BORETS

AXIOM II VSD

Induction Motors and Permanent Magnet Motors with one drive to optimize field operating expense

APPLICATIONS

- Unconventional wells
- Unstable flow
- High GOR

ENHANCED SAFETY FEATURES

- touchsafe components in drive enclosure
- Disconnect switch inside input junction box
- Pre-wired controls junction box
- External grounding stud
- Door & circuit breaker locking provision

FEATURES & BENEFITS

- Adaptable universal drive for conventional induction motors or permanent magnet motors:
    - Optimizes VSD inventory
- Effectively and safely operates:
    - Conventional ESPs
    - High efficiency systems
    - Wide flow/wide range pumping systems
    - PCP systems
- Advanced ESP software
    - Pump Unfreeze function for hard-to start or stucked pumps
- Custom programing DriveWorksEZ:
    - Application-specific algorithms
- Integrated enhanced output filter:
    - Minimizes installation time
    - Reduces overall footprint
    - Reduces electrical stresses on downhole equipment
    - Increases reliability & drive efficiency
- External USB port:
    - Safe data download
- External 110 V outlet:
    - Added convenience
- Advanced HMI:
    - Graphical touch screen display
    - Enhanced data logging
    - Ease of navigation
- HOA (hand-off auto) switch:
    - Selectable mode of operation
- Configurable Inputs/Outputs (digital & analog)

The Axiom II is the universal variable speed drive (VSD) that efficiently and safely operates a variety of systems including conventional ESP, induction motors, high efficiency permanent magnet motors (PMM), the wide range wear resistant (WR2) ESP system and the progressing cavity pump (PCP) systems.

The Axiom II advanced software features include but are not limited to gas lock detection, hard to start/stuck pumps and scale build up prevention. Custom programing is available for specific/challenging projects.

The AXIOM II has an integrated enhanced sine wave filter which reduces rig time and footprint. It also provides a near sinusoidal electrical waveform to the downhole equipment and delivers one of highest efficiency electrical VSD systems.

Safety is a prime focus; all internal parts are touchsafe (IP20 equivalent), the disconnect switch is mounted inside the input junction box, hence no power will be present in the drive cabinet when the switch is off. An integral control box mounted to the side allows SCADA, Analog and Digital I/O interconnections easy access without having to open the drive cabinet door where high volatage is present.

Drive ratings range from 112 A to 937 A and will be offered initially in 6, 12, or 18 pulse for harmonic mitigation with 380 V AC or 480 V AC ratings.

DRIVEWORKSEZ SOFTWARE

DriveWorksEZ is powerful programming software that is built-in to the AXIOM II and provides ''PLC'' capabilities. It allows implementing complex and application tailored VSD functionality.

DriveWorksEZ allows the end user to customize and adapt the AXIOM II to their application needs in fast and intuitive manner.

SOFTWARE FEATURES

Pump Unfreeze Function
The Pump Unfreeze is designed for hard to start or stuck pumps; it uses the latest software features and enhancement of the proven technology to free the majority of stuck pumps.

Pump Shaking Algorithm
The Pump Shaking algorithm alternates the motor speed with adjustable frequency limits, acceleration and deceleration to prevent or free scale deposits from the pump stages.

Gas Lock Ride Thru
The Gas Lock Ride Thru is a custom control algorithm specific for breaking gas lock conditions.

