

Instruction Sheet

μ PAC™ Flex iON Connect

General description

The μ PAC™ Flex iON Connect is a user-friendly interface that facilitates the rapid, reproducible, and low-level liquid dispersion connection of the μ PAC™ nanoLC columns to the ThermoFisher Scientific Nanospray Flex™ series of ion sources. The accessory is easily and simply mounted onto the metal rod of the DirectJunction™ adaptor of the ion source. It consists of two separate units that have been precisely fabricated from polylactic acid (PLA).

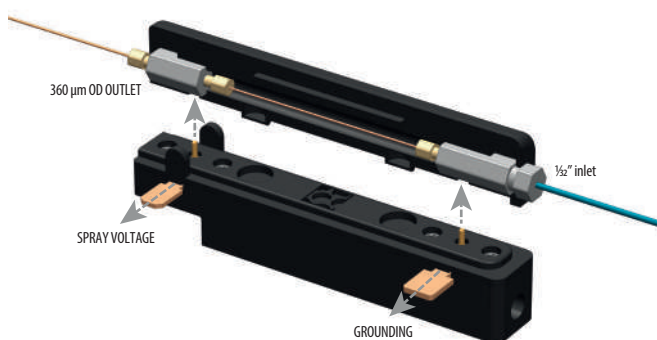


Figure 1. Schematic drawing of a transverse section of the μ PAC™ Flex iON Connect. The docking and the spray units are shown in the lower and upper images, respectively.

The docking unit contains the contact points for the grounding (blue) and high-voltage (HV) (red) cables and slides onto the metal rod of the DirectJunction™ adaptor (the recess at the front of the docking unit slides over the beige PEEK component affixed to the proximal end of the metal rod). Both cables only need to be connected once during the initial installation of the Flex iON Connect and do not need to be disconnected when exchanging the emitter in the spray unit. Spring-loaded pogo pins in the docking unit are used to activate post-column high voltage (HV) and grounding on the metal unions in the spray unit. This unit consists of two conductive metal unions (50 μ m bore) connected by a section of precisely-cut fused silica (360 μ m O.D. x 20 μ m I.D.). The inlet of the spray unit (where the grounding point is located) has a female 1/2" connection that is compatible with the 1/2" fitting on the outlet of the μ PAC™ column. Via a one-piece fingertight PEEK fitting (VICI, P/N:C360NFPKG), the outlet of the spray unit (where the HV is applied) is compatible with any 360 μ m O.D. emitter. The spray unit is positioned on top of the docking unit and held in place by magnets.

Installation of the μ PAC™ Flex iON Connect

- Ensure the mass spectrometer is in stand-by.
- Attach the HV cable to the designated electrical socket located at the bottom of the source.
- Attach the blue coiled grounding cable to a grounded point on the HPLC chassis or the mass spectrometer.
- Fully retract the DirectJunction™ adaptor to the end of the sliding rails on the source.
- Slide the docking unit onto the metal rod of the DirectJunction™ adaptor (the additional spacer unit is required when using longer 10-12 cm emitters).
- Connect the HV and grounding cables to the docking unit.
- Stop the flow from the HPLC system.
- Set the maximum pressure of the HPLC system to 350 bar (5,000 p.s.i.).
- Connect the outlet of the μ PAC™ column to the inlet of the spray unit. Once fingertight, use a spanner to further tighten the fitting by 1/8 of a turn.
- Using a one-piece fingertight PEEK fitting (VICI, P/N:C360NFPKG), connect an emitter with a 360 μ m O.D. to the outlet of the spray unit.
- Apply a recommended flow rate of between 50 and 1,000 nL/min. Droplets should appear at the tip of the emitter.
- Carefully place the spray unit on top of the docking unit.
- To hold the emitter in place, close the HV clamp on the DirectJunction™ adaptor.

CAUTION Ensure that the HV cable is disconnected and/or the source is fully retracted from the ion source.

- With the XYZ-manipulator, position the tip of the emitter almost directly in-line with the ion transfer tube of the mass spectrometer.
- As you adjust the position of the emitter, observe the distance of the tip of the emitter from the inlet to the mass spectrometer on the monitor provided. If necessary, adjust the image as described in the Nanospray Flex™ ion source manual provided by ThermoFisher Scientific.

