

LC-MS

Vanquish Neo UHPLC System

The new standard in nano-, capillary- and micro-flow LC

Beyond discovery

The Thermo Scientific™ Vanquish™ Neo UHPLC system is all-in-one nano-, capillary- and micro-flow LC system that is ready for high-sensitivity LC-MS workflows from discovery research with limited sample amounts to high-throughput validation in large sample cohorts.

- Thermo Scientific™ ProFlow™ XR pump technology enables robust operation up to 1500 bar from 1 nL/min to 100 µL/min
- Active flow control for the entire flow range ensures excellent retention time precision for long gradients as well as ultra-short run times
- Vial bottom detection technology enables injections from limited sample amounts
- Automated multi-wash of injection fluidics reduces system carryover to negligible levels

Beyond innovation

The Vanquish Neo UHPLC system is designed to accelerate productivity with long-term, trouble-free operation at maximum performance.

- Autosampler split-loop design with 1500 bar compatible low-dispersion maintenance-free ceramic valves, multifunctional metering device and Thermo Scientific™ nanoViper™ fittings maximizes productivity and enables robust operation
- Next-generation SmartInject technology minimizes column pressure shock for direct as well as trap-and-elute injections resulting in improved retention time precision, longer column lifetime, and stable electrospray ionization response
- Fast sample loading and column equilibration modes with pump operating at constant elevated pressure reduce overhead time and boost throughput



Beyond possibilities

The Vanquish Neo UHPLC system enables LC-MS experts and novice users to get high-quality results every time.

- Integrated system intelligence with standardized configurations for automated method setup guides the creation of optimal LC methods for reproducible LC-MS results
- Automatic procedures for rapid and reliable return of the system to operation after solvent exchange or system maintenance
- Thermo Scientific™ Vanquish™ User Interface with intuitive at-system control and system status monitoring enables access to guidelines, standalone diagnostics and maintenance routines

Specifications

Vanquish Neo UHPLC System— Binary pump N, split sampler NT, solvent rack, Vanquish user interface (VUI), system base with drawer, ship kit	
Settable flow range	1 nL/min–100 µL/min, in 1 nL increments
Recommended flow-range	100 nL/min–100 µL/min
Pressure range	150 MPa, (1500 bar, 21,750 psi) <small>Note: the total available column pressure depends on the mobile phase viscosity and flow rate (see the manual)</small>
Biocompatible	Yes
Gradient delay volume	<ul style="list-style-type: none"> • <0.5 µL in nano/cap direct injection configuration with 20 µm I.D. capillaries • <2.0 µL in micro direct injection configuration with 50 µm I.D. capillaries
pH range	2–10
Retention time precision	≤0.2% RSD or ≤0.1 SD min, whichever is greater for TGQAPGFSYTDANK Cytochrome C protein digest peptide based on the installation qualification procedure
Carryover (typical application)	≤0.1% for TGQAPGFSYTDANK Cytochrome C protein digest peptide using the installation qualification procedure
Vanquish User Interface (Vanquish System Controller and Vanquish Display)	<ul style="list-style-type: none"> • System monitoring • Direct system control • At-system diagnostics and troubleshooting • Remote access option (depending on on-site IT infrastructure)
Pump type and operation principle	<ul style="list-style-type: none"> • High-pressure binary gradient pump with active flow control • Serial dual-piston with independent piston drives
Pump solvent channels	2 (one per pump block); pre-calibrated for <ul style="list-style-type: none"> • 100% acetonitrile • 100% water • 80/20 acetonitrile/water (% , v/v) • 90/10 methanol/water (% , v/v) <small>Note: guided custom solvent calibration procedure is available to calibrate other solvents</small>
Contribution of the pump to the system gradient delay volume	<25 nL
Autosampler operating principle	Split-loop injection
Autosampler liquids	4 wash liquids: outer and inner needle wash, weak and strong each
Injection needle and fluidics wash	<ul style="list-style-type: none"> • Dip rinse and continuous rinse of outer needle surface with two independent wash liquids • Sample loop and inner needle rinse with two independent wash liquids
Degassing channels	2 built-in degassing channels for autosampler metering device wash liquids
Vial bottom detection technology	Yes, 2.5 µL out of 3 µL with vial bottom detection and recommended vials <small>Note: ≤0.5% RSD for injections from multiple vials</small>
SmartInject technology	Yes, with active pressure monitoring
Injection modes	<ul style="list-style-type: none"> • Direct injection with loop inline • Direct injection with loop offline • Tandem direct injection with loop offline • Trap-and-elute injection with back-flush or forward-flush elution • Heated trap-and-elute injection with back-flush or forward-flush elution (Column Compartment N with one 2-position 6-port switching valve is required)
Automation features	Barcode reading: <ul style="list-style-type: none"> • Empty segment detection • Rack/well plate identification • Inventory management

