JJTECH

CUTTING EDGE ARTIFICIAL LIFT

SELECT-JET™ JET PUMPS / **ULTRA-FLOW**™ SURFACE SKIDS / **SWD** PACKAGES

JJ TECH / **JET PUMP** ARTIFICIAL LIFT

Simple. No moving parts.

How it Works

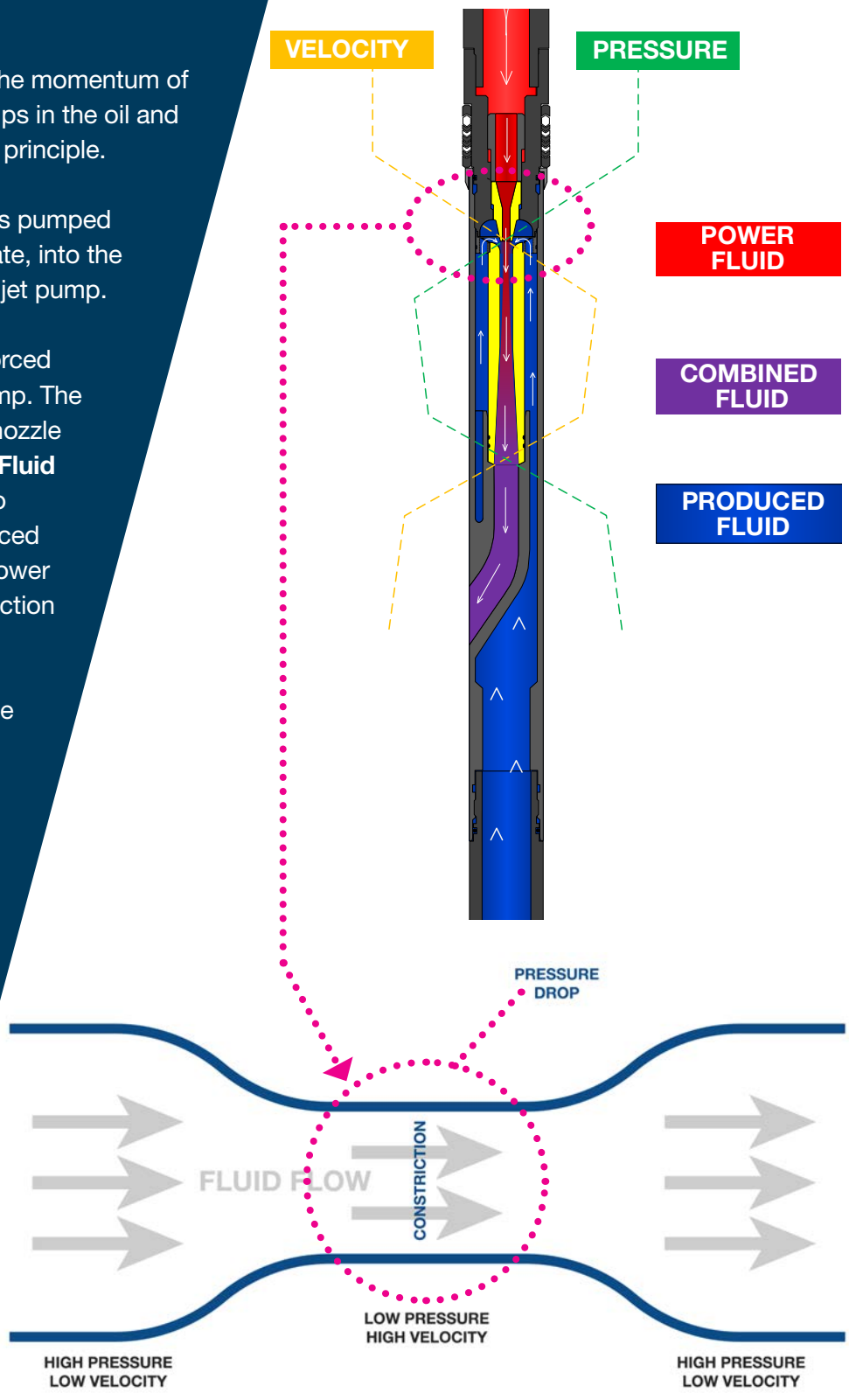
Hydraulic Jet Pumps work by using the momentum of one fluid to move another. All jet pumps in the oil and gas industry operate using this same principle.

Power Fluid (produced water or oil) is pumped from the surface at a constant flow rate, into the wellhead and down the tubing to the jet pump.

This Power Fluid (High Pressure) is forced through the Nozzle inside the Jet Pump. The resulting pressure drop through this nozzle (Venturi Effect) allows for **Formation Fluid** (Oil/Gas/Water any combination of) to enter the jet pump intake. This produced Formation Fluid combines with the power fluid in the “Mixing Tube” or throat section of the jet pump.

