ROBOTICS

IRB 52

A compact painting specialist

The IRB 52 is a compact painting robot designed specifically for painting small and medium sized parts in a wide range of industries. It provides you with an affordable, professional and high-quality painting solution.

Compact
The compact design of the IRB 52 means smaller spray-booth sizes, reduced ventilation needs and system energy savings.

Flexible
With its small size and impressive reach (1.2 or 1.45 meters) the IRB 52 is flexible and versatile, while its high speed and accuracy offer short cycle times and high quality painting.

Versatile mounting options allow the IRB 52 to meet your demands for flexible integration and increased production.

The IRB 52 can be easily integrated with a range of process accessories, such as turntables, shuttle tables and conveyor systems. The robot is light weight and very easy to install, program and maintain.

Integrated
The IRB 52 is designed for painting and is fully prepared for integrated paint process equipment. It utilizes the powerful and well proven Integrated Process System (IPS) for high speed process control synchronized with the superior IRC5P motion system.

The IPS system includes color change valves and air-and paint regulation, providing accurate process regulation, offering high quality finish and major paint savings.

The combination of proven technology and well-tested innovations offers reliable production and high uptime. The IRB 52 can significantly improve your productivity.

Designed for painting
The IRC5P is the newest generation paint robot control system specifically designed for the paint shop. Key elements of its user friendly interface are the Exi certified FlexPaint pendent with multi-language support, and the customizable PC software for paint cell supervision, RobView 5.

Specification

Robot version	Payload on wrist (kg)	Reach vertical arm (m)
IRB 52/1.2	7	0.475
IRB 52/1.45	7	0.7
Number of axes	6	
Protection	IP66 (wrist IP54)	
Mounting	Floor, inverted, wall, tilted	
Controller	IRC5P Paint	
Ex-certification	Explosion protected Exi/Exp for installation in hazardous area, Zone 1 (Europe) and Division I, Class I & II	

Performance (according to ISO 9283)

	IRB 52/1.2	IRB 52/1.45
Static repeatability (mm)	0.15	0.15
Path accuracy (mm)	+/- 2	+/- 2

Technical information

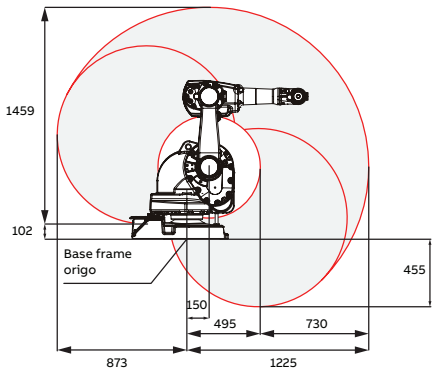
Electrical Connections	
Supply voltage	200-600 VAC, 3-phase, 50-60 Hz
Power consumption	Stand by <300 W, Production <800 W
Electrical safety	According to international standards
Physical	
Robot footprint	484 x 648 mm
Robot controller	1450 x 725 x 710 mm
Robot unit weight	250 kg
Robot controller weight	180 kg
Height IRB 52/1.2	1069 mm
Height IRB 52/1.45	1294 mm
Environment	
Ambient temperature	
Robot unit	+5 °C (41 °F) to +40° C (104 °F)
Robot controller	+48 °C (118 °F) max.
Relative humidity	Max. 95 %, non-condensing
Interface IRC5P Paint	
Digital inputs/outputs	512/512, expandable
Analog inputs/outputs	16/12, expandable
Fieldbus support	Interbus-S, ProfiBus, CC Link, DeviceNet

Data and dimensions may be changed without notice.

