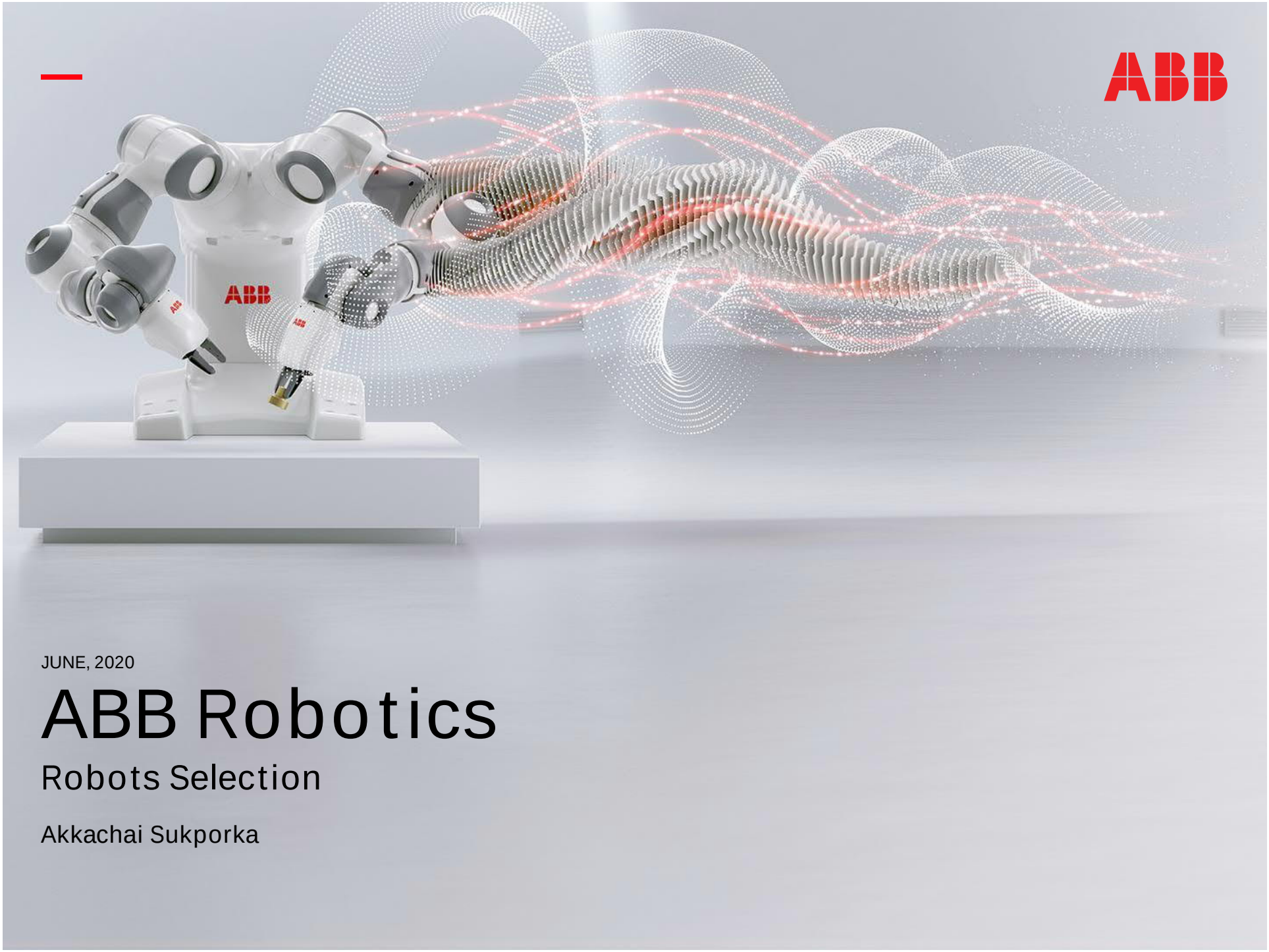

JUNE, 2020

ABB Robotics

Robots Selection

Akkachai Sukporka

Agenda
Robot Selection

- ABB Robotics Overview
- The Top 10 Reasons for Robot Investment
- Working Range
- Payload
- Speed
- Application
- Environment / Protection
- Software
- After Sales service
- Summary
- Q&A

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Robotics

Improving Productivity, Workplace Safety and Quality

Robotics

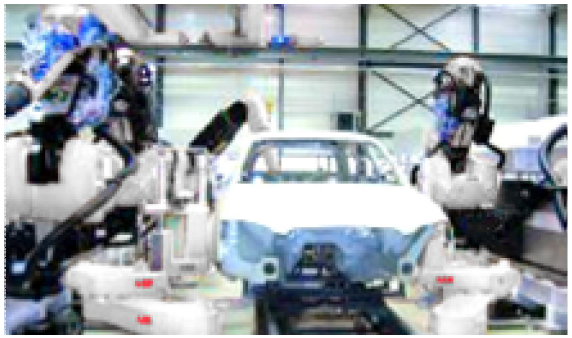
Key deliverables

Integrated Robot Solutions

Integrated robot solutions for:

- Material Handling
- Machine Tending
- Welding
- Cutting
- Painting
- Finishing

Engineering for Systems



Engineering for systems in:

- Press Automation
- Body-in-White
- Paint processes
- Power Train Assembly

Customer Service

Securing your productivity with a wide range of services within:

- Parts & Logistics
- Field Service
- Training
- Upgrade and reconditioning

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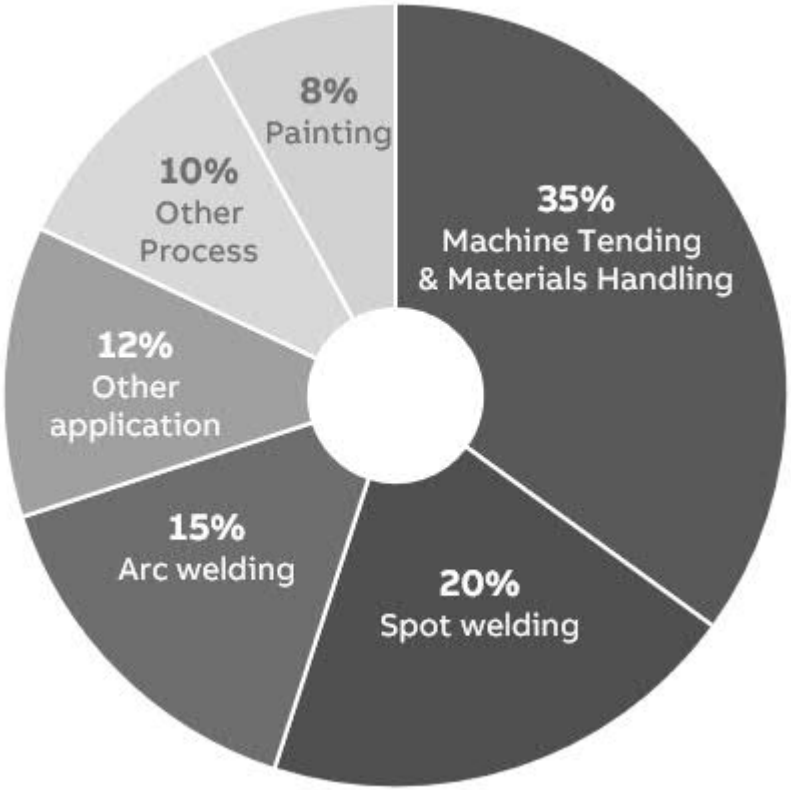
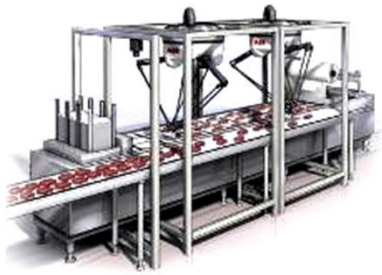
Robotics