The Combined Fluids flow through the diffuser. As the velocity of this fluid decreases, the pressure increases as it exits the Jet Pump.

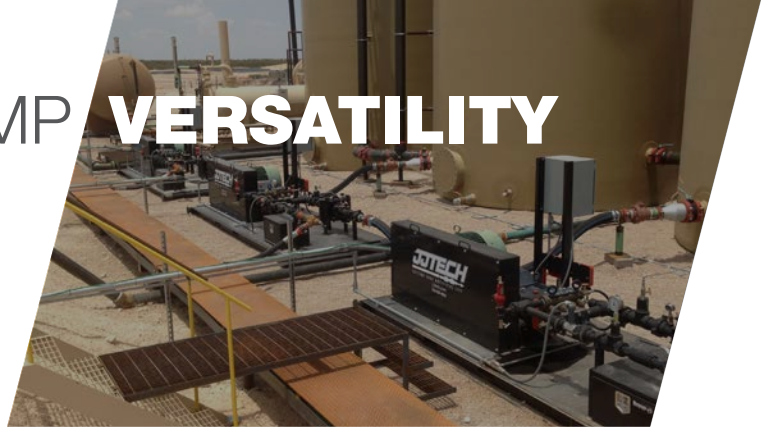
The Combined Fluids then flow to the surface.



Venturi Effect

The Venturi effect is the reduction in fluid pressure (Pressure Drop) that results when a fluid flows through a constricted section of pipe.

HYDRAULIC JET PUMP **VERSATILITY**



Compare the Benefits

Jet Pumps versus other Artificial Lift Technologies

Operating Conditions	Jet Pump Artificial Lift	Reciprocating Rod Lift	Electric Submersible Pumps	Gas Lift	Progressive Cavity Pumps
Crooked Hole	★★★★★	★	★★★	★★★★★	★
Sand	★★★★	★	★	★★★★	★★★
Corrosion	★★★★	★★★	★★	★★★	★★★
Paraffin	★★★★	★★	★★★★	★	★★
Scale	★★★	★★	★★★	★★★★	★★
Flexibility Volume	★★★★	★★★★	★★	★	★★★
High Volume	★★★	★★	★★★★★	★★★	★★
Depth	★★★	★★	★★★	★★★	★
Gas Handling	★★★	★★	★★	★★★★★	★★★
Ease of Service	★★★★★	★★	★	★★★	★★

Subsurface Configurations

The highly-versatile Jet Pump can be effective in many types of subsurface situations.

Horizontal Gas Well Dewatering Producing Inside Horizontal

Horizontal Gas Well Dewatering ESP Sump Completion

Gas Well Dewatering Vertical Completion

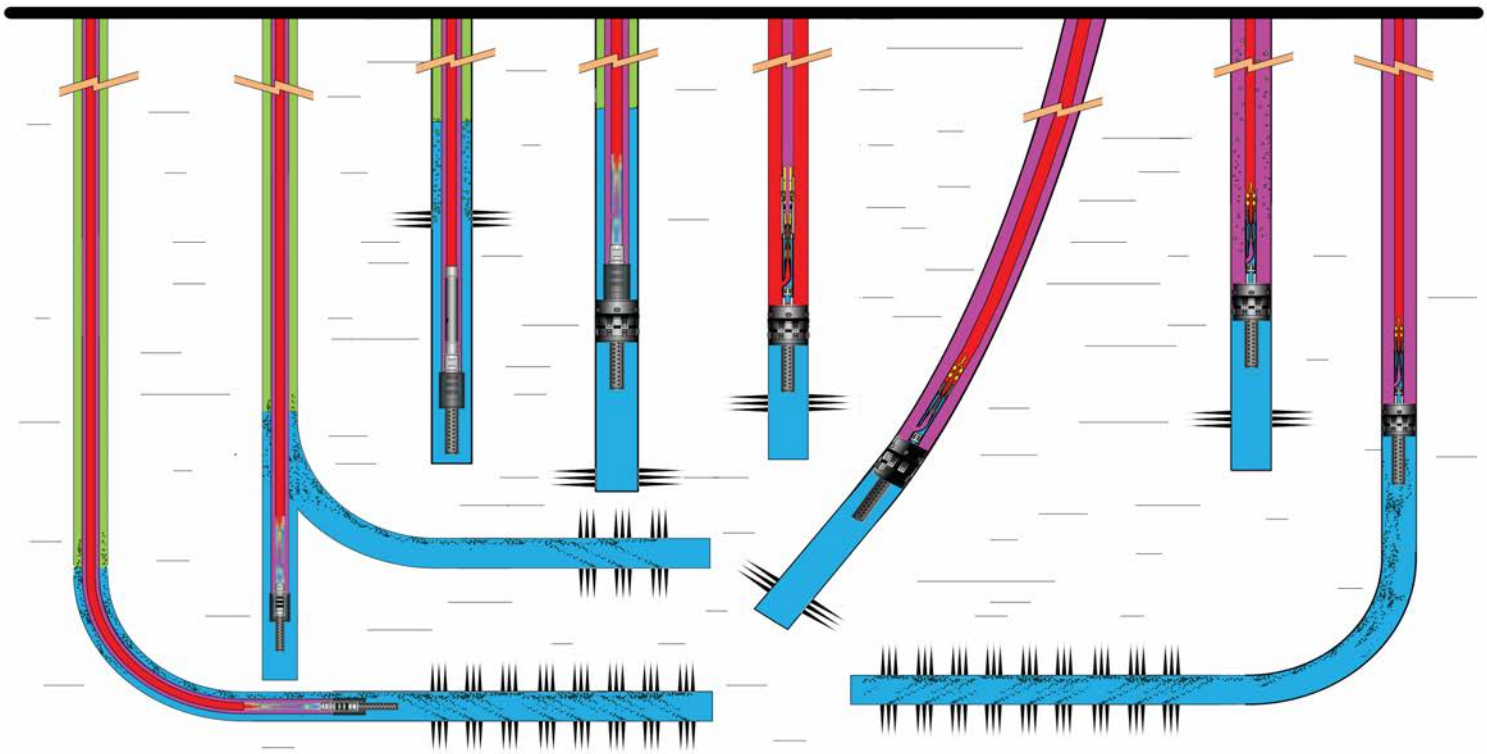
Slim Hole Completion Bad Casing Isolation

