LASER PROCESS HEADS • CRASH PROTECTION • ADJUSTABLE MOUNTS • BEAM EXPANDERS/COLLIMATORS • TRANSLATION MOUNTS
• KINEMATIC BEAM BENDERS • BEAM SWITCHING UNIT • KINEMATIC BEAM SPLITTER • BEAM SHUTTER/DIODE POINTER • BEAM
COMBINER/DIODE POINTER • SHUTTER INTERLOCK UNITS • POLARIZER HOUSINGS & WAVEPLATES • DELIVERY TUBES • LOCKING
RINGS • BEAM TUBES • ARTICULATED ARMS • COUPLERS • ACCESSORIES • BEZEL ADAPTERS • CO2 LASER NECESSITIES

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973-598-1150
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19mm SERIES SYSTEM DIAGRAM

- Beam Tubes
- Laser Bezel Adapters
- Beam Quality Enhancer
- Safety Shutters
- Targets/Optic Wrenches
- Circular Polarizers
- Beam Expanders
- Diode Pointers
- Linear Adjustable Mounts
- Beam Splitters
- Beam Benders
- Beam Switches
- Crash Protection/Detection
- Laser Head
- Trepan Heads
- Scan Heads
- Wrists

*Note: Scale varies between drawings.*
Laser Process Heads provide a protective housing for the focus lens. Each process head is equipped with a nozzle tip standoff adjustment and X-Y focus lens adjustment. Male 1”-32 threads allow for easy mounting to other "19 Series" components. Internal gas jet manifold is included for introducing assist gas to the workpiece.

### PHA-19 Specifications

- **Standard Focal Lengths:** 38mm, 50mm, 64mm, 75mm, 89mm, 95mm, 100mm, 127mm, 191mm (Custom Focal Lengths Available)
- **1”-32 Mounting Thread (C-Mount) Standard, Custom Mounting Available**
- **Assist Gas Pressure:** 7 bar (100psi) max
- **Optics:** 1.0” and 1.1” Diameter Standard (Custom Diameters Available)
- **Use with T-438 Series Tips**
- **Available for All Wavelengths**
- **Anodized Aluminum & Stainless Steel Construction**
- **19mm Clear Aperture**

### PHA-19-089-LB shown.

### Part Numbering Anatomy

- **Optic Diameter:** 25 - 25mm (1.0”)
  28 - 28mm (1.1”)

- **Focal Length:**
  038 - 38mm (1.5”)
  064 - 64mm (2.5”)
  075 - 75mm (2.9”)
  089 - 89mm (3.5”)
  095 - 95mm (3.7”)
  127 - 127mm (5.0”)
  191 - 191mm (7.5”)

- **Style:**
  SB - Short Body
  LB - Long Body

Specifications subject to change without notice. Consult Haas Laser Technologies for Details.
MIRCROMACHINING LASER PROCESS HEAD ASSEMBLY
(FOR CO₂ LASERS)

- Fine Cut Laser Head Assembly
- Linear Adjustment Translation
- Monocular/CCD Viewing Options
- Quick Disconnect Mount
- Robust Industrial Design

The Micromaching Laser Process Head is designed for fine cutting and welding applications. The unit accepts a wide variety of both cutting and welding optics. The modular design permits custom configurations for specific applications. Ultra-fine pitch adjustments enable precise accurate set-ups. Robust industrial design.

Specifications
- 25mm C.A. Fine Cut Head Assembly
- ±4mm Focus Adjustment with 0.010mm Resolution
- ±1.25mm X-Y Nozzle Tip Adjustment with Fine Pitch Adjusters
- 38mm, 64mm, 89mm, 95mm, 127mm, 191mm, ZnSe Cover Glass Focus Lens Options
- 28mm Dia. (1.1") ZnSe AR Coated
- Gas Jet Manifold
- 0.5mm & 1.0mm Nozzle Tips
- Quick Change Process Head Mount
- Monocular/CCD Camera Viewing Head Assembly Options
- Anodized Aluminum, Stainless Steel, & Brass Construction
- Accessory Kit
- Optic Cleaning Kits Available

Specifications subject to change without notice. Consult Haas Laser Technologies for Details.

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**FOCUSING OPTICS**

**CUTTING & WELDING**

- **210CV-25030-038-ZS-DAR:** ZnSe CO2 Focus Lens 38mm (1.5") F.L x 25mm (1.0") Diameter
- **210CV-28030-095-ZS-DAR:** ZnSe CO2 Focus Lens 95mm (3.75") F.L x 28mm (1.1") Diameter
- **210CV-28040-063-ZS-SCO:** ZnSe CO2 Focus Lens 63mm (2.5") F.L x 28mm (1.1") Diameter
- **210CV-28040-089-ZS-DAR:** ZnSe CO2 Focus Lens 89mm (3.5") F.L x 28mm (1.1") Diameter
- **210CV-28040-127-ZS-SCO:** ZnSe CO2 Focus Lens 127mm (5.0") F.L x 28mm (1.1") Diameter
- **210CV-28040-191-ZS-SCO:** ZnSe CO2 Focus Lens 191mm (7.5") F.L x 28mm (1.1") Diameter

**COVER GLASS**

- **210CC-25010-XXX-ZS-DAR:** ZnSe CO2 Cover Glass 25mm (1.0") Diameter
- **210CC-28010-XXX-ZS-DAR:** ZnSe CO2 Cover Glass 28mm (1.1") Diameter

