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Diligent Chinese Robot



Company Profile	02
Robot Family	03
RB Series	05
RH Series	11
RMD Series	13
C Series	15
SCARA Robot	16
Key Functional Components	17
Peripheral Equipment	20
Vision System & Off-Line Programming Technology	21
The Overall Solution And Project Implementation Of "intelligent Manufacturing" & "digitization Factory"	22
Application Examples	23
Automation Application	41



Numerical Control Industrial Base of South China

Founded in 1991, GSK CNC EQUIPMENT CO., LTD (GSK), being the Numerical Control Industrial Base of South China, had been experienced starting up business, innovation and creation, and has been one of the first new high-tech enterprises, providing with complete intelligent equipment solutions.

Aiming at the CNC machine tool industry, automatic control field and injection molding industry, GSK provides for users with machine tool CNC systems, servo drivers, servo motors, CNC machine tool's chain marketing exhibition rooms, machine tool CNC engineering, automatic control systems, industrial robots, precise CNC injection machines and CNC training institution, and offers overall process solutions of intelligent manufacture to users.

Building century enterprise, creating golden brand

We believe that the future industry is in the intelligent manufacture world everywhere the CNC technology and artificial intelligence are, which will change the industry manufacture method and human's life style. Cooperating and sharing values each other, GSK is willing to grow with its partners and establishes a more precise, more efficient and more intelligent manufacture platform through sustained technical progress and innovation, which can promote blend between human and machines, between machines and machines, and between machines and factories. It makes unremitting endeavor to promote users' product values and efficiency and to impetus intelligent equipment localization, which comes to use Chinese equipments to equip China toward the world.

Diligent Chinese Robot

With the industry control technology R&D, and manufacture experience for more than 30 years, GSK has produced our industrial robots with independent intellectual property rights, including robot controllers, servo motors and servo drivers and other key functional components. Presently, GSK industrial robot consists of 6 series product covering more than 20 kinds of application, including but not limited to handling, pick and place, welding, polishing, painting, palletizing and depalletizing etc. Being one of enterprises undertaking "National Intelligent Manufacturing Equipment Development Special Project", GSK independently researches and develops industrial robots carrying high quality and high technology of GSK's CNC systems. According to users' requirements, it provides robots with superior performance, designs and manufacturers fixture and conveyor required for automation solution.



RMD08 RMD20 RMD35 RMD50 RMD120-2400 RMD160/RMD200/RMD300 RB500-2882 RB350-3400 RB300A1-2850 RB300A2-2850 RB300A2-3200 RB210-2700 RB165A1-2790 RB130A1-3100 RB130A1-3500

GSK MDC-500P Full digital high-end welding machine RH06B1-1605 RH06A2-2000 RH06A2-1490 separate RSP600B15 integrated RSP600A15 RB80A1-2550 RB80-2080 RB80-2250 RB50A1-2071 RB35-1850 RB35-2050 RB20A3-1700 RB20A3-1900 RB12-1500 RB08A3-2076 RB08A3-1866 RB08A3-1490 RB08A3-1700 RB06-900 RB08Q1-1440 RB03A1-562

C3-1100 C3-1600 C4-1100

Application field: It is widely used in burnishing, polishing, machine loading/unloading and automatic transport on punching automation production lines.

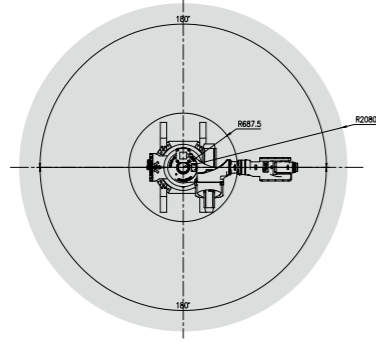
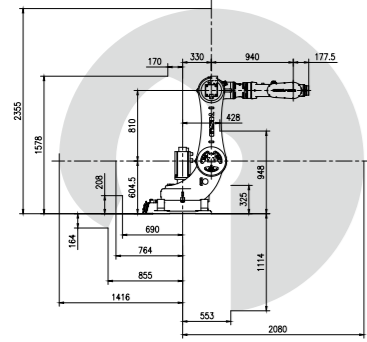
Type	DOF	Drive Method	Payload (kg)	Repeatability (mm)	Motion Range(°)						Top Velocity(°/s)						Permissible Inertia of Wrist (kg.m ²)			Allowed Top Torque (N.m)			Motion Radius (mm)	Machine Weight (kg)
					J1	J2	J3	J4	J5	J6	J1	J2	J3	J4	J5	J6	J4	J5	J6	J4	J5	J6		
RB03A1-562	6	AC Servo Drive	3	±0.02	±150	+136~-51	+64~-131	±150 ±120 ±360	375	375	419	600	600	750	0.077	0.077	0.029	9.3	9.3	4.5	562	36		
RB06-900			6	±0.03	±170	+135~-100	+155~-110	±170 ±120 ±360	337.5	270	375	300	375	468				12	10	6	900	60		
RB08Q1-1440			6 (For welding)	±0.05	±155	±90	+90~-270	±180 ±130 ±360	225	200	225	450	360	650	/	0.272	0.074	17.2	17.2	10	1440	70		
			8(For handling)	±0.05	±155	±90	+90~-270	±180 ±130 ±360	200	160	200	450	360	650	/	0.272	0.074	17.2	17.2	10	1440	70		
RB08A3系列			RB08A3-1490	±0.04	±170	+120~-85	+83~-150	±180 ±135 ±360	200	200	200	400	356	600	/	0.19	0.065	14	12	7	1490	185		
			RB08A3-1700	8	±0.04	±170	+120~-85	+83~-150	±180 ±135 ±360	180	180	180	400	356	600	/	0.19	0.065	14	12	7	1700	187	
RB12-1500			8	±0.04	±170	+120~-85	+83~-150	±180 ±135 ±360	160	160	160	300	300	360	0.33	0.33	0.17	24	24	13	1500	186		
RB20A3系列			RB20A3-1700	12	±0.04	±170	+160~-80	+76~-112	±180 ±138 ±360	175	175	180	330	330	450	/	0.93	0.4	40	50	22	1700	265	
			RB20A3-1900	20	±0.04	±170	+160~-80	+76~-112	±180 ±138 ±360	175	175	180	330	330	450	/	0.93	0.4	40	50	22	1900	273	
RB35系列			RB35-1850	15	±0.04	±170	+120~-85	+85~-155	±180 ±135 ±360	160	160	175	310	360	375	2.46	2.46	1.41	75	75	68	1850	369	
			RB35-2050	35	±0.04	±170	+120~-85	+85~-155	±180 ±135 ±360	160	160	160	310	360	375	2.46	2.46	1.41	75	75	68	2050	372	
RB50系列			RB50-1956	30	±0.05	±178	+130~-90	+75~-200	±360 ±115 ±360	171	171	171	215	251	365	51.5	51.5	16	196	196	127	1956	650	
			RB50A1-2071	50	±0.05	±178	+130~-90	+75~-200	±360 ±115 ±360	171	171	171	215	251	365	51.5	51.5	16	196	196	127	2071	650	
RB80系列			RB80-2250	50	±0.06	±180	-84~+164	-193~+68	±360 ±130 ±360	140	155	140	215	230	270	36.3	27.5	18.9	324	328	186	2250	680	
			RB80-2080	80	±0.06	±180	-84~+164	-193~+68	±360 ±130 ±360	140	160	140	205	220	260	36.3	27.5	18.9	401	406	232	2080	678	
			RB80A1-2550	100	±0.06	±180	-84~+164	-193~+68	±360 ±115 ±360	140	155	140	215	251	285	27.4	43.7	22	203	211	117	2550	744	
RB130系列			RB130A1-3500	50	±0.06	±180	-84~+164	-193~+68	±360 ±115 ±360	110	130	130	215	230	270	27.4	43.7	22	324	328	186	2550	744	
			RB130A1-3100	80	±0.08	±175	+75~-60	+80~-185	±360 ±130 ±360	100	94	120	205	220	260	36.3	27.5	18.9	401	406	232	3500	1210	
RB165A1-2790			100	±0.08	±175	+75~-60	+80~-185	±360 ±125 ±360	100	94	120	169	200	220	64.5	64.5	51.1	784	784	411.5	3100	1300		
RB210-2700			130	±0.08	±175	+75~-60	+80~-185	±360 ±115 ±360	100	94	104	152	160	220	85	85	45	951	951	490	2790	1350		
RB300系列	RB300-2508	165	±0.08	±175	+75~-60	+80~-185	±360 ±115 ±360	88	94	104	152	118	200	160	160	100	1274	1274	686	2700	1430			
	RB300A1-2850	210	±0.10	±175	±55	+116~-85	±360 ±115 ±360	85	95	95	120	120	180	160	160	100	1600	1600	850	2508	1800			
	RB300A2-2850	300	±0.10	±175	±70	-85~+130	±360 ±115 ±360	110	100	100	180	150	200	160	160	100	1600	1600	850	2850	1650			
	RB300A2-3200	300	±0.10	±175	±70	-85~+130	±200 ±125 ±360	110	100	100	180	150	200	160	160	100	1600	1600	850	2850	1650			
RB350-3400	300	±0.10	±175	±70	-85~+130	±200 ±125 ±360	110	100	100	180	150	200	160	160	100	1600	1600	850	3200	1680				
RB500-2882	220	±0.10	±178	+105~-60	+70~-62	±180 ±115 ±360	80	85	88	110	98	170	550	500	235	3400	3400	1700	3400	3340				
	350	±0.10	±178	+105~-60	+70~-62	±180 ±115 ±360	80	85	88	110	98	175	550	500	235	3400	3400	1700	2882	3300				

Note: Avoid to contact with the inflammable and explosive and corrosive gas and liquid; do not splash the water, oil and dust; keep away from the electric appliances' noisy resource (plasma).

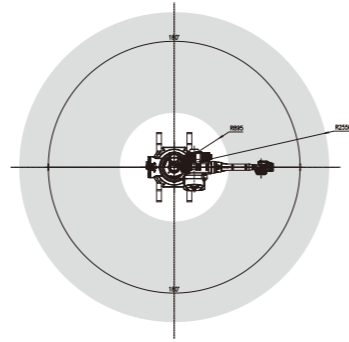
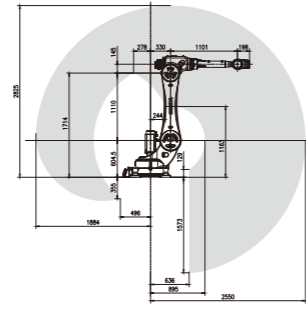


Application field: It is widely used in burnishing, polishing, machine loading/unloading and automatic transport on punching automation production lines.

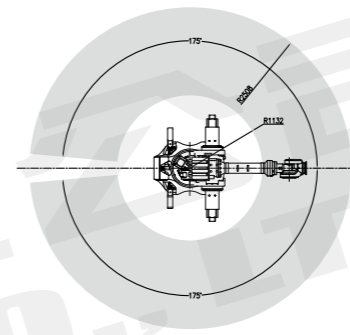
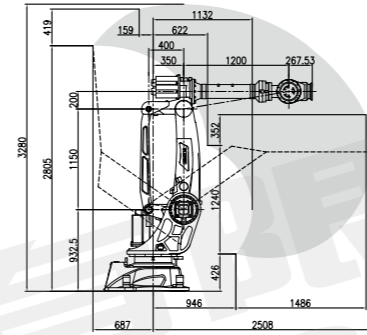
RB80-2080
Motion range diagram



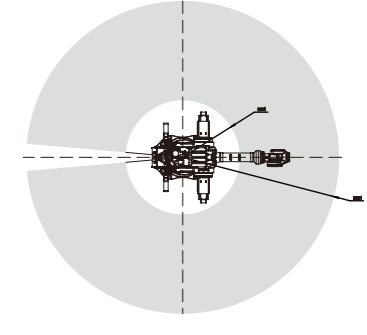
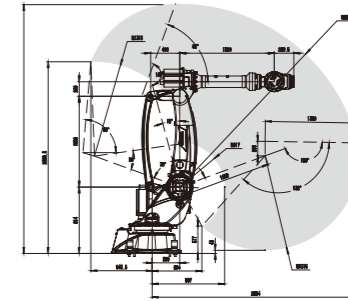
RB80A1-2550
Motion range diagram



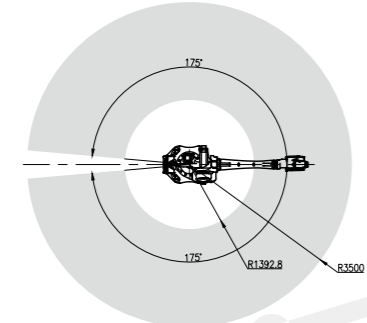
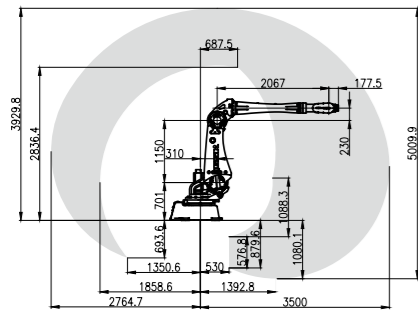
RB300-2508
Motion range diagram



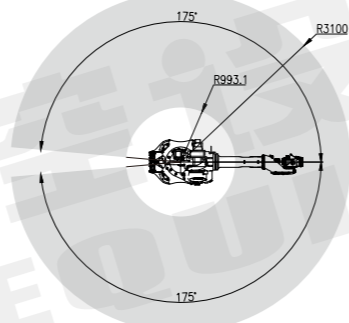
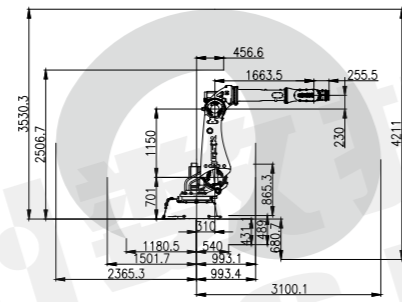
RB300A1-2850
Motion range diagram