Reverse Flow Completion Tubing Returns

Directional Completion Deviated Well Bore

Conventional Completion Casing Returns

"FRAC-EVAC" Frac Flowback



SELECT-JET™ JET PUMPS

Improve production with the most versatile Hydraulic Jet Pumps in the oil and gas industry

Jet Pump production rates are up to 6000 BPD

- Deviated and horizontal wells
- Sand/Solids producing wells
- Gas well / CBM Dewatering (Concentric)
- “Slim Hole” for wells with damaged casing
- Heavy Oil Production (>10 API)
- High Water Cut wells
- Initial Flow Back / Frac-Hit Wells
- Retrofit into existing completions

Easy Retrieval of the Jet Pump

“Normal Flow” jet pumps can be retrieved by reverse circulation. (No workover rig or slick-line needed)

“Reverse Flow” jet pumps are retrieved by slick-line.

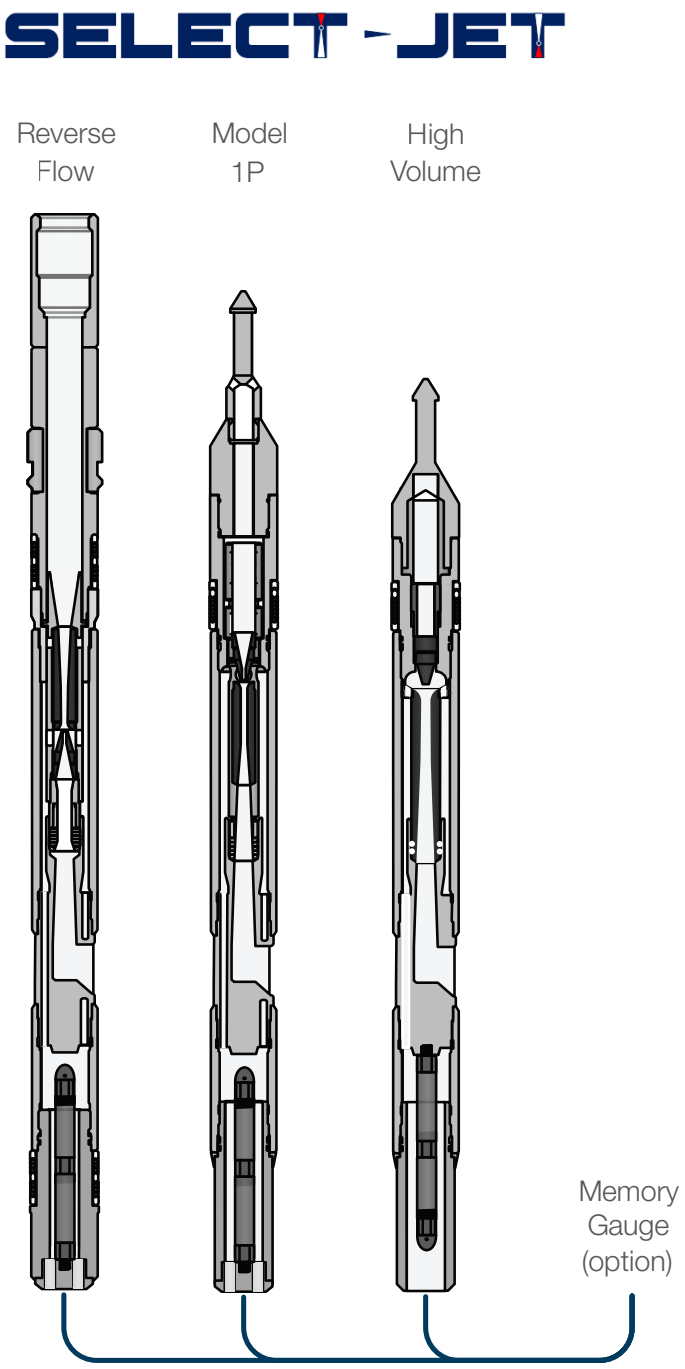
Normal and Reverse Jet Pumps both utilize JJ Tech’s SELECT-JET Bottom Hole Assembly.

