According to an aspect, the present invention concerns an online reagentless detector for parasites in drinking water or swimming pools.

According to an aspect, the present invention concerns a reagentless online *Cryptosporidium* and *Giardia* sensor for continuous water quality monitoring that can detect parasites in drinking water within less than two hours and thus prevent pollutions with *Cryptosporidium* and *Giardia* from reaching the consumers.

The number of particles in the relevant size range (3-20 µm) in regular water supply is expected to exceed the number of *Cryptosporidium* and *Giardia* by several logs. This makes the risk of false positive results very high, putting extreme demands on the specificity of the sensor. Positive readings should usually be confirmed by conventional methods. Furthermore, in case of true positive findings there is a need to collect parasite DNA in order to make the necessary species identification and typing that will allow outbreak investigations to trace the source of the pollution and thereby stop the contamination. In the present day situation collection of parasite material for this purpose would be done by labour intensive and time consuming methods.

According to an aspect, the present invention concerns a sample collection unit that may be in flow communication with a reagentless parasite sensor.

According to an aspect, the concentration device according to the invention is a concentration device for filter filtration concentration of particles from a volume of a fluid, which concentration device comprises a filter configured to filter particles of a predefined size in the volume of the fluid. The concentration device comprises an ultrasonic transducer that is configured to clean the filter by indirect sonication.

According to an aspect, a concentration device for filter filtration concentration of particles from a volume of a fluid is provided, which concentration device comprises a filter allowing filtering particles of a predefined size in the volume of the fluid ; wherein the concentration device comprises an ultrasonic transducer that allows cleaning the filter; wherein the concentration device comprises a housing having a cavity, which cavity is separated into a first volume and a second volume by the filter; wherein the housing has an inlet being in fluid communication with the first volume and wherein the housing has an outlet being in fluid communication with the second volume, and the particles are concentrated in the first volume; and wherein the ultrasonic transducer has a driving surface arranged in the second volume.

According to an aspect, an analysis system comprising a concentration device according to any of the above aspects is provided.

According to an aspect, a method for filter filtration concentration of particles from a volume of a fluid is provided, where the fluid is concentrated by pumping the fluid through a filter allowing filtering particles of a predefined size wherein an ultrasonic transducer is used to clean the filter and loosen particles into a first volume, which first volume is multiple smaller than the filtered volume.

According to an aspect, a method for operating a concentration device is provided, said concentration device comprising an ultrasonic transducer and a filter, allowing sending ultrasonic pulses towards the filter of the concentration device, said method comprising initiating and performing ultrasonic cleaning of the filter during filtration.

According to an aspect, a method for operating a concentration device is provided, said concentration device comprising an ultrasonic transducer and a filter, allowing sending ultrasonic pulses towards the filter of the concentration device, said method comprising: i) allowing the ultrasonic transducer to be in an inactive state during filtering; ii) optionally loosening particles trapped in the filter by sending a pulse while the device is filtering, if pressure drop or decreased flow indicates clogging of the filter; iii) Sending a pulse for dispersing agglomerates of particles in the filter immediately before filtration is halted; iv) Halting filtration; v)Sending a pulse for loosening particles into the volume of the retentate side of the filter; vi) Recovering particles for detection; and vii)Sending a pulse during a backwash.

Detailed Disclosure

The term "retentate" refers to the part which is retained in a filtration process, for example by a filter or porous membrane (as opposed to the "diffusate").

By "indirect ultrasonication" is meant that ultrasound is applied to a filter or membrane, opposite the side of collection of e.g. parasites. Indirect ultrasonication is applied on the diffusate side of a filter or membrane.