Experienced from Over years





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Robotics

The History of ABB Robots

1974

IRB6
World's first microcomputer controlled electric industrial robot

1986

IRB2000
World's first robot driven by AC motors

1991

IRB6000
A large 200 kg robot, the fastest and most accurate spot welding robot

1998

Flexpicker
World's fastest pick and place robot

1998

RobotStudio
the first simulation tool based on virtual controllerzz

2000

Pickmaster
The pick and place software is introduced

2001

IRB7600
World's first industrial robot to handle 500 kg

2004

IRC5
the new Robot Controller.It sets new standards with its modular concept

2007

IRB6640
The perfect robot for various applications focusing on high production capacity

2009

IRB120
ABB's smallest ever multipurpose industrial robot weighs just 25kg

2010

IRB460
The fastest palletizing robot in the world

2012

IRB1520ID
ABB's high precision arc welder

2013

IRB6700
The 7th generation of large ABB robots

2015

YuMi®
The world's first truly collaborative dual arm robot

2019

OmniCore™
ABB's new generation of robot controllers for the digital

2020

Wizard
An easy and intuitive way to program single-arm YuMi®

What's next

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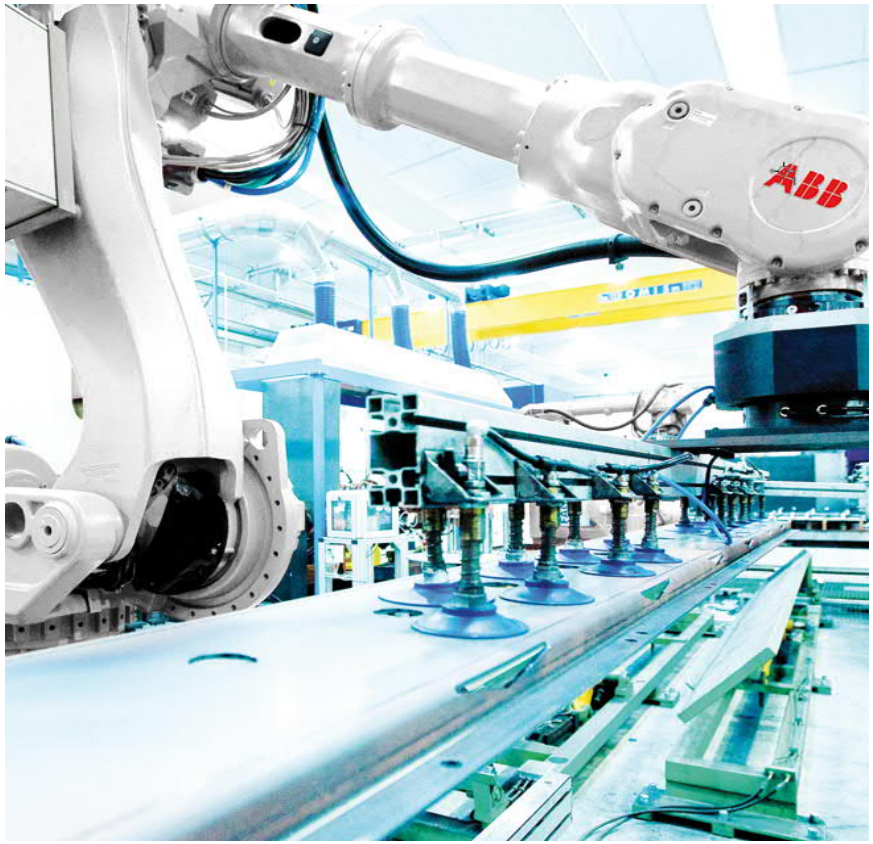
Robotics

The Top 10 Reasons for Robot Investment



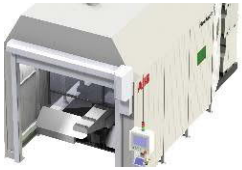
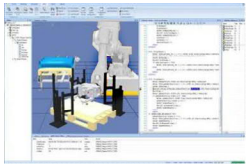
- Increase production output rates
- Reduce operating costs
- Improve process quality
- Improve workplace health & safety
- Increase product manufacturing flexibility
- Reduce material waste and increase yield
- Reduce labour turnover and difficulty of recruiting workers
- Save space in high value manufacturing areas
- Reduce capital costs (inventory, work in progress)
- Improve quality of work for employees

Based on research carried out by the International Federation of Robotics (IFR)

Robot Selection

Robotics

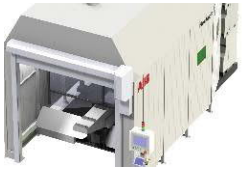
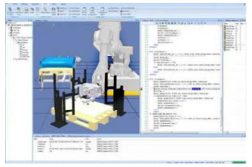
Robot-selection

Working range	Payload	Speed	Application	Environment / Protection	Software	Service
						
0.5 m – 4.5 m	Comprehensive range with capacity from 500 g to 800 kg	Medium speed robot High speed robot	Welding / cutting Material handing Palletizing De-palletizing Packing Gluing Assembly Etc.	IP Protection Cleanroom Wash down Foundry Installation area Floor, Invert, Tile or wall-mounted	Robot Simulation Software (RobotStudio) Programming language PowerPac Robot CAM RobotLoad Software Option Field Bus option Etc.	Local field service Spare part support Maintenance RoboCare Connected service Spare Part upgrade System service Training

Robot in Industries

Robotics

Robot-selection

Working range	Payload	Speed	Application	Environment / Protection	Software	Service
						
