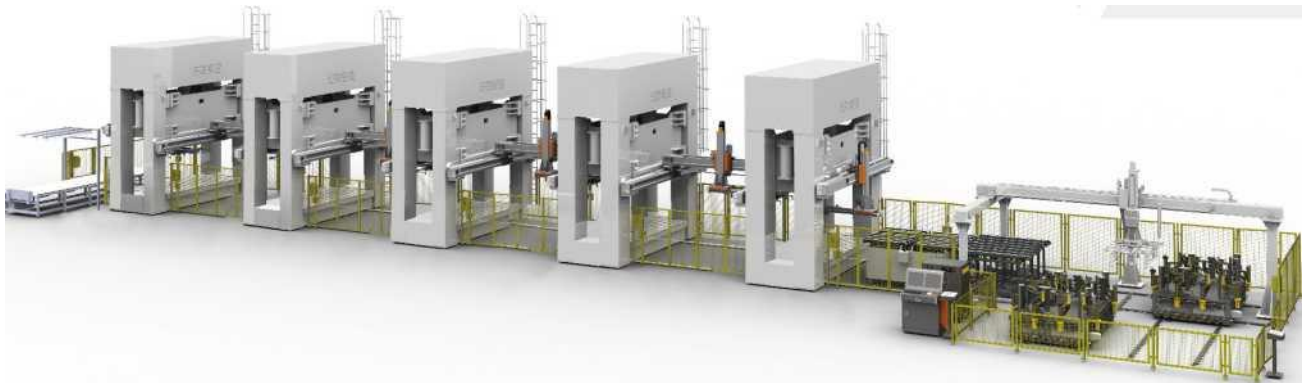


CB3S Robotics

The automatic system for large stamping machine



System Description:

The system includes motion control module, rectifier module, single-axis drive module, dual-axis drive module, I/O module, encoder and other components.

All modules use glink-II industrial bus protocol with independent intellectual property rights, the modules can be freely matched. The module can directly supply power to external I/O, IP65 protection level, low-energy consumption common bus scheme, direct installation without electricity cabinet, when building a distributed drive control system, wiring is reduced and maintenance is convenient.

Excellent communication technology, open data interface, gigabit network bus, can meet the high-speed and large-capacity data communication needs of automation system of integration information.

Drive Module:



The control system adopts the self-developed distributed drive control system. Servo drive, motion control, rectifier unit, low-voltage electrical control module, communication module, etc. are integrated into several circuit modules, and the entire electronic control system is installed on the robot beam. Adopt equal-ring network and common bus technology to realize small size and modular assembly. It saves a lot of manpower for electric control assembly, simple wiring on site, maintenance cost is greatly reduced, and reliability is enhanced. The system has the industry leading level.

Industrial bus:



It adopts the world's leading glink-II gigabit network industrial bus technology and has completely independent intellectual property rights. Super fast exchange rate is up to microseconds. Due to the fast communication speed, the efficiency of the whole line is increased by more than 30%, and the safety and reliability are enhanced. And it has excellent compatibility, compatible with PROFIBUS, HART and other bus technologies. Gigabit network is the trend of industrial communication in the future, and it is the best communication technology for constructing industrial Internet.

Gantry robot:



The excellent retrofitting solution is for connection production of existing stamping machines. The whole robot is installed on two adjacent stamping machines due to excellent structural design. It can effectively solve the disadvantages of old production lines such as unequal distance of stamping machines, unequal height of molds, and large vibration of the foundation of stamping machines.

The gantry synchronous movement structure can perform lateral movement between the two stamping machines. After the movement reaches the limit of the stamping machine side, it does not affect manual production and manual changing molds. It can also be used in single machine three-dimensional production.

