



*Applicable to flat cutting, tube cutting,  
robot cutting, welding, cladding and hardening etc.*



# Laser Beam Delivery System

@202009

# Empower Your Laser Solutions



RayTools AG.

## About Us

### General Purpose:

Evaluation, generation and application of laser beam delivery system for industrial use. Resulting project, custom industrial machine tools, robots and work cells along with co-brands and service business; Committed to establishing a platform for the sharing of industrial laser manufacturing knowledge.

### Achievements:

Laser beam delivery system for various applications and compatible to fiber laser, direct diode laser, solid state lasers and Co2 laser, unique application concepts of high power laser & diodes, related projects;  
Modular laser source- and machine concepts, components, accessories and unique beam delivery technology;

### Advantages:

Independent company with vast know-how and engineering skills on demand and in line with customer requirements.  
High market shares, outstanding recognition with global network to care you at each corner.

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# RAYTOOLS BM109 SERIES



Auto Focus Laser Cutting Head

Power Rating **1.5KW**

Modular design with easy maintenance.

3 Cover glasses (top, middle and bottom) to protect collimation & focus lens.

Dual water cooling circuits.



IP65 class dustproof, patented cover glass cover plate. All-around dust prevention.

Auto focus to reduce human intervention and improve piercing and cutting efficiency.

## Technical Data

Fiber Interface	QBH, QD
Clear Aperture	26 mm
Auto Focus	
- Range	+8 ~ -9 mm
- Acceleration	≤ 10 m/s <sup>2</sup>
- Velocity	≤ 6 m/min
- Accuracy	≤ 50 μm
Cover Glasses	
- Collimation Side (Top)	Φ24.9 * 1.5 mm
- Focusing Side (Bottom/Middle)	Φ27.9 * 4.1 mm

Collimation Length	100mm
Focus Length	125mm, 150mm
Nozzle Styles	Single, Double, Custom
Diameter of Nozzle Tip	0.8mm, 1.0mm, 1.2mm, 1.5mm, 2.0mm, 2.5mm, 3.0mm, 3.5mm, 4.0mm, 4.5mm, 5.0mm
Assist Gas Pressure	≤ 25 bar
Weight	~ 3 kg

Specifications subject to change without notice.

# RAYTOOLS BM111 SERIES



Auto Focus Laser Cutting Head

Power Rating **3.3KW**



Dual water cooling circuits.

Modular design with easy maintenance.

3 Cover glasses (top, middle and bottom) to protect collimation & focus lens.

Auto focus to reduce human intervention and improve piercing and cutting efficiency.

IP65 class dustproof, patented cover glass cover plate. All-around dust prevention.

## Technical Data

Fiber Interface	QBH, QD
Clear Aperture	28 mm
Auto Focus	
- Range	+10 ~ -12 mm
- Acceleration	≤ 10 m/s <sup>2</sup>
- Velocity	≤ 10 m/min
- Accuracy	≤ 50 μm
Cover Glasses	
- Collimation Side (Top)	Φ24.9 * 1.5 mm
- Focusing Side (Middle/Bottom)	Φ27.9 * 4.1 mm

Collimation Length	100mm
Focusing Length	125mm, 155mm, 200mm
Nozzle Styles	Single, Double, Custom
Diameter of Nozzle tip	0.8mm, 1.0mm, 1.2mm, 1.5mm, 2.0mm, 2.5mm, 3.0mm, 3.5mm, 4.0mm, 4.5mm, 5.0mm
Assist Gas pressure	≤ 30 bar
Weight	~ 5.7 kg

Specifications subject to change without notice.

# RAYTOOLS BM111E SERIES



EtherCAT Smart Laser Cutting Head

Power Rating **3.3KW**

Communication and auto focus control based on EtherCAT.

D30mm combo lens to support laser up to 3.3KW.

4-Color LED lamps to monitor status.

Optimized optical configuration and smooth gas circuit.



Top cover glass is used to further protect collimation lens.

Drawer type cover glass holder to facilitate replacement.

Standard QBH/QD (LLK-D) interfaces to work with different fiber lasers.

## Technical Data

Fiber Interface	QBH, QD
Clear Aperture	28 mm
Auto Focus	
- Range	+10 ~ -14 mm
- Acceleration	≤ 10 m/s <sup>2</sup>
- Velocity	≤ 6 m/min
- Accuracy	≤ 50 μm
Cover Glasses	
- Collimation Side (Top)	Φ24.9 * 1.5 mm
- Focusing Side (Middle/Bottom)	Φ27.9 * 4.1 mm

Collimation Length	75mm, 100mm
Focusing Length	125mm, 150mm, 200mm
Nozzle Styles	Single, Double, Custom
Diameter of Nozzle Tip	0.8mm, 1.0mm, 1.2mm, 1.5mm, 2.0mm, 2.5mm, 3.0mm, 3.5mm, 4.0mm, 4.5mm, 5.0mm
Assist Gas Pressure	≤ 30 bar
Weight	~ 5 kg

Specifications subject to change without notice.

# RAYTOOLS BM114E SERIES



EtherCAT Smart Laser Cutting Head

Power Rating **6KW**

Communication and auto focus control based on EtherCAT.

4-Color LED lamps to monitor status.

Optimized optical configuration and smooth gas circuit.



Top cover glass is used to further protect collimation lens.

D37mm combo lens to support laser up to 6KW.

Drawer type cover glass holder to facilitate replacement.

Standard QBH/QD (LLK-D) interfaces to work with different fiber lasers.

## Technical Data

Fiber Interface	QBH, QD
Clear Aperture	35 mm
Auto Focus	
- Range	+15 ~ -20 mm
- Acceleration	≤ 10 m/s <sup>2</sup>
- Velocity	≤ 15 m/min
- Accuracy	≤ 50 μm
Cover Glasses	
- Top	Φ38.1 * 1.6 mm
- Bottom	Φ37 * 7 mm

Collimation Length	75mm, 100mm
Focusing Length	150mm, 200mm
Nozzle Styles	Single, Double, Custom
Diameter of Nozzle tip	0.8mm, 1.0mm, 1.2mm, 1.5mm, 2.0mm, 2.5mm, 3.0mm, 3.5mm, 4.0mm, 4.5mm, 5.0mm
Assist gas pressure	≤ 30 bar
Weight	~ 6.2 kg

Specifications subject to change without notice.

# RAYTOOLS BM114S SERIES



Auto Focus Laser Cutting Head

Power Rating **6KW**

Rated to 6kW @ 1um, with D37 lens combo for thick plate cutting.

