

**White Paper**  
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# **Optimize your Operations:** Replacing Gate, Ball and Globe Valves with Vanessa™ Series 30,000 Triple Offset Valve Technology



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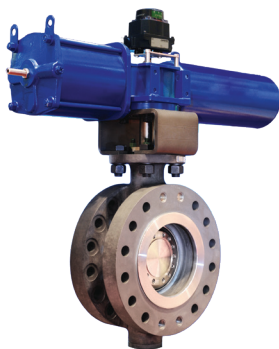
  
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## Superior Performance

### Industrial operations are increasingly challenged by the need for safer, more efficient and cost-effective valve solutions.

Industrial facilities face mounting pressure to optimize operations, reduce maintenance costs and improve safety. Conventional gate, ball and globe valves, while historically reliable, often fall short in meeting the evolving demands of modern facilities.

This white paper explores the advantages of transitioning to Triple Offset Valve (TOV) technology, highlighting its suitability for a wide range of applications and its potential to enhance operational performance, safety and sustainability.



*Vanessa Series 30,000  
Triple Offset Valve*

#### Vanessa Series 30,000 Triple Offset Valve offers...

A transformative alternative, delivering superior performance, reducing maintenance and enhancing reliability across a wide range of applications.

## Why modernize your valve infrastructure?

### Key Challenges

Gate, ball and globe valves have long served as industry standards for isolation and control.

However, they present several limitations:

- **High Maintenance Requirements:** Frictions and wear throughout valve operation lead to more frequent planned downtime and increased lifecycle costs.
- **Limited Safety Features:** Traditional designs may lack inherently fire-safe construction and cavity-free configurations, posing risks in critical applications.
- **Large Footprint and Weight:** These valves may require substantial space and support infrastructure, complicating installation and increasing capital expenditure.
- **Navigating Emissions Reduction and Regulatory Compliance Needs:** Pressure to reduce fugitive emissions and meet increasingly demanding compliance standards.

## Vanessa Series 30,000 Triple Offset Valves

### A Smart Replacement Strategy

Emerson's Vanessa Series 30,000 Triple Offset Valves are engineered to overcome these limitations:

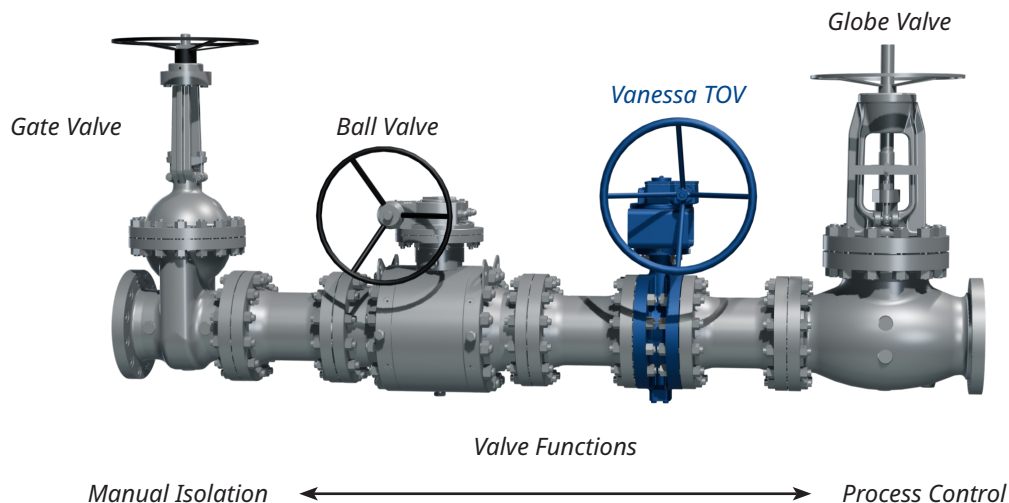
- **Tight shut-off with minimal maintenance** due to non-rubbing design, metal-to-metal torque seating.
- **Enhanced process reliability** in critical applications through frictionless operation and robust construction.
- **Cost effectiveness** from reduced installation expenses, smaller footprint and actuation size.
- **Improved safety and sustainability** due to compact, inherently fire-safe and cavity-free design and reduced fugitive emissions.

