



Thermo Scientific
UltiMate 3000 RSLCnano System

Versatility and performance

The ultimate solution
for all separation workflows

Thermo
SCIENTIFIC

Robust UHPLC with full flow flexibility

Wide UHPLC footprint to tune for highest resolution or throughput

- New Thermo Scientific™ ProFlow™ technology for outstanding performance in nano flow applications
- Precise flow control from nano to micro flow rates for unsurpassed retention time precision

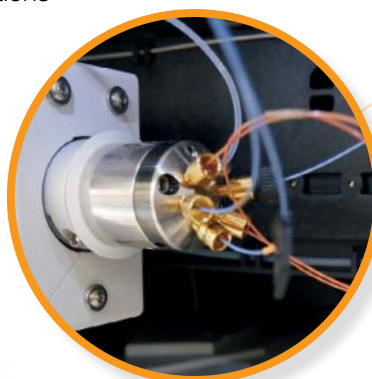
	Nano	Capillary	Micro	Analytical
Flow range, $\mu\text{L}/\text{min}$	0.05–1.5	1.0–10	10–50	>50
Typical column inner diameter, mm	0.075	0.3	1.0	2.1

SENSITIVITY

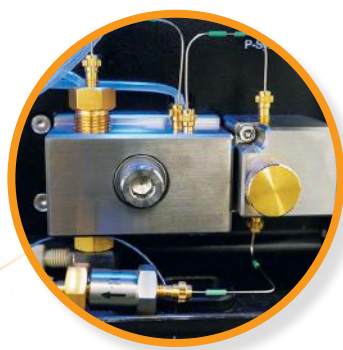
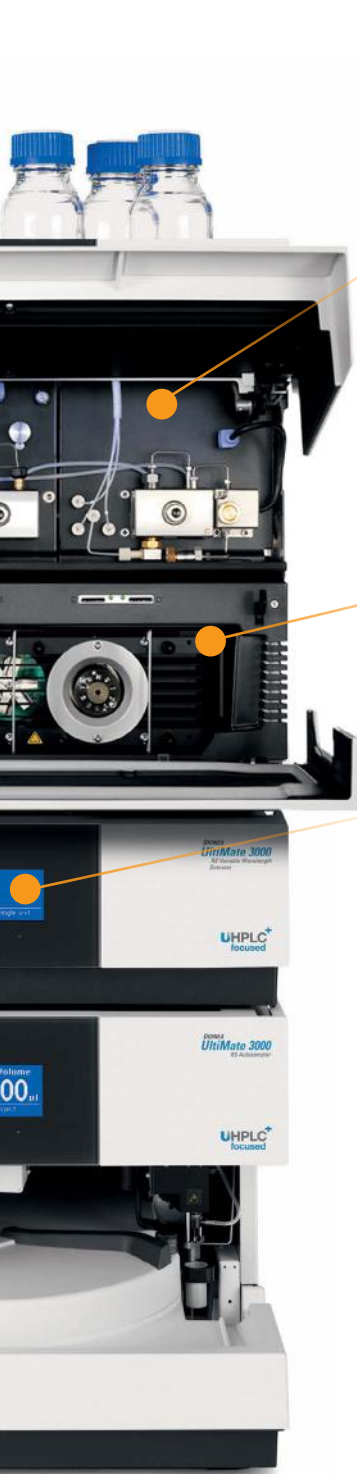
THROUGHPUT

Powerful autosampler for maximum operational performance

- Near zero sample loss with unique μL pick-up injections
- High precision for sub- μL volume injections
- Micro fraction collection option for two-dimensional workflows



Uncompromised versatility to drive any separation



One system for all low flow workflows

- Micro and analytical flow ternary pump for sample loading and multidimensional applications
- Fingertight Thermo Scientific™ nanoViper™ UHPLC connections for ease-of-use and system setup within minutes
- Two low-dispersion snap-in valves for standardized workflows and custom column switching applications