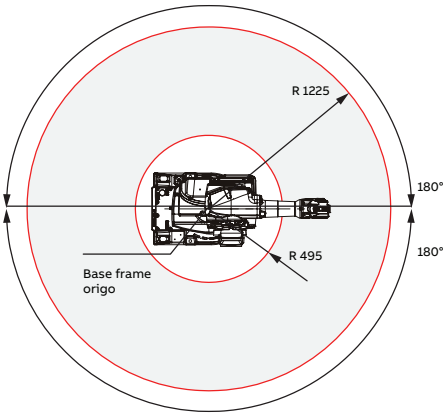
Movement

Axis movement	Working range IRB 52/1.2	Working range IRB 52/1.45	Axis max speed
Axis 1 rotation	+180° to -180°	+180° to -180°	180°/s
Axis 2 arm	+110° to -63°	+120° to -90°	180°/s
Axis 3 arm	+55° to -235°	+55° to -235°	180°/s
Axis 4 arm	+200° to -200°	+200° to -200°	320°/s
Axis 5 bend	+115° to -115°	+115° to -115°	400°/s
Axis 6 rotation	+400° to -400°	+400° to -400°	460°/s

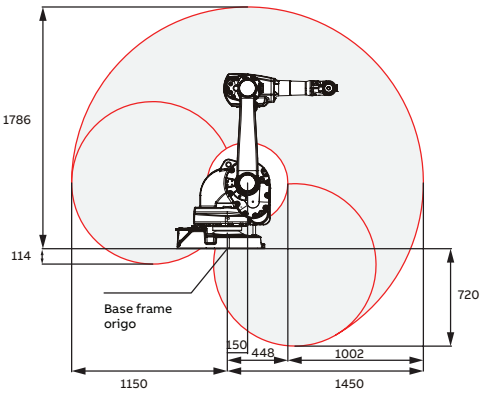
Working range, IRB 52/1.2



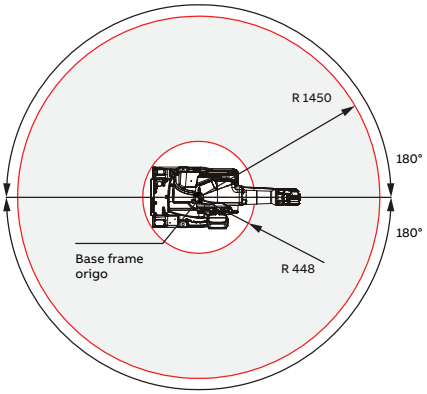
Rotation range, IRB 52/1.2



Working range, IRB 52/1.45



Rotation range, IRB 52/1.45



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ROBOTICS

IRB 5350, Door Opener Robot

Compact – Flexible – High performance

The IRB 5350 door opener robot is a compact and precise robot assistant for automotive interior painting, both for stop-and-go and moving-line solutions. A specially designed door opener tool with integrated sensors for search and force feedback makes this an efficient and important part of the interior paint zone.

Optimized design for various applications
The IRB 5350 robot provides two options for different interior painting solutions: the three axes stop-and-go version and the four axes moving-line version. This capable and efficient interior painting solution can support booth width from 4.5 to 6 meters, booth length from 3 to 10 meters and conveyor speeds ranging from 5 to 10 m/min.

Compact design and flexible installation
With the compact arm/foot/rail system, the IRB 5350 can accomplish the following:

- easily integrated into a narrow booth
- increased flexibility for the paint robot by using a dedicated rail system
- common solutions to be used on both sides of the booth, shift the working range for axis 2 for a left or right version
- the rail system support floor mounting.

High performance and reliability
For the last several decades, ABB has been peerless in robotic motion control technology. With the QuickMove™/TrueMove™ technology, the IRB 5350 robot is able to utilize swift acceleration and smart sensor tooling to complete a door opening cycle within 3 seconds (A typical cycle includes approaching, searching, gripping, opening, closing, releasing etc.)

The IRB 5350 handles a gripper tool of up to 7kg to grip, open and close different kinds of car doors using its advanced sensors, built into the tooling for detecting the door. Wellknown for its high protection standards, ABB's IRB 5350 has an IP66 rating. The rail axis has IP66 protection as standard.

Easy control and programming
With clear functionality, ABB offers a manageable solution to any interior painting challenge.

- Use the IRC5P robot controller to command both the IRB 5350 door opener r obot along with the ABB's paint robots, common spare parts and interface.
- The EX-certified Teach Pendant can be used inside the paint booth for pr ogram modifications and testing.
- Offline programming of the entire interior zone is possible with use of ABB's innovative RobotStudio.

