

51nanoFI-S-808-16-G15-P-5-2-18-0-150

Fiber-coupled low coherence laser source with integrated Faraday isolator and single-mode fiber cable



FEATURES

The Laser Diode Beam Source of type 51nanoFl-S-808-16-G15-P-5-2-18-0-150 has a <u>reduced</u> <u>power noise</u>, <u>a reduced coherence length and a low speckle contrast</u>.

- Reduced power noise: typ. < 0.1 % of P₀ (RMS, Bandwidth < 1 MHz)
- Reduced coherence length: coherence length ≈ 300 µm
- Reduced speckle contrast
- Wavelength: 808 nm
- Laser output power: 16 mW
- Integrated Faraday isolator > 30 dB
- Single-mode fiber cable
- FC APC connector (8°-polish)
- Modulation analog and TTL
- With interlock and key switch (conform to EN 60825-1)

Alternative: Laser Diode Beam Source <u>51nanoFi-N</u> (OEM version w/o key switch and w/o interlock)

With integrated Faraday isolator





DESCRIPTION



The fiber-coupled Laser Diode Beam Source of type 51nanoFI-S-808-16-G15-P-5-2-18-0-150 has a reduced power noise (typ. < 0.1 % of P_o (RMS, Bandwidth < 1 MHz)), reduced coherence length (\approx 300 μ m) and a lowered speckle contrast.

Electrical features

The output power is adjustable using a potentiometer or using the two modulation inputs for analog and TTL.

Faraday isolator

The source has an integrated Faraday isolator in order to protect the laser from back reflections.

Fiber cable

The source is fiber-coupled to a single-mode fiber cable. As a result the beam profile is rotationally symmetric with Gaussian intensity distribution. The fiber cable is equipped with an FC APC type connector (8°-polish). The fiber cable has a strain-relief and a protective sleeving (Ø 3 mm). Standard cable length is 150 cm.

Options:

- Polarization-maintaining fiber
- Core-centered (single-mode only)
- Other connector types including FC PC, DIN or AVIO, or E2000
- Other fiber cable lengths
- Incorporated vacuum feed-through

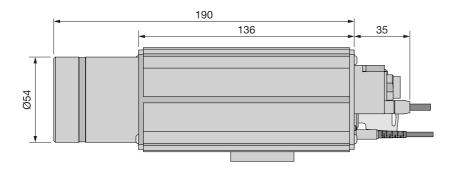
Laser safety

The laser safety is conform to IEC 825 / EN 60825-1.

- Interlock chain for the remote deactivation of the laser
- Laser power-up is only possible using the key switch
- LED status indicator for "Laser ON"
- For a quick start the laser is shipped with a interlock connector type <u>BC0106F-iLCK</u>

An OEM version is available as type <u>51nanoFi-N</u> without key switch or interlock which is not conform to EN 60825-1.

A version without Faraday isolator is available here.





