CLAIMS

1. A fluid filtration system comprising:

a workstation, the workstation including a cabinet;

a pump, the pump supported by the cabinet and adapted to selectively produce a flow of fluid;

a single use filter, the single use filter removably mounted to the workstation, the single use filter having an upstream end and a downstream end;

a fluid supply conduit, the upstream end of the single use filter being in fluid communication with the pump via the fluid supply conduit, the fluid supply conduit including a junction and a fluid supply valve, the fluid supply valve disposed between the junction and the pump;

a vent conduit, the vent conduit being in fluid communication with the junction of the fluid supply conduit such that the upstream end of the single use filter is in fluid communication with the vent conduit via the junction and a common branch extends between the junction and the upstream end of the single use filter, the vent conduit including an outlet, a liquid sensor, and a vent valve, the liquid sensor disposed between the junction and the outlet, the vent valve disposed between the liquid sensor and the outlet, the liquid sensor configured to generate a liquid detection signal in response to detecting liquid in the vent conduit;

a control unit, the control unit in electrical communication with the liquid sensor to receive the liquid detection signal therefrom, the control unit including a processor and a non-transitory computer readable medium bearing a filter conditioning program containing a filter priming module, the processor arranged with the computer readable medium to execute the filter conditioning program, the processor being in electrical communication with the pump, the fluid supply valve, the vent valve, and the liquid sensor to perform a priming operation on the single use filter based upon instructions from the filter priming module.

2. The fluid filtration system according to claim 1, wherein the filter priming module is configured to perform the following steps when executed by the processor:

open the fluid supply valve to open the fluid supply conduit,

open the vent valve to open the vent conduit,

operate the pump to deliver the flow of fluid to the upstream end of the single use filter such that gas in the fluid supply conduit is displaced to the vent conduit,

cease operation of the pump and/or close the vent valve in response to receiving the liquid detection signal.

3. The fluid filtration system according to claim 1 or claim 2, further comprising:

a discharge conduit, the discharge conduit being in fluid communication with the downstream end of the single use filter, the discharge conduit including a first outlet and a second outlet and a first outlet valve and a second outlet valve respectively associated with the first outlet and the second outlet, the first outlet adapted for fluid connection to a product container and the second outlet adapted for fluid connection to a waste repository;

wherein the filter priming module is configured to perform the following steps as part of the priming operation when executed by the processor:

close the first outlet valve to occlude the first outlet,

open the second outlet valve to open the second outlet.

4. The fluid filtration system according to claim 3, wherein the filter priming module is configured to perform the following steps as part of the priming operation when executed by the processor:

close the vent valve in response to receiving the liquid detection signal,

operate the pump to deliver the flow of fluid to the single use filter such that the flow of fluid passes through the single use filter and the discharge conduit and out of the second outlet.

5. The fluid filtration system according to claim 3 or claim 4, wherein the filter conditioning program includes a filter flushing module, the filter flushing module being configured to perform the following steps as part of a flushing operation when executed by the processor:

close the vent valve in response to receiving the liquid detection signal,

close the first outlet valve to occlude the first outlet,

partially open the second outlet valve to partially open the second outlet

operate the pump to deliver the flow of fluid to the single use filter such that the flow of fluid passes through the single use filter and the discharge conduit and out of the second outlet to thereby produce a backpressure in the discharge conduit.

6. The fluid filtration system according to claim 3 or claim 4, wherein the filter conditioning program includes a filter flushing module, the filter flushing module being configured to perform the following steps as part of a flushing operation when executed by the processor:

operate the pump to deliver the flow of fluid to the single use filter such that the flow of fluid passes through the single use filter and the discharge conduit and out of the second outlet,

close the vent valve in response to receiving the liquid detection signal,

close the first outlet valve to occlude the first outlet,

sequentially open and close the second outlet valve to sequentially open and close the second outlet to thereby produce a pulsing effect in the discharge conduit.

7. The fluid filtration system according to claim 5 or claim 6, further comprising:

a pressurized gas supply conduit, the upstream end of the single use filter being in fluid communication with the pressurized gas supply conduit, the pressurized gas supply conduit adapted to selectively direct a flow of pressurized gas therethrough to the upstream end of the single use filter;

wherein the filter conditioning program includes a filter pressurizing module, the filter pressurizing module being configured to perform the following steps as part of a pressurizing operation when executed by the processor:

close the fluid supply valve to occlude the fluid supply conduit,

close the vent valve to occlude the vent conduit,

close the first outlet valve to occlude the first outlet,

close the second outlet valve to occlude the second outlet,

direct the flow of pressurized gas through the pressurized gas supply conduit to the upstream end of the single use filter.