Jet Pump Materials of Construction

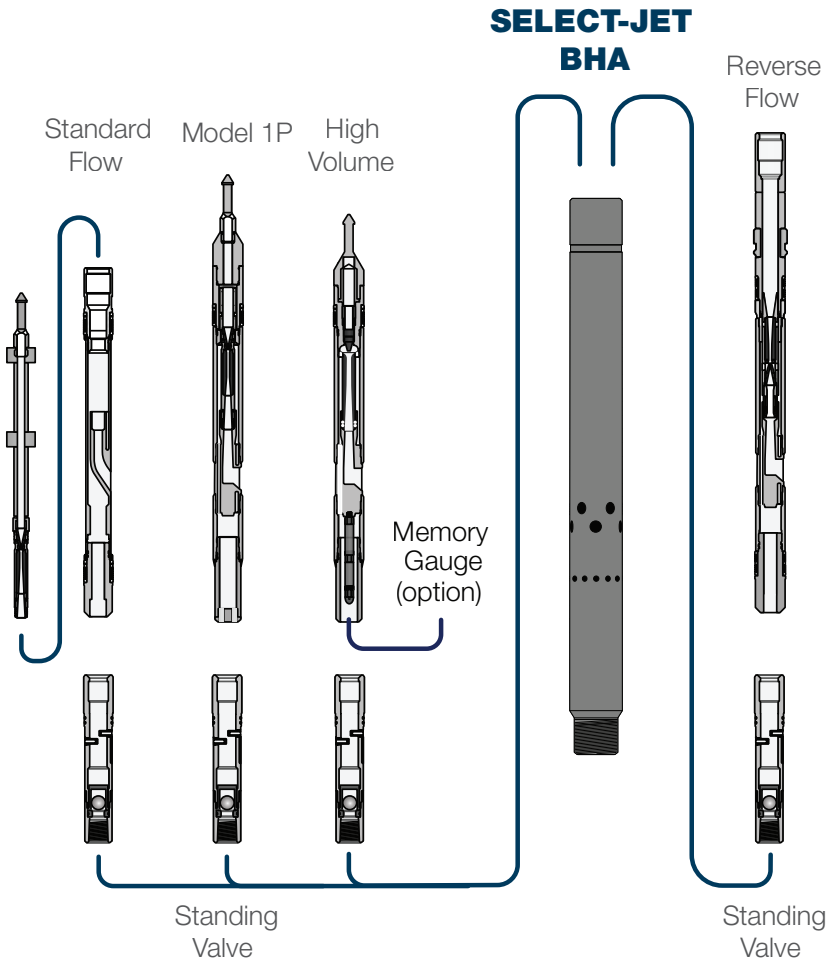
Our materials of construction are selected to ensure very long life even in the harshest of well environments. Standard material is 17-4 PH Stainless Steel – (QPQ). Premium materials include: Inconel 625, Hastelloy X, 316 Stainless Steel and 420 Stainless Steel (Boron Carbide Clad).

Sliding Sleeve / Retrofit Jet Pumps

The ability to adapt to existing completions enables lower cost of implementation and greater ease to switch to or from other forms of artificial lift.



