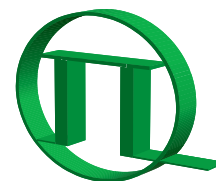


LDH Series



PICOQUANT

Picosecond Laser Diode Heads for PDL 800-B/-D/808/828

Features

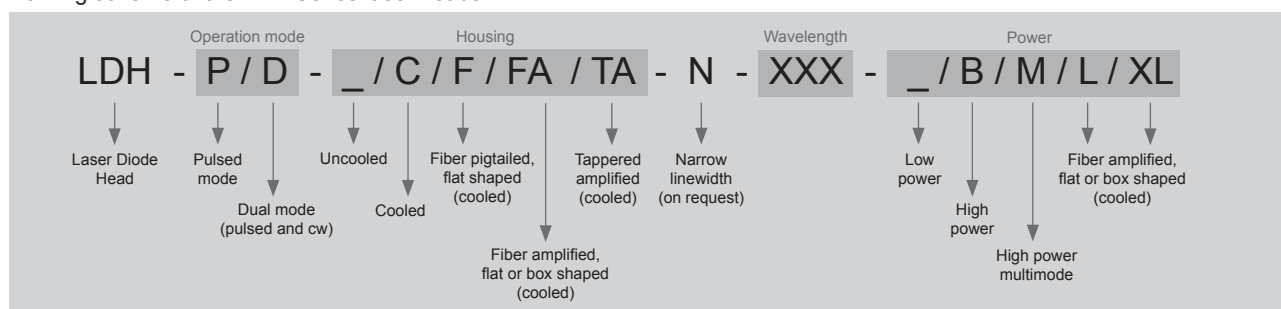
- Wavelengths from 375 to 1990 nm
- Peak power up to 1 W
- Pulse widths as short as 40 ps (FWHM)
- Repetition rates from single shot to 80 MHz
- Collimating optics, optional fiber, coupler and peltier cooling
- Optional dual mode: CW and pulsed operation

Applications

- Time-resolved fluorescence spectroscopy/microscopy
- Biochemical analytics
- Time-response characterization of opto-electronic devices
- Diffuse Optical Tomography
- Seed for fiber lasers
- Single photon sources
- Quantum optics



Naming scheme of the LDH Series laser heads



C: Laser head with thermoelectric cooler, mandatory for some laser heads, optional for all other laser heads
 F: Laser head emits a divergent beam from FC/APC fiber output connector
 M: Transversal multimode structure, reduced coupling efficiency into single mode fibers

The following tables list the pulse parameters and power values of the available wavelengths of the LDH Series. The two power adjustment levels specified here refer to the same laser head. These levels can be adjusted using the corresponding driver of the PDL Series (PDL 800-B, PDL 800-D, PDL 808 "Sepia", PDL 828 "Sepia II"). The 'low' adjustment is the best choice for shortest pulses and is usually reached close to the lasing threshold. The 'high' adjustment is used to achieve highest pulse power at moderate pulse length and corresponds to the maximum intensity setting of the driver. Dual mode laser heads (LDH-D Series, pulsed and cw operation) can only be controlled by the PDL 800-D or PDL 828 „Sepia II" laser driver. These laser heads have a spectral width of a few nm. Special selected laser heads with narrow spectral bandwidth can also be provided.

