

INTELLIGENT MANUFACTURING EXPERT

STOCK CODE 688165

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EFORT

EFORT

Creating intelligent robot intelligently, Liberating human productivity.

EFORT INTELLIGENT EQUIPMENT CO.,LTD.

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OFFICIAL ACCOUNT

INTELLIGENT MANUFACTURING EXPERT

ARC WELDING ROBOT





CONTENTS

—
Directory

P01

Company
profile

P03

Global
presence

P05

ARC series arc
welding robot

P06

Application

P07

Platform-based
mode

P08

Platform type control cabinet
and additional cabinet

P09

Rich arc welding
process package

P10

Standard combination
composition

P11

Peripherals

P13

Intelligent
welding

P15

Contact
information

COMPANY PROFILE

Vice chairman unit of
China robot industry alliance

Undertake more than
30 national R&D projects



2007

EFORT was founded headquartered in Wuhu, Anhui Province China, 2007

2020

Listed in STAR Market

52,178W

Registered Capital

EFORT Intelligent Equipment Co Ltd, a prominent high-tech company in the industrial robotics industry, has been listed on the Science and Technology Innovation Board since 2020. Ever since EFORT was founded, we have been committed to forward-looking strategic planning and relentless pursuit of core technologies. As a result, we have gradually become a well-known provider of robot solutions and intelligent manufacturing expertise in China. Our focus lies in developing a full range of robot products and offering cross-industry solutions for intelligent manufacturing. Through the integration of advanced global automation technology and experience, we have established a collaborative development model encompassing the entire industrial chain, which includes core robotic components, complete robot systems, and high-end robot system integration.

Based on the development and manufacturing of universal robots, EFORT provides solutions in many application fields including spraying, welding, palletizing, handling and loading and unloading.

Those solutions are widely applied in diverse industries, including automotive, 3C electronics, photovoltaics, lithium-ion batteries, metal products, furniture, household appliances, food, and beverage. Our robots and solutions have made their presence across China and are exported to numerous countries and regions in Europe, Asia, Africa, and Oceania.

As EFORT expand our business globally, we are establishing local subsidiaries and branches in Asia, Europe, and America. By leveraging our access to global resources, we aim to assist our customers in enhancing their competitiveness.

EFORT is one of the first batch of "Little Giant" industrial enterprises in China with the characteristics of "SRDI(specialized, refinement, differential, innovation)" and serves as the vice chairman of the China Robotics Industry Alliance. We are proud to be counted among the top 10 members of China Robotics Industry and the top 100 enterprises in China intelligent manufacturing industry.

Our achievements also include the establishment of a national enterprise technology center, national-local joint engineering research center, academician workstation, and post-doctoral research workstation. Furthermore, EFORT has been at the forefront of various national science and technology projects in the field of robotics, including the prestigious National 863 Program and the National Key R&D Program.

As EFORT, we insist on the value proposition of "customer-centric". We continuously strive to understand market demands and provide the best solutions for our customers. With a nationwide professional team and a 24/7 online customer service system, we are fully committed to help our customers to create enhanced value.



CORPORATE CULTURE



Mission and Vision

Creating intelligent robot intelligently,
liberating human productivity.



