Intellek™ Variable Speed Drive

Precise, Reliable Surface Control of Induction or Permanent Magnet Motors

Applications

Control of induction or permanent magnet motors used with

- Electric submersible pump (ESP) systems
- Progressing cavity pump (PCP) systems
- Horizontal pumping systems (HPS)

Benefits

- Increased system run life
- Optimized system performance
- Increased well production

Features

- Multiple motor start modes (soft, rocking or current)
- Automatic, manual and programmable cycle operating modes
- Protective alarms and shutdown
- Superior personnel safety
- Different configurations to fit most end-user requirements
- User-friendly UHMI interface with graphic touchscreen display
- Compatible with most downhole sensors

The Levare Intellek™ variable speed drive (VSD) provides precision speed control and protection of electric submersible pump (ESP), progressing cavity pump (PCP) and horizontal pumping systems to efficiently optimize well production and downhole equipment system performance.

The Intellek™ VSD is capable of controlling both permanent magnet (PMM) and induction motors (IM) across the widest variety of well conditions.

Specifically designed and built for oilfield applications, the Intellek™ VSD comes with an integral output sine wave filter (SWF) and incorporates the latest surface controller technology, the Levare UHMI. Integrating external surface and/or downhole sensor measurements, programmable control and protection software functions enable intelligent ESP, PMM-PCP and well operations.

Standard Intellek™ VSDs are built in a NEMA3R rated enclosure and are well suited to protect against the demanding environmental conditions experienced in many operating locations.

Superior Control

The Intellek™ VSD offers multiple pump start-up options dependent on the system type and motor torque requirements.

Soft motor starting is the default start-up mode and is executed according to predetermined user setpoints for start and operating frequency and the duration over which the speed is accelerated. Under more difficult starting conditions, additional start modes are optionally available that provide dynamic voltage pulses to “jog” motor starting or momentarily change shaft rotational direction to “rock” motor starting.

Also available is a “Torque” start mode which sets and limits the motor current level over the duration which speed is ramped-up to the desired setpoint. PID-loop is available for pump intake pressure, motor amps or analog Input signal.

Protection

- Low/high input voltage protection
- Input voltage unbalance protection
- Power ride-through protection (up to 100 ms)
- Overload and underload protection
- Motor current unbalance protection
- Advanced gas handling modes
- Start overload protection
- High vibration protection
- Motor high-temperature protection
- Low pump intake pressure protection
- High pump intake pressure protection
- High pump discharge pressure protection
- High pump discharge temperature protection
- DHG communication loss protection
- High and low analog inputs readings protections
- Digital inputs protections
- Protection against low insulation resistance in downhole cable & motor (determined by measurement of resistance or leakage current from downhole gauge)
- “Door open” protection

SCADA I/O built-in options

- MODBUS RTU via RS-485 interface
- MODBUS TCP via RJ45 Ethernet port
- SCADA via wireless modem (cellular or satellite)

Specifications

Input Voltage (+ range deviation from nominal)	480 V AC (60 Hz) -25% / + 25% 380 V AC (50 Hz) -25% / + 25%				
Current Rating, A	250	400	630	800	1,200
Output Power, kVA @ 480 V	208	332	520	664	998
Input Frequency	47 – 63 Hz				
Min. efficiency	95%				
Output Frequency / Speed Range					
- IM	2 – 75 Hz				
- PMM	120 – 7,200 rpm				
Inverter Output	Filtered PWM				
Output distortion	5% with built-in output sinewave filter				
Intermittent Overload	125% for 300 sec				
Ambient Temperature	-10°C to 55°C				
Degree of Protection	NEMA3R / NEMA 4				
Drive Controller	UHMI				

User interfaces

USB - 2.0 IP-67	1
Ethernet 10/100 Mbit	4
RS-485 (Modbus RTU protocol)	3
RS-232 (Modbus RTU protocol)	1
Digital Inputs	8
Digital Output (NO SSRs)	8
Analog Inputs (4-20 mA, 0-10 V)	8
Analog Outputs (4-20 mA, 0-10 V)	2