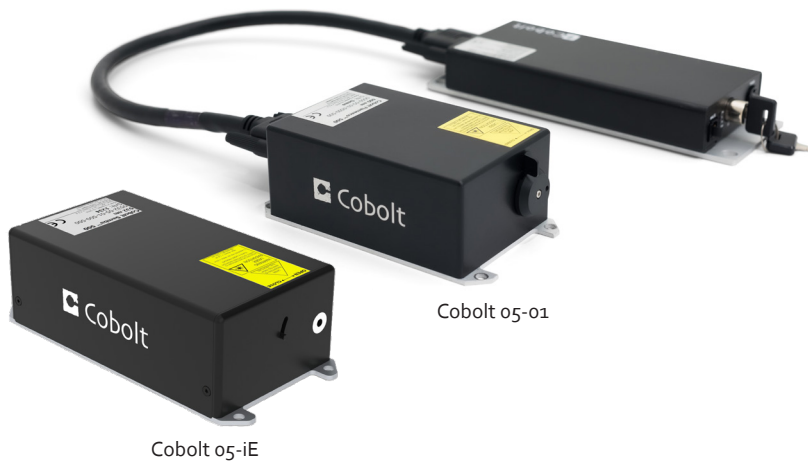


# Cobolt 05-01 Series

High Power | Single Frequency | CW Diode pumped lasers



## Applications

- Raman Spectroscopy
- Interferometry
- Holography
- Particle Analysis
- Atom and Ion trapping
- Super-resolution Microscopy
- Semiconductor Inspection
- Brillouin Scattering

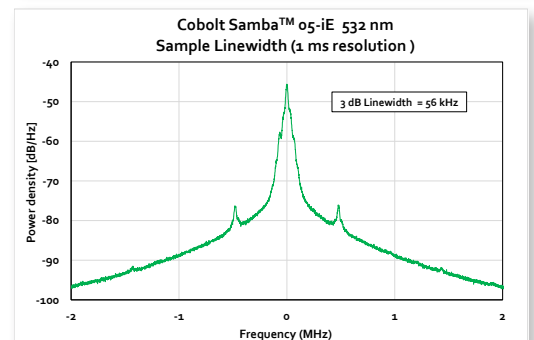
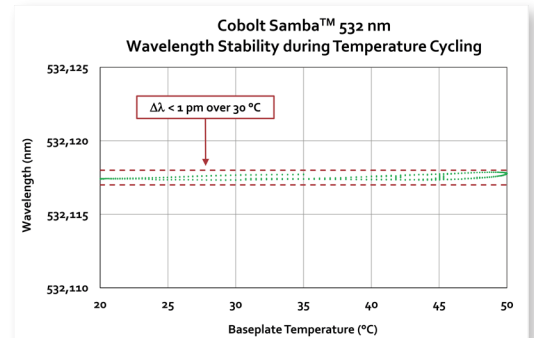
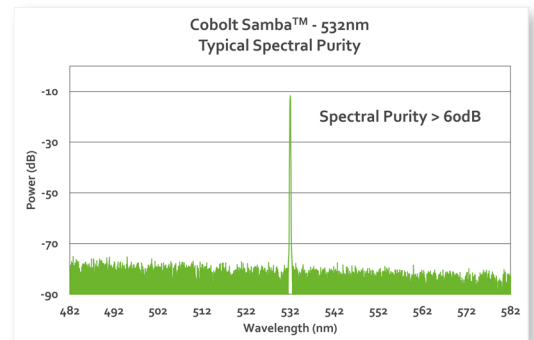
- CW output power up to 3 W in a perfect beam
- Extremely high level of spectral purity and stability
- Stable single frequency operation over wide temperature range
- Ultra-low intensity noise, down to  $< 0.1\%$
- 320 nm, 355 nm, 457 nm, 473 nm, 491 nm, 515 nm, 532 nm, 561 nm, 640 nm, 660 nm, 785 nm and 1064 nm
- Fully Integrated electronics option available
- Up to 24 months warranty, unlimited hours

The Cobolt 05-01 Series lasers are continuous-wave diode pumped laser (DPL) devices operating at a fixed wavelength between 320 nm and 1064 nm. The lasers are built using proprietary HTCure™ manufacturing technology for ultra-robustness in a compact hermetically sealed package.