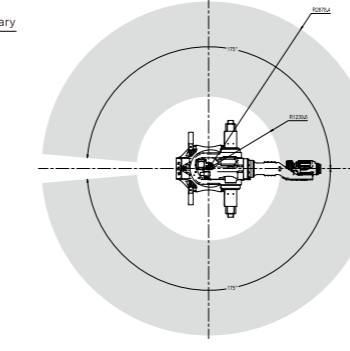
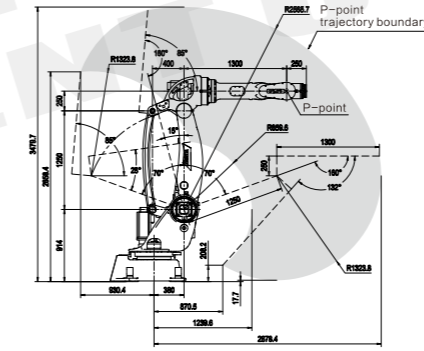
RB130A1-3500
Motion range diagram



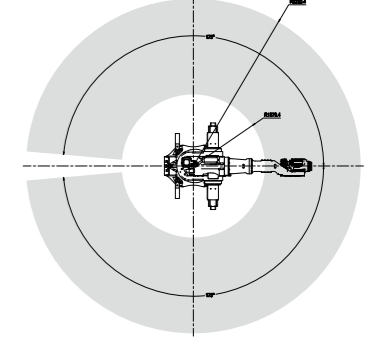
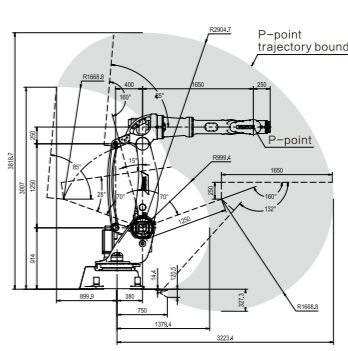
RB130A1-3100
Motion range diagram



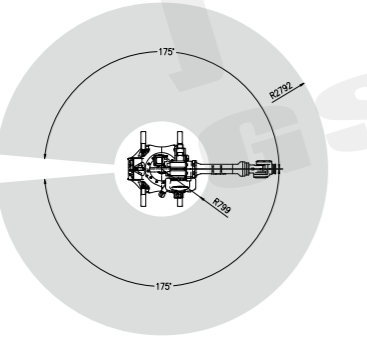
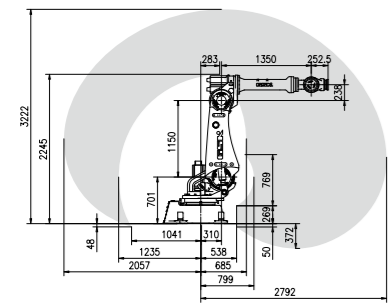
RB300A2-2850
Motion range diagram



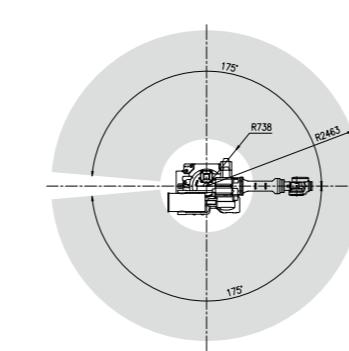
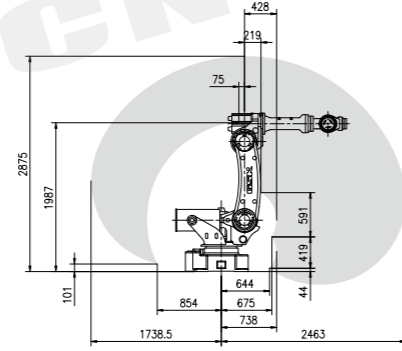
RB300A2-3200
Motion range diagram



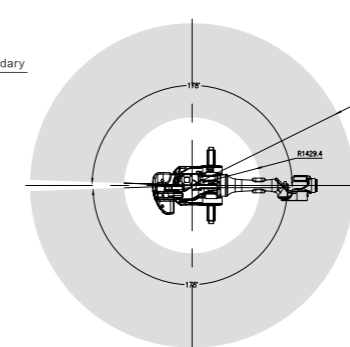
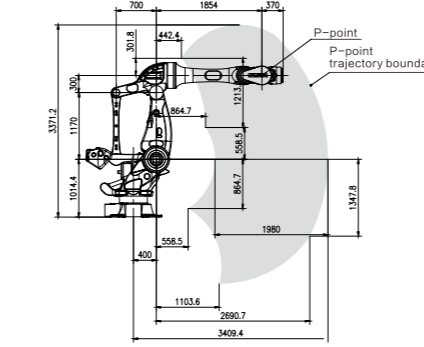
RB165A1-2790
Motion range diagram



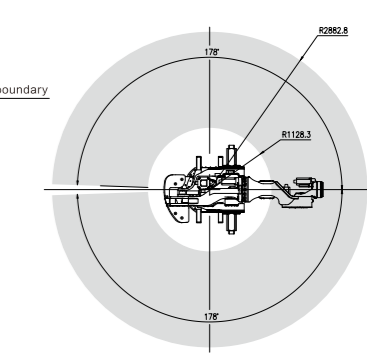
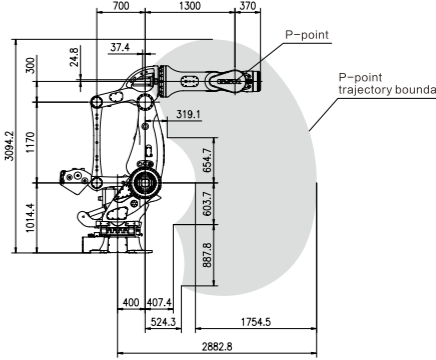
RB210-2700
Motion range diagram



RB350-3250
Motion range diagram



RB500-2882
Motion range diagram



Application field: It is widely used in automobiles and their accessories, motorcycles and their accessories, and agricultural machines, engineering machines and other hardware welding fields.

Type	DOF	Drive Method	Payload (kg)	Repeatability (mm)	Motion Range(°)						Top Velocity(°/s)						Allowed Top Torque (N.m)			Motion Radius (mm)	Machine Weight (kg)		
					J1	J2	E	J3	J4	J5	J6	J1	J2	E	J3	J4	J5	J6	J4			J5	J6
RH06A2-1490	6	AC Servo Drive	6	±0.05	±170	+115~-80	/	+80~-150	±180	±135	±360	200	200	/	200	282	370	630	14	12	6	1490	190
RH06A2-2000	6	AC Servo Drive	6	±0.05	±170	+140~-70	/	+75~-140	±180	±135	±360	175	165	/	195	282	370	630	14	12	6	2000	265
RH06A3-1490	6	AC Servo Drive	6	±0.05	±170	+120~-85	/	+83~-150	±180	±135	±360	200	200	/	200	400	356	600	14	12	7	1490	185
RH06B1-1605	7	AC Servo Drive	6	±0.05	±170	+110~-70	±90	+80~-150	±180	±135	±360	200	173	200	200	288	375	630	14	12	6	1605	215

Note: Avoid to contact with the inflammable and explosive and corrosive gas and liquid; do not splash the water, oil and dust; keep away from the electric appliances' noisy resource (plasma).

Close Cooperation

Both GSK robot and welding are absolutely made by GSK, GSK offers tailor-made welding solution.



RH06B1-1605



RH06A2-1490



RH06A2-2000



RH06A3-1490

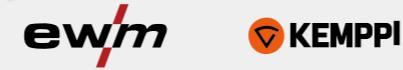


GSK MDC-500P
Full digital high-end
welding machine

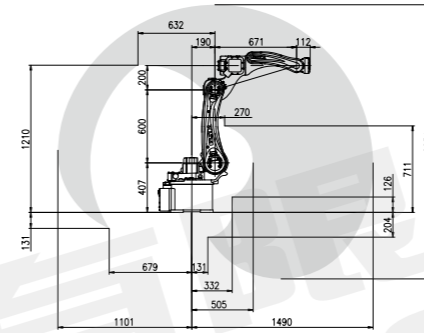


GSK BRH-350
Full digital
welding machine

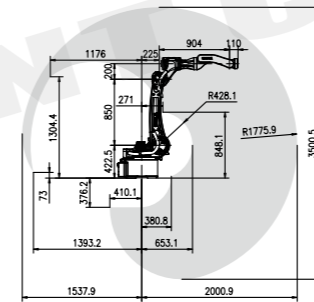
★
Matched with MEGMEET, GSK, EWM, LORCH, KEMPPi, ESAB's welders, GSK Series Welding Robot can realize DeviceNet bus digital communication, realize I/O analog communication matched with LINCOLN, OTC, Panasonic welders, and transform the present welders to meet customers' requirements.



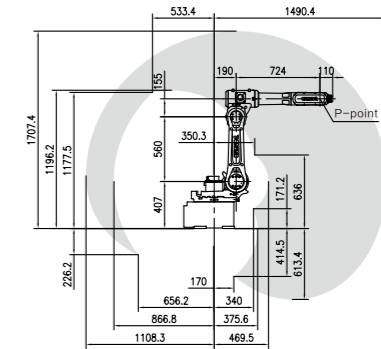
RH06A2-1490
Motion range diagram



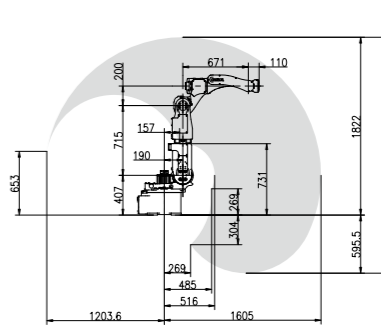
RH06A2-2000
Motion range diagram



RH06A3-1490
Motion range diagram



RH06B1-1605
Motion range diagram

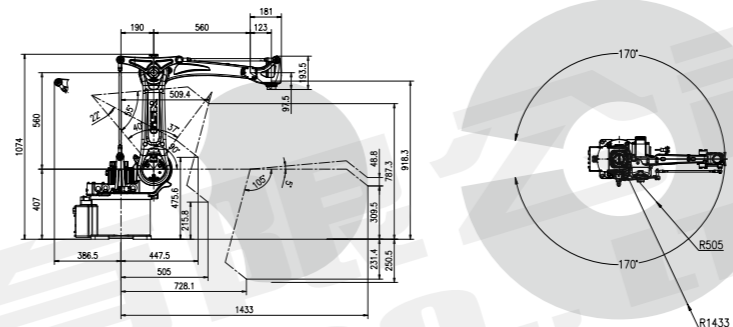


Type	DOF	Drive Method	Payload (kg)	Repeatability (mm)	Motion Range (°)				Top Velocity (m/s)				Wrist Allowable Load Inertia (kg·m ²)	Cycle Time (r/h)	Motion Radius (mm)	Machine Weight (kg)
					J1	J2	J3	J4	J1	J2	J3	J4				
RMD08	4	AC Servo Drive	8	±0.05	±170	+90~-40	+68~-90	±360	251	195	195	367.5	0.25	1800 ^③	1433	180
RMD20	4	AC Servo Drive	20	±0.05	±170	+106~-45	+73~-90	±360	175	175	185	330	0.51	1780 ^③	1755	266
RMD35	4	AC Servo Drive	35	±0.05	±170	+95~-45	+75~-90	±360	160	160	175	375	1.24	1560 ^③	2100	360
RMD50	4	AC Servo Drive	50	±0.1	±178	+90~-40	+65~-78	±360	171	171	171	222	4.5	1700 ^③	2154	660
RMD120-2400	4	AC Servo Drive	120	±0.1	±180	+85~-40	+120~-20	±360	145	130	140	420	53	2200 ^③	2404	1020
RMD160	4	AC Servo Drive	160	±0.1	±180	+100~-44	+121~-15	±360	123	123	128	300	78	1500 ^③	3150	1500
RMD200	4	AC Servo Drive	200	±0.1	±180	+100~-44	+121~-15	±360	105	107	114	242	78	1300 ^③	3150	1500
RMD300	4	AC Servo Drive	300	±0.1	±180	+100~-44	+121~-15	±360	85	90	100	190	134	1000 ^③	3150	1500

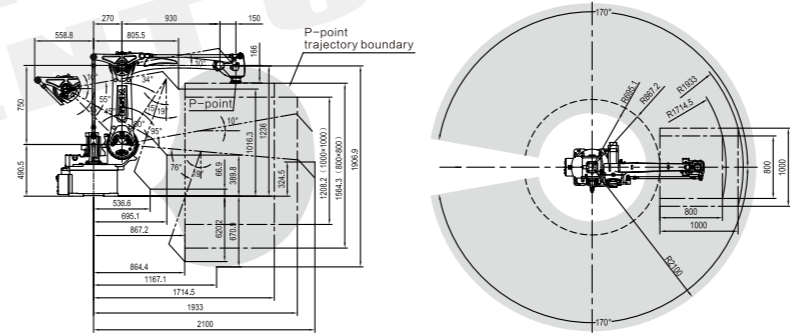
Note: ① The testing track covers 150 mm in height and 1000mm in width. Actual cycle time subject to working situation.
 ② The testing track covers 200 mm in height and 1000 mm in width. Actual cycle time subject to working situation.
 ③ The testing track covers 400 mm in height and 2000 mm in width. Actual cycle time subject to working situation.
 Avoid to contact with the inflammable and explosive and corrosive gas and liquid; do not splash the water, oil and dust; keep away from the electric appliances' noisy resource (plasma).