Values

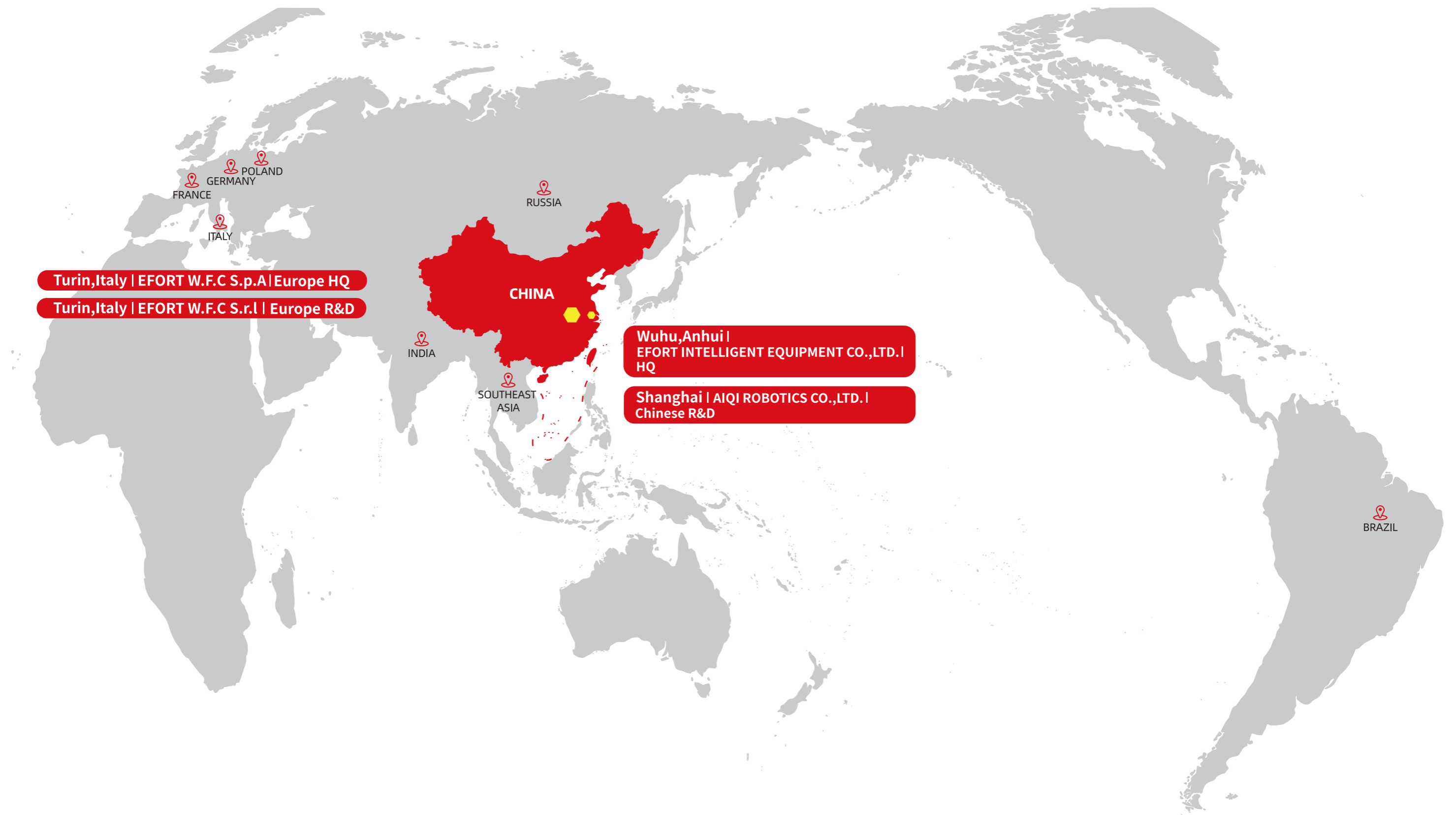
Customer-centric
striving oriented
commitment to continuous improvement



Cultural philosophy

Sincerity Diligence Lean
Innovation Collaborative

EFORT GLOBAL PRESENCE





ARC series arc welding robot

Leading robotic systems, Platform ontology design, EFORT respond to customer needs, Solve the pain points of arc welding application

Customer demand:
— Improve welding quality

To meet the welding quality requirements with high rigidity and high trajectory accuracy

- ◇ High rigidity body design, to meet the stability of the whole arm span space
- ◇ Repeatable positioning precision, high precision and high quality production
- ◇ Excellent track accuracy, 30% higher than the previous generation of products, focusing on optimizing the accuracy of welding operation speed interval, suitable for cutting and laser welding applications
- ◇ The TCP winding precision is improved by 20%, and the jitter suppression algorithm is used to improve welding quality

Customer demand:
— Reduce equipment maintenance

Adapt to welding process requirements, reduce equipment maintenance, improve reliability

- ◇ Optimization design: large hollow and high precision gearbox design, 57mm large hollow, reduce the working space restriction caused by cable interference, reduce line breaking, simplify teaching
- ◇ Functional guarantee: Anti-collision and impact technology to ensure zero point, accuracy and quick recovery after full speed position space collision
- ◇ Easy maintenance: Provide quick correction tools, monitor tool deviation to ensure welding quality, correct zero point, and quickly resume operation
- ◇ Industry certification: Mean time between failure (MTBF)>30000 hours, all systems pass EMC test

Customer demand:
— Improve equipment standardization and integration ability

Rich model selection and platform product design improve the integration ability and installation efficiency



57mm

Large hollow design, five-axis offset 75mm, can also be applied to various integrated cables, improve the integration ability



75% ↓

The control cabinet is 75% smaller than the previous generation, and the protection level is up to IP54. Enrich the device environment.