Wavelength (± 10) [nm]	Type (LDH-)	CW power [mW]	Power adjust = low (narrow pulse)				Power adjust = high (wide pulse)			
			Pulse*** (FWHM) [ps]	Average power		Pulse (FWHM) [ps]	Average power			
				40 MHz [mW]	80 MHz [mW]		40 MHz [mW]	80 MHz [mW]		
266 (± 3)	P-FA-266	--	Please see separate data sheet for LDH-P-FA Series.							
355 (± 3)	P-FA-355	--	Please see separate data sheet for LDH-P-FA Series.							
375	P-C-375	--	< 40	0.5	--	< 300	1.0	--		
	P-C-375B	--	< 40	0.5	--	< 300	3.0	--		
	D-C-375	10	< 40	0.5	--	< 300	3.0	--		
	P-C-375M	--	< 90	2.5	--	< 300	10.0	--		
	D-C-375M	50	< 90	2.5	--	< 300	10.0	--		
395	P-C-390	--	< 70	1.0	--	< 300	5.0	--		
	D-C-390	30	< 70	1.0	--	< 300	5.0	--		
405	P-C-405	--	< 50	0.4	0.8	< 300	2.0	4.0		
	P-C-405B	--	< 50	1.0	--	< 500	3.0	--		
	D-C-405	50	< 50	1.0	--	< 500	3.0	--		
	P-C-405M	--	< 90**	10.0	--	< 600	25.0	--		
	D-C-405M	200	< 90**	10.0	--	< 600	25.0	--		
420	P-C-420	--	< 70	0.5	--	< 300	5.0	--		
	D-C-420	30	< 70	0.5	--	< 300	5.0	--		
440	P-C-440	--	< 70	0.4	--	< 300	2.0	--		
	P-C-440B	--	< 70	0.8	--	< 500	4.0	--		
	D-C-440	50	< 70	0.8	--	< 500	4.0	--		
	P-C-440M	--	< 100**	10.0	--	< 500	25.0	--		
	D-C-440M	200	< 100**	10.0	--	< 500	25.0	--		
450	P-C-450	--	< 100	0.5	--	< 300	2.0	--		
	P-C-450B	--	< 60	0.7	--	< 300	5.0	--		
	D-C-450	10	< 60	0.7	--	< 300	5.0	--		
470	P-C-470	--	< 70	0.4	--	< 500	2.0	--		
	P-C-470B	--	< 70	0.8	--	< 500	4.0	--		
	D-C-470	40	< 70	0.8	--	< 500	4.0	--		
	P-C-470M	--	< 120	8.0	--	< 500	20.0	--		
	D-C-470M	200	< 120	8.0	--	< 500	20.0	--		
485	P-C-485	--	< 110	0.4	--	< 500	2.0	--		
	P-C-485B	--	< 90	0.7	--	< 550	5.0	--		
	D-C-485*	50	< 90	0.7	--	< 550	5.0	--		
500	P-C-500	--	< 130	0.5	--	< 500	2.0	--		
	P-C-500B	--	< 100	0.7	--	< 500	5.0	--		
	D-C-500	40	< 100	0.7	--	< 500	5.0	--		
510	P-C-510	--	< 130	0.3	--	< 600	2.0	--		
	P-C-510B	--	< 110	0.6	--	< 600	4.0	--		
	D-C-510*	40	< 110	0.6	--	< 600	4.0	--		
520	P-C-520	--	< 130	1.5	--	< 500	5.0	--		
	D-C-520*	30	< 130	1.5	--	< 500	5.0	--		
	P-C-520M	--	< 160	8.0	--	< 300	25.0	--		
532 (± 3)	P-FA-530B/L/XL	--	Please see separate data sheet for LDH-P-FA Series.							
532 (± 3)	D-TA-530	20	< 70	--	0.4	< 70	--	1.1		
561 (± 3)	D-TA-560	5	< 60	--	0.4	< 80	--	0.6		
594 (± 3)	D-TA-595	5	< 80	--	0.3	< 90	--	0.4		
635	P-635	--	< 90	0.3	0.6	< 400	2.5	4.0		
	P-C-635M	--	< 100	2.0	4.0	< 500	10.0	20.0		
	D-C-635M	100	< 100	2.0	4.0	< 500	10.0	20.0		
640	P-C-640B	--	< 90	1.0	2.0	< 500	10.0	20.0		
	D-C-640	50	< 90	1.0	2.0	< 500	10.0	20.0		
655	P-650	--	< 70	0.4	0.9	< 400	3.0	6.0		
	P-C-650	--	< 70	0.4	0.9	< 400	3.0	6.0		
	D-C-650	10	< 70	0.4	0.9	< 400	3.0	6.0		
660	P-660	--	< 90	0.5	1.0	< 500	5.0	10.0		
	P-C-660	--	< 90	0.5	1.0	< 500	5.0	10.0		
	D-C-660	30	< 90	0.5	1.0	< 500	5.0	10.0		
665	P-670B	--	< 90	0.3	0.7	< 400	2.0	4.0		
	P-C-670B	--	< 90	0.3	0.7	< 400	2.0	4.0		
	D-C-670B	15	< 90	0.3	0.7	< 400	2.0	4.0		

