

LH

LOW HARMONIC
INDUSTRIAL VFD PANELS & VFD'S

ENERGY SAVINGS

TURN WASTED BRAKING ENERGY INTO USABLE POWER



EFFICIENT, ROBUST, & IMPROVED LONGEVITY

LH Regenerative VFD technology reduces energy consumption by over 10% compared to traditional dynamic braking resistors, while improving overall system efficiency and returning excess power to the grid.

Phase Technologies Regenerative VFD's Offer:

- ▶ Returns regenerated energy, traditionally burned off by DBR's, back to the power grid, improving overall system efficiency and reducing lift cost.
- ▶ Utilizes Active Front End (AFE) technology to reduce harmonic distortion to 5% or less, meeting IEEE 519-2014 standards.
- ▶ Power factor correcting maximizes pumping jack efficiency. Delivering power to the motor, reducing energy costs, and eliminating utility penalties.
- ▶ Power Conditioning: Correcting up to 50% of voltage unbalance. By equalizing phase voltages your motor will run cooler, more efficiently, and last longer.
- ▶ Eliminates the need for costly harmonic filters.

\$4,323

PER ROD PUMP, PER YEAR



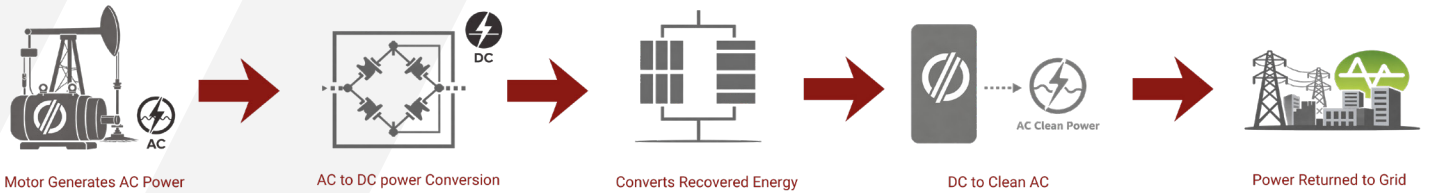
Visit our website to calculate your annual savings per year using a Phase LH regenerative drive vs using dynamic braking resistors

Based on an approximate annual consumption of 450,00 kWh/yr and 12% regenerative savings with a rate of \$0.08 per kw/hr

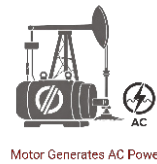
	LH Series Regenerative VFD	Rod Pump w/ DBR For energy release
Annual Energy Consumption	450,000 kWh	
Price/kWh Based on Region	\$.08/kWh	
Number of Pumps	8	
Regenerative Cost Savings	12%	0%
Annual Savings	\$34,580	No Cost Savings

In oilfield applications where high inertia loads and frequent deceleration are common this regenerative capability significantly reduces energy consumption, eliminates the need for braking resistors, lowers cooling requirements, and improves overall system efficiency and reliability.

REGENERATIVE ENERGY FLOW IN A ACTIVE FRONT END VFD

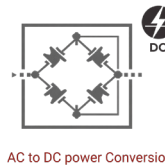


STEP 1: When the motor is slowing down or being driven by the load, it acts like a generator instead of a motor. This converts the machine's mechanical energy into AC electrical power.



Mechanical Energy is Converted to Electrical Energy

STEP 2: The generated AC power re-enters the output inverter.



Generated AC flows back to line side

STEP 3: The DC bus acts as an energy buffer. It temporarily holds the recovered energy and stabilizes it before sending it onward.



The DC Bus converts the Recovered Energy

STEP 4: The Active Front End (AFE) takes the stored DC energy and converts it into clean AC power with low harmonics.



The Active Front End Converts DC back to Clean AC

STEP 5: Power is sent back to the utility/grid. The cleaned AC power is then fed back into the utility/grid instead of being wasted as heat in braking resistors.



