



Rotary Valve and Peripheral Equipment Upgrade Offerings





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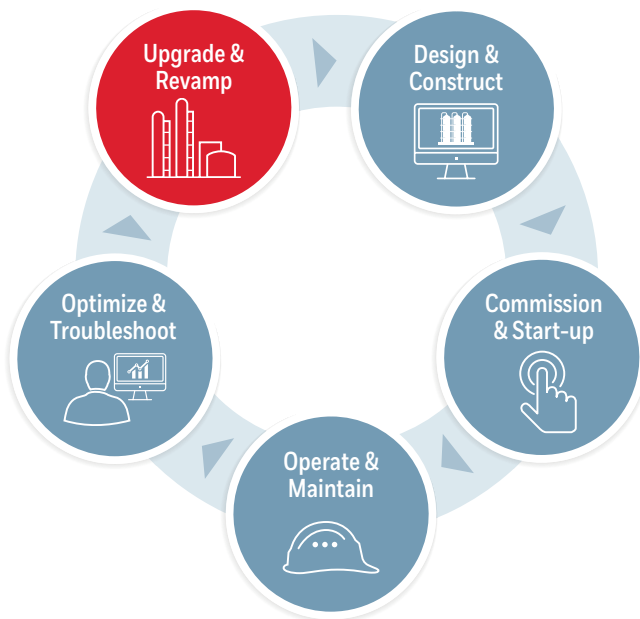
WE'RE WITH YOU

supporting you as your lifecycle needs change

It Starts With A Conversation, Not A Catalog

At UOP, we don't believe in a one size fits all approach to lifecycle management. You have unique needs and capabilities that impact your operations, and our approach is tailored to your needs.

Whether you are looking for a little bit of help or a lot of help, UOP is here for you. UOP's custom solutions allow you to fully engage the experts at UOP or just supplement your own house capabilities. Either way, we work with you to develop a solution that is right for YOU. You can rely on UOP to bring our unique knowledge, expertise and industry experience to all aspects of your operations- from design and construction to maintenance or optimization. UOP is here to help you and can make it happen.



What Upgrades are Available for My Rotary Valve?

UOP is committed to providing Aftermarket upgrade solutions that allow customers to benefit from the latest technology on their existing equipment. The best investment customers can make is investing in equipment that ultimately provides both functionality and enables profitability. With the complexity of Rotary Valves, upgrades can improve functionality, maintain equipment reliability and uptime, which increase profitability, and help make maintenance tasks safer and easier. UOP is proud to offer Rotary Valve Upgrades that give customers additional options and features designed to improve their operation and efficiently meet customer goals.

✓	UPGRADE OPTIONS	PERFORMANCE	RELIABILITY	REDUCED COST OF OWNERSHIP	ENVIRONMENTAL
	Artisan Main Bearing	✓	✓	✓✓	
	Artisan Mechanical Seal	✓✓	✓	✓✓	✓
	Dual Seal Retrofit	✓✓✓	✓✓	✓	✓
	Hydraulic Cylinder Bleed Vents	✓	✓		✓
	Hydraulic Power Unit (HPU) Manifold	✓	✓✓	✓	✓
	Improved Cylinder Bracket and Pins	✓✓	✓✓	✓	
	Port Hole Leading Edge	✓✓	✓	✓✓	
	Proximity Switch	✓	✓✓	✓	
	Remote Greasing	✓	✓		✓
	Resolver with Dial Indicator & Safety Strobe	✓	✓	✓	✓✓✓
	Rotor Plate Inversion Apparatus (RPIA)	✓		✓	✓
	Rotor Plate Stand			✓	✓
	Sight Glass Upgrade with Safety Ball Valve	✓✓	✓		✓✓
	Soft Start Capability	✓	✓	✓✓	
	Spherical Knuckle	✓	✓✓	✓	✓
	Splined Ratchet Wheel/Upper Shaft	✓✓✓	✓✓	✓	
	Splined Rotor Plate/Lower Shaft	✓✓✓	✓✓	✓	
	Tertiary Flush Revamp	✓✓		✓✓✓	
	Top Head & Shaft Stand				
	Top Head Lift Beam				✓
	ACCS Upgrade	✓	✓✓✓		
	Turbine Meter Replacement	✓✓			
	Variable Frequency Drives (VFD) for Parex	✓✓		✓✓	