Wavelength (± 10) [nm]	Type (LDH-)	CW power [mW]	Power adjust = low (narrow pulse)			Power adjust = high (wide pulse)		
			Pulse*** (FWHM) [ps]	Average power		Pulse (FWHM) [ps]	Average power	
				40 MHz [mW]	80 MHz [mW]		40 MHz [mW]	80 MHz [mW]
670	P-670	--	< 70	0.3	0.7	< 300	1.0	2.0
	P-C-670	--	< 70	0.3	0.7	< 300	1.0	2.0
	D-C-670	3	< 70	0.3	0.7	< 300	1.0	2.0
	P-C-670M	--	< 100	12.0	25.0	< 300	50.0	50.0
690	P-690	--	< 70	0.5	1.0	< 400	4.0	8.0
	P-C-690	--	< 70	0.5	1.0	< 500	4.0	8.0
	D-C-690	20	< 70	0.5	1.0	< 500	4.0	8.0
705	P-705	--	< 70	1.0	2.0	< 400	5.0	10.0
	P-C-705	--	< 70	1.0	2.0	< 400	5.0	10.0
	D-C-705	20	< 70	1.0	2.0	< 400	5.0	10.0
730	P-730	--	< 100	0.7	1.5	< 400	2.0	4.0
	P-C-730	--	< 70	1.0	2.0	< 400	3.0	6.0
	D-C-730	15	< 70	1.0	2.0	< 400	3.0	6.0
760	P-760	--	< 100	0.4	0.9	< 600	3.0	6.0
	P-C-760	--	< 90	0.4	0.9	< 600	3.0	6.0
	D-C-760	10	< 90	0.4	0.9	< 600	3.0	6.0
766 (± 3)	P-FA-765			Please see separate data sheet for LDH-P-FA Series.				
785	P-780	--	< 70	0.5	1.0	< 500	5.0	10.0
	P-C-780	--	< 70	0.5	1.0	< 500	5.0	10.0
	D-C-780	40	< 70	0.5	1.0	< 500	5.0	10.0
805	P-810	--	< 90	0.4	0.9	< 500	5.0	10.0
	P-C-810	--	< 90	0.4	0.9	< 500	5.0	10.0
	D-C-810	30	< 90	0.4	0.9	< 500	5.0	10.0
	P-C-810M	--	< 90	1.5	3.0	< 500	15.0	30.0
	D-C-810M	100	< 90	1.5	3.0	< 500	15.0	30.0
830	P-830	--	< 70	0.2	0.4	< 300	4.0	8.0
	P-C-830	--	< 70	0.2	0.4	< 300	4.0	8.0
	D-C-830	20	< 70	0.2	0.4	< 300	4.0	8.0
	P-C-830M	--	< 90	5.0	10.0	< 300	15.0	30.0
	D-C-830M	100	< 90	5.0	10.0	< 300	15.0	30.0
840	P-840	--	< 80	0.25	0.5	< 500	2.0	4.0
	P-C-840	--	< 80	0.25	0.5	< 500	2.0	4.0
	D-C-840	30	< 80	0.25	0.5	< 500	2.0	4.0
850	P-850	--	< 70	0.5	1.0	< 500	4.5	9.0
	P-C-850	--	< 70	0.5	1.0	< 500	4.5	9.0
	D-C-850	40	< 70	0.5	1.0	< 500	4.5	9.0
905	P-905	--	< 120	0.5	1.0	< 300	2.5	5.0
	P-C-905	--	< 120	1.0	2.0	< 300	4.0	8.0
	D-C-905	50	< 120	1.0	2.0	< 300	4.0	8.0
930				On request.				
950				On request.				
965	P-965	--	< 90	1.2	2.5	< 400	10.0	20.0
	P-C-965	--	< 90	1.2	2.5	< 400	10.0	20.0
	D-C-965	30	< 90	1.2	2.5	< 400	10.0	20.0
975				On request.				
1025	P-F-1030	--	< 90	1.0	2.0	< 550	5.0	10.0
1060 (± 20)	P-1060	--	< 70	1.0	2.0	< 100	10.0	20.0
	P-C-1060	--	< 70	1.0	2.0	< 100	10.0	20.0
	D-C-1060	50	< 70	1.0	2.0	< 100	10.0	20.0
1063 (± 3)	P-FA-1060/L			Please see separate data sheet for LDH-P-FA Series.				
1080	P-C-1080	--	< 50	1.2	2.5	< 50	2.0	4.0
	D-C-1080	30	< 50	1.2	2.5	< 50	2.0	4.0
1120	P-C-1120	--	< 90	1.2	2.5	< 90	2.5	5.0
	D-C-1120	20	< 90	1.2	2.5	< 90	2.5	5.0
1310 (± 20)	P-1310	--	< 50	0.08	0.15	< 500	1.0	2.0
	P-C-1310	--	< 50	0.08	0.15	< 500	1.0	2.0
	D-C-1310	5	< 50	0.08	0.15	< 500	1.0	2.0
1532 (± 3)	P-FA-1530			Please see separate data sheet for LDH-P-FA Series.				
1550 (± 30)	P-1550	--	< 50	0.01	0.02	< 400	0.5	1.0
	P-C-1550	--	< 50	0.01	0.02	< 400	0.5	1.0
	D-C-1550	2.5	< 50	0.01	0.02	< 400	0.5	1.0
1990	P-F-1990	--	< 120	0.05	0.1	< 500	0.15	0.3

