

Hydro-Helical[®] 538 Series Gas Separator

FOR MORE OIL PRODUCTION IN HIGHER-GAS APPLICATIONS

OVERVIEW

A basic understanding of how gas separators operate has been a mystery for years despite various models, testing, studies, and technological reviews. When Summit ESP decided to invest in state-of-the-art technology and innovative testing methods, the learnings led to the development of the Hydro-Helical gas separator, the first new technological advancement in this area in 35 years.

The Hydro-Helical's unique design is based on the innovative stationary helical vortex inducer and special pump stages that enable large quantities of fluid movement while immune to gas locking. The aerospace-influenced crossover technology maintains maximum kinetic energy and increased erosion protection, delivering 2x greater fluid volume and approximately 40% greater gas handling capabilities than the industry standard.

As a result, operators dealing with the most challenging gassy wells, conventional and unconventional, can maximize oil production and reduce the total cost of ownership in their ESP operations.

FEATURES AND BENEFITS

Optimizes intake to provide consistent operations at higher gas volume fractions

Includes a fluid mover that delivers up to 2x greater flow capacity

Provides 20% additional capacity through integral tandem separators

Anti-gas-lock technology results in "zero" gas lock and improved gas slug ride-through

Separates fluids consistently, regardless of flow velocities and gas volume fractions

Eliminates erosion in traditional paddle wheel, rotary, or vortex separators

Handles up to 98% total volume free gas

Reduces overheating of equipment



EXCLUSIVE FEATURES INCLUDE:

- » Thrust protection enables a wide operating flow range up to 24,000 barrels per day
- » Stationary helical design influences 100% of the fluid, creating greater than 98% separation efficiency
- » Aerospace-influenced crossover technology allows for maximum throughput while maintaining maximum kinetic energy, and optimum directional transfer of liquid to the pump
- » Fluid mover Erosion Buster® protection reduces erosion and wear throughout and provides greater reliability
- » Exclusive XRange® Xtreme (XRX) advanced bearing system provides upthrust and down thrust protection

TOP-TIER TECHNOLOGY

Stationary Helix Inducer

The stationary helix inducer creates a vortex without a spinning paddle wheel, enabling separation efficiency that increases with the flow rate. Its entry and exit angles, tapering cross-section, and pitch minimize erosion and direct flow for significantly improved separation.

Intake, Crossover, and Exit Ports

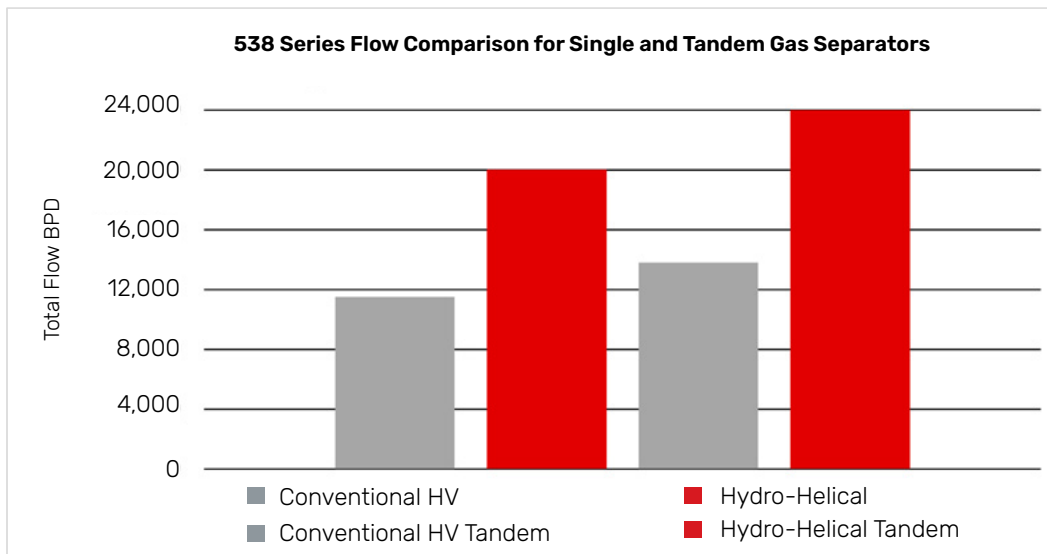
These individually optimized key components in the separation chamber help minimize flow losses and reduce erosion. The enlarged intake creates flow paths for ingesting large volumes of fluid, with minimal deviation in flow direction. Precisely directed fluid-phase streams from the separation chamber into the crossover gyratory pathways minimize recirculation and erosion while reducing fluid ingestion through the gas exit ports. The crossover port also redirects fluid at the pump's intake to reduce pre-rotation for enhanced pump performance.

Fluid Moving Stages

The unique stage design avoids pressure differentials that could cause gas locking. Modular stages support adjustable flow rates and feature abrasion-resistant (AR) bearings with patented thrust protection technology. This bearing system increases reliability through greater torsional rigidity and shaft support.

Proven Performance

The comparative bar graph below illustrates higher flow and, thus, better separation ability, using the 5.38-inch model Hydro-Helical® gas separator versus conventional high-volume (HV) gas separators.



Hydro-Helical® Gas Separator Specifications

Outer-Diameter Size	4 inches and 5.38 inches
400 Series, Single Flow Range (BPD)	Up to 10,000
400 Series, Integral Tandem Flow Range (BPD)	Up to 12,000
538 Series Single Flow Range (BPD)	Up to 20,000
538 Series, Integral Tandem Flow Range (BPD)	Up to 24,000
Percent of Gas Handling	98%
AR Bearings	Up to 7



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