

# Transcend TLX UHPLC Systems

Improve data, lower costs, and increase MS throughput

Thermo Scientific™ Transcend™ TLX UHPLC systems combine proprietary Thermo Scientific™ TurboFlow™ Technology online sample preparation technology and a unique HPLC multichannel LC technique to enable throughput of up to four separate, parallel UHPLC channels connected to a single mass spectrometer. Transcend TLX UHPLC Systems can be used with any Thermo Scientific™ mass spectrometer and also with other select mass spectrometers.

## Benefits of TurboFlow sample preparation technology

- Simplifies or eliminates offline sample preparation
- Lowers costs, labor, and time
- Reduces ion suppression through greater specificity and cleaner samples
- Streamlines method development—the same method can be used for multiple matrices
- Increases data confidence by removing interferences

## Benefits of multichannel LC technology

- Increases throughput and flexibility
- Decreases cost per sample
- Incorporates the leading precision of Thermo Scientific™ Vanquish™ Flex UHPLC pumps

## Multichannel LC maximizes the utility of your mass spectrometer and enhances your lab's return on investment

Use a two- or four-channel LC system in combination with a single mass spectrometer to increase LC-MS throughput, and enable faster return on investment.

- Reduces mass spectrometer idle time
- Increases sample throughput without changing validated methods

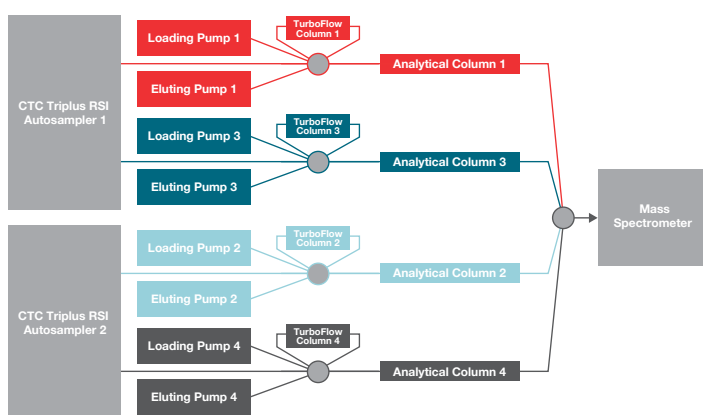
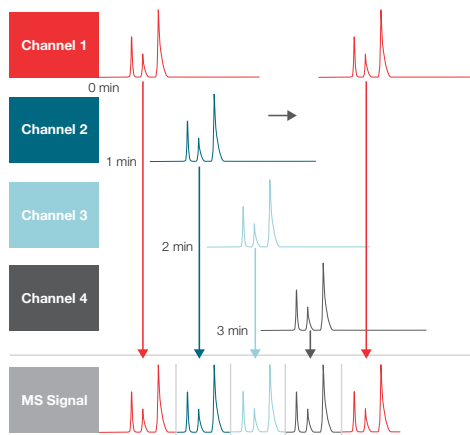


Diagram of Transcend TLX-4 system with four independent flow paths.

The unique Thermo Scientific multichannel LC technology provides the throughput of up to four separate, parallel LC systems connected to a single mass spectrometer. With Thermo Scientific™ Aria™ MX software, each channel operates independently, so you can run a single method or multiple methods simultaneously. This critical feature improves MS efficiency, unlike traditional single-channel LC systems whose detectors are typically idle more than 75 percent of the time. Transcend UHPLC systems ensure efficient utilization of your mass spectrometer with dramatically reduced idle time. Save money effortlessly and boost sample throughput, without compromising data quality or sensitivity.



**Injections are interleaved to maximize throughput and mass spectrometer utilization.**



**The Thermo Scientific™ Transcend™ TLX-1 UHPLC System incorporates the benefits of Turboflow Sample Preparation Technology.**



**The Thermo Scientific™ Transcend™ TLX-2 UHPLC System—doubles throughput compared to a single LC system and incorporates the benefits of Turboflow Sample Preparation Technology.**



**The Thermo Scientific™ Transcend™ TLX-4 UHPLC System—maximum throughput enabling four times the throughput of a single LC system with the additional benefits of Turboflow Sample Preparation Technology.**

