



Thermo Scientific UltiMate 3000 RSLCnano UHPLC System

Comprehensive and versatile low-flow UHPLC system for routine and advanced LC-MS applications

UltiMate 3000 RSLCnano benefits

- Best-in-class retention time precision with ProFlow technology
- Wide UHPLC flow and pressure footprint
- Optimized ultra-high performance platform for proteomics, metabolomics, and biopharmaceutical analysis the ultimate solution for all separation workflows

Keywords

UltiMate 3000 RSLCnano, low-flow UHPLC, nano, capillary, micro, nanoViper, ultimate precision

The Thermo Scientific™ UltiMate™ 3000 RSLCnano modular system offers precision, productivity and performance for all your low-flow UHPLC needs.

Versatile

- Standardized workflows for virtually all LC-MS applications
- No sample loss and high injection precision with unique μL pick-up mode
- Nano, capillary, and micro flow rates support routine and method development workflows, providing flexibility when optimizing for highest MS sensitivity or throughput
- Two low-dispersion, two-position snap-in switching valves allow users to setup any column-switching application (Figure 2)
- Integrated ternary micro pump enables sample pre-concentration and multidimensional workflows
- Full compatibility with the state-of-the-art Thermo Scientific Mass Spectrometers
- 75 cm \times 75 μm fused silica nanoViper columns give higher peak capacity for nano LC separations (Figure 3)



Figure 1. Thermo Scientific™ ProFlow™ technology.



Figure 2. 10-port 2-position switching valve with Thermo Scientific™ nanoViper™ connections.



Figure 3. Thermo Scientific™ Acclaim™ PepMap™ 75 cm × 75 μm column.

Reliable

- Thermo Scientific ProFlow technology results in unsurpassed retention time precision for nano separations, even for long gradients
- Fast and effortless LC-MS system start-up and operation
- Thermo Scientific nanoViper fingertight UHPLC connections for ease-of-use and system setup within minutes
- Two-column setup with uninterrupted flow on separation column and nanospray increases LC-MS robustness

Specifications

Thermo Scientific UltiMate 3000 RSLCnano System

Recommended flow range	50 nL/min–50 μL/min (controlled with dedicated flow meters); 50–2500 μL/min with ternary micro pump (only in NCS-3500RS)
Max. available column pressure	With nano ProFlow flow meter: 900 bar (13,050 psi) With capillary flow meter: 800 bar (11,600 psi) With micro flow meter: 800 bar (11,600 psi)
System delay volume	<350 nL in pre-concentration configuration
Retention time RSD	≤0.2% RSD or <0.1 SD whichever is greater with a 30 min gradient
Safety features	System wellness monitoring, leak sensors, active rear-seal wash system, excess pressure monitoring, emergency shut-down
pH range	2–10
Wetted parts	MP35N, titanium, PEEK, UHMW-PE, PTFE, FEP, sapphire, ZrO ₂ , Al ₂ O ₃ , fused silica, SST, PCTFE, perfluoro elastomer (FFKM)

NCS-3500RS - Binary High Pressure Gradient (HPG) Pump with Ternary Micro Pump and Column Compartment NCP-3200RS - Binary HPG Pump

Binary High Pressure Gradient (HPG) Pump

Flow rate range and maximum pressure	Nano ProFlow flow meter: 0–1,500 nL/min (recommended: 50–1,500 nL/min) 900 bar (13,050 psi) at full flow range Capillary flow meter: 0–15 μL/min (recommended: 0.5–10 μL/min) 800 bar (11,600 psi) at nominal flow rate 5 μL/min Micro flow meter: 0–50 μL/min (recommended: 5–50 μL/min) 800 bar (11,600 psi) at nominal flow rate 25 μL/min
Gradient delay volume	<25 nL
Number of solvent channels	2
Wetted parts HPG	MP35N, titanium, PEEK, UHMW-PE, PTFE, FEP, ZrO ₂ , Al ₂ O ₃ , fused silica, sapphire, PCTFE, SST

Ternary Micro Pump (Only in NCS-3500RS)

Micro pump (low pressure gradient)	Flow rate range: 0–2500 μL/min; recommended 5–2500 μL/min; gradient formation is recommended from 50 μL/min
Maximum pressure	620 bar (9,000 psi)
Number of solvent channels	3
Delay volume	220 μL
Proportioning accuracy/precision	±1.0% of full scale/<0.3% SD
Wetted parts	Titanium, PEEK, UHMW-PE, PTFE, FEP, ZrO ₂ , Al ₂ O ₃ , perfluoro elastomer (FFKM)

Specifications (cont'd)

Column Compartment (Only in NCS-3500RS)