Artisan Main Bearing



PERFORMANCE

Improved grease seal design reduces the risk of failure and extends service life



RELIABILITY

Replaces obsolete components and delivers a bearing with increased design life and additional load capacity



REDUCED COST OF OWNERSHIP

The Artisan Main Bearing can be refurbished rather than replaced which substantially reduces future maintenance costs



Artisan Mechanical Seal



PERFORMANCE

Self-aligned stationary seal with improved design

Seal designed from the ground up, specifically for the slow-moving, intermittent, rotational motion of the Rotary Valve



RELIABILITY

Reduces susceptibility for leakage and improves capability to handle process upsets



REDUCED COST OF OWNERSHIP

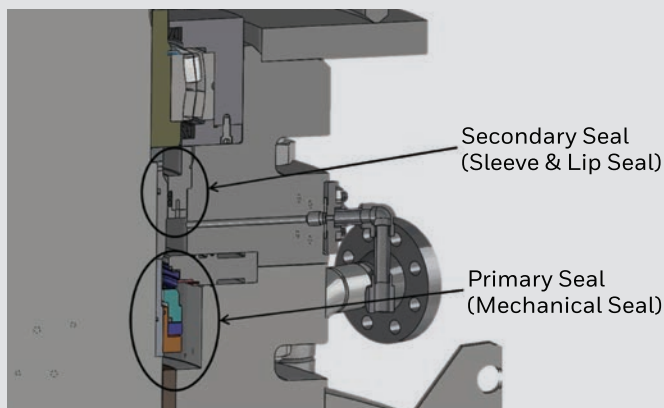
New design increases expected seal service life by reducing the chance of debris coming in contact with the critical seal

New design also helps to reduce premature wear on the o-rings



SAFETY/ENVIRONMENTAL

The Artisan Mechanical Seal reduces the potential for leakage and increases the safety of both workers and the environment



Dual Seal Retrofit



PERFORMANCE

Seal cavity pressure monitoring allows ACCS to notify user of a primary seal leak



RELIABILITY

Leakage from single seals can cause unit shutdowns and damage to Rotary Valve drive system components, such as the main bearing. A Dual Seal provides an extra layer of protection against potential system damage

Dramatically increases on-stream availability of the equipment by adding a second seal in the event of primary seal failure. This allows users to plan seal maintenance activities rather than potentially having those occur as unplanned emergencies



REDUCED COST OF OWNERSHIP

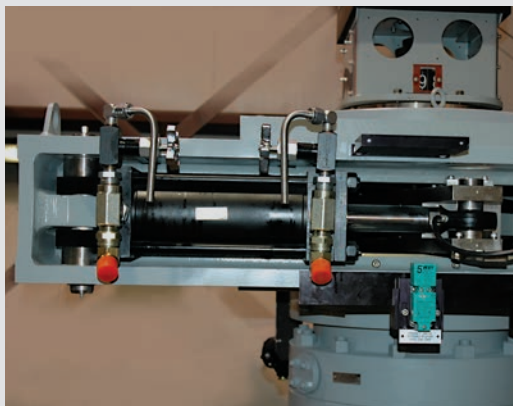
Reduction of maintenance costs due to increased on-stream reliability

Secondary seal has a lower replacement cost as compared to the use of a conventional mechanical seal



SAFETY/ENVIRONMENTAL

Moving from a single seal to double reduces the possibility of fugitive emissions getting into the atmosphere, increasing safety for both workers and the environment



Hydraulic Cylinder Bleed Vents



PERFORMANCE

Effective bleeding reduces vibration and hammering in the hydraulic system and lines, reduces creep of the hydraulic cylinder, and provides more consistent Rotary Valve indexing



