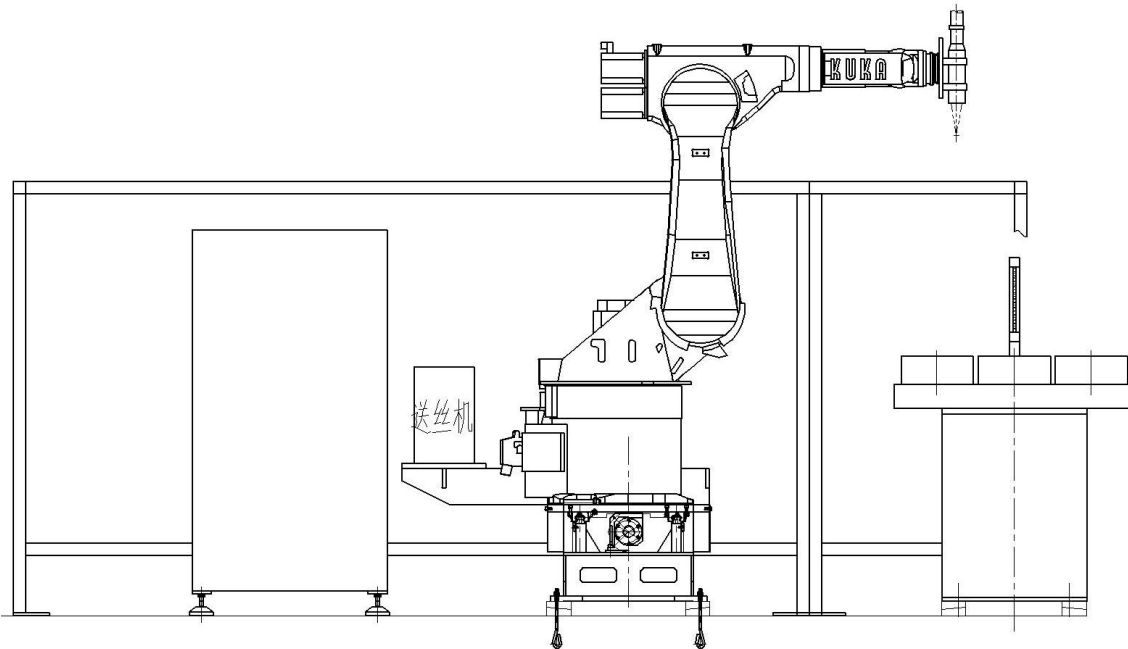
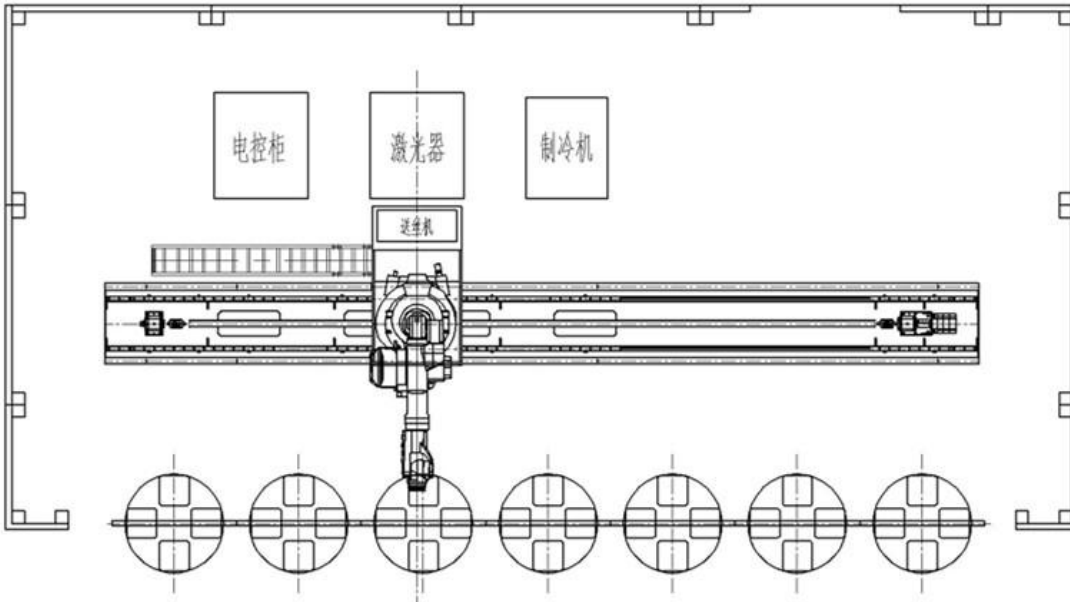


## HAN'S GS Robot Laser Welding Equipment Solution

### 1、Brief Introduction of the robot laser welding equipment Solution

Robot laser welding equipment consists of : robot , fiber laser, laser welding head, refrigerator, mobile workstations, wire feeder, offline testing, seven-station rotary indexing table and welding fixtures and other components. Its main component is as follows:



### 2、Features of the robot laser welding equipment

1, A wide range of materials can be welded. Carbon steel, stainless steel, aluminum and other metals can be welded.

2, three-dimensional welding robot software can be equipped, can achieve 3-dimensional welding.

3, A wide range of applications. Aerospace, locomotive manufacturing, engineering machinery, textile machinery, agricultural machinery, elevator manufacturing, automobile manufacturing, electrical hardware manufacturing, IT and other industries.

4, Low consumption. 4000W laser source consumes about 15 degrees / hour. Protection lens 0.5-1.0 yuan / hour.

5, High welding speed, high efficiency, safe operation and stable performance.