High joint speed index, time optimization algorithm, more beat lifting space



The wrist is loaded with a maximum of 12KG, which is suitable for multi-sensor combination applications such as lasers, cutting, and 3D cameras

Single arm large hollow, applicable to a wide range, to solve wrist interference and cable interference

The new control cabinet design of the incoming line solves the problem of increasing the cost of space and pipelines

High joint speed index to meet customer demand for production beats

High load to meet customers' different process scenarios

EFORT



Typical application case

From thin plate to medium-thick plate, handy, from batch welding to non-standard intelligent, versatile

Auto parts
— Challenge import substitution

- ◇ All series through MTBF30000 hours certification, to provide reliability guarantee
- ◇ Excellent joint movement speed indicator improves production efficiency
- ◇ Rich external communication interfaces improve the integration capability
- ◇ Reliability support and guarantee of advanced welding process

Representative applications: light truck battery box, instrument bracket, subframe, exhaust pipe, etc



Sheet metal parts
— King of cost performance

- ◇ Standard welding sleeve machine, easy maintenance, out of the box
- ◇ High rigidity design body, improve welding quality
- ◇ Welding processes such as low spatter and fast discontinuous welding reduce subsequent workload
- ◇ Improve joint motion speed and productivity

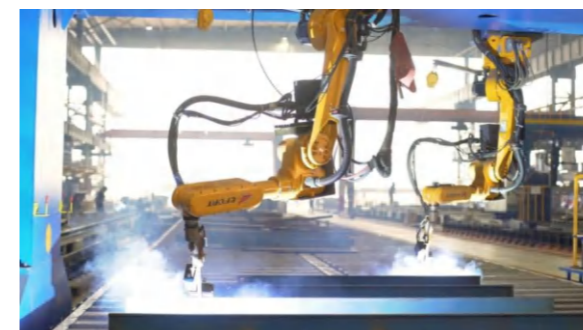
Representative applications: fitness equipment, electric two - and three-wheeler, sheet metal furniture, etc



Construction machinery
— Breakthrough medium and thick plate application

- ◇ Comprehensive advanced welding process package, to solve the consistency of incoming materials (See welding function for details)
- ◇ Rich external shaft selection configuration and functions, to ensure the stability and reliability of the system
- ◇ Standard welding sleeve machine with high-pressure locating
- ◇ Advanced welding features for external shaft applications

Representative application: motor seat, fuel tank, boom and other parts



Ships/steel structures
— Intelligent welding new blue ocean

- ◇ Excellent ontology design, high absolute accuracy, strong system robustness
- ◇ Fully open SDK interface to improve integration ability
- ◇ Excellent welding process package ensures welding quality
- ◇ Whole process intelligent welding system support and enablement

Representative application: steel beam, steel column, box beam, group, etc

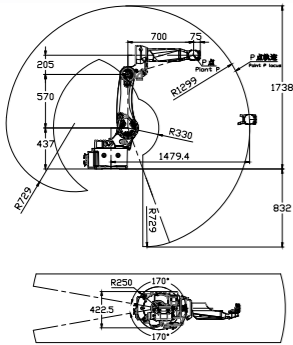




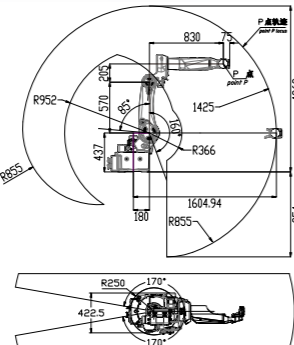
Platform type for welding

Better performance parameters at the same level

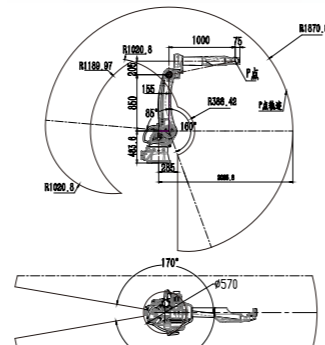
◀ ARC12-1400 ▶



◀ ARC10-1600 ▶



◀ ARC12-2000 ▶



Platform type control cabinet and additional cabinet

Miniaturization, standardization, easy integration. Low cost of ownership, high protection, easy to cope with a variety of complex environment



Miniaturized cabinet

- Control cabinet compact size, lighter weight, flexible installation;
- High internal integration and improved reliability.



