



APPLICATIONS

- Offshore ESP installations
- Surface pumping system applications
- Hot environments

BENEFITS

- 6, 12 & 24 pulse low voltage rectifier options available – guaranteed harmonic mitigation distortion >5%, IEEE 519 compliant
- Reduced harmonics reflected onto supply, THDI content of >5% at full range of load
- Increased ESP run life – multi level inverter provides near sinusoidal waveform, delivering cleaner power to motor
- Reduced operational costs – TEC system removes need for A/C units
- Designed for hot environments – rated for 55°C (131°F)
- Inverter power conversion efficiency >97%

FEATURES

- Integrated motor controller
- Modular design resulting in high reliability and low maintenance costs; each core power cell can be individually removed for maintenance
- Auto-tuning feature adjust all motor and load-dependent parameters
- Galvanic isolation with integral multi-phase transformer
- Fully NEMA-4 rated enclosure

Efficient energy-saving design

The SPECTRUM Low Voltage (LV) Variable Speed Drive (VSD) is a NEMA-4 rated drive designed to fulfill client requirements for efficient, energy-saving speed control that will extend the run life of ESP motors in hot, harsh desert environments.

Cascaded Pulse Width Modulation (PWM) rectification significantly reduces the input harmonic distortion reflected back onto the supply, avoiding penalties from energy providers.

Multi level inverter technology on the output provides a near sinusoidal waveform, eliminating Reflective Wave Phenomenon across a long ESP cable and the need for the Sine Wave Filter (SWF). The reduced voltage imbalances, motor temperature, noise and vibration extends ESP run life, achieving savings in both capital and operational expenditure.

Clean power delivery to prolong ESP run life

With cleaner power being delivered to the downhole motor, any voltage imbalance in the power delivered is minimized which significantly reduces the motor operating temperature and the associated degrading of the electrical system's insulation which results in a longer run life.

Maintains stable operating temperatures

The Thermo Electric Cooler (TEC) system, utilizing the principle of the Peltier Effect, maintains a stable operating temperature and has no moving parts (nor chlorofluorocarbons).

The TEC system is inherently reliable and economical in comparison to traditional A/C units. The compact size of the TEC modules and the ability to operate them in any orientation permits further reductions in skid footprint.

POWER SYSTEM SPECIFICATIONS

Power system	Sinusoidal, multilevel PWM control, fully isolated
Control system	Integrated ESP motor controller
Base control method efficiency	Open loop vector control, V/F control, flux vector control with feedback
Efficiency	> 97% at rated load and speed
Input power factor	0.99
Over current protection	200% (programmable)
Overload capacity	Standard overload 120% for 10 mins or 150% for 60 secs
Input voltage supply	400V to 480V, 50/60Hz
Input tolerance	Voltage: $\pm 10\%$; Frequency: $\pm 5\%$
Output	PWM Inverter
Integrated protective functions	Overcurrent, overload, current limits, overvoltage, undervoltage, output ground fault, motor overheating, output open phase, cooling fan error

CONSTRUCTION SPECIFICATIONS

Panel construction	Free-standing, front maintenance type, bottom access for motor and input power cables
Cooling	Forced air cooling with proprietary TEC system (patented)

ENVIRONMENTAL RATINGS

Ambient operating temperature, °F (°C)	14°F to 131°F (-10°C to 55°C)
Altitude	<1,000 m without de-rating, can be customized for high altitude
Enclosure type	NEMA-4, NEMA-4X = IP66

COMPLIANCE & STANDARDS

UL 61800-5-1	IEC 60721-3-3:2002	IEC 61000-4-6:2009
IEEE 519-1992	IEC 60146-1-1:2010	IEC 61000-6-2:2008
IEC 61800-4:2004	IEC 61000-4-2:2011	IEC 61000-6-4:2008
IEC 61800-3:2008	IEC 61000-4-3:2007	IEC 60721-3-1:2002
IEC 60721-3-1:2002	IEC 61000-4-4:2013	IEC 60721-3-2:2002
IEC 60721-3-2:2002	IEC 61000-4-5:2010	IEC 60721-3-3:2002