ACQUITY UPLC M-Class System

The ACQUITY UPLC® M-Class System provides reliable high resolution chromatographic separations optimized for columns from 75 µm to 1.0 mm internal diameter. The system's high pressure, direct (non-split) solvent and sample management system is optimized to minimize dispersive and adsorptive losses. The new sample manager and complementary valve and trapping management module delivers maximum sample recovery with superior chromatographic resolution through efficient use of sub-2-µm particles for a variety of system and column configurations to provide extensive application flexibility.

ACQUITY UPLC M-CLASS SYSTEM FEATURES

Total system delay volume	<1 µL default configuration
Integrated leak management	Safe leak handling; system diagnostic capability to identify and pinpoint system leaks at nL/min scale
System synchronization	Injection synchronization between pumps and the sample manager enhances retention time reproducibility
Flow control	Direct, no split, and automatic solvent flow control algorithms provide pulse-free flow
Operating flow rate range	200 nL/min to 100 µL/min without flow splitting
Maximum operating pressure	15,000 psi
pH range	pH 2 to 10
Unattended operation	Full 96-hour diagnostic data display through console software
Solvent storage	Solvent tray accommodates eluents for up to three solvent managers, two sample manager wash solvents, and one seal wash solvent

MICRO BINARY SOLVENT MANAGER (µBSM)

Number of solvents	Up to four, in combination of two: A1 or A2, and B1 or B2
Solvent conditioning	Integrated vacuum degassing, six lines with two allocated for the injector needle wash/purge solvents
Gradient formation	High pressure mixing, binary gradient
Primary check valves	Intelligent Intake Valves (i^2Valve)
Pump compositional precision	<0.25 min SD based on six repeat injections
Compressibility compensation	Automatic, no user intervention required
Priming	Automatic, user programmable; wet priming runs at a flow rate of 4 mL/min

Pump seal wash	Equipped with an integrated, programmable active wash system to flush the rear of the high pressure seals and the plungers
Flow ramping	User selectable from method editor
Primary wetted materials	UHMWPE blend, MP35N, titanium alloy, gold, sapphire, ruby, zirconia, DLC, fluoropolymer, fluoroelastomer, PEEK, PEEK blend, PPS, and fused silica
Mixing options	Optional mixer for micro scale (1.0 mm I.D.)

MICRO SAMPLE MANAGER–FIXED LOOP (µSM-FL)

Injection volume range	0.1 µL to 100.0 µL, in 0.1-µL increments; 5-µL loop standard with 1, 2, 5, 20, 50, and 100-µL optional loops; unlimited injection volume during trapping
Injection linearity	>0.999 (default needle) from 20% to 80% volume for the 5-µL loop
Injection modes	Full Loop mode for optimal quantization and dispersion; Partial Loop mode for fastest cycle time and sample volume flexibility
Sample manager precision	<1% area RSD 0.2 to 1.9-µL injection; <0.5% area RSD 2.0 to 10.0 µL-injection
Number of sample plates	Any two of the following: • 96 and 384 microtiter plates • 48 position 2.00-mL vial plates • 48 position 0.65-mL micro-centrifuge tube plates • 24 position 1.50-mL micro-centrifuge tube plates
Maximum sample capacity	768 in two 384-well plates, or 96 in 2-mL vial holders, plus 4 additional positions for dilution functions or standards
Sample compartment temperature range	4.0 to 40.0 °C, settable in 0.1 °C increments; maintains 19 °C below ambient with a tolerance range between -2 and +4 °C
Temperature accuracy	±0.5 °C at sensor
Temperature stability	±1.0 °C at sensor
Injection needle wash	Integrated, active, programmable, dual wash
Minimum sample required	3 µL residual, using Waters' total recovery 2-mL vials (zero offset)
Advanced sample manager capabilities	Load Ahead and Loop Offline mode, valve cycle timed event, multi-load with trapping independent of sample loop volume
Primary wetted materials	Fused silica, DLC, PEEK blend, PEEK, Fluoropolymer, PPS, fluoroelastomer, borosilicate glass, PPS Blend, 316 stainless steel

AUXILIARY SOLVENT MANAGER (ASM)

Column trapping pump (A side)	Choice of two eluents
NanoLockSpray™ addition (B side)	Choice of two calibration solutions
Flow rate range	A side: 0.0 mL/min to 1.0 mL/min B side: 0.0 µL/min to 100.0 µL/min
Solvent conditioning	Integrated vacuum degassing, six lines
Primary check valves	Intelligent Intake Valves (i^2Valve)
Compressibility compensation	Automatic, no user intervention required
Priming	Automatic, user programmable. Wet priming runs at a flow rate of 4 mL/min
Primary wetted materials	UHMWPE blend, MP35N, titanium alloy, gold, sapphire, ruby, zirconia, DLC, fluoropolymer, fluoroelastomer, PEEK, PEEK blend, and PPS

TRAP VALVE MANAGER (TVM)

Column capacity	Single column, 75 µm to 4.6 mm internal diameter (ID); up to 250 mm in length
Switching valves	Two six-port, two-position valves; independent programmable control
Column compartment temperature range	Ambient +5 °C to 90.0 °C, settable in 0.1 °C increments
Column compartment temperature accuracy	±0.5 °C at sensor
Column compartment temperature stability	±0.3 °C at sensor
2D configuration	Optional
Primary wetted materials	DLC, PEEK blend, and 316 stainless steel

SAMPLE ORGANIZER (SO)

Sample plate capacity	Sample plate capacity is configured based on the types and combinations of plates being used: • Maximum of 19 standard microtiter plates, up to 15.5 mm high, or • Maximum of 9 intermediate height plates (or 2-mL vial holders), up to 40.0 mm high, or • Maximum of 6 deep well plates (or 4-mL vial holders), up to 47.0 mm high
Maximum sample capacity	Maximum of 7296 samples in nineteen 384-well plates
Sample compartment temperature range	4.0 to 40.0 °C, settable in 0.1 °C increments; maintains 19 °C below ambient with a tolerance range between -2 and +4 °C
Temperature accuracy	±1 °C at the sensor
Temperature stability	±1 °C at the sensor

INSTRUMENTAL CONTROL

External control	MassLynx® Software or standalone through console software
External communications	Ethernet interfacing via RJ45 connection to host PC
Event inputs/outputs	Rear panel contact closure and/or TTL inputs/outputs
Connections INSIGHT®	Provides real-time monitoring and automatic notification of instrument performance and diagnostic information, allowing for quicker problem resolution

ENVIRONMENTAL SPECIFICATIONS

Acoustic noise	<65 dBA, system
Humidity – operating	20% to 80%, non-condensing
Operating temperature range	4 to 40 °C

ELECTRICAL SPECIFICATIONS

Power requirements	100 to 240 VAC	
Line frequency	50 to 60 Hz	
Power consumption	µBSM:	360 VA
	ASM:	360 VA
	µSM-FL:	400 VA
	TVM:	150 VA
	SO:	540 VA

PHYSICAL SPECIFICATIONS

ACQUITY UPLC M-Class System (µBSM, µSM-FL, TVM)	Width: 34.3 cm (13.5 inches) Height: 69.7 cm (27.4 inches) Depth: 71.2 cm (28.0 inches)
Sample Organizer	Width: 25.4 cm (10.0 inches) Height: 96.5 cm (38.0 inches) Depth: 71.1 cm (28.0 inches)

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