

ABSTRACT

PUMP MONITORING APPARATUS AND METHOD

5 We describe a vacuum pump monitoring apparatus having an electric motor to drive the pump. The monitoring apparatus comprises at least one sensor for measuring a current of the electric motor to generate a time-based signal and at least one electronic processor configured to transform the time-based signal into a frequency-based signal and to analyse the frequency-based signal to identify a signal pattern representing a pump fault condition.

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By monitoring the frequency-based signal, the monitoring apparatus can identify a pump fault condition. The signal pattern can, for example, correspond to a vibration signature associated with the pump fault condition. All potential sources of vibration present in a pumping system will impact the motor, for example through load torque and shaft speed variations. The energy required to drive the vibrations is provided by the electric motor and necessarily translates into its electrical power signature. The identified vibration signature can result from operation of the electric motor and/or the pump. The monitoring apparatus can diagnose a fault in the pump. Alternatively, or in addition, the monitoring apparatus can predict a fault in the pump.

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[FIGURE 1]