Global service and support
ABB customers can take advantage of the company's service organization; with more than 40 years of experience in the paint application area. ABB has support offices in 53 countries.

Specification	
Number of axes	3 axes/4 axes when rail-mounted
Robot mounting	Floor and rail mounted
Payload on tower	7 kg
Opening and closing force	Max 150N, Force is Perpendicular to the door blade.
Ingress protection degree	IP66
Robot unit ambient temperature	+0°C to +40°C*
Relative humidity, non-condensing	95% maximum
Ex classification	II 2 G Ex ib px IIB T4 Gb II 2 D Ex ib pd IIIC T65°C FM Class I, II. Div.1, Group C, D, G 135°C
Robot controller ambient temperature	+48°C maximum

* Recommended max ambient temp <30°C

Performance (according to ISO 9283)	
Position repeatability (RP)	0.02 mm
Path repeatability (RT)	0.13 mm

Physical	
Robot footprint	410 x 430 mm (standard foot) 465 mm x (3 – 10 m) length* (rail)
Robot height	1256 mm
Robot weight (3 axes)	215 kg
Robot weight (4 axes)	316 kg
Rail weight	124 kg/m
Robot Controller (H x W x D)	1450 x 725 x 710 mm
Robot controller weight	180 – 200 kg

*Longer rail lengths on request

Movement			
Axis motion	Working range		Max speed
	3 axes	4 axes	
1 – Inner arm	+150º to -150º	+88º to -88º	167º/s
2 – Outer arm	+175º to -125º (left) +125º to -175º (right)	+175º to -125º (left) +125º to -175º (right)	180º/s 180º/s
3 – Tower	350 mm	350 mm	780 mm/s
4 – Rail axis*	/	**	1920 mm/s

*Optional axis for rail motion
**Determined by the rail length

Controller interfaces	
Backup	USB connection and Ether net
I/O boards	Analog, digital, relay, 120VAC, encoder and process I/O boards available
Fieldbus support	Interbus-S, ProfiBus, Profinet, CC Link, DeviceNet and Ether net IP available
Network	Ethernet FTP/NFS

PC tools	
RobView 5 (included)	Paint cell supervision and operation
ShopFloor Editor	Off-line editing and pr ocess tuning
RobotStudio Paint	3D off-line simulation and pr ogramming

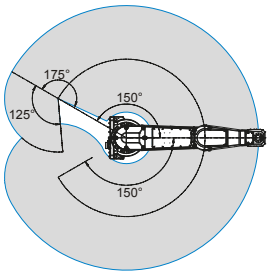
Electrical connection	
Mains voltage	200 – 600VAC, 3-phase, 50/60 Hz
Power consumption	Stand by <300 W, production <800 W
Electrical safety	According to inter national standards
Emission	EMC/EMI shielded

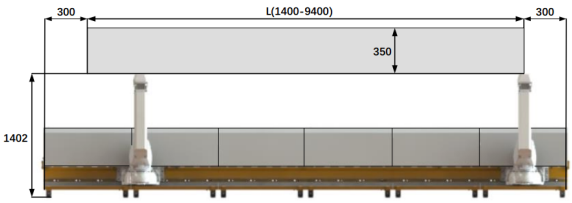
Information may be changed or updated without notice

Flexible rail system

The rails are designed for overspray protection and are available in a 1 m module that combines to the desired length, up to the 10 m (standard). It can be mounted on floor. One or two door opener robots can be mounted on one rail.

Work envelope, left version





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Elevated Rail for the IRB 5500-25

The Elevated Rail for the IRB 5500 reduces cycle times by as much as 10% on Stop & Go automotive paint lines.

Description
The Elevated Rail for the IRB 5500 system is one of the most advanced paint solutions available on the market. Ideally suited for both interior and exterior automotive painting as well as other paint applications, the system expands the fl exibility of the IRB 5500 FlexPainter, which is the most versatile working envelope of any paint robot.