**CUTTING:**

- **T-512-020-H01:** 0.5mm Nozzle Tip (Cutting)
- **T-512-040-H01:** 1.0mm Nozzle Tip (Cutting)

**NOZZLE TIPS**

- **T-512-080-H01:** 2.0mm Nozzle Tip (Welding)
- **T-512-120-H01:** 3.0mm Nozzle Tip (Welding)
- **T-512-160-H01:** 4.0mm Nozzle Tip (Welding)

**NOZZLE EXTENSIONS**

- **FCH-25-038-NE:** Nozzle Extension for 38mm (1.5") Focus Lens
- **FCH-25-063-NE:** Nozzle Extension for 63mm (2.5") Focus Lens
- **FCH-25-089-NE:** Nozzle Extension for 89mm (3.5") Focus Lens
- **FCH-25-095-NE:** Nozzle Extension for 95mm (3.75") Focus Lens
- **FCH-25-127-NE:** Nozzle Extension for 127mm (5.0") Focus Lens
- **FCH-25-191-NE:** Nozzle Extension for 191mm (7.5") Focus Lens

**OPTIONS**

**ACCESSORIES**

- **FCH-25-ACC-CO2:** Fine Cut Head Accessory Kit. Includes Optic Wrench, Target, & CO2 Alignment Paper.
- **OCK-50:** Optic Cleaning Kit

Specifications subject to change without notice. Consult Haas Laser Technologies for Details.
MicroMachining Laser Process Head Assembly
(FOR CO₂ LASERS)

- Fine Cut Laser Head Assembly
- Diffraction Limited Optics
- Floating Beam Splitter Assembly
- Linear Adjustment Translation Mount
- Monocular/CCD Viewing Options
- Robust Industrial Design

Specifications

- 25mm C.A. Fine Cut Head Assembly
- ±4mm Focus Adjustment with 10µm Resolution
- ±1.25mm X-Y Nozzle Tip Adjustment with Fine Pitch Adjusters
- Linear Adjustable Translation Mount 24mm Travel
- 38mm, 64mm, 89mm, 95mm, 127mm, 191mm, ZnSe Cover Glass Focus Lens Options
- 28mm Diameter (1.1") ZnSe AR Coated Cover Glass
- Gas Jet Manifold
- 0.5mm & 1.0mm Nozzle Tips
- Quick Change Process Head Mount
- Monocular/CCD Camera Viewing Head Assembly Options
- Anodized Aluminum, Stainless Steel, & Brass Construction
- Accessory Kit
- Optic Cleaning Kits Available

The Micromachining Laser Process Head is designed for fine cutting and welding applications. The unit accepts a wide variety of both cutting and welding optics. The modular design permits custom configurations for specific applications. Ultra-fine Pitch adjustments enable precise accurate set-ups. Robust industrial design.

Assembly shown with the following modules:
FCH-25-28-38-25-LA-OF-38
090YD-25XXX-050-GL-DVC
130YG-25032-XXX-FS-DYA
T-512-020-H01
LAM-25-25-VE
BSM-25-FCH-A
210YM-38064-X45-FS-DMR
MVH-25-10XA

Specifications subject to change without notice. Consult Haas Laser Technologies for Details.
**Low Power Laser Series**

**FCH-25-28-38-25-LA-38-QM:**
- 25mm C.A. Fine Cut Head Assembly Provision for 38mm (1.5") F.L. Lens Assy. ±4mm Focus Adjustment with 10µm Resolution. ±1.25mm XY Nozzle Tip Adjustment with Fine Pitch Adjusters. Cover Glass Cartridge with Provision for 25mm Cover Gas. Gas Jet Manifold. Quick-Change Process Head Mount. Anodized Aluminum, Stainless Steel, & Brass Construction.

**FWH-25-28-38-25-LA-QM:**
- 25mm C.A. Fine Welding Head Assembly Provision for 38mm (1.5") F.L. Lens. ±4mm Focus Adjustment with 10µm Resolution. ±1.25mm XY Nozzle Tip Adjustment with Fine Pitch Adjusters. Cover Glass Cartridge with Provision for 25mm Cover Gas. Gas Jet Manifold. Quick-Change Process Head Mount. Anodized Aluminum, Stainless Steel, & Brass Construction.

**FOCUSING OPTICS**

<table>
<thead>
<tr>
<th>Cutting</th>
<th>Welding</th>
</tr>
</thead>
</table>

**WELDING:**

| 210CV-25030-038-ZS-DAR | ZnSe CO2 Focus Lens 38mm (1.5") F.L. x 25mm (1.0") Diameter |
| 210CV-28020-063-ZS-SCO | ZnSe CO2 Focus Lens 63mm (2.5") F.L. x 28mm (1.1") Diameter |
| 210CV-28040-89-ZS-DAR | ZnSe CO2 Focus Lens 89mm (3.5") F.L. x 28mm (1.1") Diameter |

**COVER GLASS**

<table>
<thead>
<tr>
<th>Cutt</th>
<th>Weld</th>
</tr>
</thead>
<tbody>
<tr>
<td>210C-25010-XXX-ZS-DAR</td>
<td>ZnSe CO2 Cover Glass 25mm (1.0&quot;) Diameter</td>
</tr>
<tr>
<td>210C-28010-XXX-ZS-DAR</td>
<td>ZnSe CO2 Cover Glass 28mm (1.1&quot;) Diameter</td>
</tr>
</tbody>
</table>