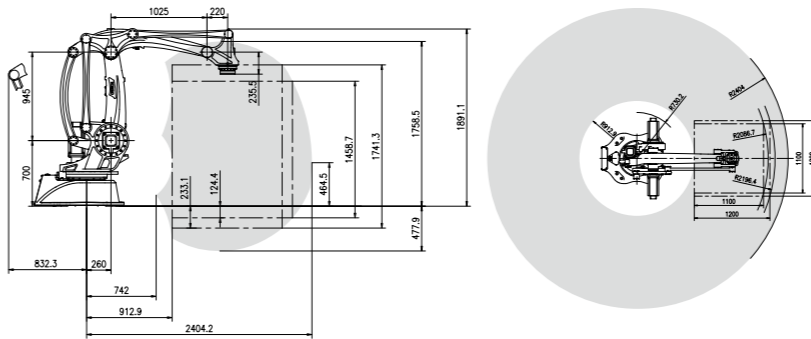
RMD08
Motion range diagram



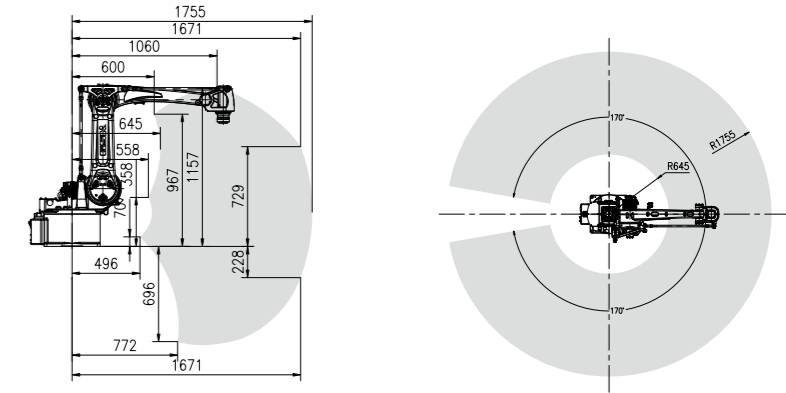
RMD35
Motion range diagram



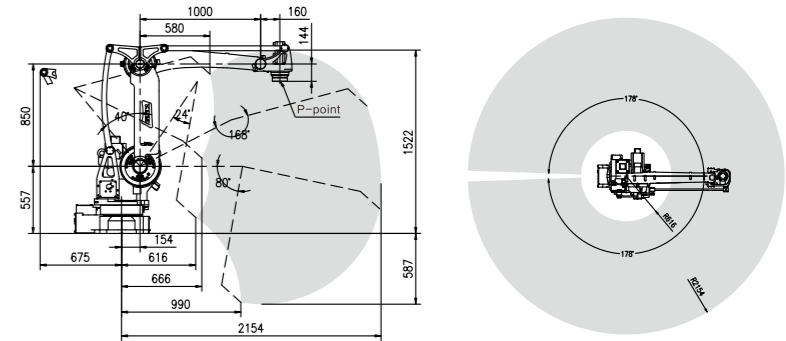
RMD120-2400
Motion range diagram



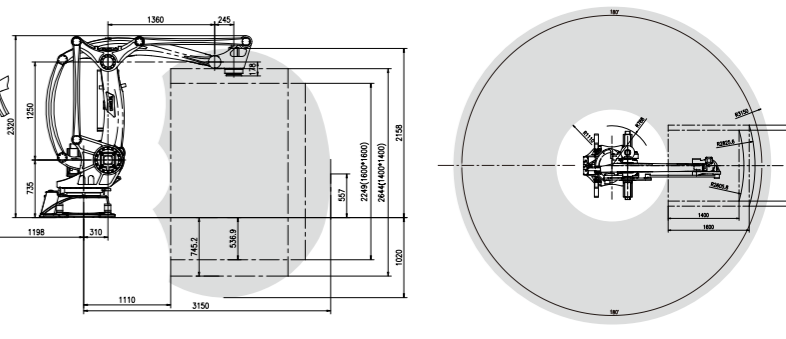
RMD20
Motion range diagram



RMD50
Motion range diagram



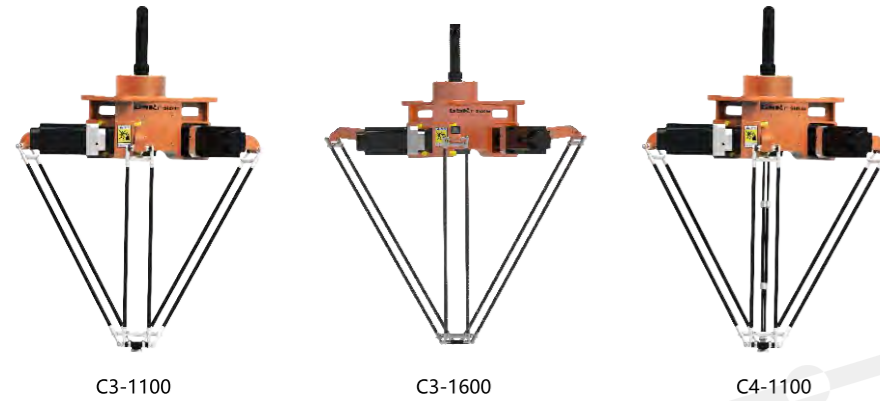
RMD160/200/300
Motion range diagram



Application field: It is widely used in electron, light industry, food and medicine etc., which can achieve the high-speed holding/unholding and sorting packing operations.

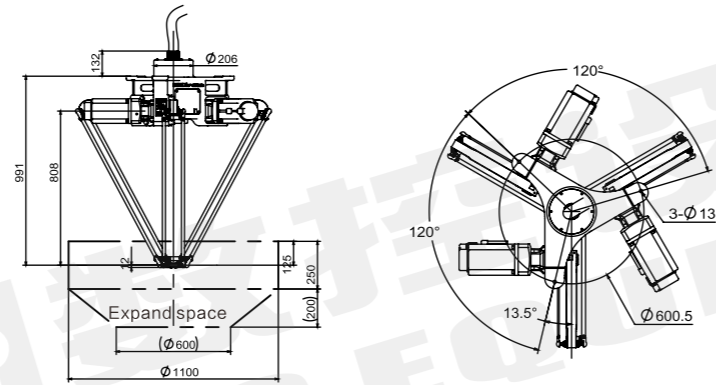
Type	DOF	Drive Method	Rated Loading (kg)	Max.Loading (kg)	Repeatability (mm)	Working Range (mm)	Revolving Angle (°/s)	Top Acceleration (m/s ²)	Top Velocity (Loading) (m/s)	Typical Beat Time (s)		Machine Weight (kg)
										25/305/25[mm]	30/400/30[mm]	
C3-1100	3	AC Servo Drive	1	3	±0.05	Φ1100x250	-	120	10	0.33(0.3kg)/0.38(1kg)	0.48(0.3kg)/0.50(1kg)	95
C3-1600	3	AC Servo Drive	1	3	±0.05	Φ1600x300	-	100	10	0.33(0.3kg)/0.38(1kg)	0.48(0.3kg)/0.50(1kg)	95
C4-1100	4	AC Servo Drive	1	3	±0.05	Φ1100x250	±180	120	10	0.33(0.1kg)/0.38(1kg)	0.48(0.1kg)/0.50(1kg)	110

Note: Avoid to contact with the inflammable and explosive and corrosive gas and liquid; do not splash the water, oil and dust; keep away from the electric appliances' noisy resource (plasma).

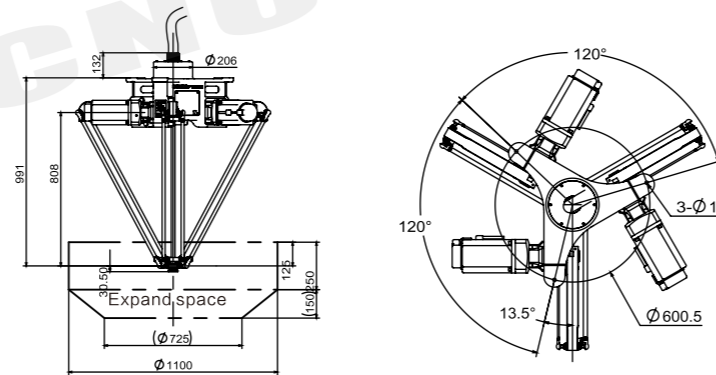


C3-1100 C3-1600 C4-1100

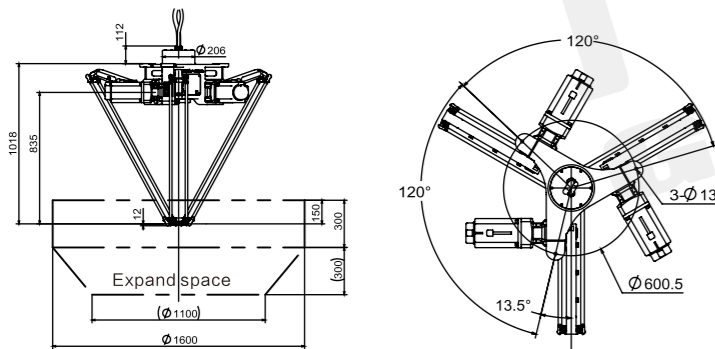
C3-1100 Motion range diagram



C4-1100 Motion range diagram



C3-1600 Motion range diagram



Application field: It is widely used in electronics, plastic, tablet and food industry, used to perform grasp, assembly, gluing and other operations.

Type	Standard Period (s)	Rated Loading (kg)	Max. Loading (kg)	Axis Specification						Top Speed (°/s)			Repeatability* (mm)			Machine Weight (kg)
				X axis		Y axis		Z axis	R axis	X,Y axis (m/s)	Z axis (m/s)	R axis (°/s)	X,Y axis	Z axis	R axis	
				Arm Length	Rotation Angle	Arm Length	Rotation Angle	Stroke	Rotation Range							
integrated RSP600A15	0.68	2	5	350mm	±140°	250mm	±135°	150mm	±360°	5,5	1.1	588	±0.01	±0.01	±0.01°	160/23
separate RSP600B15	0.68	2	5	350mm	±140°	250mm	±135°	150mm	±360°	5,5	1.1	588	±0.01	±0.01	±0.01°	160/23

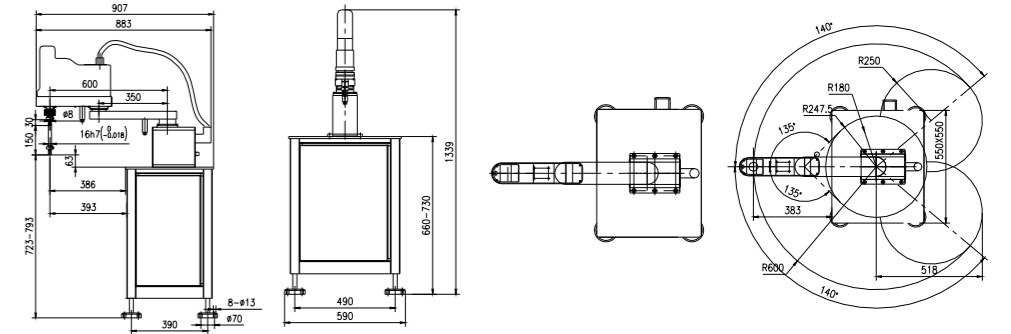
Note: * 0°- 40°
Avoid to touch with the inflammable and explosive and corrosive gas and liquid; do not splash the water, oil and dust; keep away from the electric appliances' noisy resource (plasma).



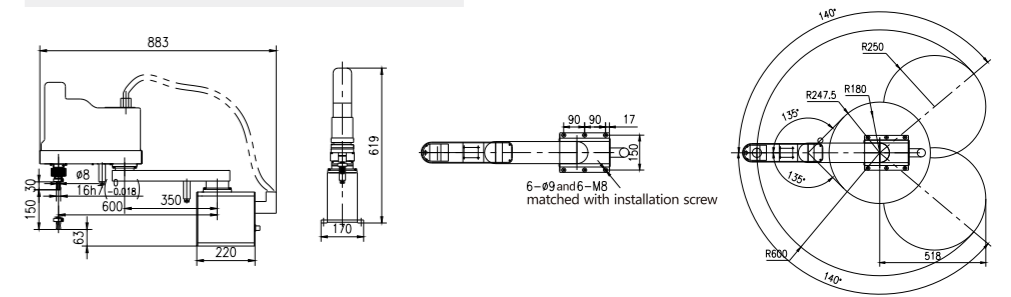
integrated RSP600A15

separate RSP600B15

RSP600A15 Motion range diagram



RSP600B15 Motion range diagram



Mainly include: controller (electric cabinet & teaching pendant), SJTR Series Servo Motor, The GSK GL series integrated servo drive unit, GE Series AC Synchronic Servo Drive Unit.

Controller (Cabinet&Teaching Pendant)

Robot Teaching Pendant

Perceptual intuition operation interface
Users can directly understand operations via icons displays

Large window
High definition color screen
6.5-inch color LCD display



Using function keys realizes simple operations
Rapid teaching program can be carried out by function button



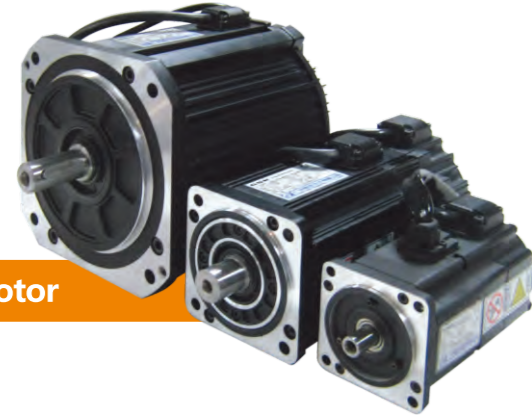
RB Series Robot Controller RMD Series Robot Controller RB 03A1 Robot Controller

Features

- 1 With independently R&D GSK-RC control system, the robot always optimizes acceleration/deceleration according to its actual load, as far as possible to shorten operation period;
- 2 Soft PLC function is more flexible for the integration control.
- 3 Embedded Control: based on ARM+DSP+FPGA hardware structure, it supports up to 10 axes, arithmetic speed up to 500MIPS, high-speed motion controlling on-site bus, Ethernet, CAN and DeviceNet's any one interface, continuous path teaching and on-line teaching, remote monitor and diagnosis functions;
- 4 The robot Fieldbus (GSK-Link): high-speed real-time character, breaking contradiction between bandwidth and real-time, combining communication rate and real-time control, resolving data real-time interaction problems among different modules;
- 5 Dynamic Identification and Control Technology: considering gravity, Coriolis Force, centrifugal force and other external forces' interference, apply self-adaption identification control technology to improve the robot's dynamic performance.