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Robot in Industries

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Working range

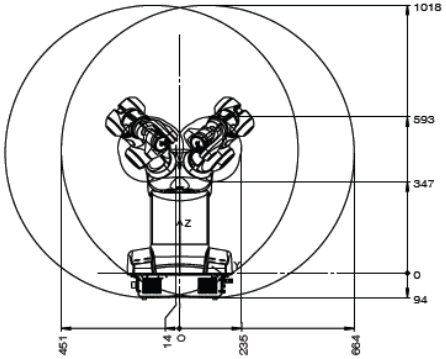
Collaborative robot

YuMi®

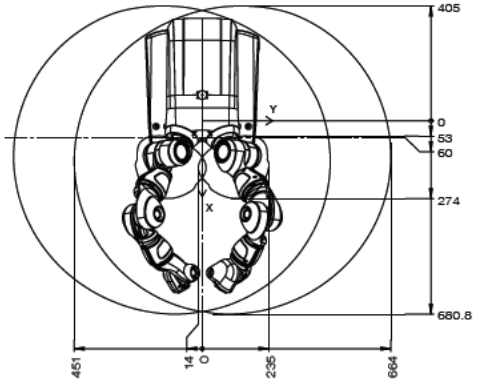
IRB14000

Reach arm

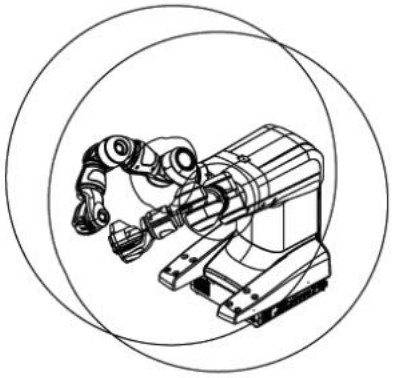
0.559 m



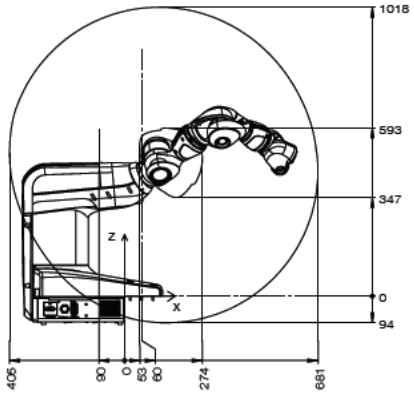
IRB 14000-0.5/0.5 Front view



IRB 14000-0.5/0.5 Top view



IRB 14000-0.5/0.5 Isometric view



IRB 14000-0.5/0.5 Side view

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Working range

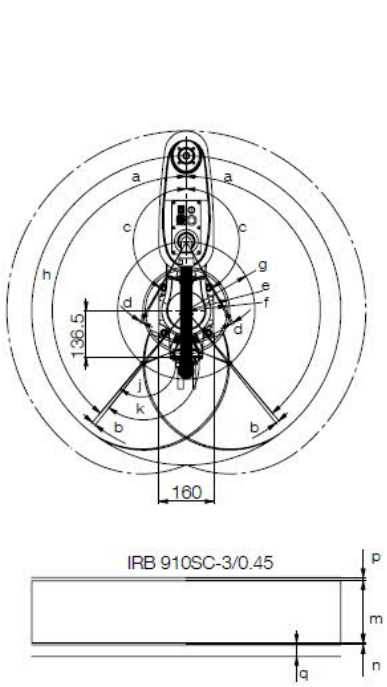
Scara robot

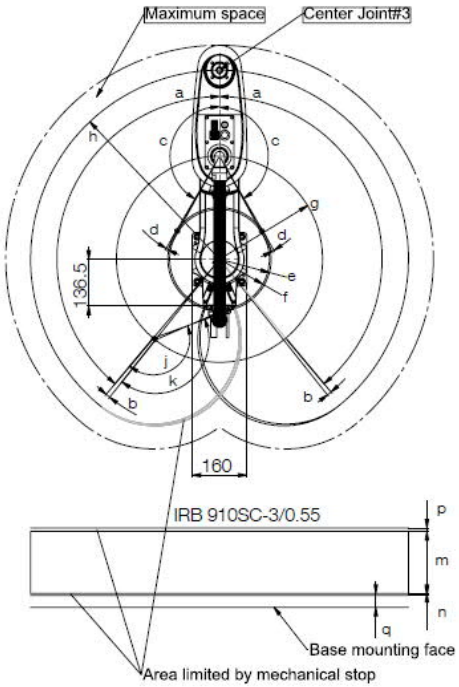
Scara robot

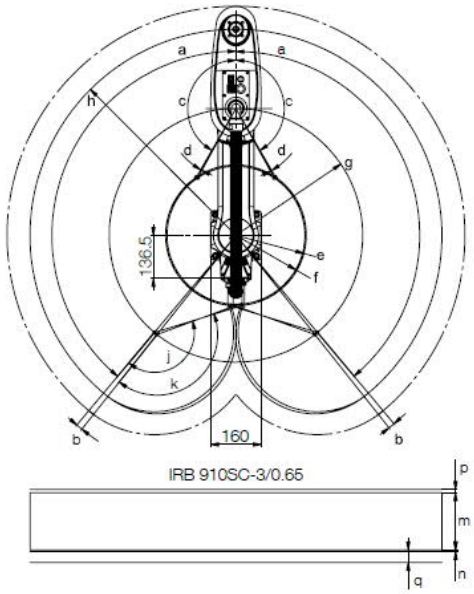
IRB910SC

Reach arm

0.55 – 0.65 m







Working range

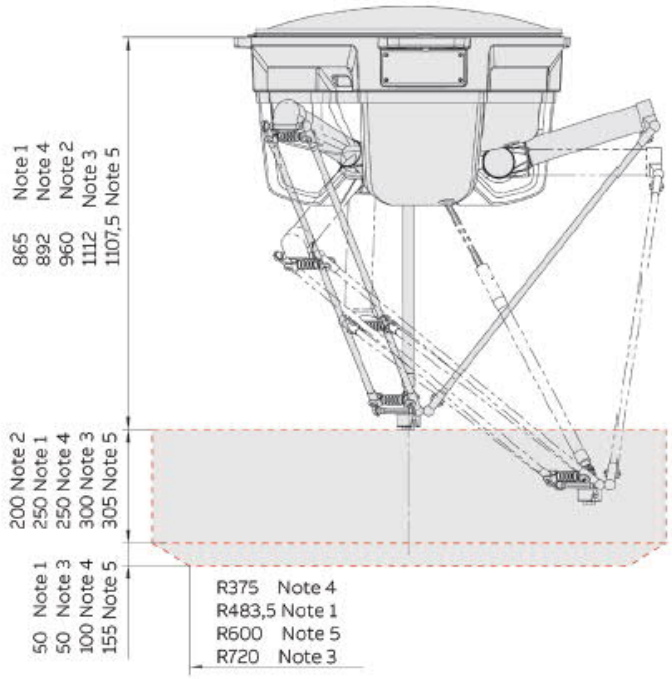
Delta robot

Delta robot

IRB360

Reach arm

0.8 – 1.6 m



Note 1: IRB 360-1/1130 and IRB 360-3/1130
Note 2: IRB 360-1/800
Note 3: IRB 360-1/1600
Note 4: IRB 360-8/1130
Note 5: IRB 360-6/1600

