

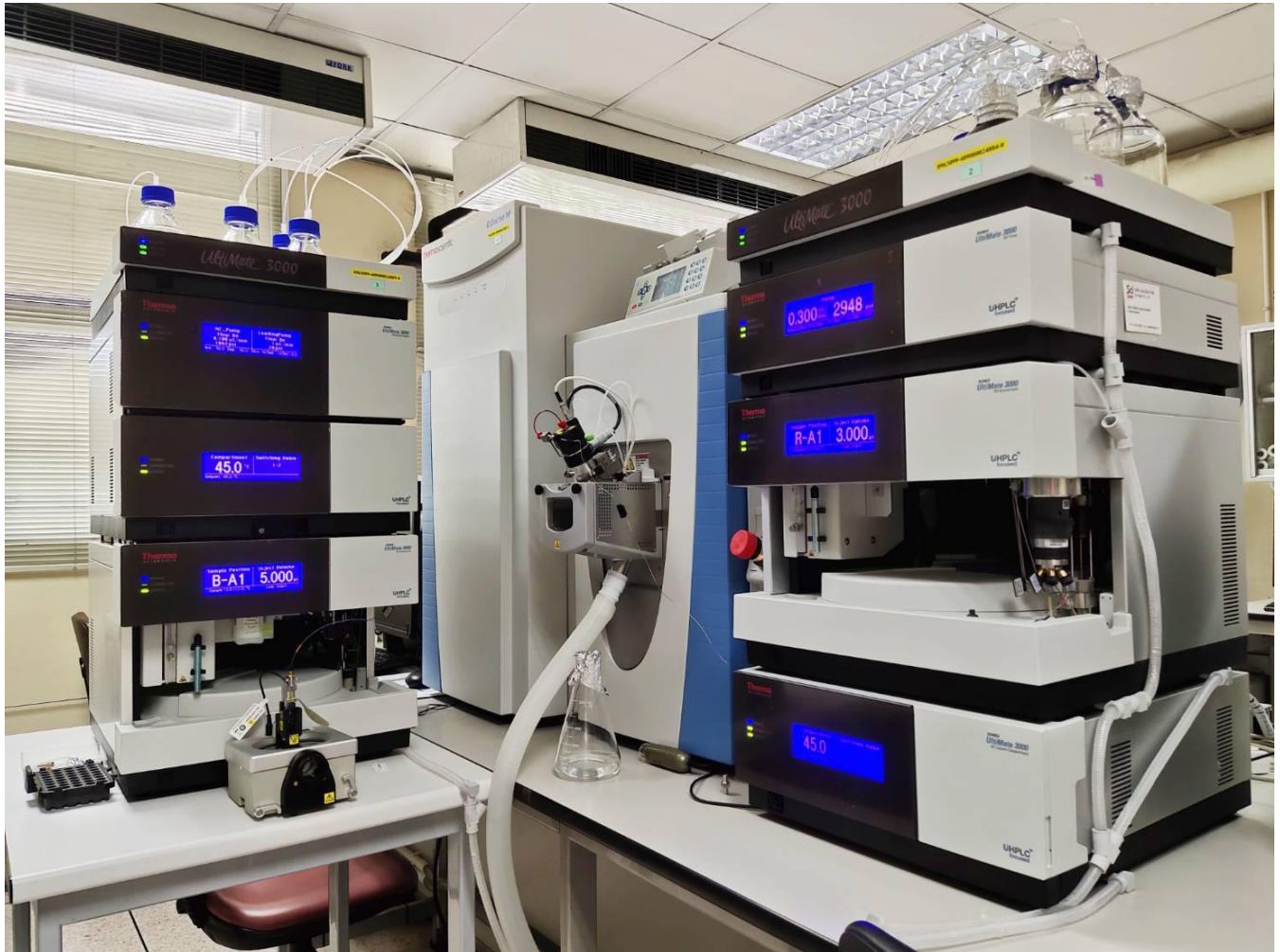
## Nano LC Orbitrap-MS/MS

**Brand:** Thermo Scientific

**Model:** Nano LC: UltiMate3000nano  
Orbitrap: Q Exactive HF  
UHPLC: UltiMate 3000

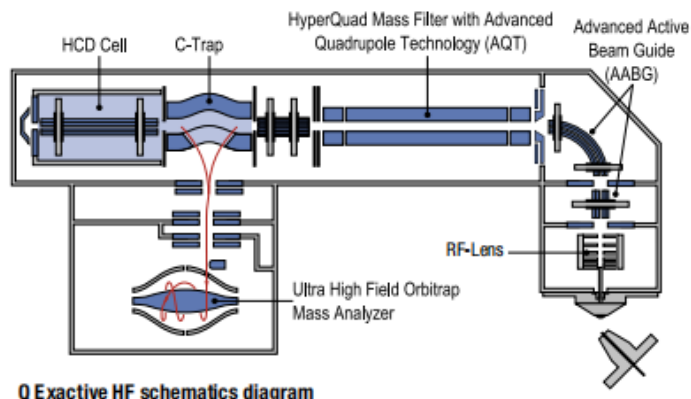
**Location:** K651 Room, 6<sup>th</sup> Floor, Chaloeprakiet Building, Phyathai Campus

**Custodian:** Pradup Mesawat



Mass Analyzer: Orbitrap

Model: Q Exactive HF



Performance Characteristics	
Scan speed	Up to 18 Hz with ultra-high-field Orbitrap Analyzer
Resolving power	Up to 240,000 (FWHM) at $m/z$ 200
Advanced Quadrupole Technology	Superior precursor isolation
Advanced Active Beam Guide (AABG)	Greater sensitivity and maximum robustness
Multiple approaches to qualification	Selected Ion Monitoring (SIM) Parallel Reaction Monitoring (PRM) Data-Independent Acquisition (DIA)
Routine mass accuracy	Ppm Higher-Energy Collisional Dissociation (HCD)
Enhanced analysis	Intact protein and protein complexes with optional intact protein mode

Performance Characteristics	
Resolving power	240,000@ $m/z$ 200
Mass range	50 to 6,000 $m/z$
Scan rate	Up to 18 Hz at resolution setting of 15,000@ $m/z$ 200
Mass accuracy	Internal: <1 ppm RMS External: <3 ppm RMS