**Vanessa Series 30,000 Triple Offset Valves help you to:**



- Improve Safety**
- Optimize Cost**
- Maximize Performances**
- Reduce Maintenance**

### Understanding Valves Functions



**When industries need a product that seamlessly combines multiple functions, they turn to Vanessa Series 30,000 Triple Offset Valves.**

## **Vanessa Series 30,000 Triple Offset Valves Features:**

- **Frictionless, metal-to-metal sealing** for tight shut-off with minimum maintenance
- **Quarter-turn rotation** for fast, reliable actuation and fugitive emissions containment
- **Compact design, torque seated** reducing installation and actuation costs
- **Full metal construction** ensuring robustness and durability in extreme conditions

***Replacement of large gate valves installed in a piping system serving the New York Aqueduct with the Vanessa Triple Offset Valves. A success story that was even reported by “The New York Times”.***

***- Andrea Sutti***

*Global Product Manager, Vanessa Series 30,000 Triple Offset Valves*

## **Safety Benefits**

### **Enhancing Operational Integrity and Risk Mitigation**

Safety is paramount in industrial environments, and Vanessa Series 30,000 Triple Offset Valves are designed to meet the highest standards.

- **Fire-Safe Design:** With its all-metal construction and adoption of graphite-based secondary seals, it is inherently fire-safe by design and ensures compliance with fire safety standards such as API 607 and ISO 10497.
- **Higher SIL Rating:** The asymmetric trim design allows to leverage in-line pressure for higher Safety Integrity Level (SIL), contributing to overall plant safety and compliance.
- **Cavity-free Design:** Eliminates the risk of trapped media that could lead to pressure buildup or contamination — especially critical in volatile or toxic service.
- **Compact and Lightweight:** Easier to handle during installation and maintenance, reducing physical strain and improving worker safety.

## Environmental Benefits

### Supporting Sustainability Goals

Vanessa Series 30,000 Triple Offset Valves contribute to environmental stewardship in several keyways:

- **Material Efficiency:** Lightweight construction lowers the carbon footprint of manufacturing, transportation and installation.
- **Lower Energy Consumption:** Compact actuators require less power, reducing energy usage across valve operations.
- **Reduced Fugitive Emissions:** Quarter-turn, non-rubbing design minimizes packing wear and leakage, helping meet the most stringent requirements of the ISO 15848 and EPA relevant standards.
- **Extended Service Life:** Fewer replacements mean less waste and support circular economy principles.

## Operational and Cost Benefits

### Quantifying the Economic Advantage of Vanessa Series 30,000 Triple Offset Valves

Replacing traditional gate, ball and globe valves with Vanessa Series 30,000 Triple Offset Valves deliver measurable cost savings across the entire lifecycle — from procurement and installation to operation and maintenance.

#### 1. Lower Purchasing and Installation Costs

**Weight Reduction:** Up to 80% lighter than comparable ball valves.

**Compact Footprint:** Laying lengths shorter by approximately 2/3.

**Single Valve for Dual Function:** Combines isolation and control, cutting hardware and installation costs.

#### 2. Reduced Actuation Costs

**Lower and Consistent Torque Demand:** Thanks to the non-rubbing, metal-to-metal, quarter-turn rotation.

**Smaller Actuators:** Torque-seated design allows for minimized safety factors and therefore reducing the actuator footprint and sizing.

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### 3. Minimized Maintenance Expenses

**Full Metal Construction:** Ensures robustness and reliable operations.

**Non-Rubbing Rotation:** Extends valve life and reduces unplanned downtime.

**Interchangeable Spares:** Minimum set of standardized parts lowers maintenance inventory costs.

### 4. Operational Efficiency Gains

**Improved Reliability:** Higher SIL ratings reduce systemic failures.

**Fewer Valve Replacements:** Longer lifecycle reduces capital expenditure over time.



**NOTE:**

Valves are highlighted to differentiate between the two types.

## Where Vanessa Series 30,000 Triple Offset Valves Make the Biggest Impact - Industrial Applications

For plants looking to enhance performance and reduce operational risks, replacing conventional gate, ball or globe valves with Vanessa Series 30,000 Triple Offset Valves offer a strategic advantage, as they are specifically designed to address common pain points such as fugitive emissions, frequent maintenance and performance degradation in demanding service environments.

To maximize the impact of this upgrade, it is important to focus on applications where the Vanessa Series 30,000 Triple Offset Valve's capabilities — such as bidirectional tight shut-off, durability and lower lifecycle costs — align with your plant's operational priorities.