Working range

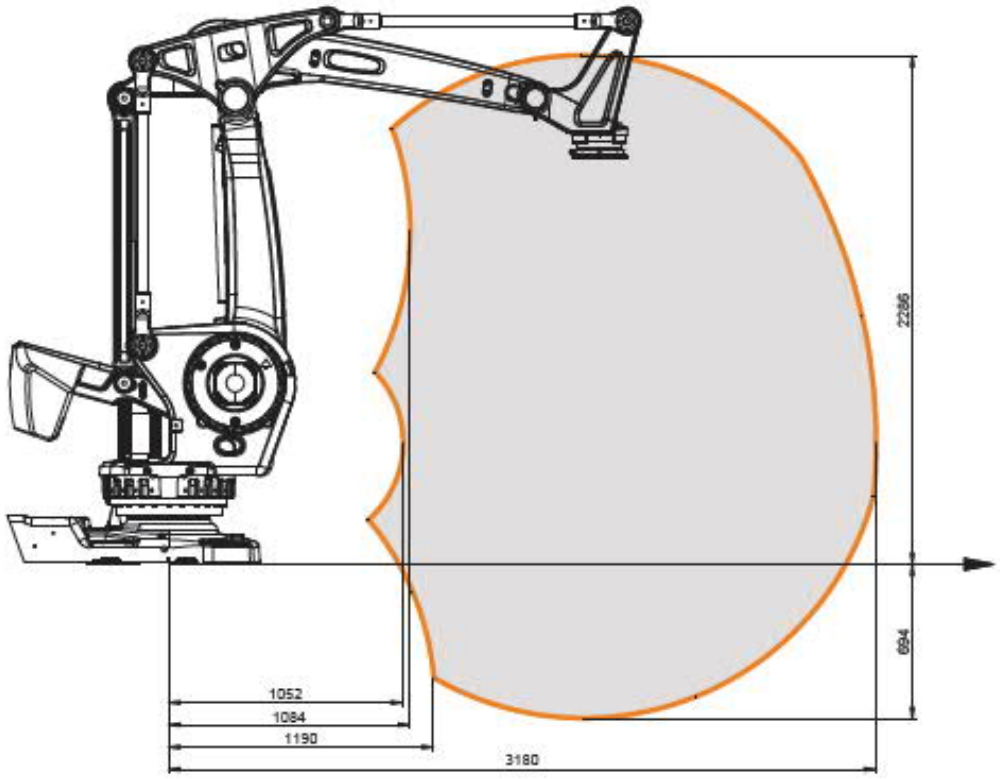
4 axis robot

4 axis robot

IRB260,
IRB460,IRB660,
IRB760

Reach arm

1.5 – 3.2 m



Working range

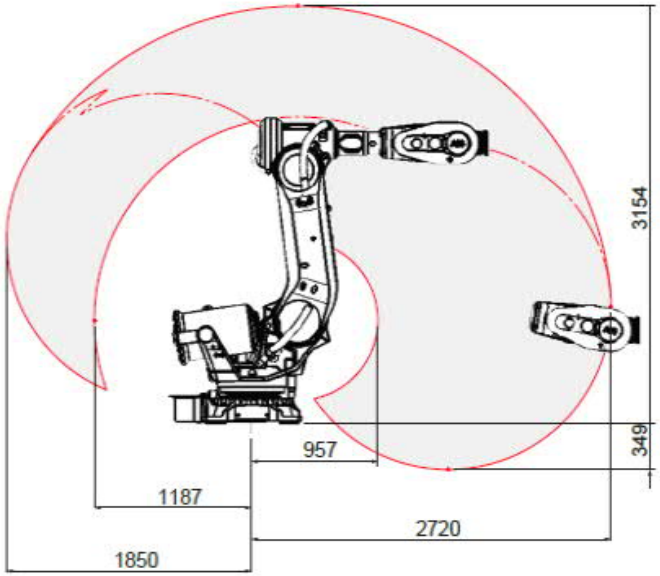
4 axis robot

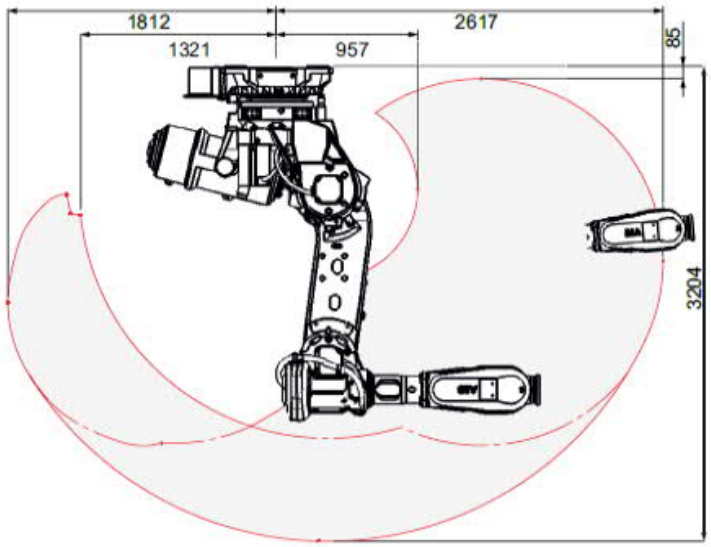
4 axis robot

IRB120,IRB1200,IRB140,IRB1410,IRB1520ID,IRB1600,IRB2600,IRB4400,IRB4600,IRB6620,IRB6700,IRB6660,IRB7600,IRB8700

Reach arm

0.45 – 4.5 m





Working range

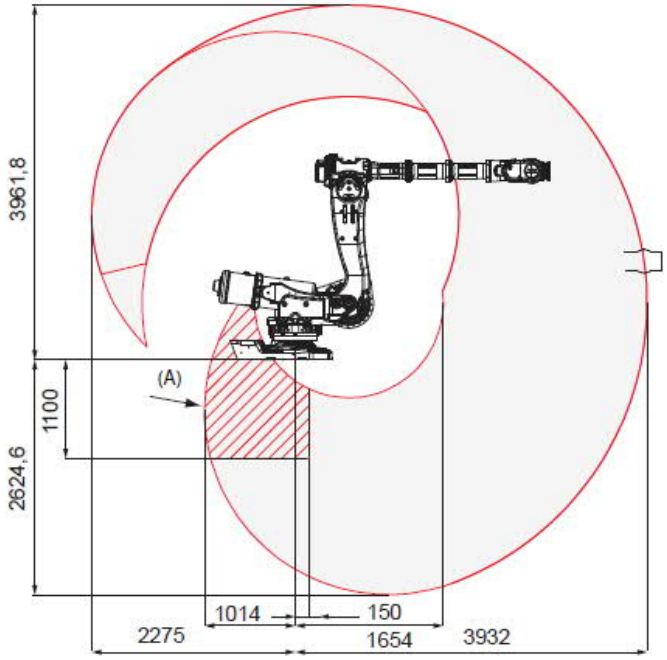
6 axis robot

6 axis robot

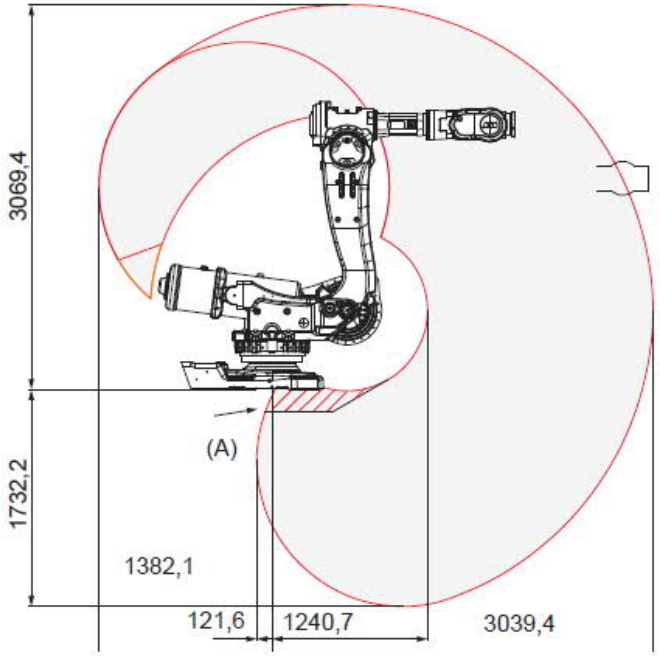
IRB1520ID,IRB2600,IRB2600ID,IRB4600,IRB6650S

Reach arm

1.45 – 3.9 m



(A) = Marked area under the robot base not available.



(A) = Marked area under the robot base not available.