Sensitivity	Full MS: 500 fg buspirone on column S/N 100:1 SIM: 30 fg buspirone on column S/N 100:1
Dynamic range	>5,000:1
Polarity switching	One full cycle in 1 sec (one full positive mode scan and one full negative mode scan at resolution setting of 60,000)
Multiplexity	Up to 10 precursor/scan
Analog inputs	One (1) analog input (0-1V) One(1) analog (0-10 V)

LC System: nano LC

Model: UltiMate3000nano



### 1. NCS-3500RS Binary High Pressure Gradient (HPG) Pump with Ternary Micro Pump and Column Compartment

Specifications	
<b>Thermo Scientific UltiMate 3000 RSLCnano System</b>	
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 <sub>2</sub> , Al <sub>2</sub> O <sub>3</sub> , fused silica, SST, PCTFE, perfluoro elastomer (FFKM)
<b>NCS-3500RS - Binary High Pressure Gradient (HPG) Pump with Ternary Micro Pump and Column Compartment</b>	
<b>NCP-3200RS - Binary HPG Pump</b>	
<b>Binary High Pressure Gradient (HPG) Pump</b>	
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 <sub>2</sub> , Al <sub>2</sub> O <sub>3</sub> , fused silica, sapphire, PCTFE, SST
<b>Ternary Micro Pump (Only in NCS-3500RS)</b>	
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 <sub>2</sub> , Al <sub>2</sub> O <sub>3</sub> , 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