**NOZZLE TIPS**

<table>
<thead>
<tr>
<th>Cutt</th>
<th>Weld</th>
</tr>
</thead>
<tbody>
<tr>
<td>T-512-020-H01</td>
<td>0.5mm Nozzle Tip (Cutting)</td>
</tr>
<tr>
<td>T-512-040-H01</td>
<td>1.0mm Nozzle Tip (Cutting)</td>
</tr>
<tr>
<td>T-512-080-H01</td>
<td>2.0mm Nozzle Tip (Welding)</td>
</tr>
<tr>
<td>T-512-120-H01</td>
<td>3.0mm Nozzle Tip (Welding)</td>
</tr>
<tr>
<td>T-512-160-H01</td>
<td>4.0mm Nozzle Tip (Welding)</td>
</tr>
</tbody>
</table>

**LINEAR ADJUSTABLE MOUNT**

| LAM-25-25-VE | Linear Adjustable Translation Mount. 24mm Travel. Rotary Barrel Adjustment w/ Zeroing Scale. 0.020mm Resolution. Aluminum, Stainless Steel & Brass Construction. |

**BEAM SPLITTER**


**BEAM SPLITTER MIRROR**

| 210CM-38030-045-ZS-DCV | CO2/Visible ZnSe Mirror. 38mm (1.5") Diameter |

**MONOCULAR**

| MVH-25-10XA | Monocular Viewing Head Assembly w/ 10x Adjustable Eyepiece & Centering. Includes Crosshair. |

**POSITION VIEWING**

| CAM-500 | B&W CCD Camera w/ Power Supply |
| MON-200 | 9" B&W Monitor |
| XHR-200 | X-Y Cross Hair |

**NOZZLE EXTENSIONS**

| FCH-25-038-NE | Nozzle Extension for 38mm (1.5") Focus Lens |
| FCH-25-063-NE | Nozzle Extension for 63mm (2.5") Focus Lens |
| FCH-25-089-NE | Nozzle Extension for 89mm (3.5") Focus Lens |
| FCH-25-095-NE | Nozzle Extension for 95mm (3.75") Focus Lens |
| FCH-25-127-NE | Nozzle Extension for 127mm (5.0") Focus Lens |
| FCH-25-191-NE | Nozzle Extension for 191mm (7.5") Focus Lens |

**OPTIONS**

| FCH-25-ACC-CO2 | Fine Cut Head Accessory Kit. Includes Optic Wrench, Target, & CO2 Alignment Paper. |

**ACCESSORIES**

| FCH-25-ACC-CO2 | Fine Cut Head Accessory Kit. Includes Optic Wrench, Target, & CO2 Alignment Paper. |

*See the Micromaching Laser Process Head Specification Sheet for Additional Options & Details.*

Specifications subject to change without notice. Consult Haas Laser Technologies for Details.
CRASH DETECTION
CP-19 SERIES

- Provides Crash Detection
- Quick Disconnect Lemo® Connectors
- Sealed Design
- Anodized Aluminum Construction

The CP-19 adds crash detection to our 19mm aperture components. Hardened steel balls and pads self locate after a crash. A quick disconnect Lemo® electrical connector provides easy integration. Crash reporting is accomplished via three (3) series wired internal switches. The sealed design and anodized aluminum construction are perfect for industrial applications.

CP-19 Specifications

- Provides X, Y, & Z Axis Crash Protection
- 4mm Z-Axis Travel
- Shelf Resetting
- Hardened Steel Locating Pads
- Switches Rated at 3A @ 125 VAC
- Lemo® Socket and Jack Provided
- Vertical and Horizontal Configurations
- 1”-32 Mounting Thread (C-Mount)
- Sealed Design
- Small Package
- Anodized Aluminum Construction
- 19mm Clear Aperture

Part Numbering Anatomy

| CP | 19 | [Blank] |

Load Rating

V - Vertical
H - Horizontal
**MAGNETIC BREAKAWAY**

**CB-19 SERIES**

- Provides Breakaway Protection
- Sealed Design
- Anodized Aluminum Construction

The CB-19 adds crash protection to our 19mm aperture components. Self locates after a crash. Crash reporting is accomplished via internal proximity switches. The sealed design and anodized aluminum construction are perfect for industrial applications.

**CB-19 Specifications**

- Provides X, Y Axis Crash Protection
- Shelf Resetting
- Hardened Steel Locating Pads
- Sealed Design
- Small Package
- Anodized Aluminum Construction
- 19mm Clear Aperture

**Part Numbering Anatomy**

CB-19 Shown Above.
Linear Adjustable Mounts are typically attached to a process head for fine adjustment of the laser focus spot relative to the workpiece. Each LAM-19 has a clear aperture of 19mm with female 1”-32 threads on top, and male 1”-32 threads on the bottom. It easily connects in line with other “19mm Series” components.

A sealed design prevents contaminant’s from entering the beam path. The micrometer allows for precision linear adjustments. The standard 25mm stroke design allows for retraction of lower mount under compressive loads. This mount also incorporates a linear crash protection.