8. The fluid filtration system according to claim 7, wherein the pressurized gas supply conduit includes an air filter.

9. The fluid filtration system according to claim 7 or claim 8, wherein the pressurized gas supply conduit includes a gas supply valve, and wherein the filter pressurizing module is configured to perform the following step as part of the pressurizing operation when executed by the processor:

sequentially open and close the gas supply valve to sequentially open and close the pressurized gas supply conduit to thereby produce a pulsing effect in the pressurized gas supply conduit.

10. The fluid filtration system according to claim 7, wherein the junction of the fluid supply conduit comprises a first junction, the pressurized gas supply conduit includes a second junction, and the vent conduit being in fluid communication with the second junction such that the upstream end of the single use filter is in fluid communication with the vent conduit via the first junction and the second junction and such that the common branch extends between the second junction and the upstream end of the single use filter.

11. The fluid filtration system according to claim 10, wherein the pressurized gas supply conduit includes a gas supply valve and an air filter, the liquid sensor, the gas supply valve, and the air filter disposed in the common branch, the liquid sensor disposed between the first junction and the gas supply valve, and the gas supply valve disposed between the liquid sensor and the air filter, and wherein the filter priming module is configured to perform the following step when executed by the processor:

close the gas supply valve in response to receiving the liquid detection signal.

12. The fluid filtration system according to any one of claim 7 to claim 11, wherein the pressurized gas supply conduit includes an integrity test device, the integrity test device adapted to be connected to a source of gas, to pressurize the gas, and to selectively direct the flow of pressurized gas through the pressurized gas supply conduit to the upstream end of the single use filter, the processor being in electrical communication with the integrity test device to selectively operate the integrity test device.

13. The fluid filtration system according to any one of claim 1 to claim 12, wherein the fluid supply conduit includes a prefilter, the prefilter disposed upstream of the single use filter between the pump and the junction.

14. A method of conditioning a single use filter in a fluid filtration system according to any one of claim 1 to claim 13, the method comprising:

removably mounting a single use filter to a workstation, the workstation including a cabinet;

fluidly connecting an upstream end of the single use filter to a pump via a fluid supply conduit, the pump supported by the cabinet, the fluid supply conduit including a junction and a fluid supply valve, the fluid supply valve disposed between the junction and the pump;

opening the fluid supply valve to open the fluid supply conduit;

opening a vent valve to open a vent conduit, the vent conduit being in fluid communication with junction of the fluid supply conduit such that the upstream end of the single use filter is in fluid communication with the vent conduit via the junction and a common branch extends between the junction and the upstream end of the single use filter, the vent conduit including an outlet, a liquid sensor, and a vent valve, the liquid sensor disposed between the junction and the outlet, the vent valve disposed between the liquid sensor and the outlet, the liquid sensor configured to generate a liquid detection signal in response to detecting liquid in the vent conduit;

operating the pump to deliver the flow of fluid to the upstream end of the single use filter such that gas in the fluid supply conduit is displaced to the vent conduit;

ceasing operation of the pump and/or closing the vent valve in response to receiving the liquid detection signal.

15. The method according to claim 14, further comprising:

closing the vent valve in response to receiving the liquid detection signal;

closing a first outlet valve to occlude a first outlet of a discharge conduit, the discharge conduit in fluid communication with a downstream end of the single use filter;

at least partially opening a second outlet valve to at least partially open a second outlet of the discharge conduit;

operating the pump to deliver the flow of fluid to the single use filter such that the flow of fluid passes through the single use filter, into the discharge conduit, and out of the second outlet of the discharge conduit.

16. The method according to claim 14 or 15, further comprising:

closing the fluid supply valve to occlude the fluid supply conduit,

closing the vent valve to occlude the vent conduit,

closing the first outlet valve to occlude the first outlet,

closing the second outlet valve to occlude the second outlet,

directing a flow of pressurized gas through a pressurized gas supply conduit to the upstream end of the single use filter.