NOV Guardian Variable Frequency Drive (VFD)

PC Pump Controller & Optimization System

The GIII progressive cavity pump (PCP) system builds on the proven reliability, configurability, and performance of prior Guardian™ Systems. Our automation system provides a vast feature set intent on safe operation, reducing downtime, and intelligent production optimization.

Artificial lift applications can be very dynamic and well conditions can change in a matter of minutes. It is critical to have adaptable automation and controls to manage any fluctuations in well conditions. We have leveraged the experience gained from our customers to deliver highly configurable and reliable control software.

This system is designed to simplify operator workflows, ease SCADA and instrumentation integration, and allow for data driven decision making in the field or office.

Guardian III overview

- Energy efficient variable frequency drive
- User friendly touchscreen interface
- 7 pump off & optimization control loops
- Backspin Modes include timer, detect and control
- Intuitive inputs & outputs configuration & alarming
- Variety of system protection options
- Detailed local event & data logger
- Multiple configurable remote control & monitoring servers
- Support for extreme climate conditions

Proprietary multistage optimization algorithms

- Downhole (intake) pressure
- Fluid level
- Fluid temperature
- Rod torque
- Flowline pressure
- Flowrate
- Custom analog input (tank level/PLC speed ref)

Additional features

- High & low rod torque protections
- Backspin detect removes need for backspin timer protection (no more unnecessary downtime due to backspin timer)
- Auto reset/restart options
- Configurable digital/logical input alarms
- Custom multistage limit alarms
- Power consumption tracking
- Data & event logger
- Customizable modbus register map (configured locally on HMI)
  - Up to 10 consecutive custom selectable modbus registers
  - 2 Modbus TCP
  - 1 Modbus RS48

Safety & performance

- cULu listed enclosure
- Automatic, non-moving AC motor tuning
- Local graphing for visualizing historical data
- Easy to use diagnostics & robust alarm historian
- Fuse protection of analog inputs/outputs

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Tool Specification

Ratings (normal duty)

Power supply voltage:	380-480 V (-15%/+10%)
Power supply frequency:	47-63 Hz

HP	kW	AMPS
7.5	5.5	12.7
10	7.5	16.5
15	11	23.5
20	15	31.7
25	18.5	39.2
30	22	46.3
40	30	61.5
50	37	74.5
60	45	88
75	55	106
100	75	145
125	90	173
150	110	211
200	130	250
250	160	302

*Other power options and sizing available upon request

Input/output configuration

	GIII-H Models
Inputs: analog (4-20mA)	4
Inputs: temperature (RTD)	2
Inputs: digital	16
Inputs: digital (high speed)	2
Outputs: analog (4-20mA)	4
Outputs: discrete/digital	2
Outputs: digital (high speed)	2
Outputs: relay	9

*Expansion IO modules are available upon request

Optional module cards

Profibus DP V1
Profinet
DeviceNet
CANopen (RJ45/DB9/screw terminals)
EtherCAT
Digital/analog IO
Relay
5/12V digital encoder
Analog encoder
Resolver encoder

Standard VFD packages include:

- Main line circuit breaker
- Lightning arrester
- 5% line reactor
- Control transformer
- Accessible terminal connections
- Low maintenance security
- Customer ESD input terminals
- Customer permissive input terminals
- Optional-cold weather thermostatically controlled heaters

Security

- User access level control (3 levels)

Options available

- Harmonic filters/output sinewave filters
- Surface and downhole pressure/temperature/ vibration transmitters
- Presco switches
- Pilot lights
- Max edge cellular devices (ATT, Verizon, ATT International)
- VFD output filters
- Enclosure configurations (UL type 3R -standard, UL type 4, UL type 4x with air conditioning)
- Braking resistors

Communications protocols

Standard	
Modbus Serial	(1) RS485 2 Wire/RJ45
Ethernet/IP	(1) RJ45 - 10/100 Mbits
Modbus TCP	(1) RJ45 - 10/100 Mbits

Work smarter, not harder, with an optional equipment upgrade.

GoConnect™ real-time condition monitoring application powered by NOV Max. Reduce maintenance costs, extend the life of your assets, and avoid unplanned downtime.

NOV Completion & Production Solutions

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