



# 500kW Anax Turboexpander (ATE)

## Reducing Natural Gas Pressure: Wasted Energy, Wasted Opportunity!

**Natural Gas Pressure Regulating Stations** maintain acceptable operating pressure in hundreds of thousands of miles of pipelines across the U.S. These stations make up an integral part of the country's natural gas infrastructure, but are inefficient and **waste easily accessible, lucrative energy**.

**The Anax Turboexpander** generates carbon-free energy from the flow of natural gas through pressure regulating stations. **Anax overcomes the obstacles that have prevented this technology from gaining widespread adoption**, including high cost, safety risks, and an inability to handle fluctuating inlet pressures.

The clean electricity from the ATE can be fed directly into the power grid or used to offset the captive load of large natural gas and electricity customers, **making it an integral part of corporate sustainability goals**.

By converting the flow of natural gas to electricity, **gas companies, pipeline operators, and end-users of natural gas maximize the return on their natural gas assets**, without increasing risk. ATE systems **increase a company's bottom line by anywhere from \$100k to +\$1M per year** by generating 475kW to 5+ MW of clean power.

**Environmental benefits** of the Anax Turboexpander include:

- Zero carbon emissions with system efficiency of over 80%
- Improved natural gas efficiency and added safety redundancy
- \$0 in variable operating costs; \$30/kw-year in fixed operating cost
- Distributed generation that creates a more resilient energy grid
- Provides reliable backup to clean-energy resources like wind and solar



The Anax-Star Turboexpander (ASTE) was field evaluated by GTI at the DNV GL Flow Centre in the UK and was found to overcome obstacles that have prevented widespread adoption of GLGs.

In its performance evaluations, GTI verified the machine's ability to generate full output while maintaining pressures, and handling controlled and fast stop scenarios such as shaft overspeed/imbalance, loss of utility grid power, loss of external heat, loss of bearing pressure, loss of instrument air, and other safe operating scenarios.

The Anax Turboexpander is the result of a global collaboration between renowned turbomachinery, technology, and engineering partners, including:

- Anax Power (USA)
- SoftInWay (USA)
- Neuman-Esser (USA)
- TurboPower Systems (UK)
- Danfoss Controls (Denmark)

### Safety & Performance

The ATE operates in-parallel with the existing pressure regulating valve to maximize safety. **This system ensures redundancy and reliability for the pipeline and the end user of natural gas.**

In a 2017 performance and safety test, the Gas Technology Institute (GTI) verified the machine's ability to generate power and operate safely in natural gas pipelines (see excerpt on right).

### Design Features

The ATE is designed for inlet pressures from 600 to 1,200 psig, with pressure ratios from about 1.4:1 to 4:1. For full 475kW power output, gas flow must be greater than 7,000 scfm.

The direct-drive generator shaft spins at 18,000 RPMs on active magnetic bearings, which eliminates the need for an unreliable, maintenance-intensive gearbox. This design enables the system to vary its power output in volatile natural gas conditions.

**Michael Longo**

mlongo@anaxpower.com

201-401-8603

[www.anaxpower.com](http://www.anaxpower.com)