Low cost of ownership

- The whole machine has low energy consumption, high energy efficiency and low daily operation cost;
- Single-phase 220V and additional cabinet three-phase 380V power supply into the line, no need to buy another transformer, cost saving;
- Improved reliability, lasting operation, and low maintenance cost.



High protection level

- Ip54 high protection grade, ensure the product in the harsh environment stable operation, improve work efficiency.



Standardized design

- Robot control cabinet and additional cabinet unified standard, the same size, high protection, can be easily integrated in a variety of harsh working environment.

Robot EC2-S type control cabinet and additional cabinet specifications

Project	Control cabinet specification	Additional cabinet specification
Structure	Dustproof construction IP54	Dustproof construction IP54
Number of axes	6 axes	1~4 axes
Overall dimension	605×440×210mm	605×440×210mm
Approximate mass	20KG	20KG or less
Cooling mode	Indirect cooling	Indirect cooling
Ambient temperature	Running: 0°C~+45°C Storage: -40°C~+55°C	Running: 0°C~+45°C Storage: -40°C~+55°C
Relative humidity	Running: 80%RH, no condensation (40°C) Storage: 93%RH, no condensation (40°C)	Running: 80%RH, no condensation (40°C) Storage: 93%RH, no condensation (40°C)
Power supply specification	Single-phase 220V ± 10%, 50/60Hz Three-phase 220V ± 10%, 50/60Hz(optional)	Three-phase 380V ± 10%, 50/60Hz
Input-output signal	Universal 16-channel PNP digital quantity output (optional NPN type) Universal 16-channel PNP digital quantity input (optional NPN type)	/
Storage capacity	1GB (USERS CAN USE MORE THAN 512MB)	/
Network interface	EtherCAT interface x1 WAN interface x1 LAN interface x1 Profibus port x1*(Hardware required with *)	ETHERCAT INTERFACE X1
Serial port I/F	RS232	/
Bus communication	TCP/IP, Modbus-TCP, EtherCAT, EtherNet/IP, Profibus DP*, CCLINK*, Profinet* (Optional hardware with *)	EtherCAT
Secure external interface	Input emergency stop, safety door lock, safety grating, emergency stop output interface	/
Other interface	Lock release unit interface (for use with Efort lock release box)	/

Controlling Axis		6 axes		
Working load on the wrist		12kg	10kg	12kg
Repeated positioning accuracy		± 0.03		
Robot weight		165kg	169kg	185kg
Maximum reach		1479mm	1604mm	2025mm
Body protection class		IP67(wrist)/IP54(other)		
Protection level of electric cabinet		IP54(standard arrangement)/IP20(matching)		
Driving mode		AC servo motor is used for electric servo drive		
Installation mode		Ground installation, top hanging installation, wall installation		
Installation condition	Ambient temperature	0~45°C		
	Ambient humidity	Usually below 80% (40°C) (no condensation phenomenon)		
	Vibration acceleration J4	4.9m/s ² (Less than 0.5G)		
The wrist allows load torque	J4	26N·m	22N·m	22N·m
	J5	26N·m	22N·m	22N·m
	J6	11N·m	9.8N·m	9.8N·m
The allowable load moment of inertia of the wrist	J4	0.9kg·m ²	0.65kg·m ²	0.65kg·m ²
	J5	0.9kg·m ²	0.65kg·m ²	0.65kg·m ²
	J6	0.3kg·m ²	0.17kg·m ²	0.17kg·m ²
Maximum uniaxial velocity	J1	265°/s	265°/s	220°/s
	J2	255°/s	255°/s	180°/s
	J3	270°/s	270°/s	210°/s
	J4	450°/s	450°/s	420°/s
	J5	450°/s	450°/s	420°/s
	J6	700°/s	700°/s	700°/s
Range of motion of each axis	J1	± 170°	± 170°	± 170°
	J2	- 150°/+85°	- 150°/+85°	- 160°/+77°
	J3	-85°/+175°	-85°/+175°	-85°/+175°
	J4	± 190°	± 190°	± 190°
	J5	± 190° (When integrating application cables externally) ± 140° (When integrating application cables internally)	± 190° (When integrating application cables externally) ± 140° (When integrating application cables internally)	± 190° (When integrating application cables externally) ± 140° (When integrating application cables internally)
	J6	± 450° (When integrating application cables externally) ± 220° (When integrating application cables internally)	± 450° (When integrating application cables externally) ± 220° (When integrating application cables internally)	± 450° (When integrating application cables externally) ± 220° (When integrating application cables internally)