Collimation and focusing lenses are both water cooled.

Compact design to reduce the payload of Z axis.



35mm Clear aperture which effectively reduces stray beam interference and guarantee cutting quality and lifespan.

Air cooling to nozzle which effectively protects the nozzle & ceramic part and extends the lifespan.

Auto focus to reduce human intervention.

## Technical Data

Fiber Interface	QBH, QD
Clear Aperture	35 mm
Auto focus	
- Range	+15 ~ -20 mm
- Acceleration	≤ 10 m/s <sup>2</sup>
- Velocity	≤ 10 m/min
- Accuracy	≤ 50 μm
Cover Glasses	
- Collimation Side (Top)	Φ38.1 * 1.6 mm
- Focusing Side (Bottom)	Φ37 * 7 mm

Collimator Length	100mm
Focusing Length	150mm, 200mm
Nozzle Styles	Single, Double, Custom
Diameter of Nozzle tip	0.8mm, 1.0mm, 1.2mm, 1.5mm, 2.0mm, 2.5mm, 3.0mm, 3.5mm, 4.0mm, 4.5mm, 5.0mm
Assist gas pressure	≤ 30 bar
Weight	~ 5.6 kg

Specifications subject to change without notice.



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# BM115 3.0 SERIES



Auto Focus Laser Cutting Head

Power Rating 6KW/8KW/12KW

Updated version from BM115 2.0 with stable cutting capability under continuous full power.

Upgraded optics beam and gas circuit.

Integrated design to ensure sealing.

Both collimation and focus lens are water cooled.



Air cooling to nozzle which effectively protects the nozzle & ceramic part and extend the lifespan.

Compact structure to reduce the payload of Z axis.

Auto focus to reduce human intervention.

35mm clear aperture to effectively reduce stray beam interference and guarantee cutting quality and lifespan.

## Technical Data

Fiber Interface	QBH, QD, Q+
Clear Aperture	35mm (6kw/8kw); 36.1mm (12kw)
Auto Focus	
- Range	+10 ~ -10 mm (Scale) +22.5 ~ -22.5 mm (FL150); +40 ~ -40mm (FL200)
- Acceleration	≤ 10 m/s <sup>2</sup>
- Velocity	≤ 15 m/min
- Accuracy	≤ 50 μm
Cover Glasses	
- Collimation Side(Top)	Φ37 * 1.6 mm
- Focusing Side (Middle/Bottom)	Φ37 * 7 mm

Collimation Length	100mm
Focusing Length	150mm, 200mm
Nozzle Styles	Single, Double, Custom
Diameter of Nozzle Tip	
Single	1.4mm, 1.5/2.0mm, 2.5/3.0mm, 3.5/4.0mm, 5.0/6.0mm, 10.0mm
Double	1.2/1.4mm, 1.5/1.6mm, 2.0/2.5mm, 3.0/3.5mm, 4.0mm
Assist gas pressure	≤ 30 bar
Weight	~ 7 kg

Specifications subject to change without notice.

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# BM115E SERIES



EtherCAT Smart Laser Cutting Head

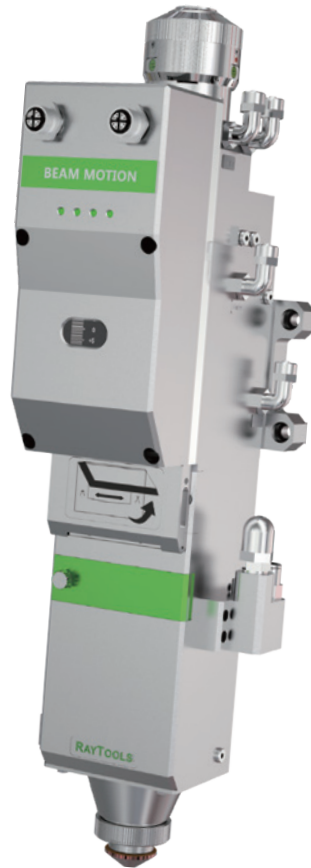
Power Rating 6KW/8KW/12KW

Communication and auto focus control based on EtherCAT.

4-Color LED lamps to monitor status.

Optimized optical configuration and smooth gas circuit.

D38.1mm or 37mm aspherical and combo lens to support laser up to 12KW.



Top cover glass is used to further protect collimation lens.

Drawer type cover glass holder to facilitate replacement.

Standard QBH/QD (LLK-D)/Q+ interfaces to work with different fiber lasers.

## Technical Data

Fiber Interface	QBH, QD, Q+
Clear Aperture	35mm (6kw/8kw); 36.1mm (12kw)
Auto Focus	
- Range	+10 ~ -10 mm (Scale) +22.5 ~ -22.5 mm (FL150); +40 ~ -40mm (FL200)
- Acceleration	≤ 10 m/s <sup>2</sup>
- Velocity	≤ 15 m/min
- Accuracy	≤ 50 μm
Cover Glasses	
- Top	Φ38.1 * 1.6 mm
- Bottom	Φ37 * 7 mm

Collimation Length	100mm
Focusing Length	150mm, 200mm
Nozzle Styles	Single, Double, Custom
Diameter of Nozzle Tip	1.0mm, 1.2mm, 1.4mm, 1.5mm, 1.6mm, 1.8mm, 2.0mm, 2.5mm, 3.0mm, 3.5mm, 4.0mm, 4.5mm, 5.0mm, 6.0mm, 7.0mm, 7.5mm, 8.0mm, 8.5mm, 9.5mm, 10.0mm
Assist gas pressure	≤ 30 bar
Weight	~ 6.5 kg

Specifications subject to change without notice.

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# BM116 SERIES

EtherCAT Smart ZOOM Laser Cutting Head



Power Rating **6KW/8KW**

Communication and control based on EtherCAT.

4-Color LED lamps to monitor status.

Automatic change of beam spot size.



Optimized optical configuration and smooth gas circuit.

Continuous monitoring to cover glass.

Top cover glass is used to further protect collimation lens.

