

Product
Description



PHOTONEX

POWERFUL EXCIMER LASER IONISATION SOURCE

Gas and particle analysis with the focus on polycyclic aromatic hydrocarbons (PAH), inorganic-compounds and PAH- compounds



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POWERFUL EXCIMER LASER IONISATION SOURCE

Device to operate and service easily.

The PhotonEx excimer laser is easy to operate and easy to service. The corona preionisation allows an extended gas lifetime and lower maintenance cycle. The internal energy stabilization control reduces significantly the pulse to pulse energy variation close to zero. A homogeneous beam profile is and the extended gas lifetime for many billion pulses increases operation reliability and comfort.

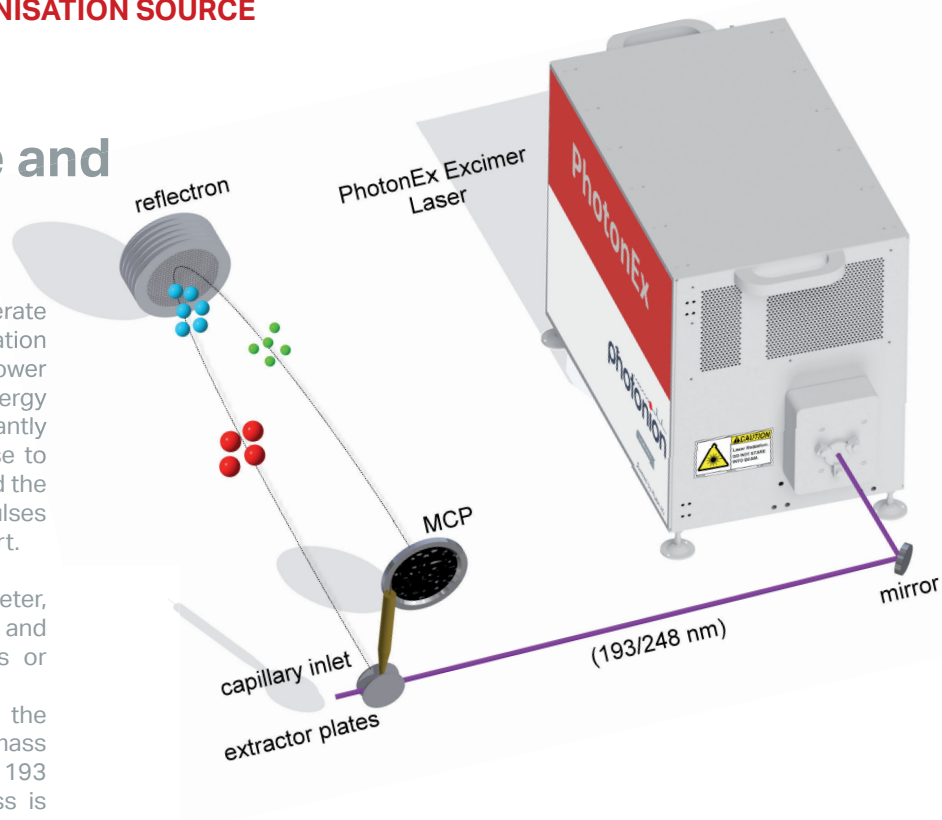
Especially integrated in a mass spectrometer, the PhotonEx excimer laser is a powerful and versatile ionization source for particles or gas-phase MS analysis. [1]

With the external trigger option, the PhotonEx can be used in single particle mass spectrometers. Using the PhotonEx with 193 nm (ArF gas filling) the primary process is "laser desorption and ionization" (LDI) which is mainly suitable for inorganic compounds.

Gas phase analysis can be realized with 248 nm (KrF gas filling) PhotonEx setup and a high frequency internal triggering up to 2 kHz. The underlying ionization process is called REMPI, which is the acronym for "Resonance Enhanced Multiphoton Ionization". This ionization technique is highly selective and sensitive for the detection of aromatic organic compounds.

Literature

[1] Aerosol Mass Spectrometer for Simultaneous Detection of Polyaromatic Hydrocarbons and Inorganic Components from Individual Particles; Passig et al.; Anal. Chem. 2017, 89, 6341-634.

