

FAIMS Pro Duo interface

Enhanced selectivity, ultimate flexibility

Benefits

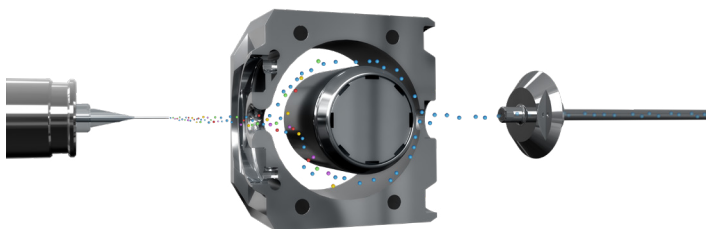
- FAIMS technology for a wide range of chromatographic flow rates
- Improved Compensation Voltage (CV) switching time for targeted applications
- Increased ion transmission relative to planar geometry
- Enhanced ease-of-use with a one-way electrode assembly
- Advanced CV optimization routines
- Seamless integration with application-specific software ensures maximum productivity

Keywords

FAIMS Pro Duo interface, Orbitrap Tribrid, Orbitrap Exploris, TSQ Altis, TSQ Quantis, Vanquish (U)HPLC

FAIMS Pro Duo interface

The Thermo Scientific™ FAIMS Pro Duo interface extends differential ion mobility separations to a broad range of applications to meet the most demanding qualitative and quantitative analytical challenges. The FAIMS Pro Duo interface, when coupled to Thermo Scientific™ next-generation mass spectrometers, delivers the ultimate performance for increased signal-to-noise detection, expanded sample coverage, and higher throughput analyses of complex samples using both high- and low-flow chromatographic separations. The exceptional analytical performance combined with advanced software designs increases productivity while maximizing data quality, enabling users to go beyond today's expectations.



Ion path through the FAIMS Pro Duo interface from emitter tip to MS capillary



Hardware features

Optimized analytical gap

A smaller analytical gap of 1.5 mm provides higher fields, maintaining separation capabilities without the need for helium gas.

Mass spectrometer compatibility

- Thermo Scientific™ Orbitrap Exploris™ 120 MS
- Thermo Scientific™ Orbitrap Exploris™ 240 MS
- Thermo Scientific™ Orbitrap Exploris™ 480 MS
- Thermo Scientific™ Orbitrap ID-X™ Tribrid™ MS
- Thermo Scientific™ Orbitrap IQ-X™ Tribrid™ MS
- Thermo Scientific™ Orbitrap Fusion™ Tribrid™ MS
- Thermo Scientific™ Orbitrap Fusion™ Lumos™ Tribrid™ MS
- Thermo Scientific™ Orbitrap Eclipse™ Tribrid™ MS
- Thermo Scientific™ TSQ Altis™ MS
- Thermo Scientific™ TSQ Quantis™ MS

Faster CV switching time

The CV switching time is associated with the ion transfer time through the FAIMS Pro Duo interface as well as the difference between two consecutive CV settings. The CV switching time is dependent on the ion transfer tube geometry. The following Thermo Scientific mass spectrometers utilize a round bore ion transfer tube (ITT) and have a maximum CV switching time of 40 ms.

- Orbitrap Exploris 120 MS
- Orbitrap Exploris 240 MS
- Orbitrap ID-X Tribrid MS
- Orbitrap IQ-X Tribrid MS
- Orbitrap Fusion Tribrid MS
- TSQ Quantis MS

The following Thermo Scientific mass spectrometers utilize a high capacity ion transfer tube (HCITT) and have a maximum CV switching time of 25 ms.

- Orbitrap Exploris 480 MS
- Orbitrap Fusion Lumos Tribrid MS
- Orbitrap Eclipse Tribrid MS
- TSQ Altis MS

For instrument methods using small CV steps (<2V), faster CV switching times are enabled to better facilitate the timescale of targeted data acquisition.

Chromatographic flow-rate compatibility

The FAIMS Pro Duo interface is compatible with direct infusion as well as chromatographic flow rates ranging from 0.1 µL/min to 1000 µL/min.

Fast and easy to install and uninstall

The FAIMS Pro Duo interface electrode assembly can be quickly installed or uninstalled without breaking vacuum. It is also easily disassembled for cleaning, reassembling, and mounting to the instrument in a few minutes.