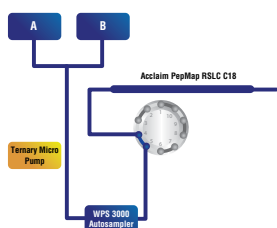
Straightforward operation and integration

- Robust software integration with Thermo Scientific mass spectrometers via Standard Instrument Integration (SII) for Thermo Scientific™ Xcalibur™
- Faster system start-up and simpler operation with ProFlow technology
- UV/Vis variable wavelength detector with dedicated flow cells for nano, capillary and micro LC for precise quantification without compromising performance

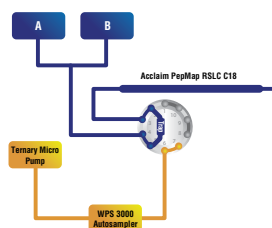


Easy to set up advanced and standardized workflows

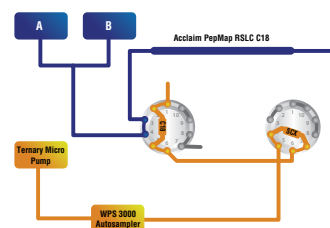
1. Direct injection



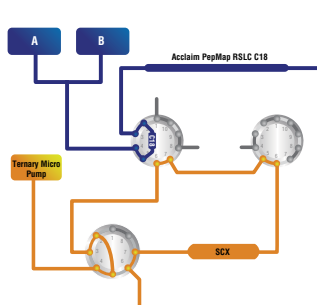
2. Pre-concentration



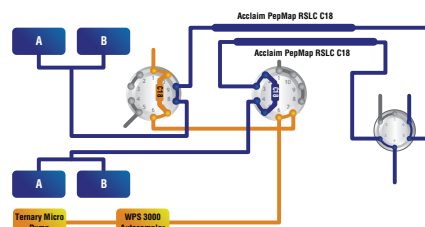
3. 2D salt plugs



4. Offline fractionation



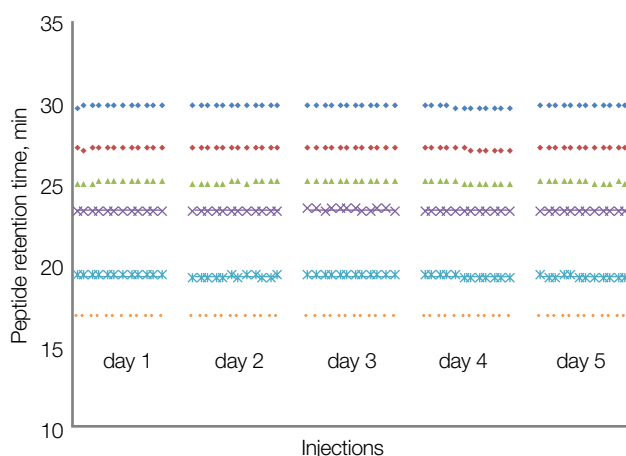
5. Tandem LC



Ultimate performance for nano LC separations

Best-in-class nano flow precision with the new ProFlow technology

Exceptional gradient reproducibility and retention time precision for highest confidence in qualitative and quantitative results



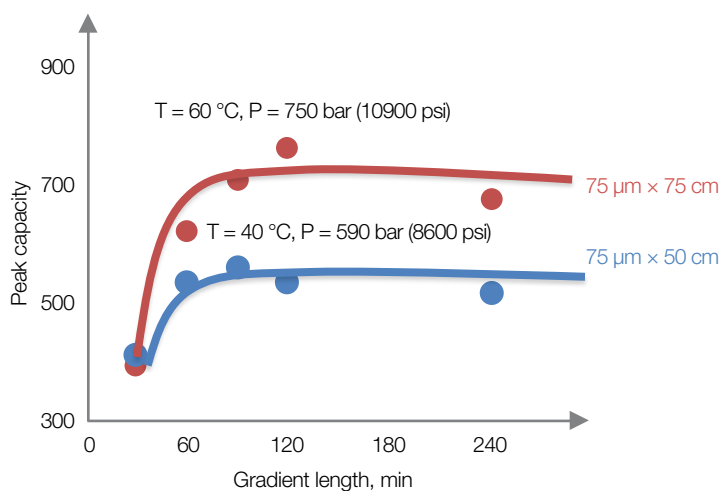
- RSD less than 0.20%
- 30 min gradient
- 75 μm $\times$ 150 mm, 2 μm , Thermo Scientific™ Acclaim™ PepMap™ columns
- Cytochrome C digest
- Five days of operation, 12 replicates per day