RELIABILITY

Allows for safe and efficient air bleeding from the hydraulic system

Bleed vents help to reduce vibration in the HPU system for improved reliability



SAFETY/ENVIRONMENTAL

Allows for safe and efficient air bleeding at Rotary Valve startup



Hydraulic Power Unit (HPU) Manifold



PERFORMANCE

Improves communication with the ACCS by providing online filter, system pressure, pump discharge pressure, oil temperature, and oil level monitoring

Includes test ports for improved troubleshooting



RELIABILITY

Retrofits include redundant key components (4-way solenoid valves, unloading valves, filters, pumps, etc.) for increased on-stream reliability

Increases shear load resistance of the hydraulic system

Fully enclosed system provides better protection for system components and helps maintain more a consistent oil temperature



REDUCED COST OF OWNERSHIP

Replaces parts that have become obsolete and are no longer available

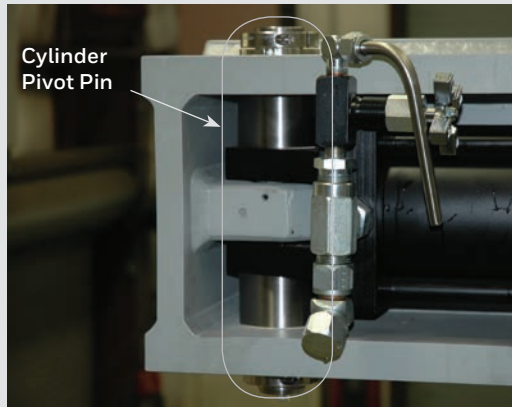
The addition of soft start capabilities reduce wear on drive components for increased life. See page 17 for more information



SAFETY/ENVIRONMENTAL

Reduces leak points and noise levels

Upgrade eligibility is subject to additional testing and specifications for operations. Contact your UOP representative for additional information.



Improved Cylinder Bracket and Pins



PERFORMANCE

Newer design helps to significantly reduce wear, which extends equipment life



RELIABILITY

Reduces the vertical movement of the hydraulic cylinder. This reduction provides a decrease of non-axial load on the hydraulic cylinder rod

Increases shear load resistance of the hydraulic system

Dramatically improves pin lubrication with increased greasing ports, which increases equipment life

Improves the pin greasing (increases grease ports to as many as 5) thus allowed for better greasing and increased equipment life

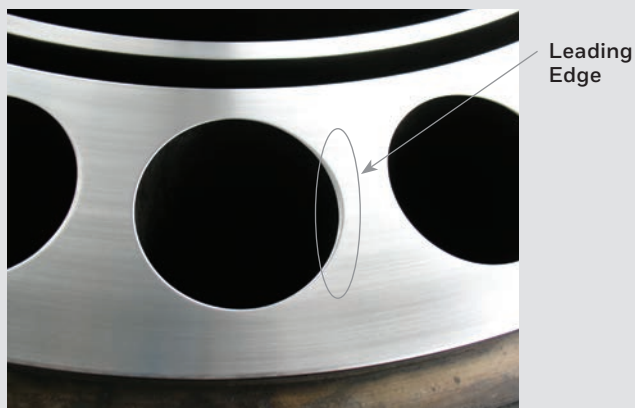


REDUCED COST OF OWNERSHIP

Extends the life of the hydraulic cylinder bracket and pins

Field replaceable bushings improve cylinder pin and bracket life

Less expensive upgrade option may be available. Contact your UOP representative for additional information



Port Hole Leading Edge



PERFORMANCE

Increases the seal sheet life by reducing the tearing, cracking, and scuffing of the seal sheet

Upgrade can be completed with minimal time lost because the work is done onsite



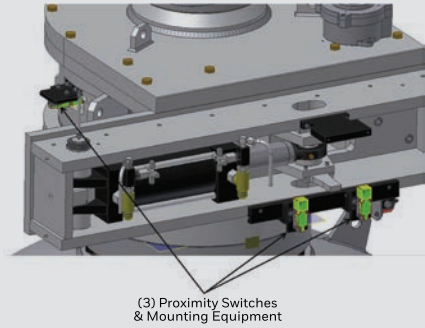
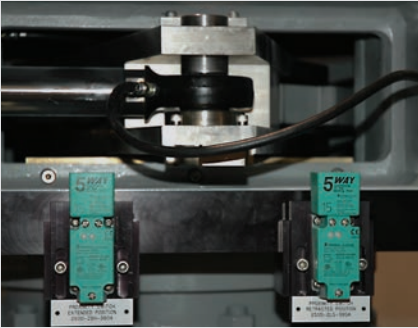
RELIABILITY