## Technical Data

Fiber Interface	QBH, QD, Q+	Nozzle Styles	Single, Double, Custom
Clear Aperture	50.8 mm	Diameter of Nozzle tip	1.0mm, 1.2mm, 1.4mm, 1.5mm, 1.6mm, 1.8mm, 2.0mm, 2.5mm, 3.0mm, 3.5mm, 4.0mm, 4.5mm, 5.0mm, 6.0mm, 7.0mm, 7.5mm, 8.0mm, 8.5mm, 9.5mm, 10.0mm
Auto focus		Assist Gas Pressure	≤ 30 bar
- Magnification Ratio of Collimated Beam	1.2 X ~ 4.0X	Weight	~7.8kg
- Range	1.2/1.5/2.0/2.5/3.0/3.5/4.0	Specifications subject to change without notice.	
- Accuracy	≤ 50µm		
Cover Glasses			
- Top	Φ37 * 1.6 mm		
- Bottom	Φ37 * 7 mm		

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# BS12K SERIES

All-In-One Smart Laser Cutting Head

Power Rating **12KW**



Optimized optical configuration and smooth gas circuit.

Compact design with high acceleration.

Monitoring status could be accessed at mobile APP or CNC controller.

Continuous monitoring to optical lens and cover glass.

Mounting verticality (gravity) detection.

Side anti-collision detection.

Fully sealed optical beam structure.



Communication and control based on EtherCAT.

4-Color LED lamps to monitor interior status.

Focus point position detection.

Gas pressure detection.

Interior air pressure detection.

Standard QBH/QD (LLK-D)/Q+ interfaces to work with different fiber lasers.

## Technical Data

Fiber Interface	QBH, QD, Q+
Clear Aperture	32 mm
Auto Focus	
- Range	+15 ~ -20 mm (FL150); +20 ~ -25mm (FL200)
- Acceleration	≤ 10 m/s <sup>2</sup>
- Velocity	≤ 10m/min
- Accuracy	≤ 50μm
Cover Glasses	
- Top	Φ24.9 * 1.5 mm
- Bottom	Φ37 * 7 mm

Collimation Length	100mm
Focusing Length	150mm, 200mm
Nozzle Styles	Single, Double, Custom
Diameter of Nozzle Tip	
	1.0mm, 1.2mm, 1.4mm, 1.5mm, 1.6mm, 1.8mm, 2.0mm, 2.5mm, 3.0mm, 3.5mm, 4.0mm, 4.5mm, 5.0mm, 6.0mm, 7.0mm, 7.5mm, 8.0mm, 8.5mm, 9.5mm, 10.0mm
Assist Gas Pressure	≤ 30 bar
Weight	~6.8kg

Specifications subject to change without notice.

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# BT240S SERIES

Manual Focus Laser Cutting Head

Power Rating 2KW/3.3KW



IP65 dustproof level with fully enclosed beam path to decrease contamination risk.

Zero focus scale recovery function to maintain accurate focus adjustment.



Integrated design and improved QBH fiber interface to prevent from sticking.

Dual-water cooling circuit to collimation lens and focus lens.

## Technical Data

Fiber Interface	QBH, QD
Clear Aperture	28 mm
Collimation Length	100 mm
Focusing Length	125mm, 155mm, 200mm
Cover Glasses	
- Collimation Side(Top)	Φ24.9 * 1.5 mm
- Focusing Side(Bottom)	Φ27.9 * 4.1 mm

Nozzle Styles	Single, Double, Custom
Diameter of Nozzle tip	0.8mm, 1.0mm, 1.2mm, 1.5mm, 2.0mm, 2.5mm, 3.0mm, 3.5mm, 4.0mm, 4.5mm, 5.0mm
Assist gas pressure	≤25 bar
Weight	~ 3.5 kg

Specifications subject to change without notice.

RAYTOOLS

# BT220RC SERIES



Robot Laser Cutting Head(To Replace BT2105RC)

Power Rating **1.5KW**

Light-duty and compact design to decline payload of robot and improve cutting speed & quality..

Optimized optical configuration and smooth air flow design to improve cutting quality and efficiency.



Skinny nozzle structure to reduce interference to workpiece.

Various fiber interfaces like QBH, QCS to match different lasers

## Technical Data

Fiber Interface	QBH, QCS	Nozzle Styles	Single, Double, Custom
Clear Aperture	25 mm	Diameter of Nozzle tip	0.8mm, 1.0mm, 1.2mm, 1.5mm, 2.0mm, 2.5mm, 3.0mm, 3.5mm, 4.0mm
Collimation Length	100 mm	Assist gas pressure	≤20 bar
Focusing Length	150 mm	Weight	~ 1.8 kg
Cover Glasses		Specifications subject to change without notice.	
- Collimation Side(Top)	Φ24.9 * 1.5 mm		
- Focusing Side(Bottom)	Φ27.9 * 4.1 mm		

# RAYTOOLS GF101 SERIES



All-In-One Robot Laser Cutting Head (To Replace BM100)

Power Rating **4KW**



Integrated design with built-in Z axis to decrease interference in narrow operation space.

Light-duty and compact design to decrease payload of robot.

Optimized optical configuration and smooth airflow design to meet different applications in thin plate cutting and other customized 3D environment.

Dual water-cooling circuits to safeguard the continuous operation.

Reliable seal, modular and skinny nozzle structure to reduce interference and prolong lifespan.

Both cover glasses to provide protection to collimation lens and focus lens.

## Technical Data

Fiber Interface	QBH, QD
Clear Aperture	28 mm
Manual Focus	
- Range	+7 ~ -9 mm
- Accuracy	≤ 50 μm
Cover Glasses	
- Collimation Side (Top)	Φ24.9 * 1.5 mm
- Focusing Side (Bottom)	Φ27.9 * 4.1 mm

Collimation Length	100mm
Focus Length	150mm
Follow Distance	20mm
Nozzle Styles	Single, Double, Custom
Diameter of Nozzle Tip	0.8mm, 1.0mm, 1.2mm, 1.5mm, 2.0mm, 2.5mm, 3.0mm, 3.5mm, 4.0mm
Assist Gas Pressure	≤ 25 bar
Weight	~ 3.5 kg

Specifications subject to change without notice.

# RAYTOOLS

# GF101+GF102 SERIES



Robot Laser Cutting Head(To Replace BM100+BM102)

Power Rating **4KW**



Compact design with light-duty to decrease the payload of robot or machine tool.

Excellent dynamic characteristics and high precision.

Programmable A/B axis which is capable of cutting to small contours.

Independent application or along with robot arm.

Built-in Z axis design to narrow down operation space and decrease interference.

Drawer type cover glass holder to facilitate replacement.

Standard QBH/QD (LLK-D) interfaces to work with different fiber lasers.