**LAM-19 Specifications**

- .001” (.025mm) Adjustment Accuracy
- 1”-32 Mounting Thread (C-mount)
- Choice of Micrometer Style
- Adjustable Slide Mount
- Can be used Horizontally
- Retraction Under Compressive Loads
- Z-axis Crash Protection
- Sealed Design
- Anodized Aluminum Construction
- 19mm Clear Aperture

**Basic Dimensions**

<table>
<thead>
<tr>
<th>Part#</th>
<th>Length</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>LAM-19-25-VE</td>
<td>86-111mm</td>
<td>525g</td>
</tr>
<tr>
<td>LAM-19-50-VE</td>
<td>111-161mm</td>
<td>655g</td>
</tr>
</tbody>
</table>

**Part Numbering Anatomy**

- **LAM**
  - **19**
  - **Travel**
    - 25 – 25mm (1.0”)
    - 50 – 50mm (2.0”)
  - **Micrometer Type**
    - VE – Vernier, English
    - VM – Vernier, Metric
INDUSTRIAL BEAM EXPANDER/COLLIMATOR
BEC-19 SERIES

- Sealed Design
- Custom Expansion Ratios
- Galilean Design
- Easily Removable Optics

Beam expanders/collimators can be used to either expand or reduce the laser beam diameter. The BEC-19 has a sealed design with easily removable optics. The adjustment ring allows for precise control of beam divergence, without rotating the optic or changing the overall length of the expander.

BEC-19 Specifications

- Machined from Aluminum, Brass, and Stainless Steel
- Fixed Overall Length for Easy Mounting
- Sealed Design
- Galilean Telescope Design Insures Minimum Aberration
- Easily Removable Optics for Cleaning and Expansion Changes
- 1”-32 Mounting Thread, for Best Results Order with TM-19
- Available for All Wavelengths
- Optics are AR Coated for Specific Wavelength
- Custom Expansion Ratios
- Max. Output Aperture (Positive Expander) - 23mm

Standard CO2 Expanders:

<table>
<thead>
<tr>
<th>Expansion</th>
<th>Max. Input Aperture</th>
<th>Exit Aperture</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5</td>
<td>10mm</td>
<td>. . . . . . . . 23mm</td>
</tr>
<tr>
<td>2.0</td>
<td>12mm</td>
<td>. . . . . . . . 23mm</td>
</tr>
<tr>
<td>2.5</td>
<td>9.0mm</td>
<td>. . . . . . . . 23mm</td>
</tr>
<tr>
<td>3.0</td>
<td>6.5mm</td>
<td>. . . . . . . . 23mm</td>
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<td>5.5mm</td>
<td>. . . . . . . . 23mm</td>
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<tr>
<td>4.0</td>
<td>4.5mm</td>
<td>. . . . . . . . 23mm</td>
</tr>
<tr>
<td>5.0</td>
<td>4.0mm</td>
<td>. . . . . . . . 23mm</td>
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</table>

Part Numbering Anatomy

BEC - 19 - Expansion - Wavelength

<table>
<thead>
<tr>
<th>Expansion</th>
<th>Wavelength</th>
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</thead>
<tbody>
<tr>
<td>1.5 - 1.5x</td>
<td>10.6 - CO₂ (10.6µm)</td>
</tr>
<tr>
<td>2.0 - 2.0x</td>
<td>1064 - Nd:YAG (1064nm)</td>
</tr>
<tr>
<td>2.5 - 2.5x</td>
<td>532 - Green (532nm)</td>
</tr>
<tr>
<td>3.0 - 3.0x</td>
<td>355 - UV (355nm)</td>
</tr>
<tr>
<td>3.5 - 3.5x</td>
<td></td>
</tr>
<tr>
<td>4.0 - 4.0x</td>
<td></td>
</tr>
<tr>
<td>5.0 - 5.0x</td>
<td></td>
</tr>
<tr>
<td>6.0 - 6.0x</td>
<td></td>
</tr>
</tbody>
</table>
Translation Mounts are designed for the critical alignment of transmissive optics, such as placing a beam collimator within a pre-existing beam path.

When two mounts are used on each end of a component, translational and angular corrections can be made. The internal, sealed stage is adjusted via four ultra fine 1/4"-80 pitch screws within a ±2mm range. A self-aligning joint allows for the placement and removal of a component without affecting the beam path.

Various mounting styles are available. Call us today or visit us online at www.haaslte.com for details.

Specifications:
- Supplied in Pairs
- Various Mounting Styles Available
- Sealed Design
- Quick Connect Self-Aligning Joint

Translation Mount for Beam Expander/Collimator

TM-19 Specifications
- Machined From Stainless Steel & Anodized Aluminum
- Sealed Design
- Quick Connect Self-Aligning Joint
- 1/4"-80 Pitch Adjustment Screws
- ±2mm Adjustment Range
- Standard 1"-32 Mounting Thread
- 19mm Clear Aperture

Part Numbering Anatomy

TM - 19 - 

Adjustment
S - Four Fine Pitch Screws
P - Screws/Spring Plungers

Mount
C - 1"-32 C-Mount
(Female)

1/32 THD, "C" MOUNT

Specifications subject to change without notice. Consult Haas Laser Technologies for Details.
Translation Mounts are designed for the critical alignment of transmissive optics, such as placing beam collimator within a pre-existing beam path. When two mounts are used on each end of a component, translational and angular corrections can be made. The internal, sealed stage is adjusted via four ultra fine pitch screws and spring plungers, within a ±2mm range. A self-aligning joint allows for the placement and removal of a component without affecting the beam path.