*different coupling efficiency into optical fibers for pulsed and CW operation due to astigmatism

** shorter pulse width available on demand

*** deconvoluted with instrument response function of 30 ps

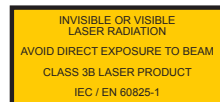
On request: narrow spectral bandwidth

The given specification are for information only, possible changes may occur.

Wavelength [nm]	Variation [nm]	Type (LDH-)	Spectral (FWHM) [nm]	Power adjust = low (narrow pulse)			Power adjust = high (wide pulse)		
				Pulse (FWHM) [ps]	Average power		Pulse (FWHM) [ps]	Average power	
					40 MHz [mW]	80 MHz [mW]		40 MHz [mW]	80 MHz [mW]
772	± 3	P-C-N-780	< 1.0	< 120	1.2	2.5	< 350	3.5	7.0
784	± 3	P-C-N-780	< 0.3	< 100	0.9	1.6	< 500	4.0	8.0
852	± 3	P-C-N-845	< 0.3	< 100	0.7	1.5	< 350	4.5	9.0
976	± 3	P-C-N-976	< 0.5	--	--	--	< 90	5.0	10.0
1063	± 3	P-F-N-1064	< 0.5	< 100	0.4	0.9	< 700	5.0	10.0
1064	± 3	P-C-N-1064	< 1	< 130	0.6	1.3	< 600	5.0	10.0
1275	± 7	P-C-N-1310	< 0.5	< 40	0.01	0.03	< 250	0.6	1.3
1300	± 7	P-C-N-1310	< 0.5	< 40	0.01	0.03	< 250	0.6	1.3
1310	± 7	P-C-N-1310	< 0.5	< 40	0.01	0.03	< 250	0.6	1.3
1325	± 7	P-C-N-1310	< 0.5	< 40	0.01	0.03	< 250	0.6	1.3
1349	± 7	P-C-N-1310	< 0.5	< 40	0.01	0.03	< 250	0.6	1.3
1417	± 3	--	< 0.2	< 100	0.01	0.03	< 400	0.5	1.0
1470	± 3	P-C-N-1550	< 0.2	< 40	0.02	0.05	< 500	0.6	1.3
1490	± 3	P-C-N-1550	< 0.2	< 40	0.02	0.05	< 500	0.6	1.3
1510	± 3	P-C-N-1550	< 0.2	< 40	0.02	0.05	< 500	0.6	1.3
1530	± 3	P-C-N-1550	< 0.2	< 40	0.02	0.05	< 500	0.6	1.3
1550	± 3	P-C-N-1550	< 0.2	< 40	0.02	0.05	< 500	0.6	1.3
1570	± 3	P-C-N-1550	< 0.2	< 40	0.02	0.05	< 500	0.6	1.3
1590	± 3	P-C-N-1550	< 0.2	< 40	0.02	0.05	< 500	0.6	1.3
1610	± 3	P-C-N-1550	< 0.2	< 40	0.02	0.05	< 500	0.6	1.3
1530 to 1560, any wavelength		P-F-N-1550	< 0.5	< 100	0.2	0.4	< 900	2.5	5.0