Seal sheet replacement is one of the most significant maintenance costs associated with a Rotary Valve. Customers often experience increased seal sheet life with this upgrade



REDUCED COST OF OWNERSHIP

Reduces frequency of seal sheet replacement because of increased reliability



Proximity Switch Upgrade



PERFORMANCE

Improves the accuracy, repeatability, and on-stream reliability of the rotor plate position during operation



RELIABILITY

The new proximity switches deliver a better aligned rotor plate, resulting in less damage to the seal sheet



REDUCED COST OF OWNERSHIP

Switches can be quickly replaced on-line with no loss in production time



Remote Greasing



PERFORMANCE

Remote greasing increases access to critical wear components

Regular and proper greasing significantly extends the life of the valve



RELIABILITY

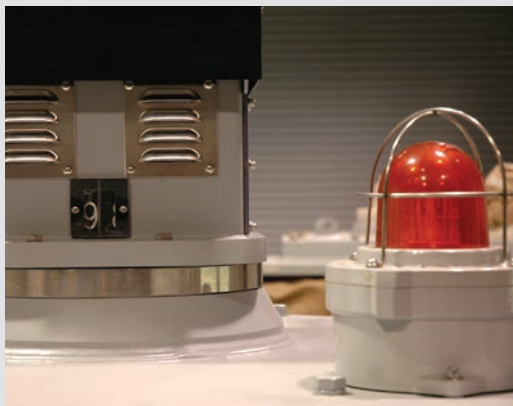
Increases accessibility to grease points

Easier greasing enables more consistent greasing to stay in line with UOP's recommended schedule. This is critical to maintaining reliability and longevity of the equipment and extending component life



SAFETY/ENVIRONMENTAL

Allows for maintenance personnel to service the Rotary Valve while being safely away from the areas with moving parts



Resolver with Dial Indicator & Safety Strobe



PERFORMANCE

Electrical positioning device that vastly increases monitoring and positioning capabilities of the rotor plate

Helps increase accuracy, repeatability, and reliability of rotor plate positioning



RELIABILITY

Continuous monitoring of rotor plate positioning is the key to maximizing seal sheet life

Helps to increase the life expectancy of the seal sheet and improves visibility

Dial indicator allows maintenance personnel to easily see rotor plate position and increases chances they will monitor through the sight glass



REDUCED COST OF OWNERSHIP

This new design delivers increased life expectancy of seal sheet

More simplistic wiring; reducing the need for specialized skill. Increases chance of maintenance personnel knowing and checking to see if the rotor plate is mis-aligned

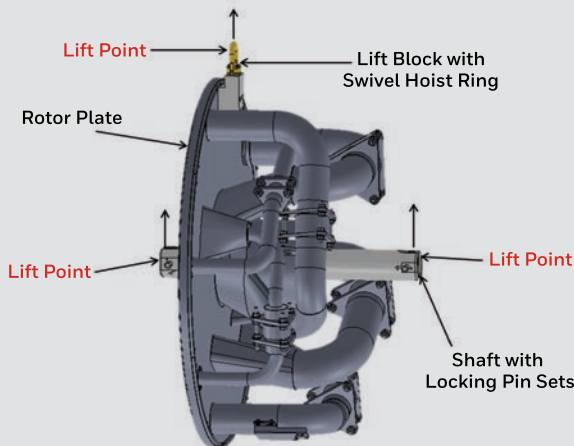


SAFETY/ENVIRONMENTAL

Safety strobe activates before and during movement to alert those around the area of impending motion of the Rotary Valve drive system components

Safety strobe can be seen from the platform. This is critical to personnel performing maintenance (i.e. greasing) which allows for time to get safely away from the valve before movement

Resolver with Dial Indicator and Safety Strobe Upgrades are available individually or as a set. Contact your UOP representative for additional information



Rotor Plate Inversion Apparatus (RPIA)



PERFORMANCE

Product is designed, certified, and load tested specifically for each rotor plate



RELIABILITY

Safe handling of the rotor plate helps prevent damage during maintenance activities

The inversion apparatus improves reliability of the valve during operation and drastically reduces the likelihood of damage that improper lifting can cause (i.e. flatness due to oversteering, damage to expansion joints, damage to pipes during lifting, etc.)



