



Process Tools

A modular range of welding & cutting focus heads for use with Medium Power Fiber Lasers



Specifically designed to preserve the beam quality of Multi Mode and Single Mode Fiber Lasers for industrial processing applications, these Process Tools feature diffraction limited optical performance, compact size and ease of use, whilst their modular construction allows them to be configured for the optimum spot size applicable to your processing needs.

Each process tool consists of a base focus head body (in straight or right-angle format) with its recollimating lens, completed with a focus lens module, CCTV viewing option and many other ancillaries. Whilst these Process Tools can be used with any single mode or multi mode laser with correct mechanical and optical fibre interface, they are especially useful for SPI's single mode high brightness fibre lasers.

The range of Process Tools consist of Recollimation Units, Welding Heads and Cutting Heads, which feature fine focus control and integrated assist gas flow. The Process Tools are designed to assist the end user in meeting many complex manufacturing operations. Despite their very compact size, their careful optical design allows them to be used for all power levels in our Fiber Laser product suite, without the need for water-cooling. Special care has been taken to keep the working volume streamlined to allow best possible access into the work piece.

Welding Head Focus Lens Modules

Two interchangeable lens modules are available, one for use with the dedicated Fiber Laser lenses up to 114mm and the other for 160mm, 200mm and 300mm lenses. Other focal lengths are available on request. Each module comes with one focus lens and a sealed screw-on cover glass holder complete with two AR-coated cover glass slides. Spare lenses and cover glass slides are available separately.



Welding Head Air Knife

The adjustable air knife option provides high velocity airflow across the cover glass to deflect welding spatter and extend cover glass life.



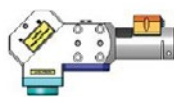
Key Benefits

- Modular range of Process Tools for optimum application specific configuration
- Cutting heads, welding heads and recollimation units
- 8µm - 90µm spot size available
- Compact size
- Fine focus adjustment and integrated co-axial gas delivery on cutting heads
- CCTV viewing options
- Through the lens (TTL) illumination options
- Sealed to industrial standard IP54 with fiber fitted
- Easy access cover glass and focus lens
- Range of formats for increased application flexibility

Process Tool Formats

No Viewing

Right Angle



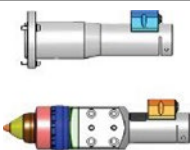
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Viewing Capability

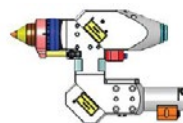


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Straight



Designator: S



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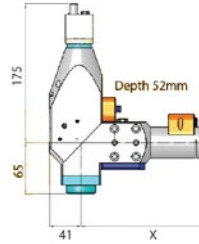
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Process Tool Range

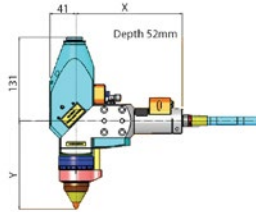
Welding tools

- Easy change focus lenses
- Fast access to cover glass
- Excellent vision
- TTL illumination



Focus Lens	Y(mm)
50	122
76	138
114	183

Recoil	X(mm)
50/76	116
114	209

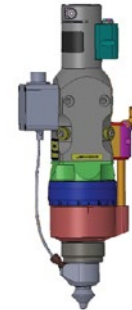


Cutting Heads

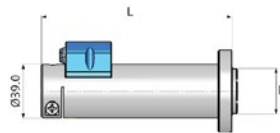
- Focus adjustment +/- 2.5mm with 50µm resolution
- Precise orthogonal turning mirror adjustment
- Integral co-axial assist gas path with optimised laminar flow
- Excellent vision & Illumination
- Standard viewing magnification is 1:1, other options available

Height Sensing Cutting Head

- Designed for integration into cutting systems
- To precisely maintain focus location on non-flat material surfaces
- Error correction signal to indicate variation from set stand-off height
- Available with and without viewing capability
- Integral co-axial assist gas path with optimised laminar flow
- 114mm f.l. focus lens module
- Length: 290mm



Recoil Lens FL (mm)	L (mm)	D (mm)
25/35	98	19
50/76	141	33
114	184	44
200	266	44



Recollimation Units

- Range of collimated beam diameters
- Four size depending on required beam diameter
- Over temperature protection
- Cover glass option available for freestanding units

Key Features

Low Power - ≤200W

Medium Power 300W - 1kW

Recoil Lens Focal Length (mm)	Collimated Beam Diameter (mm) ²	Focussed Spot Diameter (µm) ¹			Collimated Beam Diameter (mm) ²	Focussed Spot Diameter (µm) ¹		
		Focus Lens Focal Length (mm)				Focus Lens Focal Length (mm)		
		50	76	114 ⁵		50	76	114
25 ³	3.3	23	35	52	2.4	39	55	89
35 ³	4.6	16	25	37	3.4	28	42	64
50	6.5	12	17	26	4.8	20	30	44
76	10	8	12	17	7.3	13	20	29
114	15	-	8	12	11	9	13	20
200 ⁴	26	-	-	-	19	-	-	-

NOTES:

1) All Beam Diameters and Focussed Spot Diameters are measured as the 1/e² width of the Gaussian profile. Weld diameters and cut kerf widths may be larger than the Focussed Spot diameters depending on processing conditions.

2) Clear Apertures for collimated Gaussian beams should be 1.6x larger than these figures.

3) The 25mm & 35mm Recollimation lenses are fitted to the Beam Delivery Fiber. No Recollimation Lens to be fitted to Process Tool. For other Recollimation lenses a window is fitted to the Fiber.

4) Longer focal length Recollimation lenses are for Recollimation Units only.

5) For Welding tools only.