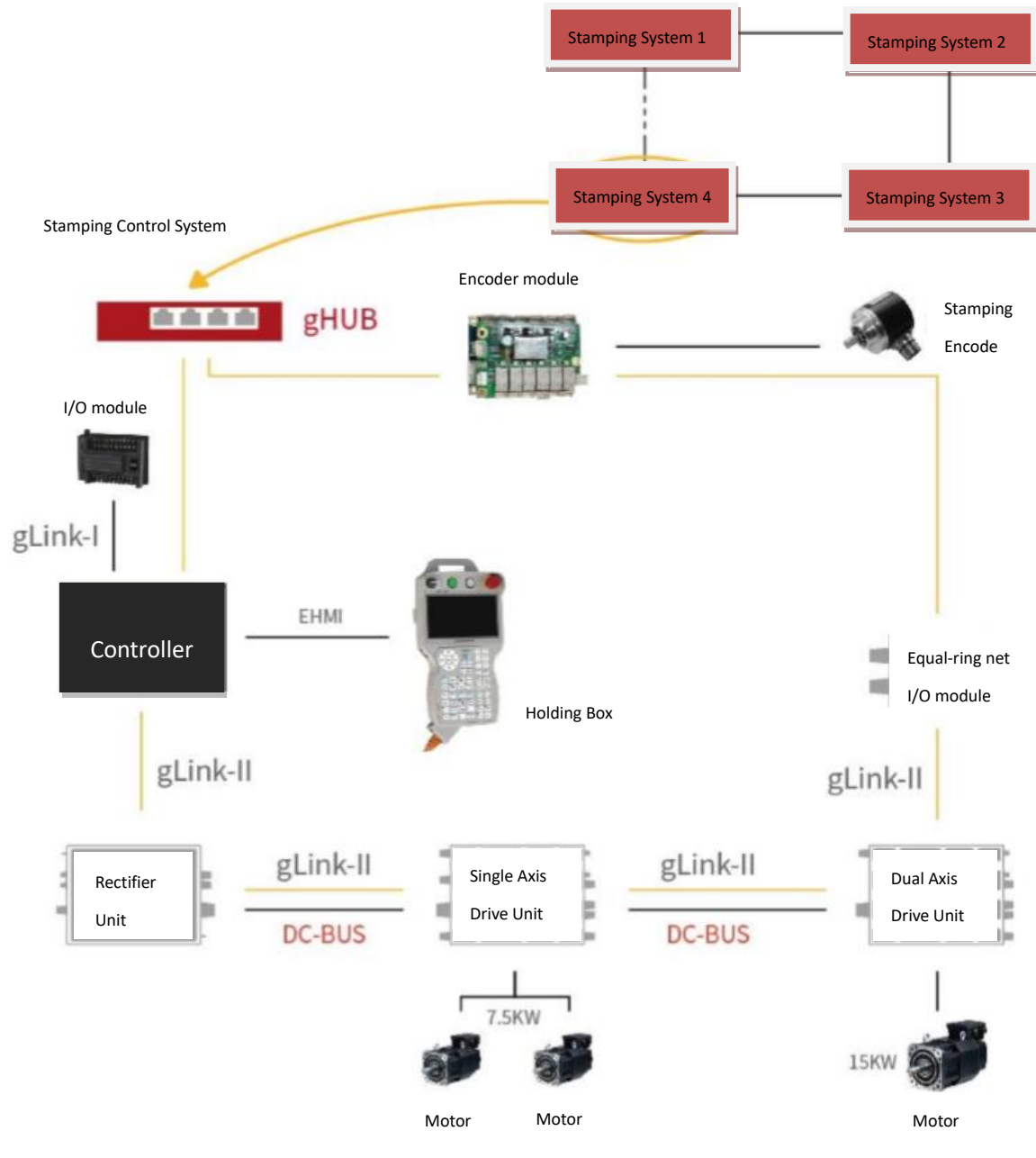
Information system:



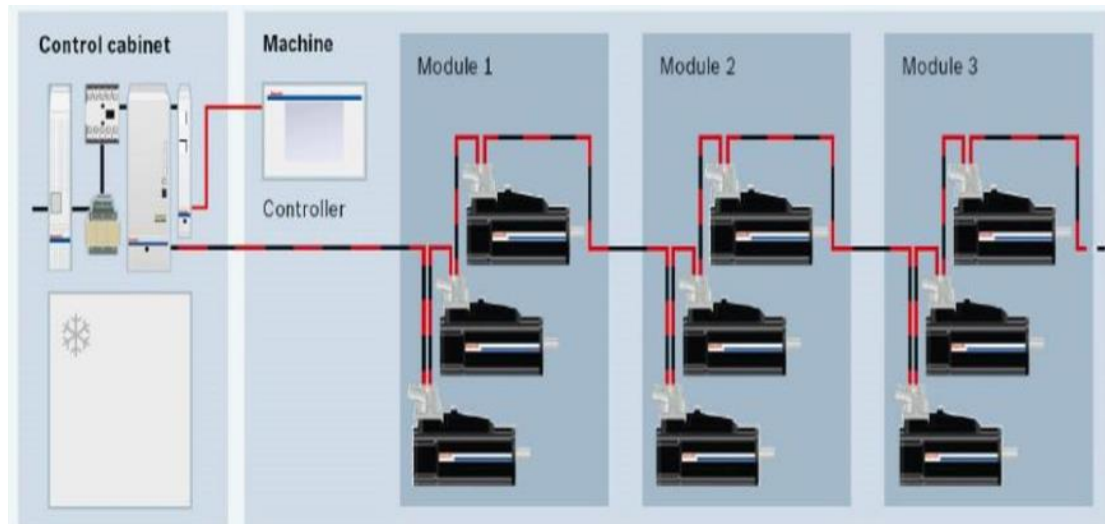
It adopts the Google industrial cloud technology and wireless module networking technology. With edge computing expansion capabilities, open data interfaces. It can easily realize data extraction and interconnection. It has industrial Internet capabilities such as remote debugging, fault diagnosis, data analysis and firmware upgrade.

