CLAIMS

1 . An integrated cleaning and test system for leak testing and cleaning a fluid test device, comprising:
a first connector configured to connect to a first mating connection of a process tubing;
a second connector configured to connect to a second mating connection on the process tubing;
a first fluid test device operatively connectable to one of the first and second connectors;
the fluid test device including a testing circuit comprising:

a first access valve (ball valve 1015) fluidly connected to the first connector;

a three way valve (1014) fluidly connected to the second connector

a first source of fluid including a first fluid, a first fluid first flow path including therein a first circulation valve (1007) fluidly connected to the first access valve (ball valve 1015) and a first fluid second flow path including therein a second access valve (1008) fluidly connected to the three way valve (1014);

a second source of fluid including a second fluid different than the first fluid, a second fluid first flow path including a first flush valve (1016) fluidly connected to the three way valve (1014) and a second fluid second flow path including a second flush valve (1004) fluidly connected to the first access valve (1015): and,

a third source of fluid including a third fluid different than the first fluid and the second fluid, and a third fluid flow path fluidly connected to the three way valve (1014): and

a source of leak test fluid, including a leak test gas, fluidly connected to a leak gas valve (1009), the leak test valve fluidly connected to the three way valve 1014;
wherein
a leak test is performable on a process tubing connected between the first and second connectors when the first access valve is closed, the first flush valve is closed, the second circulation valve is closed and the leak test valve is open, and the three way valve is positioned to fluidly connect the leak test valve to the second connector and fluidly isolate the third fluid flow path from the second connector:
a pressure test is performable on the fluid test device when the three way valve is positioned to fluidly connect the third fluid flow path to the second connector while isolating the leak test valve, the first flush valve and the second circulation valve from the second connector;
a cleaning process is performable on the fluid test device when the first and second flush valves are open, the first access valve is open, the three way valve is positioned to isolate the third fluid flow path from the second connector and the second access valve, the leak gas valve, the first flush valve and the second flush valve are closed;

a drying process is performable on the fluid test device when the first and second access valves are open, and the first and second flush valves are closed, the leak test gas valve is closed, and the three way valve is configured to block access of the third fluid flow path to the second connector.

a user selectable sequence to enable the system to test, clean, and dry a process piping without requiring that the process piping be removed from the system between any of the testing, cleaning, or drying steps.

2. The Integrated cleaning and testing system of claim 1, wherein the second source of fluid further comprises a first pressurized source of the second fluid fluidly connected to the first flush valve and a second pressurized source of the second fluid fluidly connected to the second flush valve.

3. The integrated cleaning and testing system of claim 2, wherein the first pressurized source of the second fluid and the second pressurized source of the second fluid are selectively in fluid communication through the first fluid test device

4. The integrated cleaning and testing system of claim 3, wherein the first pressurized source of the second fluid and the second pressurized source of the second fluid are in fluid communication through the first fluid test device when the first and second flush valves are open, the first access valve is open, the three way valve is positioned to isolate the third fluid path from the second connector and the second access valve (1008), the leak gas valve, the first flush valve and the second flush valve are closed;

5. The integrated cleaning and testing device of claim 2, wherein the first pressurizable source of the second fluid includes a first pressurizable vessel and the second pressurizable source of the second fluid includes a second pressurizable vessel.

6. The integrated cleaning and testing device of claim 2, wherein the first pressurizable vessel and the second pressurizable vessel are fluidly connected to the first source of fluid.

7. The integrated cleaning and test system of claim 1, wherein the second fluid is liquid isopropyl alcohol.

8. The integrated cleaning and test system of claim 1, wherein the first fluid is gaseous nitrogen.

9. The integrated cleaning and test system of claim 1, wherein the leak test gas is gaseous helium.

10. The integrated cleaning and test system of claim 1, wherein the first fluid is gaseous nitrogen. further comprising a nitrogen.

11. The integrated cleaning and test system of claim 1, further comprising a source of vacuum selectively fluidly connectable to at least one of the first connector and the second connector, the source of vacuum including a vacuum control line valve (1006) in fluid communication with the first access valve.

12. The integrated cleaning and test system of claim 1, further comprising a source of water selectively fluidly connectable to at least one of the first connector and the second connector.

13. The integrated cleaning and test system of claim 11, further comprising a source of water selectively fluidly connectable to at least one of the first connector and the second connector.

14. The integrated cleaning and test system of claim 7, further comprising a source of water selectively fluidly connectable to at least one of the first connector and the second connector.

15. The integrated cleaning and testing system of claim 1, further including a fluid drain fluidly connected to a drain valve (1005), which in fluid communication with the first access valve.