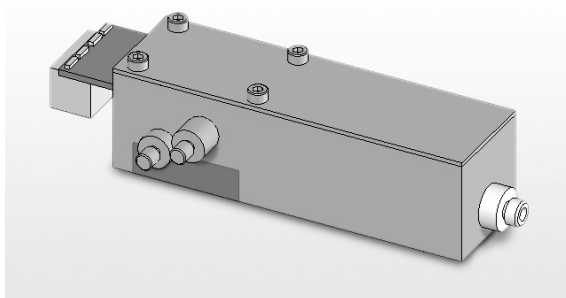


## MDL series

High-power fiber-coupled diode laser



### Features

- High brightness laser for medical, pump and material processing applications
- Up to 20 W CW output power.
- High Quality, Reliability, & Performance
- SMA905 Plug & Play connector for optical fibers

### Special features

Contains an inbuilt handler, which provides several additional functions:

- Reverse polarity protection. If module is connected not correctly, handler will automatically deactivate it and protect from damage
- Operating current surpassing protection. The built-in handler will automatically deactivate laser module and protect it from damage in case of transient or long-term operating current excess
- Stable and reliable pilot beam power supply. Pilot laser diode power management is performed with voltage 0–2.5 V
- Laser beam power measurement with the built-in optical sensor
- Laser diode temperature measurement with PT100 heat sensor (order code: DM-508).

All this functions provide higher reliability of laser module while connecting or in service. Therefore, qualification requirements for operating staff are much lower.

### Performance highlights

Parameter	Unit	Min	Typ	Max
Wavelength	nm	970	975	980
Operating Power (P)	W	-	20	22
Operating Temp. (T <sub>op</sub> )	°C	10	20	40
Fiber core diameter	μm	-	400	600
Numerical aperture		-	0.22	-

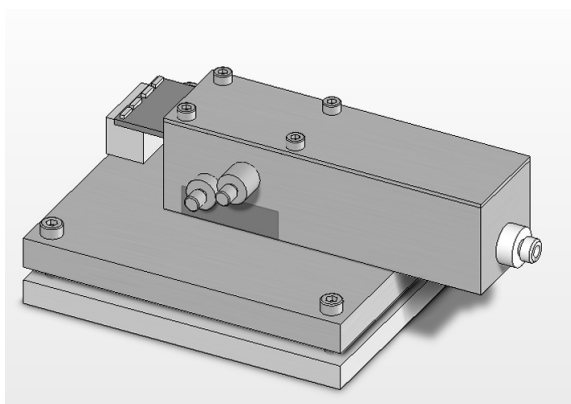
See next pages for complete specifications

## Specifications

Parameter	Unit	Min	Typ	Max
Wavelength	nm	970	975	980
Spectral width (FWHM)	nm	-	3	5
Fiber core diameter	μm	-	400	600
Numerical aperture			0.22	
Fiber-optic connector	SMA 905			
Operating Power (P)	W	-	20	22
Operating Current ( $I_o$ )	A	-	33	34.5
Threshold ( $I_{th}$ )	A	-	3	3.5
Operating Voltage ( $V_o$ )	V	-	1.8	2.2
Slope Efficiency (dP/dI)	W/A	-	0.60	0.64
Lifetime	hour	10,000	-	-
Storage Temp	°C	-40	-	60
Operating Temp. ( $T_{op}$ )	°C	10	20	40
PT100 Thermistor Resistance ( $R_{TH}$ )	Ω	-	110	-
Pilot Beam				
Wavelength	nm	-	660	-
Operating Power (P)	mW	-	1	-
Operating Current ( $I_o$ )	mA	-	26	28
Operating Voltage ( $V_o$ )	V	-	2.2	-
Threshold ( $I_{th}$ )	mA	-	23	-

