INSTRUCT P30 VSD for PCP

For Progressing Cavity Pumps

Applications

+ Progressing Cavity Pump (PCP) installations in
  - heavy, medium, and light oil wells
  - water wells
  - coalbed methane and conventional gas wells (for dewatering)
  - high-water-cut and high-sand-cut environments
  - highly corrosive wells
  - thermal applications
  - horizontal, deviated, and vertical wells

Benefits

+ Lower energy consumption and operational costs
+ Extended PCP run life
+ Enhanced safety

Features†

+ Torque limiting
+ Autorestart after power loss
+ Local data logging
+ Modular system to suit multiple applications
+ Configurable to meet all major compliance standards
+ 15 well-protection settings
+ Five control methods
+ Touchscreen interface for easy programming and supervision
+ Stuck-pump and desanding routines

†See features for details

This high-performance variable speed drive (VSD) enables sophisticated motor control with speed and torque accuracy, low harmonics, and smooth speed ramping, thereby maximizing motor performance. The system enhances safety through controlled stopping and braking, limiting of maximum speed, and direction management.

Systems are available for all major voltage levels and both 50 Hz and 60 Hz. Enclosed in a NEMA Type 3R or NEMA 4 enclosure, the VSD system can be configured in accordance with local compliance standards worldwide.

INSTRUCT P30 VSD

INSTRUCT P30 Intelligent VSD combines the standard INSTRUCT VSD with an advanced controller and upgraded user interface to help operators manage well performance. A full-color touchscreen with an intuitive interface facilitates configuration and well supervision. Acquired data is stored on site and easily retrieved on a USB. The VSD can also be configured to enable remote administration by a SCADA system.

The INSTRUCT P30 includes the INSTRUCT PCP Well Manager* well optimization unit's functionality, resulting in a top-of-the-line well management system. Five production control modes provide the highest level of PCP control, optimization, protection, and monitoring. This advanced system helps operators understand well conditions, protects well equipment, increases energy efficiency, and optimizes production.

Feature List	INSTRUCT P30 Intelligent VSD
Soft start	Yes
Torque limiting	Yes
Autorestart capability	Yes
Manual speed control	Yes
Well-protection settings	Fifteen
Backspin timers	Yes
PRESCO-SWITCH™ bypass timers	Yes
Data logging with 8-GB Secure Digital (SD) card	Yes
Real-time trending	Yes
Rod speed and rod torque display	Yes
RS485/RS232 and Modbus® TCP/IP communication	Yes
Stuck-pump routine	Yes
Desanding†	Yes
Bottomhole pressure (BHP) control‡	Yes
Dynamic liquid level (DLL) control§	Yes
Production optimization control††	Yes
Production target control††	Yes
Cold weather package to extend use to –13 °F [–25 °C]	Yes
Cellular package for remote communication	Optional
Backspin control without power	Optional

†Requires surface flowmeter or downhole instrumentation
‡Requires downhole instrumentation
††Requires surface flowmeter
§Requires surface pressure sensor and downhole instrumentation

INSTRUCT P-Series			
Drive rating, hp [kW]	30 [22]	75 [56]	100 [75]
Output rating, kVA at 480 V	28.6	70	93.7
Output current, A	46.3	106	145
Principal Control Parameters			
Motor control system	Pulse-width modulation (PWM) with flux open-loop vector control		
Input voltage	380 to 480 V (–15% to 10%), 50 or 60 Hz (±5%)		
Output voltage regulation	≤ Power supply voltage		
Frequency setting	0.1 to 500 Hz, 0.1-Hz resolution		
PWM carrier frequency	2 to 16 kHz adjustable		
Input configuration	6-pulse diode		
Efficiency	98% through speed range		
Power factor	0.97 or better at nominal load		
Overload rating	120% for 60 s		
Enclosure and Environmental Ratings			
Enclosure	NEMA Type 3R (outdoor use); UL 508A service entrance rating		
Cooling method	Separate, air cooled with forced ventilation		
Maximum altitude	3,330 ft [1,000 m] without derating; derating of the current by 1% for each additional 330 ft [100 m] up to an altitude of 15,748 ft [4,800 m]		
Relative humidity	5%–95% with no condensation or dripping water, conforming to IEC 60068-2-3		
H_2S protection	Protective coating on electronic cards		
Enclosure material	12-gauge carbon steel		

INSTRUCT P30 Intelligent VSD on a optional stand

INSTRUCT PCP Intelligent Wellsite Controller	
Processors	CPU: 32-bit ARM7 microcontroller, 32-MHz clock, integrated watchdog timer Microcontroller coprocessor, 20-MHz clock
Memory	16-MB flash ROM, 4-MB CMOS RAM, 4-KB EEPROM
Nonvolatile RAM	CMOS SRAM with lithium battery retains contents for 2 years with no power
Event logging capacity	20,000 events
Maximum database points	1,000 typical
I/O	
Analog inputs	Eight: 0–20/4–20 mA, 0–5/0–10 V, software configurable
Analog outputs	Two: 0–20/4–20 mA
Digital I/O	16 digital inputs: 12/24 V, 48 V, 115/125 V, 240 V 10 relay outputs: dry contact or DC solid-state Dry contact rating: 3 A, 30 VDC or 240 VAC (resistive) DC solid-state rating: 3 A, 60 VDC
Counter inputs	One: 0–10 Hz or 0–5 kHz (dry contact) Two: 0–10 kHz (turbine or dry contact)
Communications	
Serial port COM3	RS-232 port, 8-pin modular RJ45 jack, full or half duplex with RTS/CTS control and operator interface power control
Serial protocols	DNP3 slave, DNP3 master, IEC60870-5-101 slave, IEC60870-5-103 master, Modbus RTU slave, Modbus RTU master, DF1
Touchscreen Interface	
Display type	Thin-film-transistor (TFT) color LCD
Display size	5.7 in
Resolution	320 × 240 pixels (QVGA)
Touchpanel service life	1 million taps or more
USB interface	USB 2.0 (Type A)
Local storage	SD card slot (maximum 32-GB SD/SDHC Class 10 card)