Customers can also effectively connect various product data and inventory data with ERP and their own cloud platform through the device-side edge computing server, and data extraction and communication are completely open. It is the basic system for customers to build digital smart factories.

Topological structure:



Connection of distributed servo drive module:



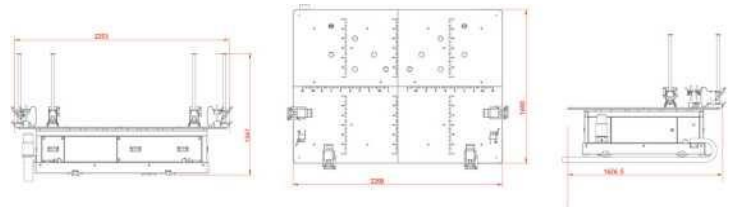
Features:

1. Where the servo motor is, the drive is placed.
2. There are only 3 cables from the electrical cabinet to the module on the beam.
3. Cable lengths can be standardized, customized, prefabricated in advance.
4. Connectors are applied for all cables, low labor cost and improve the assembly efficiency.
5. Common bus solution, energy saving, environmental protection and 4G network module.

System Advantages:

1. Distributed drive control technology, modular design, assembly without electric cabinet, saving time and labor cost.
2. Adopt the gigabit network industrial bus technology, data exchange fast, quadruple-speed linear guide, specially customized servo motor and reducer, fast dynamic response speed, SPM>12.
3. Not only multi-stamping machine production can be connected, also single-stamping machine can be used for in-mold production. The connection and single-machine alternate production modes enrich the automated line body scheduling and increase the utilization rate of the stamping machine.
4. With the common bus technology, each servo mechanism effectively distributes energy, greatly reducing the total energy consumption. Compared with the traditional structure, the robot saves more than 40% of electric energy.
5. The whole line adopts closed safety protection system, safe PLC control, and the system is safe and reliable.
6. Adopt high rigidity, low-density aviation aluminum material, meet the requirements of rapid assembly of lightweight, high-strength new professional profiles.

1. Dual station loading platform



Description:

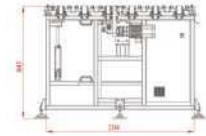
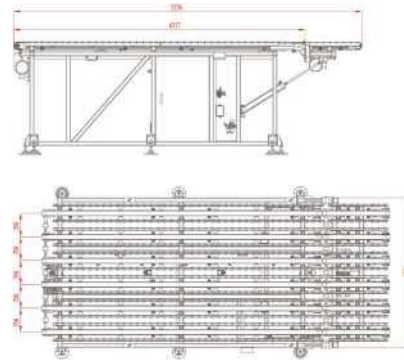
The magnetic levitation splitter loading station uses the super-strong magnetic field of the magnetic splitter to magnetize the sheets to be split with the same pole, so that the mutually repulsive forces are generated between the multi-layer steel sheets to achieve splitting. The sheets are stacked on the rack and placed on the magnetic levitation sharding station by forklift or crane. Through the magnetic levitation slicing station, the sheets are placed in the destacking area. The system is equipped with two magnetic levitation slicing loading stations, and a positioning steel scale is embedded on the surface of the magnetic levitation slicing loading station to facilitate the positioning of the stacking materials.

Model	Name	Max stacking(mm)	Tray height (mm)	Max load(tons)	Maximum size single sheet(mm)
CEB1812	magnetic levitation split feeding station I	500	150	10	1800x1200
CEA2816	magnetic levitation split feeding station II	500	200	20	4000x2000

Model	name	Minimum size single sheet(mm)	Maximum size double sheets(mm)	Minimum size double sheets(mm)
CEB1812	magnetic levitation split feeding station I	500x250	900x1200	250x300
CEA2816	magnetic levitation split feeding station II	1600x500	1950x2000	800x500

Model	Name	Type	L(mm)	B(mm)	H(mm)
CEB1812	magnetic levitation split feeding station I	Horizontal moving	2200	1600	1275
CEA2816	magnetic levitation split feeding station II	Horizontal moving	3300	2150	1341