Instrument control of Nitrogen cooling gas

The FAIMS Pro Duo interface uses nitrogen to move ions through the analytical gap between inner and outer electrodes and to maintain electrode temperatures. Carrier gas ranges are dependent on ion transfer tube type:

- HCITT: 3.5–7.7 L/min with a default of 4.6 L/min
- ITT: 0.7–4.3 L/min with a default of 1.2 L/min

Cooling gas is dependent on the FAIMS resolution mode and vaporizer temperature. Under standard operating conditions for nanoflow applications, the cooling gas flow rate is 5 L/min. Under standard operating conditions for high-flow applications, the

cooling gas flow rate is approximately 10 L/min. Increasing the vaporizer temperature or operating at high-resolution mode will increase the cooling gas flow-rate requirements.

Software features

Compensation Voltage optimization

Two different workflows are enabled for CV optimization. All instruments have an automated CV optimization routine in Tune that can be implemented into the instrument method editor. The second method developed for targeted data acquisition workflows on the TSQ Altis and Quantis mass spectrometers performs on-line CV optimization on a chromatographic timescale. Key features include:

- A sample analysis dedicated as an optimization injection
- Scheduled data acquisition routines automatically step through CV values from a user-defined range and step size during the scheduled elution profile
- The resulting data is processed in Thermo Scientific™ FreeStyle™ 1.8 SP1 and newer versions software to determine the optimum CV value for each compound
- CV values are extracted and imported into the instrument method

Software compatibility

- Compatible with Thermo Scientific™ Proteome Discoverer™ v2.1 and later software for basic peptide identification and Thermo Scientific™ Tandem Mass Tag™ (TMT™) multiplexing support; Thermo Scientific Proteome Discoverer v2.4 and later software for advanced applications
- Compatible with Thermo Scientific™ Compound Discoverer™ v3.2 and later software for automated qualitative and quantitative data processing for one CV value
- Compatible with Thermo Scientific™ LipidSearch™ 4.2 and later software for automated qualitative and quantitative data processing for scan filters with one CV value
- Compatible with Thermo Scientific™ Tracefinder™ v5.1 and later software for automated quantitative data processing
- Compatible with Thermo Scientific™ FreeStyle™ v1.3 and later software for automated analysis of CV data and v1.8 SP1 and later software for automated determination of CV maxima and exportation into targeted TSQ Altis and Quantis instrument method files
- Compatible with Thermo Scientific™ Biopharma Finder™ v4.1 and later software for automated qualitative and quantitative data processing
- Compatible with Thermo Scientific™ Chromeleon™ 7.3.0 Chromatography Data System (CDS) and later software for automated qualitative and quantitative analysis

Installation requirements

Power

- 100–240 VAC 50/60 Hz 2.0 A
- Free from voltage variations above or below the recommended operating range

Gas

- FAIMS gas: 99.5% pure Nitrogen, ≥ 20 L/min (100 psi)

Environment

- Functional temperature range: 15–32 °C (59–9 °F)
- Optimal temperature range: 18–27 °C (65–81 °F)

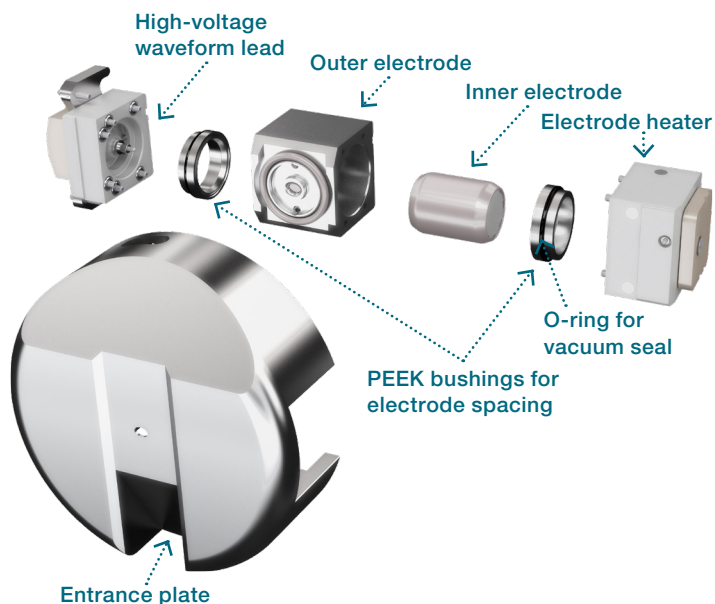
Dimensions

Size

- Main control box: 483 × 318 × 64 mm
(h, w, d – 19 × 12.5 × 2.5 in)
- RF coil box and adapter flange: 254 × 330 × 483 mm
(h, w, d – 10 × 13 × 19 in)

Weight

- Main control box: 3.7 kg (8.2 lb)
- RF coil box and adapter flange: 3.5 kg (7.7 lb)



Learn more at thermofisher.com/FAIMSProDuo