FANUC

FIBER LASER ROBOT SOLUTION

The only seamlessly integrated robotic laser package

FANUC FIBER LASER SERIES

The FF series lasers are compact, high performance and reliable fiber lasers offering a 500-6,000W range (models FF500*i*A – FF6000*i*A) of laser oscillators with direct and high-speed control through the FANUC robot. The robot is equipped with laser application software that features built-in commands to provide high-speed operation and precise control for a wide range of cutting, welding and additive manufacturing tasks.

Key Features:

- Fully integrated user interface provides total control of all laser processes including laser start and stop, high-speed pulsing, power ramping, gas and wire feed control through the robot's teach pendant

- Supports welding and cutting applications, as well as built-in low power mode for marking applications through simple software settings from the teach pendant

- High-quality and long-life laser diodes offer years of cost-effective, low maintenance operation

- New power supplies offer increased performance through high-speed circuit technology

- Enhanced back reflection protection and built-in diagnostics improve reliability, and a modular construction makes it easy to service

- High-speed user interface allows customers to check system status with a teach pendant or web browser

- Fast and accurate robot motion optimizes path performance and throughput

Widest Range of Process Solutions:

MARKING

REMOTE WELDING

CUTTING

WELDING

Quick Facts:

High-power lasers range from 500-6,000W

BEST-IN-CLASS PERFORMANCE:

- Stable power output allows for low power marking
- Excellent beam quality offers the best welding and cutting performance
- Improved electrical efficiency makes for a cost effective process
- Ideal one micrometer wavelength offers the best solution for processing metals
- Compact and space saving installation area
- Easy maintenance because all components are designed and engineered by FANUC
- Lowest cost of ownership offers highest value manufacturing

INTELLIGENCE:

- Status control on the robot teach pendant shows the laser and robot metrics
- Plug and play function with direct connection of the robot controller to the fiber laser
- All laser processing commands through the robot teach pendant
- Dedicated laser functions within the robot control for laser power, assist gas, ramping slopes, wire feed, etc.
- Fast setup and startup with precondition settings from the robot teach pendant
- Data collection is relative to the robot path for complete process analysis

Software:

FANUC's Fiber Laser software package is fully supported on the latest R-30*i*B Plus controller. All commands via the teach pendant provide:

- Quick setup

- Instructions for position and laser output control

- Up to 32 kH z pulsing control

- Adaptive process functions to improve process quality

- Pierce control for cutting

- Comprehensive status and diagnostics

Laser Status Display

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	FF500i-A / FF1000i-A	FF2000i-A	FF3000i-A	FF4000i-A	FF5000i-A	FF6000i-A
Design	Diode pumped fiber laser					
Structure	Resonator combined with power supply unit					
Laser rated output (W)	500 / 1000	2000	3000	4000	5000	6000
Laser power command range	10%~100% of rated output power: 50 W (with minute laser output function)					
Laser power stability	+/- 1% *1	+/- 1% *1	+/- 1% *1	+/- 1% *1	+/- 1% *1	+/- 1% *1
Laser wavelength [nm]	1070 +/-10	1070 +/-10	1070 +/-10	1070 +/-10	1070 +/-10	1070 +/-10
Beam mode	Multimode	Multimode	Multimode	Multimode	Multimode	Multimode
Polarization	Random	Random	Random	Random	Random	Random
Feed fiber type	QBH type (with cooling water)					
Feed fiber, core diameter [μm]	50 or 100	50, 80, 200 or 200		80 , 100 or 200		
Processing fiber, core diameter (μm)	none	100, 150, 200	100, 150, 200	100, 150, 200	150, 200	150, 200
Guide laser wavelength [nm] [Class 3R]	660					
Pulse output frequency command [Hz]	5 – 32767					
Pulse output duty command [%]	0 – 100					
Cooling water — Water quality	Purified water					
Conductivity [μS/cm]	< 500	< 500	< 500	< 500	< 500	< 500
Particle [μm]	< 100*2	< 5 *2	< 5 *2	< 5 *2	< 5 *2	< 5 *2
Flow rate [liter/min]	> 10	> 30	> 40	> 50	> 60	> 70
Water temperature [° C]	25 +/- 0.5	25 +/- 1	25 +/- 1	25 +/- 1	25 +/- 1	25 +/- 1
Recommended cooling capacity [kW]	> 1.5 / 3	> 6	> 8	> 10	> 12	> 14
Power requirements	AC 200 V + 10 %, -10 %, 50/60 Hz +/- 1 Hz or 220 V AC + 10 %, -10 %, 60 Hz +/- 1 Hz					
Electrical — Earth	D-class grounding (100Ω or less)					
Required input power [kVA] *3	3 / 6	14	20	28	34	40
Warning lamp	Active when laser diodes are emitting					
Mass [Approximate] [kg]	45 / 50	300	350	500	550	600
Dimensions [H x W x D] in mm	177 x 447 x 775	1230 x 653 x 1072	1230 x 653 x 1072	1382 x 653 x 1072	1382 x 653 x 1072	1382 x 653 x 1072

Ambient temperature: 5°C ~ 35°C Humidity 95%RH or less (No dew formation)   *1 for 1 hour operation from 5 minutes (With constant cooling water temperature)   *2 Installation of 5μm/100μm fitter
*3 a 200V Transformer might be needed. Available options include fiber coupler and fiber selector