2. Magnetic conveyor

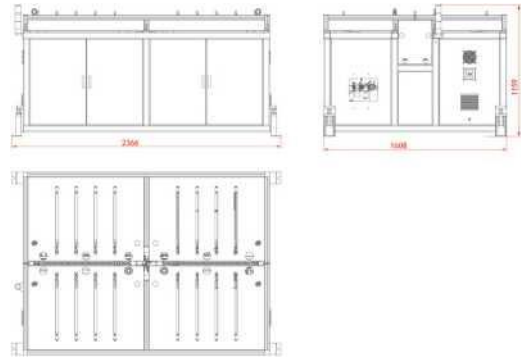


Description:

This equipment is used to transfer the single sheet dismantled by the depalletizing robot to the servo centering station or oiling machine. The conveyor frame is a standard profile welding structure. Install multiple independent aluminum alloy profiles and synchronous toothed conveyor belt on the frame. A self-guided synchronous belt is used to automatically prevent deviation. The drive shafts of each conveyor belt are connected by a coupling, which can effectively eliminate the misalignment error of each drive shaft caused by processing or assembly. In order to ensure that the sheet material does not run out of position during the transportation process, a series of permanent magnets are installed under each conveyor belt in the fixed part, and a roller bracket is installed between each conveyor belt to prevent the sheet material from sagging. Setting a detection switch for the presence or absence of the sheet at an appropriate position is convenient for automatic loading and unloading of the conveyor.

Item	Parameter	Unit
Maximum linear speed	120	m/min
Machine height	1500	mm
Dimension of sheet	2000(left&right)x4100(front&rear)	mm
Belt type	Self-directed gear timing belt	
Belt quantity	5-6	Pcs
Main motor	Three-phase asynchronous motor	
Power	2.2	KW

3. Servo centering platform



Description:

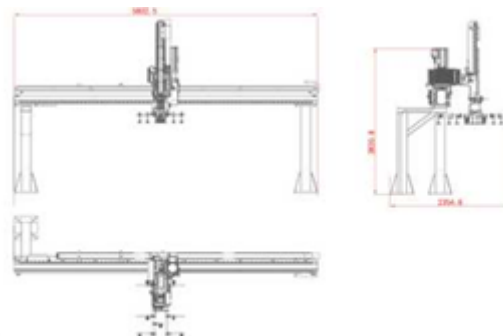
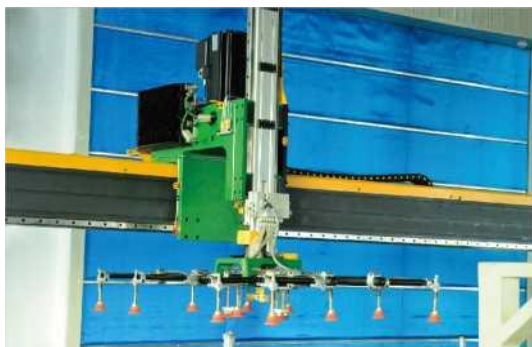
The function of the multi-function servo centering is to perform precise positioning of the conveyed sheet material before feeding, so as to ensure the accurate feeding of the loading robot and the safety of the mold. The automatic centering positioning device adopts full servo control, which can adjust the position of each stopper through the clutch according to the shape of the sheet material, and accurately position the sheet material at the picking position of the loading robot. All stops and positioning systems have position memory, which can be used to center a single sheet or double sheets.

Model	Name	Maximum size single sheet(mm)	Minimum size single sheet(mm)	Maximum size double sheet(mm)	Minimum size double sheet(mm)	Minimum inside margin double sheets(mm)
CWA1812	Horizontal Multifunctional servo centering platform I	1800x1200	500x250	900x1200	250x300	200
CWA2816	Horizontal Multifunctional servo centering platform II	2800x1600	500x400	1300x1600	300x400	200
CWA4020	Portrait Multifunctional servo centering platform	4000x2000	1600x500	1950x2000	800x500	200

CB3S Robotics

Model	Name	Precision 1mm	L mm	B mm	H mm	L1 mm	L2 mm	L3 mm	A(pcs)	B(pcs)	Thickness
CWA1812	Horizontal Multifunctional servo centering platform I	1	2166	1608	1105	170	530	170	4	2	1-3
CWA2816	Horizontal Multifunctional servo centering platform II	1	3166	2058	1104	330	493	370	4	2	1-3
CWA4020	Portrait Multifunctional servo centering platform	1	4400	2600	1650	300	1500	/	5	/	0.6-2.5

