



# Laser welding

## 10 kw Fiber Laser

**PSLIW1080F10KC**

### DESCRIPTION

In this machine, by combining the latest welding technology and robotics, high-quality welding on extra-long, over-sized and complex shaped products are provided. Amongst these various laser welding types, fiber laser welding allows for the highest power density and highest concentrated beams. The power density of laser welding is said to be more than 1000 times that of gas arc welding. Fiber lasers (not to be confused with fiber-delivered lasers where the fiber is merely an optical delivery mechanism) are solid state lasers in which an optical fiber doped with low levels of a rare earth element is the lasing medium. Laser diodes are used to stimulate the lasing medium to emit photons, an action known as pumping, at a wavelength specific to the rare earth element used as the doping element. Ytterbium is generally used for the high-power fiber lasers currently available for material processing and emits a wavelength approximately the same as Nd: YAG lasers, i.e., between 1.060 and 1.085 micron. The doped fiber is surrounded by a low refractive index material that acts as a waveguide for the pumping light and ensures optimum transfer of this energy to the lasing medium. Diffraction gratings are used as rear mirror and output coupler, to form the laser resonator, creating a long thin laser, which due to the flexibility of the optical fiber (which is simply coiled up) can be very compact.

### ADVANTAGES

- High-precision accuracy for joining parts
- High-strength welding is achieved at high speed
- Discoloration or deformation, burns from welding are minimal
- The robotic nature of this welding accommodates complex welding requirements such as remote welds, long welds, curved welds and spot welds
- The heat affected zone is limited, and due to rapid cooling, the surrounding material is not annealed.
- Low heat input for minimal distortion
- Optimal energy consumption
- The short, controllable melting time
- Controllable process parameters
- The very narrow weld may be obtained
- High quality of the weld structure.

### APPLICATIONS

- Dissimilar metals can be welded together
- They can sometimes even join materials that are otherwise impossible or difficult to weld
- Weld materials with both high melting temperatures and high thermal conductivity
- Ability to weld metals with different thickness

### INDUSTRIAL USERS

- Aviation industry
- Heavy metal parts
- Heavy industrial molds
- Automotive Manufacturing
- Energy and power plant industries

### SUPPORT FEATURE

- One-year warranty and full after-sales
- Product delivery with installation.
- Complete training with safety tips by expert trainers.
- Maintenance of all products in case of technical issues.
- Product guide with detail explanation.

### TECHNICAL SPECIFICATION

|                           |                                           |
|---------------------------|-------------------------------------------|
| Laser type                | Fiber laser: YFL-10000-MM                 |
| Wave length               | 1080 nm                                   |
| Power                     | 10 kw                                     |
| Laser mode                | CW                                        |
| Lasers per unit           | 13 * 1 KW (+2 spare)                      |
| Transmission fiber length | 30 m                                      |
| Main process system       | 2.4 MHz                                   |
| Beam guidance             | Reflective optics with cooling capability |
| Working accuracy          | ±0.1                                      |
| Beam transmission optics  | QD                                        |
| Cooling                   | water                                     |
| Power consumption         | 3 phases                                  |