REDUCED COST OF OWNERSHIP

Decreases time to invert the rotor plate, shortening maintenance duration and activity. The inversion apparatus also helps to prevent damage to newly applied seal sheet



SAFETY/ENVIRONMENTAL

Maintenance is done in a predictable and controlled manner – increasing safety of both people and equipment



Rotor Plate Stand



PERFORMANCE

Product is designed, certified, and load tested specifically for each rotor plate



RELIABILITY

Safe handling of the rotor plate keeps it from being damaged during maintenance and movement



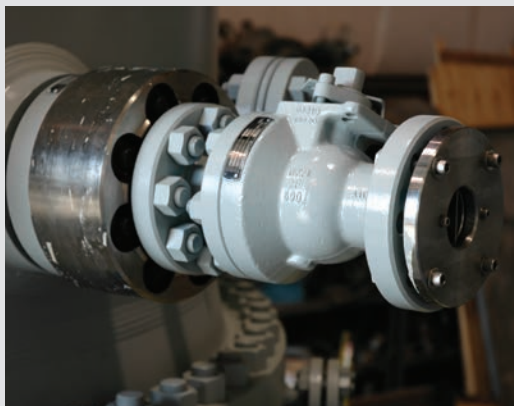
REDUCED COST OF OWNERSHIP

Increased safety and assists in the transportation via fork lift and pallet jack



SAFETY/ENVIRONMENTAL

Supports the rotor plate during inspection and maintenance



Sight Glass Upgrade with Safety Ball Valve



PERFORMANCE

Helps ensure maintenance personnel will have access to checking rotor plate alignment during operation for increased reliability



RELIABILITY

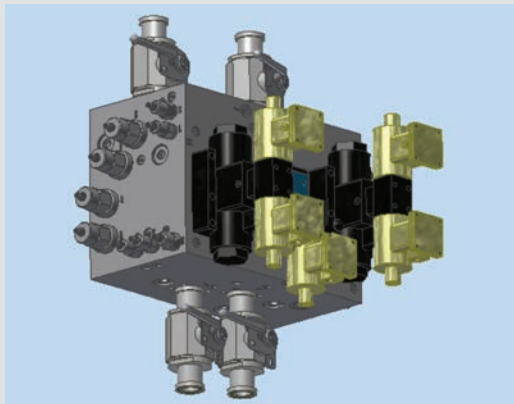
Glass is in one piece, reducing failure because of delamination during operation



SAFETY/ENVIRONMENTAL

Reduces possibility of fugitive emissions

Safety ball valve with an isolation that can be turned off while still in operation



Soft Start Capability



PERFORMANCE

Soft start takes away impact forces by closing the gap between the pawl and ratchet wheel. This allows for a gentler push and less impact on drive components

Increases drive system component life of the pawl, ratchet wheel, mounting pins, etc. by dramatically reducing impact forces of components during indexing



RELIABILITY

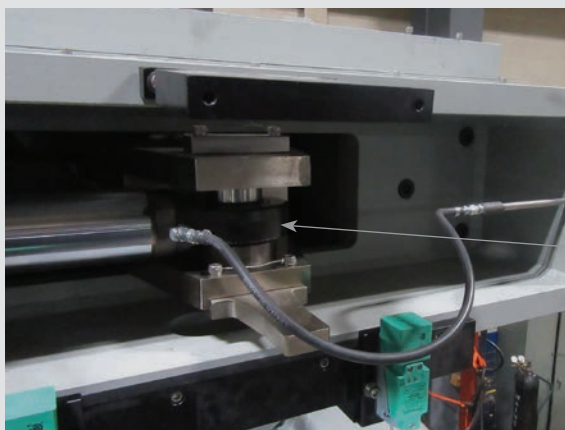
Decreases wear on components which contributes to more on-stream reliability and reduces unplanned shutdowns