Pin out chart of control plug and socket unit BH-10R

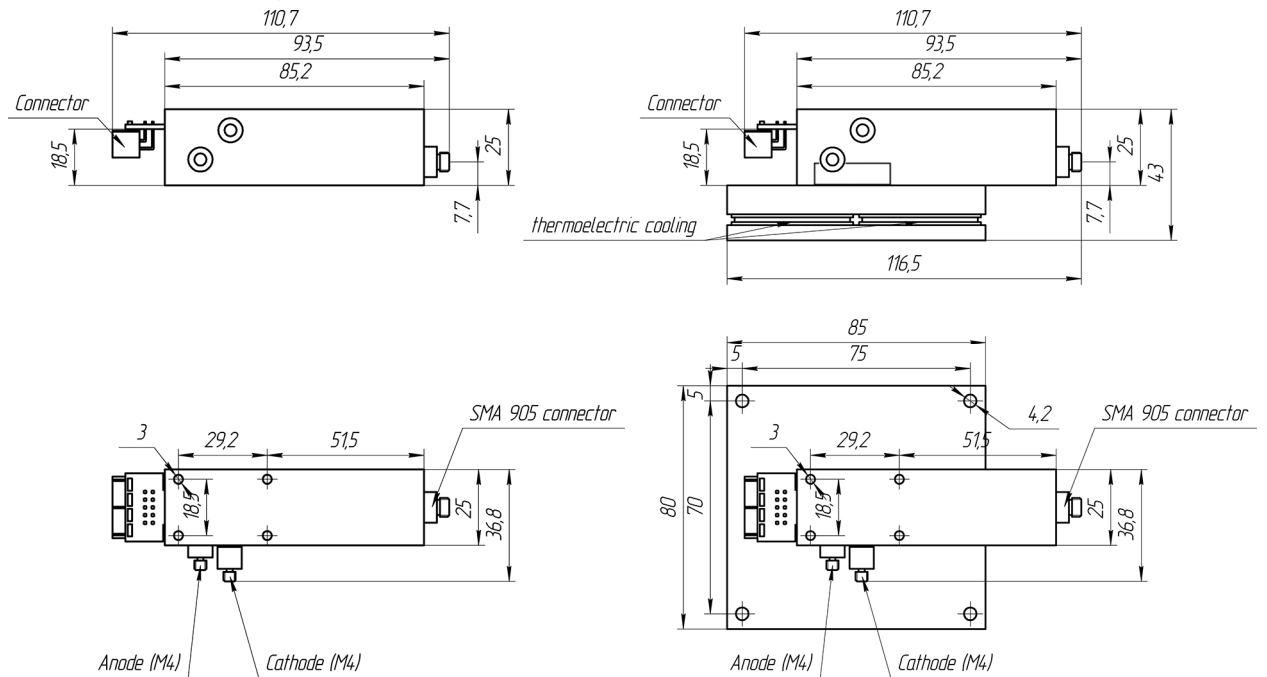
Pin №	Notation	Description
1	+12V	Supply voltage input 12 V, 50 mA
2	GND	Supply voltage output 12 V, 50 mA
3	PWM_PILOT	Pilot beam power driving voltage 0–2,5 B for 0–1 mW
4	STB_PILOT	Pilot beam enabling signal. Enabling with a low bit (Boolean 0)
5	IN_PT100	PT100 thermistor input
7	OUT_PT100	PT100 thermistor output
8	IN_PD	Photodiode input
9	OUT_PD	Photodiode output
10	ERROR	“Abuse” error output. Error – high bit (Boolean 1)



Also we can offer a model with already installed thermoelectric cooler.