Rich arc welding process package

A variety of high-level process packages to meet the needs of different industries



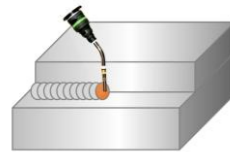
Standard composition

Rich welding configuration beautiful and stable welding quality

Arc welding foundation

Meet the standard function package of routine use, adapt to 80% welding scenarios

- Support CANOpen/DeviceNet bus and analog module, suitable for more than 90% of the market welding machine;
- There are 6 kinds of swing welding forms, such as sine/triangle/arc/8 font/three-dimensional triangle/ three-dimensional V type, to meet various applications;
- With intermittent welding function, specified number of segments or spacing welding

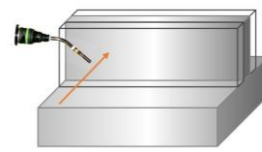


Welding positioning	X
Welding tracking	X
Function combination	General
Applicable work piece	General
accuracy	± 0.1 mm
Working material	General

Contact locating

Through the welding wire and the workpiece contact, the actual workpiece positioning

- Automatically calculate and determine the weld position according to the program setting, without the need for accurate teaching point position;
- High cost performance, no need to increase the external equipment;
- Wide adaptability, support acute Angle, obtuse Angle finding, to adapt to different customer site requirements, groove Angle.

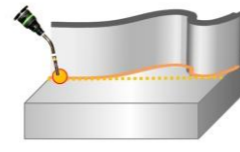


Welding positioning	√
Welding tracking	X
Function combination	Can be used in combination with arc tracking, multi-layer and multi-channel
Applicable work piece	4mm and above
accuracy	±1 mm
Working material	Surface conductivity

Arc tracking

The weld deviation can be adjusted in real time by welding real-time current feedback

- High cost performance, no current collection box, matching support bus communication welding machine;
- Wider adaptability: it can realize more than 120A process, at the same time, single pulse mode, flux-cored wire can also realize stable arc tracking;



Welding positioning	√
Welding tracking	√
Function combination	Can be used in combination with contact locating
Applicable work piece	4mm and above
accuracy	±1 mm
Working material	Iron, stainless steel

Laser locating/tracking

Non-contact workpiece positioning and high precision weld tracking are realized by laser sensor

- High efficiency and high precision, faster than contact locating, higher accuracy;
- Simple instruction, automatic adjustment of welding gun position and attitude through laser sensor, without accurate alignment;
- Wide adaptability, thin plate and medium-thick plate can be used, laser can recognize a variety of joint forms.

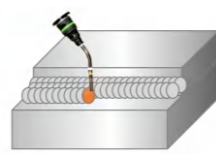


Welding positioning	√
Welding tracking	√
Function combination	Can be used in combination with multiple layers and channels
Applicable work piece	General
accuracy	±0.5mm
Working material	surface is non-mirror

Multilayer multichannel

Through the interface setting of the teaching device, the multi-layer and multi-channel weldings completed

- The teaching device can directly set the deviation of each weld and the process parameters of each weld, without repeated teaching work;
- Adapt to a variety of weld forms, fillet welding, butt and a variety of groove forms of weld.
- Can be combined with contact positioning, laser positioning, additional axes, etc

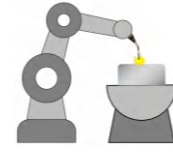


Welding positioning	X
Welding tracking	X
Function combination	Can be used in combination with contact and laser locating
Applicable work piece	8mm and above
accuracy	±0.5mm
Working material	General

Additional axis alignment coordination

Gantry rail interpolation movement to achieve wide range of welding, positioner coordination to achieve complex working conditions

- Additional shaft can be parametrized on the teaching device, no need to customize software, convenient and fast;
- The control system supports gantry dual drive control, without separate control, cost-effective;
- Gantry and earth rail participate in robot interpolation, and can cooperate with the transformer at the same time, to meet a variety of complex scenarios.