## 2. WPS-3000TPL RS Autosampler

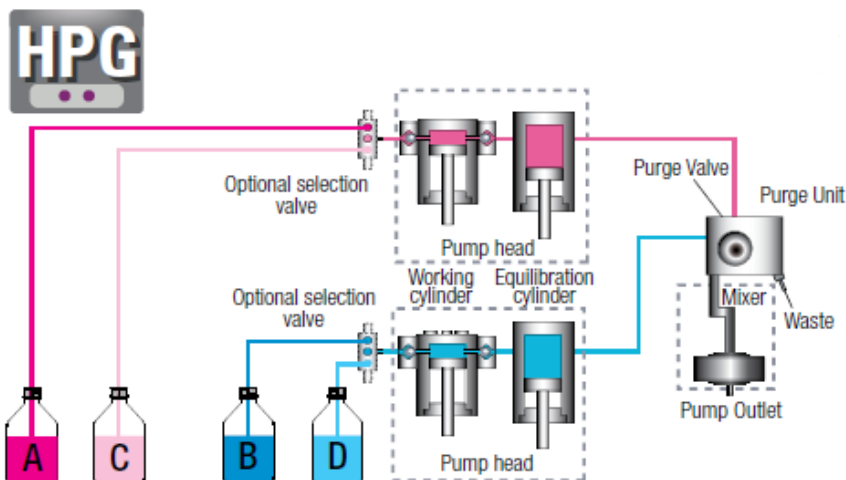
<b>Autosampler (WPS-3000TPL RS)</b>	
Injection volume range	0–20 $\mu$ L (recommended 20 nL–20 $\mu$ L with different nanoViper sample loops); upgrade kit for injection volumes up to 125 $\mu$ L available
Sample capacity	3 $\times$ well plates (128 $\times$ 86 mm) 15 $\times$ 10 mL vials for reagents, 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 $\mu$ L full-loop injection
Injection valve:	6-port 2-position UHPLC valve (maximum pressure: 1034 bar/15,000 psi) optionally a PAEK 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, $\mu$ L pick-up, user-defined programs
Injection technique	Needle-in-needle with programmable needle wash
Injection precision	<0.4% RSD for 1 $\mu$ L 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 $^{\circ}$ C, or 22 $^{\circ}$ 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, PAEK, PCTFE, PEEKsil™, fused silica
Dimensions (h $\times$ w $\times$ d)	36 $\times$ 42 $\times$ 51 cm (14.2 $\times$ 16.5 $\times$ 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

LC System: UHPLC

Model: UltiMate 3000

1. HPG-3400RSPump



ULTIMATE 3000 COMMON PUMP SPECIFICATIONS	
Operating Principle	Serial dual-piston
Flow Accuracy	± 0.1% (For BM pumps: ± 0.5%; For NCP-3200RS: < 0.1% RSD at 300 nL/min and 40 MPa)
Flow Precision	< 0.05% RSD or < 0.01 min SD whichever is greater
Pulsation	Typically: < 0.2 MPa or < 1% whichever is greater (For ISO-3100BM pump: Typically: < 0.02 MPa or < 0.1%, whichever is greater)
GLP Features	Full support of Thermo Scientific™ Dionex™ AutoQ instrument qualification, qualification status and system wellness monitoring. All system parameters are logged in the Chromeleon™ Audit Trail.
Communications	USB for PC connection, USB hub with 3 sockets integrated, 15-pin D-sub connector for solvent rack/degasser connection.
I/O Interface	2 digital inputs, 2 relay outputs.
Emission Sound Pressure Level	< 70 dB(A) in 1-m-distance
Dimensions (h × w × d)	16 × 42 × 51 cm (6.3 × 16.5 × 20 in)
Power requirements	100–120 V, 60 Hz; 200–240 V, 50 Hz

Pump Class

Thermo Scientific Dionex pump	HPG-3400RS
Flow range (recommended range)	0.001-8.0 mL/min (0.05-8.0 mL/min)
Max. Pressure	2-103.4 MPa up to 5 mL/min, 2-80 MPa up to 8 mL/min
Gradient Formation	High pressure proportioning
Proportioning Accuracy	±0.5% (full scale)
Proportioning Precision	<0.15% SD
No. of Eluent Lines	2
Gradient Delay Volume	35-1550 µL Default: 200 µL
Solvent Degassing	External (optional)