“Upgrading to the ProFlow meter resulted in superior retention time stability and system robustness.”

Hjalmar Permentier, Interfaculty Mass Spectrometry Center, University of Groningen

Maximum peak capacity with long columns for unbeatable separation performance

Longer nano LC columns, near zero dead volume nanoViper connections and accurate column temperature control provide exceptional chromatographic efficiency to reveal low abundant components in complex mixtures



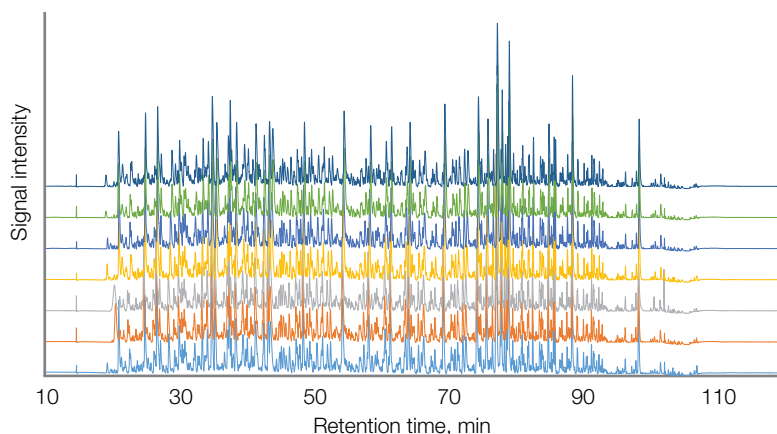
- 75 μm $\times$ 500 mm, 2 μm and 75 μm $\times$ 750 mm, 2 μm , Acclaim PepMap columns
- Cytochrome C digest
- 12 replicates per gradient length
- Peak capacity was calculated using full width at half maximum (FWHM)



Confident identification and accurate quantification in proteomics

Unparalleled run-to-run, day-to-day reproducibility

High-throughput label free-quantification in large sample cohorts with highest confidence



- 90 min gradient
- 75 μm $\times$ 500 mm, 2 μm , Thermo Scientific™ EASY-Spray™ column
- HeLa cell lysate digest
- Seven consecutive replicates
- MS detection: Thermo Scientific™ Q Exactive™ HF
- Flow rate: 300 nL/min

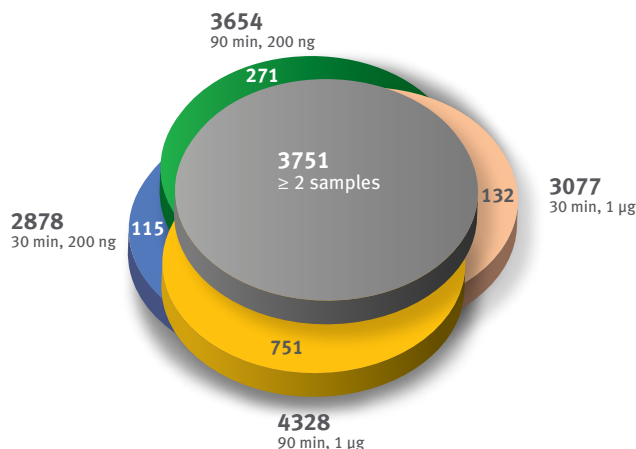
“ProFlow technology allows robust long-term nano LC-MS operation with less maintenance and delivers the highest performance.”