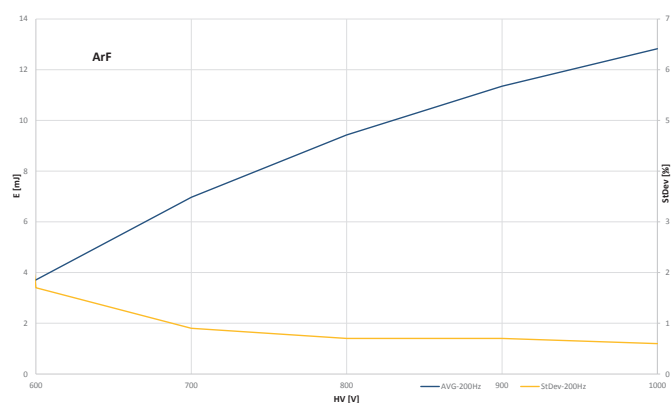


Specifications ▶

Wavelength (nm)	193 (ArF) / 248nm (KrF)
Max. Repetition Rate	200Hz up to kHz
Stabilized Pulse Energy	6* mJ
Stabilized Pulse Power	1.2* W
Energy Stability (sigma)	2*%
Beam Dimensions (FWHM, V x H mm)	6 x 3*
Beam Divergence (FWHM, V x H mrad)	2 x 1*
Pulse Duration (FWHM)	5 to 10* ns

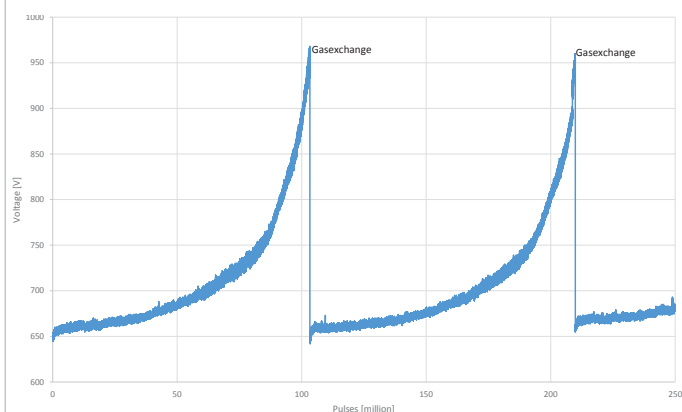
*parameter values for 200 Hz repetition rate and might be different for higher repetition rates.

LASER ENERGY OUTPUT CHART



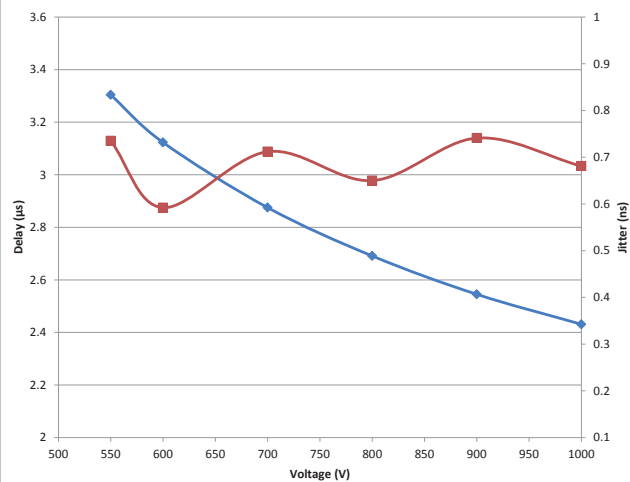
The blue line illustrates the increase of laser energy output [mJ] with increasing excitation Voltage [V] for the PhotonEx 193 nm (ArF) laser at 200 Hz. The corresponding standard deviation is shown in yellow.

GAS FILLING LIFETIME



Example measurements of ArF gas filling lifetimes at 200 Hz and a stabilized laser output energy of 4 mJ. The gas filling lifetime is up to 100 million pulses.

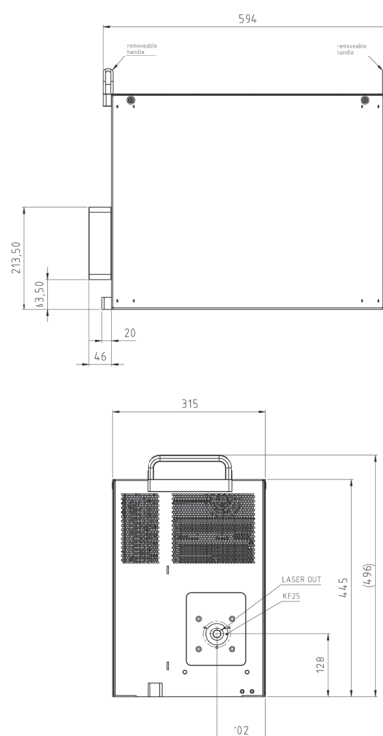
SHORT TRIGGER DELAY TIMES



The delay between an external trigger signal and a laser pulse is less than 4 μs. The corresponding jitter is in the range of 0.6 up to 0.8 ns.

Technical specifications

Weight	app. 75 kg
Cooling	air/water**
Electrical	230 V, 50/60 Hz, 2000 W
Dimensions (LxWxH)	594 x 315 x 496 mm***



**depending on rep rate and continuous use time.
***might vary with specific options.





Applications

Gas analysis with the focus on polycyclic aromatic hydrocarbons (PAH)

- | coffee roasting
- | industrial combustion
- | process control

Particle analysis with the focus on inorganic- and PAH- compounds

- | ship exhaust
- | wood stove exhaust
- | car exhaust

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