Various mounting styles available. Contact Haas Laser Technologies today for details at 973-598-1150 or visit us online at www.haaslti.com.

**Part Numbering Anatomy**

- **TA**
- **19**

**Adjustment**
- **S** - Four Fine Pitch Screws
- **P** - Screws/Spring Plungers

**Mount**
- **C** - 1"-32 C-Mount (Female)
The Beam Quality Enhancement System is designed to prevent back reflections from the laser process from re-entering the laser cavity. The system preserves the laser’s intra-cavity conditions, mode quality, and power stability. In addition, the laser beam is converted from a linearly polarized beam to a circularly polarized beam.

**BQE-25 Specifications**

- Designed for CO2 Lasers (10.6µm)
- All Mirrors Included
- Offset Mirrors Can be Rotated to “Fresh” Surface for Small Beam Sizes
- Liquid Cooled Mirrors - 1/8 BSPT Fittings
- Anodized Aluminum Construction
- 25mm Clear Aperture
- Mounts for any Input/Output Configuration

**Replacement Mirrors**

1. Phase Retarder ........ .210CM-5105-P45-SI-EAU
2. Mirror ................... 210CM-5105-045-SI-EAU
1. Back Reflection Isolator .170CM-50100-I45-CU-POL

**Part Numbering Anatomy**

| BQE | 25 |

Specifications subject to change without notice. Consult Haas Laser Technologies for Details.
The Beam Circular Polarizer System is designed to convert the laser beam from a linearly polarized beam to a circularly polarized beam.

**CPU-25 Specifications**
- Designed for CO2 Lasers (10.6µm)
- All Mirrors Included
- Offset Mirrors Can be Rotated to “Fresh” Surface for Small Beam Sizes
- Liquid Cooled Mirrors - 1/8 BSPT Fittings
- Anodized Aluminum Construction
- 25mm Clear Aperture
- Mounts for any Input/Output Configuration

Contact Haas Laser Technologies for proper mounting applications.

**Replacement Mirrors**
(1) Phase Retarder ............... 21OCM-5105-P45-SI-EAU
(1) Mirror ...................... 21OCM-5105-045-SI-EAU

**Part Numbering Anatomy**

Specifications subject to change without notice. Consult Haas Laser Technologies for Details.
**KINEMATIC BEAM BENDERS**

**BBK-19 SERIES**

- 90° Beam Displacement
- Independent Angular Orthogonal Mirror Correction
- Easy Optic Removal/Replacement

The BBK-19 series kinematic laser beam benders provide a ninety-degree beam displacement with a 19mm clear aperture.

Independent angular orthogonal mirror correction with eighty pitch adjustment screws provides precise, repeatable alignment. Optic removal and replacement can be accomplished without affecting alignment. Several mirror diameters and thicknesses can be accommodated. Both mounting faces have 1”-32 female threads.

### BBK-19 Specifications

- ±2° Independent Orthogonal Mirror Adjustment
- 80 Pitch Adjustment Screws
- Accommodates 25mm & 28mm Diameter Mirrors (other diameters available)
- 1”-32 Mounting Thread (C-Mount)
- Face and Side Mounting Holes
- Available for All Wavelengths
- Sealed Design
- Anodized Aluminum Construction
- 19mm Clear Aperture

### Part Numbering Anatomy

<table>
<thead>
<tr>
<th>BBK</th>
<th>19</th>
<th>-</th>
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</table>

<table>
<thead>
<tr>
<th>Optic Diameter</th>
<th>Optic Edge Thickness</th>
<th>Cooling</th>
<th>Interlock</th>
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</thead>
<tbody>
<tr>
<td>25 – 25mm (1.0”)</td>
<td>030 – 3.0mm</td>
<td>N – None</td>
<td>N – None</td>
</tr>
<tr>
<td>28 – 28mm (1.1”)</td>
<td>040 – 4.0mm</td>
<td>W – Water</td>
<td>I – Interlock</td>
</tr>
</tbody>
</table>

Specifications subject to change without notice. Consult Haas Laser Technologies for Details.
The SSDP-19 Safety Shutters are fail-safe shutters designed to handle up to 500W. Gold plated liquid cooled reflecting shutter blade design.

The blade is designed for fail-safe operation and is closed when power is off. When the shutter is closed, the laser beam is reflected off the shutter blade into the water-cooled beam dump. The replaceable beam dump surface can be ordered in several styles. Both mounting faces have 1”-32 female threads. The diode pointer option utilizes a 650nm diode laser with 1/4”-80 pitch adjustment screws. An independent, isolated mirror injects the diode pointing laser into the beam path when the shutter is closed.

SSDP-19 Specifications

- 24VDC
- 35ms Maximum Response
- Standard Gold Plated Blade
- Optional Shutter Open Detection
- Optional Thermal Detection
- Liquid Cooled (50PSI Max)
- Replaceable Beam Dump Surface
- 1”-32 Mounting Thread (C-Mount)
- Optional Alignment Diode
- DB15 Connection for I/O
- Anodized Aluminum Construction
- 19mm Clear Aperture
- For use with SIU-100 Shutter Interlock Unit

Specifications subject to change without notice. Consult Haas Laser Technologies for Details.
The SIU-100 Shutter Interlock Unit provides the source of electrical power to open and close Haas LTI shutters. The high peak power circuitry is designed to deliver the shortest open/close times. The unit provides safety interlock circuitry for enclosure doors, panels, beam delivery, etc...