Power is Sent Back to the Utility/Grid



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Optional Phase Conversion

Convert single-phase power to three-phase power while maintaining across the line voltage with advanced motor control capabilities.

Power Conditioning

Our LH panel corrects up to 50% incoming voltage imbalance without oversizing the VFD. Through sophisticated controls and circuitry, incoming power is conditioned and balanced before being sent to the motor.

Low Harmonic Active-Front-End Technology

Phase Technologies guarantees that the LH SERIES product line will meet the IEEE 519- 2014 standard without additional harmonic filters as long as a minimum load of 50% is maintained as related to the max current rating of the system.

Power Factor Correcting

The LH Drive controls how power is taken from the grid using Power Factor Correction (PFC) technology. By correcting poor power factor, it reduces wasted energy, lowers operating costs, and helps avoid utility penalties.



Protect Your Equipment

The LH controls motor speed to keep the rod operating at its optimal range, helping maximize production while reducing strain, protecting the rod and extending the life of the entire pumping system.

Eliminate Harmonic Filters

- ▶ Traditional drive systems often require bulky, expensive harmonic filters to mitigate electrical distortion and meet compliance standards. The LH Drive changes that.
- ▶ With its advanced design, the LH Drive inherently minimizes harmonics, eliminating the need for external filtering equipment. This not only reduces upfront capital costs, but also saves valuable space, simplifies installation, and lowers long-term maintenance requirements.



PRODUCT BUILDER

PHASETECHNOLOGIES.COM/PRODUCTS

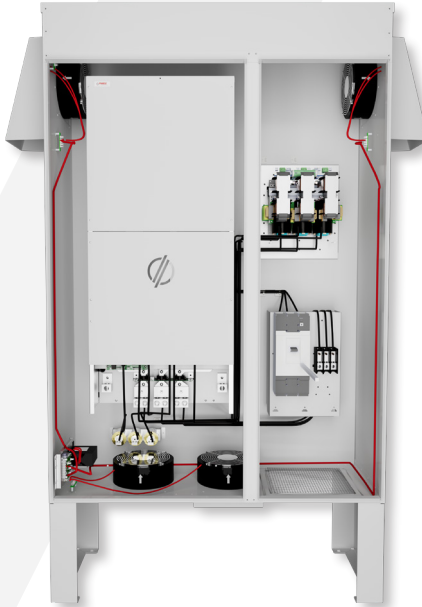


UP-TO-DATE

- ✓ LEAD TIMES
- ✓ PRICING
- ✓ DIMENSIONS

Inner Panel Design

1. **Drive** - The LH is powered by a Phase Technologies LHX VFD.
2. **Enclosure** - Configured panels come standard with NEMA 3R all steel enclosures made in house.
3. **Circuit Breaker** - Protect your drive with a Circuit Breaker which is available in our 508A panel shop options.
4. **Integrated LCL** - LCL filters can be included in LH models as a panel shop option.
5. **Motor Protection** - Built with components to limit peak voltage, these filters are recommended with lead lengths up to and above 1,000 feet.



Panel Shop Options

- ▶ AuxPower
- ▶ MCCB
- ▶ HOA Switch
- ▶ Speed Pot
- ▶ Run & Fault Light
- ▶ Motor Protection
 - Input/Line Reactor
 - Output/Load Reactor
 - dV/dt Output Filter
 - Sine Wave Output Filter
- ▶ Power Supply
- ▶ Surge Protection
 - Protec
 - Strikesorb
- ▶ Leg Kit
- ▶ System Bypass

EXPLORE ALL OUR PRODUCT OFFERINGS AT PHASETECHNOLOGIES.COM.

DIGITAL PHASE CONVERTERS

VARIABLE FREQUENCY DRIVES

MOTOR PROTECTION

SOFT STARTER

508A PANEL SHOP

OUR MISSION

Relentlessly seek to provide Uncommon Value, solutions, innovation, and support for the industries that we serve.

