108"W x 42"D	70"H x 73"W x 36"D	81"H x 65"W x 150"D
Connections	3/8 in OD Compression	3/8 in OD Compression	3/8 in OD Compression	3/8 in OD Compression

Additional Services & Support

Engineered Buildings

Complete custom skids or turnkey self framed buildings with lifting lugs, heater, exhaust fans, lights, electrical and instrumentation are available upon request. Ready for hazardous locations including Zone 1 inside and Zone 2 around the structure.



Lifecycle Service & Support

Our team of trained and certified field experts know and understand the requirements needed to develop a customized service program to suit your application. We provide complete turn-key services and problem solving to assist you every step of the way. From pre-installation services to on-going maintenance and support long after commissioning, we have the expertise to ensure your odorizer run at ideal operating conditions during its lifecycle.

Training Services

Whether your goal is to reduce maintenance costs, maximize up-time, or reduce unodorized gas running through the pipeline, Spartan offers a complete list of training courses and continuous support programs to ensure your technicians know how to properly operate and maintain the odorizer during its life-cycle.

Our certified instructors offer two types of training courses:

Standard training classes are scheduled periodically throughout the year at one of our training facilities.

Private training classes can also be arranged at an off-site location. Training is conducted in both a formal classroom setting and a hands-on instructional approach to give Customers a complete training program.

All courses are taught by Spartan certified instructors who work with each student to provide the necessary hands-on training, theory, and conceptual knowledge needed to perform on-the-job functions safely and accurately.

Typical students who attend our training program include plant personnel, analytical technicians, and field service engineers.



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