## **Emergency Shutdown and Emergency Blow-Off**

### **Reliable Valve Technology for Emergency Shutdown and Blow-Off Systems**

In high-stakes industrial environments, safety and operational continuity are non-negotiable. Emergency Shutdown (ESD) and Emergency Blow-Off (EBO) systems play a pivotal role in protecting personnel, equipment and processes during critical events. These systems are engineered to rapidly isolate or vent sections of a plant, mitigating risks and preventing escalation.

At the heart of these systems lies the need for **valves with superior performances** — that must respond swiftly and reliably under pressure. Emerson's Vanessa Series 30,000 Triple Offset Valves are purpose-built to meet these demands, offering a robust solution for facilities where safety and uptime are paramount.

### **Why Vanessa Series 30,000 Triple Offset Valve is the Ideal Choice for ESD/EBO Applications**

The Vanessa Series 30,000 Triple Offset Valve stands out for its advanced engineering and proven reliability in emergency applications. Key features include:

- **Asymmetric Trim Design** - Utilizes in-line pressure to achieve higher Safety Integrity Levels (SIL), enhancing system reliability.
- **Quarter-Turn Operation** - Enables rapid open/close cycles for immediate response during emergencies.
- **Frictionless Design** - Reduces wear and ensures consistent performance over time.
- **Torque Seating Mechanism** - Guarantees tight shut-off and optimal sealing force distribution, even under extreme conditions.

When safety and operational integrity are on the line, choosing the right valve technology is essential. Emerson's Vanessa Series 30,000 Triple Offset Valves deliver the speed, reliability and sealing performance needed to support your ESD and EBO systems — ensuring your facility remains protected and productive.



## Cryogenic Applications

### Leading the Way in Cryogenic Valve Technology

Cryogenic processes demand uncompromising performance. Whether handling liquefied natural gas or other liquefied industrial gases, valves must operate flawlessly at extremely low temperatures to ensure safety, efficiency and compliance.



### Engineered for Cryogenic Excellence

Vanessa Series 30,000 Triple Offset Valves are designed to meet the unique challenges of cryogenic environments.

- **Innovative Trim Design** - Non-rubbing rotation and metal-to-metal torque seating maintain operability and tightness even at cryogenic temperatures.
- **Robust Construction** - Solid seal ring in Nitronic® 50 and integral body seat overlaid with Stellite® 21 ensure durability and resistance to wear.
- **Maintenance-free Operation** - Full metal construction eliminates soft parts, preventing embrittlement and premature wear — delivering long valve life with minimal or no maintenance required.
- **Optimized Connection Options** -  
**Buttweld pipe connections:** Ideal for manual valves, maximizing fugitive emissions containment.  
**Double flanged or LUG connections:** Recommended for automated valves to ensure the best availability and mean time to repair.

### Emerson Manufacturing Excellence

- **High Production Capacity** - Thousands of cryogenic valves produced annually, supported by comprehensive in-house infrastructure.
- **Advanced Testing Facilities** - Equipped to meet the most rigorous international standards for cryogenic performance and quality assurance.

In cryogenic environments, where failure is not an option, Emerson's Vanessa Series 30,000 Triple Offset Valve delivers unmatched reliability, safety and performance. With proven success across thousands of installations, it remains the trusted choice for engineers and operators worldwide.

## **Molecular Sieve**

### **Durability and Reliability in Demanding Gas Treatment Environments**

Molecular sieving is a critical process used to separate molecules in various gas treatment operations. It plays a vital role in industries such as natural gas processing, petroleum refining, industrial gases, petrochemicals, coal chemicals and ethanol production.

These applications place intense demands on valve performance due to:

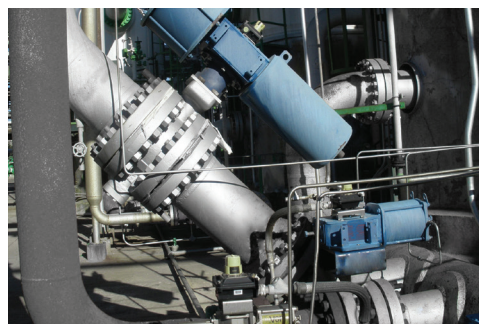
- **Frequent Operation Cycles** - Valves may open and close every 2 to 4 hours, requiring exceptional durability.
- **Thermal Cycling** - Regeneration temperatures can reach 450 to 600°F, causing thermal expansion and contraction that can impact valve geometry.
- **Abrasion** - Aging molecular sieve beds generate dust and particles that can erode valve internals.
- **Corrosion** - Acid gases and water in the feed stream can compromise valve integrity depending on pre-treatment conditions.