The Cobolt 05-iE is a fully integrated laser device, including all control electronics. The Cobolt 05-iE eliminates the need for an external controller, bringing the trusted laser performance of Cobolt 05-01 Series into a compact, self-contained device.

The lasers emit a very high-quality laser beam with stable characteristics over a wide range of operating conditions. Single frequency operation provides a narrow spectral bandwidth and long coherence length. The lasers are designed and manufactured to ensure a high level of reliability.

The Cobolt 05-01 Series lasers are intended for stand-alone use in laboratory environments or for integration as OEM components in instruments for applications including fluorescence microscopy, flow cytometry, DNA sequencing, semiconductor inspection, Raman spectroscopy, interferometry, holography and particle analysis.

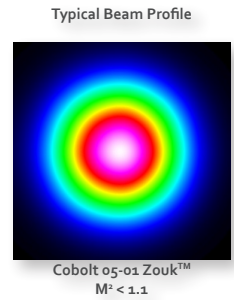


# Cobolt 05-01 Series

## Performance Specifications

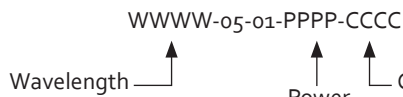
|                                       | Zydeco™*             | Zouk™*               | Twist™            | Blues™            | Calypso™*   | Fandango™   | Samba™              |
|---------------------------------------|----------------------|----------------------|-------------------|-------------------|-------------|-------------|---------------------|
| Wavelength in air (nm)                | 319.8 ± 0.3          | 354.8 ± 0.3          | 457.0 ± 0.3       | 473.0 ± 0.3       | 491.5 ± 0.3 | 514.8 ± 0.3 | 532.1 ± 0.3         |
| Available Power Levels (mW)           | 20                   | 10<br>20             | 100<br>200<br>300 | 100<br>200<br>300 | 200         | 300         | 500<br>1000<br>1500 |
| Power stability (±2°C and 8hrs)       | < 2%                 |                      |                   |                   |             |             |                     |
| Noise, 20 Hz - 20 MHz (pk-pk)         | < 5 %                | < 2 %                |                   |                   | < 5 %       | < 2 %       | < 1 %               |
| Noise, 20 Hz - 20 MHz (rms)           | < 0.5 %              | < 0.2 %              |                   |                   | < 0.5 %     | < 0.2 %     | < 0.1 %             |
| Beam diameter at aperture (µm)        | 700 ± 50             |                      |                   |                   |             |             |                     |
| Beam symmetry at aperture             | > 0.90:1             |                      |                   |                   |             |             | > 0.95:1            |
| Beam divergence (full angle, mrad)    | < 0.8                |                      |                   | < 1.2             |             |             |                     |
| Spatial mode (TEM <sub>00</sub> )     | M <sup>2</sup> < 1.2 | M <sup>2</sup> < 1.1 |                   |                   |             |             |                     |
| Spectral linewidth (FWHM)             | < 500 kHz            |                      |                   |                   |             |             |                     |
| Wavelength stability (±2°C and 8hrs)  | < 1 pm               |                      |                   |                   |             |             |                     |
| Polarization ratio (linear, vertical) | > 100:1              |                      |                   |                   |             |             |                     |
| Warranty (unlimited hours)            | 12 mo.<br>3000 hrs   | 12 months            |                   |                   | 24 months   | 12 months   | 24 months           |

