APPLICATION NOTE

Sensata Technologies

PRESSURE SENSORS FOR RESIDENTIAL AND COMMERCIAL WATER BOOSTER PUMPS

Background

Booster pumps are a very common way of increasing water pressure in a home or office if the water is coming from a well or if the water pressure coming from the city is low. As the world becomes more conscious of energy use and there are increasing regulations and focus on energy consumption, the OEM's have moved to variable speed pumps to meet these growing energy concerns. In addition to energy savings there are reduced maintenance costs due to the system operating at reduced pressures. Variable speed pumps use a variable frequency drive (VFD) or variable speed drive (VSD) to continuously optimize the pump speed and power consumption while maintaining constant outlet pressure of the pump. Pressure sensors are a fundamental part to this system. A pressure sensor is mounted on the outlet converting the outlet pressure to an electrical signal which the VFD uses to adjust the pump's speed. Similarly, in many cases, a high cut out pressure switch is mounted to prevent the pump from outputting extreme pressure and an additional pressure sensor can be mounted on the inlet of the pump to monitor efficiency.

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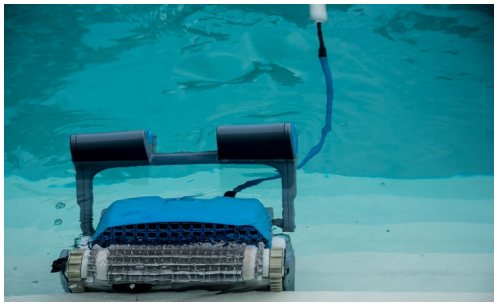
Solution

Sensata now offers a cost-efficient pressure sensor (116CP/117CP) family, for these smaller residential booster pumps. The 116CP/117CP sensor design is patented according to US9857260B2 2018- 01-02 and is developed according to 'automotive' standards. These applications would mimic the much larger industrial booster pump systems which require a more robust 60CP/70CP pressure sensor.
The pressure sensor converts the pressure signal into an electronic (voltage) or digital (I2C) value which can be acquired by the VFD of the pump. The sensor measurement pressure value is usually presented on the pump's display. In digital trends customers are able to view and monitor pressures via an application on their smartphone or tablet. In addition, a notification can notify users of irregularities and assist in preventative maintenance.

Pump Motor Protection

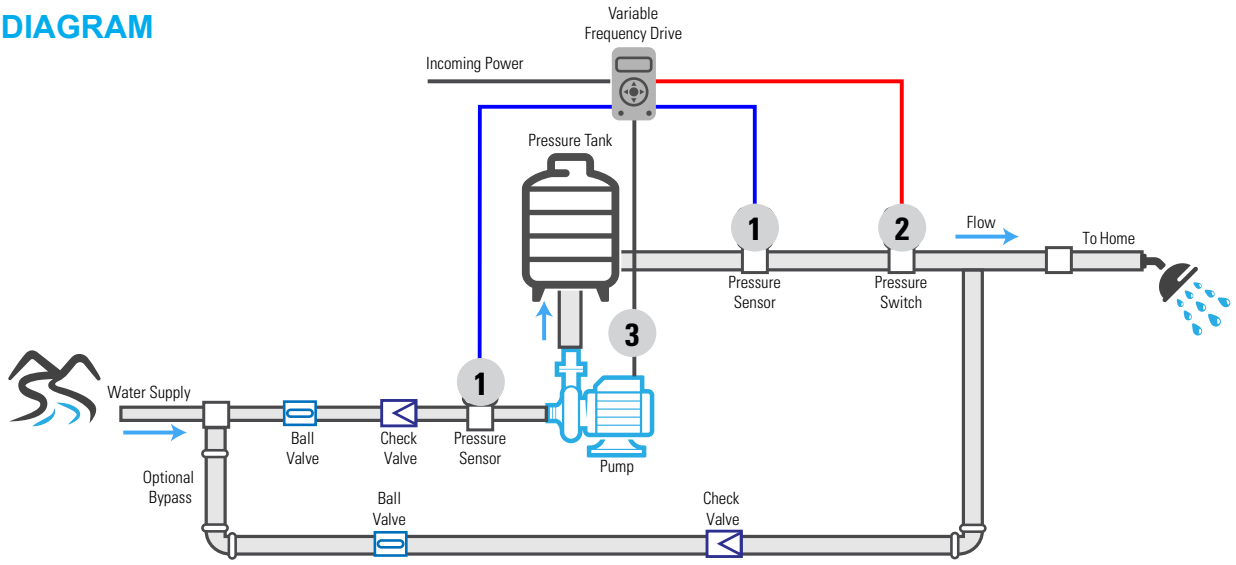
In most cases the pump motor would need protection in order to disengage in the event of dangerous running overload and locked rotor conditions. The industry preferred, cost-effective solution is a bimetal switch which reacts to both increased current and winding temperature. Sensata offers numerous motor protector product families depending on the size and environmental conditions of the motor and application.



RECOMMENDED PRODUCTS

Reference on Diagram	Product	Features	Function	Brand
1	 116CP/117CP 126CP/127CP* *Drinking water certified	• Operating pressure range: 0-60 to 0-230 PSI (0-4 to 0-16 Bar) • Supply voltage: 5VDC ratiometric or 8-30VDC voltage regulated • Output: 0-3.5VDC, 0-4.5VDC, or 4-20mA • Pressure port: Quick Connect, G1/4, G3/8 • Electrical connection: RAST 2.5	Monitor the pump inlet/ outlet pressure (residential and commercial)	Sensata Technologies
1	 60CP/70CP	• Operating pressure range: 0-15 to 0-750 PSI (0-1 to 0-50 Bar) • Supply voltage: 5VDC ratiometric or 8-30VDC voltage regulated • Output: 0-4.5 VDC or 4-20 mA • Pressure port: 1/8"" NPTF-2A male, 1/4"" NPTF-2A male • Electrical connection: Packard Metri-Pack • Drinking water certified options available	Monitor the pump inlet/ outlet pressure (industrial)	Sensata Technologies
2	 PS80	• Operating pressure range: 0-750 PSI • Electrical ratings: 120/240 Vac - 6.0 FLA, 36 LRA 120/277 Vac - 375 VA pilot duty • Cycle life: 100,000 cycles • Pressure port: 7/16-20 UNF-2B, 1/8-27 NPTF, copper clad TIF tube • Electrical connection: wire lead, quick connect	High pressure cut out on outlet	Klixon
3	 2AM / 8AM	• Electrical ratings: 120 Vac - 60 Amps 230 Vac - 37 Amps • Cycle life: 10,000 cycles • Electrical connection: wire lead	Pump motor protector	Klixon

DIAGRAM



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