Temperature range	Room temperature + 7 °C up to 75 °C
Temperature accuracy/precision	±0.5 °C (at 50 °C setpoint)/±0.1 °C
Temperature stability	±0.1 °C (at 50 °C setpoint)
Heat-up time	From 35 °C to 65 °C in 12 min at an ambient temperature of 25 °C
Switching valves	Up to two valves 6-port 2-position (port-to-port volume: 91 nL, maximum pressure: 1034 bar (15,000 psi)) 10-port, 2-position (port-to-port volume: 114 nL, maximum pressure: 1034 bar (15,000 psi))
Capacity	Maximum available width for column plus fittings: 350 mm; coiled fused silica columns
Features	Humidity sensor (column compartment), leak sensor, gas leak sensor, active rear-seal wash system, excess pressure monitoring

NCS-3500RS/NCP-3200RS Features and Dimensions

GLP features	Column tracking
Dimensions	NCS-3500RS (h × w × d): 36 × 42 × 51 cm (14.2 × 16.5 × 20 in.) NCP-3200RS (h × w × d): 21 × 42 × 51 cm (8.3 × 16.5 × 20 in.)
Weight	NCS-3500RS: 32 kg (70.6 lb); NCP-3200RS: 17.5 kg (38.6 lb)
Power requirements (automatic voltage selection)	100–120 V, 60 Hz 200–240 V, 50 Hz; max 300 VA
PC connection	USB 2.0; USB hub with three integrated sockets
I/O interfaces	Two digital inputs and two programmable outputs
Additional communication port	15-pin D-Sub port for connection of a solvent rack or degasser

Autosampler (WPS-3000TPL RS)

Injection volume range	0–20 µL (recommended 20 nL–20 µL with different nanoViper sample loops); upgrade kit for injection volumes up to 125 µL available
Sample capacity	3 × well plates (128 × 86 mm) 15 × 10 mL vials for reagents, diluents, and transport liquids*
Sample formats	96 (deep) well plate, 384 (deep) well plate, sealed or open; 40 standard autosampler vials, 1.8 mL, sealed or open*
Injection cycle time	<30 s for a 1 µL full-loop injection
Injection valve:	6-port 2-position UHPLC valve (maximum pressure: 1034 bar/15,000 psi) optionally a PEEK or Titanium valve can be ordered (maximum pressure: 345 bar/5,000 psi)
Maximum pressure	1034 bar (15,000 psi)
Injection methods	Full loop and partial loop injections, low-dispersion mode, µL pick-up, user-defined programs
Injection technique	Needle-in-needle with programmable needle wash
Injection precision	<0.4% RSD for 1 µL full loop injection
Injection linearity	Correlation coefficient >0.9995, at 100 to 500 nL partial-loop injections, caffeine in water
Carryover	<0.02% for caffeine with external wash
Sample cooling	4–45 °C, or 22 °C below ambient
Biocompatible version	Yes (upgrade kit available)
Fraction collection	Yes, with sample cooling (WPS-3000TFC, extra parts required: nano/cap modification kit and injection valve, 2pos-6port, C82 for WPS 3000TPL RS)
Wetted parts	PEEK, SST, PEEK, PCTFE, PEEKsil™, fused silica
Dimensions (h × w × d)	36 × 42 × 51 cm (14.2 × 16.5 × 20 in.)
Weight	24 kg (53 lb)
Power requirements (automatic voltage selection)	100–120 V, 60 Hz 200–240 V, 50 Hz
PC connection	USB; USB hub with three integrated sockets
I/O interfaces	Four digital inputs and four programmable outputs

*Contact local sales representative for specific information

Specifications (cont'd)

UV/Vis Detector (VWD-3400RS)

Data collection rate	Up to 200 Hz (in single wavelength mode); 5 Hz in multichannel mode
Maximum number of channels	4
Lamps	Deuterium lamp, Tungsten lamp Temperature control for both lamps
Drift	4.0 mAU/h
Wavelength range	190–900 nm ±1 nm
Noise	Typically <0.05 mAU at 254 nm
Wavelength accuracy	1 nm
Flow cell volume	3 nL for nano LC; 45 nL for capillary LC; 180 nL for micro LC
Dimensions (h × w × d)	16 × 42 × 51 cm (6.3 × 16.5 × 20 in.)
Weight	15 kg (33 lb)
Power Requirements (automatic voltage selection)	100–120 V, 60 Hz 200–240 V, 50 Hz
PC connection	USB
I/O and analog interfaces	Two digital inputs and two programmable outputs Two analog inputs available as an option via DAC plug-in module

Solvent Rack with Degasser (SRD-3400)

Capacity	Sixteen 0.5 L reservoirs
Degassing channels	4 (SRD-3400); 0 (SR-3000)
Channel volume	670 µL
Wetted materials	Teflon AF, PEEK, and Tefzel
Status LEDs	Power, vacuum pump status, error (vacuum and/or leak)
Power supply and communication	15-pin D-Sub (through UltiMate 3000 pumps) or external power supply
Dimensions (h × w × d)	10 × 42 × 51 cm (3.9 × 16.5 × 20 in.)
Weight	With internal degasser: 4.8 kg (10.6 lb)