6, Provide smooth, beautiful welding appearance without deformation.

### 3、 Components and functions of the device

#### 3.1, Robot

The program uses KR30HA robot of the KUKA company. This robot belongs to precision series and designed specifically for high-precision work, especially for laser applications.

Robot	KR30HA
Load	30KG
Working Range	2033mm
Number of axles	6
Repeat Accuracy	<±0,05 mm
Weight	665 kg
Installation location	Ground
Control System	KR C4

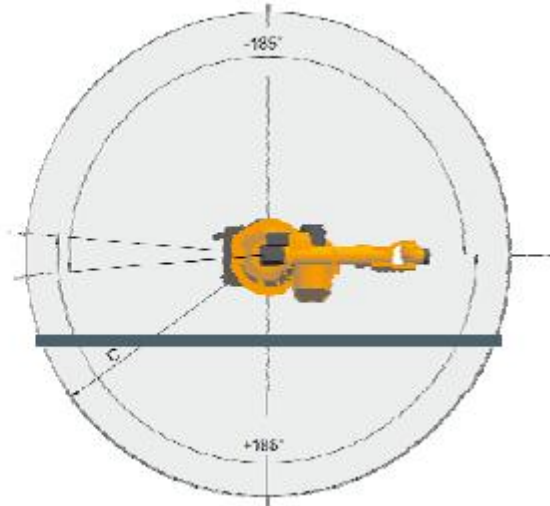
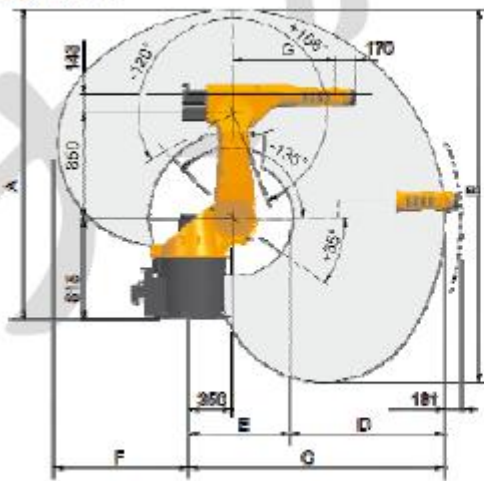


Robot control software can undertake flexible programming process for 3-dimensional welding , and can be freely combined with the peripheral devices. Control system function can be set with different packages to meet the individual needs of different customers.

Peripheral equipment package can be controlled from a central control software.

A	B	C	D	E	F	G	Volume
2498m m	3003m m	2033mm	1218mm	815mm	1084mm	820m m	27.2m <sup>3</sup>

Dimensions: mm



### 3.2 Laser

Use world-advanced fiber laser , IPG 4000W, or ROFIN FL040, stable performance, overall product quality security.

Main technical performance of fiber lasers:



Laser	Fiber Laser 4000W
Laser Medium	Ytterbium-doped Fiber
Output Power	4000 W
Rated input voltage	380V±10%
Power consumption	<12.2KW
Beam quality BPP	≥4mm*mrad
The maximum welding depth	10mm (Carbon Steel)
weld width	2mm
Laser power stability	±1%
Continuous working time	24hours
Optical system	Fiber transmission

- (1) Fiber laser - The high light conversion efficiency, conversion efficiency of more than 25%, the water-cooled power fiber lasers, can greatly save power at work and in operating costs, to achieve maximum production efficiency;
- (2) Laser runs with power, without generating additional gas, causing the lowest operating and maintenance costs;
- (3) Fiber laser uses semiconductor modular and redundant design, and resonant cavity without optical lenses, no start-up time, with adjustment-free, maintenance-free, high stability advantages, reducing parts cost and maintenance time, which can not be matched by conventional lasers;

### 3.3 Welding head

Equipment uses the US LASERMECH's fiber welding head. It is specifically for fiber-coupled laser transmission welding head intelligent design, the product is designed with a built-in smart sensors and built-in water manifold full compact design, rugged crashworthiness, stable performance, fully meet the 24 hours in- a -row working plant environment. Operation of the optical fiber welding head is very simple and easy to use , protecting lens and focusing lens drawer mirror chamber design can be more flexible and easy to replace, but also can better protect the inside optical unit, in order to protect welded joints have a longer service life. Optical fiber welding head configuration is very flexible, it can be based on the specific requirements of end-users, the optional in-line type or level of the incident, and whether to use CCD coaxial monitoring, auto-focus, side to send the wire, an air knife, coaxial nozzles, welding monitoring unit and a special focus unit module (bifocal or rectangular beam), etc.

Applicable power	8000W
wavelength	1030nm~1070nm
Collimator focal length	100 mm
Aperture	48mm
focus	250 mm
Focus unit module	Round light spot
Fiber Optic Connected	QD(LLK-D,LCA), QBH(HLC-8), LLK-B(Q5)
weight	7 KG



### 3.4, the cooling system

Han's external cooling water recycling system with filter system for filtration. That can decrease water change frequency into 1/6 compare with others.

Constant-temperature control ensures circuit water from frozen in Winter.

Dual temperature independent control, equipped with two sets cooling water to meet constant temperature request of laser cavity and outlet of laser.

Tech specifications are as follows :

Match laser power (W)	4000
Cooling capacity (kW)	16
Power	AC 3P 380V/50Hz
Rated power (kW)	8
Pump flow (L / min)	35
Water Pressure (Bar)	3.5
Recycled water	deionized water
Water temperature range (°C)	High Temperature 27 ~ 33, High Temperature 20 ~ 22
Temperature Accuracy (°C)	±0.1

