Versatility and performance

The ultimate solution for all separation workflows
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

<table>
<thead>
<tr>
<th></th>
<th>Nano</th>
<th>Capillary</th>
<th>Micro</th>
<th>Analytical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flow range, µL/min</td>
<td>0.05–1.5</td>
<td>1.0–10</td>
<td>10–50</td>
<td>&gt;50</td>
</tr>
<tr>
<td>Typical column</td>
<td>0.075</td>
<td>0.3</td>
<td>1.0</td>
<td>2.1</td>
</tr>
<tr>
<td>inner diameter, mm</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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 × 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 × 500 mm, 2 µm and 75 µm × 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 × 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

Reliable intact protein separation for quality control of biopharmaceuticals

- Rituximab was reduced with Dithiothreitol
- 1.0 x 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 quantification

- 10 amol sensitivity
- Three consecutive replicates
- 0.3 x 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

<table>
<thead>
<tr>
<th>Performance</th>
<th>EASY-nLC 1200</th>
<th>UltiMate 3000 RSLCnano</th>
</tr>
</thead>
<tbody>
<tr>
<td>Splitless nano flow</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>System pressure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Retention time precision</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nano flow range</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Space saving</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Design</td>
<td>Integrated</td>
<td>Modular</td>
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<tr>
<td>Column compartment</td>
<td>n.a.</td>
<td>✓</td>
</tr>
<tr>
<td>Sample capacity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zero-loss sample pick-up</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Nano flow pump</td>
<td>High pressure binary syringe pump</td>
<td>High pressure binary continuous flow pump</td>
</tr>
<tr>
<td>Micro flow pump</td>
<td>n.a.</td>
<td>Low pressure ternary gradient pump</td>
</tr>
<tr>
<td>Direct injection</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Pre-concentration</td>
<td>Vented column setup</td>
<td>Continuous direct flow by integrated micro flow pump</td>
</tr>
<tr>
<td>Application range</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2D salt steps</td>
<td>–</td>
<td>✓</td>
</tr>
<tr>
<td>Offline fractionation</td>
<td>–</td>
<td>✓</td>
</tr>
<tr>
<td>Tandem nano LC</td>
<td>–</td>
<td>✓</td>
</tr>
<tr>
<td>Software features</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Integrated PC</td>
<td>✓</td>
<td>–</td>
</tr>
<tr>
<td>Audit trail</td>
<td>–</td>
<td>✓</td>
</tr>
</tbody>
</table>

1 Easily expandable to capillary and micro flow rates. More information available at [www.thermoscientific.com/nanoLCMS](http://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.

The Thermo Scientific nano LC portfolio: The right choice for every lab
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.