

# Automated Valve Package Provides Extended Reliability in VSA Oxygen Generation

## CUSTOMER

Established global industrial gas producer.

## APPLICATION

The vacuum swing adsorption (VSA) process separates ambient air into gaseous oxygen molecules through a mol sieve. This process requires a durable and reliable valve & actuation package to provide high cycle counts (every 15 seconds) with very fast stroke times (<1 second open/close.)

## CHALLENGE

The valve/actuation lifecycle requirement for this customer was 2 years or 2 million cycles. The existing valve/actuation packages were having performance issues related to actuation and controls. These problems are common in this type of application where the pressure in the actuator & control components is higher than the pressure in the valve — 80 psi (5.5 bar) actuation vs 14 psi (1 bar) valve operation. In addition, the existing supplier had very long product lead times, up to 36 weeks.

## SOLUTION

Bray’s engineering team recommended a valve/actuation package that has been field proven beyond 1 million cycles. This package included a Series 41 high performance butterfly valve with high cycle trim, and a Series 98 scotch yoke pneumatic actuator with x-ring seal technology for extended life. Solenoids were included to provide accurate control for continuous high cycling.

A direct connection between Bray’s valve and actuator (instead of a coupling) eliminated possible failures that may occur from coupling play or hysteresis.

## RESULTS

With a shorter lead time of only 20 weeks, Bray provided two valve/actuator packages for field testing. The valves and actuators have been operating for over 3 years, with only recommended packing adjustments. This impressive performance equates to approximately **3 million continuous cycles** — and still counting. After another two years of service, planned maintenance is scheduled to replace seals and soft goods.

Overall, Bray’s solution has provided several benefits including:

- > **Shorter product lead times**, using a majority of standard components.
- > **Reduced operations downtime** resulting from less actuator maintenance.
- > **Extended lifecycle beyond 3 million cycles**, far exceeding requirements.
- > Product was added to **approved vendor list** based on outstanding performance.
- > Valve/actuator solution was **replicated in other plant locations**.



## PROCESS CONDITIONS

<b>Industry</b>	Industrial Gas Production.
<b>Process</b>	Ambient air separated into gaseous oxygen molecules through a mol sieve.
<b>Application</b>	Vacuum Swing Adsorption (VSA)
<b>Media</b>	Gas
<b>Operating Pressure</b>	14 psi (25 maximum design) 1 bar (1.7 maximum design)
<b>Operating Temperature</b>	130°F 54°C
<b>Performance Requirements</b>	High cycles; stroke time <1 second open/close; stroke every 15 seconds; 1 million cycles per year.

## BRAY PRODUCT DETAILS

<b>Valve</b>	Series 41 high performance butterfly valve.
<b>Size</b>	NPS 14, 24   DN 350, 600
<b>Pressure Class</b>	ASME 150   PN 10
<b>Materials, Modification, or Upgrades</b>	High cycle trim with WHA compliant soft goods for gaseous oxygen production.
<b>Actuator</b>	Series 98 scotch yoke pneumatic actuator with x-ring seal technology.
<b>Controls</b>	Solenoids.