**SIU-100 Specifications**

- Provides the Electronic Circuitry Needed for Rotary Solenoid Shutters
- Provides High Peak Power at Beginning of Rotary Stroke and Then Reduces the Wattage to Hold the Solenoid in the Energized Position for 100% Duty Cycle Operation
- Power On Switch
- Removable Keyswitch (enabled only) for Interlock Override
- Shutter Status Bi-color LED, Red (closed)/Green (open)
- 120/240 VAC
- DB-9 External Interface Connection
- For use with Haas LTI 24VDC Shutters

**Part Numbering Anatomy**

```
SIU  100
```

- Voltage
  - 120
  - 240
The BD-19 Laser Beam Dump provides a method to terminate a laser beam. Air and water cooled versions are available. Internal cone geometry diffuses laser beam.

**BD-19 Series Specifications**

- Water or Air Cooled
- 500W Capacity. Water / 500W - Air / 100W
- Internal Cone Diffuser
- Liquid Cooled (80 PSI Max)
- #10-32 Tap (Recommend 6mm or 1/4" tube fittings)

**Part Numbering Anatomy**

- BD
- 19
- 

**Fittings**
- B - Brass
- C - Copper

**Cooling**
- W - H2O
- A - Air

Specifications subject to change without notice. Consult Haas Laser Technologies for Details.
The Beam Shutter/Diode Pointer has an integrated laser beam alignment diode with a manual shutter blade and water cooled beam dump. Four independent fine-pitched adjustment screws permit precise control of the diode alignment. Positive spring pressure and hardened balls and pads ensure mirror repeatability.

The Diode Laser Module Assembly can be ordered separately (DLM-650-2MW)

**BSDP-19 Specifications**

- 650nm, 2mW Laser Diode
- Laser Diode ON/OFF Switch
- Laser Diode On Indicator Light
- 1/4"-80 Pitch Adjustment Screws
- Interlocked Shutter Blade, Includes Plug and Receptacle
- Water Cooled Beam Dump
- 1”-32 Mounting Threads
- Anodized Aluminum Construction
- 19mm Clear Aperture
- Includes 120V AC Power Supply

**Part Numbering Anatomy**

BSDP 19 - - - - -

- **Blade Material**
  - AU - Gold Plated
  - AF - Aluminum, Flat

- **Wavelength**
  - 10.6 - 10.6nm
  - 1064 - 1064nm
  - 532 - 532nm
  - 355 - 355nm

- **Shutter Detection**
  - D - Detection
  - N - No Detection

- **Thermal Detection**
  - D - Detection
  - N - No Detection

- **Activation**
  - M - Manual
**Beam Combiner/Diode Pointer**

**BCDP-19 Series**

- Precise Control of Diode Alignment
- Low Loss
- Minimum Beam Displacement

The Beam Combiner/Diode Pointer has an integrated laser alignment diode and beam combining optic. The output combines the laser beam with the diode pointer beam. Four independent fine-pitched adjustment screws permit precise control of the diode alignment without affecting the main beam. The combining optic is AR coated with a thin edge thickness for low loss and minimum beam displacement.

**BCDP-19 Specifications**

- 650nm, 2mW Laser Diode
- Laser Diode ON/OFF Switch
- Laser Diode ON Indicator Light
- 1/4"-80 Pitch Adjustment Screws
- Available in Multiple Wavelengths
- 1"-32 Mounting Threads
- Anodized Aluminum Construction
- 19mm Clear Aperture
- Less than 1mm Beam Displacement
- Includes 120V AC Power Supply

**Part Numbering Anatomy**

<table>
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<tr>
<th>BCDP</th>
<th>19</th>
<th>Part Numbering Anatomy</th>
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**Wavelength**

- 10.6 - CO₂ (10.6µm up to 50W)
- 1064 - Nd:YAG (1064nm)
- 532 - Green (532nm)
- 355 - UV (355nm)

Specifications subject to change without notice. Consult Haas Laser Technologies for Details.
Beam Switching Unit
BSU-19 Series

- Precise, Repeatable Alignment
- Water Cooling & Interlock Options
- Easy Optical Replacement and Removal
- Several Configurations Available

The Beam Switching Unit contains an internal BBK-19 Beam Bender mounted on precision linear bearings and can be translated in and out of the beam path. The kinematic laser beam bender provides a ninety-degree beam displacement with a 19mm clear aperture. Independent angular orthogonal mirror correction with eighty pitch adjustment screws provides precise, repeatable alignment. The BSU-19 provides a method to “Time-Share” or redirect the laser beam.

Optic removal and replacement can be accomplished without affecting alignment. Several mirror diameters and thickness can be accommodated.

