

# SIGMA MYRIAD QPC, TRIPLEX/QUADRAPLEX PUMP CONTROLLER

## ENGINEERING SPECIFICATION

The following specification covers a comprehensive, programmable, fully automatic Triplex/Quadraplex Pump Control and Monitoring Instrument for constant or variable speed pump operation of three (3) or four (4) pumps.

The Controller shall be panel mounted or wall mounted in a Nema 4X, waterproof, non-metallic enclosure with a clear Lexan viewing window.

The Controller shall be microprocessor based with 24 bit signed integer variables and fully user configurable through five front of panel user keys. The Controller shall display all level and alarm information on its graphical, backlit, LCD display with a resolution of 128 x 32 pixels in bitmap form. Process variables and set point information shall be displayed in digital, alpha, bargraph and trend formats.

The Controller shall accept a primary and secondary level input. The Controller shall continuously monitor the primary sensor and automatically change to the secondary sensor in the event of a primary failure. A sensor failure alarm shall be generated.

All programmable parameters shall be password protected to prevent unauthorized changes. The password shall be user programmable. An 'on-board' alarm horn shall be user selectable to activate upon alarm conditions and shall be silenced with any operator key.

The following operational parameters shall be user programmable.

- A) Pump Operation – Lead On, Lead Off, Lag On, Lag Off, 3<sup>rd</sup> and 4<sup>th</sup> Lag On and Off, High Level Alarm On and Off, Low Level Alarm On and Off, Pump on Delay, Pump Off Delay.
- B) Level Display – 4/20mA, 0-5 VDC, 1-5 VDC, 1-10 VDC shall be settable for any numeric value in the input range, six full digits, selectable decimal point, engineering units and update time (filter).
- C) Analog Outputs – 4 analog outputs shall be standard and programmable for variable speed minimum and maximum when variable speed pumps are used, and speed versus level set points as well as engineering values.

- D) Pump Alternation – 3 modes of pump alternation shall be available: alternation off, alternate on pump cycle, alternate on time of day. When time of day is selected the alternate time shall be user programmable.

Pump Sequencing shall be standard with operator selection of lead/lag order, number of pumps to alternate and maximum number of pumps to run.

- E) Trend Screen – A diagnostic trend screen of the process variable shall be standard, trend screen time base shall be selectable over 2 minutes, 2 hours or 12 hours.
- F) Elapsed Time Meters – shall be standard for each pump and shall be operator resettable or automatically resettable at 1,000,000 hours of operation.
- G) Peak and Valley Process Values – shall be recorded and displayed and shall be resettable by the operator.

## OPERATION MONITORING

The Pump Controller shall monitor all normal operational conditions common to triplex/quadruplex pump control. These parameters shall be: Pump Run Feedback, Pump Hand Off Auto Selector Position, Motor Overtemperature, Seal Leak, Process Level.

The Controller shall provide outputs for control and alarm. For control, the unit shall provide four form 'C' relays and four 4/20mA analog signals for VFD speed (if required). Alarm outputs shall be provided for Level (High & Low), General Alarm, Primary Sensor Fail, Pump1, 2, 3 & 4 Fault and Seal Leak. Each alarm shall be independent of other alarms.

The Pump Controller shall include a level simulation screen, which will allow the operator to manually manipulate the level display to confirm the operation of the various set points. The simulate screen shall default to normal operation if left unattended for 30 seconds.

The Controller shall be powered from 230/110 VAC or 24 VDC and will provide 100mA of DC excitation output for the level sensor and other external loads.

All inputs and outputs shall be optically isolated with common negative. Analog inputs and outputs shall be user selectable for 4/20mA, 0-5 VDC, 1-5 VDC and 0-10 VDC. Output relays shall be single pole double throw (SPDT) rated at 5 amps.

A comprehensive diagnostic screen shall be standard, which allows the operator to view the status of all analog and digital outputs in real time.

For SCADA and communication purposes the Controller shall contain two RS485 data ports. Controllers shall be able to be connected in a Network and communicate with each other in true peer-to-peer form, with up to 4,000 feet between nodes.

If used in the panel mount format the controller chassis should be removable without tools or removal of any wiring. Withdrawal shall be through the front of the Din case.

It is the intent of this specification that a standard device be supplied that requires no special software, programming or specialized knowledge.

The Controller shall be a Sigma Myriad QPC.