4. Depalletizing robot



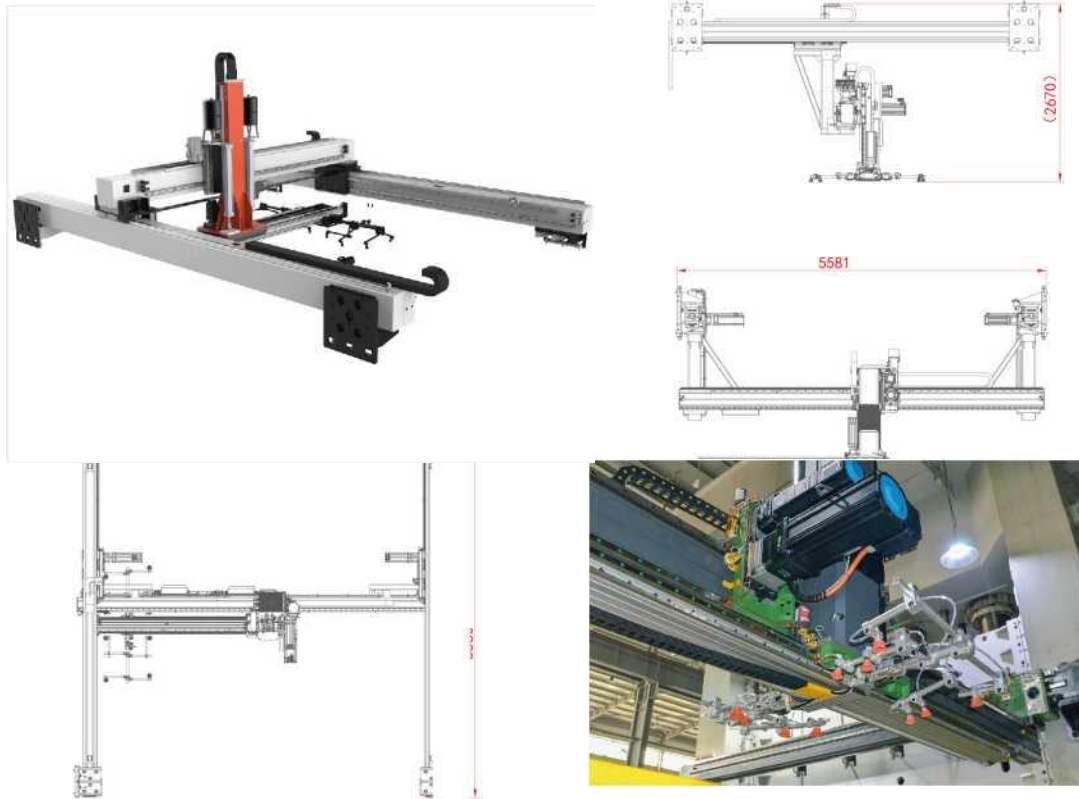
Description:

Depalletizing robot is an important part of the initial unit of large stamping line. It adopts a gantry structure, which can split the materials on the magnetic separation table under harsh working conditions, and automatically detect the double-sheet condition, and transfer the detected proper materials to the magnetic conveyor. The Depalletizing robot can realize the split operation of single-sheet materials, double-sheet materials, special-shaped materials, welding materials, etc. The double-sheet detection adopts the German Roland detector commonly used by major automobile factories, and can store 255 detection programs. The detection is stable and reliable, and the production is quickly changed. The quick-change mechanism is adopted for the gripper to achieve rapid production.

Item	Parameter	Unit	Remarks
Sheet thickness	0.4-12	mm	
Single sheet size	2800x1650	mm	Single sheet production
Single sheet size	600x350	mm	Single sheet production
dual sheet size	1200x600	mm	Dual sheet production
dual sheet size	800x300	mm	Dual sheet production
X axis carry stroke	0-5000	mm	
Z axis lifting stroke	0-800	mm	
Production cycle	10-12	PCS/min	
Vacuum sucker	14	PCS	Φ 60 sucker

Item	Parameter	Unit
Dual workpiece detection	2	Pcs
Grab weight	30	Kg
Equipment weight	666	Mpa
Compressed air	0.45-0.65	L/min
Air consumption	250	
Power supply	3 phases 380V 50Hz 20KVA	

5. Handling robot



Description:

The robot is installed on the side wall of two adjacent stamping machine. The connected production mode completes the high-speed handling of materials between the two machines (no shuttle is required). It is suitable for many complex situations such as unequal machines and unequal mold heights. The equipment can also be produced in a single-machine multi-station mode, and after being equipped with loading and unloading equipment, it can also be produced automatically on a single line. The suspended structure of the equipment is less affected by the vibration of the foundation of the stamping machines, does not occupy the floor space, the user can easily change the mold, and can flexibly switch to the manual mode for production.