BSU-19 Specifications
- Pneumatic or Manual Configuration
- ±2º Independent Orthogonal Mirror Adjustment
- 80 Pitch Adjustment Screws
- Accommodates 25mm & 28mm Diameter Mirrors (Other Diameters Available)
- Available Interlock Output
- 1”-32 Mounting Thread (C-Mount)
- Available for All Wavelengths
- Anodized Aluminum Construction
- 19mm Clear Aperture

Part Numbering Anatomy

<table>
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<th>BSU</th>
<th>19</th>
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<th>-</th>
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</table>

Optic Diameter
- 25 – 25mm (1.0")
- 28 – 28mm (1.1")

Optic Edge Thickness
- 030 – 3.0mm
- 040 – 4.0mm
- 064 – 6.4mm

Actuation
- M – Manual
- P – Pneumatic

Cooling
- N – None
- W – Water

Orientation
- L – Left
- R – Right

Interlock
- N – None
- I – Interlock

Left-Handed Orientation
- Input Beam
- Output (Bender Up)
- Output (Bender Down)

Right-Handed Orientation
- Input Beam
- Output (Bender Up)
- Output (Bender Down)
The BSK-19 series kinematic laser beam splitters provide a ninety-degree angular beam displacement of reflected beam with minimal lateral beam displacement of transmitted beams (lateral displacement is determined by optic thickness). Several laser beam split options are also available.

Independent angular orthogonal mirror correction with eighty pitch adjustment screws provides precise, repeatable alignment. Optic removal and replacement can be accomplished without affecting alignment. Several mirror diameters and thickness can be accommodated.

**BSK-19 Specifications**

- ±2º Independent Orthogonal Mirror Adjustment
- 80 Pitch Adjustment Screws
- Accommodates Standard 38mm Diameter Mirror (Other Diameters Available)
- Face and Side Mounting Holes
- Available for all Wavelengths
- Sealed Design
- Anodized Aluminum Construction
- 19mm Clear Aperture
- Order with ADP-CMNT-25BLT to Connect to 19mm Series Components

**Part Numbering Anatomy**

```
```

- **Optic Diameter**
  - 25 – 25mm (1.0”)
  - 28 – 28mm (1.1”)
  - 38 – 38mm (1.5”)

- **Optic Edge Thickness**
  - 030 – 3.0mm
  - 040 – 4.0mm
  - 064 – 6.4mm
  - 100 – 10.0mm

- **Cooling**
  - N – None
  - W – Water

- **Interlock**
  - N – None
  - I – Interlock

Specifications subject to change without notice. Consult Haas Laser Technologies for Details.
Low Power Laser Series

Industrial Articulated Arms provide sealed beam delivery with constant path length on moving systems. With larger bearings and thicker tube cross sections, these arms provide higher accuracy than arms designed for medical applications.

ARM-19 Specifications

- Gray Ceramic Hard-Coat Tubes & Knuckles with Stainless Steel Bearing Cups
- Standard 1”-32 Output Thread
- 19mm Clear Aperture
- Sealed Bearings
- Counterweight = 4.5kg, Arm = 2.7kg
- Custom Configurations Available

Part Numbering Anatomy

<table>
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<th>Length Arm 1</th>
<th>Length Arm 2</th>
<th>Wavelength</th>
<th>Counter Balance</th>
<th>Base Mount</th>
</tr>
</thead>
<tbody>
<tr>
<td>558 - 558mm (22&quot;)</td>
<td>370 - 370mm (14&quot;)</td>
<td>10.6 - CO₂ (10.6µm)</td>
<td>N - None</td>
<td>S - Standard</td>
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<tr>
<td>890 - 890mm (35&quot;)</td>
<td>490 - 490mm (19&quot;)</td>
<td>1064 - Nd:YAG (1064nm)</td>
<td>W - Weight</td>
<td>C - Custom</td>
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<tr>
<td>1145 - 1145mm (45&quot;)</td>
<td>660 - 660mm (26&quot;)</td>
<td>532 - Green (532nm)</td>
<td>R - Rod</td>
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<tr>
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<td>355 - UV (355nm)</td>
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Specifications subject to change without notice. Consult Haas Laser Technologies for Details.
"Quick-Mount" Beam Delivery Tubes & Couplers

BTQ-19 Series

- Sealed Beam Path Containment
- Tubes Can be Easily Cut to Any Length
- Allows Beam Tubes to be Removed from Beam Path for Alignment

“Quick-Mount” Beam Delivery Tubes are high-grade anodized aluminum tubes that provide sealed containment of the laser beam path. Tubes are supplied in standard lengths that can be easily cut to any desired length. Use with a “Quick-Mount” Coupler on each end to complete the system. Each Coupler has a 1"-32 thread on one end with a sealed receptacle for the Beam Tube on the other end.

**BTQ-19 Specifications**

- High-Grade Anodized Aluminum
- Internal Non-Metallic Seals
- Standard 1"-32 Mounting Thread (C-Mount)
- 19mm Clear Aperture
- Coupler Length (L) = 51mm
- Coupler Diameter = 35mm

**Part Numbering Anatomy:**

**COUPLER**

<table>
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<th>19</th>
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**Part Numbering Anatomy:**

**TUBE**

| BT | 19 | T | ___ |

**TO SIZE TUBE LENGTH:**

SUBTRACT 30mm FROM COMPONENT FACE-TO-FACE DISTANCE

Uncut Tube Length

- 0300 - 300mm
- 0600 - 600mm
- 1200 - 1200mm
- 1800 - 1800mm

Specifications subject to change without notice. Consult Haas Laser Technologies for Details.
Beam Tubes & Locking Ring
BTA-19 Series

- Sealed Containment of Beam Path
- Rigidly Mount Beam Delivery Components
- Custom Lengths Available

Low Power Laser Series

Beam Delivery Tubes are high-grade anodized aluminum tubes, which provide sealed containment of the laser beam path. These beam tubes have a 19mm clear aperture with 1"-32 mounting threads. The tubes provide a method to rigidly mount beam delivery components.