|                                       | Jive™                              | Bolero™     | Flamenco™         | Disco™               | Rumba™                      |
|---------------------------------------|------------------------------------|-------------|-------------------|----------------------|-----------------------------|
| Wavelength in air (nm)                | 561.2 ± 0.3                        | 639.6 ± 0.6 | 659.6 ± 0.3       | 785 ± 0.3            | 1064.2 ± 0.6                |
| Available Power Levels (mW)           | 200<br>300<br>500<br>750<br>1000** | 300<br>500  | 100<br>300<br>500 | 500                  | 500<br>1000<br>2000<br>3000 |
| Power stability (±2°C and 8hrs)       | < 2%                               |             |                   |                      |                             |
| Noise, 20 Hz - 20 MHz (pk-pk)         | < 1%                               | < 7 %       | < 1%              |                      |                             |
| Noise, 20 Hz - 20 MHz (rms)           | < 0.1%                             | < 1 %       | < 0.1%            |                      |                             |
| Beam diameter at aperture (µm)        | 700 ± 50                           |             |                   | 1000 ± 50            |                             |
| Beam symmetry at aperture             | > 0.95:1                           |             |                   |                      |                             |
| Beam divergence (full angle, mrad)    | < 1.2                              | < 1.4       | < 1.5             | < 1.6                |                             |
| Spatial mode (TEM <sub>00</sub> )     | M <sup>2</sup> < 1.1               |             |                   | M <sup>2</sup> < 1.2 |                             |
| Spectral linewidth (FWHM)             | < 500 kHz                          |             |                   | < 100 kHz            | < 500 kHz                   |
| Wavelength stability (±2°C and 8hrs)  | < 1 pm                             |             |                   |                      |                             |
| Polarization ratio (linear, vertical) | > 100:1                            |             |                   |                      |                             |
| Warranty (unlimited hours)            | 24 months**                        | 12 months   | 24 months         | n/a                  | 24 months                   |



\* Cobolt Zydeco™ 320 nm, Zouk™ 355 nm and Calypso™ 491 nm laser is not yet available in the 05-IE package.  
\*\* Cobolt Jive™ 1000 mW warranty is limited to 12 months.

## Model Number



- 500 = Gen 5b Controller, RS-232, CE / CDRH  
600 = Gen 5b Controller, RS-232, OEM  
700 = Gen 5b Controller, USB, CE / CDRH  
800 = Gen 5b Controller, USB, OEM  
1100 = Integrated electronics, CE / CDRH  
1200 = Integrated electronics, OEM  
XXXX = OEM customization

## Communication Interface

|                   |               |
|-------------------|---------------|
| Communication     | USB or RS-232 |
| Standard Baudrate | 115200        |



**WARNING VISIBLE AND INVISIBLE LASER RADIATION!**



Avoid exposure to beam.  
Class 3B Laser Product  
Classified per IEC 60825-1:2014



| Wvl (nm) | Max.Pwr (mW) |
|----------|--------------|
| 320      | 100          |
| 355      | 60           |
| 457      | 499          |
| 473      | 499          |
| 491      | 499          |
| 515      | 499          |
| 561      | 499          |
| 660      | 499          |



Avoid eye or skin exposure to direct or scattered radiation.  
Class 4 Laser Product  
Classified per IEC 60825-1:2014

| Wvl (nm) | Max.Pwr (mW) |
|----------|--------------|
| 532      | 3500         |
| 561      | 3000         |
| 640      | 1500         |
| 785      | 2000         |
| 660      | 1000         |
| 1064     | 4000         |



This device contains components that may be sensitive to Electrostatic Discharge (ESD).

ESD protection can be achieved with proper electrical grounding.

# Cobolt 05-01 Series

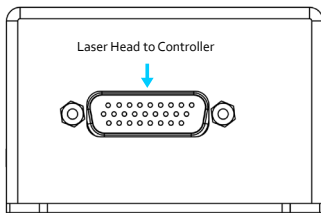
## Operational Environment

The optical performance specifications are not effected by the choice of electronics configuration. However when choosing between the Cobolt 05-01 and 05-iE the operation environment, power supply requirements and thermal management must be considered.