Designed for Stop & Go automotive paint lines, the Elevated Rail for the IRB 5500 increases the flexibility on these types of lines and allows for easy repositioning of the robot, guaranteeing an effective backup solution. It is able to accommodate most car body sizes which has the added advantage of potentially reducing the number of robots on a paint line. This added flexibility and the ability to place the robot in an optimal position directly contributes to reducing cycle times by up to 10%.

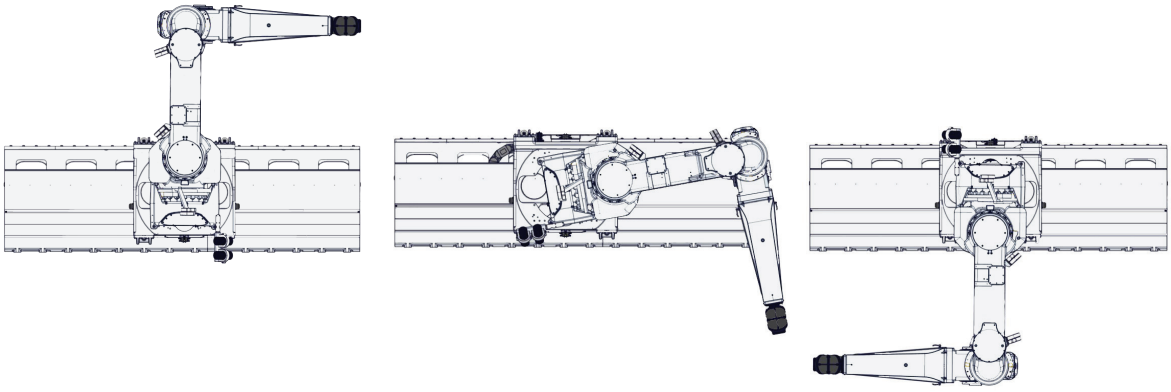
Reliability
Based on more than 30 years of rail experience, the Elevated Rail for the IRB 5500 is the fifth generation of ABB rail systems for automotive paint shops.

The Elevated Rail for the IRB 5500, eliminates the need for additional engineering and other costs associated with installing an IRB 5500 on a third party rail. The integrated ABB dynamic modelling for all axes lowers energy consumption, increases accuracy and provides a fully synchronized and balanced paint robot motion.

The elevated rail sections (rail elements) are designed to be a self-carrying structure without the need for a beam support under the rail.

To maintain accuracy and prevent deflection only two pillars with up to 4.7 meters (center-to-center) are employed with one or two robots on the rail.

RobotStudio®
The Elevated Rail for the IRB 5500 is fully supported for offline programming and 100% accurate cycle checks and path accuracy for all components (including the rail).



Features and benefits

- Extends unique features of IRB 5500, such as fully integrated process and motion- control and the special integration into the paint booth.
- Supports up to four robots on a single rail.
- Two pillar design accommodates most car body length configurations
- Maximum flexibility for use with a variety of applications.
- Total height (dog house) 1123 mm.
- Numerous manipulator mounting positions on a single trolley design – tilted, upright, inverted.
- Protected cable chain – 300 mm cable chain integrated into the rail elements.
- Centralized lubrication - track rails and gear rack, and trolley rollers.
- Automatic calibration sequence on axis 7 - sensor todetect the calibration position; no calibration tooling needed.

Technical data

Environment	
Payload	13 kg (at 350 mm COG) - same as standard IRB 5500
Reach	2975 mm (at TCP 0) Same as IRB 5500 + from 2 m to 9 m as standard, up to 15m rail, or more, on request. Capable of supporting from 1-4 robots on the same rail (1 & 2 is covered as standard)
Accuracy	Robot: 0.15 mm (on TCP) Trolley: 0,3 mm. ABB dynamic modeling for all axes. Velocity axis 7 (rail axis): 1,4 m/sec
Deflection of rail	< 1 mm (with maximum speed and acceleration of manipulator in vertical direction)
Weight	Manipulator 600 kg. Trolley 370 kg, Rail element 380 kg/meter
Mounting position	Floor or Elevated. Robot: tilted, upright, inverted
Temperature	0°C - 40°C degree
IP Protection	IP 67 as standard (Ex zone 1, Class 1 Div 1)
Ex approval	Explosion protected Exi/Exp for installation in hazardous area Zone 1 & Zone 21 (Europe) and Division I, Class I & II.