Gradual contact reduces impact loads and increased design life



REDUCED COST OF OWNERSHIP

Increases life of drive components over time and reduces wear of drive components, extending replacement time maintenance



Spherical
Knuckle

Spherical Knuckle



PERFORMANCE

Decreases the load and wear on the hydraulic cylinder and drive components by decreasing the non-axial load on the hydraulic cylinder



RELIABILITY

Spherical knuckle provides improved load resistance and increased life because of the updated design



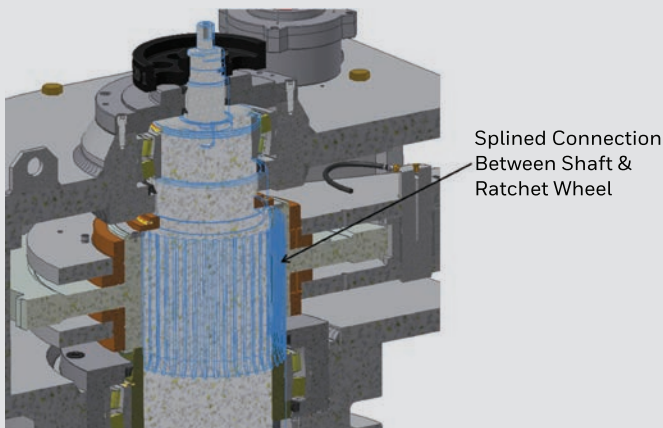
REDUCED COST OF OWNERSHIP

Increases the life of the hydraulic cylinder and drive components due to less wear on components from vertical movement



SAFETY/ENVIRONMENTAL

Upgrade allows for safe and simplified installation



Splined Ratchet Wheel/Upper Shaft



PERFORMANCE

Decreases the risk of fatigue failure when compared to keyway type designs



RELIABILITY

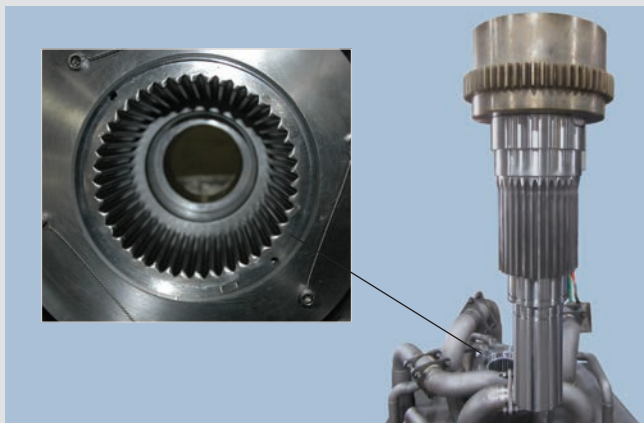
Improves load distribution which reduces risk of fatigue failure



REDUCED COST OF OWNERSHIP

Increases on-stream reliability which reduces maintenance costs

Reduces the possibility of unexpected downtime



Splined Rotor Plate/Lower Shaft



PERFORMANCE

Splined connections offer equal load distribution around the shaft and along all teeth. This results in a higher load carry capability when compared to single keyway designs

Customers upgrading to a splined lower shaft must also upgrade to a splined rotor plate



RELIABILITY

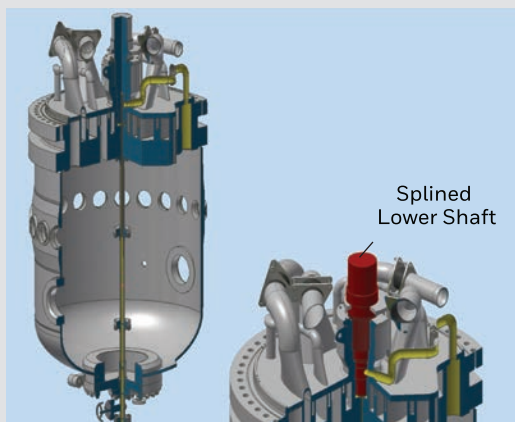
Improves load distribution which reduces risk of fatigue failure



