

The Centrisys-Viscotherm Scroll Drive is the **Most Efficient** in the Centrifuge Industry





Benefits of the Centrisys Hydraulics

Our hydraulic scroll drive is powerful and precise, achieving the highest torque-to-weight ratio with the best process control. By using hydraulics we eliminate the gearbox, and as a result simplify the design, radically reducing the number of moving parts and wear components. The Centrisys scroll drive delivers unmatched reliability with lower operating costs— a direct benefit to our customers.

1 Hydraulics is a Trusted Technology: Whether we realize it or not, hydraulics is a part of our daily lives. It is a reliable and precise technology that delivers maximum power using the smallest footprint. Hydraulic components are a fundamental part of the steering and braking system in every car manufactured today. Hydraulics are used in nearly all forms of daily travel: planes, trains, boats and cars. It is commonly used in manufacturing facilities from heavy lifting to material handling.

2 Hydraulics is a Versatile Application: It is used in industrial, military and transportation applications where there is no room for error, and where work is dangerous, dirty or unforgiving. Examples include jet airliners, railways, ships, nuclear submarines, elevators, construction equipment, mining, drilling, and more. This technology is so versatile that it can be used in widely differing environmental conditions – from the most sterile to the dirtiest.

3 Hydraulic Scroll Drive Increases Capacity: Precise speed control and the highest torque capabilities allow for increased through-put capacities.

4 Hydraulic Scroll Drive Maximizes Recovered Energy: The Centrisys CERS (Centrifuge Energy Recovery System) concept is equivalent to technology used in today's hybrid automobiles, high-performance race cars, and the aerospace industry. The Centrisys system captures energy from the rotating bowl. This recovered energy powers the hydraulic scroll drive at shutdown or power failure, allowing for seamless backup continued operation with controlled scroll speed. Since the scroll continues to unload solids from the bowl, it prevents costly dismantling to free up a blocked centrifuge.

5 Our Hydraulic Technology Offers the Highest Energy Efficiency: Hydraulic technology operates independently from the main drive. Gearbox machines generally rely on the main drive; using solids removal mechanisms that apply braking (additional drag) to the bowl and maindrive. (Think of driving a car with the parking brake on.) Unnecessary braking with gearbox technology results in the need for larger main drive motors. Commonly, a centrifuge requires a main drive motor that is 50% larger in comparison to a centrifuge with our hydraulic scroll drive system to accomplish the same job. For every one horsepower needed to move solids out of the machine, one horsepower must be added to the main drive to overcome this braking action. The Centrisys scroll drive uses only the energy needed to drive the scroll; it is independent of the main drive, therefore no energy from the main drive is wasted.

Centrisys-Viscotherm Hydraulic Scroll Drive Based on ROTODIFF Technology **Outperforms** Our Competitors' Gearbox Drive

 Centrisys-Viscotherm Hydraulic Scroll Drive	 Competitors' Gearbox Drive	Centrisys Hydraulic Advantage
1 Highest torque-to-weight ratio; allows for proper balance to handle solids and hydraulic flow capacity	Lower torque-to-weight ratio; limits loading of solids, requiring larger or multiple machines	Powerful and Efficient Operation
2 Simple, compact, lightweight design	Complex, heavy design	Lower Maintenance
3 No gears, uses only slow-moving parts; creates less friction	Multiple gears and moving parts at higher speeds; creates more friction and higher power consumption	Long-term Reliability
4 Robust and reliable; process control with direct torque reading. The direct measurement of scroll torque and speed allows immediate response to process changes	Complicated calculations of different speeds through multiple gear reductions/ increases error/ dramatically slows response to process changes	Lower Maintenance, Energy Efficient
5 Simple and accurate measurement of scroll speed; provides precise control of differential with unlimited bowl speed options <i>Differential = speed of ROTODIFF</i>	Complicated, indirect measurement of scroll speed; calculated from bowl and pinion speed, gearbox ratio and control error <i>Differential = (bowl speed - pinion speed) / gearbox ratio</i>	Precise Measurement and Control
6 One set of V-belts	Multiple sets and types of belts	Precise Measurement and Control Lower Maintenance Cost
7 Lower overhung weight reduces load on main bearings; reduces machine vibration; <i>Less weight means less horsepower needed to operate</i>	Heavy overhung gear increases load and heat on main bearings, causing reduced bearing life <i>More weight means more horsepower needed to operate</i>	Lower Maintenance
8 Versatile design for multiple applications	Limited design requires different units for each application	Lower Maintenance, Energy Efficient, Versatile
9 Low energy consumption; power is not lost or wasted. Scroll drive operates independently from the main drive motor	Increased energy cost; gearbox design steals energy from the main drive.	Versatile, Energy Efficient, Lower Operating Cost
10 State-of-the-art technology CERS (Centrifuge Energy Recovery System) allows the hydraulic scroll drive to recover energy at shut down	All energy is lost at shut-down; no power recovered	Energy Efficient
11 100% torque at all speeds, including standstill	Limited torque at maximum differential speed and standstill	More Powerful at All Speeds
12 Full range of differential speeds at all bowl speeds, including zero RPM, startup, shutdown and standstill	Limited range of differential speeds at lower bowl speeds and standstill	More Powerful at All Speeds
13 Low maintenance; continuous cleaning and cooling in a closed, 100% filtered system (filtered to 10 microns)	Unfiltered, uncooled closed system; retains all wear debris possibly shortening the gearbox life	Lower Maintenance, More Reliable
14 Pressure relief valves prevent high shock load, protecting the hydraulic system AND centrifuge; system does not transfer impact force to the shafting	Claims to have high shock load capability, but repeated high shock loads will damage and destroy in-line components and cause premature failure	Lower Maintenance, More Reliable
15 Standard on a Centrisys centrifuge	Standard on competitors' machines; if higher torque is required, hydraulic technology is offered as an upgrade	Lower Cost, Energy Efficient
16 No drag or parasitic loss on the main drive; uses only the energy required to convey solids	Robs energy from main drive; torque adds braking horsepower; increases drag on main drive motor	Efficient Operation
17 Capacity to run leading or lagging (optimized performance)	Limited to a one-direction process	Lower Maintenance, More Powerful and Efficient
18 No overheating of the hydraulic motor due to automatic, continuous heat dissipation through the oil conditioning system	External cooling often required; overheating is a common problem	Lower Maintenance, Longer Life