## 2. WPS-3000TRS Autosampler



### COMMON ULTIMATE 3000 WELL PLATE AUTOSAMPLER SPECIFICATIONS

Sample capacity	216 × 0.3 mL vials, 120 × 1.1 mL conical vials, 216 × 1.2 mL vials, 120 × 1.8 mL/2.0 mL vials, 66 × 4 mL vials, 30 × 10 mL vials, 3 × 24 deep well plates, 96 and/or 384 normal or deep well plates, 3 × 40 0.5 mL and/or 1.5 mL Eppendorf tubes*, and/or 3 × 384 low well PCR plates + 15 × 10 mL vials (depending on sample tray configuration; also for fractionation in (un-)capped vials, WPS-3000T(B)FC)
Needle wash	Active external needle wash
Sample thermostating	4–45 °C or 22 °C below ambient (thermostatted autosampler versions)
Sample temperature accuracy	± 2 °C (thermostatted autosampler versions)**
GLP Features	Full support of Thermo Scientific Dionex Automatic Equipment Qualification (AutoQ™), Qualification Status and System Wellness Monitoring. All system parameters are logged in the Chromeleon Audit Trail.
Communications	All functions controllable via USB; integrated USB hub with three USB 1.1 ports
I/O Interface	4 digital inputs, 4 programmable relay outputs
Emission sound pressure level	Typically < 65 dB(A) in 1-m-distance
Dimensions (h x w x d)	36 × 42 × 51 cm (14.2 × 16.5 × 20 in.)
Power requirements	100–120 V, 60 Hz; 200–240 V, 50 Hz
Weight	19 kg (42 lb), without cooling, 24 kg (53 lb) with cooling; WPS-3000T(B)FC: 25 kg (55 lb)

\* The in-line split-loop (flow-through) autosamplers (WPS 3000SL, WPS-3000RS, and WPS-3000XRS series) support sampling from uncapped (open) Eppendorf tubes. The pulled-loop autosamplers (WPS-3000PL and WPS-3000FC series) support piercing Eppendorf tube caps which are marked or specified as pierceable.

\*\* At a setpoint of 10 °C at ambient temperatures of ≤25 °C and ≤50% relative humidity.

### Autosampler Class

Autosampler	WPS-3000(T)RS
Injection method	In-line split-loop (flow-through) injections
Fraction modes	n.a.
Injection volume (recommended)	0.01-100 µL (1-100 µL) Optional: 0.2-25 µL, 1.5-250 µL, 1.5-500 µL
Injection volume accuracy	Typically ±0.5% at 20 µL
Minimum sample required	<0.25% RSD at 5 µL (typically <0.15% RSD) caffeine in water
Carryover	<0.004% for caffeine with external wash at 20 MPa
Injection cycle time	<15 s for 5 µL
Wetted parts	PEEK, stainless steel, PCTFE, Fused Silica

### 3. TCC-3000RS Column Thermostat

<b>ULTIMATE 3000 THERMOSTATED COLUMN COMPARTMENT SPECIFICATIONS</b>	
Temperature Range	5 °C – 110 °C Max. 18 °C below ambient
Temperature Accuracy	±0.5 °C
Temperature Stability	±0.1 °C
Temperature Precision	±0.1 °C
Heatup/Cooldown Time	Typically 12 min from 20 °C to 50 °C/Typically 15 min from 50 °C to 20°C at ambient temperature of 25 °C
Column Capacity	Up to 12 columns, depending on column length Max. column length: 30 cm
Postcolumn Cooler Capacity	TCC-3000RS only: $\Delta T > 40$ °C at 3 mL/min water and 100 °C compartment temperature
GLP Features	Full support of Automatic Equipment Qualification (Dionex AutoQ), Qualification Status and System Wellness Monitoring All system parameters are logged in the Chromeleon Audit Trail Column Identification System for four columns
Communications	All functions controllable via USB
I/O Interface	2 digital inputs, 2 programmable relay outputs
Emission Sound Pressure Level	< 65 dB(A) in 1 m distance
Dimensions (h × w × d)	19 × 42 × 51 cm (7.5 × 16.5 × 20 in.)
Power Requirements	100–120 V, 60 Hz; 200–240 V, 50 Hz