

Eliminating Gas Preheat in Pressure Reduction

Universal Vortex, Inc. (UVI) offers patented and proprietary products and technologies that provide the natural gas, CNG, LNG, and industrial gas industries with non-freeze high pressure reduction solutions. These innovative solutions secure energy savings and eliminate greenhouse gas emissions; they also improve the reliability of gas supply.

The technique is based on the use of the **vortex phenomenon** taking place in the patented Self-Heating Dual and Single Flow Vortex Tubes.

Self-Heating Pressure Reducers

The Vortex Tube



The Single Flow Vortex Tube



The vortex tube (VT) generates cooling and heating duty as a result of routine pressure reductions in expanding gas. In UVI's patented VT design, a portion of the generated hot gas internally applied to warm the VT inlet nozzle (**non freeze provision!**). This makes the VT a **self-heating pressure reducer**.

The self-heating design allows for using the VT to serve as a primary non-freeze pressure reducer, **thus eliminating the need for upstream gas preheat**; Additional benefit is the availability of **free cooling and heating load to be utilized for technical needs**.

UVI's Primary Product Applications:

Gas Production and Gathering:

- Vortex Wellhead Choke- Wellhead gas thermal conditioning to prevent hydrocarbon vapor condensation in gas gathering lines.

Gas Processing:

- Vortex Hydrocarbons Recovery- Replaces JT valve at JT Plants. Yields up to 8% increase in NGLs, decreases size and cost of installation and operation.

Power Generation:

- Vortex Turbine Fuel Gas Thermal Conditioning technology to eliminate the need for conventional fuel gas preheat in pressure regulation.
- Vortex Pressure to Power/Turbo-Expansion.

Gas Transmission & Distribution:

- Vortex Pressure Regulation Station- Eliminate upstream gas preheat.
- Vortex Pilot Gas Heater- Reliable and thermally efficient alternative to catalytic heaters.

CNG:

- Vortex Pressure Reduction Station- Eliminate gas/electric boilers from pressure letdown station.
- Vortex Cooling System- Replace chillers or support chillers in gas cooling during compression/filling process.

Liquid Industrial gases, LPG/LNG:

- Vortex Vaporization- Reduce energy consumption in liquefied gas vaporization.

Distributed by: Linc Energy Systems

Vortex Pressure Regulation Installation



Universal Vortex, Inc. (USA)

www.universal-vortex.com +1-609-586-3702

www.LincEnergySystems.com +1-303-697-6701

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CNG Decompression



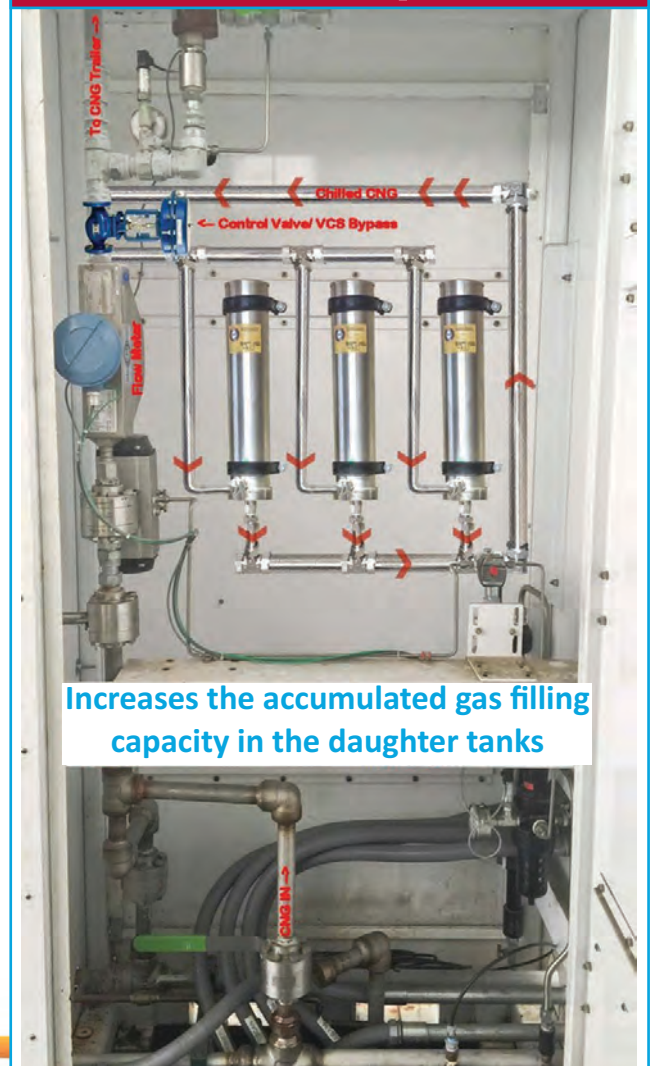
- Completely eliminate gas preheat boilers
- No CO₂ emissions or gas consumption
- No limitation on flow rate
- Increased reliability and safety

Vortex Pilot Gas Heaters



- Eliminates catalytic heaters
- No moving parts, no energy consumption
- No maintenance, ever!

Vortex Cooling System for CNG Compression



Increases the accumulated gas filling capacity in the daughter tanks

- Eliminates or supplements chillers
- Up to 67°C colder than compressor outlet
- No moving parts!

...AND MUCH MORE! See reverse side for more info!

Over 4,500
Installations
Worldwide!

Vortex Pilot Gas Heaters at High Volume PRS



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