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ACQUITY Premier with Binary Solvent Management

The Waters™ ACQUITY™ Premier System is the first to offer novel MaxPeak™ High Performance Surfaces (HPS) Technology that provides a truly inert LC system and is holistically designed to complement the Waters sub-2-µm particle ACQUITY Premier Column family. This system represents the ultimate in chromatographic performance and confidence.
The ACQUITY Premier System reduces variability and losses due to surface interactions, while avoiding time consuming passivation and/or additive use. The system also increases sensitivity, repeatability, and confidence in analytical results, ultimately leading to time savings, improved productivity, and better decision making. This configuration features the robustness and low dispersion of binary solvent management with a direct-injection style sample manager. The ACQUITY Premier System is available with a choice of column management options.

ACQUITY PREMIER WITH BINARY SOLVENT MANAGEMENT FEATURES

Total system bandspread,[†] 5σ	≤12 µL, default configuration for Flow-Through Needle (FTN) ≤11 µL, default configuration for Fixed Loop (FL)
Dwell volume (total system)[†]	≤115 µL, default configuration for FTN ≤110 µL, default configuration for FL
Gradient delay volume[†]	≤90 µL, default configuration for FTN ≤85 µL, default configuration for FL
Integrated leak management	Leak sensors, as standard, and safe leak handling
System synchronization	Injection synchronization between both pumps and the sample manager enhances retention time reproducibility
Operating flow rate range	0.001 to 2.000 mL/min, in 0.001 mL increments (firmware version 1.71 and later)
Maximum operating pressure	15,000 psi up to 1.0 mL/min, 9000 psi up to 2.0 mL/min
pH range[†]	1 to 12.5
Unattended operation	Leak sensors, full 96-hour diagnostic data display through console software
Cycle time	≤30 s inject-to-inject for FTN ≤15 s inject-to-inject for FL

BINARY SOLVENT MANAGER (BSM)

Number of solvents	Up to four, in combination of two, A1 or A2 and B1 or B2
Solvent conditioning	Five vacuum degasser chambers, one allocated for injector purge solvent
Gradient formation	High pressure mixing, binary gradient
Gradient profiles	11 gradient curves (including linear, step [2], concave [4], and convex [4])
Primary check valves	Intelligent Intake Valves (i^2Valve)
Flow accuracy[†]	±1.0% of set flow rate at 0.500 mL/min, as per Empower™ SystemsQT™
Flow precision[†]	≤0.075% RSD or 0.01 min SD, (0.2 to 2.0 mL/min), whichever is greater using premixed solvent

Composition ripple (baseline noise)†	≤1.0 mAU
Composition precision†	≤0.15% RSD or ±0.01 min SD, whichever is greater
Composition accuracy†	±0.5% absolute from 5% to 95%, 0.2 to 2.0 mL/min
Pressure pulsation†	≤0.4% or 25 psi, whichever is greater
Compressibility compensation	Automatic, no user intervention required
Priming	Wet priming runs at a flow rate of 4 mL/min
Pump seal wash	Equipped with a programmable active wash system to flush the rear of the high-pressure seals and the plungers
Flow ramping	Automatic
Primary wetted materials	Titanium, PPS, fluoropolymer, fluoroelastomer, UHMWPE blend, sapphire, ruby, zirconia, Nitronic 60, DLC, PEEK and PEEK blend, Inconel 600, FEP
Mixing options	Standard: 50 µL Optional: 340 µL

SAMPLE MANAGER-FTN (SM-FTN)

Injection volume range	0.1 to 10.0 µL as standard configuration Up to 1000.0 µL with optional extension loop
Accuracy	±0.2 µL, measured by fluid weight removed from vial with 10.0 µL injections averaged over 20 injections using standard 100-µL syringe
Precision†	≤1% RSD, 0.2 to 1.9 µL ≤0.5% RSD 2.0 to 4.9 µL ≤0.25% RSD 5.0 to 100.0 µL
Linearity†	≥0.999
Maximum sample capacity	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
Sample compartment	4.0 to 40.0 °C, settable in 0.1 °C increments; maintains 19 °C below ambient with a temperature range tolerance range between -2 and +4 °C
Temperature accuracy	±0.5 °C at sensor
Temperature stability	±1.0 °C at sensor
Sample manager heat time	≤30 min, ambient-40 °C
Sample manager cool time	≤60 min, ambient-4 °C
Injection needle wash	Integrated, active, programmable
Minimum sample required	3 µL residual, using Waters Total Recovery 2-mL Vials (zero offset)

Sample carryover[†]	≤0.002% caffeine (UV) ≤0.002% sulphadimethoxine (MS)
Advanced sample manager capabilities	Auto-dilution and auto-addition
Primary wetted materials	Vespel SCP, PEEK blend, DLC, HPS