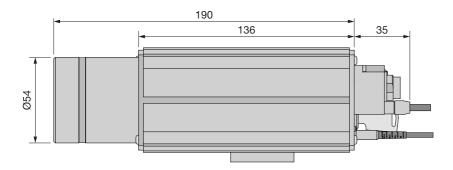
TECHNICAL DATA

51nanoFI-S-808-16-G15-P-5-2-18-0-150

Series 51nanoFI-S (single-mode)	Order Code	51nanoFI-S-808-16-G15-P-5-2-18-0-150		
Center Wavelength 808 ± 10 nm Bandwidth 0.7 - 4 nm Output power typ. 16 mW Power adjustment < 1 - 100 % Power noise typ. < 0.1 % of P ₀ (RMS, BW < 1 MHz) Coherence length = 300 μm Isolation > 30 dB Fiber cable single-mode Fiber type SMC-780 Nominal fiber NA 0.12 Effective fiber NAe ² 0.09 ± 10 % (1/e ²) Mode field diameter MFD 5.7 μm ± 10 % (1/e ²) Fiber cable length 1.5 ± 0.05 m (standard) Fiber cable type Ø 3 mm with Kevlar strain-relief Fiber connector type FC APC (standard) Power stability max. 12 % power variation between 15°C and 35°C Electronics type H Electr. cable length 1.5 ± 0.1 m (standard) Connector type 3 pin (male, Lumberg SV30) Supply voltage 5.0 ± 0.2 V Max. current consumption* 260 mA Modulation input connector 6 pin (male, Lumberg SV60) Modulation input solutage 5.0 ± 0.2 V	Series	51nanoFI-	51nanoFI-S (single-mode)	
Bandwidth 0.7 - 4 nm Output power typ. 16 mW Power adjustment < 1 · 100 % Power noise typ. < 0.1 % of P₀ (RMS, BW < 1 MHz) Coherence length ≈ 300 μm Isolation > 30 dB Fiber cable single-mode Fiber type SMC-780 Nominal fiber NA 0.12 Effective fiber NAe² 0.09 ± 10 % (1/e²) Mode field diameter MFD 5.7 μm ± 10 % (1/e²) Fiber cable length 1.5 ± 0.05 m (standard) Fiber cable type Ø 3 mm with Kevlar strain-relief Fiber connector type FC APC (standard) Power stability max. 12 % power variation between 15°C and 35°C Electronics type H Electr. cable length 1.5 ± 0.1 m (standard) Connector type 3 pin (male, Lumberg SV30) Supply voltage 5.0 ± 0.2 V Max. current consumption* 260 mA Modulation inputs Analog TTL Max. input voltage 5 V 5 V Voltage for P _{min} / P₀ 0 V / 2.5 V < 0.8 V / > 2.4 V	Laser class		3B	
Output power typ. 16 mW Power adjustment < 1 · 100 %	Center Wavelength	808 ± 10 nm		
Power adjustment < 1 - 100 % Power noise typ. < 0.1 % of P₀ (RMS, BW < 1 MHz) Coherence length ≈ 300 μm Isolation > 30 dB Fiber cable single-mode Fiber type SMC-780 Nominal fiber NA 0.12 Effective fiber NAe² 0.09 ± 10 % (1/e²) Mode field diameter MFD 5.7 μm ± 10 % (1/e²) Fiber cable length 1.5 ± 0.05 m (standard) Fiber cable type Ø 3 mm with Kevlar strain-relief Fiber connector type FC APC (standard) Power stability max. 12 % power variation between 15°C and 35°C Electronics type H Electr. cable length 1.5 ± 0.1 m (standard) Connector type 3 pin (male, Lumberg SV30) Supply voltage 5.0 ± 0.2 V Max. current consumption* 260 mA Modulation input connector 6 pin (male, Lumberg SV60) Modulation inputs Analog TTL Max. input voltage 5 V 5 V Voltage for P _{min} / P _O 0 V / 2.5 V < 0.8 V / > < 2.4 V Input impedance 22 kOhm 22 kOhm 40 kHz	Bandwidth	0.7 - 4 nm		
Power noise typ. < 0.1 % of P₀ (RMS, BW < 1 MHz) Coherence length ≈ 300 μm Isolation > 30 dB Fiber cable Single-mode Fiber type SMC-780 Nominal fiber NA 0.12 Effective fiber NAe² 0.09 ± 10 % (1/e²) Mode field diameter MFD 5.7 μm ± 10 % (1/e²) Fiber cable length 1.5 ± 0.05 m (standard) Fiber cable type Ø 3 mm with Kevlar strain-relief Fiber connector type FC APC (standard) Power stability max. 12 % power variation between 15°C and 35°C Electronics type H Electr. cable length 1.5 ± 0.1 m (standard) Connector type 3 pin (male, Lumberg SV30) Supply voltage 5.0 ± 0.2 ∨ Max. current consumption* Modulation input connector 6 pin (male, Lumberg SV60) Modulation inputs Analog TTL Max. input voltage 5 ∨ 5 ∨ Voltage for Pmin / Po 0 ∨ / 2.5 ∨ 5 ∨ Voltage for Pmin / Po 100 kHz Not Medical in put voltage 22 kOhm Analog TTL Max. input impedance 22 kOhm 22 kOhm Modulation frequency 100 kHz	Output power	typ. 16 mW		
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Fiber cable Fiber type SMC-780 Nominal fiber NA Solution Fiber type SMC-780 Nominal fiber NA Solution Fiber cable length Solution Fiber cable length Solution Fiber cable length Solution Fiber cable type FC APC (standard) Fiber connector type FC APC (standard) FI Standard FI Standar	Power noise	typ. $< 0.1 \%$ of P ₀ (RMS, BW $< 1 \text{ MHz}$)		
