TW Series
Wavelength-Tunable Narrow Linewidth Diode Laser

Data Sheet

Overview

The TW Series Wavelength-Tunable Narrow Linewidth Diode Laser Systems are precision continuous-wave (CW) laser sources featuring narrow spectral linewidth and fine wavelength tuning around a designated center wavelength. The TW Series combines high stability, compact design, long operating lifetime, and user-friendly operation, with multiple wavelength models covering the UV, visible, and near-infrared spectral regions. It is well suited for high-resolution spectroscopy, atomic and molecular physics, Raman spectroscopy, metrology, and scientific research.

Features

- 390-1074 nm (model dependent)
- CW operating mode
- Narrow spectral linewidth <0.1nm
- Good beam quality
- Compact design

Applications

- Scientific research and teaching
- Holographic imaging
- Raman
- Atomic clock
- Coherent detection

390.2-522 nm Specifications

Parameter		TW391	TW405	TW410	TW444	TW449	TW520
Wavelength range of roughly tuning		390.2-392 nm	403-406 nm	408-411 nm	443-445 nm	448-450 nm	518-522 nm
Operating mode		CW					
Output power(1)		1-15 mW	1-30 mW	1-30 mW	1-400 mW	1-10 mW	1-30 mW
Transverse mode		Near TEM_{00}	Near TEM_{00}	Near TEM_{00}	Multimode	Near TEM_{00}	Near TEM_{00}
Power stability (rms, over 4 hours)		<3%, <2%, <1%					
Spectral linewidth		<0.1 nm					
Frequency shift (over ±2°C and 1 hr)		<10 pm	<10 pm	<10 pm	<50 pm	<10 pm	<10 pm
Coarse tuning accuracy		~0.03 nm	~0.05 nm	~0.05 nm	~0.05 nm	~0.05 nm	~0.1 nm
Fine tuning range(2)		>40 GHz (25pm)	>20 GHz (20pm)	>20 GHz (20pm)	>30 GHz (20pm)	>30 GHz (20pm)	>40 GHz (52pm)
Fine tuning accuracy(2)		0.001 nm					
Beam diameter at aperture ($1/e^2$)		~3.0 mm	~3.0 mm	~3.0 mm	~2.2x1.0 mm	~3.0 mm	~3.0 mm
Beam divergence, full angle		<1.0 mrad	<1.0 mrad	<1.0 mrad	~1.0x5.0 mrad	<1.0 mrad	<1.0 mrad
Polarization ratio		>50:1, Horizontal ±20 degree	>50:1, Vertical ±5 degree	>50:1, Vertical ±5 degree	-	>50:1, Horizontal ±5 degree	>50:1, Horizontal ±5 degree
Warm-up time		<5 min					
Operating temperature		20-30°C					
Power supply operating voltage		100-240 VAC					
Parameters of customed power supply	Current	0-270 mA					
	TEC	7-12 kΩ					
	PZT voltage	0-100 V					
Expected lifetime		>10,000 hours					

Remarks:

1. Any output power level can be selected within this range
2. Wavelength fine tuning is multi-parameter join tuning. Customer only needs to adjust the PZT voltage value to realize.
3. Specifications of the CW laser are based on the laser performance at full power output after the specified warmup period. The stability of output power may change when output power is adjusted at a different power level.
4. Specifications are subject to change without notice.

628-817 nm Specifications

Parameter		TW633	TW639	TW660	TW730	TW783	TW808
Wavelength range of roughly tuning		628-637 nm	634-643 nm	657-664 nm	725-735 nm	775-790 nm	800-817 nm
Operating mode		CW					
Output power(1)		1-40 mW	1-40 mW	1-40 mW	1-30 mW	1-40 mW	1-30 mW
Transverse mode		Near TEM_{00}	Near TEM_{00}	Near TEM_{00}	Near TEM_{00}	Near TEM_{00}	Near TEM_{00}
Power stability (rms, over 4 hours)		<3%, <2%, <1%					
Spectral linewidth		<0.1 nm					
Frequency shift (over ±2°C and 1 hr)		<10 pm	<10 pm	<10 pm	<10 pm	<10 pm	<10 pm
Coarse tuning accuracy		~0.1 nm	~0.1 nm	~0.1 nm	~0.1 nm	~0.1 nm	~0.1 nm
Fine tuning range(2)		>40 GHz (55pm)	>40 GHz (60pm)	>35 GHz (55pm)	>35 GHz (65pm)	>30 GHz (60pm)	>30 GHz (70pm)
Fine tuning accuracy(2)		0.001 nm					
Beam diameter at aperture ($1/e^2$)		~3.0 mm	~3.0 mm	~3.0 mm	~3.0 mm	~3.0 mm	~3.0 mm
Beam divergence, full angle		<1.0 mrad	<1.0 mrad	<1.0 mrad	<1.0 mrad	<1.0 mrad	<1.0 mrad
Polarization ratio		>50:1, Horizontal ±5 degree	>50:1, Horizontal ±5 degree	>50:1, Horizontal ±5 degree	>50:1, Horizontal ±5 degree	>50:1, Horizontal ±5 degree	>50:1, Horizontal ±5 degree
Warm-up time		<5 min					
Operating temperature		20-30°C					
Power supply operating voltage		100-240 VAC					
Parameters of customed power supply	Current	0-270 mA	0-270 mA	0-300 mA	0-300 mA	0-300 mA	0-300 mA
	TEC	7-12 kΩ					
	PZT voltage	0-100 V					
Expected lifetime		>10,000 hours					

Remarks:

1. Any output power level can be selected within this range
2. Wavelength fine tuning is multi-parameter join tuning. Customer only needs to adjust the PZT voltage value to realize.
3. Specifications of the CW laser are based on the laser performance at full power output after the specified warmup period. The stability of output power may change when output power is adjusted at a different power level.
4. Specifications are subject to change without notice.