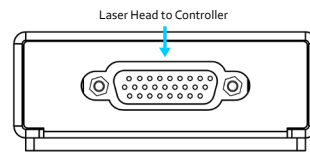
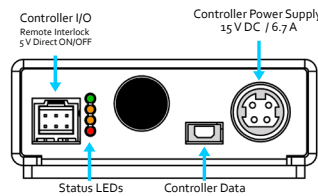
|   | 05-01                           | Zydeco / Bolero | 05-iE         |
|---|---------------------------------|-----------------|---------------|
| Power supply requirements   | 15 VDC, 6 A                     |                 | 12 VDC, 6.7 A |
| System power consumption  | < 65 W, typical 30W             |                 |               |
| Maximum laser head baseplate temperature                            | 50 °C                           | 45 °C           | 45 °C         |
| Ambient temperature, operation                                      | 10 - 40 °C                      | 10 - 35 °C      | 10 - 35 °C    |
| Laser head heat sink thermal impedance (at max ambient temperature) | < 0.2 K/W                       | < 0.18 K/W      | < 0.15 K/W    |
| Beam pointing stability (over operation temperature range)          | < 10 µrad/°C, typical 5 µrad/°C |                 |               |
| Ambient temperature, storage  | -10 -> +60 °C                   |                 |               |
| Humidity  | 0 - 60 % RH non-condensing      |                 |               |
| Ambient air pressure  | 950 - 1050 mbar                 |                 |               |

## Electrical Interfaces

### Cobolt 05-01 - Laser head



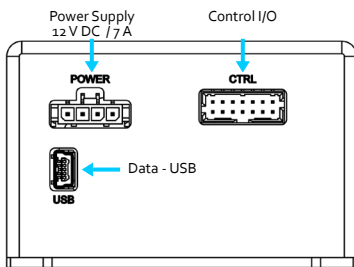
### Cobolt 05-01 - Controller



### Molex 6 pin - Controller I/O

| Pin | Function         |
|-----|------------------|
| 1   | Remote interlock |
| 2   | 0V – Ground      |
| 3   | Direct Input     |
| 4   | --               |
| 5   | LED 1 (LASER ON) |
| 6   | LED 2 (ERROR)    |

### Cobolt 05-iE - Laser head



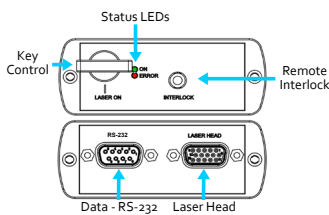
### Molex 14 pin - Control I/O

| Pin | Function          |
|-----|-------------------|
| 1   | Remote interlock  |
| 2   | 0V – Ground       |
| 3   | 0V – Ground       |
| 4   | RS-232 TX         |
| 5   | RS-232 RX         |
| 6   | LED 1A (LASER ON) |
| 7   | LED 1B (LASER ON) |
| 8   | LED 2 (ERROR)     |
| 9   | --                |
| 10  | --                |
| 11  | Key Switch        |
| 12  | Direct Input      |
| 13  | 0V – Ground       |
| 14  | --                |

### Molex 4 pin - Power Supply

| Pin | Function    |
|-----|-------------|
| 1   | 0V – Ground |
| 2   | 0V – Ground |
| 3   | + 12 V - DC |
| 4   | + 12 V - DC |

### Cobolt 05-iE - Key control box



### Sub-D 15 pin - Control I/O

| Pin | Function          |
|-----|-------------------|
| 1   | LED 1A (LASER ON) |
| 2   | LED 2 (ERROR)     |
| 3   | --                |
| 4   | 0V – Ground       |
| 5   | Key Switch        |
| 6   | --                |
| 7   | RS-232 TX         |
| 8   | RS-232 RX         |
| 9   | --                |
| 10  | 0V – Ground       |
| 11  | Remote interlock  |
| 12  | --                |
| 13  | --                |
| 14  | --                |
| 15  | 0V – Ground       |