## Specifications

<b>Transcend TLX-1 UHPLC System (PN 60500-60201)</b>	
Software	Aria MX software 2.6 or later Thermo Scientific™ Xcalibur™ 4.2 software or later Thermo Scientific™ Foundation™ platform 3.1 SP6 or later (Optional) Thermo Scientific™ TraceFinder™ 4.1 SP4 software or later
Number of solvent lines	10
Solvent and additives	LCMS-grade solvents
Supported reservoir containers	0.25 L to 5 L with maximum height <350 mm
<b>Loading Pump (LPG)</b>	<b>Vanquish Quaternary Pump F</b>
Gradient Formation	Low-pressure gradient proportioning
LPG flow range (settable) [mL/min]	0.001–8, in 1 µL/min increments
LPG maximum pressure [bar]	1034 (103 MPa, 15,000 psi), linear decrease down to 800 (80 MPa, 11,600 psi) at flow rate >5 mL/min
LPG flow precision [% or µL min <sup>-1</sup> ]	<0.05% RSD or <0.01 min SD, whichever is greater
LPG flow accuracy [% or µL min <sup>-1</sup> ]	±0.1%
Mixer volume [µL]	100 µL (includes 25 µL proprietary capillary mixer and 75 µL static mixer)
Dwell volume	379 µL
Pulsation [% or bar]	<1.0% or <2 bar, whichever is greater
LPG pH range	2–12 (buffer or chloride concentration up to 1 mol/L)
<b>Eluting Pump (HPG)</b>	<b>Vanquish Binary Pump F</b>
Gradient Formation	High-pressure gradient proportioning
HPG flow range (settable) [mL/min]	0.001–8, in 1 µL/min increments
HPG maximum pressure [bar]	1034 (103 MPa, 15,000 psi), linear decrease down to 800 (80 MPa, 11,600 psi) at flow rate >5 mL/min
HPG flow precision [% or µL min <sup>-1</sup> or min]	<0.05% RSD or <0.01 min SD, whichever is greater
HPG flow accuracy [% or µL min <sup>-1</sup> ]	±0.1%
Mixer volume [µL]	100 µL (includes 25 µL proprietary capillary mixer and 75 µL static mixer)
Dwell volume	100 µL
Pulsation [% or bar]	<1.0% or <2 bar, whichever is greater
HPG pH range	2–12 (buffer or chloride concentration up to 1 mol/L)
<b>Autosampler</b>	<b>Thermo Scientific™ TriPlus™ RSH Autosampler (Single Head) 80 cm Rail</b>
Maximum pressure [bar]	1034 (103 MPa, 15,000 psi)
Carryover [%]	<0.003% with Chlorhexidine (600 µg/mL)
Sample capacity	2304 (well plate, 384 × 6 plates), 576 (well plate, 96 × 6 plates), 576 (6, 7 and 8 mm OD vial (≤1.2 mL), 96 × 6 racks), 324 (12 mm OD vials (≤2 mL), 54 × 6 racks)
Injection linearity [R <sup>2</sup> ]	>0.9999 (100 µL LCMS-P Tool)
Injection volume range [µL]	0.1–100
Maximum injection volume [µL]	100 (10 mL optional)
Temperature range [°C]	4–40
pH range	2–12
Injection precision 1	<0.1 % area RSD full loop injection (caffeine in water)
Injection precision 2	<0.5 % area RSD partial loop injection (caffeine in water)
Injection principle	Heart-Cut Loop Injection
<b>Sample Extension</b>	<b>Optional CoolStack (3 drawer or 6 drawer 12MT)</b>
Samples	4608 (well plate, 384 × 12 plates), 1152 (well plate, 96 × 12 plates), 1152 (6, 7 and 8 mm OD vial (≤1.2 mL), 96 × 12 racks), 648 (12 mm OD vials (≤2 mL), 54 × 12 racks) 12MT 6912 (well plate, 384 × 18 plates), 1728 (well plate, 96 × 18 plates)
Plate capacity	6 deep well plates or 12 well plates
Temperature range [°C]	4–40