## Technical Data

Fiber Interface	QBH , QD(LLK-D)
Clear Aperture	28 mm
Manual Focus	
- Range	+7 ~ -9 mm
- Accuracy	≤ 50 μm
Cover Glasses	
- Top	Φ24.9 * 1.5 mm
- Bottom	Φ27.9 * 4.1 mm

Collimation Length	100mm
Focus Length	150mm
Min. Cutting Diameter	1 mm (accuracy ±0.1mm)
Nozzle Styles	Single, Double, Custom
Diameter of Nozzle Tip	0.8mm, 1.0mm, 1.2mm, 1.5mm, 2.0mm, 2.5mm, 3.0mm, 3.5mm, 4.0mm
Assist Gas Pressure	≤ 25 bar
Weight	~ 11 kg

Specifications subject to change without notice.



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# BM109TC SERIES



Auto Focus Tube Cutting Head

Power Rating 1.5KW

Modular design with easy maintenance.

Dual water cooling circuits.

Auto focus to reduce human intervention and improve piercing and cutting efficiency.



3 Cover glasses (top, middle and bottom) to protect collimation & focus lens.

IP65 class dustproof, patented cover glass cover plate. All-around dust prevention.

Skinny nozzle structure to decrease interference.

## Technical Data

Fiber Interface	QBH
Clear Aperture	25 mm
Auto Focus	
- Range	+8 ~ -9 mm
- Acceleration	$\leq 10 \text{ m/s}^2$
- Velocity	$\leq 6 \text{ m/min}$
- Accuracy	$\leq 50 \mu\text{m}$
Cover Glasses	
- Collimation Side (Top)	$\Phi 24.9 * 1.5 \text{ mm}$
- Focusing Side (Middle/Bottom)	$\Phi 27.9 * 4.1 \text{ mm}$

Collimation Length	100mm
Focusing Length	150mm
Nozzle Styles	Single, Double, Custom
Diameter of Nozzle Tip	1.2mm, 1.5mm, 2.0mm, 2.5mm, 3.0mm, 3.5mm, 4.0mm
Assist Gas Pressure	$\leq 25 \text{ bar}$
Weight	~ 3 kg

Specifications subject to change without notice.

RAYTOOLS

# BM111TC SERIES



Auto Focus Tube Cutting Head

Power Rating **3.3KW**

Modular design with easy maintenance.

Dual water cooling circuits.

Auto focus to reduce human intervention and improve piercing and cutting efficiency.



3 Cover glasses (top, middle and bottom) to protect collimation & focus lens.

IP65 class dustproof, patented cover glass cover plate. All-around dust prevention.

Skinny nozzle structure to decrease interference.

## Technical Data

Fiber Interface	QBH, QD	Collimation Length	100mm
Clear Aperture	28 mm	Focusing Length	155mm, 200mm
Auto Focus		Nozzle Styles	Single, Double, Custom
- Range	+10 ~ -12 mm	Diameter of Nozzle Tip	1.2mm, 1.5mm, 2.0mm, 2.5mm, 3.0mm, 3.5mm, 4.0mm
- Acceleration	$\leq 10 \text{ m/s}^2$	Assist Gas Pressure	$\leq 30 \text{ bar}$
- Velocity	$\leq 10 \text{ m/min}$	Weight	~ 5.5 kg
- Accuracy	$\leq 50 \mu\text{m}$		
Cover Glasses			
- Collimation Side (Top)	$\Phi 24.9 * 1.5 \text{ mm}$		
- Focusing Side (Middle/Bottom)	$\Phi 27.9 * 4.1 \text{ mm}$		

Specifications subject to change without notice.

# RAYTOOLS GF401 SERIES



4-Axis Tube Cutting Head (To Replace BM140)

Power Rating **6KW**

DD servo motor motorized bevel axle to keep high positioning accuracy and stability.

Slag blow to ensure stable cutting.

Auto-focus by 0-10V to facilitate fast piercing.



Modular design with easy maintenance.

EtherCAT protocol for bevel motion. Other protocols could be customized.

Height tracking to be accomplished by EtherCAT or 0-10V analog.

## Technical Data

Fiber Interface	QBH, QD
Clear Aperture	35 mm
Auto Focus	
- Range	+10 ~ -10mm (Scale) -22.5 ~ +22.5mm (FL150) -40 ~ +40mm (FL200)
- Acceleration	$\leq 6 \text{ m/s}^2$
- Velocity	$\leq 10 \text{ m/min}$
- Accuracy	$\leq 50 \mu\text{m}$
Cover Glasses	
- Collimation Side (Top)	$\Phi 38.1 * 1.6 \text{ mm}$
- Focusing Side (Middle/Bottom)	$\Phi 37 * 7 \text{ mm}$

Collimation Length	100mm
Focusing Length	150mm, 200mm
Nozzle Styles	Single, Double, Custom
Diameter of Nozzle Tip	1.0mm, 1.2mm, 1.5mm, 2.0mm, 2.5mm, 3.0mm, 3.5mm, 4.0mm
Assist Gas Pressure	$\leq 30 \text{ bar}$
Weight	$\sim 18 \text{ kg}$
Swing	
- Swing Angle	$\pm 135^\circ$
- Rotation Speed	$\leq 90 \text{ r/min}$
- Angular Acceleration	$\leq 50 \text{ rad/s}^2$
- Positioning Accuracy	0.015°
- Repeated Positioning Accuracy	0.015°

Specifications subject to change without notice.

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# FM220 SERIES

Micro Laser Cutting Head (To Replace BT220)

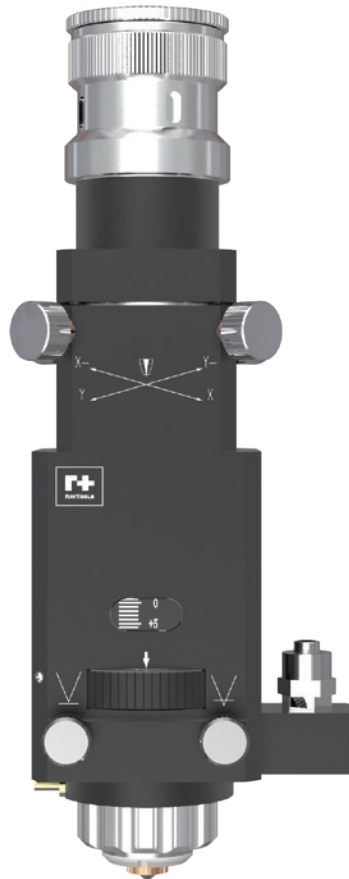
Power Rating 500W



Light-duty and compact design to improve cutting speed and reduce operation space.

Optimized optical configuration and smooth air flow design to improve cutting quality and efficiency.

Fiber interface like QBH or QCS is optional.



Special optical system to eliminate spherical aberration.

