

+ INSTRUCT E30 Intelligent VSD

Industry-Leading Power & Control for Electric Submersible Pumps (ESPs)

FEATURES

+ Live High-Voltage Measurements

Measuring ESP motor voltage is a dangerous and potentially lethal task. The included INSTRUCT Power Analyzer 5kV Voltage Sensor easily fits inside the step-up transformer and reports live motor phase to phase and phase to ground voltages, thereby eliminating the need to manually check these voltages. Further, it provides more real-time data about the health and operating efficiency of your ESP system to optimize performance and extend run life.

+ Dedicated Low-Voltages Control Cabinet

Avoid unnecessary shutdowns and provide your crews the tools needed to safely manage your wellsite with the E30's oversized low-voltage compartment that is separate from the main power electronics cabinet's dangerous energy sources. This creates a safe working environment for commissioning, troubleshooting or other activities involving SCADA, temperature or pressure transducers, and other accessories.



396 kVA, 6-pulse input model



Live High-Voltage Measurements



Dedicated Low-Voltages Control Cabinet

Designed by experts with more than 100-years of combined ESP experience to be the most reliable, easiest-to-use, and safest VSD.

Maximize uptime, reduce deferred-production, and slash maintenance and repair costs with INSTRUCT E30's power system providing **10-years mean time between failures (MTBF)**. Separated power and control sections allow field staff to safely troubleshoot control, communication, or instrumentation issues without exposure to dangerous voltage sources. The included 5 kV voltage sensor provides live readings of motor phase voltages, eliminating the need for high-safety-risk no-load or loaded voltage checks, while at the same time providing new insights into ESP system performance. Get the most from your ESP wells with the **most reliable, easiest-to-use, and safest VSD** available: INSTRUCT E30 Intelligent VSD.

Power Specifications & Features

Input power supply	380 to 480 ph-ph V AC ± 10% 50 or 60 Hz ± 3%
Input configuration options	6, 12, or 18 pulse input Integrated IEEE519 passive filter Integrated transformer 18 pulse
Input current protection	<400 A: thermal circuit breaker(s) >400 A: electronic circuit breaker(s)
Input surge suppression	Class I+II SPD / TVSS Response time: <1 ns Max continuous: 350 V Phase-Earth Voltage Protection Level: 1,600 V I _n : 20 kA 8/20 µs I _{imp} : 7.5 kA 10/350 µs
DC overvoltage trip	815 V DC
Harmonic mitigation	DC bus choke (standard)
Output voltage	Variable up to input voltage
Output frequency	0.1 to 120 Hz, 0.1-Hz resolution
Output waveform	High-Performance Sinewave (FPWM)
Motor control	Constant or Variable Torque (V/Hz), Sensorless Vector, Flux Vector
Motor technology	Induction (IM) Permanent Magnet (PMM)
Efficiency	>97% at full load
Δ Power factor	0.98 across entire speed range
Overload rating	110% for 1 min of 10 mins 150% for 3 s of 60 s
Certifications	UL-508
Power system MTBF	>86,000 hours

Available Power Ratings

kVA*	80	130	206	300	396	513	615	868	1,180	1,719
Amps	96	156	248	361	477	617	740	1,045	1,420	2,070



Environmental Ratings & Features

Enclosure rating	Junction boxes & main power sections: NEMA 4 Magnetics section: NEMA 3R
Cooling system	NEMA 4: Air-Air Heat Exchanger(s), Heat Sink NEMA 3R: Forced Air Cooling
Max. altitude, ft [m]	15,748 [4800] w/derating See attitude guidelines
Ambient operating temp degF [degC]	up to -22 to 131 [-30 to 55] ²
Relative humidity	20% to 95% maximum (noncondensing)
H2S protection	Conformal-coated PCBs & bus bars
Material	12-gauge carbon steel enclosure
Line-side termination	Circuit breaker lugs in power junction box
Load-side termination	Lugs in power junction box
Control terminations	Dedicated low-voltage junction box
Conduit attachment	Unistrut rails near junction boxes
Safety features	Emergency Stop Button Electronic interlocks and transformer door switch (included loose for field installation) Separated power and control sections High voltage sensor for step up transformer Prewired IO Junction Box

IO Specifications & Features:

Analog inputs (AI)	Qty 1: 0-20 mA or 0-10 V (user selectable)
Digital inputs (DI)	Qty 4: current-limited 24 V DC provided
Analog outputs (AO)	Qty 1: 0-20 mA ± 1% accuracy
Digital outputs (DO)	Qty 2 NO/NC Relays: User-configurable Qty 1 NO/NC Relays: Run/stop mode Rated up to 250 V AC at 8 A or 30 V DC at 5 A
Optional expansion IO	Qty 1 INSTRUCT ESP IO Card Adds AI: 4, DI: 6, AO: 2, DO: 3
Serial communication	Qty 1 RS485 2/4 wire port, modbus slave
Accessory card slots	Qty 3 (each self-powered, any combination)
Optional accessory cards	INSTRUCT ESP RS232/RS485 Communications Card INSTRUCT ESP TCP/IP Communications Card INSTRUCT ESP Gateway Card Schlumberger Phoenix Interface Card (PICv2)
High voltage measurement	INSTRUCT Power Analyzer 5kV Voltage Sensor which field mounted in step up transformer and included 8m cable which connects sensor to controller.
Optional power accessories	INSTRUCT CT Kit: Adds current CTs to step up transformer providing live phase currents and real, apparent, and total power of ESP system. 1 Rated at 480V input, 40 degC 2 Derating may apply.