
ARCs™ are a family of compact, state-of-the-art, Raman Convertors capable of extending the tuning range of Light Age PAL™ (alexandrite) lasers, and most other pulsed lasers, into the UV, Visible and IR.

A unique gas recirculation system minimizes thermo-optic effects, permitting operation at power levels otherwise unachievable.

The Scientific and Technical Staff at Light Age is available to assist you in your application. Ask us about our Large Aperture and Multipass Convertors.

**ARC™ Principles of Operation**

Wavelength conversion is effected by the stimulated Raman process that occurs in the (nonlinear) gaseous media when laser (“pump”) pulses are focused into the Convertor by the integral lens system. Output consists of the residual pump laser frequency, ω, and the corresponding Stokes and Anti-Stokes frequencies, at ω ± nν, where ν corresponds to the frequency of Raman-Active vibration of the gas and n takes on integral values 1,2,3... etc.

Stokes output, at longer wavelengths than the incident pump, is emitted essentially along the pump beam direction, and is re-collimated along with the residual pump. Anti-Stokes
output, at higher frequencies, is emitted along specific directions that satisfy conservation of momentum. When used with a tunable laser pump source, such as an alexandrite, OPO, or Ti:Sapphire laser, all Raman outputs tune in frequency, following the pump.

During the Raman process, an appreciable amount of energy is deposited in the gas. In high power operation, as heat builds up locally within the gas, thermo-optic refractive index distortions degrade beam quality and reduce conversion efficiency. The Light Age ARC™ (Advanced Raman Convertor) patented recirculation system essentially eliminates these effects.

Operation is straightforward: Once the pressure of the gas and focal conditions are set, there are no adjustments to make, not even when the pump laser tunes. The only alignment is simple bore-sighting through the aperture of the Convertor. If desired, the output frequencies can be separated using dichroic or dispersive optics. By varying pressure, focal conditions, and other characteristic, output into the various Raman orders can be optimized. The Light Age ARC™ Raman Convertor permits quick and easy modification of those parameters.