Working range

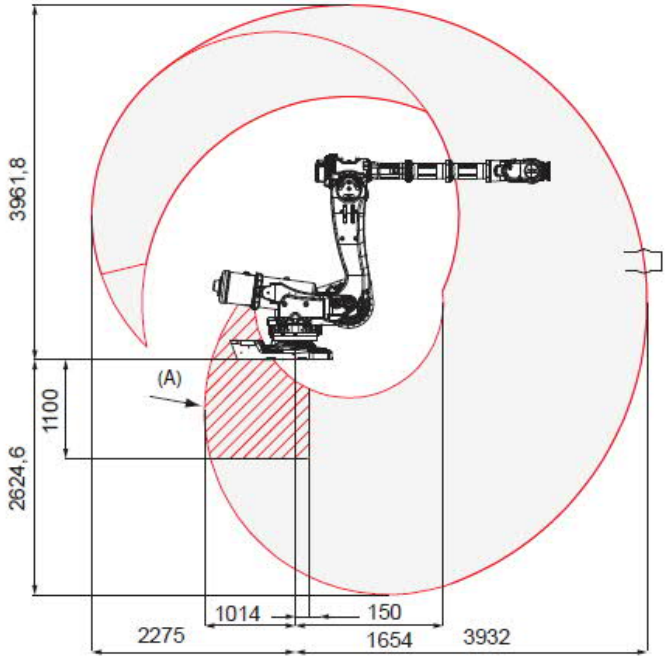
6 axis shelf type robot

6 axis shelf type robot

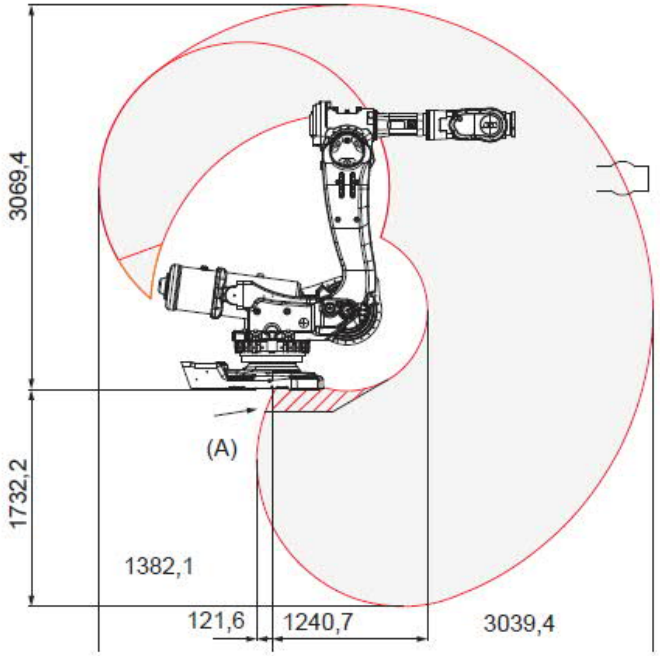
IRB1520ID,IRB2600,IRB2600ID,IRB4600,IRB6650S

Reach arm

1.45 – 3.9 m



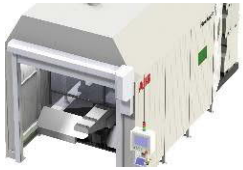
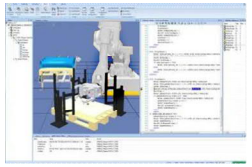
(A) = Marked area under the robot base not available.



(A) = Marked area under the robot base not available.

Robotics

Robot-selection

Working range	Payload	Speed	Application	Environment / Protection	Software	Service
						
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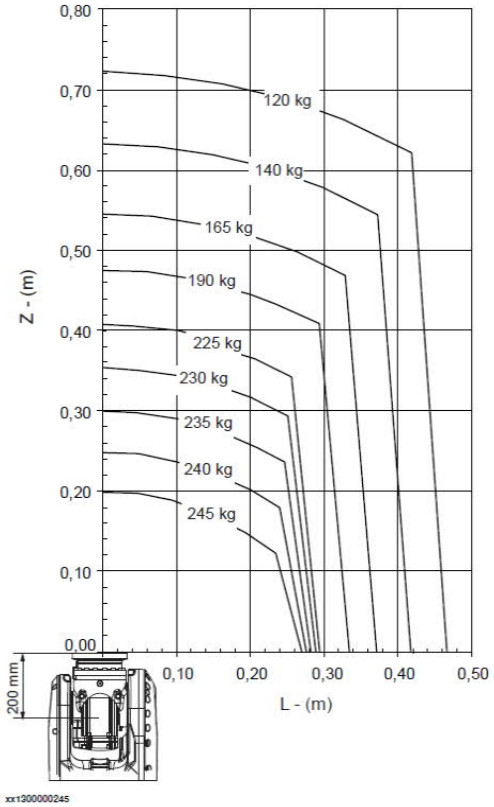
Robot in Industries

