Advantages of Piston Pump over Syringe Pump

Specifications	Piston Pump	Syringe Pump
Valves	No Valves	2-4 port solenoid or motorized Valves
Fluid Path	Only 2 port configuration	Syringe and Valves required multiple connections
Moving Parts	Only ceramic rotor type piston	Solenoid or motorized valves and syringes
Reliability and Cost	At least one Million trouble free cycles	Requires service and calibration after 10-20,000 cycles.
Total Components and Power Consumption	One pump, One driver board, less components and power consumption	Syringes, Valves, Motor, multiple electronic boards, more no. of components and comparatively high power consumption
Space	Smaller compared to Syringe Pump	Needs more space than Piston Pump
Through-put	Very fast sampling, high accuracy	Slow and valve switching is time consuming with similar accuracy as piston pump

Model (DS14000 SMART) with Piston Pump
(Advance Technology as compare to Syringe Pump) with 7" big touch screen having 21 CFR part 11 Compliant Software

Software features and CFR compliance

- Non-Volatile memory storage of 200 methods with parameters. Unlimited storage of Dissolution Run Data & Report storage in PDF form.

The Hardware is based on Embedded PC having storage memory expanable to 32GB so large storage of data - Methods, Raw data, Test Run Pdf Reports, Users, System Settings & Configuration, Diagnostic Data, Audit Trail & PDf reports.

- Diagnostic functionality and validation report of the system confirms reliability for QC applications.

Yes. Builtin Diagnostics for System check and connectivity status an complete GLP compliant information.

Validation software to validate RPM (15 log points), Bowl temperature (50 log points). Sampling & Replenishment Volume.

Yes. Each parameter RPM, Temperature, Volume has supportive Validation report generation facility in PDF format with complete GLP compliant information

Auto start in case of power failure.

Yes. User can set the Duration / Time (Max 10Min), its advantageous for long duration Dissolution test runs for R&D.

Multilevel user roles with password protection – levels like admin, manager, supervisor & user.
Yes. 4 Levels of Roles with Flexible User Privileges selection under Admin Role.

User authentication is performed for each major activity done by user.
Yes. And all the activities are logged in to Audit Trail Log.
User Password also have Expiry period - 15/30/60/90 days duration. Duration can be configured by Admin as per Company's IT Policy. Password Policy also can be Set with combination of Number of charactors (6 - 20) &
Password Complexity with minimum of 1 Upper case, 1 Lower case, 1 Special Char & 1 Numerical (0-9)

Audit Trail for all activities with search facility
Yes. Search facility provided with User ID, Date and Date Range.

Audit Trail – PDF report generation with print option.
Yes. PDF report of Audit Trail Log with Print.
Printer connectivity - WiFi Direct, Wifi Network printer, LAN connected printer or Direct connectivity to USB Printer

Customized PDF Run Report can be generated.
Preformated PDF report consisting of Complete GLP complient information - Company Name, Instrument details, Program/Method details, Test Run Data - Sample batch/dentification number, Run time test parameters - RPM, Temperature, Interval Time with Real Time info, Run Start time, User Id, E-Signature manifestation information, etc.

Electronic signature functionality.
Yes. 4 Levels of E-Signture of the Authorised User ID as per Privileges - Tested, Reviewed, Approved & Authenticated.
Once the E-Sign is applied by the authorised User, it becomes parmanent integral data to that Test Run. E-sign once applied cannot be reversed as per compliance requirement of CFR.

Manual archive and data backup facility.
Yes. Smart Disso has built in all Data Backup and Restore facility.
Data can be backed up Manually as well as Automatically to desired/Preset Data Path to Shared Folder on LAN Networked Server or

PC with defined TCP/IP address with Desired backup frequency - Montly, Weekly, Daily or on specific Date of each month with Time of Backup.