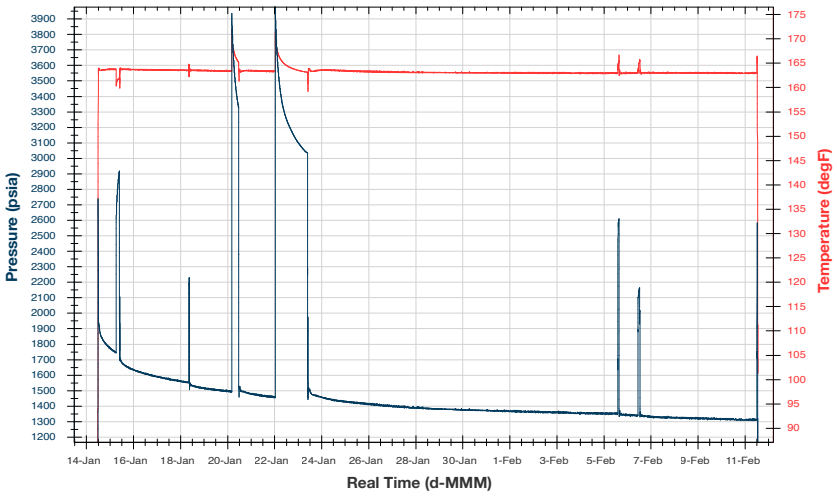
Standard Flow, Model 1P, High Volume, and Reverse Flow Jet Pumps all utilize the same SELECT-JET Bottom Hole Assembly (BHA)

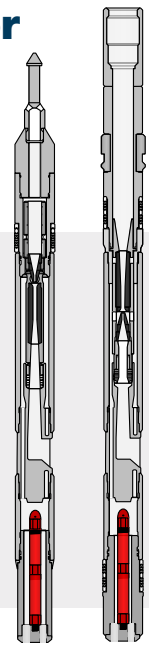


- Versatile Bottom Hole Assembly (17-4 PH Standard)
- Anti-Hang / Rapid Equalizing Standing Valve
- Simple Design / More Laminar Flow
- Tubing Sizes 2-3/8", 2-7/8", 3-1/2"
- BH Pressure / Temperature Data Log Capability

Downhole Pressure & Temperature Sensor

No need for slick-line to set or retrieve





- Circulates in and out of well with Jet Pump
- Records BHP data for up to 45 days
- Works with any SELECT-JET pump

JJ TECH **JET PUMP DESIGN & OPTIMIZATION APP**

Optimize Well Production With Modeling

Produce your well with confidence. Our Hydraulic Jet Pump Design & Optimization App uses your production data and well parameters to evaluate all possible nozzle and throat combinations to achieve the highest jet pump efficiency possible. Maximizing Jet Pump efficiency can lower energy cost and/or increase total production.

Our powerful app calculates the optimal injection pressure or jet pump intake pressure based on the actual operational data from your oil or gas well. These features let you plot predicted performance at multiple injection pressures and jet pump intake pressures.

- **Simplify optimization for any Jet Pump System**
- **Maximize efficiency to utilize all available horsepower**

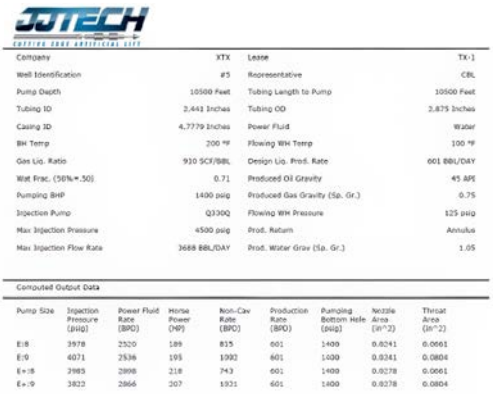
The Jet Pump Design & Optimization App:

- Is available at no cost for JJ Tech Jet Pump customers
- Calculates pumping bottomhole pressure
- Helps determine if a jet pump system is a viable artificial lift solution for your well
- Lets you input your specific well conditions and plot the predicted jet pump performance
- Calculates every possible nozzle/mixing tube possible to ensure the most efficient combination is in use
- Saves and recalls previous jet pump analyses to help plot reservoir drawdown over time

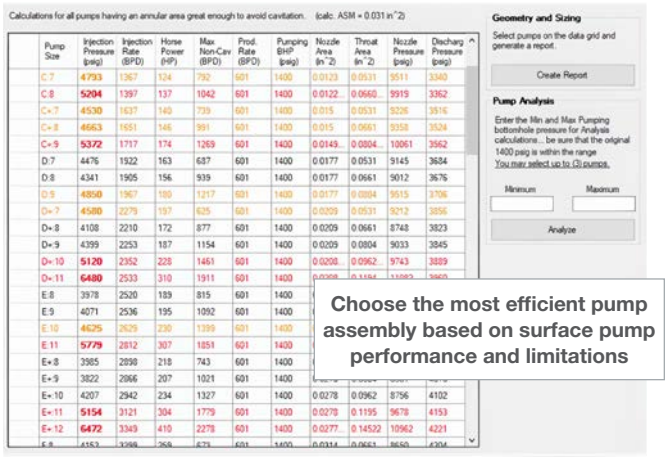
Scan this QR code to get the app or visit our website at: j-jtech.com/jet-pump-design/register