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ROBOTICS

IRB 5500 FlexPainter

A new way of exterior painting

The IRB 5500 FlexPainter takes painting closer to perfection by integrating the paint application equipment. Combined with its large work area and high acceleration and painting speed, the result is the most efficient and flexible paint robot solution for basically any application.

Paint savings
Our compact and light-weight paint application components enable us to put vital paint regulation equipment, like the pumps, as close as 15 cm from the wrist. This reduces paint and solvent waste during color change significantly.

We have integrated the process equipment in the IRB 5500 FlexPainter in addition to the fully integrated process control (hardware and software). The IRC5P is controlling both the paint process and the robot motion so you can enjoy substantial savings.

Powered by IPS
The “push-out” function integrated in the IPS system is one specific feature that enables a reduction of paint even further. The basic architecture of IPS is built on combining process control and motion control as one, this simplified the system set up and enables for real savings and process perfection.

Built for painting
Standard solutions accommodate color change valves for up to 32* colors with circulation, integrated in the process arm of the robot. Also two pumps, driven by integrated servo motors, 64 pilot valves, atomizer control with dual shape air and closed loop regulation, closed loop regulation of bell speed and high voltage control – all fully integrated. Solutions for both solvent- and water-borne paint are available. Please note that more is avalible on special request.

Less atomizers, higher flow
ABB’s high flow RB1000 atomizer family is specifically designed for the high acceleration and speed of the IRB 5500 FlexPainter. This unique combination significantly reduces the number of robots needed in a spray booth and provides superior performance and high finish quality.

Modular paint components
To integrate the process into the IRB 5500 FlexPainter, ABB has developed a series of light-weight, compact and modular paint application components. This includes color change valves, 2K mixers, air- and paint regulators and pumps. All components are designed for maximum flow.

Paint robot control system
IRC5P is a modern control system, specifically designed for the paint shop. With the IPS (Integrated Process System), the userfriendly Ex certified FlexPaint Pendant and RobView 5 it is a combination of standardized functions for the paint installation and to fit specific needs. This package includes standard applications for defining User screens, Program editing and Version control, and many more. RobView 5 can also be a components in a larger Cell control HMI, like ABB FlexUI or other.

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01 IRB 5500-22 process robot/elevated mounted
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02 IRB 5500-22 process robot/floor mounted
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03 IRB 5500-23 process robot on clean-wall rail

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Specification

Number of axes	6
Payload on wrist	13 kg
Protection	IP66 (wrist IP54)
Ex approval	Explosion protected Ex i/Ex p/ Ex c for installation in hazardous area Zone 1 & Zone 21 (Europe) and Division I, Class I & II.
Mounting	Wall, floor, tilted, inverted, clean-wall rail

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Technical information

Electrical Connections	
Mains voltage	200 - 600VAC, 3-phase, 50/60 Hz
Energy consumption	According to international standards
Physical	
Dimensions	
Robot footprint	500 x 680 mm
Robot controller	1450 x 725 x 710 mm
Weight	
Robot unit	600 kg
Robot controller	180 kg
Environment	
Ambient temperature	
Robot unit	0 °C to +40 °C*
Robot controller	+48 °C maximum
Relative humidity	95 % maximum

*Recommended max ambient temp <30°

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Technical information

PC Tools	
RobView 5	Paint cell supervision and operation (included)
ShopFloor Editor	Off-line path- and process tuning using 3D graphics
RobotStudio® Paint	Full 3D simulation and programming of the paint cell
Interface	
Backup	USB connection and Ethernet
I/O boards	Analog, digital, encoder and process I/O boards available
Fieldbus support	Interbus-S, ProfiBus, Profinet, CC Link, DeviceNet and Ethernet IP available
Network	Ethernet FTP/NFS