Equipped with a quick-change end pickup that can be replaced by a single person without tools, the quadruple-speed gantry robot structure is good at large-stroke high-speed handling.

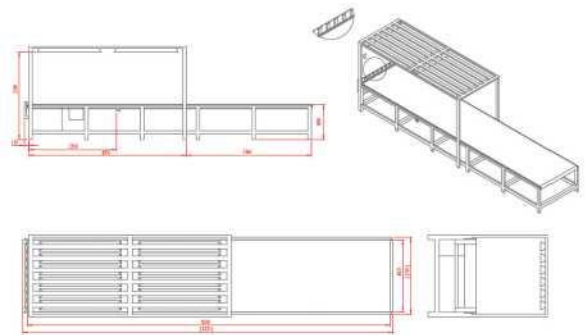
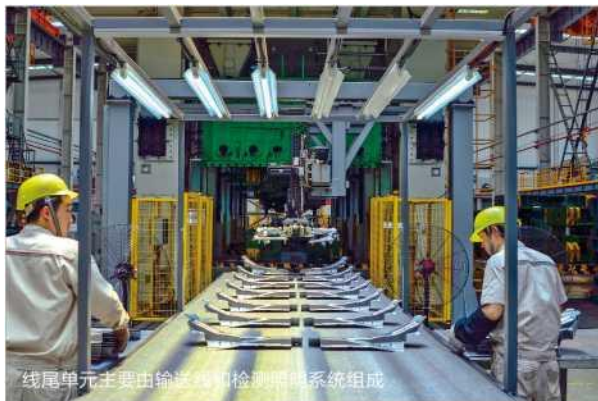
Using the distributed drive control technology independently developed by CB3S, it integrates functions such as power supply, overcurrent protection, motion control, servo motor drive, and I/O control into several functional modules, which are installed on the robot arm and greatly reduce the cable and construction cost, increase the reliability of the control system and significantly improve the convenience of customers in using and maintaining.

CB3S Robotics

Use glink-II Gigabit Ethernet industrial bus to communicate with other robots, stamping machines and complete line control systems at high speed, continuous production mode SPM>12.

Item	Parameter	Unit
Sheet thickness	0.5-3	mm
X axis stroke	0-3100	mm
Y axis stroke	0-4055	mm
Z axis stroke	0-500	mm
Grab weight	50	Kg
Equipment weight	2630	Kg
Max moving speed	4.32	m/s
Compressed air pressure	0.45-0.65	Mpa
Compressed air consumption	250	L/min
Power supply	3 phases 380V 50Hz 20KVA	

6. Final unit

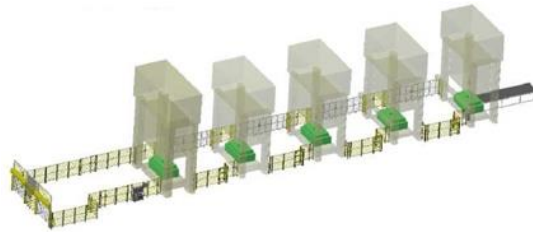


Description:

1. The use of frequency conversion speed regulation can flexibly match the production speed.
2. Two optional modes: continuous conveying mode and step conveying mode.
3. The production line can be stopped through the conveyor line, which is convenient for customers to use.
4. The belt is made of wear-resistant material.

Conveyor specification		Lighting system	
Power supply	3 phases 380V	Single lamp	28W
Reducer brand	JSCC/TCG	Lamp quantity	12
Frequency converter brand	INVT	Illumination height	2500mm
Weight bearing	180Kg	Illumination range	6000mm
Belt thickness	3mmPVC		

7. Safety protection unit



Description:

1. 1.8m high fully enclosed safety metal mesh fence.
2. The line initial unit is protected by a safety telescopic door.
3. The system is controlled by Siemens safety PLC.
4. System safety redundancy is sufficient.
5. Application for fail-safe functions and standard functions.
6. Support to S3 Category4PLe security level.
7. Can be used independently as a master station, suitable for small applications.
8. The hardware parameters can be uploaded completely from the site.
9. Support Shared Device.
10. Read access monitoring for fast diagnosis.