Fiber cable Fiber type SMC-780 Nominal fiber NA 0.12 Effective fiber NA _e ² 0.09 ± 10 % (1/e ²) Mode field diameter MFD 5.7 μm ± 10 % (1/e ²) Fiber cable length 1.5 ± 0.05 m (standard) Fiber cable type Ø 3 mm with Kevlar strain-relief Fiber connector type FC APC (standard) Power stability max. 12 % power variation between 15°C and 35°C Electronics type H Electr. cable length 1.5 ± 0.1 m (standard) Connector type 3 pin (male, Lumberg SV30) Supply voltage 5.0 ± 0.2 V Max. current consumption* Modulation input connector 6 pin (male, Lumberg SV60) Modulation inputs Analog TTL Max. input voltage 5 V Voltage for P _{min} / P _O 0 V / 2.5 V 100 kHz Input impedance 22 kOhm Max. modulation frequency 100 kHz	Coherence length	≈ 300 µm		
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Nominal fiber NA 0.12 Effective fiber NA _e ² $0.09 \pm 10 \% (1/e^2)$ Mode field diameter MFD $5.7 \mu m \pm 10 \% (1/e^2)$ Fiber cable length $1.5 \pm 0.05 \text{ m}$ (standard) Fiber cable type Ø 3 mm with Kevlar strain-relief Fiber connector type FC APC (standard) Power stability max. 12 % power variation between 15°C and 35°C Electronics type H Electr. cable length $1.5 \pm 0.1 \text{ m}$ (standard) Connector type 3 pin (male, Lumberg SV30) Supply voltage $5.0 \pm 0.2 \text{ V}$ Max. current consumption* 260 mA Modulation input connector 6 pin (male, Lumberg SV60) Modulation inputs Analog TTL Max. input voltage 5 V Voltage for P_{\min} / P_0 $0 \text{ V} / 2.5 \text{ V}$ $< 0.8 \text{ V} / > 2.4 \text{ V}$ Input impedance 22 kOhm 22 kOhm Max. modulation frequency 100 kHz 100 kHz	Fiber cable		single-mode	
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Mode field diameter MFD 5.7 µm ± 10 % (1/e²) Fiber cable length 1.5 ± 0.05 m (standard) Fiber cable type Ø 3 mm with Kevlar strain-relief Fiber connector type FC APC (standard) Power stability max. 12 % power variation between 15°C and 35°C Electronics type H Electr. cable length 1.5 ± 0.1 m (standard) Connector type 3 pin (male, Lumberg SV30) Supply voltage 5.0 ± 0.2 V Max. current consumption* 260 mA Modulation input connector 6 pin (male, Lumberg SV60) Modulation inputs Analog TTL Max. input voltage 5 V 5 V Voltage for P _{min} / P _O 0 V / 2.5 V Consumption of the	Nominal fiber NA		0.12	
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Fiber cable type Fiber connector type FC APC (standard) Power stability max. 12 % power variation between 15°C and 35°C Electronics type H Electr. cable length 1.5 ± 0.1 m (standard) Connector type 3 pin (male, Lumberg SV30) Supply voltage 5.0 ± 0.2 V Max. current consumption* Analog Modulation input connector 6 pin (male, Lumberg SV60) Modulation inputs Analog TTL Max. input voltage 5 V Voltage for P _{min} / P _O 0 V / 2.5 V Input impedance 22 kOhm Max. modulation frequency 100 kHz 100 kHz	Mode field diameter MFD	5.7 μm ± 10 % (1/e ²)		
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Electronics typeHElectr. cable length $1.5 \pm 0.1 \text{ m}$ (standard)Connector type $3 \text{ pin (male, Lumberg SV30)}$ Supply voltage $5.0 \pm 0.2 \text{ V}$ Max. current consumption* 260 mA Modulation input connector $6 \text{ pin (male, Lumberg SV60)}$ Modulation inputsAnalogTTLMax. input voltage 5 V 5 V Voltage for $P_{\text{min}} / P_{\text{O}}$ $0 \text{ V} / 2.5 \text{ V}$ $< 0.8 \text{ V} / >$ Input impedance 22 kOhm 22 kOhm Max. modulation frequency 100 kHz 100 kHz	Fiber connector type	FC APC (standard)		
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$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Electr. cable length	1.5 ± 0.1 m (standard)		
Max. current consumption*260 mAModulation input connector6 pin (male, Lumberg SV60)Modulation inputsAnalogTTLMax. input voltage5 V5 VVoltage for Pmin / PO0 V / 2.5 V< 0.8 V / > 2.4 VInput impedance22 kOhm22 kOhmMax. modulation frequency100 kHz100 kHz	Connector type	3 pin (male, Lumberg SV30)		
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Modulation inputsAnalogTTLMax. input voltage5 V5 VVoltage for Pmin / PO0 V / 2.5 V< 0.8 V / > 2.4 VInput impedance22 kOhm22 kOhmMax. modulation frequency100 kHz100 kHz	Max. current consumption*	260 mA		
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Voltage for P _{min} / P _O 0 V / 2.5 V < 0.8 V / > 2.4 V Input impedance 22 kOhm Max. modulation frequency 100 kHz 100 kHz	Modulation inputs	Analog	TTL	
2.4 V Input impedance 22 kOhm 22 kOhm Max. modulation frequency 100 kHz 100 kHz	Max. input voltage	5 V	5 V	
Max. modulation frequency 100 kHz 100 kHz	Voltage for P _{min} / P _O	0 V / 2.5 V		
	Input impedance	22 kOhm	22 kOhm	
Time delay ON/OFF* 2/0.3 μs 1.5/0.1 μs	Max. modulation frequency	100 kHz	100 kHz	
l l	Time delay ON/OFF*	2/0.3 μs	1.5/0.1 µs	