Payload

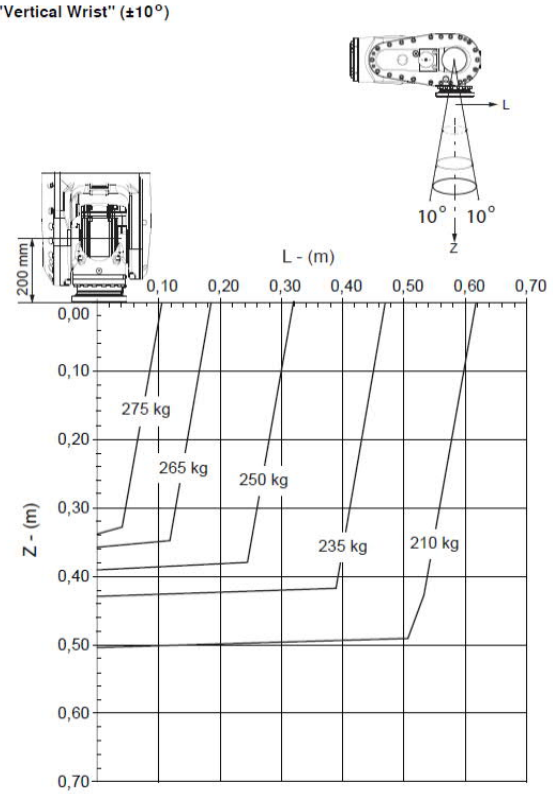
Load Diagram

Load diagram

IRB 6700-235/2.65

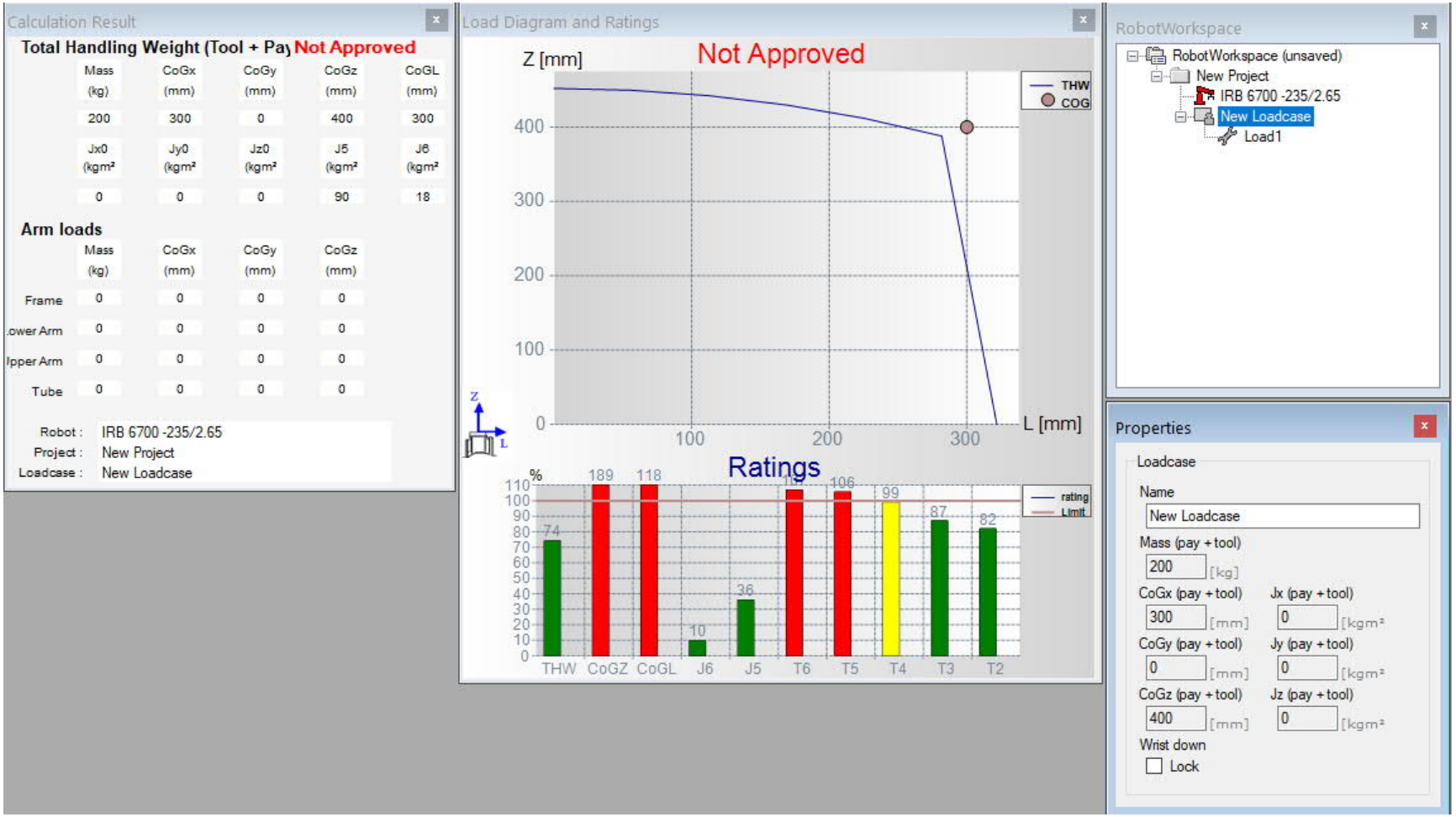


IRB 6700-235/2.65 "Vertical Wrist" (±10°)



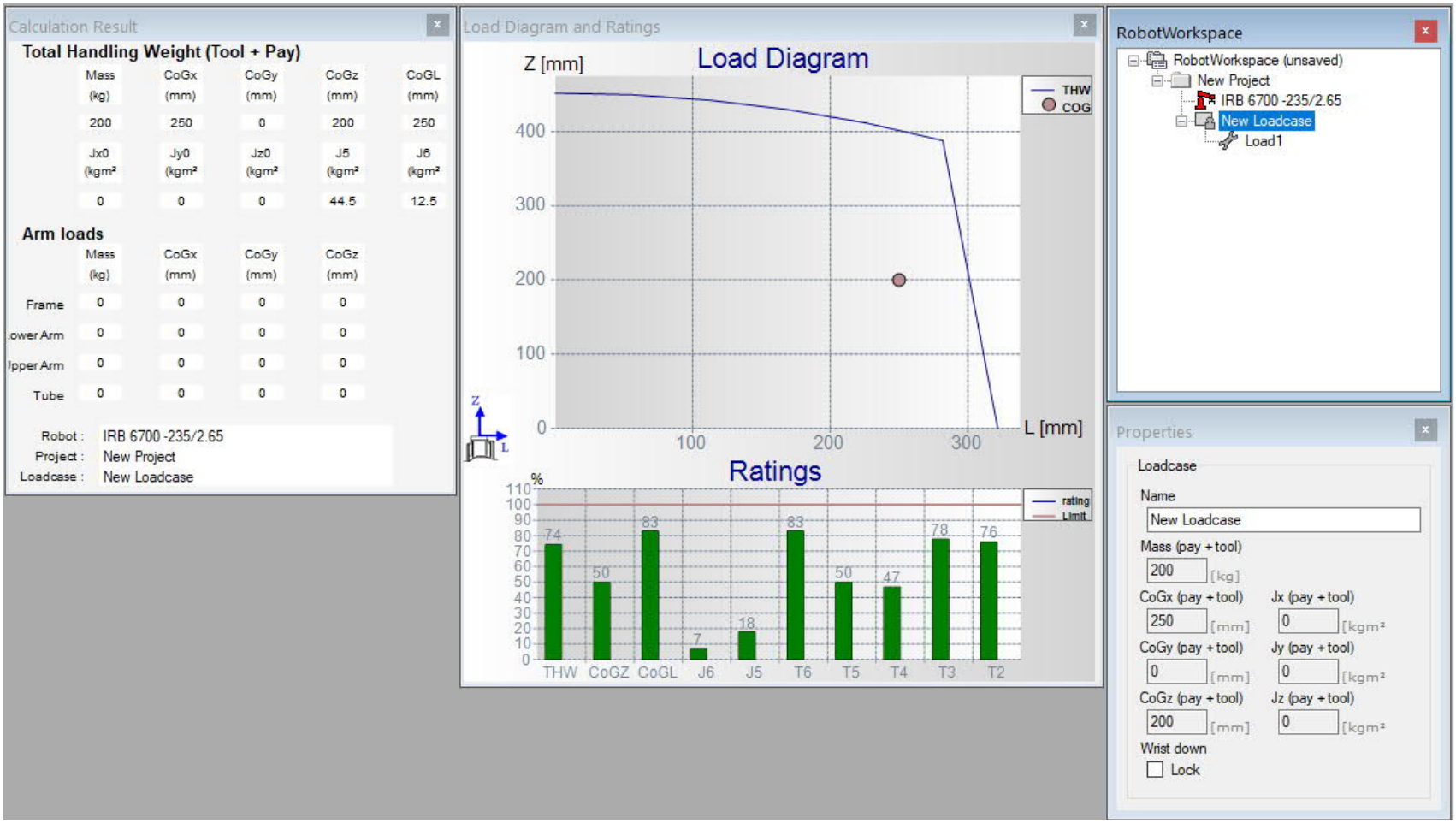
Payload

RobotLoad Software : Not Approved result



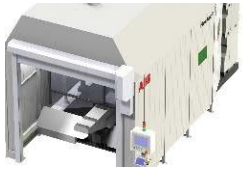
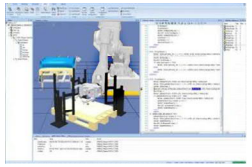
Payload

RobotLoad Software : Approved result



Robotics

Robot-selection

Working range	Payload	Speed	Application	Environment / Protection	Software	Service
						