Software

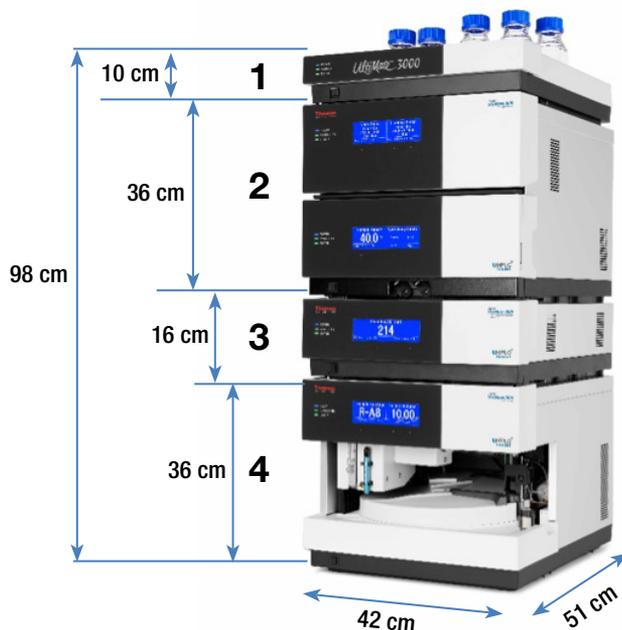
Stand-alone UltiMate 3000 RSLCnano system	Thermo Scientific™ Chromeleon™ 7.2 SR4 or later, Chromeleon 6.8 SR16 or later*
UltiMate 3000 RSLCnano with Thermo Scientific MS detectors	Thermo Scientific Standard Instrument Integration (SII) 1.2 or later for Xcalibur™ and Chromeleon 7.2 SR4 or later; Chromeleon 7.2 SR4 or later*
UltiMate 3000 RSLCnano with Bruker MS detectors	DCMSLink™ based on Chromeleon 6.8 SR16 or later for Bruker Compass™/HyStar™*

*Contact local sales representative for more details about instrument control

Ordering information

In the U.S., call (800) 346-6390 or contact the Thermo Fisher Scientific Regional Office nearest you. Outside the U.S., order through your local Thermo Fisher Scientific office or distributor. Refer to the following part numbers:

Description	Part Number
NCS-3500RS Nano LC Pump with ProFlow Flow Meter and Column Compartment	5041.0010A
NCS-3500RS Nano LC Pump with Capillary Flow Meter and Column Compartment	5041.0020
NCP-3200RS Nano LC Pump with ProFlow Flow Meter	5041.0030A
Capillary Flow Meter for NCS-3500RS, NCP-3200RS	6041.7902A
Micro Flow Meter for NCS-3500RS, NCP-3200RS	6041.7903A
WPS-3000TPL RS Thermostatted Pulled-loop Well Plate Autosampler	5826.0020
WPS-3000TFC Thermostatted Fraction Collector	5824.0020
PAEK Modification Kit for Biocompatible Autosampler	6821.0045
Upgrade Nano/Cap Kit for Fraction Collector WPS-3000TFC	6825.0030
Injection valve, 2pos-6port, C82 for WPS 3000TPL RS	6826.0011A
125 µL loop/250 µL Syringe Upgrade Kit	6820.0031
VWD-3400RS Variable Wavelength Detector (Without Flow Cell)	5074.0010
Flow Cell for VWD-3000 Series (3 nL/45 nL)	6074.0270/6074.0280
SRD-3400 Solvent Rack with Four Degasser Channels	5035.9245
SR-3000 UltiMate 3000 Solvent Rack without Degasser	5035.9200
ProFlow Flow Meter (Nano)	6041.7850
Upgrade Kit for ProFlow Flow Meter	6041.3003
Direct Injection Nano LC Kit	6720.0300
Direct Injection Capillary LC Kit	6720.0305
Pre-concentration Nano LC Kit	6720.0310
Pre-concentration Capillary LC Kit	6720.0315
Pre-concentration Monolithic LC Kit	6720.0320
2D Salt Plug Kit	6720.0325
Automated off-line RP-RP Peptide Separation Kit	6720.0340
Automated off-line SCX-RP Peptide Separation Kit	6720.0330
Tandem Nano LC Kit	6720.0335
MS Connection Kit	6720.0345
EASY-Spray Connection Kit	6720.0395
Low-Dispersion valve 2pos-10port, C82, for NCS	6041.0001A
Low-Dispersion valve 2pos-6port, C82, for NCS	6041.0004A



Find out more at [thermofisher.com/nanoLCMS](https://www.thermofisher.com/nanoLCMS)

ThermoFisher
SCIENTIFIC

©2018 Thermo Fisher Scientific Inc. All rights reserved. All trademarks are the property of Thermo Fisher Scientific and its subsidiaries. This information is presented as an example of the capabilities of Thermo Fisher Scientific products. It is not intended to encourage use of these products in any manners that might infringe the intellectual property rights of others. Specifications, terms and pricing are subject to change. Not all products are available in all countries. Please consult your local sales representatives for details. **PS71899-EN 0418S**