Particularly designed micro cutting nozzle to safeguard the performance.

Max shrinkage of beam spot size by 1/2 which is applicable to ultra micro cutting in ceramic, medical and semi-conductor industry, etc.

## Technical Data

Fiber Interface	QBH, QCS
Clear Aperture	25 mm
Follow Distance	20mm
Manual Focus	
- Range	10mm
- Accuracy	≤ 50 μm
Cover Glasses (Bottom)	
- 50mm FL	Φ22.4 * 4.1 mm
- 80mm/100mm FL	Φ27.9 * 4.1 mm

Collimation Length	100mm
Focusing Length	50mm, 80mm, 100mm
Nozzle Styles	Single
Diameter of Nozzle Tip	0.3mm, 0.5mm, 0.8mm, 1.0mm, 1.5mm, 2.0mm
Assist Gas Pressure	≤ 20 bar
Weight	~ 1.5 kg

Specifications subject to change without notice.

# RAYTOOLS AK090 SERIES

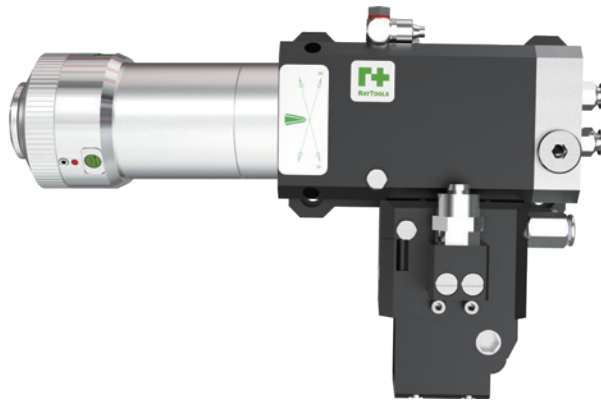


Compact Laser Welding Head

Power Rating **6KW**

High power rating. Parabolic optics system based on single piece parabolic mirror with direct water cooling and long life-span.

Compact size with easy access to narrow space



Light-duty to reduce the payload of machine tool and fulfill high speed processing.

Dual-water cooling circuits as well as water cooling to cover glass holder and body of laser welding head.

## Technical Data

Diode Version	
- Collimator Focal Length	100 mm
- Focusing Focal Length	150mm, 200mm, 250mm
Fiber Version	QBH, QD
CCD	TYPE-C , TYPE-CS

Specifications subject to change without notice.

Clear Aperture	35mm
Cover Glass	27.9mm*4.1mm
Assist Gas Pressure	
- Air Knife	≤8 bar
- Protection Air	25L/min
Weight	~2kg

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# BF310 SERIES



Dual-spot Laser Welding Head

Power Rating **4000W**

High tolerance to welding gap; Adjustable distance between dual spots to obviously improve the welding quality and seam when the welding gap is relatively big.

The direction of spot is able to be adjusted via transmission mechanism. The distance between 2 spots could be adjusted via precision adjusting mechanism to cater for various applications.

The energy distribution of beam spot is adjustable within below range:  
23% : 77% to 77% : 23%



Favorable to special welding. Particularly applicable to butt-welding of unequal thickness, welding of unequal material, and welding of galvanized steel.

CCD or laser vision seam tracking interface is optional for expanding of function.

Efficient fluid structure design to obtain the best protection to melting pool.

## Technical Data

Fiber Interface	QBH, QD
Clear Aperture	37 mm
Collimator Focal Length	100 mm
Focusing Focal Length	200mm,250mm,300mm,500mm
Rotation range	0-360°
CCD interface	TYPE-C, TYPE-CS
Cover Glasses	
- Collimation Side (Top)	Φ30 * 1.5 mm
- Focusing Side (Bottom)	Φ50 * 2 mm

Assist Gas Pressure	
- Air Knife	≤6 bar
- Air Protection	10-25 L/min
Weight	~8.5 kg

Specifications subject to change without notice.

RAYTOOLS

# BF320 SERIES

Coaxial Wobble Laser Welding Head

Power Rating 2000W



Large welding seam, low porosity, excellent mechanical property and surface quality.

CCD or laser vision seam tracking interface is optional for expanding of function.

Continuous wobbling paths: circle, polygonal line and sine curve.  
Non-continuous wobbling paths: circle, line, C type and S type.

Power rating 2KW; Light-duty design with overall weight 5.5kg.



## Technical Data

Fiber Interface	QBH, QD
Clear Aperture	34 mm
Collimator Focal Length	100 mm
Focusing Focal Length	250mm
Cover Glasses	
- Collimation Side (Top)	Φ38 * 1.5 mm
Wobble Frequency	70Hz
CCD mudule	TYPE-C, TYPE-CS

Assist Gas Pressure	
- Air Knife	≤6 bar
- Air Protection	10-25 L/min
Weight	~5.5 kg

Specifications subject to change without notice.

# RAYTOOLS BF330S SERIES



Wobble Laser Welding Head (To Replace BW320)

Power Rating **2KW**

Various wobbling paths like continuous circle, continuous line, spot weld circle, spot weld line, C type and S type.

Both internal control and external control mode.

CCD or laser vision seam tracking interface is optional for expanding of function.



Strengthened melting pool could be acquired comparing to standard welding.

To increase melting width, gas adaptability and reduce seam defects.

Smooth and efficient fluid structure to obtain the best protection to melting pool.

## Technical Data

Fiber Interface	QBH, QD
Clear Aperture	25 mm
Collimator Focal Length	75mm, 100 mm, 150mm
Focusing Focal Length	250mm
Wobble Frequency	≤1500Hz (Depends on the wobble diameter)
Cover Glasses	
- Collimation Side (Top)	Φ24.9 * 1.5 mm

Assist Gas Pressure	
- Air Knife	≤6 bar
- Air Protection	25 L/min
Weight	~3.2 kg
Optional Tip Components	Side Blow / Coaxial Nozzle

Specifications subject to change without notice.



# RAYTOOLS BF330M SERIES



Wobble Laser Welding Head (To Replace BW330)

Power Rating **4KW**

Various wobbling paths like continuous circle, continuous line, spot weld circle, spot weld line, C type and S type.

Both internal control and external control mode.

CCD or laser vision seam tracking interface is optional for expanding of function.



Strengthened melting pool could be acquired comparing to standard welding.

To increase melting width, gas adaptability and reduce seam defects.

Smooth and efficient fluid structure to obtain the best protection to melting pool.