Easy data entry

Compare selected calculated results

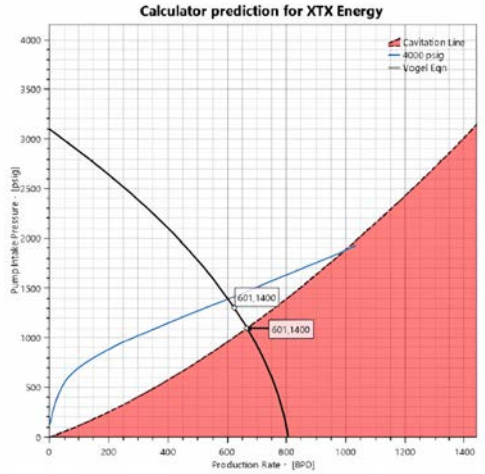


Simulate every possible Nozzle and Mixing Tube (Throat) combination all at once



Choose the most efficient pump assembly based on surface pump performance and limitations

Plot Jet Pump performance with IPR curve



OPTIMIZED FOR YOUR OPERATION

Optimize your well production and your return on investment

Flexible Lease and Purchase Solutions

JJ Tech lease programs are designed for flexibility, letting you try our technology prior to purchase, and choose the terms that make the most sense for your well or to conserve your capital equipment budgets.

Whether for short-term unloading of a recently frac'ed or frac-hit well, or a long-term artificial lift solution, JJ Tech has a flexible program to fit your needs.

Our lease programs offer several benefits:

- Preserve your CAPEX dollars
- Prove ROI on your well before you purchase
- Apply lease payments toward purchase
- Fix operational costs; all preventative and routine maintenance included on all leased equipment

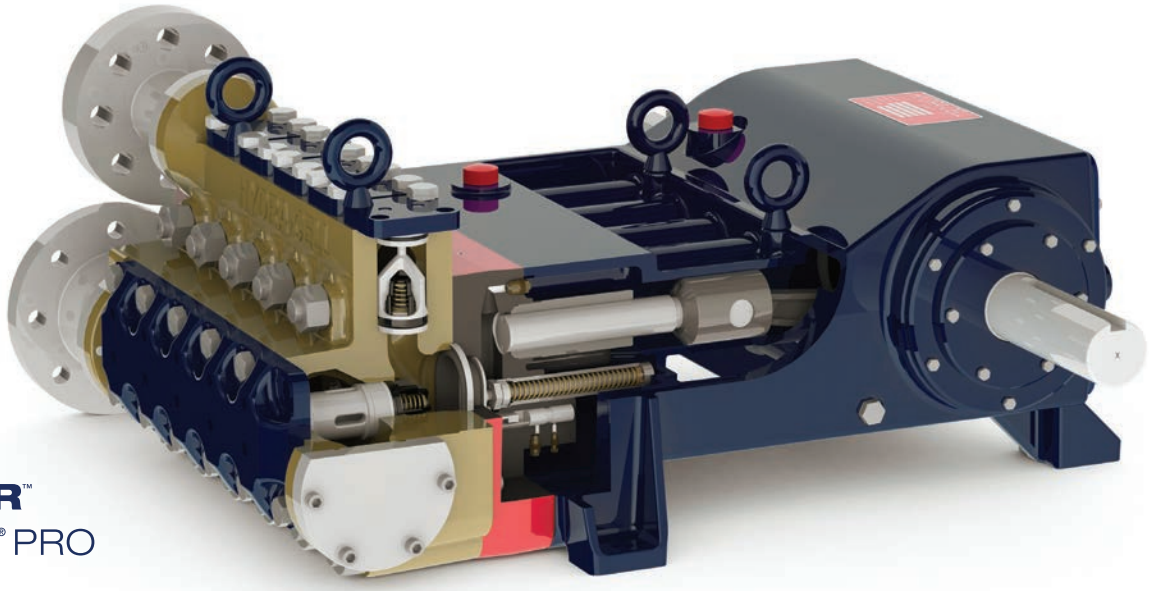
Get a No-Cost Well Analysis

Our team of experts specialize in resolving your challenging oil and gas well production problems. Talk to JJ Tech about analyzing your well and learn how a jet pump can optimize your efficiency and lower your operating costs. We only recommend our equipment when it's a good fit for your application.

Contact us to receive an analysis of your well.