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Performance

	Static repeatability (mm)	Wrist work envelope
	0.15	±140º

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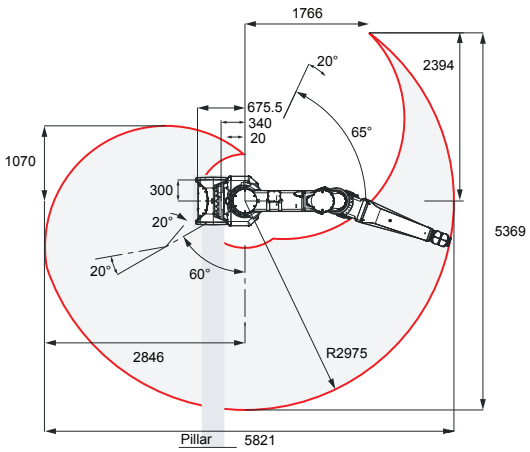
Specification

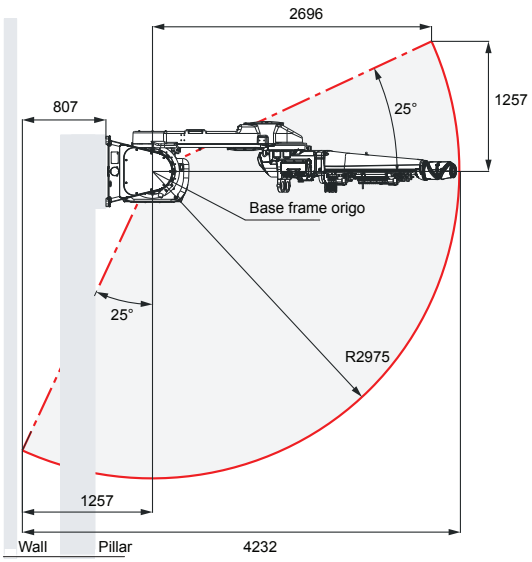
	IRB 5500-22	IRB 5500-22 Floor mounted	IRB 5500-23 Clean wall rail
Robot foot-print (mm)	500 x 680	581 x 718	500 x 680
Weight robot unit (kg)	600	610	600
Weight trolley (kg)	N/A	N/A	330
Rail system	N/A	N/A	Rail is available in steps of 0.5 m from 2-15 m for 1 robot on rail and 4-8 m for 2 robots on rail as standard. Longer rail can be delivered on request.
Cable chain wide (mm)	N/A	N/A	400
Accuracy (mm)	0.15	0.15	Robot: 0.15 (on TCPO) Trolley: 0,3 Velocity rail axis: 1,4 m/sec

IRB 5500 FlexPainter

Axis movement	Working range	Axis max speed
Axis 1	See work envelope drawings	100°/s
Axis 2	See work envelope drawings	100°/s
Axis 3	See work envelope drawings	100°/s
Axis 4 wrist	See work envelope drawings	465°/s
Axis 5 bend	See work envelope drawings	350°/s
Axis 6 rotation	See work envelope drawings	535°/s