## Technical Data

Fiber Interface	QBH, QD	Assist Gas Pressure	
Clear Aperture	35 mm	- Air Knife	≤6 bar
Collimator Focal Length	100 mm	- Air Protection	10-25 L/min
Focusing Focal Length	250mm, 400mm	Weight	~8 kg
Wobble Frequency		Optional Tip Components	Side Blow / Coaxial Nozzle
	≤1500Hz (Depends on the wobble diameter)	Specifications subject to change without notice.	
Cover Glasses			
- Collimation Side (Top)	Φ30 * 1.5 mm		
- Focusing Side (Bottom)	Φ38 * 2 mm		

# RAYTOOLS BW101 SERIES



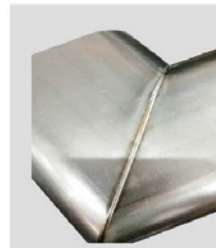
Handheld Laser Welding Head

Power Rating **2KW**

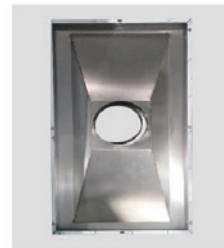
Light-duty design with comfortable access.

Variable strip beam spot or circular beam spot. Width variation of strip beam spot is adjustable within 0.1-1.0mm.

Wide welding seam, low porosity and excellent melting pool protection.



Scar free



Deformation free



Nice welding seam

## Technical Data

Fiber Interface	QBH
Clear Aperture	24 mm
Collimator Focal Length	75 mm
Focusing Focal Length	125 mm
Cover Glass (Bottom)	Φ25.4 * 4 mm
Assist Gas Pressure	
- Air Protection	25 L/min
Weight	~1.1 kg

Specifications subject to change without notice.

Optional distribution wire components



# RAYTOOLS BW210 SERIES



Laser Welding Head

Power Rating **1.5KW**

Different versions applicable to fiber laser, direct diode laser and blue laser for option.

Light-duty and compact design.

Both collimation and focus lens are water cooled.



CCD interface and laser vision seam tracking interface is optional for expanding of function.

Efficient fluid structure design to obtain the best protection to melting pool.

Coaxial nozzle or air knife+side blow nozzle is optional.

## Technical Data

### WD-Diode/Blue Version

- Fiber Interface	QBH, SMA905
- Focal Length of Collimation/Focusing Lens	50mm:100/125/150mm

### WF-Fiber Version

- Fiber Interface	QBH
- Focal Length of Collimation/Focusing Lens	100mm:150/200/250/300mm

CCD	TYPE-C , TYPE-CS
Clear Aperture	26mm
Cover Glass (Bottom)	Φ24.9 * 1.5 mm
Assist Gas Pressure	
- Air Knife	≤6 bar
- Air Protection	10-25L/min
Weight	~ 2.6kg (with CCD)
Optional Tip Components	Side Blow / Coaxial Nozzle

Specifications subject to change without notice.

# RAYTOOLS BW240 SERIES



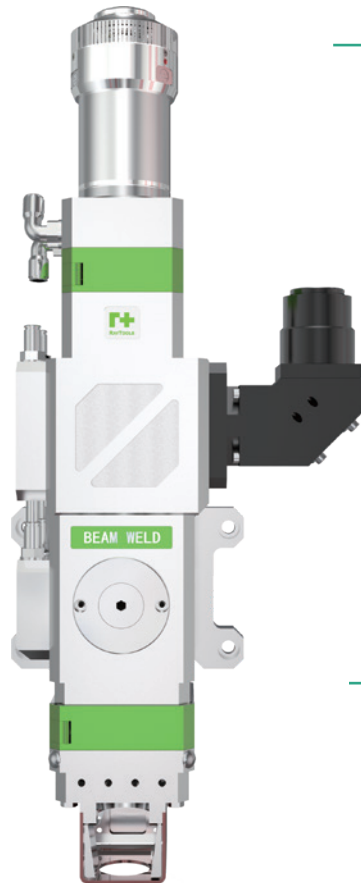
Laser Welding Head

Power Rating **4KW**

Compatible to the wavelength range of mainstream fiber lasers in market.

Both collimation lens and focus lens are water cooled.

Optimized optical design to realize deep penetration welding.



Large depth-to-width ration which is favorable to welding of medium/thick plate.

3 cover glasses to provide adequate protection to collimation and focus lens.

CCD or laser vision seam tracking interface is optional for expanding of function.

Coaxial nozzle or air knife+ side blow nozzle is optional.

## Technical Data

Fiber Interface	QBH, QD
Clear Aperture	35 mm
Collimator Focal Length	100 mm
Focusing Focal Length	200mm , 250mm , 300mm, 400mm , 500mm
CCD	TYPE-C , TYPE-CS
Cover Glasses	
- Collimation Side (Top)	Φ30 * 1.5 mm
- Focusing Side (Bottom/Middle)	Φ38 * 2 mm

Assist Gas Pressure	
- Air Knife	≤6 bar
- Air Protection	10-25 L/min
Weight	~ 4kg (with CCD)
Optional Tip Components	Side Blow / Coaxial Nozzle

Specifications subject to change without notice.

# RAYTOOLS BW290 SERIES



Laser Welding Head (To Replace BW250)

Power Rating **8KW**

Fiber/Diode version is optional to match various fiber lasers or diode lasers.

Dual-wavelength (fiber laser 4KW and diode laser 8KW) optical configuration is optional.

3 Cover glasses to provide adequate protection to collimation/focus lens.



Both collimation lens and focus lens are water cooled.

Optimized optical design to achieve high speed, high quality and high power laser welding.

CCD or laser vision seam tracking interface is optional for expanding of function.

Smooth and efficient fluid structure design to obtain the best protection to melting pool.

## Technical Data

### Diode Version

- Fiber Interface	QBH , QD
- Collimator Focal Length	100 mm
- Focusing Focal Length	100mm, 150mm, 200mm, 250mm, 300mm

### Fiber Version

- Fiber Interface	QBH, QD
- Collimator Focal Length	100mm, 150mm
- Focusing Focal Length	200mm, 250mm, 300mm

### CCD TYPE-C , TYPE-CS

Clear Aperture	48mm
Cover Glass	
- Collimation Side (Top)	Φ50 * 2 mm
- Focusing Side (Bottom/Middle)	Φ50 * 2 mm
Assist Gas Pressure	
- Air Knife	≤6 bar
- Protection Air	10-25L/min
Weight	~7.5kg (with CCD)
Optional Tip Components	Side Blowing Nozzle

Specifications subject to change without notice.

