

Appendix A

Specifications

This appendix includes the following specifications for the Waters Alliance 2795 XE Separations Module with optional column heater and optional bar code reader:

- Physical
- Environmental
- Electrical
- Solvent management system
- Sample management system
- Instrument control and communication

Table A-1 Physical Specifications

Item	Specification
Height	22.5 in. (57 cm)
Depth	23.5 in. (60 cm)
Width	23 in. (58 cm)
Weight	136 lb. (62 kg)
Wetted Surface Materials	316 stainless steel, UHMWPE, sapphire, ruby, Tefzel [®] (ETFE), Teflon [®] (FEP and PTFE), PEEK, Fluoroloy G, Fluoroloy-08R

Table A-2 Environmental Specifications

Item	Specification
Operating Temperature	4 to 40 °C
Relative Humidity	20 to 80%, noncondensing
Acoustic Noise	<65 dB(A)
Solvent Compatibility (see Appendix C, Solvent Considerations)	Solvents consistent with materials of construction. Salts and buffers can reduce seal life, especially at pressures in excess of 3000 psi.

Table A-3 Electrical Specifications

Item	Specification
Line Voltage	85 to 264 Vac
Frequency	47 to 63 Hz

Table A-4 Solvent Management System Specifications

Item	Specification
Number of Solvents	One to four, three with vacuum degas
Solvent Conditioning	Vacuum degas, three solvents plus purge solvent
Typical Operating Flow Rate Range	0.050 to 5.000 mL/min in 0.001-mL/min increments
Programmable Flow Rate Range	0.000 and 0.010 to 10.000 mL/min in 0.001-mL/min increments
Compressibility Compensation	Automatic and continuous
System Delay Volume	<400 μ L, independent of backpressure, 1 mL/min
Plunger Seal Wash	Integral, active, programmable
Gradient Profiles	Eleven (11) gradient curves [including linear, step (2 curves), concave (4 curves), and convex (4 curves)]
Dry Prime/Wet Prime	Automatic, front panel control
Flow Ramping	Time (0.01 to 30.00 min in 0.01-min increments) to reach maximum flow rate
Maximum Operating Pressure	5000 psi (345 bar) at 0.010 to 3.000 mL/min; Programmable upper and lower limits
Composition Range	0.0 to 100.0% in 0.1% increments
Composition Accuracy	\pm 0.5% absolute, independent of backpressure (Proportioning Valve Pair Test [degassed methanol:methanol/propylparaben, 2 mL/min, 257 nm])

Table A-4 Solvent Management System Specifications (*Continued*)

Item	Specification
Composition Precision	$\leq 0.15\%$ RSD or ≤ 0.02 min SD, whichever is greater, based on retention time. (Degassed 60% methanol:40% water Dial-a-Mix, 1 mL/min, six replicates, phenone mix, 257 nm)
Flow Precision	$\leq 0.075\%$ RSD or ≤ 0.02 min SD, whichever is greater, based on retention time (N = 6) or volumetric measures (0.200 to 5.000 mL/min), isocratic premix
Flow Accuracy	$\pm 1\%$ or 10 $\mu\text{L}/\text{min}$, whichever is greater, (0.200 to 5.000 mL/min), degassed methanol, at 600 psi backpressure

Table A-5 Sample Management System Specifications

Item	Specification
Number of Sample Plates	Total of four plates: <ul style="list-style-type: none"> • Microtiter plate – 96- or 384-well • Vial plate – 2.0-mL vial (48) • Tube plate – 0.5-mL microcentrifuge tube (48) or 1.5-mL microcentrifuge tube (24) • Open access plate – 2.0-mL vial (24 or 48)
Sample Temperature Control	4 to 40 °C, programmable in 1 °C increments
Maximum Sample Capacity	1536 in four 384-well plates
Number of Sample Injections	1 to 99 injections per sample
Sample Delivery Precision	$< 0.3\%$ RSD, full loop 50 μL . (Default wash/purge conditions, degassed 60% methanol:40% water Dial-a-Mix, 1 mL/min, six replicates, paraben mix, 257 nm)
Sample Volume Linearity	$> 0.999\%$ correlation, 5 to 20 μL , partial fill in 50- μL loop, 3- μL pre- and post-sample air gaps (Default wash/purge conditions, degassed 60% methanol:40% water Dial-a-Mix, 1 mL/min, six replicates, paraben mix, 257 nm)
Needle Wash Solvents	Two: wash (strong solvent) and purge (sample-compatible) solvent

Table A-5 Sample Management System Specifications (*Continued*)

Item	Specification
Sample Carryover	<0.01% or <2.5 nL (default wash/purge volumes), whichever is greater. (Blank injection, 25 µL, 60% methanol:40% water, after six replicates, 25 µL propylparaben, 1 g/L, 257 nm)

Table A-6 Instrument Control and Communication Specifications

Item	Specification
Parallel Sample Processing	User-programmable next-sample aspiration and loop fill, column equilibration, just-in-time gradient delivery
Advanced Operations	Auto addition, sample pooling, open access, priority samples
Column Heater	20 °C (5 °C above ambient) to 60 °C, in 1 °C increments
Column Selection	3- or 6-column select valve (optional)
IEEE-488 Interface	Control of Waters IEEE-488 equipped detectors; communication with Millennium ³² Chromatography Manager workstations or MicroMass detectors using MassLynx software
RS-232 Interface	Output of ASCII text files to a printer/PC/integrator (Port A)
Floppy Disk Drive	1.44-MB, 3.5-inch floppy disk, for methods transfer and archiving; reportable GLP log; sample list import from ASCII file
Event Inputs	Three TTL or switch closures
Programmable Event Outputs	Six contact closures