

Arc Welding

Complete robot automation packages
for industrial applications



Improve the efficiency of your arc welding processes with robot automation.

Robot automation increases the efficiency of arc welding processes. Industrial robots allow your organisation to manufacture more parts in less time, while minimizing scrap and increasing quality. The payback time of a single or double-robot cell in industrial applications may be as short as six months.

Long series? Not necessarily.

Robot automation used to be reserved for advanced assembly lines and long-series production, particularly in the automotive supplier industry. Today, it can be economically viable for smaller enterprises producing short series – or even for one-piece production.

Programming and operation used to be a complex and time-consuming business. Thanks to a range of easy-to-use software tools, some of which are designed specifically for arc welding, operators can quickly and easily program and re-program the latest generation of ABB robots themselves – saving valuable implementation time.

One supplier, one responsibility.

ABB offers complete arc welding packages designed for general industrial applications.

Purchasing all equipment and software from one supplier simplifies ordering, reduces prices and shortens delivery times. And because all components have been lab tested together, you can trust them to work together smoothly as a single unit.

In addition to automating the welding process itself, ABB robots can be used for loading, unloading and other material handling tasks. ABB partners are available worldwide to integrate cell automation solutions that will help further increase the efficiency of your production processes.

Sample cell configuration: A two-station concept for long workpieces.

The illustration shows a two-station configuration for workpieces up to 4 m in length. With two stations, the operator can load and unload a workpiece on one side of the robot station, while the robot is welding on the other side – maximizing robot operating time.

The positioner rotates axially to allow for rapid loading of the next workpiece during operation.

Software products



RobotStudio

ABB's simulation and offline programming software. Allows robot programming to be done on a PC in the office, without shutting down production. Makes programming of MultiMove easy.



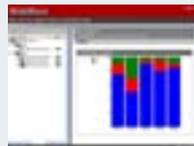
ArcWeld PowerPac (AWPP)

An add-in to RobotStudio, designed specifically for generating arc welding programs. Contains a set of ready-made welding templates that can be edited easily by the user.



WebWare

A monitoring system that examines production trends over time, identifies the causes of robot failures and backs up robot systems. The information is easily accessible via a standard web interface.



VirtualArc

Predicts and tunes welding parameters off-line. Predictions from arc simulations are used as input to predict weld quality and profile as well as weld defects. Optimizes welding productivity and quality.



Torch system – PKI 500 D

The PKI 500 D (double interchange) is a water-cooled torch system that allows you to remove the dresspack without removing the torch, saving operating time.

Positioner – IRBP K 750

A positioner holds the workpiece in place during welding. IRBP K 750 has a handling capacity of 750 kg. The positioner rotates the workpiece axially to provide full robot access. In addition, the positioner itself rotates to allow loading and unloading.

Robot - IRB 1600ID

The IRB 1600ID is a modern arc welding robot providing high speed and stroke, suitable for most applications. Two robots working next to each other will reach every part of even a long workpiece, while maximizing welding efficiency.

Alternative single-robot configuration

Another solution is to use one robot, mounted on a track motion. A track motion moves the robot from side to side, allowing one robot to reach every part of the workpiece. The illustration shows the IRB 1600 robot mounted on the RTT 1600 track motion.



Torch Service Center (TSC)

A complete torch service package. The TSC mechanically cleans and lubricates the gun and cuts the wire. If necessary, it gauges and calibrates the gun after deformation in automatic mode after operator execution – ensuring uninterrupted welding even after a collision of the welding gun.



Interface unit – FlexPendant

A lightweight interface unit for single point of programming of both robot and power source, and for the control of up to four robots. Intuitively operated thanks to touch-screen interaction and joystick control. The Windows CE platform makes it easy to optimize operator screens. Having only eight programmable buttons adds to simplicity.

Power source – MigRob 500

This integrated inverter power source (IGBT) was designed specifically for the robotic welding of all materials. 300 ready-to-use synergic welding lines allow for easy setup and operation. Using the FlexPendant, the operator selects wire-feeding speed, and the MigRob 500 will automatically set the appropriate voltage.

Controller – IRC 5

The IRC5 is ABB's modular control system, allowing independent distribution of modules. Offers support for ABB's MultiMove feature. In this sample illustration, the IRC5 uses one control module and two drive modules – one for each robot.

MultiMove

ABB's MultiMove feature, supported by IRC5, lets up to four robots work together in coordinated patterns, or independently – shifting dynamically between modes. In a dual-robot configuration, each robot can work independently during rotation of the workpiece. This means that more operations can be made simultaneously, maximizing welding efficiency.