To maintain continuous and efficient operation, valves must be **robust, reliable** and **low-maintenance**.

Emerson's Vanessa Series 30,000 Triple Offset Valves are specifically configured to excel in molecular sieve systems:

- **Triple Offset Non-Rubbing Design** - Eliminates wear between sealing components, ideal for frequent open/close cycles.
- **Full Metal Construction** - Designed to withstand thermal cycling, with heavy-duty trim including bearings and thrust bearing.
- **Corrosion and Abrasion Resistance** - Materials of construction are selected to match specific service conditions, ensuring long-term integrity.
- **Enhanced Reliability** - Solid seal ring, external bearings and live-loaded packing options ensure operational efficiency with minimal maintenance.

Molecular sieve systems demand valves that can endure frequent cycling, high temperatures and abrasive/corrosive conditions. Emerson's Vanessa Series 30,000 Triple Offset Valves delivers the performance, reliability and longevity required to keep these critical processes running smoothly.



## General Applications

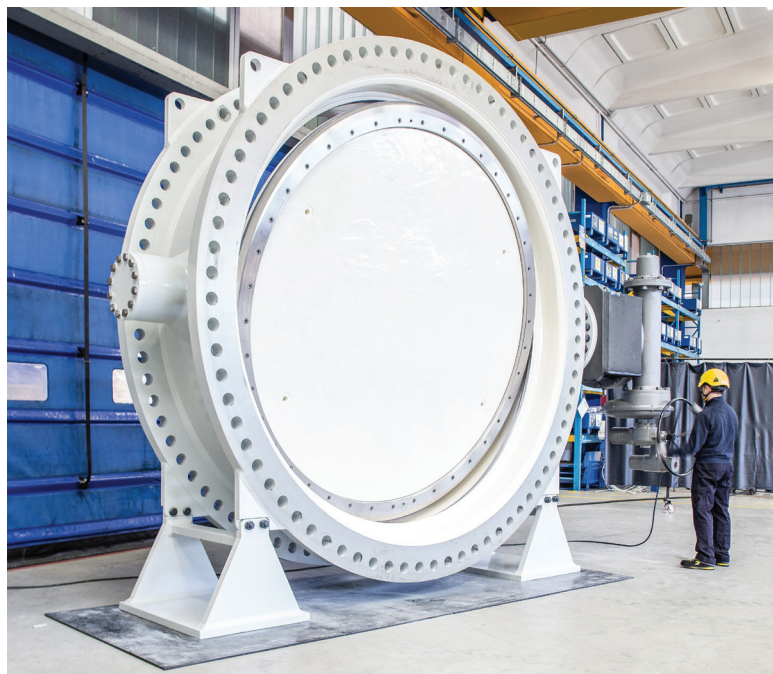
### Performance Across a Broad Range of Applications

In today's dynamic industrial landscape, versatility and reliability are essential. Emerson's Vanessa Series 30,000 Triple Offset Valves are engineered to deliver exceptional performance across a wide spectrum of applications and industries.

Vanessa Series 30,000 Triple Offset Valves excel in environments that demand durability and precision:

- **High-Cycle Operations** - Withstand frequent open/close cycles without compromising performance.
- **Extreme Temperatures (cryogenic or high temperature) and High-Pressure Systems** - Maintain integrity and tight sealing under severe conditions.
- **Corrosive and Abrasive Media** - Engineered with robust materials to resist wear and chemical degradation.
- **Critical Safety Systems** - Reduce the risk of valve failure during essential operations.
- **High-Production Facilities** - Minimize downtime and maintenance needs, improving overall productivity.

Whether your facility handles high-pressure steam, corrosive chemicals, or frequent cycling, the Vanessa Series 30,000 Triple Offset Valves offer a proven solution. Their versatility and reliability make them a valuable asset in achieving safer, more efficient and cost-effective operations.



*A Vanessa 120" double flanged valve*

Vanessa Series 30,000 Triple Offset Valve state-of-the-art technology represents a strategic upgrade for industrial facilities seeking to modernize their valve infrastructure.

By replacing gate, ball and globe valves with Vanessa Series 30,000 Triple Offset Valves, plants can achieve greater reliability, safety and cost-effectiveness across a wide range of applications.

*More than a  
product upgrade.  
A strategic investment.*

[Click here to learn more](#)

*"We deliver solutions that precisely align with our  
customers' needs."*

*- Andrea Sutti*

*Global Product Manager, Vanessa Series 30,000 Triple Offset Valves*



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