



KUDU's Thermal Package

Heat It Up

- High Temperature PCPs rated up to 350°C (660°F)
- Functions in low and high viscosities
- Robust and simple

Bringing Solutions to Surface



Thermal Recovery

Enhanced Oil Recovery methods such as Steam Assisted Gravity (SAGD), Cyclic Steam Stimulation (CSS), steam drive, solvent and electric heating allow production of highly viscous crude oil at elevated temperatures. The choice of artificial lift technique is critical to well performance. KUDU has a variety of products to keep your mid to high temperature application pumping.

The Thermal Package for your Operation

Over 120 installs using PCP technology for thermal applications has given KUDU a level of expertise unmatched in the artificial lift industry. A KUDU product specialist is ready to help you determine the best fit for your operation. KUDU's Thermal Package consists of the following products:

- All metal PCP, PCM Vulcain™
- High Temperature (HT) EvenWall PCP
- High Temperature (HT) Oryx Seal
- VH 125 Drivehead

Contact KUDU today and a thermal specialist will work with you to determine which thermal products will achieve optimum results for your operation.

High Temperature Oryx Seal

KUDU's HT Oryx Seal is field tested to 315°C (600°F) dynamic and proven in thermal well applications. This patented seal is low maintenance and has a zero tolerance for leaks. Utilizing an early warning seal failure system it increases operator safety while still delivering outstanding performance. The HT Oryx Seal exceeds EUB environmental standards and is field serviceable.



Steam Flood, California - USA

Blue is the New Green

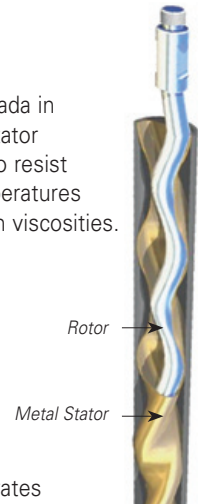
KUDU provides products and services for sustainable development making the system a natural fit for your environment. PCP's typically use a third the power of an ESP and half the power of a pump jack. Lower power consumption means less green house gas associated with your operation. KUDU's rotary seal packing diminishes the risk of onsite leakage and the system's overall small footprint reduces its impact on the landscape.

All Metal Progressing Cavity Pump

KUDU introduced the only all metal PCP to Canada in 2005. The PCM Vulcain™ consists of a metal stator and matching rotor utilizing special metallurgy to resist wear and maximize run life. It is rated for temperatures up to 350°C (600°F) and functions in low to high viscosities.

Operating Advantages

- Pumps a wide range of viscosities, temperatures, pressures and flow rates
- Ability to steam through the stator
- No rod fall problems
- Will not gas lock
- Continuous power demand
- Low NPSH, maintenance and internal shear rates



Even Better with EvenWall

Available in up to 1800m (6000ft) lift models, KUDU's EvenWall pumps increase the efficiency of PCP's by expanding the current capabilities of conventional pumps. Pump run life is improved due to the elastomer swelling evenly, enabling a consistent fit between the rotor and stator. The elastomer also swells less than traditional PCP's, which makes EvenWall well suited for high temperature and API applications. KUDU's EvenWall PCP's are capable of withstanding solids, while requiring less drive power for the same production rate and depth.



SAGD, Bonnyville - Alberta - Canada

KUDU is committed to developing and servicing safe reliable products.