SURFACE PUMPING JET PUMP & SWD

Wanner™ Hydra-Cell® Pro Seal-less Diaphragm Pumps to API 674 and API 675 Standards



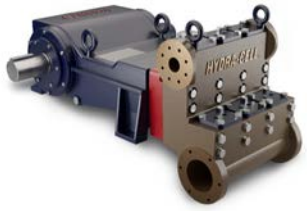
WANNER™
HYDRA-CELL® PRO

Hydra-Cell Pro T & Q Series "Packing-Free" Pumps

Wanner Hydra-Cell Pro T and Q Series Pumps offer high pressure performance with exclusive low-pulse, linear flow that reduces pump energy costs and stress. Wanner's patented, seal-less diaphragm design eliminates packing and plunger wear, leakage, emission, external lubrication, and time-consuming field adjustment. This results in lower costs for maintenance and delivers a longer service life than traditional packed pumps. Manifold options include Nickel Aluminum Bronze (NAB), 316L Stainless Steel (SST), Duplex Alloy 2205 Stainless Steel, and Hastelloy CX2M depending on model.

- Seal-less design separates the power end from the process fluid end, eliminating leaks, hazards, and the expense associated with seals and packing.
- Can operate with a closed or blocked suction line and run dry indefinitely without damage, eliminating downtime and repair costs.
- Unique diaphragm design handles more abrasives with less wear than gear, screw-type or plunger pumps.
- Hydraulically balanced diaphragms to handle high pressures with low stress.
- Provides low-pulse, linear flow due to its multiple diaphragm design.
- Lower energy costs than centrifugal pumps (H-type) and other pump technologies.
- Rugged construction for long life with minimal maintenance.
- Compact design provides a variety of installation options – T100 and Q155 models
- Flow rate controllable to API 675 performance standards to provide ultimate optimization of Jet Pump production.

PUMP MODELS & PERFORMANCE



HYDRA-CELL PRO
T60 Series
60 HP

Model	Maximum Capacity BPD	gpm	l/min	Max. Discharge Pressure psi	bar
T60C	3209	93	354	1000	69
T60D	2554	74	282	1250	86

HYDRA-CELL PRO
T100 Series
100 HP

Model	Maximum Capacity BPD	gpm	l/min	Max. Discharge Pressure psi	bar
T100E	3292	96	363	1500	103
T100F	2605	76	287	1850	128
T100H	2297	67	253	2100	145
T100K	1543	45	170	3000	207
T100M	1302	38	143	3500	241
T100S	891	26	98	5000	345

HYDRA-CELL PRO
Q155 Series
155 HP

Model	Maximum Capacity BPD	gpm	l/min	Max. Discharge Pressure psi	bar
Q155E	5383	157	594	1500	103
Q155F	4354	127	480	1850	128
Q155H	3806	111	420	2100	145
Q155K	2571	75	284	3000	207
Q155M	2160	63	238	3500	241

HYDRA-CELL PRO
T200 Series
200 HP

Model	Maximum Capacity BPD	gpm	l/min	Max. Discharge Pressure psi	bar
T200E	6925	202	764	1500	103
T200F	5896	172	651	1750	120
T200G	4971	145	548	2000	138
T200K	3222	94	355	3000	207
T200M	2880	84	318	3500	241
T200P	2469	72	272	4000	276
T200Q	2160	63	238	4500	310

HYDRA-CELL PRO
Q330 Series
330 HP

Model	Maximum Capacity BPD	gpm	l/min	Max. Discharge Pressure psi	bar
Q330E	11312	330	1249	1500	103
Q330F	9598	280	1060	1750	120
Q330G	7884	230	871	2000	138
Q330K	5247	153	579	3000	207
Q330M	4664	136	514	3500	241
Q330P	4045	118	446	4000	276
Q330Q	3566	104	393	4500	310

Maximum Inlet Pressure for all models: 500 psi (34 bar).
Maximum Operating Temperature for all models: 180˚F (82˚C).

ULTRA-FLOW™ SURFACE SKIDS

The high-performance, high-reliability choice for artificial lift

JJ Tech's ULTRA-FLOW System pairs two proven technologies to provide a surface / downhole pumping solution that outperforms other artificial lift methods, by reducing the need for costly workovers and associated well downtime. ULTRA-FLOW can perform in all stages of a well's production life, in both initial artificial lift installations and to replace less effective artificial lift methods that demand excessive workovers.

The ULTRA-FLOW System is an artificial lift technology that combines a JJ Tech SELECT-JET Pump downhole, powered from the surface by a Hydra-Cell® Pro seal-less positive displacement diaphragm pump from Wanner Engineering.

Our patented technology (US PAT. 7,255,175) can be used in all stages of a well's production life. Since the downhole pump has no moving parts and can be reverse circulated to the surface, the ULTRA-FLOW System is the best choice for initial flowback, wells that are "frac-hit" and need rapid fluid recovery, and most importantly, wells that are plagued by unnecessary workover costs.