Welding positioning	X
Welding tracking	X
Function combination	Can be used in combination with contact and laser locating
Applicable work piece	General
accuracy	±0.5mm
Working material	/

Welding power supply	EFT -350L	EFT -350Pro	EFT -500P	EFT - MIG500RP
Characteristic	Ultra-low splash and fast spot welding	Ultra-low splash, constant penetration, ultra-short arc pulse	Single pulse, fast pulse, deep penetration pulse	Ultra high frequency, single pulse, double pulse, short arc pulse, large penetration
Contour drawing				
Rated input voltage/frequency	Three-phase 380±10%/50HZ			
Output current	60 A ~ 350 A	60 A ~ 350 A	60 A ~ 500 A	60 A ~ 500 A
Output voltage	17V ~ 31.5 V	17V ~ 31.5 V	17V ~ 39 V	17V ~ 39 V
Transient load rate	60%	60%	100%	100%
Technological advantage	<ol style="list-style-type: none"> Can realize 1~3mm carbon steel ultra-low splash welding, welding splash reduction by 60%; Reduce 10% ~ 20% heat input, welding sheet is easy to control, small deformation. 	<ol style="list-style-type: none"> Welding splash minimal, welding joint forming beautiful; More optimized arc initiation, arc retraction and ball removal functions; Built-in welding expert database, automatic intelligent parameter combination. 	<ol style="list-style-type: none"> With contact sensing function, it is convenient for people to complete the locating operation of the standard high-voltage locating; Welding parameters can be transmitted to the robot in real time, and the robot arc tracking function is more stable; One-pulse and one-drop drop transition, welding without splash. 	<ol style="list-style-type: none"> One-pulse and one-drop control technology to realize splash-free welding; Full digital system, continuous and stable welding quality; Adjustable arc starting/closing parameters, high welding quality.
Applicable material	Carbon steel, ordinary low alloy steel, galvanized sheet	Carbon steel, ordinary low alloy steel, galvanized sheet, stainless steel	Carbon steel, ordinary low alloy steel, galvanized sheet, stainless steel	Aluminum alloy, carbon steel, ordinary low alloy steel, galvanized sheet, stainless steel
Applicable diameter of welding wire	Φ0.8/1.0/1.2	Φ0.8/1.0/1.2	Φ0.8/1.0/1.2/1.6	Φ0.8/1.0/1.2/1.6
Appearance size	660×320×560mm	635×320×630mm	660×320×560mm	660×320×560mm
Weight	55kg	59.64kg	55kg	55kg
Advantageous industry	Electric tricycle, two-wheeler, fitness equipment	Car parts	Shipbuilding, steel structure, stainless steel, engineering machinery, power tower	Aluminium alloy



High precision standard peripheral equipment

Efficient and stable collaborative operation

Servo motor

- Coordinate with robot to realize automatic welding production
- A full range of products to meet customer application requirements, with rest assured

Version	M1020B2ND -A01	M1331B2NH - H01R	M1350B2NH-H01R
Rated power (W)	2000	3140	5000
Rated torque (N·m)	6.4	10	15.92
Instantaneous maximum torque (N·m)	25.6	30	47.75
Rated speed (r/min)	3000		
Maximum speed (r/min)	5000	5000	5000
Moment of inertia(X10-4kg·m2)	3.86	10.34	14.8
Voltage (V)	380		
Body weight (kg)	7.5	9.9	14.4
Operating environment temperature (°C)	0-40		
Cable length	10m、16m、20m are optional		

Additional equipment

- Special positioner to help ensure the most appropriate welding posture for high quality welding
- Rich type of transposition machine, according to customer needs to adapt the most appropriate external equipment
- High-precision coordinated control, easy to handle fine working conditions