Project	GSK-GRC	
Control System	Teaching Method	Teaching Playback/Remote Control
	Driving Mode	Digital Bus AC Servo Drive
	Number of Controlled Axes	Six Axis (extend to 10 axes)
	Position Control Method	PTP/CP
Memory	Speed Control	TCP Constant Speed Control
	Coordinate System	Joint Coordinate/Cartesian Coordinate/User Coordinate/Tool Coordinate
	Memory Medium	Flash Memory
Action	Memory Capacity	256M
	Memory Content	Point, line, arc, condition command, etc.
	Interpolation Function	Linear Interpolation, Arc Interpolation
External Control Input	Manual Operation Speed	5 Levels Adjustable (speed limit 250mm/s)
	Edit	Add, input, copy, cut, delete, modify, check
	Condition Setting	Set up Conditions in Program
Application	General Physical I/O	Digital I/O panel, standard input/output 32 points respectively, extend and support 2 analog output (0~10V)
	Application	Arc welding, transferring, rubber coating, spraying, etc.
	External Communication	USB, Ethernet, Modbus TCP
	Protection	Welding gun mechanical anti-collision sensor, position software limit, mechanical hardware limit (partial axes) control cabinet
	Maintenance	Check the abnormal records regularly
	Anomaly Detection	Emergency stop anomaly, control time sequence anomaly, servo anomaly, encoding disk anomaly, teaching box anomaly, user operation anomaly, spot welding anomaly, arc welding anomaly, sensor anomaly
	Diagnosis	Key diagnosis, signal diagnosis, alarm diagnosis, etc.
	Origin Point Reset	Supported by encoding disk battery; no need to reset origin point for every starting-up.
	Cooling System	Air Cooling
	Noise	<70dB
Ambient Temperature/Humidity Range	0~40°C (No Frost) / 0~90%RH(No Frost)	
Power Supply	Three-phase AC220V 50/60HZ(single phase for a small number of models) (Note: the exported robot is configured according to local voltage)	
Ground	Special grounding for D-class robot or above	

Mainly include: controller (electric cabinet & teaching pendant), SJTR Series Servo Motor, The GSK GL series integrated servo drive unit, GE Series AC Synchronic Servo Drive Unit.



SJTR Series Servo Motor

Features

- 1 It adopts the optimum electromagnetic design, low noise, stable operation, and high efficiency;
- 2 It adopts high performance rare-earth permanent magnetism material, perfect low-speed character and strong overloading capacity (3 times);
- 3 It adopts a 17-bit absolute high-speed and high accuracy photoelectric encoder, which can achieve a high-accuracy control matched with a high-performance drive unit;
- 4 It adopts an imported high-accuracy bear and rotor with high-precision dynamic technologies to ensure that the motor is stable and reliable, less vibration and low noise when it operates within the high speed range;
- 5 The motor can be reliably used in -15°-40 ° ambient temperature and the dust oil-mist environment;
- 6 It owns high torque inertial ratio and strong rapid response capacity.

Parameters

Type	Rated Power (Kw)	Rated Current (A)	Zero Torque (N.m)	Rated Torque (N.m)	Top Torque (N.m)	Rated Speed (r/min)	Max Speed (r/min)	Inertia (kg.m2)
60SJTR-MZ003E	0.1	1.2	0.318	0.318	0.955	3000	5000	0.05×10 ⁻⁴
60SJTR-MZ005E	0.16	1.65	0.5	0.5	1.5	3000	5000	0.07×10 ⁻⁴
80SJTR-MZ006E	0.2	2.9	0.637	0.637	1.91	3000	6000	2.71×10 ⁻⁵
80SJTR-MZ010E	0.3	3.1	1.0	1.0	3.0	3000	6000	3.36×10 ⁻⁵
80SJTR-MZ013E	0.4	3.3	1.27	1.27	9.81	3000	6000	3.88×10 ⁻⁵
150SJTRG-MZ040C	0.84	5.5	4	4	12	2000	3500	1.3×10 ⁻³
150SJTRG-MZ060C	1.26	8.6	6	6	18	2000	3500	1.9×10 ⁻³
150SJTRG-MZ080C	1.68	11.2	8	8	24	2000	3500	2.9×10 ⁻³
150SJTRG-MZ100C	2.1	14.3	10	10	30	2000	3500	3.4×10 ⁻³
150SJTRG-MZ120C	2.5	14.5	12	12	33.8	2000	2800	3.9×10 ⁻³



The GSK GL series integrated servo drive unit

The GL series integrated servo drive unit is the latest 6-axis robot servo drive with industrial Ethernet bus communication interface by GSK. It has good low-speed performance, wide range inertia matching, high dynamic response, and wide compatibility (can be adapted to 17-26 bit encoders) to meet the needs of various robots. At present, there are three types of robots based on their power: large, medium, and small, covering a load range of 3-35kg with 4-6 joints. At the same time, they can support dual axis expansion modules to adapt to the positioner and meet the welding application characteristics.

Features

- 1 More energy-saving: using common bus rectification technology, it can reduce energy consumption by 15-35% compared to traditional independent servo units
- 2 More compact: after adopting an integrated electrical cabinet, the volume can be reduced by more than 50% compared to single axis servo electrical cabinet .
- 3 More reliable: the reasonable arrangement of radiators and air ducts ensures heat dissipation, improving the servo protection level.
- 4 More safer: it has high response and reliability safety brake function and dynamic braking function, effectively improving the safety of human and machine.
- 5 More easy to maintain: it integrates and optimizes physical interfaces, Reduce the number of connectors, improve the convenience and productivity of installation and maintenance
- 6 More easy to operating: It can realize the servo parameter debugging, status monitoring, fault alarm and processing in the robot system interface.
- 7 Advanced anti-collision soft floating function: A welding torch anti-collision control function can better protect the welding torch and avoid issues such as position deviation.

Welding Positioner



Dual-axis Positioner HBS150-1



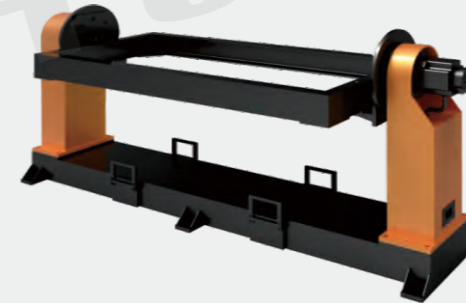
Single-axis Positioner HBD250-1

Single/dual-axis positioner

Type	Driving Method	Max. Loading (kg)	Repeatability (mm)	Motion Range (°)		Rated Speed (°/s)		Rated Torque (N.m)		Machine Weight (kg)
				Tilting shaft	Revolving shaft	Tilting shaft	Revolving shaft	Tilting shaft	Revolving shaft	
HBS150-1	AC Servo Drive	200	±0.15	±135	±370	125	124	330	144	200
HBD250-1	AC Servo Drive	300	±0.10	/	±370	/	124	/	244	105

Features: using the reducers and servo motors developed by GSK can ensure various welding joints of welding workpieces rotate to the best position, which avoids vertical position welding and over-head position welding, and improves the welding quality and production efficiency. The robot control system not only controls the robot body motion, but also automatically controls the positioner to send welding start commands, automatic control and regulation welding parameters (voltage, current), and automatically checks whether arc striking is done successfully. The single-axis positioned is also applied to automatically load/unload.

Head-tail-type single axis servo positioner



Rated loading (kg)	Rated torque (N·M)	Standard revolving radius (mm)	Maximum revolving angle (°)	Rated revolving rate (R/Min)	Repeatability (mm)	Deflection frame dimension (mm)
500	700	700	±360	15	±0.1	2000*800*130
1000	1000	700	±360	15	±0.1	2500*800*130
Appearance dimension of Deflection machine (mm)		Spindle revolving disk (mm)	Revolving shaft center high (mm)	Power supply condition		Net weight of equipment (kg)
2750*520*1100		φ400	900	the 7th/8th axis robot electric cabinet control*		600
3250*550*1100		φ400	900			600

*It can be linked with the GSK robot

Movement Guide Rail



Type 1

Type 2

Type	Application Robot	Top Motion Speed (m/s)	Repeated Positioning Accuracy (mm)	Top Loading (kg)	Application Robot
Type one (Grounding installation method)	RB series Multi-joint robot	1.5 (Related with motor)	±0.05 (Top)	800	Ambient temperature: 0-45° Ambient humidity: 20~80%RH (No condensation)
Type two (Gantry movement method)				400	

Vision System

Character: GSK machine visual system, basic function of integral machine visual system and high accuracy calculation are suitable for variable sales scenarios which can be carried out the identification measurement and default detection functions for the workpiece or the object to be detected. It owns the great visual analysis function and can be set up the machine visual application system rapidly based upon the simply and flexible configuration; so that it owns the abundant functions, stable and reliable capacity and friendly operation surface.

Application: Application demands in different areas, for example: visual positioning, measurement, detection and identification etc.



Use the robot's vision system to complete sorting transportation work



Off-line Programming System

Character: The preprocessing can be generated by the off-line programming software; and then coordinates changing and optimally outputting machining file compiled by the robot language can generate complicated paths.

Application: It mainly used for cutting, gluing, painting, milling, graving and polishing entities.

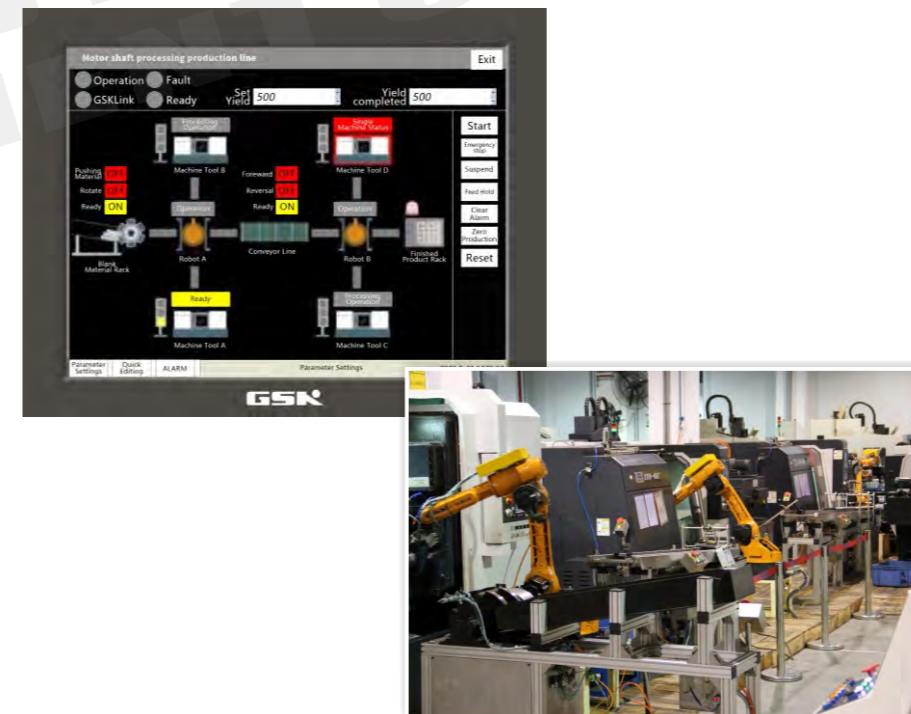


Robot's drawing application based upon the off-line programming



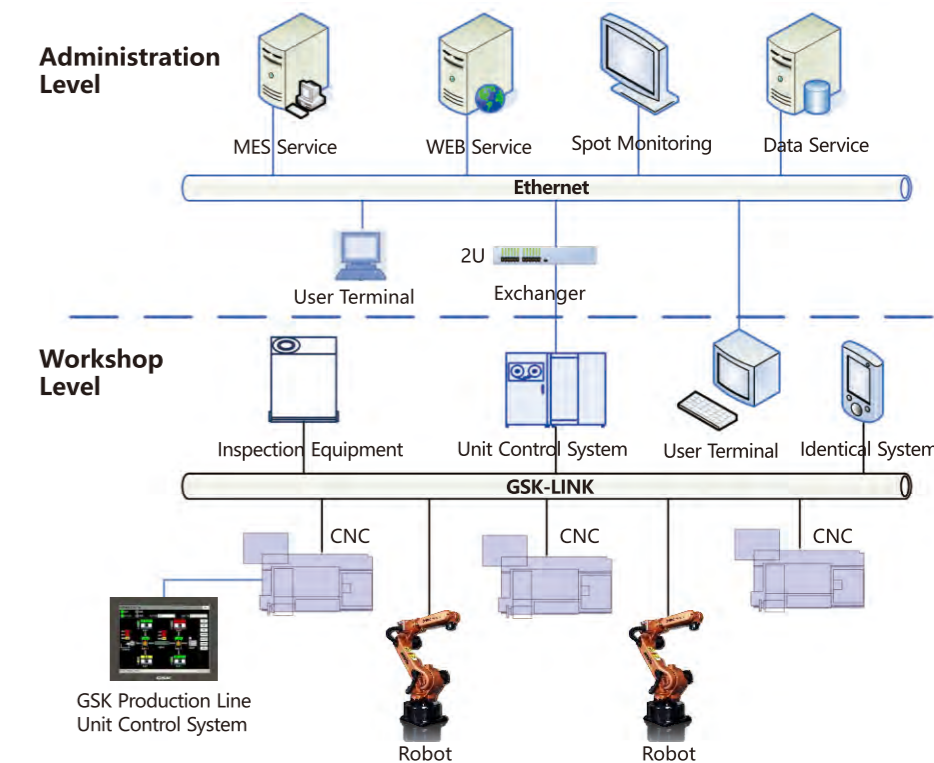
GSK Production Line Unit Control System

- 1 It is for a machining field's monitor management system to assemble lines of production equipments used for machining all kinds of parts;
- 2 Utilizing GSK-LINK on-site bus realizes high-speed connection between the CNC machine, industrial robot and production line's auxiliary operation device;
- 3 On-line and off-line programming support;
- 4 Simply humanized operation;
- 5 Maximally improve production efficiency and stability of production quality Reduce labor cost;
- 6 Optimize and improve customers' management system.



