PROTEGO® Solutions for Wastewater Treatment Plants, Biomass Digesters & Landfills



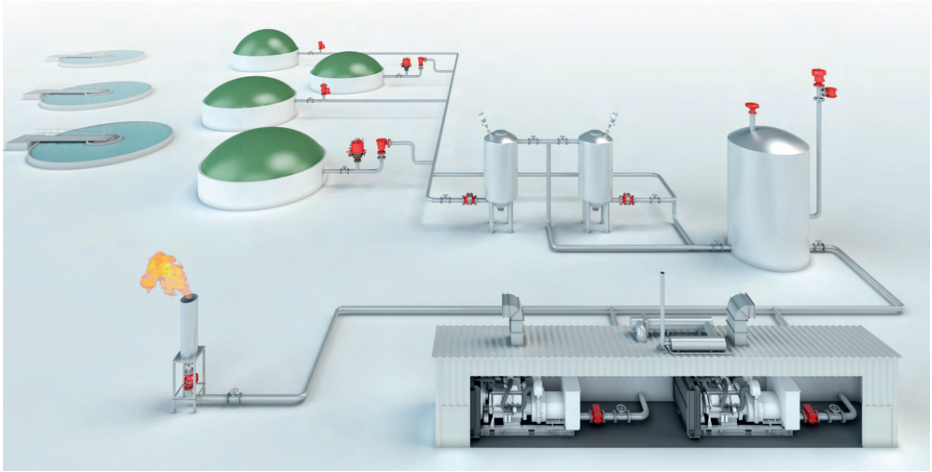
SPECIAL SOLUTIONS FOR CHALLENGING APPLICATIONS

Waste to energy plants can have digesters, CHP units, flare systems, potentially with **complex piping arrangements**, **condensate management**, and the need for **emissions control**. As organic matter decomposes it produces methane-rich gas along with moisture and corrosive compounds. Seasonal temperature swings, freeze–thaw cycles, and heavy rain create vacuum fluctuations and condensate that can foul equipment and stress tanks. Operators are expected to recover energy, control odors and emissions, while staying compliant with international safety standards. Selecting **durable, maintenance friendly, type approved** safety devices is critical in challenging applications, such as waste to energy plants.

COMMON PROBLEMS

Biogas systems face a unique combination of **environmental** and **operational stressors** that can compromise equipment and safety. Among the most common and critical issues are:

- Constant **risk of solid organic matter** within vapor and gas transmission lines
- **Corrosion** and **clogging** caused by condensate and organic compounds commonly present in biogas production.
- **Freezing temperatures** that can prevent valves from opening, risking dangerous overpressure and potential tank failure
- **Explosion hazards** due to the presence of natural gas in biogas mixtures



Our Solutions: FA-CN, DR/ES, UB/SF, FA-E & VD/TS

PROTEGO® FA/CN

- High-performance design with minimal maintenance
- Easy-access cover – FLAMEFILTER® removal without pipe disassembly
- Fully disassemblable multi-disc system for quick cleaning, fewer spare parts
- Fewer FLAMEFILTER® discs for improved flow capacity
- Integrated condensate drain to reduce buildup, corrosion, and clogging



In-line Deflagration Flame Arrester with "easy access" cover



In-line Detonation Flame Arrester

PROTEGO® DR/ES

- Maintenance and cleaning without removing housing from pipeline or vessel
- 90° elbow is not required – reduced pressure loss and simpler installation
- Condensate drains back into the tank, lowering corrosion and maintenance
- Hanging cage with individually removable FLAMEFILTER® discs
- Easy cleaning and single-disc replacement to cut spare parts and extend service intervals

PROTEGO® UB/SF

- Proven reliability with over 30 years of field use
- Frost-proof diaphragm valve operates down to −40 °C without external heating
- Extremely tight sealing to minimize emissions and improve odor control
- Integrated dynamic Flame Arresting – no separate static Flame Arrester needed
- Reduced risk of clogging in contaminated vent lines
- Hinged valve top for quick access and efficient maintenance



End-of-line P/V Valve & Flame Arrester



In-line Deflagration Flame Arrester

PROTEGO® FA-E

- Eccentric, flat-bottom design prevents condensate pooling in saturated gas systems
- Ideal for space-limited installations – easy mounting near floors or walls
- Suitable for elevated temperature and pressure; ATEX-certified for explosion groups IIA1, IIA, IIB3, IIC (NEC D, C, B)
- Corrosive condensate (e.g. H_2S) flows through the housing, reducing internal corrosion and extending service life
- Modular design for quick cleaning and single-disc FLAMEFILTER® replacement, reducing downtime and spare parts costs

PROTEGO® VD/TS

- 10% Technology for minimum pressure increase up to full lift
- Integrated PROTEGO® Flame Arrester Unit saves space and weight and reduces costs
- Valve pallet is guided inside the housing to protect against harsh weather conditions
- Extreme Tightness, resulting in lowest possible product losses and reduced environmental pollution
- Can be used as a protective system in areas with potentially explosive atmosphere in accordance with ATEX
- Valve and Flame Arrester performance is assured for all relief and explosion scenarios that may occur according to the design case



End-of-line P/V Valve & Flame Arrester

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