BTA-19 & LR-BT-19 Specifications

- High Grade Anodized Aluminum
- Standard 1"-32 Mounting Thread (C-Mount)
- 19mm Clear Aperture
- Custom Lengths Available

Part Numbering Anatomy

BTA - 19 - - -

Mounting Style
- CM - 1"-32 (C-Mount male)
- CF - 1"-32 (C-Mount female)

Length
- 0012 - 12mm
- 0025 - 25mm
- 0038 - 38mm
- 0050 - 50mm
- 0100 - 100mm
- 0300 - 300mm

Specifications subject to change without notice. Consult Haas Laser Technologies for Details.
Telescopic Beam Tubes are typically used when a part of the delivery system is attached to a translating axis. The BBT has telescopic aluminum tubes to ensure protection from misaligned beams. Sealing is accomplished by either internal shaft seals or by an external bellow.

BTT-19 Specifications

- High-Grade Anodized Aluminum
- Internal Non-Metallic Seals (optional)
- Neoprene or Gortex® Bellows (optional)
- Standard 1”-32 Mounting Thread (C-Mount)
- 19mm Clear Aperture
- Custom Lengths & Strokes

Part Numbering Anatomy

BTT → 19 → □ → □ → □ → □ → □

Mounting Style

CM – 1”-32 (C-Mount male)
CF – 1”-32 (C-Mount female)
F38 – Flange (38mm BC)

Compressed Length

To Be Determined

Application

V – Vertical
H – Horizontal

Extended Length

To Be Determined

Specifications subject to change without notice. Consult Haas Laser Technologies for Details.
**TELESCOPIC BELLOW BEAM TUBES**

**BTB-19 SERIES**

Telescopic Bellow Beam Tubes are typically used when a part of the delivery system is attached to a translating axis. The BTB Bellow tubes to ensure protection from mis-aligned beams.

### BTB-19 Specifications

- High-Grade Anodized Aluminum Hardware
- Internal Non-Metallic Seals (optional)
- Neoprene or Gortex® Bellows
- Standard 1”-32 Mounting Thread (C-Mount)
- 19mm Clear Aperture
- Custom Lengths & Strokes

### Part Numbering Anatomy

- **BTB**
- **19**
- **CM**
  - 1”-32 (C-Mount male)
- **CF**
  - 1”-32 (C-Mount female)
- **F38**
  - Flange (38mm BC)

### Compressed Length

- To Be Determined

### Extended Length

- To Be Determined

### Application

- V – Vertical
- H – Horizontal

Specifications subject to change without notice. Consult Haas Laser Technologies for Details.
19mm SERIES ACCESSORIES
TARGETS/OPTIC WRENCHES

TARGETS
Alignment targets aid in the centering of the laser beam relative to the mechanical center of beam delivery components. The 19mm clear aperture series has two standard targets designed to satisfy most alignment needs. Both targets have an anodized aluminum construction with 0.9mm diameter brass cross hairs.

Beam Bender Alignment Target
After removing the kinematic plate of the beam bender, the Beam Bender Alignment Target is installed with the cross-hairs in the same plane as the optic. Alignment between beam benders can be made without removing beam tubes. Part#: TGT-BBK-19

Optic Wrench
The optic wrench has an anodized aluminum construction and is specifically designed for tightening and loosening the focus lens of the PHA-19. Part#: OW-110-092

C-Mount Alignment Target
1”-32 male threads allows the C-Mount Alignment Target to connect easily with the output side of the LAM-19, PHA-19, and BEC-19, as well as other 19mm clear aperture components. Part#: TGT-CMNT

Specifications subject to change without notice. Consult Haas Laser Technologies for Details.
CO2 THERMAL ALIGNMENT CARDS

Thermal sensitive CO2 alignment cards are used to align optical components to the laser beam axis. They can also be used to document the laser beam shape, mode, intensity, divergence and energy distribution. Use the back of the card to record important laser parameters. The 82mm x 187mm size cards come packaged in quantities of 100.

OPTIC CLEANING KIT

The Optic Cleaning Kit contains the proper tools to clean CO2 optics. A cleaning procedure card is included for reference. Each kit includes: Solvent Free Lens Cleaner (2oz.), German Blower Brush, 100% Cotton Swabs with Wooden Stem (100), Lens Cleaning Paper (50), Finger Cots (10), Hemostat Pliers and an Optic Cleaning Holder.

Specifications subject to change without notice. Consult Haas Laser Technologies for Details.
Laser Bezel Adapters provide a sealed connection of 19mm Series components to the industry’s most common low power lasers. Custom designs are also available.

- Provide Sealed Connections for 19mm Components
- Custom Designs Available

Coherent Diamond K-Series
Part#: ADP-K500-CMNT
Threads to Laser Bezel

Beam Tube Coupler
Part#: TC-19
- For use with BT-19 Beam Tubes
- Sealed Design

For Use with BTA Threaded Beam Tubes
Part#: ADP-19-CMNT
- For use with BT-19 Beam Tubes
- Sealed Design

Provides a method to rigid mount BT-19 Beam Tubes to lasers, flanges, mounting plates, etc...

Specifications subject to change without notice. Consult Haas Laser Technologies for Details.
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Specifications subject to change without notice. Consult Haas Laser Technologies for Details.