Technical parameter	
Motor brand	JSCC/TCG
Open height	2000/3000/3500mm
Open width	2000mm(nonstandard)
Color	Yellow/white

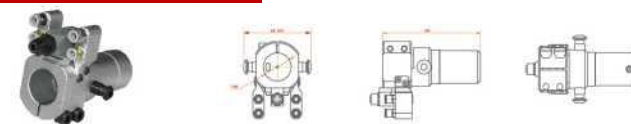
8. Gripper



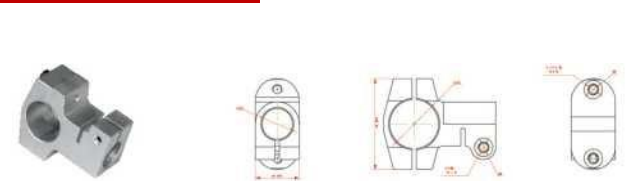
Quick-fitting socket Model: 3SUN-40-FP-4-5



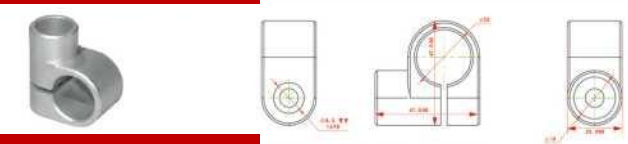
Quick-fitting plug Model: 3SUN-40-MP-4-5



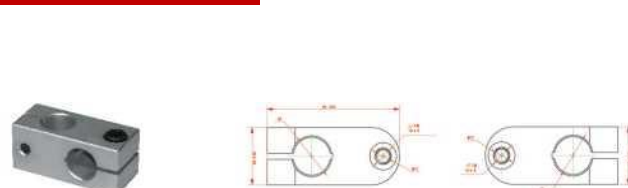
Joint apparatus Model: 3SUN-03-02-Z003B



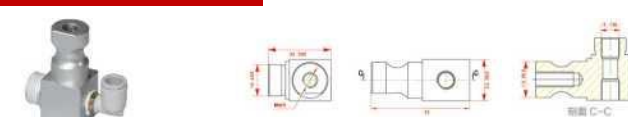
Joint apparatus Model: 3SUN-03-02-Z005B



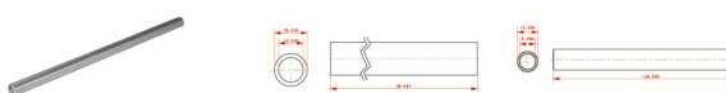
Joint apparatus Model: 3SUN-03-02-Z001B



Gas-type fitting Model: 3SUN-03-02-Z004B



Aluminum/carbon fiber tube Model: AB-B-Φ25-2.5-320/AB-B-Φ40-4-550

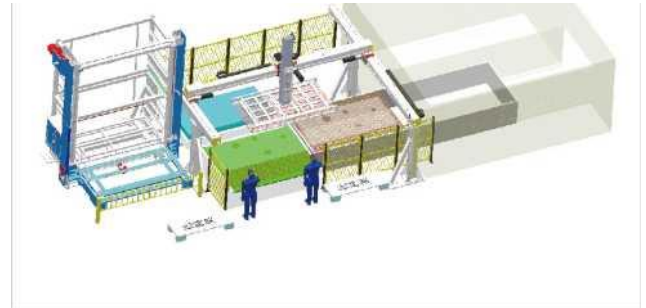


9. Expanding application of gantry robot

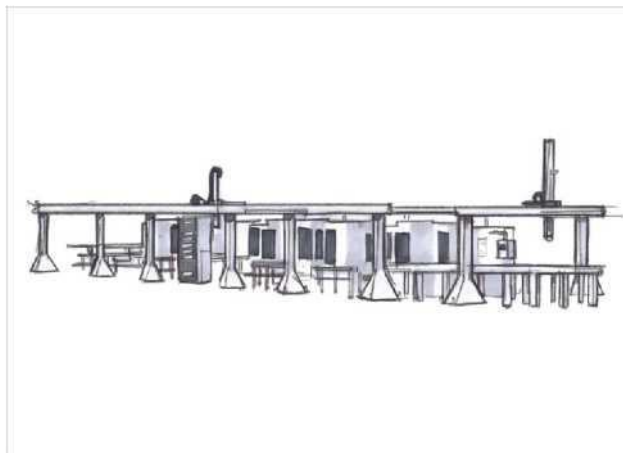
Logistics



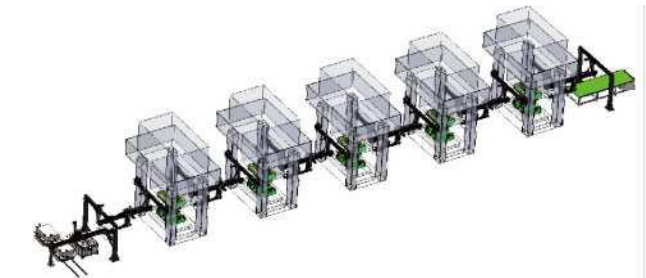
Loading & unloading (Laser)