## Specifications

<b>Transcend TLX-2 UHPLC System (PN 60500-60202)</b>	
Software	Aria MX 2.6 software or later Xcalibur 4.2 software or later Foundation platform 3.1 SP6 or later (Optional) TraceFinder 4.1 SP4 software or later"
Number of solvent lines	20
Solvent and additives	LCMS-grade solvents
Supported reservoir containers	0.25 L to 5 L with maximum height <350 mm
<b>Loading Pump (LPG)</b>	<b>2 Vanquish Quaternary Pump F</b>
Gradient Formation	Low-pressure gradient proportioning
LPG flow range (settable) [mL/min]	0.001–8, in 1 $\mu$ L/min increments
LPG maximum pressure [bar]	1034 (103 MPa, 15,000 psi), linear decrease down to 800 (80 MPa, 11,600 psi) at flow rate >5 mL/min
LPG flow precision [% or $\mu$ L min <sup>-1</sup> ]	<0.05% RSD or <0.01 min SD, whichever is greater
LPG flow accuracy [% or $\mu$ L min <sup>-1</sup> ]	$\pm$ 0.1%
Mixer volume [ $\mu$ L]	100 $\mu$ L (includes 25 $\mu$ L proprietary capillary mixer and 75 $\mu$ L static mixer)
Dwell volume	379 $\mu$ L
Pulsation [% or bar]	<1.0% or <2 bar, whichever is greater
LPG pH range	2–12 (buffer or chloride concentration up to 1 mol/L)
<b>Eluting Pump (HPG)</b>	<b>2 Vanquish Binary Pump F</b>
Gradient Formation	High-pressure gradient proportioning
HPG flow range (settable) [mL/min]	0.001–8, in 1 $\mu$ L/min increments
HPG maximum pressure [bar]	1034 (103 MPa, 15,000 psi), linear decrease down to 800 (80 MPa, 11,600 psi) at flow rate >5 mL/min
HPG flow precision [% or $\mu$ L min <sup>-1</sup> or min]	<0.05% RSD or <0.01 min SD, whichever is greater
HPG flow accuracy [% or $\mu$ L min <sup>-1</sup> ]	$\pm$ 0.1%
Mixer volume [ $\mu$ L]	100 $\mu$ L (includes 25 $\mu$ L proprietary capillary mixer and 75 $\mu$ L static mixer)
Dwell volume	100 $\mu$ L
Pulsation [% or bar]	<1.0% or <2 bar, whichever is greater
HPG pH range	2–12 (buffer or chloride concentration up to 1 mol/L)
<b>Autosampler</b>	<b>TriPlus RSH Autosampler (Single Head) 80 cm Rail</b>
Maximum pressure [bar]	1034 (103 MPa, 15,000 psi)
Carryover [%]	<0.003% with Chlorhexidine (600 $\mu$ g/mL)
Sample capacity	2304 (well plate, 384 $\times$ 6 plates), 576 (well plate, 96 $\times$ 6 plates), 576 (6, 7 and 8 mm OD vial ( $\leq$ 1.2 mL), 96 $\times$ 6 racks), 324 (12 mm OD vials ( $\leq$ 2 mL), 54 $\times$ 6 racks)
Injection linearity [R <sup>2</sup> ]	>0.9999 (100 $\mu$ L LCMS-P Tool)
Injection volume range [ $\mu$ L]	0.1–100
Maximum injection volume [ $\mu$ L]	100 (10 mL optional)
Temperature range [°C]	4–40
pH range	2–12
Injection precision 1	<0.1 % area RSD full loop injection (caffeine in water)
Injection precision 2	<0.5 % area RSD partial loop injection (caffeine in water)
Injection principle	Heart-Cut Loop Injection
<b>Sample Extension</b>	<b>Optional CoolStack (3 drawer or 6 drawer 12MT)</b>
Samples	4608 (well plate, 384 $\times$ 12 plates), 1152 (well plate, 96 $\times$ 12 plates), 1152 (6, 7 and 8 mm OD vial ( $\leq$ 1.2 mL), 96 $\times$ 12 racks), 648 (12 mm OD vials ( $\leq$ 2 mL), 54 $\times$ 12 racks) 12MT 6912 (well plate, 384 $\times$ 18 plates), 1728 (well plate, 96 $\times$ 18 plates)
Plate capacity	6 deep well plates or 12 well plates
Temperature range [°C]	4–40