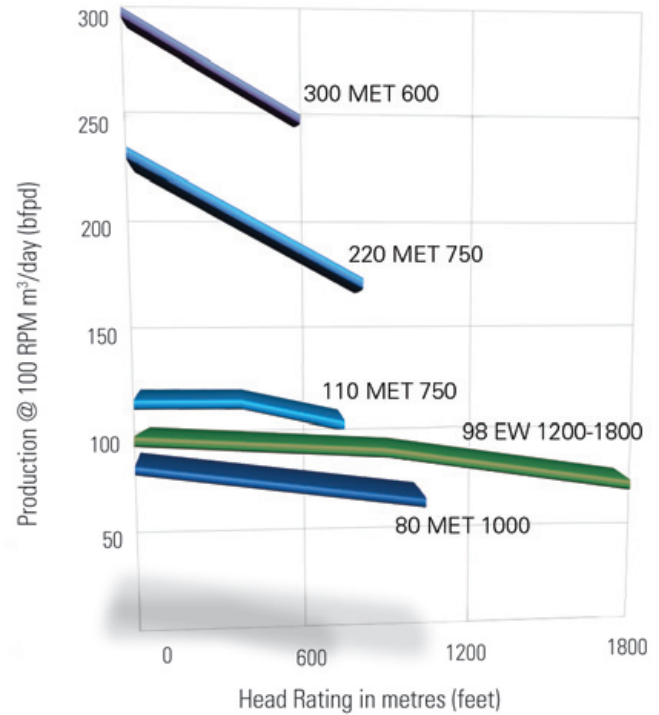


VH 125 Drivehead

The VH 125 uses the High Temperature Oryx Seal and is available in up to 125 horsepower. It is safe, reliable and operator friendly. For additional safety, the VH 125 uses an anti-ejection mechanism on the polish rod to keep it in place. This Drivehead is transported with its own stand to ensure easy installation and workovers. The VH 125 also incorporates a new braking system to control backspin at a rate between 200 rpm and 500 rpm. This system ensures full fluid dump, reducing the potential for residual fluid in the tubing. The VH 125 is also ATEX Certified for use in explosive environments.



Thermal Pump Models



Thermal Pump Model Specifications

THERMAL PUMP MODEL	DISPLACEMENT@100 RPM		PRESSURE RATING		STATOR OD		ROTOR OD		STATOR CONNECTION		ROTOR CONNECTION	
	(m³/day)	(bbls/day)	(m of H ₂ O)	(f of H ₂ O)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)
80 MET 1000	80	500	1000	3300	115	4.5	57.5	2.3	101 NUE	4 NUE	28.6	1.125
110 MET 750	110	700	750	2500	115	4.5	57.5	2.3	101 NUE	4 NUE	28.6	1.125
220 MET 750	220	1400	750	2500	141	5.6	72.7	2.9	114 EUE	4.5 EUE	28.6	1.125
300 MET 600	300	1900	600	2000	141	5.6	72.7	2.9	114 EUE	4.5 EUE	28.6	1.125

HT EvenWall Pump Model Specifications

EVENWALL PUMP MODEL	DISPLACEMENT@100 RPM		PRESSURE RATING		STATOR OD		ROTOR OD		STATOR CONNECTION		ROTOR CONNECTION	
	(m³/day)	(bbls/day)	(m of H ₂ O)	(f of H ₂ O)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)
98 EW 800-1600	98	625	800-1600	2600-5200	110	4.3	54.1	2.1	88.9 EUE	3.5 EUE	25.4	1.0

Thermal Elastomer Choices

MODEL	ELASTOMER	MAXIMUM	ABRASION	H ₂ S RESISTANCE	CO ₂ RESISTANCE	AROMATICS	WATER	EXPLOSIVE
	DESCRIPTION	TEMP. °C						
HTR1	HNBR (Ultra High)	185	3	3	3	2	3	2
HTR2	FPM	225	1	3	3	3	3	2

1= Average 2= Good 3= Excellent

SAGD, Ft McMurray - Alberta - Canada



CSS, Cold Lake - Alberta - Canada



KUDU's manufacturing and distribution systems are ISO registered.

Did you know KUDU provides customized customer training?

KUDU's training program is the best in the industry. Our team of PCP specialists takes a personal approach to your education needs. KUDU's comprehensive training manual is intended as a guide for the operation and maintenance of KUDU PCP systems. Whether you are in Operations, Engineering or anyone wanting to learn more about PCP's, KUDU's training program is tailored to your specific needs. Completion of the KUDU program credits you with a certificate of completion in PCP application training.

KUDU is continually innovating and developing new products for light, medium and heavy oil; thermal, coal bed methane and dewatering applications. The following are examples of the information you will receive from KUDU's detailed training sessions:

- PCP overview
- System components
- Installation guidelines
- KUDU specifications
- Drive Systems
- Power Units
- Downhole Accessories
- PCP manufacturing
- Applications
- Troubleshooting

Visit www.kudupump.com to learn more about KUDU's many products that will get the most from your well.



T H E R M A L



Contact your local KUDU representative or visit our website to find a distributor near you. All information is considered accurate and up to date at time of printing. KUDU reserves the right to amend the contents of this document at any time. KUDU does not warranty manufacturers claims.

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