

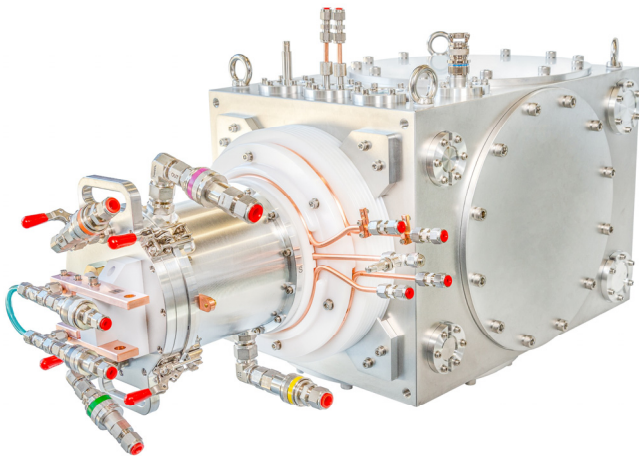


FILAMENT POWERED TURNKEY PROTON SOURCE SYSTEM

ISV.F-070

D-Pace TRIUMF-licensed, DC, volume-cusp

- Yields proton beam currents up to 3 mA DC
- Low maintenance with long filament lifetime (> 5250 mA·hours)
- Negligible electrode wear due to the optimized ion optics and low emittance
- Internal steering magnet enables beam alignment corrections
- Instrumentation options include Faraday cup, emittance scanner, beamlines, beam profiler and mass spectrometer



Proton Source with Vacuum Box

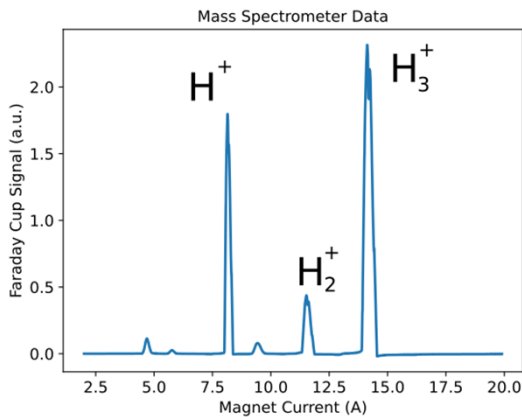
Ion	Beam Current (mA)	Beam Energy ² (keV)
H ⁺	0-3	20-30

Commercially Available Beam Intensities

SPECIFICATION¹: ISV.F-070

ION SOURCE	
Particle Type	H ⁺ , H ₂ ⁺ , H ₃ ⁺
Beam Kinetic Energy ²	20 to 30 keV
Normalized 4rms Emittance	< 0.5 mm·mrad
Filament Lifetime	> 5250 mA·hours
Beam Current Stability	± 1% over 24 hours
POWER SUPPLIES	
Max Bias Supply	20 mA, 30 kV
Arc Supply	10 A, 150 V
Filament Supply	300 A, 10 V
Extraction Electrode	10 mA, -4 kV
Suppression Electrode	10 mA, -3 kV
X & Y Steering Magnet	±5 V, 5 A
VACUUM SYSTEM SPECIFICATIONS	
Turbo Pumps, 1X Upstream & 1X Downstream	1500 l/s Flange ISO250F
Dry Scroll Roughing, 1X Upstream & 1X Downstream	35 m ³ /hr
GAS FLOW	
Mass Flow Controller	1-10 sccm
CONTROLS	
Control PLC	Phoenix Contact ILC, Ethernet
User Interface Options	D-Pace standalone or OPC command library for customer integration
High Voltage Interlocks	HV grounding relay with access control locks
COOLING WATER, DEIONIZED, 20°C (>1.0 MOhm.cm)	
Source Body	8.0 LPM, 40 PSI (275 kPa)
Filament	1.0 LPM, 70 PSI (480 kPa)
Back Plate	1.5 LPM, 70 PSI (480 kPa)
Plasma Electrode	1.5 LPM, 70 PSI (480 kPa)
Extraction Electrode	1.5 LPM, 70 PSI (480 kPa)
XY Steering Magnet	1.0 LPM, 70 PSI (480 kPa)

Tune Data			
H ⁺ Beam Current (mA)	1.0	2.0	3.0
Bias Supply (mA, kV)	3.2, 30	6.2, 30	9.8, 30
Arc Supply (A,V)	1.9, 120	2.9, 20	4.0, 120
Filament Supply (A,V)	242, 3.4	238, 3.4	231, 3.4
Extraction Electrode Supply (mA, kV)	0.6, 2.7	0.8, 3.3	1.2, 3.6
Suppression Electrode Supply (mA, kV)	0.3, -2	0.5, -2	0.6, -2
Steering Magnet X (A)	0	0	0
Steering Magnet Y (A)	0	0	0
H ₂ (sccm)	5	5	5
Vacuum, Ion Source (Upstream) (10 ⁻⁵ Torr)	2.6	2.6	2.6
Vacuum, V-Box (Downstream) (10 ⁻⁶ Torr)	2.8	2.8	2.8
Unnormalized 4rms Emittance (mm·mrad)	17.8	29.5	55.3
Normalized 4rms Emittance (mm·mrad)	0.1	0.17	0.31



Beam Composition, 3 mA H⁺ Tune



Mounted Filament Set

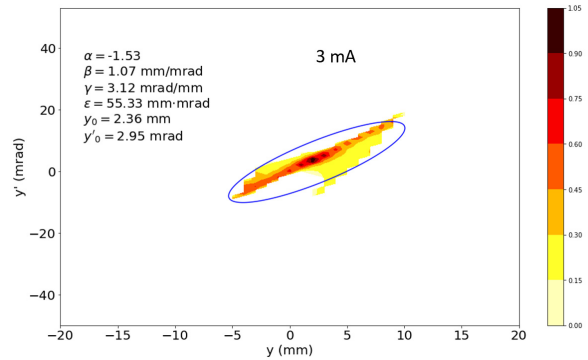
The ISV.F-070 Filament Ion Source system is a complete, turnkey ion source system including:

- Ion source & vacuum box
- Vacuum system & gauges
- Power supplies, PLC controls & software
- Low voltage and high voltage racks
- 40 kV isolation transformer
- Interlocks and HV grounding system
- User interface & Ethernet-based remote controls
- Ion source stand
- Personnel access control interlocks
- Water flow gauges and interlocks
- Mass flow controller for feed gases

Optional:

- High-voltage Faraday cage/enclosure
- Water de-ionization and cooling system
- Sliding Faraday cup
- UniBEaM fiber optic beam profile monitor³
- TRIUMF-licensed emittance scanner
- 1:500 mass spectrometer with slits

Enquire about other negative and positive ion beams, and our RF-powered ion sources



Turnkey Filament-Powered Ion Source Including Optional Beamline and Mass Spectrometer

1. D-Pace reserves the right to update specifications as part of its ongoing product improvement program.
2. Configurations to run at lower energies are possible.
3. UniBEaM technology is licensed from AEC-LHEP University of Bern.