The **Truth** About Hydraulic Scroll Drives



The Centrisys-Viscotherm hydraulic scroll drive system with ROTODIFF technology is the best in the industry. Check the facts below to clear up any misconceptions about our system.

Misconception: Hydraulic drives are not efficient.

Fact: With ROTODIFF technology our hydraulic system is the most capable in the industry. Fewer (slow-moving) parts create less friction, and energy loss is minimized. Precise control of the scroll at any speed increases centrifuge capabilities

and efficiency, even when loading conditions fluctuate. Hydraulics do not put a drag or load on the main motor and use only the power needed to turn the scroll.

Misconception: A hydraulic system is not effective in messy, dirty or hazardous environments.

Fact: Hydraulic technology is commonly used in rugged environments with high levels of shock, vibration, dust, water, corrosive chemicals and other potential hazards. Industries using hydraulic technology include construction, agriculture, marine, military, mining, paper production, drilling and tunneling. Hydraulic systems are used in mines, chemical plants, near explosives and in paint applications, because they are inherently spark-free and can tolerate high temperatures. Hydraulics have the strength and reliability for jobs requiring the best, most durable heavy equipment.

Misconception: Hydraulic systems are noisy.

Fact: Our hydraulic scroll drive is quieter than a gearbox. It has been shown to reduce ambient noise by 15 dB over the older electric scroll drives.

Misconception: Hydraulic systems are messy and leak.

Fact: Because fluids are enclosed in a contained system, there is virtually no leakage in modern hydraulics. Advanced sealing techniques and materials and state-of-the-art electronics are

so efficient that today's manufacturers can raise the operating pressures of their pumps. It is not unusual to find hydraulic systems operating without leakage at pressures 2,000-3,000 psi higher than just a few years ago.

Misconception: A hydraulic drive is difficult to repair, requiring specialized technicians with hydraulic experience.

Fact: With fewer slow-moving parts and a less complicated design, hydraulic drives are easier to repair than a standard gearbox. Maintenance technicians with the skills to fix gearbox drives are more than capable of repair and maintenance with hydraulics.

Misconception: Hydraulic systems are more maintenance-intensive than a typical gearbox.

Fact: On average, hydraulics need only simple oil and filter preventive maintenance, just like a car.

Misconception: Parts for the hydraulic drive are difficult to source.

Fact: Centrisys has distribution centers across the United States and around the world for all hydraulic components. In fact, many parts can be shipped express overnight delivery.

Misconception: Hydraulic technology is old and abandoned by other centrifuge manufacturers.

Fact: Hydraulic technology remains a dominant system in modern industrial manufacturing. No other system is as efficient and effective in transferring energy through small tubes or hoses and other hard-to-reach parts. Hydraulic innovation is progressing at an astonishing rate – so quickly that some experts cite more progress in the last ten years than in the 50 preceding years combined. Competitive centrifuge suppliers have not abandoned a hydraulic scroll drive, since most will offer it as an upgrade to the gearbox.

The Choice is Clear

When you compare the Centrisys hydraulic scroll drive to a gearbox drive, the better choice is the Centrisys system. Centrisys is the only USA repair facility (besides Viscotherm affiliates) authorized by Viscotherm AG to repair, service, and perform warranty work on Viscotherm hydraulic components in North America. Contact Centrisys for more information on products, hydraulic scroll drive, service, parts or any other questions