IRB 5500 FlexPainter, working range





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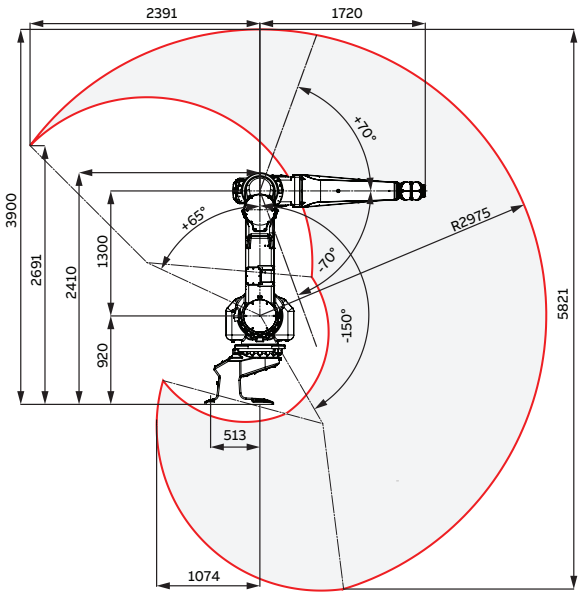
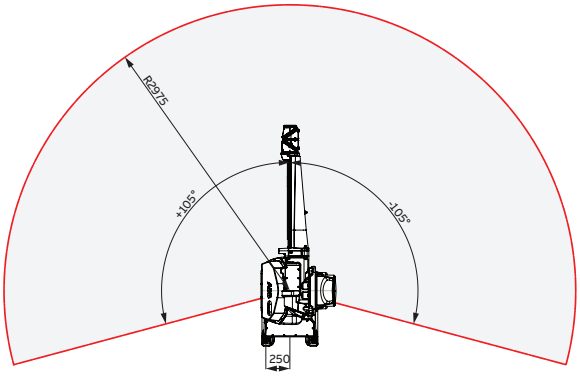
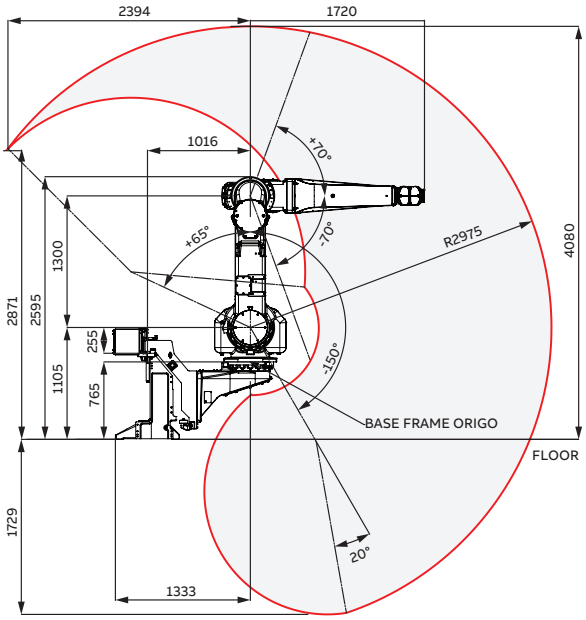
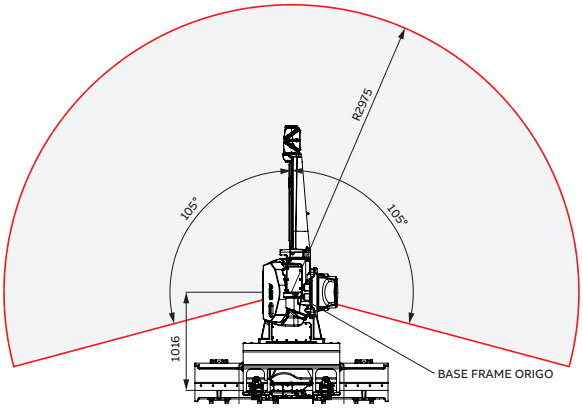
IRB 5500-22 Floor mounted working range





IRB 5500-23 Clean wall rail working range





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ROBOTICS

IRB 5510

Medium-sized paint robot

IRB 5510 FlexPainter is a highly flexible and accurate medium-sized paint robot for automotive small parts and general industrial painting. This robot provides a shorter cycle time, process optimization, and digital platform to ensure premium paint quality and uptime.

IRB 5510 offers the same advanced functions as IRB 5500 in a small form factor with a small foot print compared with other similar robots on the market. Highly versatile, IRB 5510 is aimed at small work piece painting, flaming treatment, and opener applications.

The increased acceleration provided by including IRB 5500 drivers and schematics allows us to equip IRB 5510 with advanced functions such as “StayOn”, as done very successfully with IRB 5500. This robot also provides a shorter cycle time, process optimization, and path control to ensure premium paint quality.

This functionality is crucial for industries where cycle time is essential to productivity, such as automotive small parts and General Industry (GI) customers.
To address the needs of GI customers, IRB 5510 is designed for ease of use, streamlined manipulator maintenance, simplified software support, reduced operational costs, and increased spare parts availability.

IRB 5510 is equipped with ABB’s hollow wrist technology. This high-precision hollow wrist features a straight design that eliminates wear and tear on the paint- and air-supply hoses, increasing overall reliability.