REDUCED COST OF OWNERSHIP

Increases on-stream reliability which reduces maintenance costs

Reduces the possibility of unexpected downtime



Tertiary Flush Revamp



PERFORMANCE

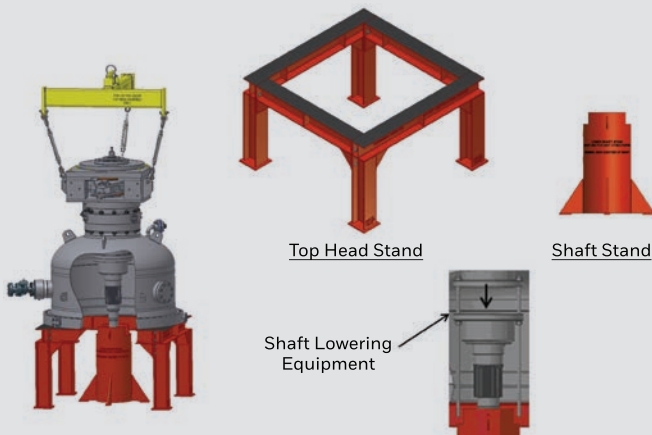
Revamp can help to improve adsorption efficiency of Parex/MX Sorbex units. It increases *para*-xylene/*meta*-xylene production or reduces utilities consumption



REDUCED COST OF OWNERSHIP

Reduces production cost per metric tons by increasing production and greatly reduces utilities consumption for products

Upgrade eligibility is subject to additional testing and specifications for operations. Contact your UOP representative for additional information.



Top Head & Shaft Stand



PERFORMANCE

Product is designed, certified, and load tested specifically for each rotor plate



RELIABILITY

Shaft stand allows for easier, safer, and more accurate replacement of lower drive shaft



REDUCED COST OF OWNERSHIP

Reduces the risk of binding damage between the top head, shaft and rotor plate



Top Head Lift Beam



PERFORMANCE

Product is designed, certified, and load tested specifically for each Rotary Valve size

Turnbuckle adjustments allow for accurate level lifting of the top head assembly



RELIABILITY

Top Head Lift Beam allows for safe staging, lifting, and maintenance of the Rotary Valve



REDUCED COST OF OWNERSHIP

Reduces risk of binding damage between the top head, shaft, and rotor plate



SAFETY/ENVIRONMENTAL

Allows for safe removal of the top head during disassembly



ACCS Upgrade



PERFORMANCE

Maximizes unit capacity and minimizes utility consumption

Rapid response to process changes and upsets

High steady-state product recoveries and purities



RELIABILITY

ACCS incorporates sophisticated Rotary Valve stepping logic and diagnostics which enable increased onstream reliability

Independent control system with redundant or fault-tolerant components

Turbine Meter Replacement

UOP recommends replacing the turbine meter if it has been in service for more than 10 years



PERFORMANCE

Flow meter for high accuracy readings

Used in critical services of pumparound flow for mass balance and calculating recovery

Custom calibration curve included only when purchasing from UOP - optimum flow accuracy

Drift in flow – if the end user notices error or drift, the turbine may require replacement



Variable Frequency Drives (VFD) for Parex



PERFORMANCE

The chamber circulation flowrate varies over 7 different set-points within a 30-minute cycle

VFDs vary the speed of pump motors to control the Pumparound and the Pusharound flowrates

Pumparound and Pusharound control valves will remain open throughout the cycle – throttling only occasionally



REDUCED COST OF OWNERSHIP

Pumparound and Pusharound pumps help to reduce wasted energy

Reduces energy consumption by varying the speed of the motor

The energy savings are made possible by removing the pressure drop normally taken across the valve

By utilizing ACCS combined with VFDs, energy efficiency can be significantly improved

Additional testing required to determine payback after business model is finalized

For more information

For more information, please
contact your UOP representative
or visit us online at www.uop.com.

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