RAYTOOLS

# AK190TC SERIES

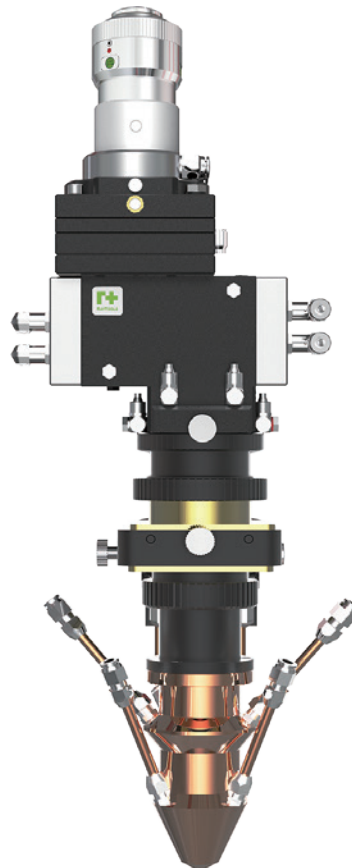


Laser Cladding Head

Power Rating **6KW**

Adapts direct water-cooled parabolic copper mirror to support high power with a long lifespan.

Dual water circuits design to prolong lifespan of head.



A variety of fiber interfaces like QBH, QD (LLK-D) or LLK-B.

3-Way cladding nozzle is fixed to get 3-way powder cladding.

## Technical Data

Fiber Interface	QBH , QD (LLK-D), LLK-B
Clear Aperture	34.5 mm
Collimator Focal Length	75mm , 100mm , 120mm
Focusing Focal Length	300mm

Cover Glass (Bottom)	Φ30 * 5 mm
Assist Gas Pressure	4~6 bar
Internal Gas Pressure	≤2 bar
Weight	~5 kg

Specifications subject to change without notice.

# RAYTOOLS AK390HT SERIES



Laser Hardening Head

Power Rating **20KW**

Adapts direct water-cooled parabolic copper mirror to support high power with a long lifespan.

Dual water circuits design to prolong lifespan of head.

A variety of fiber interfaces like QBH, QD (LLK-D) or LLK-B.



With a special integrated mirror to conduct rectangular beam spot for hardening.

Different integrated mirrors in size for option to achieve a variety of beam spot size.

## Technical Data

Fiber Interface	QBH , QD (LLK-D), LLK-B
Clear Aperture	49.5 mm
Collimator Focal Length	75mm , 100mm , 150mm , 120mm
Focusing Focal Length	300mm

Cover Glass	Φ50 * 2 mm
Assist Gas Pressure	~6 bar
Weight	~4 kg
KIS Size	10*2, 15*2, 20*2, 20*4mm or others

Specifications subject to change without notice.

# RAYTOOLS AK390PC SERIES



Wideband Laser Cladding Head

Power Rating **20KW**

Adapts direct water-cooled parabolic copper mirror to support high power with a long lifespan.

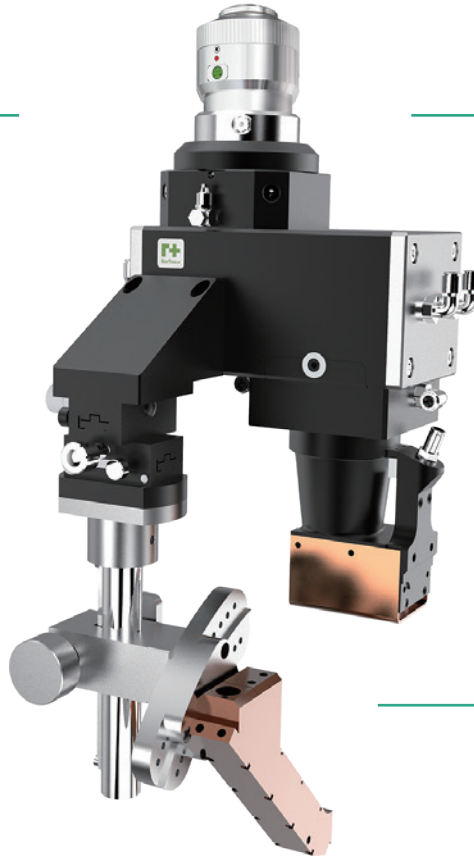
Wideband powder feeding mechanism is fixed to conduct wideband cladding.

Dual water circuits design to prolong lifespan of head.

Different integrated mirrors in size for option to achieve a variety of beam spot size.

A variety of fiber interfaces like QBH, QD (LLK-D) or LLK-B.

With a special integrated mirror to conduct rectangular beam spot to work along with wideband powder feeding mechanism for high efficiency cladding.



## Technical Data

Fiber Interface	QBH , QD (LLK-D), LLK-B
Clear Aperture	49.5 mm
Collimator Focal Length	75mm , 100mm ,150mm 120mm
Focusing Focal Length	300mm
Assist Gas Pressure	≤5 bar
Weight	~7 kg

Cover Glass	Φ50 * 2 mm
KIS Size	10*2, 15*2, 20*2, 20*4mm or others
Axis Range	
- X	±15mm
- Y	±15mm
- Z	±30mm
Angle Range	3°x10

Specifications subject to change without notice.



# RAYTOOLS AK390TC SERIES

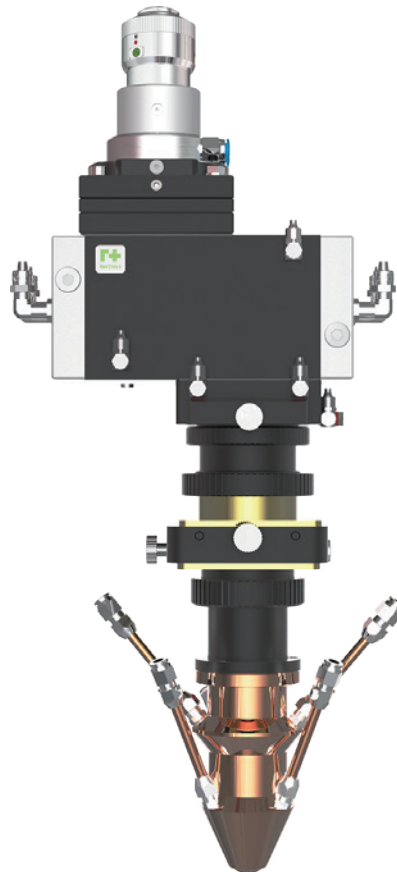


Laser Cladding Head

Power Rating 20KW

Adapts direct water-cooled parabolic copper mirror to support high power with a long lifespan.

Dual water circuits design to prolong lifespan of head.



