Injection Control Application for FloBoss™ 107 and ROC800-Series

SmartProcess™ Oil & Gas Applications

The Injection Controller Application for the FloBoss 107 and the ROC800-Series provides simple, configurable management of multiple injection streams. Injection manifolds are used to deliver specific quantities of water or steam to one or more wells. The Injection Controller Application will attempt to meet flow rate targets while also limiting wellhead pressures to safe levels.

The Injection Control Application delivers three key benefits:

Dramatically Lower Installed Cost

- Low power system does not require AC power to be available at the wellsite
- Replaces PLC and flow transmitter(s) with a single device
- Native HART support permits high I/O density reducing I/O module cost
- WirelessHART support allows monitoring of wellhead pressures without trenching
- Configurable – not programmable – system expedites commissioning

Improved Control

- Configurable, dual objective control strategy provides simplified, yet effective control
- Valve 'no flow pre-positioning' simplifies injection system restarts following an upset
- Target flow rates can be by volume, mass, or heat flow
- Pressure control with rate override also supported
- Dual valve control schemes also supported

Superior Visibility to Injection Configuration, Status, and History

- Interfaces easily with leading SCADA/HMI/PLC systems
- Serial and/or Ethernet physical media
- Supports multiple simultaneous hosts

- Minimum/maximum/average values of flow rates, pressures, and temperatures available on an hourly and daily basis
- Historical retention of any desired values

The Injection Control Application delivers these benefits through features including:

Versatile Meter Interface

The application can be configured to compute flow rate using typical injection instrumentation:
- Coriolis
- Magnetic
- Orifice
- Turbine
- Vcone
- Vortex

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Flexible Control Strategy

The control algorithm employs a configurable "dual objective" strategy. For example, the system may be configured to maintain a target flow rate (primary objective) but not to exceed a specific wellhead pressure limit (override objective). Other combinations are possible. A conventional proportional-integral-differential (PID) algorithm drives the control valve as long as the override set point is not violated. If the override objective is violated, the control immediately begins bringing the process back into conformance.

Water or Steam

The application is designed to calculate volume, mass, and heat flow rates for:

- Water
- Saturated Steam (single phase vapor)
- Saturated Steam (two phase)

Orifice calculations are performed per ISO 5167.

Steam calculations through orifice plate elements support a variety of wetness correction factors for 2-phase steam.

Supports All Valve Actuators

The Injection Controller Application can be configured to interface with the following valve positioners:

- Analog
- Digital

Extensive Data Logging

The application accumulates hourly, daily, and monthly values for all parameters on each flow stream:

- Volume flow (minimum, maximum, average, total accumulated)
- Mass flow (minimum, maximum, average, total accumulated)
- Heat flow (minimum, maximum, average, total accumulated)
- Pressure (minimum, maximum, average)

These values can be retained in the controller for up to 35 days of history.

SCADA-Ready

- Natively communicates via modbus RTU or ROC protocol communications
- Modbus map can be customized
- Supported by leading OPC servers (including tag browsing)

Multi-Stream Support

- Floboss supports up to 4 streams (ideal for wellsite injection skids)
- ROC supports up to 25 streams (ideal for injection manifolds)

Valve 'No Flow Pre-Positioning'

- Program detects injection system upsets and pre-positions control valve to simplify injection system restarting

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