GSK General Control Management System

- 1 It is used for achieving the "Digitalized factory", "Intelligent workshop" management system;
- 2 CAM and CAPP application and management;
- 3 Conveniently flow plan fast;
- 4 Count and regulate production capacity;
- 5 Equipment utilization statistics;
- 6 Production flow interference;
- 7 Elevate C/T and so on.



Loading/Unloading Application

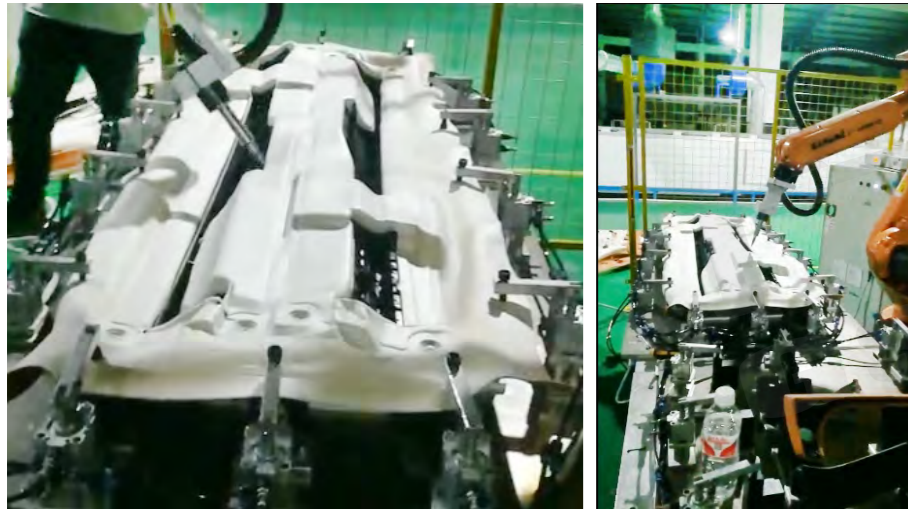
01 Auto interior injection part trimming application of GSK RB08 Robot

Customer Requirements

- Robot replacing manual labor to achieve automatic cutting of the injection molding flash.

Application Effect

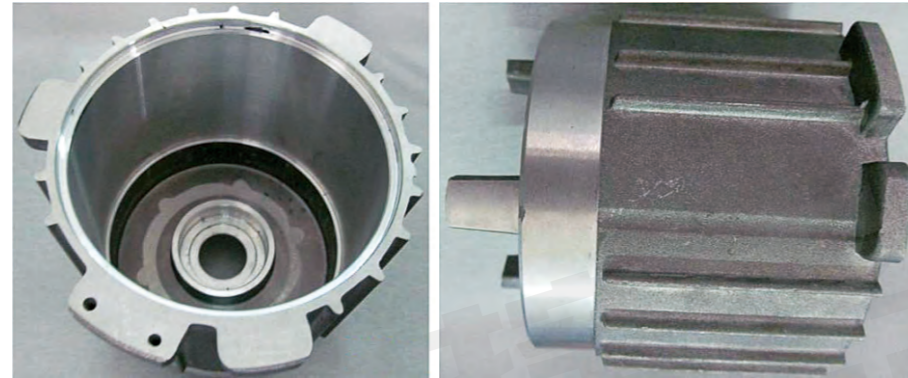
- Put the raw material into the fixed fixture to orientate and confirm by hand;
- 1 RB08 transfer robot, 1 set of plasma cutting device, the cutting head installed at the end flange of the six-axis robot;
- The manual teaching robot is programmed, robot is performed the cutting operation along with the trimming of the product's contour.
- The robot replacing manual work and manual shift can work at any time for 24 hours, and stably completes the work task;
- The robot cuts the flash and can effectively reduce the cutting problems and ensure the consistency of the products;
- Greatly improve the product quality and improve the impact of enterprises.



02 GSK RB08 Robot Applied to Load /Unload for the Turning Machine

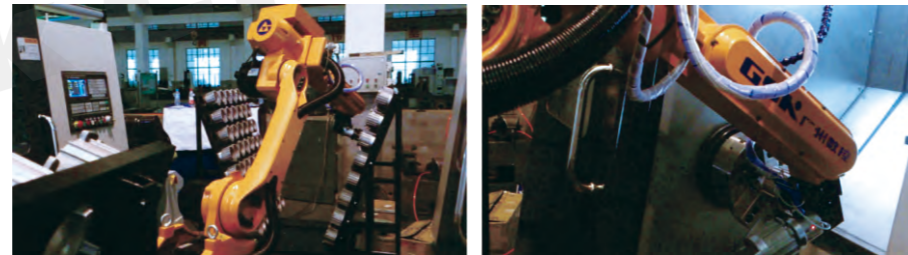
Customer Requirements

- One robot with two turning machines consists of one set of the robot loading/unloading system;
- Closely match with the production cycle time to ensure production efficiency.



Application Effect

- Being parts occupying much space, to guarantee processing volume and positioning precision for more than 2 hours, use double-servo high precise sliding table design to alternately operate to get high efficiency;
- Workblank loading structure and finished product unloading structure are integrated, which shortens the robot running time and gets continuity and fluency during automatic production;
- The robot with high flexibility makes it alter its posture in smaller space, which increases space utility;
- Its control system takes GSK98 CNC System as its main control unit to get simple operations and good stability.



03 GSK RB08 Robot Applied to Load/Unload for the Machine Tool

Customer Requirements

- Using two turning machines performs two processes to completely machine parts;
- The first process is to machine the inner, end and groove, taking 40s;
- The second process is to machine the outer, end and groove, taking 48s.

Application Effect

- Use the servo rotary loading table to get high positioning accuracy;
- The rotary index is performed by GSK96 CNC System's programming, with high universality;
- Grab and lift parts by a rodless cylinder to guarantee automatic operation for more than 2 hours;
- Its production cycle time is closely matched, and its run in use is smooth.



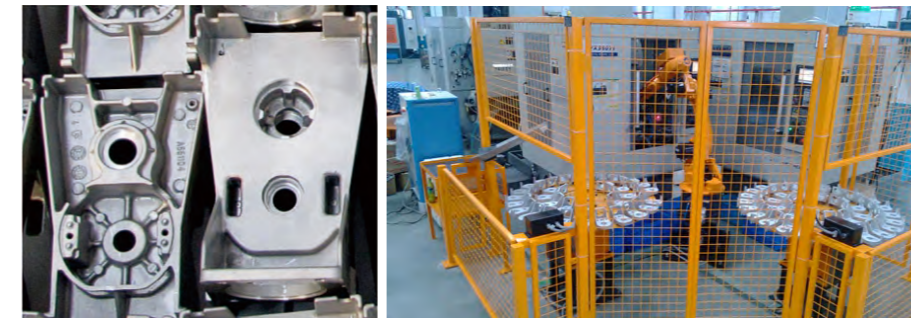
04 GSK RB08 Robot Applied to Load/Unload for the Machining Center

Customer Requirements

- One robot with two CNC machines consists of one set of robot loading/unloading system;
- The 1st machining center machines the part's yellow end and inner bore, and the 2nd does the green inner bore;
- One cycle time takes 57s to completely machine a part.

Application Effect

- The workpiece clamped on the machine is positioned by a pin to gain high accuracy;
- Using two loading machines, the robot normally operates to guarantee continuous production process when reloading is performed;
- High machining, loading/unloading efficiency does not occupy the turning machine's wait time to realize 100% machining time utilization in the whole process.



05 GSK RB08 Robot Applied to Load/Unload for the Machine Tool

Customer Requirements

- One RB08 robot, two CNC turning machines and one automatic loading/unloading auxiliary device consists of a robot turning machine loading/unloading system;
- It can closely follow the production cycle time to gain high production efficiency, safety and reliability during production;
- Workpiece grabbed by its gripper cannot be released or fall out when the robot is turned off or its gas runs out, and the gripper has a position confirmation switch.
- Its loading/unloading system with strong flexibility can be generally used in many kind of workpiece automatically loading/unloading.



Application Effect

- The resolution sticks to design principles of economy, safety, excellent operation, reliability, and higher flexibility, slightly regulating its rotary loading machine and gripper can be applied to load/unload four kind of workpiece provided by customers;
- After the robot outputs the signal, the turning machine inputs it, and after the robot enters the turning machine, it outputs the signal, the turning machine receives the signal interlock to prohibit all motion structures' operations till the robot complete escapes from the turning machine, then the signal is reset to guarantee safe and reliable between the robot and the machine tool.
- Its control system has soft/hard limit, controls abnormality, emergency stop and other default displays and alarm functions. Workpiece grabbed by its gripper cannot release or fall out when the robot is turned off or its gas runs out.
- The resolution can perform three shifts working with enough workblank provided by workers to complete continuous machining and high production efficiency.

06 GSK RB08 Robot applied to Gear Machining Loading/Unloading

Customer Requirements

- One robot with two turning machines composes a loading/unloading system;
- Closely match with the production cycle time to ensure production efficiency.

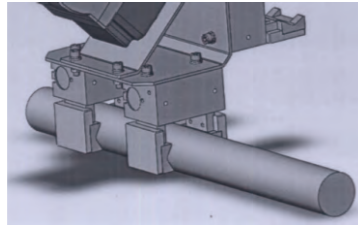


Application Effect

- It is used in gear machining, and the turning machine's fixture with high precision, smaller clearance, and supplied materials are conveyed by flow channels to acquire big randomness and the economical and practical;
- The robot's gripper increases secondary positioning device, which makes the gear installed into the turning machine's gripper consistent.
- The machining loading/unloading with high efficiency and positioning precision does not occupy the machine wait time and reaches 100% machining time utilization.

07 GSK RB08 Robot Applied to Load/Unload Motor Shafts**Customer Requirements**

- The machined workpiece is a motor shaft with 360-490 length, and about 3-6kg weight;
- Machining cycle time of the production line is within 140s, i.e., one production line performs one finished product that takes even 70s;
- Ensure stable, safe and reliable working.

**Application Effect**

- Its storage shelf can arrange MS100L 180 rods once to meet 3-hour continuous machining, and it is not regulated during changing rods with the same diameter and different specifications, and is slightly done during changing rods with different diameter;
- The stacked rack is driven by the motor, the splitting wheel runs and carries the blank to the robot loading position to transport materials to the robot. When the sensor have not inspected the material within one minute, the motor stops rotation, and sends guard signals to remind the workers to charge into the stock bin. The whole robot setting has multiple guard, safe and stable;
- According to 26 days per month, 2 shifts to 16 hours per day, the counted machining time of MS100L part, a finished product formed in 65s and more than 18000PS per month, the planned production program can meet the customer requirements.

**08 GSK RB08 Robot Matched with a Die-Casting Machine Applied to Pour****Customer Requirements**

- The robot replacing manual transport pours molten aluminium into one die-casting machine.

Application Effect

- The robot replaces manual work, performs operation any time within 24 hours and stably completes working task;
- The die-casting industry is danger, and high-temperature has an effect on worker's physical and psychological health,so using the robot can avoid all kind of accident;
- Die-casting experts think it is a general tendency that the robot is used in the die-casting industry, which is not only pushed by the market, but also required by the technical upgrade.

**09 GSK RB08 Robot Applied to Punching Workshops****Customer Requirements**

- Punching machines in the punching workshop perform automated on-line, and 8 punching machines do continuously punching;
- After being punched, the workpiece is taken out of the punching machine by the robot and then it is input into the next punching machine in parallel, which procedure is repeated till the last process, the punched workpiece taken out by the robot from the last punching machine is put on the conveyor, and then is checked by workers and packed.

Application Effect

- One finished product is performed within about 10s, and its yield is 8600pcs in 24h production time per day, which improves 15% compared to manual work;
- Safety and reliability, and preventing working accidents.

**10 GSK RB08 Robot Applied to Automatic Line of Electric Kettle's Rough Punching****Customer Requirements**

- The robot matched with a punching machine loads/unloads electric kettles, and the control process is stable, is closely match with the production cycle time, and customer requires the whole frequency is 12-14s/pcs to ensure production efficiency.

Application Effect

- It improves its operation safety, and reduces labor intensity and disabling injury frequency rate;
- It improves the product quality and consistency, and reduces labor cost;
- Its punching frequency is 9.5s, it performs 2 shifts per day, which shortens machining cycle time and improves production efficiency;
- Realize precise positioning in high-speed production.

**11 GSK RB08 Robot Applied to Load/Unload Air-Condition's Shell****Customer Requirements**

- The robot matched with a punching machine loads/unloads the air-condition's shell, and the control process is stable, safe and reliable;
- Closely match with the production cycle time to ensure production efficiency.

Application Effect

- The robot's gripper uses frame-type chuck structure which is conveniently adjusted and meets the same type of workpiece with different dimension;
- It improves its operation safety, and reduces labor intensity and disabling injury frequency rate;
- Compared to traditional manual labor, the robot cooperated with the punching machine can reach 10s production period, shortening machining cycle time and improving production efficiency;
- Shorten processing cycle time and improve production efficiency;
- Realize precise positioning in high-speed production.

**12 GSK RB08 Robot Matched with the Punching Machine Applied to Load/Unload****Customer Requirements**

- 2 robots, 2 cooling extruding machines and a 4-axis hydraulic machine complete twice extrusion moulding of a rod; Extruding workpiece: Phosphatized rod;
- One robot loads material and another unloads material from the 1st hydraulic machine, then loads material to the 2nd and last unloads.

Application Effect

- For shaft parts, it uses rolling-magazine loading type (including positioning, separating structure) to ensure more than 2 hours automatic production;
- Preset clearance between the part and hydraulic machine's grinding apparatus is 0.08mm, which effectively demonstrates the RB08 robot's repeated precision (the moulding does not increase auxiliary positioning device);
- Compared to the original manual work, two RB08 robots cooperating shortens wait time of two operations, and one complete workpiece process period is 30s;
- That the higher flexible of RB08 makes it can be avoided the obstacle with the obstacle with the suitable posture even in the narrow space;
- Humanized operation programming makes customers be familiar with and know well operations, and shortens input use time.