**Vanquish Neo UHPLC System—
Binary pump N, split sampler NT, solvent rack, Vanquish user interface (VUI), system base with drawer, ship kit**

Injection volume range	Default: 0.01–25 µL, min step 0.01 µL Optional: 0.01–100 µL, min step 0.01 µL High volume trapping by multiple draw-and-trap cycles up to 500 µL using 100 µL sample loop
Injection volume precision	From 0.05 to 0.20 µL: ≤5.0% RSD From 0.20 to 0.50 µL: ≤1.5% RSD From 0.50 to 2.00 µL: ≤0.5% RSD Above 2 µL: ≤0.25% RSD
Injection accuracy	Typically, ±0.5% for injection volume 5 µL (caffeine aqueous solution)
Injection linearity	$R \geq 0.9999$
Autosampler cooling	4–40°C, ≥23 K below ambient at <80% relative humidity
Sample temperature stability	±1°C
Sample formats and capacity	Any four of the following <ul style="list-style-type: none"> • 54 × 12 mm OD vials (≤1.5 mL) • 96 × 6, 7, and 8 mm OD vials (≤1.2 mL) • 16 × 15 mm OD vials (≤4 mL) • 9 × 22.5 mm OD vials (≤10 mL) • Well plates (96 and 384, deep and shallow, with SBS footprint) + capacity of 12 × 22.5 mm OD vials (≤10 mL) in the carousel Note: Refer to User Guide for recommended consumables.
Safety features	Leak detection and safe leak handling; excess pressure monitoring; temperature monitoring
System interlink	4 × system interlink connectors (2 pairs, RJ45-8)
PC connection	USB 2.0 3-port-HUB to connect further Vanquish modules LAN
I/O interfaces	2 × USB 2.0 (Host) 1 × LAN 2 × 6 pin Mini-Din connectors each having functionality: 1 input, 1 relay out
GLP features	<ul style="list-style-type: none"> • System wellness monitoring • Predictive performance functions for scheduling maintenance procedures based on the actual operating and usage conditions • System parameters logged in the Thermo Scientific™ Chromeleon™ Chromatography Data System (CDS) audit trail
Environmental conditions	5–35°C 20–80% relative humidity (non-condensing) Max. altitude 2000 m above sea-level
Power requirements	Binary Pump N: 100–240 V AC, ±10%; 50/60 Hz; max. 525 W / 550 VA Split Sampler NT: 100–240 V AC, ±10%; 50/60 Hz; max. 525 W / 550 VA VUI: 100–240 V AC ± 0%; 50/60 Hz; max. 50 W / 150 VA
Dimensions (h × w × d)	740 × 450 × 650 mm (29.1 × 17.7 × 25.6 in.) (Vanquish Display is positioned in front of the solvent rack)
Weight	66 kg = 145.5 lbs
Software control	
Vanquish Neo stand-alone (no MS detector)	Chromeleon CDS Version 7.2.10 MUE or higher; Chromeleon 7.3.1 or higher; Chromeleon 7.3.2 MUA or higher
Vanquish Neo with Thermo Scientific MS instruments	Chromeleon CDS Version 7.2.10 MUE or higher; Chromeleon 7.3.1 or higher; Chromeleon 7.3.2 MUA or higher with MS instruments supported by Chromeleon CDS Thermo Scientific™ Standard Instrument Integration (SII) for Xcalibur (version 1.7 or higher)

