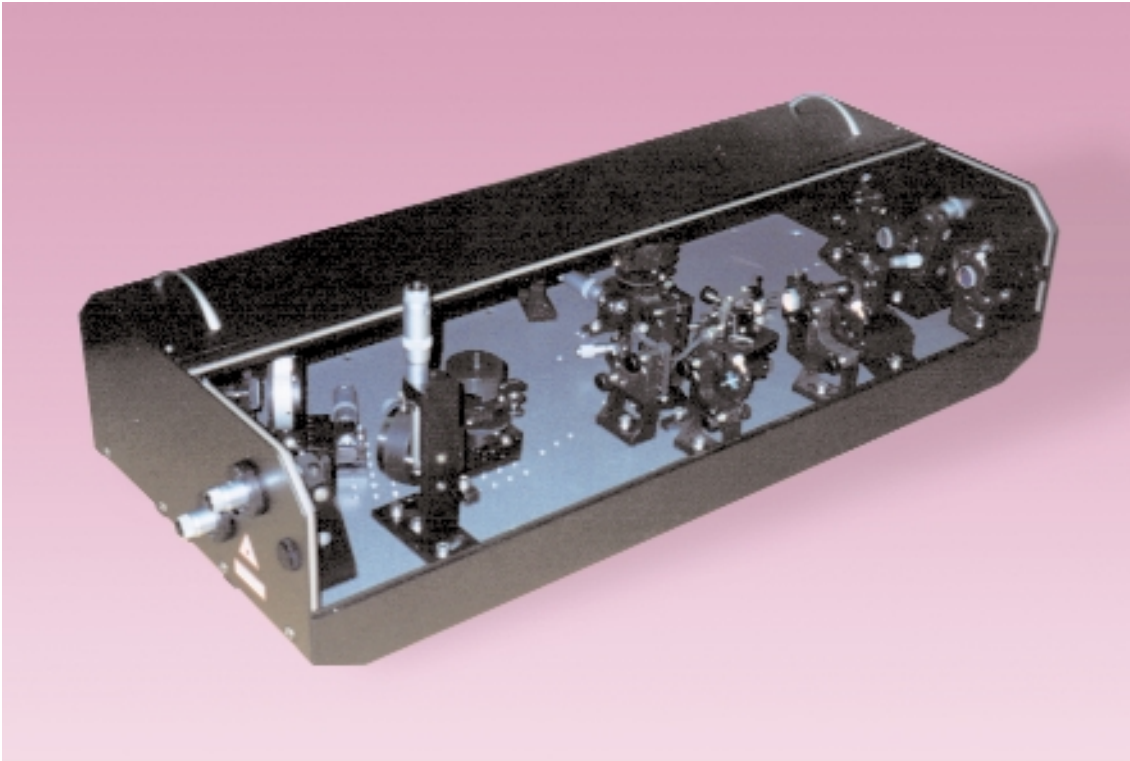
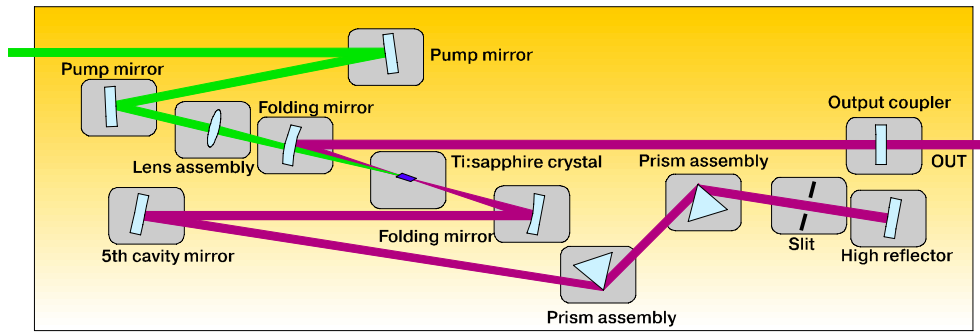


