

ACQUITY APC System Specifications

Waters® ACQUITY® Advanced Polymer Chromatography® (APC™) System defines a new category of chromatographic polymer analysis that gives you more information about your polymers, faster than ever before. Combining low-dispersion system fluidics with rigid, small particle columns of a wide-range of pore sizes, the system defines the ultimate in polymer peak resolution, particularly for low molecular weight oligomers. Getting more information about your polymers in less time means better characterization, better asset utilization, and ultimately a better solution for achieving your scientific, business and sustainability goals.

ACQUITY APC SYSTEM FEATURES

Integrated leak management	Leak sensors, as standard equipment, compatible with the supported solvents and safe leak handling. Drip trays direct all leaks to the front of the instrument and into the waste line.
Maximum operating pressure	15,000 psi up to 1 mL/min, 9,000 psi up to 2 mL/min
Super synchronization	Synchronization between the solvent manager pistons enhances retention time reproducibility
Operating flow range	0.010 to 2.00 mL/min in 0.001 mL increments
pH range	2 to 12
Unattended operation	Full 96-hour diagnostic data displayed through the instrument console software

ACQUITY APC ISOCRATIC SOLVENT MANAGER

Number of eluents	One standard, or six with optional solvent selection valve.
Solvent conditioning	Two integrated, vacuum degassing channels, one of which is used for the SM-pFTN purge solvent
Primary check valve	Intelligent Intake Valve (<i>i² Valve</i>)
Pump seal wash	Equipped with a wash system to flush the rear of the high-pressure seal and the plunger
Compressibility compensation	Automatic and continuous with no user intervention required
Priming	Automated priming at flow rate of 4 mL/min
Flow ramping	0.01 to 30.00 min to reach 2.0 mL/min
Flow accuracy	±1.0% of set flow at 0.5 to 2.0 mL/min (both water and THF) with back pressure at 2000 psi ± 10%
Flow precision	<0.075% RSD or <0.020 min SD, whichever is greater based on six replicates of a polystyrene standard at 10-µL injection volume, 0.5, 1.0, and 1.5 mL/min, 100% THF, ACQUITY APC XT 200 Å, 2.5 µm 4.6 x 150 mm, column at 40 °C, RI detection

ACQUITY APC ISOCRATIC SOLVENT MANAGER (CONTINUED)

Flow drift	Flow precision over 24 hrs: <0.2% RSD for 24 injections (one per hour) based on 24 replicates of a polystyrene standard at 10 μ L injection volume, 1.0 mL/min, 100% THF, ACQUITY APC XT 200 \AA , 2.5 μ m 4.6 x 150 mm, column at 40 $^{\circ}$ C, RI detection
Primary wetted materials	302 SS, 316 SS, Nitronic 60, titanium alloy, fluoropolymer, UHMWPE blend, fluoroelastomer, PPS, zirconia, ruby, sapphire, DLC, gold, PEEK, MP35N, PEEK blend, polyimide
Solvent selection	Automatic up to six solvents (optional)

