



2023

GPL 5000 Case Study



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GPL Odorizers

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GPL Odorizers replaces obsolete odorization equipment with a new product achieving 100% accuracy.

Snapshot

A Zeck 9000 natural gas odorization system was reaching end-of-life (EOL). The model had been discontinued and utilized a differential pressure technology, and the manufacturer's replacement (GPL 10000) that met the application's injection capacity utilized different technology, which, upon replacement, required higher maintenance. The customer, a gas distributor, challenged the manufacturer's engineering department to create a similar odorizer using the same DP technology they were familiar with to meet its application's demands requiring higher flow and over a 200% increase in injection capacity. The new GPL 5000 (patent pending and released August 2023) solved all the client's objectives.

About Us

GPL Odorizers manufactures simpler, cost-effective, emissions-free odorization systems. We utilize advanced technology to deliver safe, accurate, and reliable natural gas, biogas, RNG, and propane odorization. The company acquired the assets of the Sentry Equipment/Zeck Systems odorant injection line in 2015 and has relied on 20+ years of field-proven DP odorization principles. Our systems always have a sealed loop, ensuring no odorant or gas discharge and no smell operation and maintenance. GPL Odorizers is a WBE-certified small business located in Lakewood, Colorado, and all our products are made in the United States.

The GPL Odorizers standard is the following:

- no emission designs
- odor-free operation & maintenance
- simple to operate & maintain
- modern
- reliable - safe - accurate
- 24/7 technical support

GPL Odorizers recognizes that almost every odorization application is unique and does not provide cookie-cutter products. The company has always prided itself on its ability to analyze challenging applications and provide solutions to meet its customers' needs. Director of Sales Garrett Cox encourages potential clients to:

"Find your most challenging odorization application — and give us a shot at it! Once GPL succeeds with the problematic application, you'll know we can handle all your odorization needs."

Challenge

A natural gas distributor in Connecticut used a Zeck 9000 odorizer to odorize natural gas in a distribution line. The Zeck 9000 is a legacy model initially designed and manufactured by Zeck Systems. GPL Odorizers discontinued the Zeck 9000 with the launch of the more advanced GPL 750 in 2018 and supported the obsolete equipment with parts and service until 2020.

The client's Zeck 9000 was still operational in 2022. However, it had become unreliable and a safety concern requiring considerable onsite monitoring, which became costly. The primary safety concern was the potential for under- and over-odorization of gas.

The client expressed interest in reviewing the new model's design and functionality to replace their Zeck 9000 in MQ 2022. After reviewing the application, engineering determined that the flow and injection rates exceeded the GPL 750 specifications. The Zeck 9000 offered a higher flow and injection capacity than the 750, which can inject odorant up to 3.5 cm³/minute, but the client's application requires 10.9 cm³/minute.

While the GPL 10000 would have satisfied the client's odorization objective, they had grown accustomed to the simpler differential pressure style odorizer of the Zeck 9000 and requested to beta test the upcoming GPL 5000, which was due to market in mid-2023. Like the GPL 750, the GPL 5000 offered the familiar differential-style odorization and would meet all flow and injection needs. Additionally, the GPL 5000 requires considerably less maintenance than the Zeck 9000 and the GPL 10000, which is typically for higher-pressure and higher-volume applications.

Linc Energy Systems, an authorized GPL service provider, installed the GPL 5000 beta unit on December 14, 2022, and since installation, it has had a perfect injection rate. The GPL 5000 has accurately odorized within +/- 0.05 lb. odorant/ (MMCF of natural gas) of the target injection rate, resulting in 100% hourly odorization accuracy since installation.

The odorizer solved the safety problem by providing uniform odorant distribution relative to the gas flow. The client's substantial expense of onsite monitoring has stopped. Additionally, the GPL 5000 satisfied the customer's request to remain with the familiar and less costly DP technology.



Figure 1: Installation at the test site.

Solution

Reliability is one of the greatest strengths of the GPL 750. The odorizer utilizes differential pressure as the driving force, not fuel gas, and a solenoid valve acts as a barrier to allow odorization. The GPL 750 relies on drops of odorant to odorize the gas, offering precision odorization at flows that are generally considered low flow. This injection style, however, does not handle high-flow applications.

While the client’s challenge was to correct the unreliable system that had presented a safety concern, the GPL engineering team’s challenge was replacing it by utilizing the same differential pressure process at a higher flow and injection rate without the drop method.

For the GPL 5000, engineering integrated a flow meter into the drip chamber to keep the reliability and precision typical of the GPL 750. By doing so, the odorizer no longer needs to count the precision drops of odorant to determine the volume of odorant injected into the gas. Instead, the precision flow meter measures the appropriate volume of odorant based on the gas flow. The odorant is injected into the gas stream, and volumetric data (ranging from 0.5 to 1800 cm³/minute) accurately goes to the PLC.

Please note that because the GPL 5000 can also be a batching odorizer, the odorizer can lower volumetric flows lower than 0.5 cm³ /minute. This means the unit can safely odorize “low flow” natural gas moving at as low as 0.1 MMCF/hour (at 0.5 lb. odorant/MMCF of natural gas).