ABB arc welding equipment

Robots

	Load (kg)	Reach (m)	Repeatable (mm)
IRB 140	5	0.81	0.03
IRB 1410	5	1.44	0.05
IRB 1600-5/1.2	5	1.2	0.05
IRB 1600-5/1.45	5	1.45	0.05
IRB 1600-7/1.2	7	1.2	0.05
IRB 1600-7/1.45	7	1.45	0.05
IRB 1600ID	4	1.5	0.0
IRB 2400-10	10	1.5	0.06
IRB 2400-16	16	1.5	0.06
IRB 2400L	5-7	1.8	0.06
IRB 4400-45-60	45/60	1.95	0.07
IRB 4400L-10-30	10/30	2.55/2.43	0.1
IRB 4450S	30	2.40	0.1

Positioners

IRBP R	IRBP 250 R	IRBP 500 R	IRBP 750 R
Handling capacity (kg)	250	500	750
Max diameter (mm)	1000	1200	1200
Max length (mm)	1600	2000	2000
IRBP C	IRBP 500 C	IRBP 1000 C	
Handling capacity (KG)	500	1000	
IRBP C INDEX	IRBP 250 Ci	IRBP 500 Ci	
Handling capacity (KG)	250	500	
IRBP L	IRBP 250 L	IRBP 500 L	IRBP 750 L
Handling capacity (kg)	250	500	750
Max diameter (mm)	1600	1600	1600
Max length (mm)	4000	4000	4000
IRBP L	IRBP 2000 L	IRBP 5000 L	
Handling capacity (kg)	2000	5000	
Max diameter (mm)	1600	3200	
Max length (mm)	4000	5000	
IRBP A	IRBP 250 A	IRBP 500 A	IRBP 750 A
Handling capacity (kg)	250	500	750
Max diameter (mm)	1000	1450	1450
Max length (mm)	900	950	950
IRBP K	IRBP 250 K	IRBP 500 K	IRBP 750 K
Handling capacity (kg)	250	500	750
Max diameter (mm)	1200	1400	1400
Max length (mm)	4000	4000	4000
IRBP B	IRBP 250 B	IRBP 500 B	IRBP 750 B
Handling capacity (kg)	250	500	750
Max diameter (mm)	1000	1450	1450
Max length (mm)	900	1000	1000
IRBP D	IRBP 250 D	IRBP 500 D	
Handling capacity (kg)	250	500	
Max diameter (mm)	1000	1200	
Max length (mm)	1600	2000	

Arc Welding Packages

FlexArc	Modular standardized robotic arc welding cells
IRB 1410 ArcPack	Arc welding function package

Rotary units

	MTC 250	MTC 500	MTC 750	MTC 2000	MTC 5000
Handling capacity (kg)	250	500	750	2000	5000

Power sources

MigRob 500			
Voltage/current range MIG/MAG	8-60 V/ 16-500 A		
Permissible load at MIG/MAG			
60% duty cycle	500 A / 39 V		
100% duty cycle	400 A / 34 V		
Process methods	Short arc, Spray arc, Rapid arc, Pulsed arc		
RPB	RPB 320	RPB 420	RPB 520
Voltage range	10-36 V	10-41 V	10-45 V
Current range	10-320 A	10-420 A	10-520 A
Permissible load			
80% duty cycle	320 A / 32.8 V	420 A / 36.8 V	520 A / 40.0 V
100% duty cycle	320 A / 32.8 V	400 A / 36.0 V	440 A / 37.6 V
Process methods	Short arc, Spray arc, Rapid arc		

Controller system

	Size H x W x D	Elec. connect.	Protection
Single Cabinet	970x725x710	200-600 V, 50-60 Hz	IP 54
Dual Cabinet	1370x725x710	200-600 V, 50-60 Hz	IP 54
	Size H x W x D	Protection	Application
Process Module	720x725x710	IP54	Process and cell contr. equipment
	Size/Weight	Protection	Application
FlexPendant	7.5" Screen/1.3 kg	IP54	Robot oper., Customized screens

Torch systems

PSF 315 M ¹⁾	PSF	Length (m)	Bend	Amp. 100% ³⁾	Wire (mm)
	315	1.5	25	170	0.8-1.2
PKI-S & PKI-	PKI				
	250	169	22	250	0.8-1.2
	300	182	45	300	0.8-1.2
	500	169	22	400	0.8-1.6
	630	169	22	500	1.0-2.4

1) Gas-cooled.

2) Water-cooled.

3) Amp. at 100% duty cycle with mixed gas. Other torch neck configurations are available on request.

Motor units

MU 10/20/30	MU 10	MU 20	MU 30
Rated speed (rpm)	3300	3300	3300
Rated torque (Nm)	1.5	6.8	19

Track motions

	Robot model	Speed	Repeatability
IRBT 1003S	IRB 1600	1.8 m/s	+/- 0.15 mm
RTT 1400	IRB 1410	1.06 m/s	+/- 0.05 mm
RTT 1600	IRB 1600	1.06 m/s	+/- 0.05 mm
RTT 2400	IRB 2400	1.06 m/s	+/- 0.05 mm
IRBT 4003S	IRB 4400	1.6 m/s	+/- 0.10 mm