Key Features & Benefits

No moving parts downhole

- Sand / Solids production is excellent
- Pump can be hydraulically retrieved

High performance in deviated wells

- No mechanical connection to Jet Pump
- Produced water/oil powers the Jet Pump

Wide range of production volumes

- Production volume is determined by injection rate / pressure
- Control production volume at the surface with VFD

Versatility of installation possibilities

Temporary or permanent installation

Lower overall operational costs using Hydra-Cell Pro and SELECT-JET technologies

Mitigate workover costs with a solution that outperforms other systems and pays for itself with reduced workovers and less production downtime

SWD SKID PACKAGES

Read-to-ship, ready-to-deploy SWD skids and custom solutions built-to-order

JJ Tech Pump skids are available in ready-to-deploy, standard Skid / Pump / Motor units, available with or without Murphy safety package, depending on needs.

We also offer complete SWD packages with charge pump, filtration, and metering, or will fabricate application specific units based on your needs.

Our skids are equipped with Wanner Hydra-Cell Pro seal-less pump technology that is proven to offer a more reliable, more efficient operation in a smaller footprint than competitive products.

Custom Skid Design and Fabrication

JJ Tech is your complete design and fabrication resource for custom SWD pump skids built specifically for your needs, installation and performance requirements. Like all our skids, we offer a comprehensive approach to get the job done, and robust components that perform reliably with much lower maintenance requirements and costs. Contact us to discuss your challenges and our custom capabilities.

Custom SWD Skid example:
D66X – 3×5

- 2293 BPD @ 700 psi
- 3' x 5' Oilfield Skid w/Lifting Eyes
- 40 HP, C1D2, TEFC Electric Motor
- 3-5V Belt/Sheave Power Transmission w/ Belt Guard
- Mechanical PSV
- Murphy L129 Hi/Lo Oil Level Switch

Standard Skid Packages

T100E – 6×9
Package Features

- 3292 BPD @ 1500 psi
- 6' x 9' Oilfield Skid (Lifting Eyes & Fork Pockets)
- 100 HP, C1D2, TEFC Electric Motor
- 6-5V Belt/Sheave Power Transmission w/ Belt Guard
- Mechanical PSV
- Murphy TTD Annunciator with Safety Switches for: Pump Suction/ Discharge, Oil Level, Vibration

Q155E – 6×9
Package Features

- 5383 BPD @ 1500 psi
- 6' x 9' Oilfield Skid (Lifting Eyes & Fork Pockets)
- 200 HP, C1D2, TEFC Electric Motor
- 6-8V Belt/Sheave Power Transmission w/ Belt Guard
- Mechanical PSV
- Murphy TTD Annunciator with Safety Switches for: Pump Suction/ Discharge, Oil Level, Vibration

T200M – 8×16
Package Features

- 2,846 BPD @ 3500 psi
- 8' x 16' Oilfield Skid (Lifting Eyes & Fork Pockets)
- 200 HP, C1D2, TEFC Electric Motor
- 6-8V Belt/Sheave Power Transmission w/ Belt Guard
- Mechanical PSV
- Murphy TTD Annunciator with Safety Switches for: Pump Suction/ Discharge, Oil Level, Vibration

Q330Q – 8×14
Package Features

- 3,567 BPD @ 4500 psi
- 8' x 14' Oilfield Skid (Lifting Eyes)
- 350 HP, C1D2, TEFC Electric Motor
- 10-5V Belt/Sheave Power Transmission w/ Belt Guard
- Mechanical PSV
- Murphy TTD Annunciator with Safety Switches for: Pump Suction/ Discharge, Oil Level, Vibration

ABOUT JJ TECH

Founded in 2002, JJ Tech is a US-based company that supplies artificial lift systems to the oil and gas industry worldwide.

JJ Tech's innovative jet pump was developed to produce large volumes of subsurface formation fluids, with inclusions of moderate to high solid content. Our unique, patented design allows easy retrieval of the pump from the hole for replacement of the nozzle or mixing tube. Retrieval is accomplished by adjusting the surface valves and reversing the circulation of fluid with the existing surface pump – no wireline or workover rig is required.

JJ Tech holds patents in the US and in various countries on both its hydraulic jet pump and its breakthrough ULTRA-FLOW™ artificial lift system. This unique and powerful solution combines our hydraulic Jet Pump technology downhole with the revolutionary Wanner™ Hydra-Cell® Pro diaphragm surface pump to offer the industry a cutting-edge artificial lift solution superior to alternatives when dealing with a range of challenging downhole issues including:

- Producing Horizontal and Deviated Wells
- Slow Frac Flowback
- Gas Well Dewatering
- Low Oil Production
- Producing Sand and Other Solids

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