When the Gas Lock condition is detected, the AXIOM II will follow the specific algorithm for several attempts, or until the Gas Lock condition is no longer present.
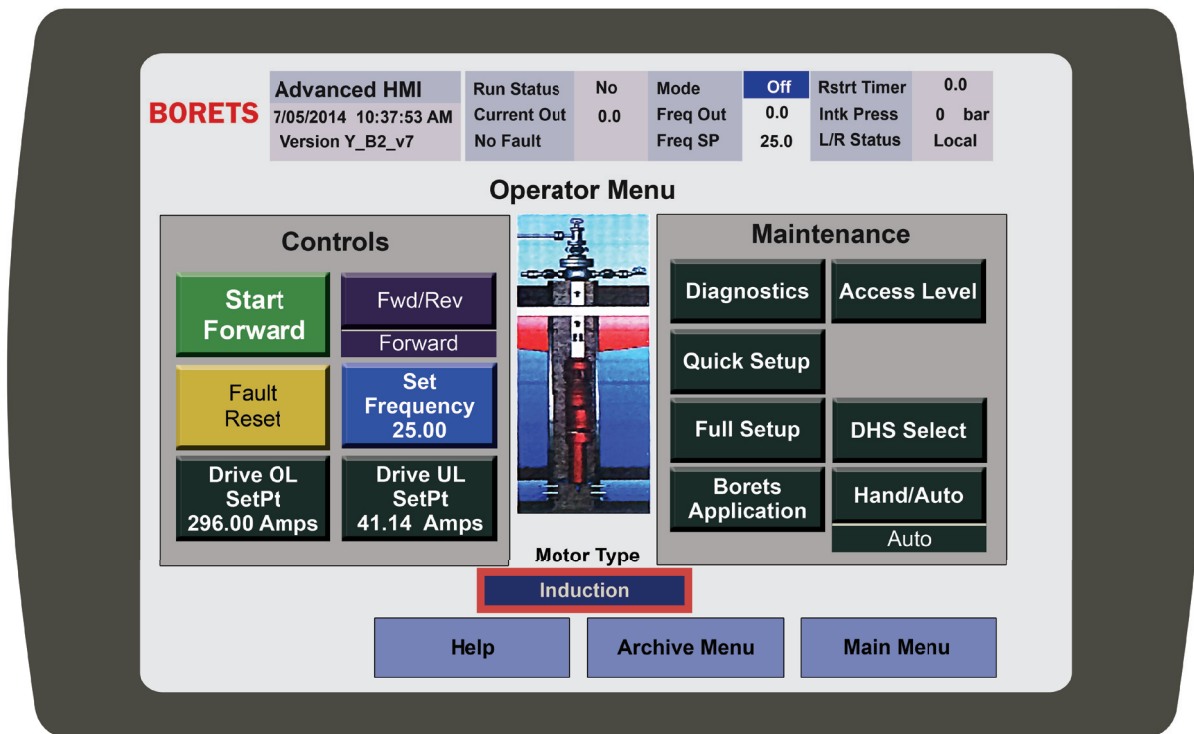

Control Algorithms:

- V/f Control for Induction motors
- V/f Control with PG Speed Feedback
- Open & Closed Loop Vector Control
- Open & Closed Loop Vector Control for PMM
- Advanced Open Loop Vector Control for PMM

The AXIOM II is fully UL and CSA certified VSD in a NEMA 3R cabinet.

AXIOM II OPERATOR MENU

BORETS

Advanced HMI	Run Status	No	Mode	Off	Rstrt Timer	0.0
7/05/2014 10:37:53 AM	Current Out	0.0	Freq Out	0.0	Intk Press	0 bar
Version Y_B2_v7	No Fault		Freq SP	25.0	L/R Status	Local

Operator Menu

Controls

Start Forward	Fwd/Rev
	Forward
Fault Reset	Set Frequency 25.00
Drive OL SetPt 296.00 Amps	Drive UL SetPt 41.14 Amps

Maintenance

Diagnostics	Access Level
Quick Setup	
Full Setup	DHS Select
Borets Application	Hand/Auto
	Auto

Motor Type

Induction

| Help | Archive Menu | Main Menu |

Parameters	Specifications
Input voltage	480 V AC -25 % / +10 % 380 V AC -15 % / +15 %
Input frequency	47-63 Hz
Power factor	> 0.95 across all speeds
Output frequency	10-240 Hz (0.1Hz resolution)
Output distortion	<5 % after PWM filter
Intermittent overload	150 % for 1 min
Maximum operating ambient temperature	55 °C / 131 °F
Minimum storage and operating temperature (has internal heaters)	-40 °C / -40 °F
Noise	<75 bd at 1 m
SCADA/ I/O built in (i.e. more options available with additional cards)	- RS485 (115 kbps) MODBUS Slave SCADA - interface for monitoring and control - 5 digital inputs (24 V DC) - 3 analog inputs (0-10 V DC/ 4-20 mA) - 1 fault relay (Form C) - 3 relay outputs (Form A) - 2 analog outputs (0-10 V DC/ 4-20 mA)
Fault & event logging	Incorporated in the AHMI with SD card