

ABSTRACT

AUTONOMOUS FILTER ELEMENT

An autonomous filter device and a method for improving the filter life and performance is disclosed. The filter element is equipped with one or more sensors, adapted to measure one or more characteristics or parameters of the fluid, such as temperature, pressure, or flow rate. In response to the measured characteristic or parameter, the control logic within the filter element is able to determine an appropriate response. For example, the control logic may determine that a sudden, but temporary, blockage has occurred in the filter membrane. In response to this, the control logic may initiate a specific response designed to alleviate the blockage. This response may be a temperature change, a vibration, a change in fluid flow path, or some other action. The control logic will then determine the success of the response, based monitoring any change in the fluid characteristics. Based thereon, the control logic may alert the operator that the filter element must be replaced. Alternatively, if the response was successful in correcting the blockage, the control logic need not notify the operator, as the filter element is back to normal operating operation.

Fig. 1