## Specifications

<b>Transcend TLX-4 UHPLC System (PN 60500-60203)</b>	
Software	Aria MX 2.6 software or later Xcalibur 4.2 software or later Foundation platform 3.1 SP6 or later (Optional) TraceFinder 4.1 SP4 software or later"
Number of solvent lines	40
Solvent and additives	LCMS-grade solvents
Supported reservoir containers	0.25 L to 5 L with maximum height <350 mm
<b>Loading Pump (LPG)</b>	<b>4 Vanquish Quaternary Pump F</b>
Gradient Formation	Low-pressure gradient proportioning
LPG flow range (settable) [mL/min]	0.001–8, in 1 µL/min increments
LPG maximum pressure [bar]	1034 (103 MPa, 15,000 psi), linear decrease down to 800 (80 MPa, 11,600 psi) at flow rate >5 mL/min
LPG flow precision [% or µL min <sup>-1</sup> ]	<0.05% RSD or <0.01 min SD, whichever is greater
LPG flow accuracy [% or µL min <sup>-1</sup> ]	±0.1%
Mixer volume [µL]	100 µL (includes 25 µL proprietary capillary mixer and 75 µL static mixer)
Dwell volume	379 µL
Pulsation [% or bar]	<1.0% or <2 bar, whichever is greater
LPG pH range	2–12 (buffer or chloride concentration up to 1 mol/L)
<b>Eluting Pump (HPG)</b>	<b>4 Vanquish Binary Pump F</b>
Gradient Formation	High-pressure gradient proportioning
HPG flow range (settable) [mL/min]	0.001–8, in 1 µL/min increments
HPG maximum pressure [bar]	1034 (103 MPa, 15,000 psi), linear decrease down to 800 (80 MPa, 11,600 psi) at flow rate >5 mL/min
HPG flow precision [% or µL min <sup>-1</sup> or min]	<0.05% RSD or <0.01 min SD, whichever is greater
HPG flow accuracy [% or µL min <sup>-1</sup> ]	±0.1%
Mixer volume [µL]	100 µL (includes 25 µL proprietary capillary mixer and 75 µL static mixer)
Dwell volume	100 µL
Pulsation [% or bar]	<1.0% or <2 bar, whichever is greater
HPG pH range	2–12 (buffer or chloride concentration up to 1 mol/L)
<b>Autosampler</b>	<b>TriPlus RSH Autosampler (Dual Head) 80 cm Rail</b>
Maximum pressure [bar]	1034 (103 MPa, 15,000 psi)
Carryover [%]	<0.003% with Chlorhexidine (600 µg/mL)
Sample capacity	2304 (well plate, 384 × 6 plates), 576 (well plate, 96 × 6 plates), 576 (6, 7 and 8 mm OD vial (≤1.2 mL), 96 × 6 racks), 324 (12 mm OD vials (≤2 mL), 54 × 6 racks)
Injection linearity [R <sup>2</sup> ]	>0.9999 (100 µL LCMS-P Tool)
Injection volume range [µL]	0.1–100
Maximum injection volume [µL]	100 (10 mL optional)
Temperature range [°C]	4–40
pH range	2–12
Injection precision 1	<0.1 % area RSD full loop injection (caffeine in water)
Injection precision 2	<0.5 % area RSD partial loop injection (caffeine in water)
Injection principle	Hard Cut Loop Injection
<b>Sample Extension</b>	<b>Optional CoolStack (3 drawer or 6 drawer 12MT)</b>
Samples	4608 (well plate, 384 × 12 plates), 1152 (well plate, 96 × 12 plates), 1152 (6, 7 and 8 mm OD vial (≤1.2 mL), 96 × 12 racks), 648 (12 mm OD vials (≤2 mL), 54 × 12 racks) 12MT 6912 (well plate, 384 × 18 plates), 1728 (well plate, 96 × 18 plates)
Plate capacity	6 deep well plates or 12 well plates
Temperature range [°C]	4–40

## TurboFlow technology—simplifies sample preparation and reduces matrix interferences

Complex biological matrices can require difficult and time-consuming sample cleanup. The Transcend TLX UHPLC systems use TurboFlow technology to automate most sample cleanup tasks. Eliminate costly and time-consuming sample preparation steps by performing online sample preparation with TurboFlow technology. By reducing manual labor, lowering laboratory costs, and improving the signal-to-noise ratio, TurboFlow technology boosts throughput of routine assays.

## How does TurboFlow technology work?

In TurboFlow columns, injected solutes separate by molecular size as fast-moving mobile phase flows past the column packing particles. Since small molecules diffuse fast, they quickly enter the pores of the column particles while slow-diffusing larger molecules, especially proteins, are flushed away to waste.

Analytes of interest are retained by the stationary phase on the surfaces of the pores while other small molecules that don't have affinity for the stationary phase, such as salts and sugars, rapidly elute from the particles' pores and get rinsed away to waste. This loading step typically takes only 30 seconds. TurboFlow technology automates sample cleanup, which saves time, reduces cost, and increases sensitivity while minimizing matrix interferences and chemical noise.

Thermo Scientific TurboFlow columns		Part numbers	
Thermo Scientific™ Cyclone™ columns	Analytes of interest	1 × 50 mm	0.5 × 50 mm
Cyclone	Most analytes	CH-952434	CH-953288
Cyclone-P	Polar analytes not well retained by Cyclone	CH-952605	CH-953289
Cyclone MAX	Carboxylic acids	CH-952979	CH-953286
Cyclone MCX	Amines and Pyridiniums	CH-952813	CH-953287
Thermo Scientific™ silica-based columns	Analytes of interest	1 × 50 mm	0.5 × 50 mm
C18	Most analytes	CH-953244	CH-953280
C18-P	Polar analytes not well retained by C18	CH-953275	CH-953281
C2	Hydrophobic analytes not easily eluted from C18	CH-953279	CH-953285
C8	Hydrophobic analytes not easily eluted from C18	CH-953276	CH-953282

Find out more at

[thermofisher.com/TranscendMultichannelSystems](https://thermofisher.com/TranscendMultichannelSystems)