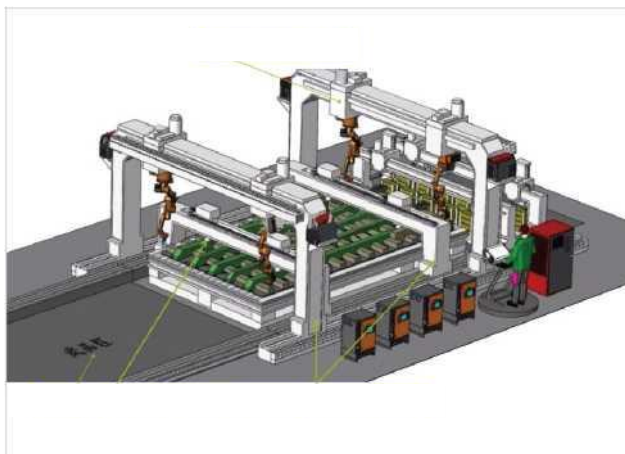
Loading & unloading (CNC)



Stamping



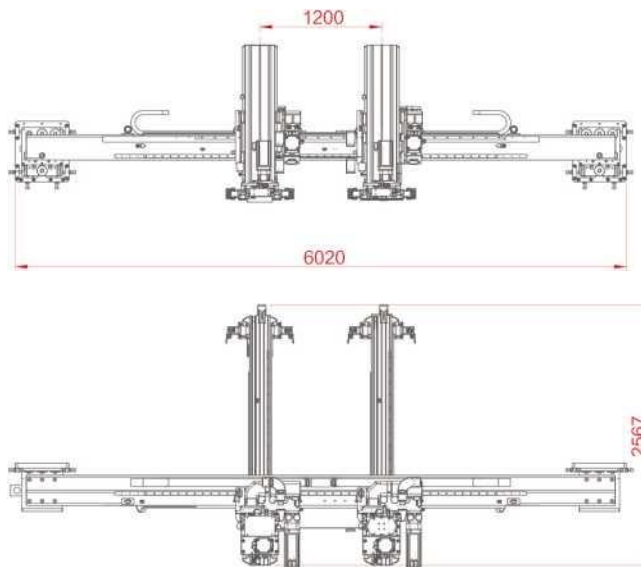
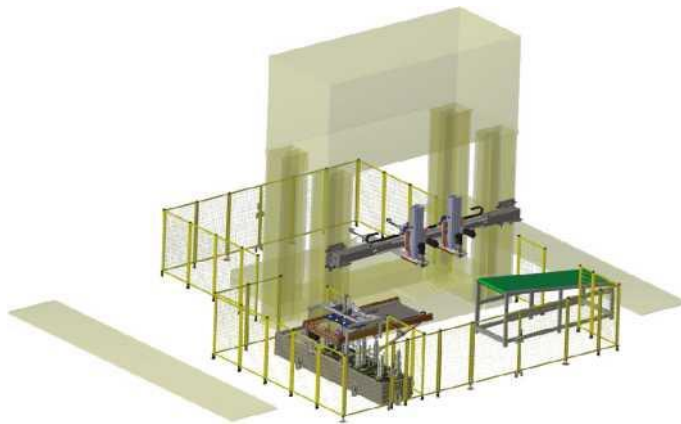
Welding



Palletizing



10. Dual-arm mold internal gantry robot



Description:

The dual-arm gantry robot is mainly used for the automatic production of large-tonnage presses and hydraulic presses with single machine and multiple molds. With the cooperation of the automatic feeding machine and the end-of-line conveyor line, it can achieve fully enclosed and safe production. It is an excellent equipment for the retrofitting of existing stampes and molds, which can effectively replace labor and achieve safe production.

For the design of gantry robot is independent that can perform the automatic production of molds with unequal height and unequal distance. Adjacent two robotic arms use independent control systems, cooperate with each other, and can operate independently, the whole system is flexible and convenient.

The control system uses distributed drive technology with a common bus structure and no traditional electrical cabinet. There is less on-site wiring, simple and convenient installation, and high reliability.

CB3S Robotics

Item	Parameter	Unit
Sheet thickness	0.5-3	mm
X axis stroke	0-1600	mm
Y axis stroke	0-3850	mm
Z axis stroke	0-600	mm
Grab weight	40	Kg
Equipment weight	2030	Kg
Max moving speed	2.18	m/s
Compressed air pressure	0.45-0.65	Mpa
Compressed air consumption	250	L/min
Power supply	3 phases 380V 50Hz 20KVA	

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