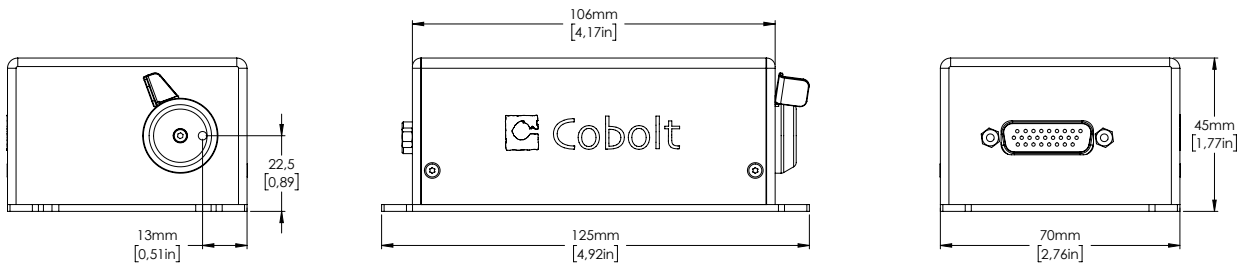
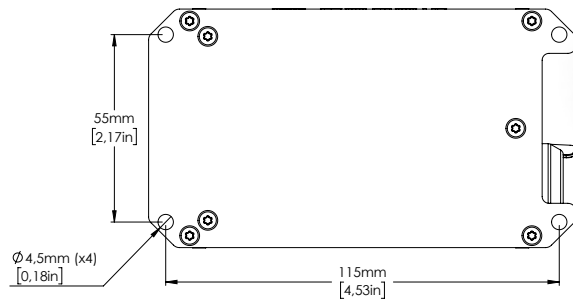
### Sub-D pin - RS-232

| Pin | Function    |
|-----|-------------|
| 1   | --          |
| 2   | RS-232 TX   |
| 3   | RS-232 RX   |
| 4   | --          |
| 5   | 0V – Ground |
| 6   | --          |
| 7   | --          |
| 8   | --          |
| 9   | --          |

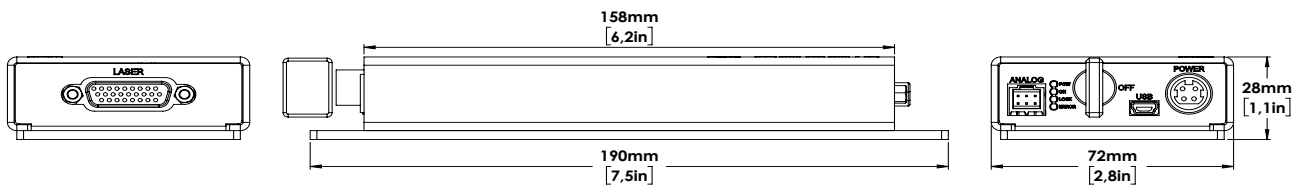
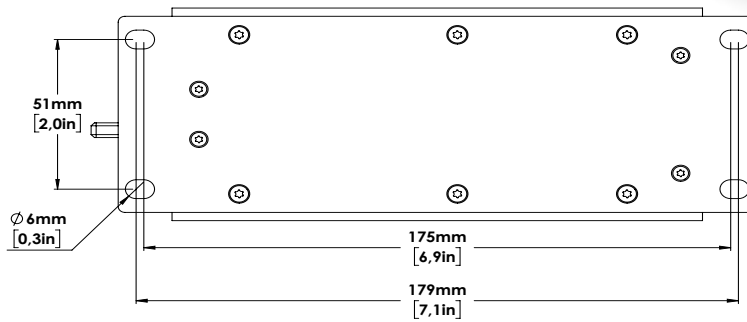
# Cobolt 05-01 Series

