Technical Information:

Date:January 2006Subject:Sigma Control Version PumpsCategory:Operational Overview

Sigma Control Version Pump - Operational Overview Sigma 1, 2 and 3

These pumps have a standard power cord for a 115 VAC supply. When the pump is powered, there are a few things that happen. The incoming voltage is measured and internal voltages are controlled to accommodate the supply voltage.

The pump is capable of accepting anything in the range of 115 - 220 V AC +/- 10 %. This universal power supply is used so that the pump can be used over a wide range of local supply voltages around the world. The supply to the pump is a single phase supply.

Internally, the pump has a built in inverter. The supplied motor is driven by this integrated frequency inverter. The supplied motor is a 3 Phase motor.

The three phase voltage to the motor is electronically generated and regulated. This allows us to be able to easily vary the speed of the motor. It also allows the motor voltage and current to be regulated, the motor does not see any variations in the incoming supply voltage.

We monitor for the proper rotation and speed of the motor via a Hall sensor and software, the motor will be stopped and a fault generated if the proper rotation speed is not fulfilled.

The motor current is also monitored, the current limit is adjusted slightly above the needs of a "regular load". If the motor gets to the current limit by e.g. a mechanical overload, it will be electronically slowed down so that the current is within the predefined limit. If the overload persists, the pump will stop due to the software monitoring of the motor speed (Hall sensor).

Starting and stopping is done under controlled acceleration and deceleration so no abnormal current will flow in these situations.

The locked rotor current is mentioned on the name plate of the motor but isn't relevant since in a locked situation the motor will be stopped immediately.

The operating voltage of the motor is maintained by the electronics to a close tolerance and is corrected according to the motor frequency as is normal with most frequency converter drives.

Since the voltage, current and rotation of the motor are continuously monitored, an integral temperature sensor is not necessary.

Normally with motor driven pumps, as you slow the speed of the motor the suction and discharge strokes of the pump become longer and longer, at low speeds you have inconsistency in the flow through the check valves leading to inconsistent dosing.

With the control version pump, this problem is eliminated by having the variable speed motor run from max speed down to a predetermined motor speed, at this point a changeover to have

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individual strokes at the preset motor speed is done, simulating what a solenoid pump would do. This gives a good linear capacity response even down to one stroke per minute.

The display and keypad allow you to interface with the pump, due to the integrated electronics, it can easily proportionally pace the pump directly from incoming 4 - 20 mA signals or from contact inputs without any external hardware.

A number of control possibilities exist.

The pump has a large digital display where operating information is visible.

For more information regarding the pump, control options and accessories available, please refer to the Product catalog and Operating Instructions.