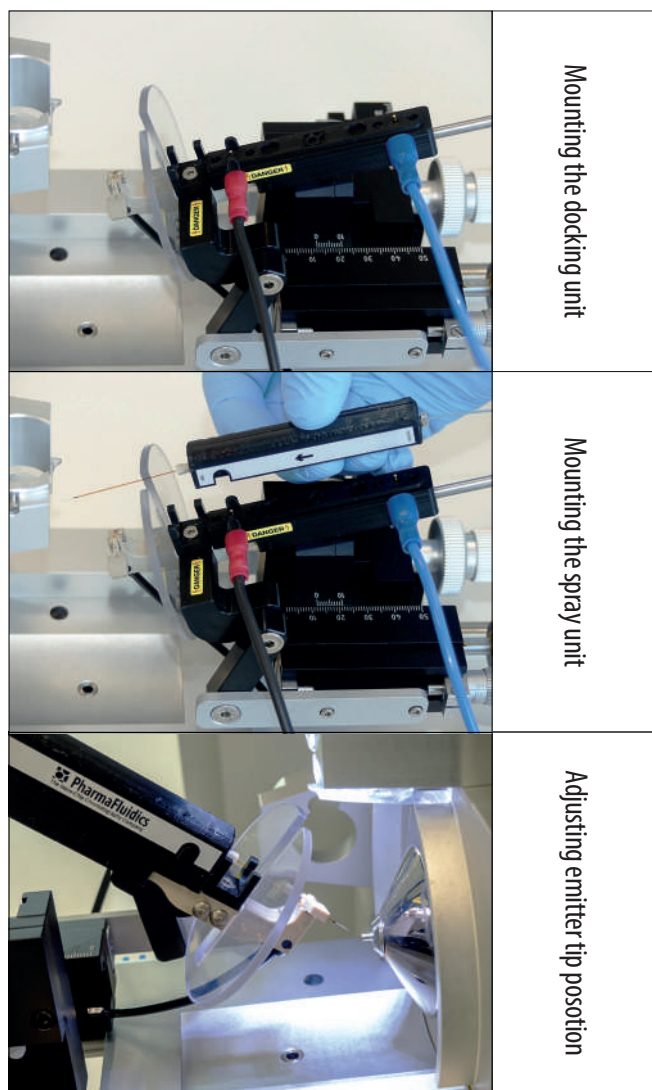


Figure 2. Installation of the μ PAC™ Flex iON Connect on a ThermoFisher Scientific NanoSpray Flex™ ion source. Upper panel: mounting the docking unit; middle panel: mounting the spray unit; lower panel: adjusting the position of the emitter.

CAUTION Avoid contact with high voltage. Before installing the μ PAC™ Flex iON Connect interface, ensure that the mass spectrometer is in stand-by and fully retract the DirectJunction™ adaptor to the end of the sliding rails on the source. Then disconnect the HV cable from the bottom of the NanoSpray Flex™ source.

The μ PAC™ Flex iON Connect MS interface is designed to be used in the nanoLC flow range of 50 to 1,000 nL/min, with a maximum flow rate of approximately 1,500 nL/min. Selecting the appropriately-dimensioned emitter tip opening is crucial in obtaining optimal spray quality for your specific application. In general, analyses at a higher nanoLC flow rate (500-1500 nL/min) will benefit from emitters with larger tip openings (20-30 μ m). Emitter tip openings \leq 10 μ m will give the best results for analyses in the lower nanoLC flow range (50-500 nL/min). Although smaller tip openings generate an optimal spray for reduced sample volumes, the risk of blockage increases and, subsequently, more frequent exchange of the emitter is inevitable.

Mobile phase

- Only use filtered and degassed LCMS-grade mobile phases.
- To prevent crystallisation and/or precipitation of solutes, alternate between miscible mobile phases, e.g., acetonitrile (ACN), methanol (MeOH), isopropanol (IPA), trifluoroacetic acid (TFA), formic acid (FA).

μ PAC™ Flex iON Connect routine operation

CAUTION Avoid personal injury. Before removing an emitter, ensure that the LCMS system is fully depressurised and disconnect the HV cable from the bottom of the source. Else, the emitter may eject at high speed and cause personal injury to you or someone in the near vicinity.

- Once the upper pressure limit of the HPLC has been adjusted to a maximum of 350 bar, start the flow through the μ PAC™ column and μ PAC™ iON Flex Connect.
- Once the back pressure stabilises, apply the flow rate used to analyse samples, e.g., 300 nL/min.
- When the pressure has again stabilised, apply 1.5 kV to the emitter and wait until the spray stabilises. If the spray does not stabilise, gradually increase the voltage.

Disconnecting the μ PAC™ Flex iON Connect

- Turn off the spray voltage on the mass spectrometer.
- Stop the HPLC flow and wait until the backpressure of the μ PAC™ column has decreased and stabilised.

Part numbers for spares and consumables

PharmaFluidics grounding cable	201901TLK
PharmaFluidics μ PAC™ Flex iON Connect	202000FiC

VICI one-piece PEEK fitting for 360 μ m O.D. tubing	C360NFPKG
VICI one-piece PEEK fitting plug	C360PPK
VICI ZDV union end plug	ZU.5FPK

ESI emitter consumables

Fossil Ion Tech 360 O.D. \times 20 μ m I.D. \times 5 cm	FIT-20-5
Fossil Ion Tech 360 O.D. \times 10 μ m I.D. \times 5 cm	FIT-10-5
New Objective PicoTip emitter 10 μ m tip, 5cm	FS360-20-10-N-20
New Objective PicoTip emitter 15 μ m tip, 5cm	FS360-50-15-N-20

Further information

For column specifications, pressure limits, pH range, tips and tricks including operational instructions, visit:

<https://www.pharmafluidics.com/our-products/>

For technical support visit:

<https://www.pharmafluidics.com/contact-us/>