## Mechanical Specifications

### Cobolt 05-01 Laser head



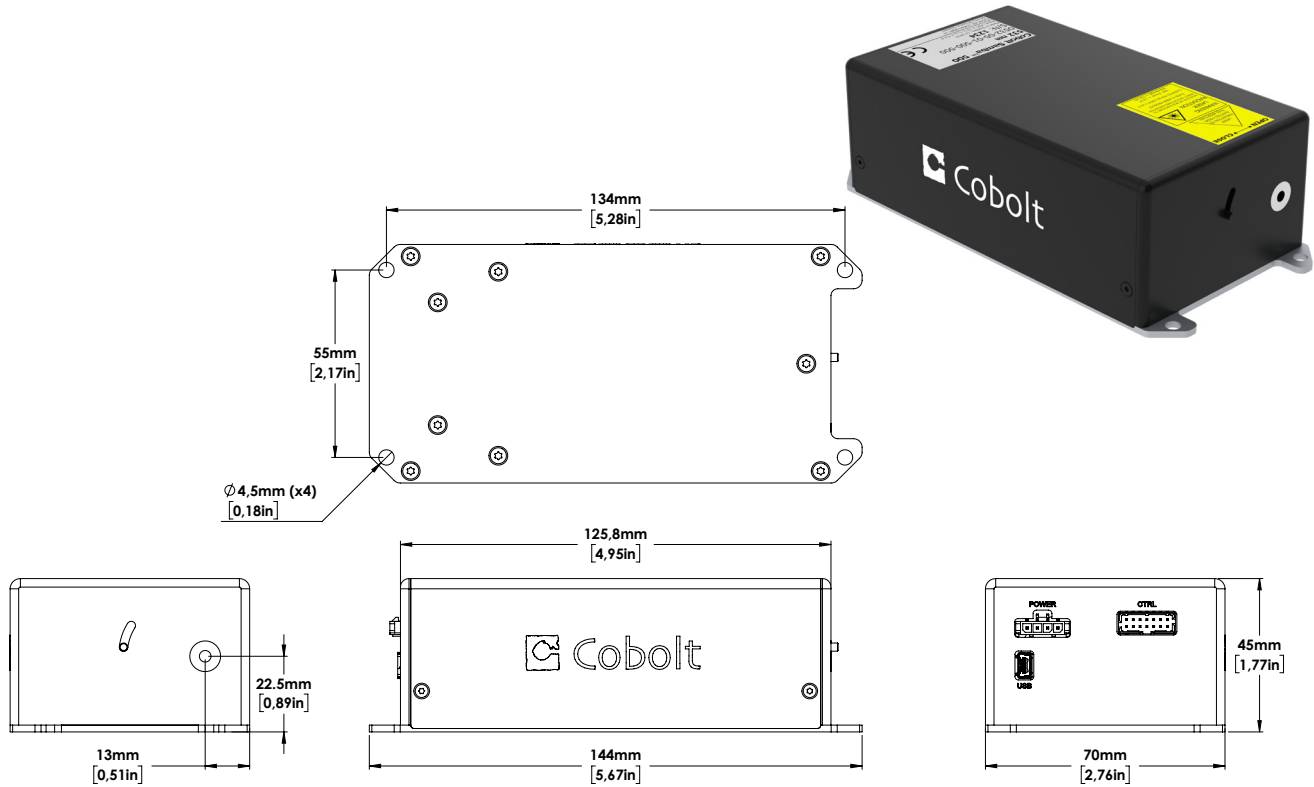
### Cobolt 05-01 - Controller



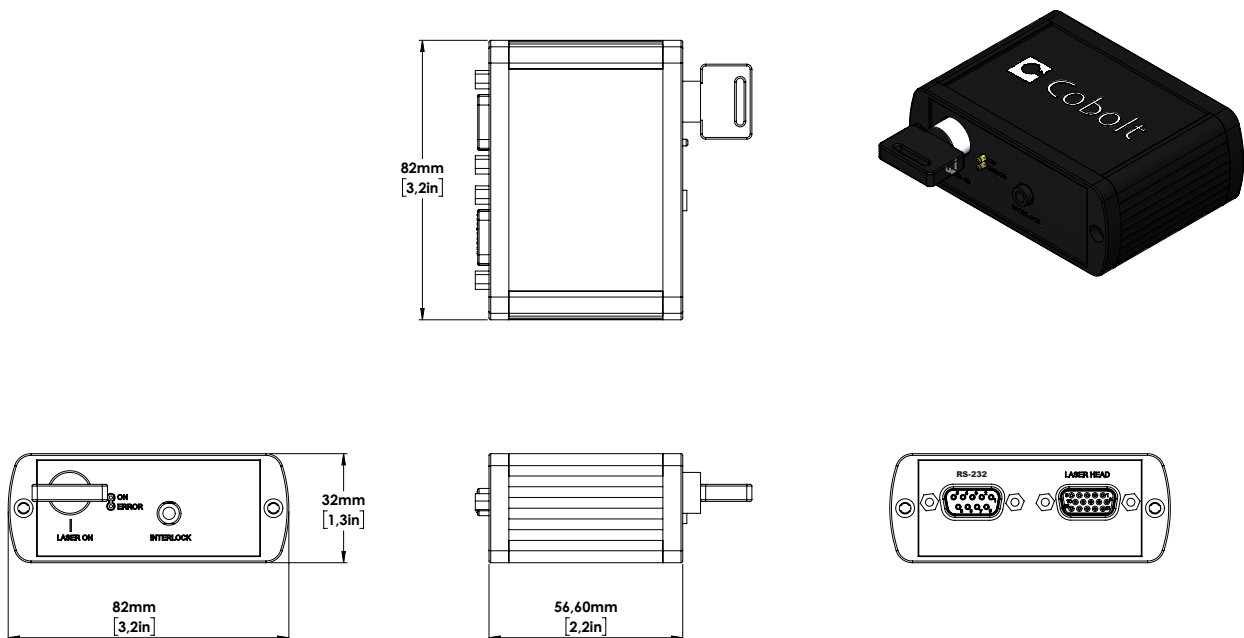
# Cobolt 05-01 Series

## Mechanical Specifications

### Cobolt 05-iE Laser head



### Cobolt 05-iE - Key control box



# Cobolt 05-01 Series

## Options and Accessories

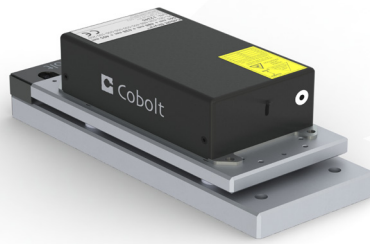
- C-FLEX Laser combiner
- Laser head heatsink with fans for 05-01 lasers : HS-04
- Laser head heatsink with fans for 05-iE lasers : HS-05
- TEC Plate for active baseplate temperature control
- Heatsink with fiber coupling for 05-01 lasers : FIC-04



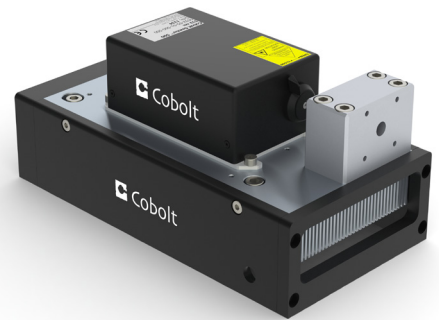
C-FLEX Laser combiner



Heatsink with fans



TEC-Plate for active baseplate temperature control



Heat sink with fans for fiber coupling FIC-04

## Our Locations

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