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Robot in Industries

Speed

High speed

High Speed robot

IRB360
IRB910SC
IRB260
IRB460
IRB660
IRB760
IRB2600
IRB4600
IRB6660

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Speed

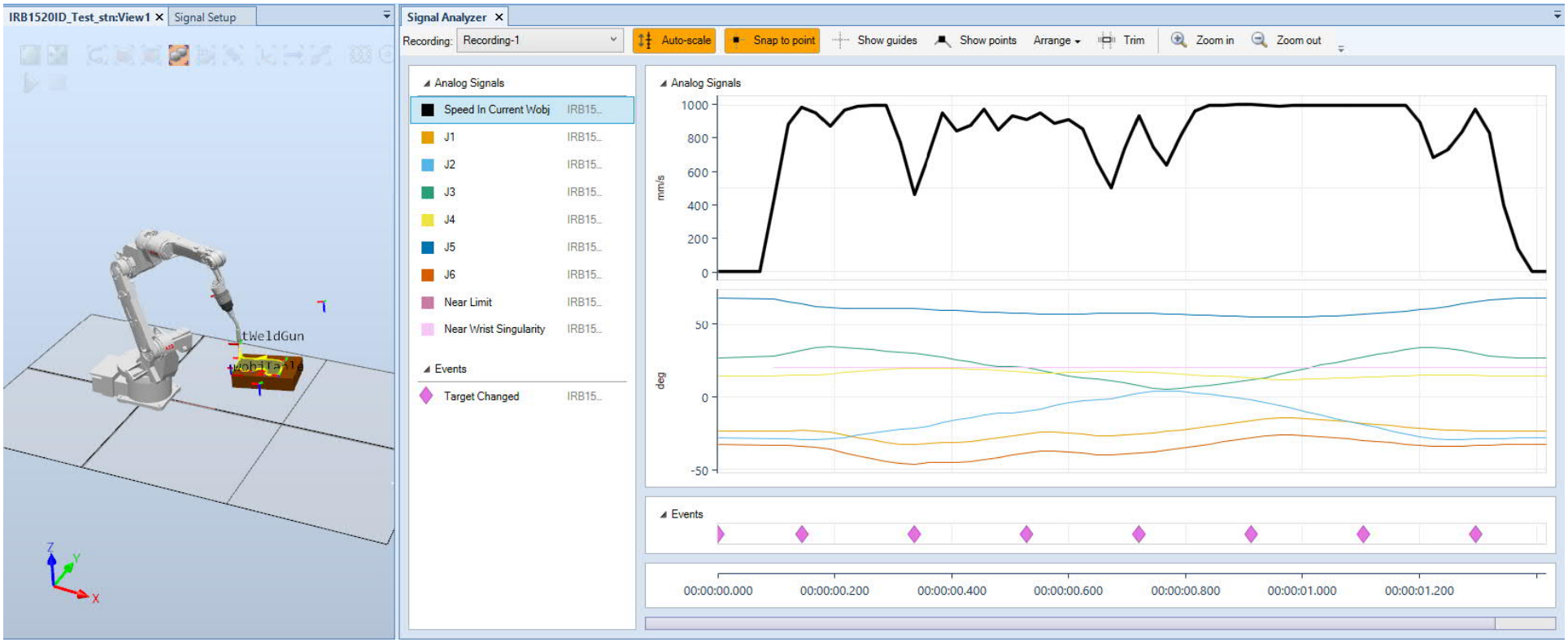
Medium speed

Medium Speed robot

IRB6700
IRB7600
IRB8700

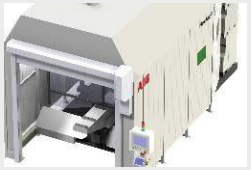
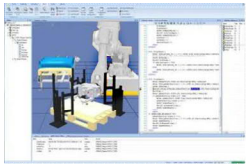
Speed

RobotStudio : Signal Analyzer



Robotics

Robot-selection

Working range	Payload	Speed	Application	Environment / Protection	Software	Service
						
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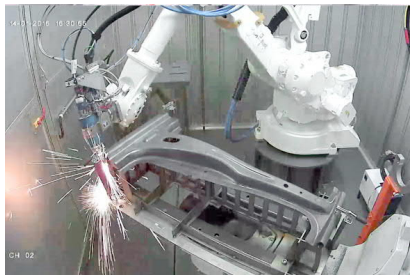
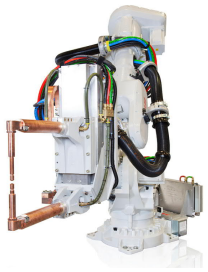
Robot in Industries

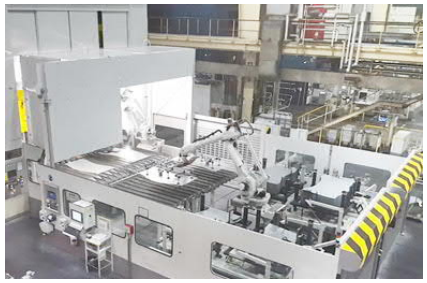
Robotics

Application

- Spot Welding
- Arc Welding
- Laser Cutting
- Plastics (Injection Molding)
- Diecasting
- Machining Force Control
- Machine Tending
- Assembly
- Packing
- High Speed Picking
- Press Tending
- Palletizing / Depalletizing
- Gluing
- Painting
- Etc







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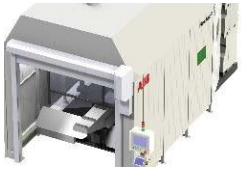
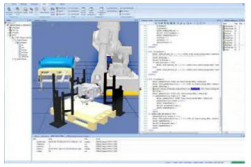
Robotics

Robot-selection

Working range	Payload	Speed	Application	Environment/ Protection	Software	Service
						
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Robot in Industries

Environment/Protection

IP Protection

IP 6 7

Code	Degree of protection (solids)
0	No Protection
1	Protection against large foreign bodies (diameter <50mm)
2	Protection against medium foreign bodies (diameter <12.5mm)
3	Protection against small foreign bodies (diameter <2.5mm)
4	Protection against small foreign bodies (diameter <1mm)
5	Dust Protected
6	Dust-tight

Code	Degree of protection (water)
0	No Protection
1	Protection against vertical water drops
2	Protection against inclined water drops (15° from vertical)
3	Protection against splash water from all directions (60° from vertical)
4	Protection against splash water from all directions
5	Protection against water jets from any angle
6	Protection against temporary flooding
7	Protection against water submersion to 1m for 30 min.
8	Protection against high pressure water and submersion for an indefinite time

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Robotics

Environment/Protection

Cleanroom standard

ISO 14644-1 cleanroom standards

Class	maximum particles/m³						FED STD 209E equivalent
	≥0.1 µm	≥0.2 µm	≥0.3 µm	≥0.5 µm	≥1 µm	≥5 µm	
ISO 1	10	2					
ISO 2	100	24	10	4			
ISO 3	1,000	237	102	35	8		Class 1
ISO 4	10,000	2,370	1,020	352	83		Class 10
ISO 5	100,000	23,700	10,200	3,520	832	29	Class 100
ISO 6	1,000,000	237,000	102,000	35,200	8,320	293	Class 1000
ISO 7				352,000	83,200	2,930	Class 10,000
ISO 8				3,520,000	832,000	29,300	Class 100,000
ISO 9				35,200,000	8,320,000	293,000	Room air