What benefits did the client receive from the resolution?

The customer received numerous benefits using the GPL 5000:

- The client remained with an odorization system actuated by differential pressure, a process they were familiar with that offered reliability and accuracy.
- The client has saved maintenance expenses, given that since filling the odorant tanks on site, they haven’t had any maintenance calls in nearly eight months.
- The new unit’s ongoing maintenance is considerably less than its predecessor.
- The initial safety concern of over and under-odorized gas is solved as the unit has achieved 100% hourly injection accuracy since installation.
- The GPL 5000 efficiency surpasses the Zeck 9000, saving on odorant.

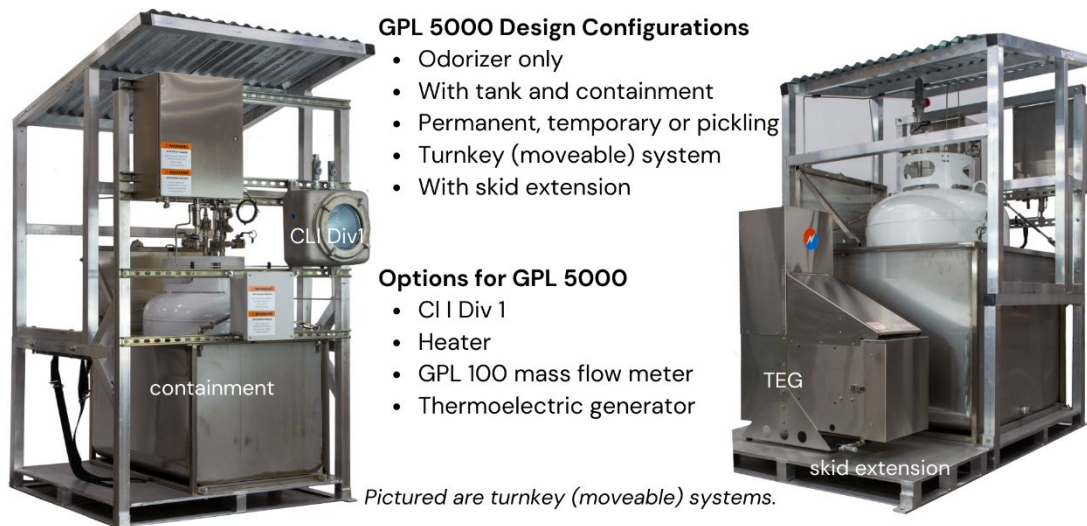


Figure 2: Design configurations and options for the GPL 5000

Noteworthy Results

1 Lowered the maintenance requirements and saves on maintenance costs.

The GPL 5000 has only two moving parts with simple operation, long-lasting performance, and little ongoing maintenance needed with the unit, aside from replacing the solenoid valves when reaching end-of-life expectancy. Had the customer chosen to replace the Zeck 9000 with the GPL 10000, the client would have had to change the seal cartridges once or twice a year. When comparing the GPL 10000 and GPL 5000 annual maintenance components cost, the client saves over \$3,200 per year by going with the GPL 5000.

2 One source removed the complexity of replacing an existing system and saved money.

The GPL staff developed the GPL 5000. The client hired a single source, Linc Energy Systems, a GPL-authorized service provider, to oversee all aspects of the odorization project, including the design, equipment (including ancillary materials), installation, startup, and decommissioning of obsolete equipment to provide a seamless turnkey system. The factory-trained technicians ensured the odorizer was operating within factory standards before leaving the site. This alone saves the client money and the hassle of micromanaging the project.

3 Safety is invaluable.

Accurate and reliable odorization alone has value. Without it, there is the potential for property or infrastructure damage and the potential of injury or death caused by the failure of under-odorization.

4 Better performance means less stress and quality family time.

Before installing the GPL 5000, the client was frequently deployed to the Zeck 9000 during regular and off-hour odorization events. Continued after-hour events eventually take a toll on family time. Since the GPL 5000, only routine scheduled maintenance calls have ensued.

Summary

GPL Odorizers accepted the challenge the client had proposed. The ultimate objective of replacing the obsolete Zeck 9000 system with an advanced odorization system using the same DP technology was accomplished. Engineering used the GPL 750 model as a blueprint and modified its injection operation to include a precision flow meter to deliver accurate and reliable uniform odorization based on the gas flow rate with over a 200% increase in injection capacity. The client stayed with the familiar technology with lower maintenance, saving \$3,200/year on component costs alone (versus the GPL 10000). Most importantly, the customer felt relieved knowing its system was safe, resolving the threat of over or under-odorization after seeing the unit had a 100% hourly accuracy injection over the eight months of beta testing.

Learn more:

If you are interested in learning more about the GPL 5000, [visit our website](https://www.gasodorizer.com/) (https://www.gasodorizer.com/) or call today at (303) 927-7683.

The GPL 5000 is available for purchase on August 1, 2023.