

Instruct FS

Fixed-speed acquisition and control unit

APPLICATIONS

- Fixed-speed motor control and protection
- Surface data acquisition for monitoring downhole gauges
- Direct replacement for K095 systems with available retrofit kit

BENEFITS

- Enables real-time on-screen data visualization and trending
- Centralizes data gathering and storage for optimization, engineering analysis, and troubleshooting, eliminating multiple components
- Replaces current universal site controller installations with more data storage and visualization options

FEATURES

- Optional remote monitoring and control capability when integrated with individual or multiple compatible SCADA systems and the Lift IQ* production life cycle management service
- 1 GB of internal memory, multiprocessor architecture ensuring smooth performance, data logging, and trending up to 32 million data points
- True root-mean-square three-phase current and voltage measurements and accurate power and power factor calculation
- Built-in digital and analog I/O with an option for expansion
- On-screen charting for both live and historical data
- High-resolution start current and voltage capture with waveform display
- Plain-language, multilingual alarms and prompts, at-a-glance wellsite assessment, dedicated function keys, and a color screen
- Optional backspin module that provides direct high-voltage monitoring, leg ground fault detection, and backspin alarming in an optically isolated, regulatory compliant module

The Instruct FS* fixed-speed acquisition and control unit is a wellsite interface used in artificially lifted wells. It monitors operating data points, electrical system data, information from analog and digital devices, data measured by a downhole monitoring system, and remote commands. Features such as data recording, internal memory, SCADA and Lift IQ service connectivity, and an easy-to-read interface make the Instruct FS unit a more efficient and effective tool in comparison with other acquisition and control units, such as the K095 system. Based on the technology from the Instruct* acquisition and control unit, the Instruct FS unit brings a single platform for protection, control, and data acquisition to fixed-speed applications. Users can program alarm and trip settings locally or remotely.

Controller provides extensive monitoring

In addition to monitoring the electrical system, the controller for the Instruct FS unit provides protection against surface and downhole electrical faults, and supports two- and three-phase transformer configurations. The controller comes with an expansion card to read the backspin and current transformer (CT) burden modules. The backspin module provides leg ground protection and three-phase voltage measurement, safely and efficiently eliminating the need for manual readings. The CT burden module also improves controller reliability by physically separating the load impedance from the controller itself.

Switchboard card enables control

The switchboard card has a dedicated relay output for contactor control plus a set of configurable analog and digital I/O points. Using StarView* wellsite display software—an intuitive controller interface—these I/O points can be configured to create custom alarms for measurements such as pressure, temperature, speed, and flow. The I/O points also provide the status for indicators or external control systems. An I/O card can be installed with the switchboard card to expand the number of I/O ports.

The switchboard card also calculates accurate power and power factor measurements and provides cumulative power consumption. A high-resolution snapshot of all motor voltages and currents is captured on every motor start. The waveforms can be viewed directly on the controller or downloaded to the powerful data viewer, which is included in the StarView software. These waveforms can help troubleshoot difficult pump starts and provide insight on the power system reaction at startup.

Retrofit kit simplifies upgrades

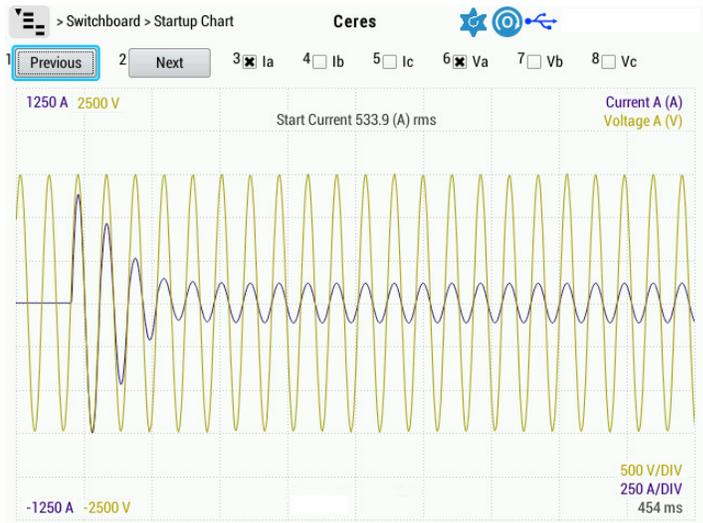
The Instruct FS unit is a direct replacement for K095 systems. The upgraded unit communicates with gauges and displays data on an easy-to-read color screen; it can also transmit data over the internet through the Lift IQ service. A retrofit kit is available to simplify the upgrade. It includes cable harnesses and a terminal strip assembly for fast and trouble-free installation that takes about an hour. The controller for the retrofit kit is housed in a National Electrical Manufacturers Association Type 3R enclosure and has mounting templates to accommodate a wide range of cabinet types.



Switchboard card for the Instruct FS unit.



Backspin module for the Instruct FS unit.



The startup chart displayed on the controller of the Instruct FS unit showing the amperage stabilizing over time. The detail that the startup chart provides enhances the troubleshooting capabilities of the unit.

Instruct FS Unit Specifications

Switchboard card

Part number	100840440
Operational temperature, degF [degC]	-40 to 167 [-40 to 75]
Storage temperature, degF [degC]	-40 to 185 [-40 to 85]
Regulatory compliance	UL, CE, IEC 61010-1
Switchboard contactor control	Dedicated relay output 1-250 V AC, 8-A maximum 1-30 V DC, 5-A maximum
Configurable digital outputs (relay outputs)	Quantity: 2 1-250 V AC, 8-A maximum 1-30 V DC, 5-A maximum
Digital inputs	Quantity: 4 1-28 V DC Current-limited DC power provided on DPWR terminal (pin 27)
Analog output	Quantity: 1 0-20 mA in current source mode ±1% accuracy
Analog input	Quantity: 1 0-20 mA or 0-10 V (user selectable) ±1% accuracy
Current transformer (CT) input	Uses existing CT burden module (P/N 100468928) Intended for use with 5-A nominal output CTs ±5% accuracy
Potential transformer (PT) input	Compatible with existing PTs Intended for use with 120-V nominal output PTs 3-PT mode (standard) or 2-PT mode (for K095 retrofit) ±5% accuracy
Line frequency, Hz	30-140 Hz ±1% accuracy
Rotation direction detection	Selectable on voltage or current
Power factor	±5% accuracy

Backspin module

Part number	100840441
Operational temperature, degF [degC]	-40 to 167 [-40 to 75]
Storage temperature, degF [degC]	-40 to 185 [-40 to 85]
Regulatory compliance	UL, CE, IEC 61010-1
Supported voltage range, V	400-5,000
Spin frequency detection, Hz	0.2-140 ±1% accuracy
Leg ground detection	±5% accuracy

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