Rise / fall time*	1.0/1.0 μs	1.0/1.0 μs	
* Typical value. Depends on laser diode.			
Operating temperature	15	15 - 35°C ± 0.5°C	
Warm-up time		approx. 10 min	
Air humidity	max. 90 % r	max. 90 % non-condensing	
Casing Type		S1	
Weight		g	
Dimensions (w/o base)	66	x 66 x 225 mm	
Protection Class		IP30	
Dimensions (for a complete dimensional drawing please refer to the downloads section)			



TECHNOTES

- Fiber-coupled low noise beam source
 Comparison of a low noise laser source to a conventional laser source
- 51nano: Electronics Type H
 Electronic features for electronics type H

DOWNLOADS



090410090100.pdf (Dimensional drawing)



Conformity 51nano 2023 E web.PDF (CE certificate)



ACCESSORIES

PS051003E Power Supply 5 V

BC0106F-ILCK Interlock connector

FIBER COLLIMATORS Fiber Collimators for collimating light exiting a single-

SINGLE-MODE/PM mode or polarization-maintaining fiber cable

RELATED PRODUCTS

51NANO-S (SINGLE- Fiber-coupled low coherence laser source with

MODE) single-mode fiber cable

51NANOFI-N WITH Fiber-coupled low coherence laser source with

FARADAY ISOLATOR single-mode fiber cable (OEM version)

51NANOFI-S WITH Fiber-coupled low coherence laser source with

FARADAY ISOLATOR polarization-maintaining fiber cable

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5/3/2024

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