ACQUITY APC SAMPLE MANAGER WITH FLOW-THROUGH-NEEDLE

Injection volume range	0.5 to 50.0 μ L as standard 0.1 to 250.0 μ L with or without optional extension loops
Injection needle wash	Integral, active, programmable
Number of sample plates	Two
Maximum sample capacity	96 in 2-mL vial holders. For more information see Waters Sample Vials and Accessories brochure
Injection accuracy (aspiration)	\pm 0.2 μ L, measured by water weight removed from vial with 10.0- μ L injections over 20 injections using standard 100- μ L syringe
Injection linearity	>0.999 based from 0.5- μ L to 50- μ L injections of a polystyrene standard, 0.5 mL/min, 100% THF, ACQUITY APC XT 200 \AA , 2.5 μ m 4.6 x 150 mm, column at 40 $^{\circ}$ C, RI detection
Injection precision	<0.5% RSD 2.0 to 50.0 μ L based six replicates at each injection volume of a polystyrene standard, 0.5 mL/min, 100% THF, ACQUITY APC XT 200 \AA , 2.5 μ m 4.6 x 150 mm, column at 40 $^{\circ}$ C, RI detection
Sample compartment temperature range	4.0 $^{\circ}$ C to 40.0 $^{\circ}$ C, settable in 0.1 $^{\circ}$ C increments with a tolerance range between -2 $^{\circ}$ C and +4 $^{\circ}$ C
Temperature accuracy	\pm 0.5 $^{\circ}$ C at the sample compartment temperature sensor
Temperature stability	\pm 1.0 $^{\circ}$ C at the sample compartment temperature sensor
Sample carryover	<0.005% caffeine (UV) based on carryover after 4 mg/mL standard, 5- μ L injection volume, 90/10 water/acetonitrile (for eluent, wash solvents, and diluent/blank), 0.6 mL/min, ACQUITY UPLC [®] BEH C18 1.7 μ m 2.1 x 50 mm column at 40 $^{\circ}$ C, UV detection at 273 nm
Primary wetted materials	316 SS, PPS, polyimide, fluoropolymer

ACQUITY SINGLE ZONE COLUMN MANAGER

Column capacity	One bank of columns connected in series: - Maximum of four 30- to 75-mm columns - Maximum of three 150-mm columns Two modules configurable per APC System
Valves	Optional valves for column switching, column bypass, waste, or solvent recycling
Solvent conditioning	Active pre-heating as standard
Column tracking	Individual eCord™ connectors for all columns in the bank
Temperature range	Controlled 4.0 °C to 90.0 °C settable in 0.1 °C increments
Time to temperature ready	12 min after door open 30 s, at internal temperature sensor after 1 hour thermal equilibrium at set point
Temperature accuracy	±0.5 °C measured at sensor on trough
Temperature precision	±0.1 °C measured at sensor on trough
Temperature stability	±0.3 °C measured at sensor on trough
Primary wetted materials (including optional valves)	PEEK, 316 SS, polyimide, fluoropolymer
Column switching with optional valves	- Up to 2 APC column banks (one bank per CM-S module) - Up to 2 GPC column banks (two banks in CM-30S)

ACQUITY 30 CM SINGLE ZONE COLUMN MANAGER (OPTIONAL)

Column capacity	Support for one or two banks of up to four columns per bank: - Maximum column length 300 mm, plus 50 mm guard column - Maximum column ID 8 mm
Solvent conditioning	Passive pre-heating (standard)
Column tracking	Optional eCord connectors with support for up to four columns per bank
Temperature range	Settable 20 °C to 90 °C in 0.1 °C increments Controllable (ambient +5 °C) to 90 °C
Time to temperature ready	12 min after door open 30 s, at internal temperature sensor after 1 hour thermal equilibration at 60 °C temperature set point, 25 °C ambient temperature.
Temperature accuracy	±0.5 °C measured at sensor
Temperature precision	±0.1 °C measured at sensor
Temperature stability	±0.3 °C measured at sensor
Primary wetted materials	316 SS, DLC

ACQUITY APC INSTRUMENT CONTROL

External control	Empower® 2 FR5 or later, or Empower 3
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 faster problem resolution

PHYSICAL/ENVIRONMENTAL SPECIFICATIONS*

Acoustic noise	< 62 dBA, system
Operating temperature range	15 °C to 40 °C (59 °F to 104 °F)
Operating humidity range	20% to 80%, non-condensing
Dimensions	Width: 34.3 cm (13.5 in.) Height: 70.6 cm (27.8 in.) Depth: 71.2 cm (28.0 in.)
Weight	74.9 kg (165.0 lbs.)

*Core system with single CM-S only

ELECTRICAL SPECIFICATIONS

Power requirements	100 to 240 VAC
Line frequency	50 Hz to 60 Hz
Power consumption*	1000 VA

*Core system with single CM-S only

Waters

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