Mark Larance, Centre for Gene Regulation and Expression, University of Dundee

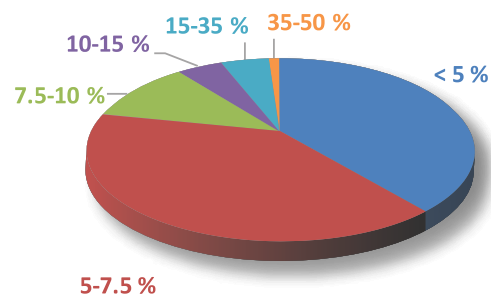
Seamless integration of efficient nano UHPLC separations and high-resolution accurate mass spectrometry

Deep proteome coverage and relative protein quantification for large scale discovery studies

Number of identified proteins with different gradient lengths and sample loading amounts



>40,000 targets were quantified with less than 15% peak area RSD

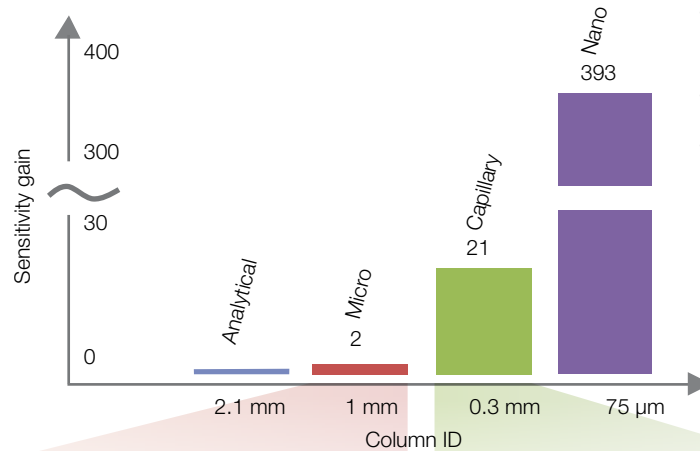


Number of peak frames that were quantified with corresponding RSD, % values for seven replicates; 50,000 peak frames in total

Tune for the highest resolution or the fastest analysis time with widest flow footprint

Select highest throughput or sensitivity

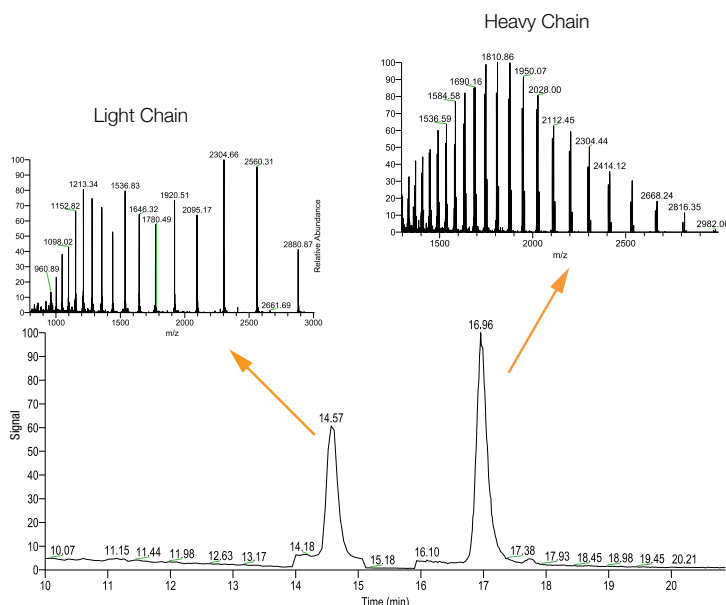
The unique combination of nano, capillary, micro and analytical flow rates allows to optimize for high resolution, high speed, and high sensitivity in different application areas



- Sensitivity gain compared to 2.1 mm ID column
- Cytochrome C protein digest
- Q Exactive HF Full MS detection

