

SOLID STATE RAMAN SHIFTER



Solid State Raman Shifter

MODEL

CRS 14

CRS14 SOLID STATE RAMAN SHIFTER FOR CONVERSION OF Nd:YAG LASER OUTPUT

The CRS14 Solid State Raman Shifter is an easy-to operate device to allow conversion of Nd:YAG laser output of the fundamental and second harmonic. A $\text{Ba}(\text{NO}_3)_2$ crystal providing a 1047 cm^{-1} shift is used for radiation conversion. The specially designed cavity pair mirrors allow generation of output radiation with the following parameters:

For fundamental wavelength 1064 nm the CRS14 provides:

- | | |
|-----------------------------------|--------------------------|
| - 1st Stokes component at 1197 nm | - average efficiency 30% |
| - 2nd Stokes component at 1369 nm | - average efficiency 15% |
| - 3rd Stokes component at 1598 nm | - average efficiency 10% |

For second harmonic wavelength 532 nm the CRS14 provides:

- | | |
|------------------------------------|--------------------------|
| - 1st Stokes component at 563,4 nm | - average efficiency 50% |
| - 2nd Stokes component at 598,6 nm | - average efficiency 40% |
| - 3rd Stokes component at 638,7 nm | - average efficiency 30% |
| - 4th Stokes component at 684,5 nm | - average efficiency 10% |
| - 5th Stokes component at 737,3 nm | - average efficiency 8% |

- Upon request:**
- ◆ a set of mirrors can be supplied to provide simultaneous generation of the 1st, 2nd, 3rd, 4th and 5th Stokes radiation components.
 - ◆ the CRS14 can be also completed with a telescopic system to ensure optimum power densities in a $\text{Ba}(\text{NO}_3)_2$ crystal.
 - ◆ the CRS14 can be supplied with a second harmonic generator (KTP, BBO, LBO) to increase the number of output wavelengths.

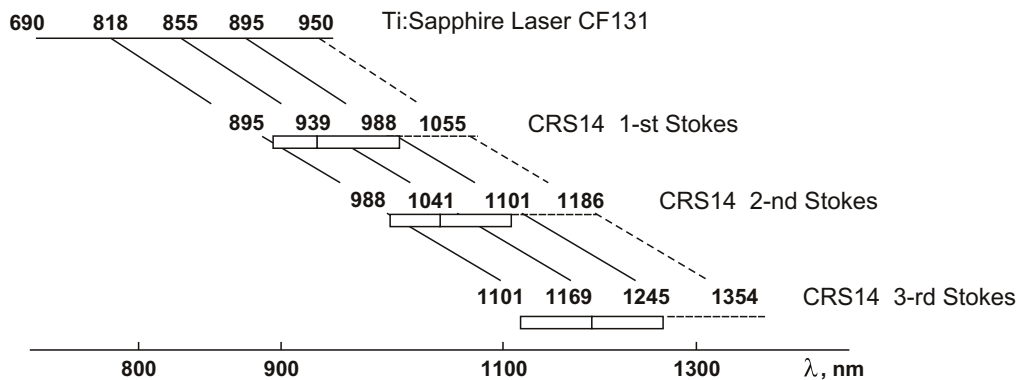
The CRS14 Raman Shifter can be combined with another laser operating in the spectral range from 400 nm to 1800 nm.

CRS14 SOLID STATE RAMAN SHIFTER FOR CONVERSION OF TUNABLE TI:SAPPHIRE LASER OUTPUT

The Solid State Raman Shifter CRS14 is an easy to use device for extending of the tuning range of a Ti:Sapphire laser to 1300 nm.

The CRS14 provides highly-efficient conversion of tunable radiation from a Ti:Sapphire laser to tunable radiation of Stimulated Raman Scattering at 1st, 2nd and 3rd Stokes components. The optimum conversion in the CRS14 is achievable at pump with a Ti:Sapphire laser operating in the wavelength range from 815 to 900 nm. A Ba(NO₃)₂ crystal providing a 1047 cm⁻¹ shift is used for radiation conversion.

The diagram illustrates the principle of the CRS14 operation.



The CRS14 uses 6 pairs of specially designed changeable cavity mirrors. By changing one mirror pair for another, highly-efficient generation of tunable radiation of the 1st, 2nd and 3rd Stokes components individually or together can be established at the CRS14 output.

The Ti:Sapphire pump wavelength range is divided into two Subranges. Subrange I covers to the operational wavelength range 815-850 nm, while Subrange II covers the operational wavelength range 850-900 nm of Ti:Sapphire.

By choosing Type I or Type II tunability range and using one from the available 6 pairs of cavity mirrors, tunable radiation with the parameters as follows can be established at the CRS14 output:

For Ti:Sapphire output from 815 to 850 nm (Subrange I), the CRS14 provides:

- 1st Stokes component in the 890-950 nm range - max. efficiency ~ 35%
- 2nd Stokes component in the 980-1050 nm range - max. efficiency ~ 30%
- 3rd Stokes component in the 1090-1170 nm range - max. efficiency ~ 20%

For Ti:Sapphire output from 850 to 900 nm (Subrange II), the CRS14 provides:

- 1st Stokes component in 940-990 nm range - max. efficiency ~ 35%
- 2nd Stokes component in 1030-1120 nm range - max. efficiency ~ 25%
- 3rd Stokes component in 1160-1245 nm range - max. efficiency ~ 20%

- Upon request:**
- ◆ a set of mirrors can be supplied to provide simultaneous generation of the 1st, 2nd and 3rd Stokes radiation components.
 - ◆ the CRS14 can be also completed with a telescopic system to ensure optimum power densities in a Ba(NO₃)₂ crystal.
 - ◆ the CRS14 can be supplied with a second harmonic generator to extend the tunability range from 350 to 620 nm.

The CRS14 Raman Shifter combined with a Ti:Sapphire pump laser, allows generation of a tunable narrow-linewidth output radiation in the ranges 350-620 nm and 690-1245 nm.

DIMENSIONAL DRAWING