Uniaxial flip		Biaxial		L-shape	
Load:500~3000kg	Turn/roll Angle:± 180°	Load:300~500kg	Turn/roll Angle: n*360° /±90°	Load:500~2000kg	Turn/roll Angle: n*360° /±90°
Maximum velocity: 15r/min	Repeated positioning accuracy: ± 1.5arc minutes	Maximum velocity: 10r/min	Repeated positioning accuracy: ± 2arc minutes	Maximum velocity: 10r/min	Repeated positioning accuracy: ± 2arc minutes

Triaxial		Earth track		Longmen	
Load:500~1000kg	Turn/roll Angle:± 180°	Load:Max500kg	Turn/roll Angle: /	Load:Max5000kg	Turn/roll Angle: /
Maximum velocity: Main axis5r/min Small axis10r/min	Repeated positioning accuracy: ±2arc minutes	Maximum velocity: 1m/s	Repeated positioning accuracy: ±0.05mm	Maximum velocity: 1m/s	Repeated positioning accuracy: ±0.05mm



Full range of technology enabling partners

The School of Robotics has been upgraded in all directions

Independently developed off-line simulation software

- Various models: including all models of Efort and other mainstream brands in the market
- Rich application scenarios: applicable to industrial robot arc welding, polishing, spot welding, spraying, engraving, laser cutting, handling, palletizing
- Support virtual debugging simulation: automatic trajectory optimization

Welding



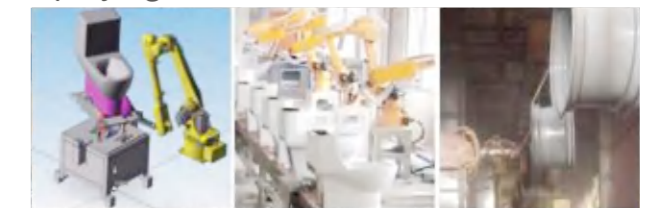
Cut



Weld grinding



Spraying

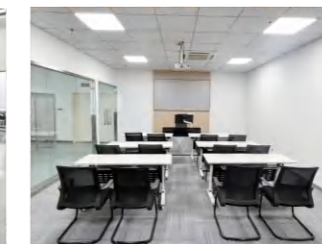


Professional technical team to provide full support

- Program planning support
- Beat analysis support
- Fixture design support
- Simulation support

Robotics Academy: Help partners grow rapidl





- Robot system training: systematic training of all aspects of robot knowledge to help quickly build the knowledge structure;
- Industry professional training: welding, spraying and other application special training, help to become an application expert;
- Small class teaching: Participants get full exercise, strong pertinence.





Intelligent welding

EFORT welds the second growth curve to help partners form differentiated competitive advantages
 Redefinition of welding with excellent ontology platform design and independent open system to help intelligent transformation
 Intelligent landing is guaranteed by perfect arc welding process package

Parametric programming	Off-line programming	Visual programming	Man-machine collaboration
			
<ul style="list-style-type: none"> ◇ Parameter configuration ◇ Process configuration ◇ Path generation ◇ Delivery execution 	<ul style="list-style-type: none"> ◇ Model import ◇ Weld creation ◇ Path planning ◇ Process matching ◇ Path generation ◇ Delivery execution 	<ul style="list-style-type: none"> ◇ Visual photography ◇ Job identification ◇ Model reconstruction ◇ Weld identification ◇ Process matching ◇ Path generation ◇ Delivery execution 	<ul style="list-style-type: none"> ◇ Drag instruction ◇ Weld identification ◇ Process configuration ◇ Path generation ◇ Delivery execution

Robot body

- ◇ 12kg high load can be adapted to various peripheral sensors
- ◇ High rigidity body design improves accuracy and reliability to meet the requirements of high precision scenarios
- ◇ Abundant mechanical interface, to meet the installation and fixing of peripheral pipeline package

Functional guarantee

- ◇ Multi-layer multi-channel adapts to medium-thick plate welding, easy to use
- ◇ Offline programming software trajectory planning
- ◇ All-position arc tracking one-stop solution to 3D cameras etc. brought into the starting point deviation

Open interface

- ◇ Rich C++ and C# SDK interface, to meet the integration of applications
- ◇ Robot motion control is fully open
- ◇ Welding process setting and function package are fully open

