Claims

1. A fluid filtration system comprising a fluid processing pressure vessel comprising a plurality of fluid filtration modules provided in series between an inlet, and a reject outlet and a permeate outlet, each fluid filtration module of the plurality of fluid filtration modules comprises a permeate pipe; a plurality of sensor modules including an individual sensor module; and at least one data collection module,

each of the plurality of sensor modules comprises a tubular body, at least one sensor, an energy receiver, and a data transmitter,

each of the at least one data collection module comprises an energy transmitter and a data receiver configured to receive data from the data transmitter of a corresponding sensor module of the plurality of sensor modules;

wherein the individual sensor module is positioned between two adjacent fluid filtration modules of the plurality of fluid filtration modules such that the tubular body of the individual sensor module is configured to be retro-fitted to be inserted or installed into the permeate pipe of each of the adjacent fluid filtration modules to thereby connect the permeate pipes of the adjacent fluid filtration modules, wherein an individual data collection module of the at least one data collection module is positioned outside of the fluid processing pressure vessel within a predetermined distance from the individual sensor module, wherein during use fluid flows into the inlet of the fluid processing pressure vessel, through each fluid filtration module of the plurality of fluid filtration modules sequentially and permeate flows out of the permeate outlet and reject flows out of the reject outlet, wherein each data collection module of the at least one data collection module is operable to provide a carrier electromagnetic field such that (1) the energy receiver of each of the plurality of sensor modules receives energy from the energy transmitter of the corresponding data collection module and (2) each of the plurality of sensor modules communicates with the corresponding data collection module via near field communication.

2. The fluid filtration system of claim 1, wherein a sensor module of the plurality of sensor modules is provided either side of a selected fluid filtration module or selected fluid filtration modules of the plurality of fluid filtration modules.

3. The fluid filtration system of any preceding claim, wherein a sensor module is provided between each pair of adjacent fluid filtration modules.

4. The fluid filtration system of claim 1, wherein the at least one sensor is configured to determine at least one parameter of fluid flowing through the tubular body and/or past the exterior of the tubular body.

5. The fluid filtration system of any preceding claim, wherein the body of each sensor module of the plurality of sensor modules comprises at least one sensor.

6. The fluid filtration system of any preceding claim, wherein each sensor module of the plurality of sensor modules comprises at least one elongate element extending away from the body.

7. The fluid filtration system of claim 6, wherein the at least one elongate element comprises at least one sensor.

8. The fluid filtration system of any preceding claim, wherein the energy receiver is configured to receive power from the external energy transmitter to thereby power the corresponding sensor module.

9. The fluid filtration system of any preceding claim, wherein a sensor or a sensor module is provided upstream of a first fluid filtration module of the series of fluid filtration modules and a sensor or sensor module is provided downstream of a final fluid filtration module of the series of fluid filtration modules.

10. The fluid filtration system of claim 6, wherein the at least one elongate element comprises the energy receiver.

11. The fluid filtration system of claim 10, wherein the at least one elongate element has a distal end furthest from the tubular body and the energy receiver is positioned at the distal end.

12. The fluid filtration system of claim 1, wherein the at least one data collection module is positioned on the exterior of the fluid processing vessel.

13. The fluid filtration system of claim 12, wherein the at least one data collection module is adjacent to a sensor module of the plurality of sensor modules.

14. The fluid filtration system of claim 13, wherein the at least one data collection module comprises a plurality of data collection modules and a data collection module of the plurality of data collection modules is adjacent to each sensor module of the plurality of sensor modules.