SAMPLE MANAGER FL (SM-FL)

Injection volume range	0.1 µL to 250.0 µL, in 0.1-µL increments 10 µL loop standard with 1, 2, 5, 20, 50, 100, and 250 µL optional loops
Linearity[†]	≥0.999, (default needle) from 20% to 75% of loop, Partial Loop uses Needle Overfill mode, (PLUNO), per SystemsQT protocol
Injection mode	Three – Full Loop mode, for optimal quantitation and dispersion; Partial Loop mode for fastest cycle time, and Partial Loop uses Needle Overfill mode; default mode, for optimal quantitation using partial loop injection volumes
Precision[†]	<1% area RSD, 0.2 to 1.9 µL injection <0.5% area RSD, 2 to 10 µL injection ≤0.25% area RSD, 5 to 50 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 four additional positions for dilution functions
Sample compartment	4.0 to 40.0 °C, settable in 0.1 °C increments; maintains 19 °C below ambient with temperature range a tolerance range between -2 and +4 °C
Temperature accuracy	±0.5 °C at sensor
Temperature stability	±1.0 °C at sensor
Sample manager heat time	≤30 min, ambient-40 °C
Sample manager cool time	≤60 min, ambient-4 °C
Injection needle wash	Integrated, active, programmable, dual wash
Minimum sample required	3 µL residual, using Waters Total Recovery 2-mL Vials (zero offset)
Sample carryover[†]	≤0.001% caffeine (UV) ≤0.001% sulphadimethoxine (MS)
Advanced sample manager capabilities	Load Ahead and Loop Offline mode, valve cycle timed event
Primary wetted materials	UHMWPE blend, DLC, titanium alloy, gold, sapphire, ruby, zirconia, Nitronic 60, fluoropolymer, PEEK and PEEK blend, fluoroelastomer, HPS

COLUMN HEATER (CH-A AND CH-30A)

Column capacity	CH-A: Single column, up to 4.6 mm internal diameter (I.D.), up to 150 mm in length with filter or guard column; mounting extends out for use with MS-based detector CH-30A: Single column, up to 4.6 mm internal diameter (I.D.), up to 300 mm length with filter or guard column
Fittings	15,000 psi, low dispersion, with reusable column inlet fittings
Column compartment temperature range	Settable from 20.0 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
Column compartment heat time	≤15 min from ambient to 60 °C
Solvent conditioning	Active pre-heating as standard; passive pre-heating (for legacy method support)
Column tracking	eCord™ Technology column information management tracks and archives column usage history (Care and Use information can be access by use of custom QR code)

COLUMN MANAGEMENT (CM-A AND CM-AUX)

Column capacity	CM-A: Two columns, as standard (maximum length of 150 mm with filter or guard column), up to 4.6 mm internal diameter (I.D.) CM-Aux: Two columns (maximum length of 150 mm, with filter or guard column), up to two CM-Aux units can be configured with one CM-A for support of up to six columns
Switching valves	Two nine-port, eight-position valves (CM-A only); provides programmable access switching, waste, and bypass positions for rapid solvent changeover
Column compartment(s) temperature range	4.0 to 90.0 °C, settable in 0.1 °C increments; two independent heat/cool zones
Column compartment(s) temperature accuracy	±0.5 °C at sensor
Column compartment(s) temperature stability	±0.3 °C at sensor
Column compartment heat time	≤15 min ambient-60 °C
Column compartment cool time	≤15 min from 60-20 °C
Solvent conditioning	Active pre-heating as standard; passive pre-heating (for legacy method support)
Fittings	15,000 psi, low dispersion, with reusable column inlet fittings
Column tracking	eCord Technology column information management tracks and archives column usage history

SAMPLE ORGANIZER

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 19 384-well plates
Sample compartment	4.0 to 40.0 °C, settable in 0.1 °C increments with a tolerance range between temperature range -2 and +4 °C
Temperature accuracy	±1 °C at the sensor
Temperature stability	±1 °C at the sensor

BASED INSTRUMENTAL CONTROL

External control	Empower Software, MassLynx™ Software, waters_connect™ 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

ENVIRONMENTAL SPECIFICATIONS

Acoustic noise	≤62 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	BSM: 360 VAC FTN: 400 VAC CM-A: 400 VAC

PHYSICAL SPECIFICATIONS

ACQUITY PREMIER

System with Binary Solvent Management: BSM, SM-FTN, CH-A	Width:	34.3 cm (13.5 in.)
	Height:	71.1 cm (28.0 in.)
	Depth:	71.2 cm (28.0 in.)
Sample Organizer	Width:	25.4 cm (10.0 in.)
	Height:	96.5 cm (38.0 in.)
	Depth:	71.1 cm (28.0 in.)

[†]*For specific test conditions, contact your Waters Sales Representative.*