**13 GSK RB08 Robot Applied to Load/Unload for the Turning Machine****Customer Requirements**

- One robot with two CNC machines consists of one set of robot loading/unloading system, low-cost and high reliability design;
- Its fixture can simultaneously grab two parts, which compactly fits the part machining's production cycle time to ensure working efficiency.

Application Effect

- Economic design, a one-piece structure of loading/unloading parts;
- Simple and practical overturn structure based on parts with some taper;
- Use pneumatic high-accuracy rotary structure to simplify control and reduce cost;
- According to the turning machine's internal space, distance between the turning machine's chuck and tool post is less than or equal to 260mm, and the robot's paw uses the right-angle structure.



14 GSK RB08 Robot Applied to Production Lines of the Motor's Rear end Cover

Customer Requirements

- Products are the motor's end covers which both sides are machined by two turning machines (it takes teaching demonstration effect on production automation).

Application Effect

- Production lines for motor's rear end cover use 2 robots to realize double-station machining, its double grippers get integrated loading/unloading material, which does not occupy the tool machine's machining time, and largely improves machining efficiency;
- It meets customers' requirements about production cycle time, which has important meaning for teaching demonstration;
- The whole production line is equipped with monitor equipments, and there is an interlocking protecting between the machine and robot to get reliable safety during machining.



15 Automatic punch production line application of GSK RB20 and RB08 Robot

Customer Requirements

- The robot equipped with supporting punching devices to form an automatic punching production line.

Application Effect

- 2 RB20 and 4 RB08 transfer robots, grabbing a workpiece from a bar magazine; after secondary orientation, putting the workpiece into a punching device for punching of various process, placing a workpiece in a finished bar magazine, and then complete automatic punching;
- The magnetisable material is divided by using a magnetic separator, and the non-magnetisable material is divided by a saw-tooth separator so as to prevent the workpiece from stacking;
- Stable and efficient production and ensure product quality;
- Auto-punch production line has become the target of automation factory, and it has a big application market



16 Loading and unloading application of GSK RB20 Robot in gear parts

Customer Requirements

- The gross weight of the gear is 2~6kg, and combine with the gear machining process to achieve the automatic loading and unloading of the gear parts on the lathe and the machining center;
- The loading and unloading system has strong flexibility, and can be applicable to workpieces with various specifications;
- In line with the beat of the part machining and with reasonable layout to guarantee the production quality.

Application Effect

- Adopt the multi-position loop material storage rack and each position's orientation mechanism can be adjusted, and the clamping finger can be adjusted or replaced to adapt to workpieces with various specifications;
- The automatic production line consists of 1 robot for two lathes, one robot for 2 machining centers for loading and unloading, 2 robots transfer workpieces through conveying belts;
- Making use of production line of GSK control system unit to manage the communication between robots and lathes, robots and storage racks, robots and belts, etc. and also manage the statistics for calculation of production capacity and devices utilization rate, etc.



17 Application of GSK RB20 Robot coordinating with punch machine

Customer Requirements

- Upgrading the original production line, and transforming the last four steps into an automation unit;
- The robot is used for replacing manual carrying, and the robot is used for loading and unloading of the punch;
- The automation unit needs to achieve seamless butt joint on the original production line to meet the requirement of the beat.

Application Effect

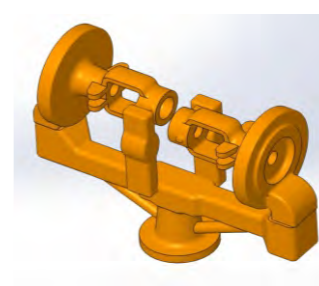
- The workers put the semi-finished products of the previous process on the conveying line and through the visual system above the conveying line, robot grips the workpieces to the loading of punch and achieve the butt joint with the robot;
- 5 robots are used respectively to feed the 4 punches, and the product finally flows out of the conveying line, and is picked up by someone.
- The reformed production line saves the cost of three workers, which obviously saves the production cost;
- The robot can work at any time for 24 hours and it can replace manual work to complete the work tasks steadily;
- The ram work is dangerous, when the workers are working repeatedly for a long time, it is easy to have a feeling of fatigue and boredom. Making the use of robots can avoid the occurrence of various accidents.



18 Flame cutting system matching application of GSK RB20 Robot

Customer Requirements

- The robot replaces the manual cutting workpiece, and the cutting accuracy is $\pm 5\text{mm}$;
- The workpiece orientation clamping device is designed reasonably, and the product compatibility is considered (there are two kinds of products in total, with 2 specifications per product).



Application Effect

- Adopt "one for two" layout form, that is, a robot, two turrets and a pneumatic clamp of each turret can be respectively compatible with workpieces of two specifications of the same type, and the workers unload at the turret side;
- A flame cutting system is mounted on the robot, and the complex cutting path is completed in cooperation with the turret.
- Compared with the manual cutting, the clamping time of the product is shortened, the cutting speed is accelerated, and the production efficiency is remarkably improved;
- Cutting experts believe that flame cutting automation is the trend in the industry, which is both the push of the market and the requirement of technological upgrading.



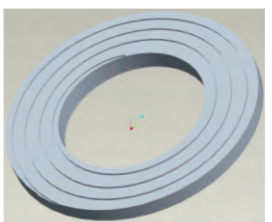
19 GSK RB20 Robot Applied to Load/Unload for the Turning Machine

Customer Requirements

- One robot with two CNC machines consists of one set of robot loading/unloading system, and each turning machine separately completes a workpiece process machining;
- At least complete 5 type of workpiece machining.

Application Effect

- Regulate the position of the positional pin which is assembled on the rotary platform's, and change the gripper and carry out at least 5 kinds of loading/unloading machining of disk-type workpiece;
- Use one rotary platform to load/unload. After all workpieces are completely machined, workers load/unload workpieces on the rotary platform.



20 GSK RB20 Robot Applied to Load/Unload for the Gear Hobbing Machine**Customer Requirements**

- One robot matched with three devices consists of one set of robot loading/unloading system;
- The 1st gear hobbing machine machines the part's tooth profile, and the 2nd chamfering machine does the part's tooth profile corner, and the 3rd gear shaving machine does the part's gear profile;
- One TAKT cycle is 60s to complete part machining.

Application Effect

- The workpiece is clamped on the machine tool with pins, high-precision.
- Matched with one load/unload rack, and servo rotary load/unload rack, the robot can get highly repeated positioning precision and more than 2 hours automatic production;
- Loading/unloading with high-efficiency does not occupy the machine wait time, which realizes 100% machining time availability in the whole process.

**21 GSK RB50 Robot Applied to Load/Unload Hubs****Customer Requirements**

- Load/unload hubs. The robot grabs the outer pointed by the yellow arrow in the following figure. Three-jaw chuck end closes the small convex platform. Use the turning machine to completely machine the hub's inner hole, end and outer, taking 3 minutes and 45 seconds;
- Use the milling machine to machine thread, each big hole of the big end, using 7 minutes

Application Effect

- The machined parts are the automobile hubs, using a center propulsive structure guarantee the parts' positioning accuracy on the turning machine's chuck;
- Linear guide increases the robot's motion stroke, and simultaneously the robot loads/unloads for several machines;
- The vision positioning system resolves workpieces which are disorderly placed, grabbed on the convey belt.

**22 GSK RB50 Robot Applied to Load/Unload to Multi-Axis Machine****Customer Requirements**

- Two robots matched with four multi-machines consist of one set of robot loading/unloading system;
- The machine's 4 stations simultaneously load/unload, and machine end face's holes, side holes and threaded holes;
- One TAKT is 80S can completely machine four workpieces.

Application Effect

- The workpiece is gripped on the machine tool with pins, high-precision;
- Matched with one ring rack with many stations, the robot simultaneously grabs 4 workpieces with highly repeated positioning precision, more than 2 hours automatic production;
- The transfer table completes parts transportation by the magnetic coupling rodless cylinder, reversing parts is done by rotating the air cylinder and clamping it, which can realize process join of two robots;
- The robot can normally work to ensure continuous production process during reloading;
- Loading/unloading with high-efficiency does not occupy the machine wait time, which realizes 100% machining time availability in the whole process.

**23 Automatic Dipping and Sanding application of GSK RRB50 Robot****Customer Requirements**

- Robots replace the manual work of clamping wax mould for dipping and floating sand.

Application Effect

- 1 RB50 transfer robot grabbing the workpiece from the bar magazine and carrying out dipping and floating sand, putting the workpiece back into the bar magazine and completing the work;
- The robot wears protective clothing for dust prevention, and the control cabinet adopts sealed industrial air-conditioning heat dissipation.
- The robot can work at any time for 24 hours and it can replace manual work to complete the work tasks steadily;
- The dipping and floating sand is a high dust job, which has certain damage to the health of human body so the employment is difficult, and the robot can solve this problem.
- In many industries, there is a process of dipping and floating sand, so the application prospect is considerable.

**24 Servo system gripping application of GSK165 Robot 2D vision automobile floor****Customer Requirements**

- Vehicle floor information: Dimensions: 1700mm × 1500mm, Weight: 20kg, material: Q235A;
- Workpieces are conveyed at a speed of 750mm/ s on the belt, and the robot needs to follow up to grip workpieces;
- There are four different workpieces at the same time on the production line, and the robot needs to recognize to grip automatically.
- 1 piece of workpiece packing shall be completed every 6 seconds for the whole line beat;

Application Effect

- The feeding on the conveying line is casual and the position is uncertain, and the 2D vision guide robot is used for servo gripping;
- For compatibility with gripping of 4 products, the robot hand gripping adopt the adjustable endworking pick up device structure;
- Production line configuration, 4 GSK RB165 robots, two conveying belt lines, two sets of positioning capture systems of visual movement, 4 sets of workpiece grabbing endworking pick up devices and one set of production line control system;
- The project breaks the application monopoly of imported brand robots in this field, and is at the leading level in China;
- The automation line can save the cost of 12 workers and if calculate on the basis of 3-shift-changing in a vehicle plant, it can save the cost of 36 workers. With the labor cost of 100,000 workers per year, the project can save 3.6 million in the whole year, and the project can earn the cost at the year of investing it.

**25 Transfer application of GSK RB165 robot 3D vision-guided condenser****Customer Requirements**

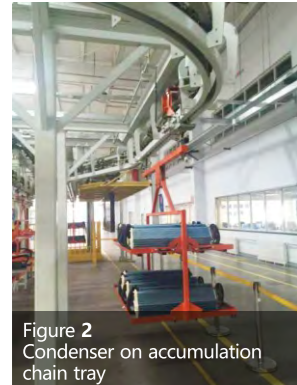
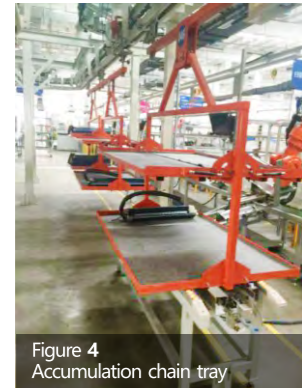
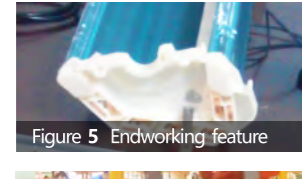
- Casually place the condenser on the static accumulation chain tray to the belt conveyor line in the uniform motion;
- Move the casually placed condenser on the conveying belt which is in uniform motion under some circumstance to the static accumulation chain tray;
- Compatible with the gripping of 6 different workpieces;
- The entire line beat is 10 seconds.

Application Effect

- The shape of the condenser is irregular, the grabbing structure is spatial three-dimensional grabbing, and is arranged at random on the product accumulation chain tray and the belt line;
- The robot gripping scheme is guided by 3D vision, the robot hand gripping adopts the simulated structure, and the contact part of the condenser adopts soft polyurethane;
- The condenser grabbing on the accumulation chain tray is guided and positioned by identifying the white plastic feature of the condenser endworking part, and the camera is mounted on the robot hand gripper;
- The condenser grabbing on the conveying line is guided and positioned by identifying characteristics of the surface of the condenser, and the camera is fixed above the conveying line;



Figure 1 Condenser

Figure 2
Condenser on accumulation
chain trayFigure 3
Condenser on the belt lineFigure 4
Accumulation chain trayFigure 5
Endworking featureFigure 6
Robot hand grippingFigure 7
Surface featureFigure 8
Vision camera on conveyor line

- Two RB165 robots are used to transfer the condenser to the conveyor line from the accumulation chain tray to form two unloading automatic integration workstations. 2 RB165 robots are used to transfer the condenser from the conveyor line to the product accumulation tray to form two loading automatic integrated workstations.
- The robot replaces the manual labor, and is guided stably by the 3D visual guide, and the production line beat is 10 seconds;
- 24 hours working at any time and finish the work task stably;
- It reaches to the intended purpose of robot's automatic identification workpiece and automatically transport the loading/unloading, and can be simultaneously applied to the production of six products and the exchange production of products with each other;
- It can be used for more products by replacing the gripper in the late stage.



Welding Application

01 Application in aluminum template industry of GSK RH06 welding robot

Customer Requirements

- Robot replaces manual work, and alternative welding with double-position.

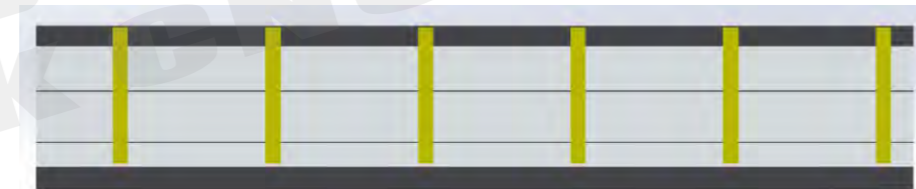


Figure 1.1 Product Image

Application Effect

- The general loading and clamping workpiece, pneumatically clamping to orientate the workpiece, the robot completes welding according to a preset program, and the double-position man-machine alternating operation is performed;
- Equipped with automatic torch cutting mechanism to effectively guarantee the continuity of production.
- 2 welds are replaced by two robots at the same time, and the work can be stably carried out for a long time;
- The welding is a high-risk industry, the high temperature/ smoke dust/ arc light has certain negative influence on the physical and mental health of workers, and robots can avoid the occurrence of various accidents;
- The application of the welding robot in the trend that the manufacturing cost is saved, the quality of the product is greatly improved, and the stability of manufacturing the production capacity of the enterprise is effectively ensured, and the welding robot is an essential element for transforming the labor-intensive manufacturing enterprise to the intelligent manufacturing enterprise.