Available upon request: 760, 763, 780, 795, 937, 1083 nm (± 3 nm)

These tables are updated on a regular basis based on data of recently manufactured laser heads. Other specifications such as shorter pulse widths or higher powers than listed might be possible depending on the performance of diodes on stock. Please contact us for more information. All measurements shown may be subject to a 10 % calibration error. Each laser head undergoes an extensive burn-in test to ensure long-term stability and is shipped with a comprehensive set of test data. This test data is kept in our database, which already holds records of more than 18 years.



Specifications

Beam parameters

Optics focus length $f = 4.5 \text{ mm}$
 Numerical aperture 0.55
 Typical divergence with optics $\Theta_{\parallel} 0.32 \text{ mrad}, \Theta_{\perp} 0.11 \text{ mrad}^*$
 Polarization typ. linear, perpendicular to the fast axis*
 Polarization degree $> 90 \text{ \%}^*$
 Sidemode suppression ratio (SMSR) $< 0.01^*$

Cooling (optional)

Peltier cooling stability better than 1 K for ambient temperature between 15 °C and 30 °C

Spectral width ¹⁾

Wavelength $< 900 \text{ nm}$ approx. 2-8 nm
 Wavelength $> 900 \text{ nm}$ approx. 10-20 nm
 CW operation $< 1 \text{ nm}$

Power stability (cooled)

12 hours, $DT_{\text{ambient}} < 3 \text{ K}$ 1 % RMS, 3 % peak to peak

Dimensions

Cooled ($\varnothing \times \text{length}$) $62 \times 100 \text{ mm}$, with fiber coupling: $62 \times 132 \text{ mm}$
 Uncooled ($\varnothing \times \text{length}$) $25 \times 76 \text{ mm}$, with fiber coupling: $25 \times 106 \text{ mm}$
 Flat type ($l \times w \times h$) $195 \times 112 \times 24 \text{ mm}$

¹⁾ for spectral width of laser heads with narrow bandwidth, please see table above

* typical values

All Information given here is reliable to our best knowledge. However, no responsibility is assumed for possible inaccuracies or omissions. Specifications and external appearances are subject to change without notice. Trademarks or corporate names are used for explanation and identification, to the owner's benefit and without intent to infringe.

© PicoQuant GmbH, February 2016



PicoQuant GmbH
 Rudower Chaussee 29 (IGZ)
 12489 Berlin
 Germany

Phone +49-(0)30-6392-6929
 Telefax +49-(0)30-6392-6561
 Email info@picoquant.com
 WWW http://www.picoquant.com