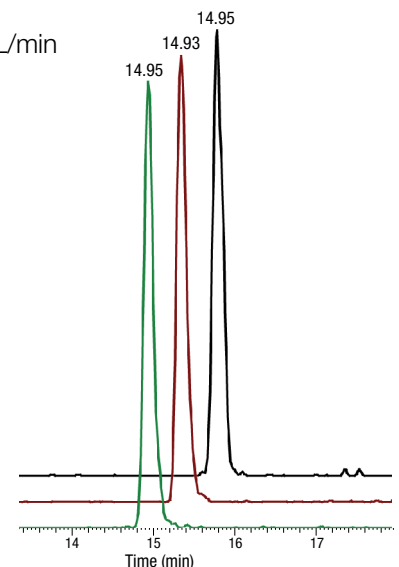
Reliable intact protein separation for quality control of biopharmaceuticals

- Rituximab was reduced with Dithiothreitol
- 1.0 × 50 mm, Thermo Scientific™ ProSwift™ RP-10R column
- UV and MS detection with HESI source



Fast, sensitive and robust targeted peptide quantification with capillary flow rates

- 10 amol sensitivity
- Three consecutive replicates
- 0.3 × 50 mm, 2 µm, Acclaim PepMap column
- HESI-II probe
- Flow rate: 4 µL/min



The Thermo Scientific nano LC portfolio:

The right choice for every lab



EASY-nLC 1200
Operational simplicity
and excellent performance



UltiMate 3000 RSLCnano
Versatility and unsurpassed
precision

Performance	Splitless nano flow	✓	✓
	System pressure	○ ○ ○	○ ○ ●
	Retention time precision	○ ○ ●	○ ○ ○
	Nano flow range	○ ○ ○	○ ○ ○ ¹
System features	Space saving	○ ○ ○	○ ○ ●
	Design	Integrated	Modular
	Column compartment	n.a. ²	✓
	Sample capacity	○ ● ○	○ ○ ○
	Zero-loss sample pick-up	✓	✓
	Nano flow pump	High pressure binary syringe pump	High pressure binary continuous flow pump
	Micro flow pump	n.a.	Low pressure ternary gradient pump
	Direct injection	✓	✓
Application range	Pre-concentration	Vented column setup	Continuous direct flow by integrated micro flow pump
	2D salt steps	—	✓
	Offline fractionation	—	✓ ³
	Tandem nano LC	—	✓ ³
	Integrated PC	✓	—
Software features	Audit trail	—	✓

¹ Easily expandable to capillary and micro flow rates. More information available at www.thermoscientific.com/nanoLCMS

² Not applicable, built-in heating for EASY-Spray column.

³ May require an additional nano pump and corresponding application kit.

Full compatibility with state-of-the-art mass spectrometers

Thermo Scientific low flow LC systems offer market leading performance and interface seamlessly with all Thermo Scientific ESI sources and MS families.



Thermo Scientific™ EASY-nLC™ 1200
Operational simplicity and excellent performance



Thermo Scientific™ Dionex™ UltiMate™ 3000 RSLCnano
Versatility and unsurpassed precision



Thermo Scientific™ EASY-Spray™ source



Thermo Scientific™ EASY-Spray™ column

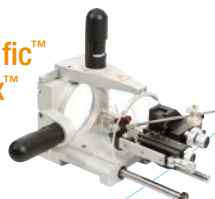


Thermo Scientific™ Q Exactive™ HF hybrid quadrupole-Orbitrap mass spectrometer

Thermo Scientific™ Ion Max ion source



Thermo Scientific™ Nanospray Flex™ ion source



Thermo Scientific™ Orbitrap Fusion™ Lumos™ Tribrid™ mass spectrometer



Thermo Scientific™ TSQ Quantiva™ triple quadrupole mass spectrometer



For more information,
visit: www.thermofisher.com/nanoLCMS or www.planetorbitrap.com

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