# TISSA Series

## FEMTOSECOND AND CONTINUOUS WAVE TITANIUM: SAPPHIRE LASERS AND LASER KITS

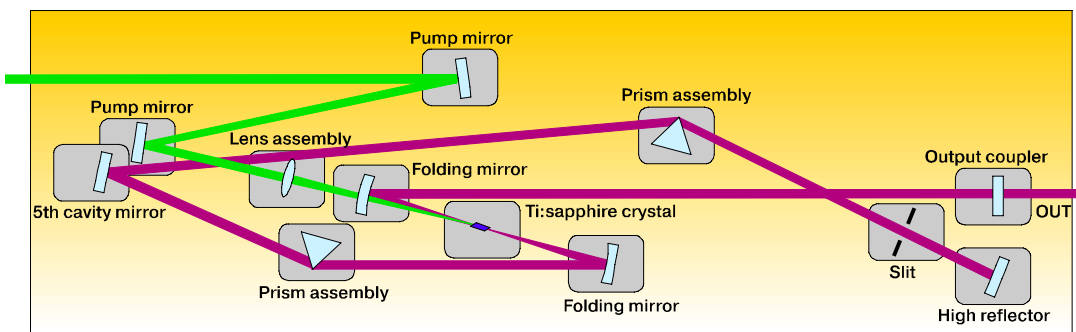


TISSA mode-locked femtosecond Ti:sapphire lasers have been designed as low-cost and reliable devices for ultra-fast applications or for seeding Ti:sapphire amplifier systems. Models TISSA-50 and TISSA-100 provide effective and stable femtosecond operation within 740 - 950 nm and 710 - 950 nm spectral ranges, respectively. Typical pulse duration is  $<50$  fs for model TISSA-50 and  $<100$  fs for model TISSA-100 over the all spectral range. Highly doped Ti:sapphire crystal gives a possibility to obtain pulses shorter than 20 femtoseconds at 800 nm for model TISSA-20. TISSA femtosecond lasers was designed to be matched with any type of 3 - 10 Watt argon-ion or diode-pumped solid-state pump laser. TISSA-CW continuous wave Ti:sapphire laser provides effective operation over a 700 - 980 nm spectral range at 2 -15 Watt pump giving  $< 2$  GHz bandwidth. Both horizontal and vertical polarization of pumping light are acceptable for TISSA series of Ti:sapphire lasers.



## TISSA-100

Optical schematic layout of the TISSA-100 mode-locked femtosecond Ti:sapphire laser



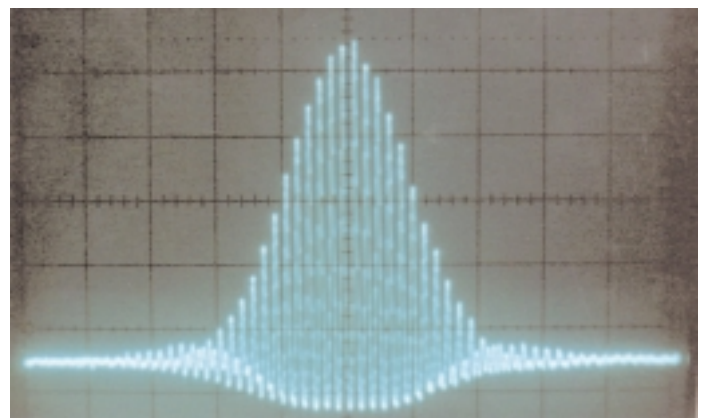
## TISSA-50 TISSA-20

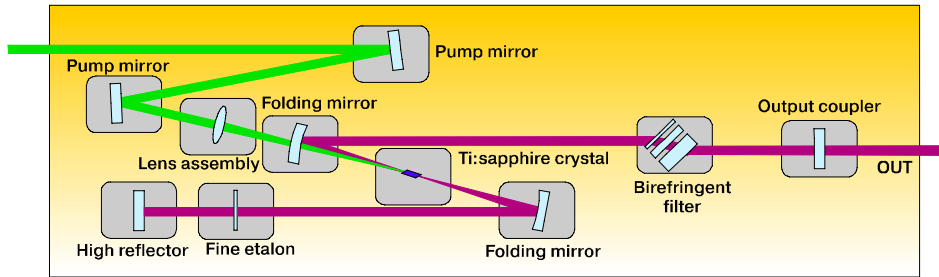
Optical schematic layout of the TISSA-50 and TISSA-20 mode-locked femtosecond Ti:sapphire lasers

