Waters
THE SCIENCE OF WHAT'S POSSIBLE.™

nanoACQUITY UPLC System

The Waters® nanoACQUITY UPLC® System supplies direct (non-split) capillary and nanoflow rates for high-resolution chromatographic separations optimized for columns ranging from 1 mm to 75 µm internal diameter.

Core components of the nanoACQUITY UPLC System include: nanoACQUITY UPLC Binary Solvent Manager, nanoACQUITY UPLC Sample Manager with integrated heating and trapping module, nanoACQUITY UPLC Auxiliary Solvent Manager, and optional ACQUITY UPLC Tunable UV-Visible (TUV) Detector. Also available is Waters full line of mass spectrometers ranging from single quadrupole, tandem quadrupole, and hybrid quadrupole time-of-flight (QTof), to High Definition MS™ (HDMS™).

nanoACQUITY UPLC BINARY SOLVENT MANAGER

Number of solvents	Up to four: A1, A2, B1 and B2. User must choose A1 or A2 and B1 or B2 before the start of the gradient	
Solvent storage	Solvent tray accommodates up to four chromatographic solvents, two Sample Manager wash solvents and one Binary Solvent Manager wash solvent	
Solvent conditioning	Vacuum degassing (six channel): one channel per solvent and two channels for Sample Manager wash solvents	
Operating flow rate range	200 nL/min to 100 µL/min without flow splitting	
Compressibility compensation	Automatic and continuous	
Effective system delay volume	<1 µL, from point of gradient mixing to analytical column; sample loop off-line	
Plunger seal wash	Integral, active, programmable	
Gradient profiles	11 gradient curves [including linear, step (2), concave (4) and convex (4)]	
Wet prime	Automatic, user programmable	
Maximum operating pressure	10,000 psi	
Primary wetted materials	316 stainless steel, UHMWPE, sapphire, ruby, FEP, PTFE, ETFE, diamond-like coating, PEEK and PEEK alloys, titanium alloys, alumina ceramic, fused silica	
Gradient precision	<0.25 min standard deviation for retained peptides, n=6	
Conditions	Flow rate:	400 nL/min
	Sample:	MassPREP™ Enolase Digestion Standard (p/n 186002325)
	Injection mode:	Partial loop in 5 µL loop (injection volume 1.0 µL)
	Column:	100 µm i.d. X 100 mm, Waters BEH 130, 1.7 µm column
	Column temp.:	35 °C
	Eluent A:	Water/0.1% formic acid
	Eluent B:	Acetonitrile/0.1% formic acid
	Gradient:	Linear from 5 to 50% B over 30 minutes
	Detection:	UV at 214 nm

nanoACQUITY UPLC SAMPLE MANAGER

Number of sample plates	Total of two plates: 96 and 384 microtiter plates 48 position 2 mL vial plates 48 position 0.65 mL micro-centrifuge tube plates 24 position 1.5 mL micro-centrifuge tube plates
Maximum sample capacity	768 in two 384-well plates
Number of sample injections	1 to 99 injections per sample
Injection volume range	0.1 µL to 50 µL, in 0.1 µL increments, partial or full loop mode, 5-µL loop is standard; 2-µL, 10-µL, 20-µL, and 50-µL loops also available
Sample delivery precision	<0.3% RSD, full loop, 3x overfill, 5 to 50 µL (default wash/purge conditions, degassed methanol:water, 60:40 pre-mix, 1 mL/min, six replicates, propylparaben mix, 254 nm)
Injector linearity	>0.999 coefficient of deviation (from 2 to 10 µL, partial loop mode using 20-µL loop with 2 µL air gaps – no conditions cited)
Sample temperature control	4 to 40 °C, programmable in 0.1 °C increments (with ambient temperature of 20 °C)
Sample probe	XYZZ based needle-in-needle design
Minimum sample required	5 µL, using maximum recovery 2 mL vials
Wash solvents	Two degassed: strong solvent and sample compatible solvent, programmable to suit application, made available from the Binary Solvent Manager
Sample carryover	<0.005% or <2.0 nL, whichever is greater (with dual wash)
Sample loading options	Can use fixed loop injector to load multiple sample loop volumes on to a trapping column to increase sample loading capacity independently of sample loop volume

nanoACQUITY UPLC HEATING AND TRAPPING MODULE

Column heater	Accommodates one column, up to 250 mm length x 75 µm, pivots out for use with optional mass spectrometer
Column temperature control	5 °C above ambient to 65 °C, 0.1 °C increments

nanoACQUITY UPLC AUXILIARY SOLVENT MANAGER

NanoLockSpray™ addition	Choice of two calibrating solutions
Flow rate range	200 nL/min to 50 µL/min
Column trapping pump	Choice of two eluents
Flow rate range	1 µL/min to 100 µL/min

ACQUITY UPLC TUV OPTICAL DETECTOR (optional – see Waters literature 720000465EN)

Wavelength range	190 to 700 nm
Light source	Deuterium arc lamp, 2000-hour warranty
Bandwidth	5 nm
Wavelength accuracy	±1 nm
Wavelength repeatability	±0.25 nm
Power-up diagnostics	Optics and electronic diagnostic routine
Lamp on/off timer	Remote event input, time programmable
Analytical flow cell design	Light-guided UPLC® flow cell, 500 nL, 10-mm pathlength
Nano-scale flow cell design	Transverse-illuminated, 10 nL
Pathlength	Standard 10 mm (both high and low flow rate flow cells), nano 75-µm pathlength
Illuminated cell volume	Analytical 500 nL (both high and low flow rate flow cells), nanoflow 10 nL
Wetted materials	316 stainless steel, fused silica, PTFE
Pressure limit	1000 psi

ACQUITY UPLC INSTRUMENT CONTROL

External communications	Ethernet interfacing via RJ45 connection to host PC
Event inputs/outputs	Rear panel contact closure and/or TTL inputs/outputs
External control	MassLynx™ Software
User diagnostics	Available through software on host PC via the Instrument Console software

ENVIRONMENTAL

Acoustic noise	<65 dBA
Operating temperature range	15 to 28 °C (58 to 82 °F)
Operating humidity range	20% to 80%, noncondensing

POWER REQUIREMENTS

Voltage range	90 to 264 Vac
Frequency	47 to 63 Hz

PHYSICAL DIMENSIONS

Core ACQUITY UPLC® System:		
Binary Solvent Manager,	Width:	13.5 inches (34.3 cm)
Sample Manager with Column Heater,	Height:	36.3 inches (92.2 cm)
Solvents Tray and TUV or PDA Detector	Depth:	28 inches (71.1 cm)

ORDERING INFORMATION	PART NUMBER
nanoACQUITY UPLC System (core)	176016000
nanoACQUITY UPLC System (base – without Auxiliary Solvent Manager)	176016001
nanoACQUITY UPLC System with 2D Technology	176016002
nanoACQUITY UPLC Cart	205016040
ACQUITY UPLC Tunable UV (TUV) Detector	186015028
ACQUITY UPLC TUV Nano Flowcell, 10 nL	205015013

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