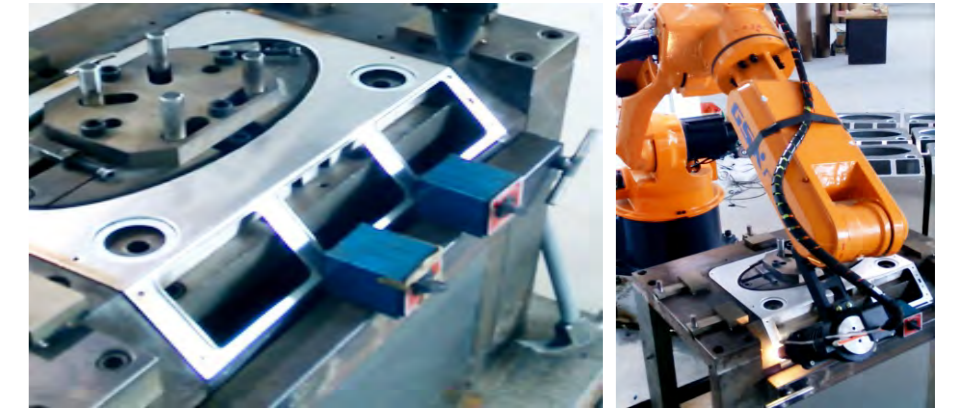
02 GSK RH06 Robot Applied to Laser Welding

Customer Requirements

- GSK RH06 welding robot application in small appliance industry

Application Effect

- Robot replaces manual welding, stainless steel sheet (0.6mm) is welded, and there is no obvious deformation and turn through.
- The general loading and clamping workpiece, pneumatically clamping to orientate workpieces, and the robot completes the welding according to a preset program;
- The robot equipped with optical fiber transmission laser welding machine is capable of high-speed continuous welding;
- Replacing the welder by the robot, replacing the traditional argon arc welding machine by a laser welding machine;
- The welding speed is greatly improved than the traditional argon arc welding, the welding deformation is small, the forming consistency and color of the welding bead are better than that of argon arc welding;
- The use cost of welding consumables is lower than that of argon arc welding.



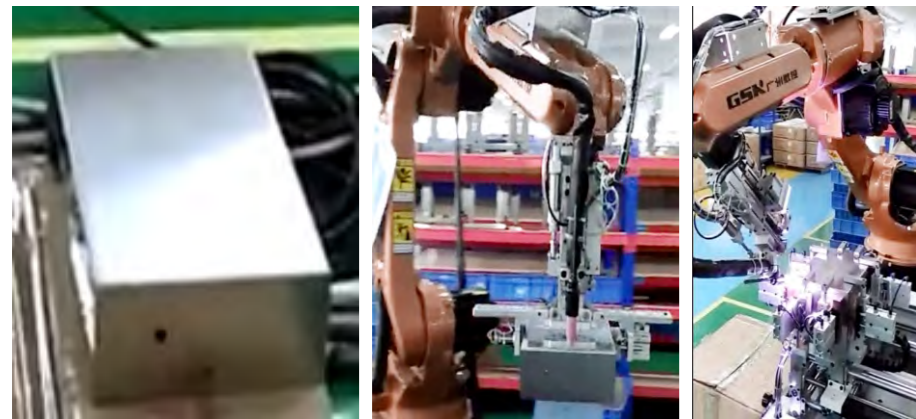
03 Application of GSK RH06 Robot in electrical industry

Customer Requirements

- Robot substitutes artificial loading, unloading and welding, stainless steel products TIG welding.

Application Effect

- The robot grips the workpiece to rotate to the orientation tool, automatically clamping and orientation workpiece, and the robot completes the welding according to a preset program;
- The robot is matched with pneumatic clamping and argon-arc welding machine, and can be automatically welded after loading and unloading;
- Replacing operator and welder by robot to achieve full-automatic welding and no need labor any more;
- The tooling is flexible tooling, and the length and width can be adjusted automatically according to the selected procedure.



04 GSK RH06 Welding Robot Applied to Axle

Customer Requirements

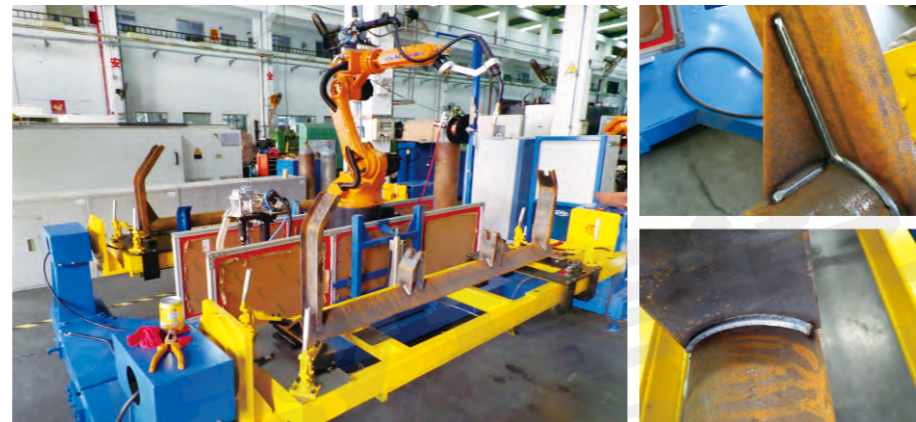
- The spot welded semi-product completes full-length welding, and the welding must not be distorted, must not appear insufficient welding, undercut, air vent and other welding faults, and the welding fixture should be as simple as possible.



05 GSK RH06 Welding Robot Applied to Some Company's Welding Fixture

Customer Requirements

- The spot welded semi-product completes full-length welding, and the welding must not be distorted;
- The workstation can apply products with different specifications, the weld assembly can be dismantled during welding to save time;
- The workstation with compact structure and proper rational utilization has arc light guard.



06 GSK RH08 Welding Robot Applied to Welding Fixture

Customer Requirements

- Elements of parts are welded together, the welding must not be distorted, and the weld assembly can be dismantled simultaneously during welding to save time.

Application Effect

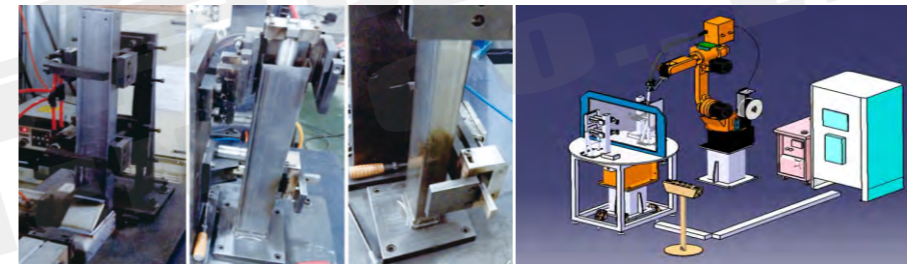
- Using industrial robot to replace manual welding improves the welding quality and efficiency, and the welding appearance is beautiful to enhance the visual aesthetics.



07 GSK RH06 Welding Robot Applied to Jiechang Linear Transmission Company's Welding Fixture

Customer Requirements

- Parts and components are clipped by the customized fixture to perform full-length welding, and the welding must not be distorted, must not appear insufficient welding, undercut, air vent and other welding faults
- Try to reduce manual work activity range between two stations in the robot reaching area. Rationally distribute workstations, and loading/unload.
- The workstation has interference to arc light and other guard facilities. Two stations independently work, without interference each other to further improve the device utilization;
- The worktable is applied to three products' welding requirements.



08 GSK RH06 Welding Robot Applied to Laser Welding

Customer Requirements

- One robot and one welding station consist of one robot welding system;
- Have no obvious weld penetration, well consistent welding forming;

Application Effect

- Manually clamp workpieces, use pneumatic to complete clamp positioning, and the workpiece clamped one time completes all welding work;
- Consistent welding forming appearance is beautiful without weld penetration, stable quality and small deformation after welding.



09 GSK RH06 Welding Robot Applied to MAG/ CO² Welding

Customer Requirements

- The product must meet customers' techniques, process drawing and quality's requirements;
- Butt welding interval is less than 0.5mm;
- Corner joint welding interval is less than 1mm;
- Conformity error at workpiece welding joint is less than 0.3mm;
- Workpieces have no welding burrs and other flaws after being welded;
- Welding efficiency: the welding time is $\leq 30S/PC$.

Application Effect

- Manual fixture workpiece, use the pneumatic clamping positioning, and the revolving shaft adapts with the overall welding operations of the robot at a time;
- When the workpiece is fixed by manual, robot is performed the welding at another side to guarantee the consecutiveness during the production.



10 GSK RH06 Welding Robot Applied to Automobile Accessories' Welding Fixture

Customer Requirements

- Parts and components are clipped by the customized fixture to perform full-length welding, but the welding must not be distorted, must not appear insufficient welding, undercut, air vent and other welding faults;
- Reduce manual work's operation range between two stations as much as possible in the range of the robot arriving, properly layout stations, and workstations should be compact, reasonably using space, and reducing occupied area;
- Its workstations have arc light protection, safety light curtains and other safety facilities, two stations independently work, without interference each other to further improve the device utilization;



Stacking/Stamping Application

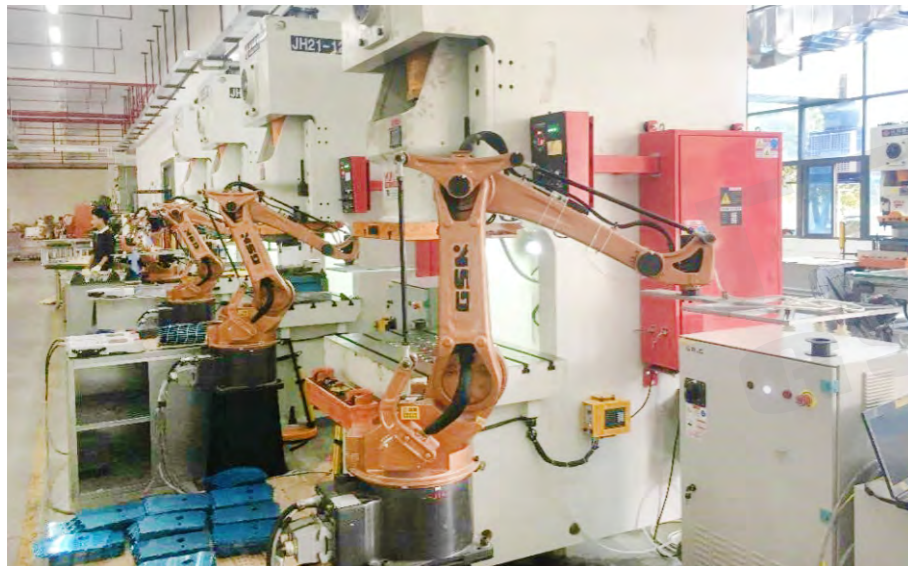
01 Application of RMD08 Palletizing Robot in Metal Plate Stamping

Customer Requirements

- Use four robots to load and unload materials for three punching machines, finished products are sent from conveyor line;
- High flexibility for loading and unloading system, suitable for workpieces with different specifications.

Application Effect

- Workers put semi-finished product in the previous process to conveyor line. Positioning with the upper visual system, the robot grabs workpiece to load materials for punching machine;
- Use four robots to load and unload materials for three punching machines, finished products are sent from conveyor line, taken by workers;
- The renovated assembly line greatly saves cost by cutting down three workers;
- Robot replaces workers to work 24/7 and finish work task steadily;
- Convenient operation, high efficiency and high quality.



02 GSK RMD08 robot applies to one company's automatic punching production line on the left and right panel of a coffee machine.

Customer Requirements

- The matched punching equipment of robot consists of automatic punching production line one the left and right panel of a coffee machine.

Application Effect

- Robot replaces labor; it can be consecutively operated for 24 hours and completed the tasks stably;
- Stable & high-efficient production; quality guarantee;
- The automatic punching production line becomes an objection of automation factory, which owns a wide application market.



03 GSK RMD08 robot applies to one company's punching of the body of thermos bottle.

Customer Requirements

- Robot replaces labor; it completes the technical process: "Punching-Punching bottom-Place unloading line."

Application Effect

- Robot can be consecutively operated for a long time to improve the productivity;
- Replace the robot's arm can be compatible with the production of different products.



04 GSK RMD08 robot loading/unloading application with vacuum inner container in one company

Customer Requirements

- It is suitable for the different workpiece productions with vacuum inner container: the maximum weight is about 1.5kg;
- Robot captures the inner container to put into the vacuum roll-welding device from the belt line; simultaneously, take out the inner container completed by roll-welding to put into automatic laser marking device, and then the production is performed;
- Production beat: 16 seconds/piece.

Application Effect

- Robot replaces labor, which can be consecutively operated for 24 hours and then can be stably completed the task;
- It adapts to the production beat of assembly line, which adopts the roll-welding layout as 1 to 2, carries out the 13 second/piece for the production beat and saves the production cost as well as improves the efficiency;
- The production character of the appliance industry is variable types, strong equipment compatibility, frequent and single of production process, intensive labor force and short production period; if it uses the robot to replace the labor, it will reduce the production cost and hold the production period.



05 GSK RMD08 robot applies the automatic production of Shenzhen's punching inner container

Customer Requirements

- Robot replaces labor that completes the workpiece delivery and loading/unloading for 3 punching machines with 63 tons and loading/unloading machines;
- Production types are variable, and single batch production is less; wide universality of robot's fixture so that it needs to capture the loading/unloading for different products;
- Dedicated production machining time is 6 seconds; production capacity: 350pcs/hour.

Application Effect

- It adapts to the compatible flexible manipulator design and solves the trouble that the different types and pilot production are shared with a same production line based upon the less improvement cost;
- The robot operation is closely matched up with punching machine, so that it operation is stable and maximized to improve the production efficiency and reduce the production cost.