### FEATURES:

- Stable Kerr-lens mode-locking operation started manually or with electronic starter
- 5-mirror compact cavity design
- Model TISSA-100: Wavelength tuning from 710 to 950 nm with two sets of mirrors
- Model TISSA-20: Seeding source of broadband femtosecond pulses for Ti:sapphire amplifiers
- Model TISSA-20: < 20 fs pulsewidth
- Rotation of pump beam polarization with optically active quartz plate
- Assembled prisms for extracavity pulse compression (option)
- SHG, FHG (option)
- Real - time autocorrelator (option)

Interferometric autocorrelation function of 16 fs pulse obtained from TISSA-20 laser with external group velocity dispersion compensation





## TISSA-CW

Optical schematic layout of the TISSA-CW continuous wave Ti:sapphire laser

### FEATURES:

- High efficiency continuous waves operation with 2-15 W argon-ion or DPSS pump laser
- Wavelength tuning from 700 nm to 980 nm with two sets of mirrors
- Wavelength tuning with three-plate birefringent filter
- Wavelength stabilization with fine etalon
- < 2 GHz bandwidth
- Tuning curve optimization with output coupler
- Rotation of pump beam polarization with optically active quartz plate

## Titanium : Sapphire Laser Kits

### BASIC KIT ELEMENTS:

- Ti:sapphire crystal assembly
- Two mounted cavity folding mirrors
- Mounted cavity high reflector (s)
- Mounted cavity output coupler
- Pump lens assembly
- Two mounted pump mirrors
- Two prism assemblies for femtosecond kits
- Slit assembly for femtosecond kits
- Birefringent filter assembly for CW kit
- Fine etalon assembly for CW kit
- Electronic starter (option)
- Breadboard (option)
- Two extracavity prism assemblies (option)

TISSA series of Ti:sapphire laser kits represent an excellent compromise between time and cost. Femtosecond and continuous wave laser kits contain all optical and mechanical components which can be assembled together and adjusted by the user following enclosed detailed instructions. Basic configurations correspond to TISSA-100, TISSA-50, TISSA-20 and TISSA-CW Ti:sapphire lasers, but other configurations are possible resulting in several advantages compared to fixed setups, e.g. repetition rates may be varied from 70 to 120 MHz.

## SPECIFICATIONS:

	Model TISSA-20	Model TISSA-50	Model TISSA-100	Model TISSA-CW
Pump Power <sup>1)</sup>	3 - 5 Watt	3 - 7 Watt	3 - 10 Watt	2 - 15 Watt
Output Power at 800 nm	150 - 250 mW	150 - 500 mW	150 mW - 1.0 W	150 mW - 2.5 W
Pulse Duration	<20 fs <sup>2)</sup>	<50 fs	<100 fs	
Bandwidth <sup>3)</sup>				<2 GHz
Tuning Range	810 ± 30 nm	740 - 950 nm <sup>4)</sup>	710 - 950 nm <sup>4)</sup>	700 - 980 nm <sup>4)</sup>
Repetition Rate	83 MHz	83 MHz	93 MHz	
Polarization	Horizontal			
Divergence	< 2 mrad			
Output Beam Diameter	2 - 3 mm			
Spatial Mode	TEM <sub>00</sub>			
Stability	5% typical, depends on pump laser stability			

- 1) DPSS or Ar-ion pump laser is required.  
TEM<sub>00</sub> spatial mode is important
- 2) External group velocity dispersion compensation should be done to obtain pulse duration <20 fs
- 3) With 3-plate birefringent filter and fine etalon
- 4) Wavelength tuning with two sets of mirrors

## DIMENSIONS (MM):

<b>TISSA-100</b>	822 (L) x 360 (w) x 192 (H)
<b>TISSA-20 / TISSA-50</b>	942 (L) x 360 (w) x 192 (H)
<b>TISSA-CW</b>	565 (L) x 260 (w) x 192 (H)