Optional modules

Column compartment N

Thermostatting principle	Forced-air mode, no cooling
Orientation	Horizontal
Temperature range	Min: 5 K above room temperature Max: 80°C without valves installed Max: 60°C with Vanquish valves installed
Temperature precision	±0.1 K
Temperature accuracy	±0.5 K (at 50°C setpoint)
Heat-up time	Less than 12 min from 35 to 65°C ±1 K
Column compatibility	<ul style="list-style-type: none">• Coiled fused silica columns• Linear columns with maximum available length for column plus fittings: 300 mm
Compartment dimensions (h × w × d)	343 × 78 × 37 mm (13.5 × 3.1 × 1.5 in.)
Switching valves	Optional, inside the column compartment, grounded Mixed configurations with compatible Vanquish and VICI™ valves are possible VICI valve drive has to be removed/installed by a certified engineer Up to 2 valves <ul style="list-style-type: none">• Vanquish valves<ul style="list-style-type: none">– 2-position 6-port Vanquish low-dispersion (LD) 1500 bar valve• VICI valves:<ul style="list-style-type: none">– 2-position 6-port C82 1034 bar valve– 2-position 6-port C82 1/32 VICI C2N 344 bar valve
Passive pre-heater	Installable, optional accessory 0.1 mm I.D. × 530 mm, MP35N
Biocompatible	Yes
System interlink	2 system interlink connectors (RJ45-8)
PC connection	USB 2.0
GLP features	Predictive performance functions for scheduling maintenance procedures based on the actual operating and usage conditions of the column compartment All system parameters are logged in the Chromeleon CDS audit trail
Environmental operating conditions	5–35°C 20–80% relative humidity (non-condensing) Max. altitude 2000 m above sea-level
Power requirements	100–240 V AC, ±10%; 50/60 Hz; max. 525 W/550 VA
Outer dimensions (h × w × d)	159 × 420 × 620 mm (6.3 × 16.5 × 24.4 in.)
Weight	11 kg (24.3 lbs) (without switching valves)

Binary pump N

Pump type and operation principle	High-pressure binary gradient pump with active flow-control Serial dual-piston with independent piston drives
Settable flow range	1 nL/min–100 µL/min, in 1 nL increments
Recommended flow-range	100 nL/min–100 µL/min
Pressure range	150 MPa, (1500 bar, 21,750 psi) <small>Note: the total available column pressure depends on the mobile phase viscosity and flow rate (see the manual)</small>
Pump solvent channels	2 (one per pump block); pre-calibrated for <ul style="list-style-type: none"> • 100% acetonitrile • 100% water • 80/20 acetonitrile/water (% v/v) • 90/10 methanol/water (% v/v) <small>Note: guided custom solvent calibration procedure is available to calibrate other solvents</small>
Contribution of the pump to the system gradient delay volume	<25 nL
Biocompatible	Yes
Safety features	Leak detection and safe leak handling; excess pressure monitoring
System interlink	2 system interlink connectors (RJ45-8)
PC connection	USB 2.0 3-port-HUB to connect further Vanquish modules
I/O interfaces	2 × 6 pin Mini-DIN connectors each having functionality: 1 input, 1 relay out
GLP features	Predictive performance functions for scheduling maintenance procedures based on the actual operating and usage conditions of the column compartment All system parameters are logged in the Chromeleon CDS audit trail
Environmental operating conditions	5–35°C 20–80% relative humidity (non-condensing) Max. altitude 2000 m above sea-level
Power requirements	100–240 V AC, ±10%; 50/60 Hz; max. 525 W/550 VA
Dimensions (h × w × d)	192 × 420 × 620 mm (7.6 × 16.5 × 24.4 in.)
Weight	26 kg (57.3 lbs)



Vanquish Neo UHPLC system



Vanquish Neo UHPLC system with Column Compartment N



Vanquish Neo UHPLC system with Tandem Direct Injection workflow

Ordering information

Description	Part number
System	
Vanquish Neo UHPLC System	VN-S10-A-01 and 6036.1180 Vanquish Display (required)
	Includes: Binary pump N, split sampler NT, solvent rack, Vanquish user interface (VUI), system base with drawer, ship kit
	The Ship kit includes all items required for following workflows: Direct injection Trap-and-elute (2-column setup) Heated trap-and-elute (requires column compartment N and 1 × 2pos-6port valve)
Optional modules	
Column compartment N	VN-C10-A-01
Binary pump N	VN-P10-A-01
Accessories	
Valve drive VICI, VN-C*	6253.1640
Vanquish low-dispersion valve 2pos-6port, 1500 bar	6250.1520
VICI valve 2pos-6port, 1034 bar*	6041.0001B
VICI valve 2pos-6port, 1/32 low pressure, PAEK*	6820.6232
VICI valve lock ring, VN-C	6253.1651
Sample loop, 25 µL	6252.1940
Sample loop, 100 µL	6252.1950
Sample loop, 10 µL	6252.1960
IonBench with stack mounting kit	6036.1720
Stack stabilizer kit	6036.1710
Passive pre-heater, 0.1 × 530 mm, MP35N, VH/VN-C	6732.0174
Tandem workflow kit	6250.1030

*VICI valve drive has to be removed/installed by a certified engineer

 Learn more at thermofisher.com/vanquishneo

For Research Use Only. Not for use in diagnostic procedures. © 2021, 2022, 2024 Thermo Fisher Scientific Inc. All rights reserved. VICI® is a registered trademark of Valco Instruments Co. Inc. All other 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 Inc. 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 representative for details. **PS74081-EN 0724**