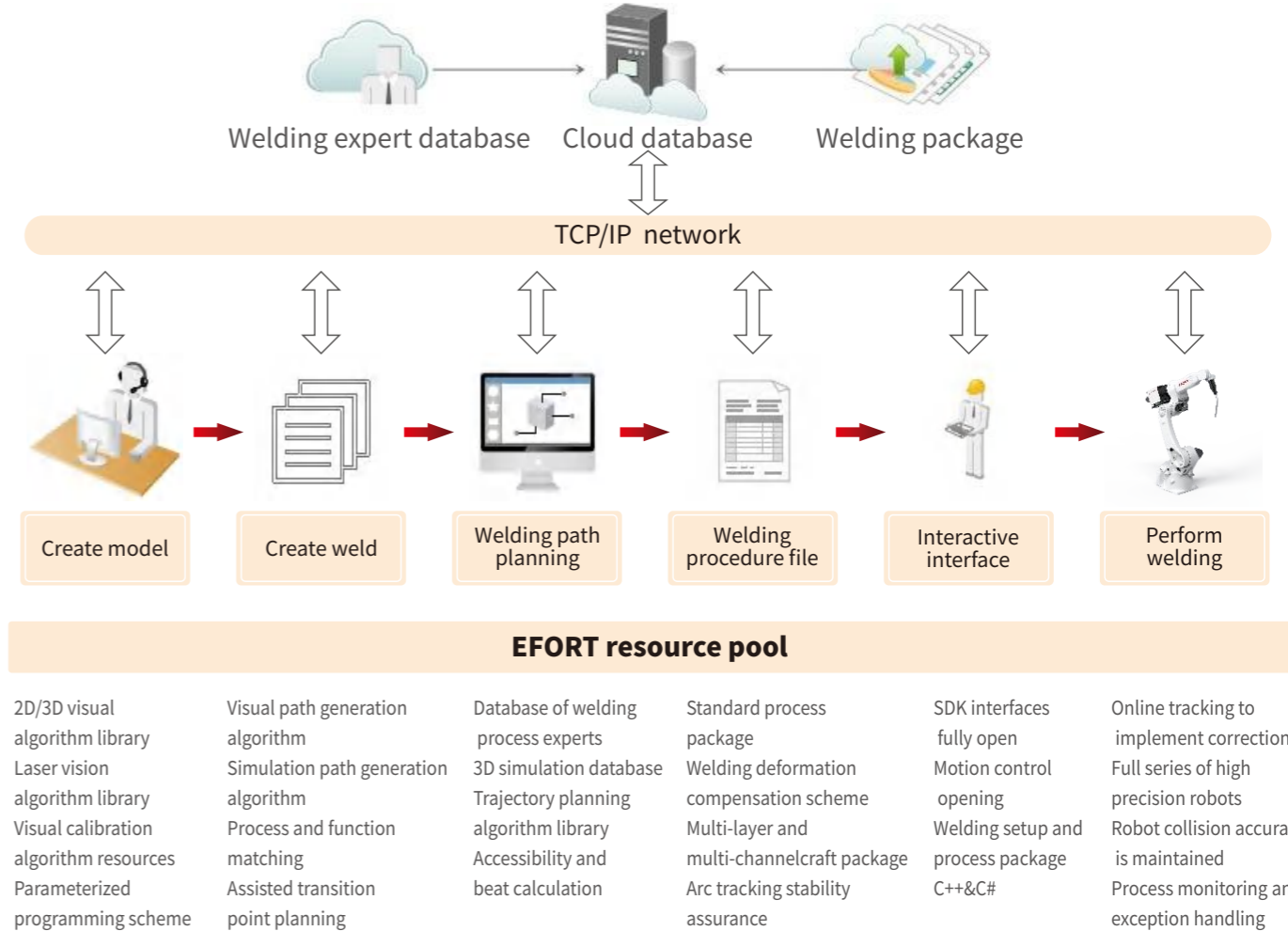
System solution

- ◇ Rooted in intelligent welding for 5 years, the industry leader
- ◇ Rich welding case and system-level solution enabling
- ◇ It can be matched with 3D cameras and laser vision commonly used in the market



Intelligent welding

EFORT welds the second growth curve to help partners form differentiated competitive advantages
 Redefinition of welding with excellent ontology platform design and independent open system to help intelligent transformation
 Intelligent landing is guaranteed by perfect arc welding process package



Typical industry case



EFORT



Scan the code to get the electronic version.