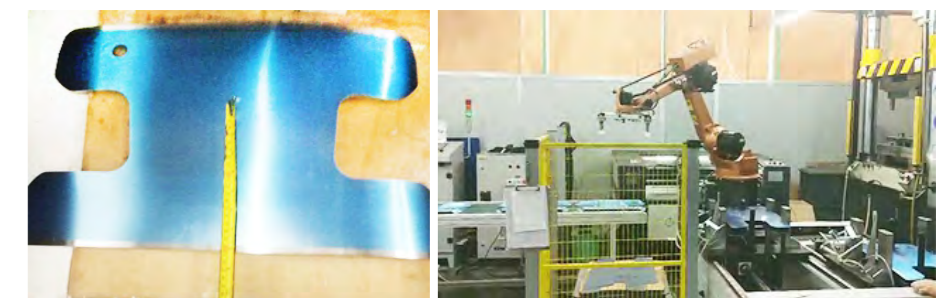
06 GSK RMD20 robot automatic loading/unloading production application on punching and laser cutting

Customer Requirements

- That robot replaces labor which can be completed the loading/unloading production among one grease-press punching, laser cutting and loading/unloading bar;
- Production types are variable, and single batch production is less; wide universality of robot's fixture so that it needs to capture the loading/unloading for products with different appearance;
- The dedicated machining time of production is 25 seconds, production capacity: 120pcs/hour.

Application Effect

- It is used the compatible and flexible manipulator design and settled multiple types by less cost as well the troubles when the pilot production shares with a same production line;
- The production character of the appliance industry is variable types, strong equipment compatibility, frequent and single of production process, intensive labor force and short production period; if it uses the robot to replace the labor, it will reduce the production cost and guarantee the production cycle.



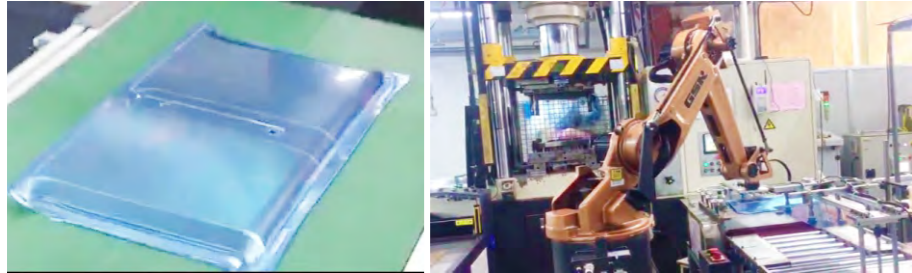
07 GSK RMD20 robot applies the automatic production loading/unloading for kettle decorative board

Customer Requirements

- That the robot replaces the labor force to complete the workpiece oil-brushing, loading/unloading for the oil press, and the production process of laser cutter's loading/unloading as well;
- Production types are variable, and single batch production is less; wide universality of robot's fixture so that it needs to capture the loading/unloading for products with different appearance;
- The machining time of laser cutter is 20 seconds; production capacity: 180pcs/hour.

Application Effect

- It is used the compatible and flexible manipulator design and settled multiple types by less cost as well the troubles when the pilot production shares with a same production line;
- The production character of the appliance industry is variable types, strong equipment compatibility, frequent and single of production process, intensive labor force and short production period; if it uses the robot to replace the labor, it will reduce the production cost and guarantee the production cycle.



08 GSK RMD50 robot applies directional palletizing for diverse products

Customer Requirements

- It is used the corresponding equipments of industry robot for replacing labor force to complete production process of directional palletizing for diverse products.

Application Effect

- The robot replaces the labor force, which can be operated for 24 hours and completed the task with high efficiency;
- Reduce the quantity of labor force and decrease the labor intensity.



09 GSK RMD50 robot applies in automatic palletizing for egg roll with whole cartoon

Customer Requirements

- That the robot replaces the labor force and finishes the production process of cartoon's automatic palletizing;
- Palletizing 5 layers, and its palletizing height is 1825mm, 1975mm is the total height with cardboard;
- It can be palletized one cartoon with 7-8 seconds; Capacity of production line: 320 seconds/palletizing.

Application Effect

- If the robot is performed the palletizing, you will find the appearance of the palletizing is orderliness, stability; the automatic package-sealing, palletizing production line can enhance the company's image and greatly reduce labor intensity and manual cost.



10 Loading and unloading of GSK RMD200 palletizing robot in a famous machine tool factory

Customer Requirements

- Replace the manual operation on the whole assembly line with automated whole-process monitor
- Robot automated motion such as loading, unloading, glue filling, drying and cooling multistation;
- Identify position offset while clamping product every time.

Application Effect

- Use additional axis rail to help robot monitor multistation;
- Automatic compensation and correction of high-precision visual system towards position offset;
- High automation of assembly line and continuously steady process flow.



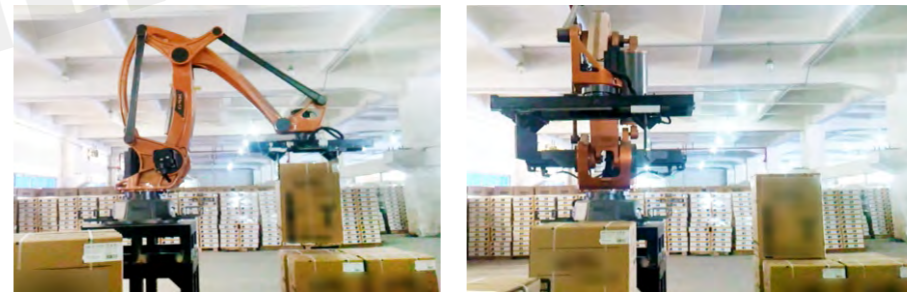
11 Palletizing washing machine application of GSK RMD160 palletizing robot

Customer Requirements

- The palletized workpiece is 500 * 500 * 720mm, and the finished product of the washing machine with the weight of about 40-60kg;
- The beat of the stacking line meets the beat of the upstream production line, and the robot palletizing beat is 15s;
- Ensure stability and reliability during the process.

Application Effect

- One RMD160 transfer robot and the hand to grip the washing machine, moves the washing machine out of the conveying line, and finishes the palletizing operation on the tray;
- A pressure sensor is arranged on the robot hand gripper to prevent the washing machine from being damaged, and the washing machine is orientated at the end of the conveying line.
- Robot palletizing unit is compatible with 5 types of palletizing;
- The RMD robot will palletize the left and right, i.e., two stacks, one stack of left and right stacks, 8 sets of 60kg washing machine of each stacking/the robot can be palletized 6 sets of 60kg washing machines, the stack type being divided into upper and lower layers, each layer being 4 sets;
- According to the production plan of 26 days every month, 2 shifts per day for 16 hours per day, according to the palletizing beat of 15s; monthly robot palletizing is 99840 sets in the large unit of washing machines. And fully meets the production line capacity of the washing machine.



12 GSK RMD200 robot applies the rice bag palletizing for one company

Customer Requirements

- Connecting with manual package and package-sealing production line; replacing the manual to perform the automatic palletizing;
- Compatible 5-50kg, total five specifications for the rice bag.

Application Effect

- Connecting with the artificial production line, achieving the rice bag automation technology process: put down, guide, height adjustment, flat and palletizing capture;
- It is used the product-change adjustment by labor force, and the production-change can be reduced by MPG and rocker to improve the working efficiency and compatible five specification for the rice bag.



Polishing Application

01 GSK RB08 Robot Applied to Deburring in Automobile Assembly Production

Customer Requirements

- Connected with their customers' devices, it can automatically load, perform burring, unload and other operations meeting general user operation conditions.

Application Effect

- The whole robot system runs stably, saving device investment, ensuring well continuous production;



02 GSK RB20 Robot Applied to Polish Cylinder in Automobile Industry

Customer Requirements

- Docking Party A's device, automatically polish and bur the workpiece;
- Total loading/unloading, polishing and burring time is below 85S;

Application Effect

- Closely match with its cycle time, the robot's production runs smoothly, and its cycle time is 70S.



03 GSK RB50 robot sand filter polishing application

Customer Requirements

- Robot replaces labor to capture the sand filter for operating the automation polishing;
- Hemp wheel polishing on workpiece surface, beat < 60S/workpiece;
- There is no flaw such as scratch, water wave on the surface.

Application Effect

- That robot replaces labor can be consecutively operated for 24 hours, and stably completed its task;
- The polishing industry is dangerous; especially in the dust polishing, for example, the wearing from sand, gravel and metal dust, and the dust will affect the workers' health; accidents may be avoided if you use the robot.



Professional Skill Competition Platform

01 GSK Series of industry robot professional skill competition platform (CLASS II)

GSK03A2 intelligent manufacturing real training platform consists of six-axis industrial robot unit, numerical control machine tool, intelligent bar magazine, visual detection device and control system, intelligent production line control system and so on. The platform can intelligently identify the randomly placed blank in the bar magazine through color, number, shape, feature and the like, and send the identified position, type and other data to the industrial robot. The industrial robot grips the blank, the intelligent production line control system automatically calls the program in the numerical control machine tool, the blank is machined, and after the processing is finished, the robot returns the finished product to the designated position of the finished product magazine. And the intelligent manufacturing of different quantities of different workpieces can be completed according to the uninterrupted circle function achieved by the proposed program.



02 GSK INTELLIGENT MANUFACTURING AND PRODUCTION PRACTICE TRAINING BASE — The national first intelligent manufacturing technology application skill competition designated technical platform (class I events)

The platform is based on the practical application and development of intelligent manufacturing technology. According to the principle of "Equipment Automation + Lean Production + Management Informatization + Artificial High Efficiency", The typical manufacturing equipment, such as NC machining equipment, industrial robot, product detection equipment and data information collecting equipment, are integrated into the "hardware" system of intelligent manufacturing unit, and combined with the comprehensive application of "software" such as intelligent control technology, high efficiency machining technology, industrial internet of things technology, RFID digital information technology, etc. to form the technology platform of competition. The competition highlights the technical skills of intelligent decision-making management system such as digital equipment interconnection, man-machine coordination and part flexibility design, traceability process and MES.

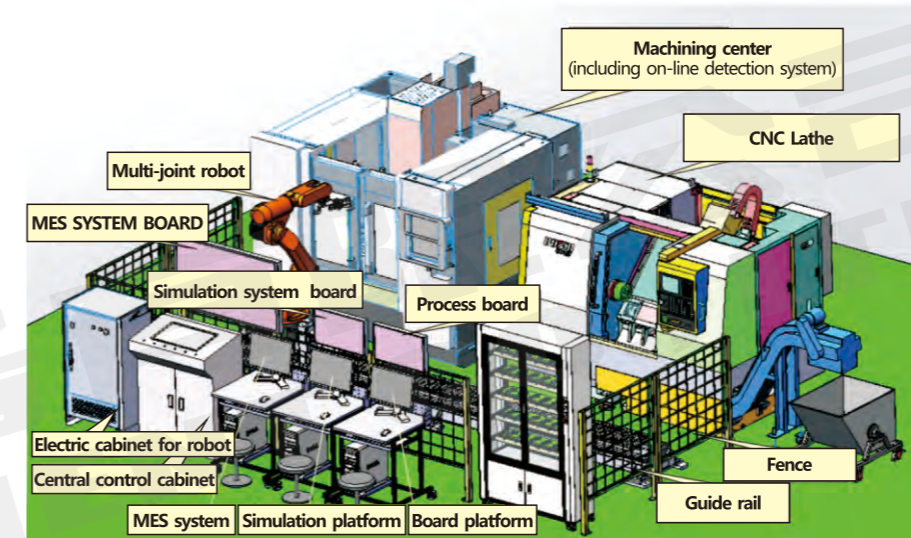
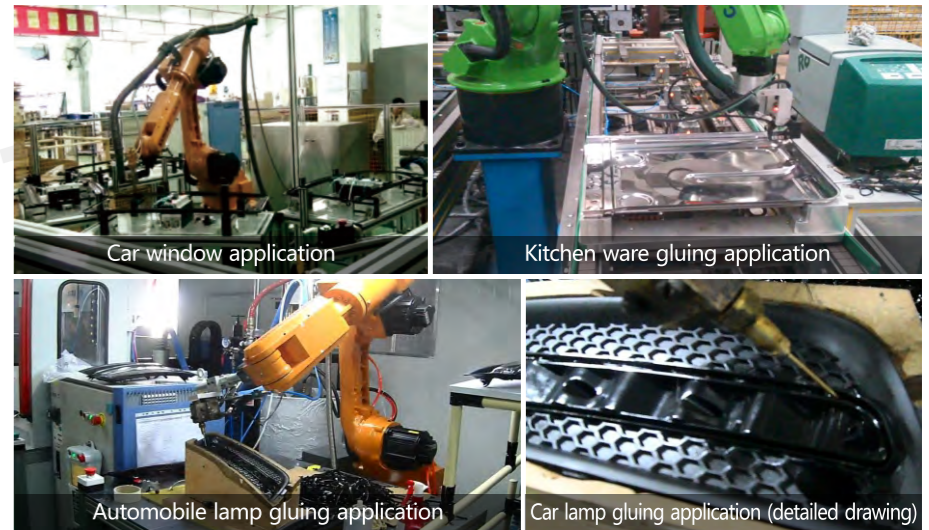


Table1. Main configuration list of cutting processing intelligent manufacturing unit

Serial No.	Device Name	quantity	Unit
1	CNC Lathe	1	Set
2	Machining center (three-axis)	1	Set
3	On-line measuring device (for machining center)	1	Set
4	Pneumatic accurate flat clamp (for machining center)	1	Piece
5	Industrial robot and clamp	1	Set
6	Guide rail for industrial robot	1	Set
7	Stereoscopic warehouse	1	Set
8	Visualization system and display terminal	3	Set
9	Central electrical control system (including wireless router)	1	Set
10	MES software system	1	Set
11	Safety protection system	1	Set
12	FRID reader/ writer and FRID chip	1	Set
13	Intelligent manufacturing simulation software	1	Set
14	CAD/ CAM software	1	Set
15	Programming and design position computer	2	Set

Gluing Application



Packaging Application