Additionally, the wrist supports 140-degree rotation in any direction, making IRB 5510 one of the most versatile and easy-to-program paint robots in its class.

IRB 5510 also features ABB’s unique Integrated Process System (IPS) with closed-loop regulation capabilities and high-speed paint and airflow control. The IPS can increase process response times and reduce paint and solvent waste. Synchronizing the flow of paint with the motion of the robot arm improves transfer efficiency and minimizes overspray, thereby reducing paint wastage and increasing cost efficiency.

Why choose IRB 5510?

- This robot provides a shorter cycle time, process optimization, and digital platform to ensure premium paint quality.
- High-precision technologies including ABB’s hollow wrist, IPS, and bell technologies
- Inherent IRB 5500 family advantage
- Increased productivity with rapid installation and high system uptime
- Compact footprint
- State-of-art robot platform with digital infrastructure
- More scenarios for mounting

Specification

Number of axes	6
Payload on wrist	13 kg
Protection	IP66 (wrist IP54)
Ex approval	Explosion protected Ex i/Ex p/ Ex c for installation in hazardous area Zone 1 & Zone 21 ATEX, IECEx.
Mounting	Floor

Technical information

Mains voltage	200 - 600VAC, 3-phase, 50/60 Hz
Energy consumption	According to international standards

Dimensions	
Robot footprint	581 x 717,5 mm
Robot controller	1450 x 725 x 710 mm
Weight	
Robot unit	587 kg
Robot controller	180 kg

Ambient temperature	
Robot unit	0 °C to +40 °C*
Robot controller	+48 °C maximum
Relative humidity	95 % maximum

*Recommended max ambient temp <30°

RobView 5	Paint cell supervision and operation (included)
ShopFloor Editor	Off-line path- and process tuning using 3D graphics
RobotStudio® Paint	Full 3D simulation and programming of the paint cell

Interface	
Backup	USB connection and Ethernet
I/O boards	Analog, digital, encoder and process I/O boards available
Fieldbus support	Interbus-S, ProfiBus, Profinet, CC Link, DeviceNet and Ethernet IP available
Network	Ethernet FTP/NFS

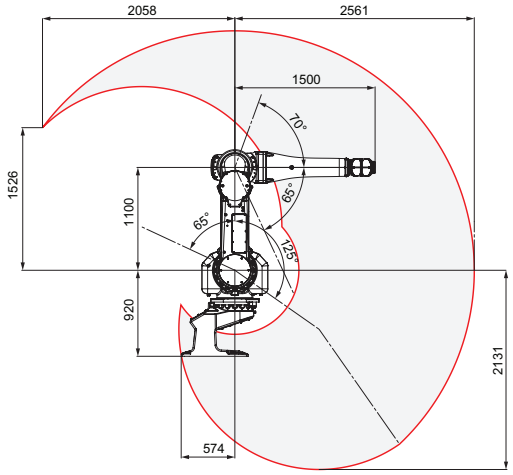
Performance

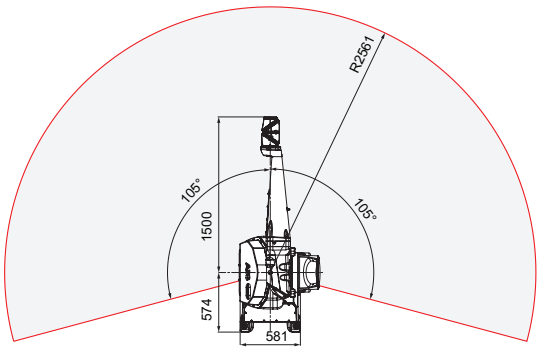
	Static repeatability (mm)	Wrist work envelope
	0.15	±140º

IRB 5510 FlexPainter

Axis movement	Working range	Axis max speed
Axis 1	See work envelope drawings	100°/s
Axis 2	See work envelope drawings	100°/s
Axis 3	See work envelope drawings	100°/s
Axis 4 rotation	+/-720°	465°/s
Axis 5 bend	+/-720°	350°/s
Axis 6 turn	+/-460°	535°/s
Wrist working envelope +/-140°		

IRB 5510 FlexPainter, working range





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