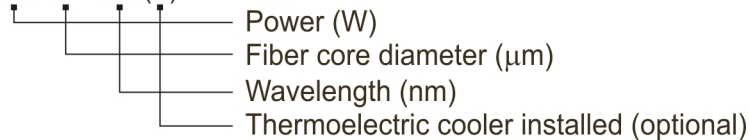
Parameter	Unit	Min	Typ	Max
TEC Operation (typ/max @ TCASE = 25 °C / 70 °C)				
TEC Current ( $I_{TEC}$ )	A	-	6	12
TEC Voltage ( $V_{TEC}$ )	V	-	12	24

## Outline drawings



## Determining Your Product number

Example: MDL-20-400-980(T)



## Considerations in Safety and Operation

This is a laser class IV product regarding CDRH regulations and a Laserklasse 4 product regarding DIN: EN60825-1. The laser light emitted from this laser diode is invisible and/or visible and may be harmful to the human eye. Avoid looking directly into the laser diode, into the collimated beam along its optical axis, or directly into the fiber when the device is in operation

**ESD PROTECTION** – Electrostatic discharge is the primary cause of unexpected laser diode failure. Take extreme precaution to prevent ESD. Use wrist straps, grounded work surfaces and rigorous antistatic techniques when handling laser diodes.

Operating the diode laser outside of its maximum ratings may cause device failure or a safety hazard. Power supplies used with the component must be employed such that the maximum peak optical power cannot be exceeded. CW diode lasers may be damaged by excessive drive current or switching transients.

When using power supplies, the diode laser should be connected with the main power on and the output voltage at zero.

The current should be increased slowly while monitoring the diode laser output power and the drive current.

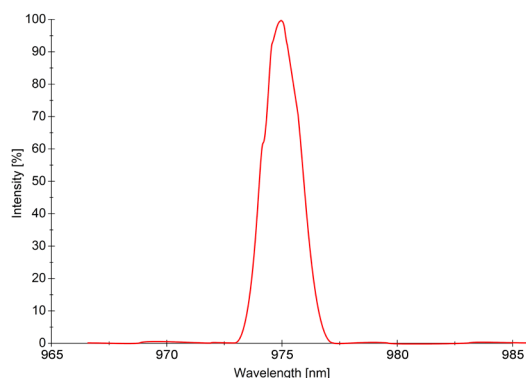
Device degradation accelerates with increased temperature, and therefore careful attention to minimize the case temperature is advised.

A proper heat sink for the diode laser on a thermal radiator will greatly enhance laser life.

## HIGH-POWER DIODE LASER TEST

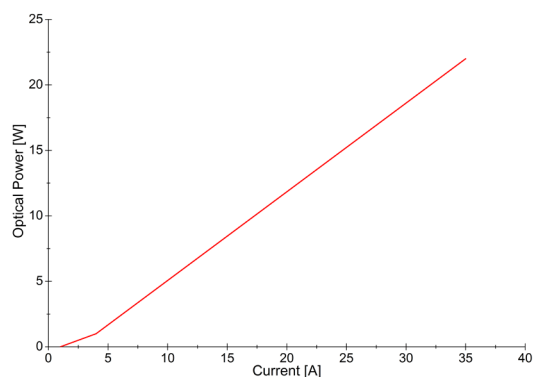
MDL-20-400-980

### Wavelength characteristics



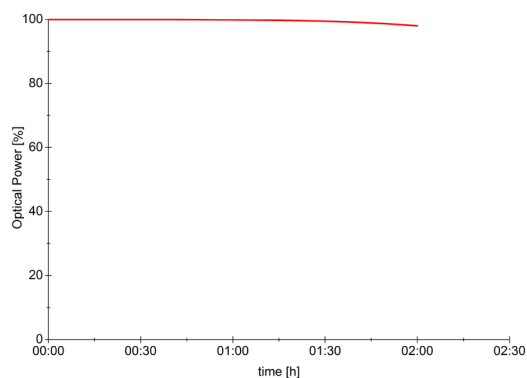
Peak Wavelength	975 nm
Nominal Current	33 A
Spectral Width (FWHM)	3 nm
Nominal Temperature	20 °C

### Current power characteristic



Current (A)	Optical Power (W)
1	0.08
4	1
5	1.7
10	5.1
15	8.5
20	11.8
25	15.2
30	18.6
35	22

### Long-term test



Parameter	value
Test duration (h)	2:00
Mean Power (W)	20.5
Min Power (W)	20.3
Max Power (W)	20.7
Stability ± (%)	1