A variety of fiber interfaces like QBH, QD (LLK-D) or LLK-B.

3-Way cladding nozzle is fixed to get 3-way powder cladding.

## Technical Data

Fiber Interface	QBH , QD (LLK-D), LLK-B
Clear Aperture	49.5 mm
Collimator Focal Length	100mm , 150mm
Focusing Focal Length	300mm

Cover Glass	Φ50 * 2 mm
Assist Gas Pressure	4~6 bar
Weight	~7.5 kg

Specifications subject to change without notice.

# RAYTOOLS EMP5030 SERIES



Micro Laser Cutting Station

Processing Size 500x300mm

High precision linear guide with high repeated positioning accuracy, less wearing and stable performance.

ECAT/AheadTechs CNC controller based on EtherCAT protocol. Friendly HMI with high flexibility and easy expanding.

Laser source and chiller are excluded.



Raytools laser cutting head along with EtherCAT height sensor to safeguard the cutting.

Highly dustproof class IP 5x.

CCD vision system is optionalx.

Applicable to laser cutting in jewelry, glasses, luminaire finish, kitchen appliance, mobile communication, digital products, electronics components, watch & clock, computer accessories and instruments etc

## Technical Data

Item	Specification	Brand
Linear Motor	ULMAC3 , ULMC3	RayTools
Linear Encoder	Resolution Ratio 1µm	
Linear Drive	CDHD-4D52AEB2/C- DHD-0062AEB2	Servotronix
Z-Axis Ball Screw Moduley		Empower
Laser Cutting Head	BT240S (other models are optional)	RayTools
Linear Guide		THK
Marble	1400* 1350*200	
Dust Cover	Mental	RayTools

X-Axis	Fast-Moving Speed	60m/min
	Effective Travel	300mm
	Positioning Accuracy (Cutting)	±0.015mm
	Repeated Positioning Accuracy	±0.004mm
Y-Axis	Fast-Moving Speed	60m/min
	Effective Travel	500mm
	Positioning Accuracy (Cutting)	±0.015mm
	Repeated Positioning Accuracy	±0.004mm
Z-Axis	Travel	100mm

Specifications subject to change without notice.

# RAYTOOLS EMP6060 SERIES



Micro Laser Cutting Station

Processing Size 600x600mm

High precision linear guide with high repeated positioning accuracy, less wearing and stable performance.

ECAT/AheadTechs CNC controller based on EtherCAT protocol. Friendly HMI with high flexibility and easy expanding.

Applicable to laser cutting in jewelry, glasses, luminaire finish, kitchen appliance, mobile communication, digital products, electronics components, watch & clock, computer accessories and instruments etc.



Raytools laser cutting head along with EtherCAT height sensor to safeguard the cutting.

Highly dustproof class IP 5x.

CCD vision system is optionalx.

Laser source and chiller are excluded.

## Technical Data

Item	Specification	Brand
Linear Motor	ULMAC3 , ULMC3	RayTools
Linear Encoder	Resolution Ratio 0.5μm	
Linear Drive	CDHD-4D52AEB2/C- DHD-0062AEB2	Servotronix
Z-Axis Ball Screw Moduley		Empower
Laser Cutting Head	BT240S (other models are optional)	RayTools
Linear Guide		THK
Marble	1800* 1350*200	
Dust Cover	Mental	RayTools

X-Axis	Fast-Moving Speed	60m/min
	Effective Travel	600mm
	Positioning Accuracy (Cutting)	±0.015mm
	Repeated Positioning Accuracy	±0.004mm
Y-Axis	Fast-Moving Speed	60m/min
	Effective Travel	600mm
	Positioning Accuracy (Cutting)	±0.015mm
	Repeated Positioning Accuracy	±0.004mm
Z-Axis	Travel	100mm

# RAYTOOLS EMP8080 SERIES



Micro Laser Cutting Station

Processing Size 800x800mm

High precision linear guide with high repeated positioning accuracy, less wearing and stable performance.

ECAT/AheadTechs CNC controller based on EtherCAT protocol. Friendly HMI with high flexibility and easy expanding.

Applicable to laser cutting in jewelry, glasses, luminaire finish, kitchen appliance, mobile communication, digital products, electronics components, watch & clock, computer accessories and instruments etc.



Raytools laser cutting head along with EtherCAT height sensor to safeguard the cutting.

Highly dustproof class IP 5x.

CCD vision system is optionalx.

Laser source and chiller are excluded.

## Technical Data

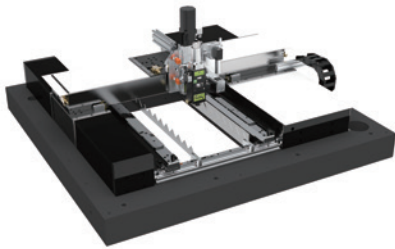
Item	Specification	Brand
Linear Motor	ULMAC3, ULMCC3	RayTools
Linear Encoder	Resolution Ratio 0.5μm	Fagor
Linear Drive	CDHD-4D52AEC2/C- DHD-1D52AEB2-R0	Servotronix
Z-Axis Ball	uyj-80h-s100	Empower
Screw Moduley		
Laser Cutting Head	BT240S (other models are optional)	RayTools
Linear Guide		THK
Marble	1800* 1350*200	
Dust Cover	Mental	RayTools

X-Axis	Fast-Moving Speed	60m/min
	Effective Travel	800mm
	Positioning Accuracy (Cutting)	±0.03mm
	Repeated Positioning Accuracy	±0.005mm
Y-Axis	Fast-Moving Speed	60m/min
	Effective Travel	800mm
	Positioning Accuracy (Cutting)	±0.03mm
	Repeated Positioning Accuracy	±0.005mm
Z-Axis	Travel	100mm

# RAYTOOLS EMP9000 SERIES



Linear Motor Laser Cutting Module



Single-Drive Gantry 500x400mm



Double-Drive Gantry 600x600mm



Double-Drive Gantry 800x800mm

## Features

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· The frame uses marble structure with excellent rigidity and strength; The beam structure gets light-duty design with excellent acceleration performance to achieve the precise motion after CNC milling.

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· Fixed with THK (Japan) precise linear guide with high positioning accuracy and less wearing to get stable precision and easy maintenance in a long term.

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· AheadTechs CNC system based on EtherCAT to boost the flexibility and expanding, which makes smart factory and machine interconnection possible.

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· Supports multiple modes of axis pitch compensation to ensure the machining accuracy of the machine tool.

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· Support parts processing statistics and production quantity management.

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