822-1074 nm Specifications

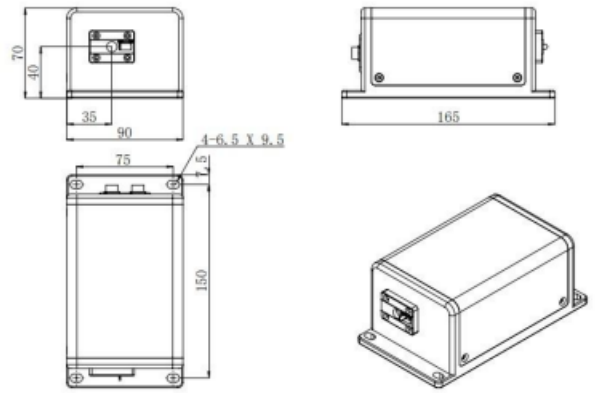
Parameter		TW830	TW849	TW913	TW930	TW978	TW1064
Wavelength range of roughly tuning		822-837 nm	841-856 nm	902-923 nm	918-941 nm	972-984 nm	1054-1074 nm
Operating mode		CW					
Output power(1)		1-40 mW	1-40 mW	1-40 mW	1-40 mW	1-40 mW	1-30 mW
Transverse mode		Near TEM_{00}	Near TEM_{00}	Near TEM_{00}	Near TEM_{00}	Near TEM_{00}	Near TEM_{00}
Power stability (rms, over 4 hours)		<3%, <2%, <1%					
Spectral linewidth		<0.1 nm					
Frequency shift (over ±2°C and 1 hr)		<10 pm	<10 pm	<10 pm	<10 pm	<10 pm	<10 pm
Coarse tuning accuracy		~0.1 nm	~0.1 nm	~0.1 nm	~0.1 nm	~0.1 nm	~0.1 nm
Fine tuning range(2)		>30 GHz (50pm)	>30 GHz (75pm)	>23 GHz (65pm)	>20 GHz (70pm)	>30 GHz (100pm)	>20 GHz (80pm)
Fine tuning accuracy(2)		0.001 nm					
Beam diameter at aperture ($1/e^2$)		~3.0 mm	~3.0 mm	~3.0 mm	~3.0 mm	~3.0 mm	~3.0 mm
Beam divergence, full angle		<1.0 mrad	<1.0 mrad	<1.0 mrad	<1.0 mrad	<1.0 mrad	<1.0 mrad
Polarization ratio		>50:1, Horizontal ±5 degree	>50:1, Horizontal ±5 degree	>50:1, Vertical ±5 degree	>50:1, Horizontal ±5 degree	>50:1, Vertical ±5 degree	>50:1, Vertical ±5 degree
Warm-up time		<5 min					
Operating temperature		20-30°C					
Power supply operating voltage		100-240 VAC					
Parameters of customed power supply	Current	0-300 mA	0-300 mA	0-270 mA	0-300 mA	0-270 mA	0-300 mA
	TEC	7-12 kΩ					
	PZT voltage	0-100 V					
Expected lifetime		>10,000 hours					

Remarks:

1. Any output power level can be selected within this range
2. Wavelength fine tuning is multi-parameter join tuning. Customer only needs to adjust the PZT voltage value to realize.
3. Specifications of the CW laser are based on the laser performance at full power output after the specified warmup period. The stability of output power may change when output power is adjusted at a different power level.
4. Specifications are subject to change without notice.

TW Series Laser Head Dimensions

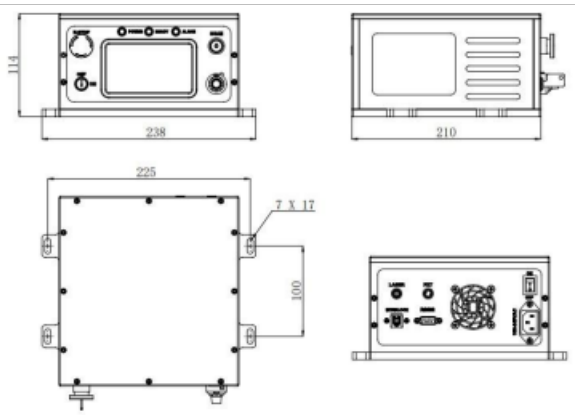
Unit: mm



Parameter	TW Series
Dimensions	165(L)×90(W)×70(H) mm^3
Weight	3.0 kg
Beam height from base plate	40 mm
Beam exit (from side)	35 mm

TW Series Power Supply Dimensions

Unit: mm



Parameter	TUN Power Supply
Dimensions	210(L)×238(W)×114(H) mm^3
Weight	4.0 kg
Operating voltage	100-240 VAC
Notes	Output power adjustable 10-100%. RS232 control optional.

Ordering Information

For more information, please contact Lasermate directly at sales@lasermate.com.

Part Number Configuration **TW-[1][2][3]**			
TW = Laser Model Series	**[1] = Tuning Range**	**[2] = Output Power**	**[3] = Power Stability**
	391=390.2-392 nm 403=403-406 nm 410=408-411 nm 444=443-445 nm 449=448-450 nm 520=518-522 nm 633=628-637 nm 639=634-643 nm 660=657-664 nm 730=725-735 nm 783=775-790 nm 808=800-817 nm 830=822-837 nm 849=841-856 nm 913=902-923 nm 930=918-941 nm 978=972-984 nm 1064=1054-1074 nm		E=<3% 2=<2% D=<1%

Note: The above specifications are subject to change without notice.