Source: www.iso.com

Robotics

Environment/Protection

Wash down

Primary process in food industry

Robotics

Environment/Protection

Foundry protection

Forging

Diecasting

Casting

Electro plating

Hot Stamping

Protection

Foundry plus

Foundry prime

Foundry prime 2

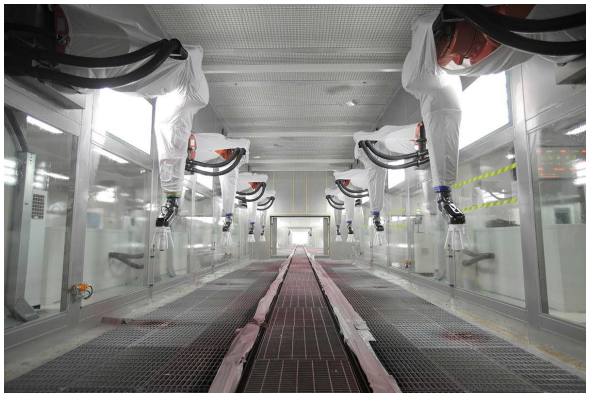
©ABB

Robotics

Environment/Protection

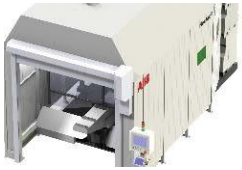
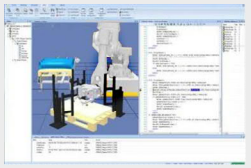
Exposion proof

- Painting



Robotics

Robot-selection

Working range	Payload	Speed	Application	Environment/ Protection	Software	Service
						
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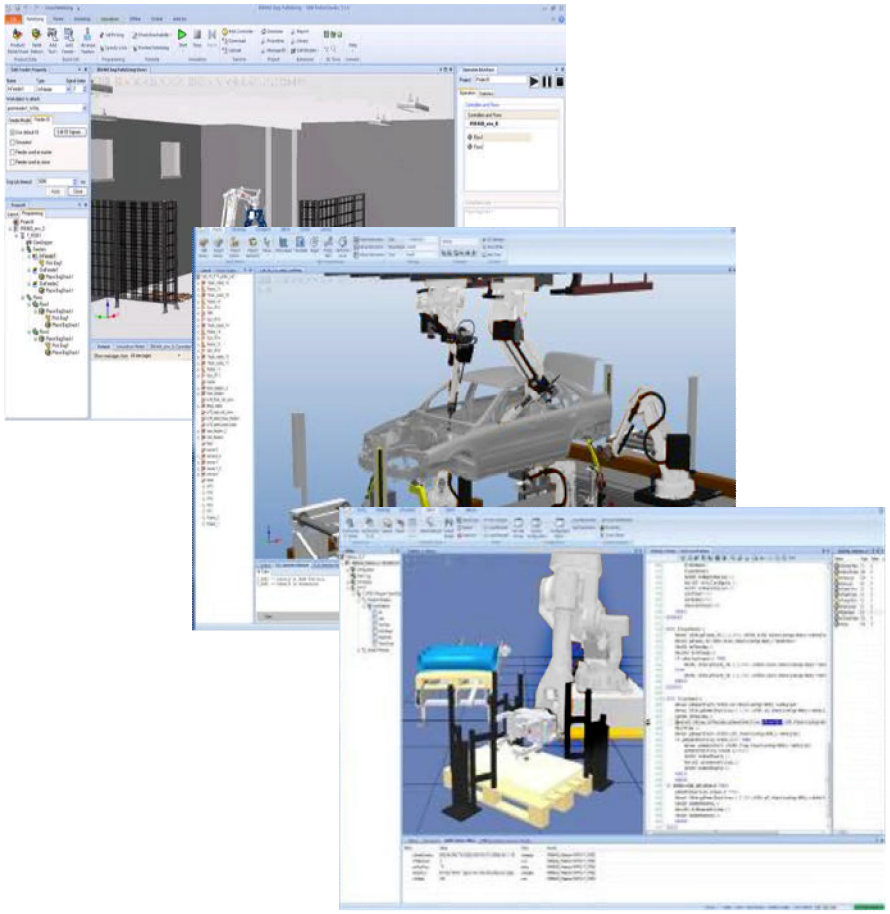
Robot in Industries

Software: RobotStudio®

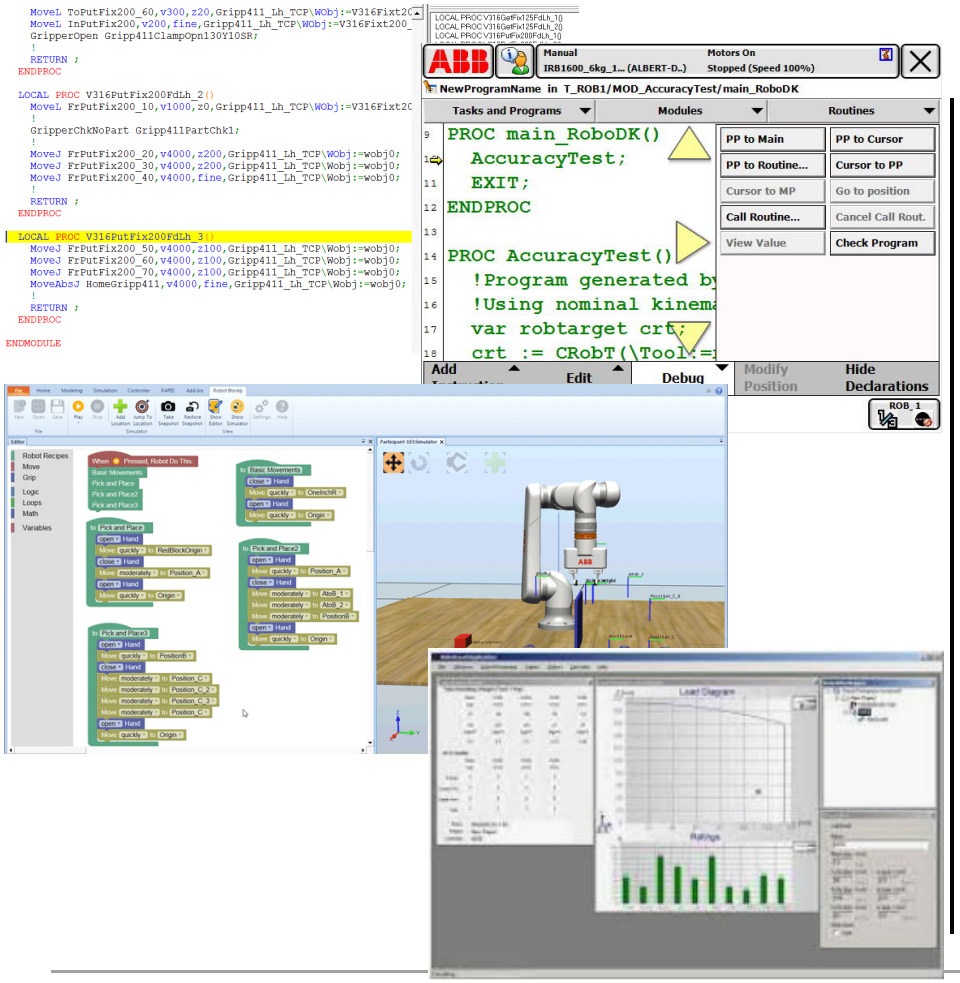
Delivering Power and Value



- Reduced risk of operator mistakes
- Less need for Training
- Easy to use Operator Interfaces
- Application customization
- Programming and testing offline
- Verifying new products quickly
- Remote Monitoring of production
- Remote Diagnostics
- Easy to use Programming Interfaces

Software: Programming Language

Delivering Power and Value



- Rapid Programming (Structure text)
- Teach Pendant programming
- CoBlox Programming (Blockly base)
- RobotLoad

Software: PowerPac

Delivering Power and Value

- 3D Printing PowerPac
- Arc Welding PowerPac
- Cutting PowerPac
- Machine Tending Power =Pac
- Machining PowerPac
- Painting PowerPac
- Palletizing PowerPac
- PickMaster
- Press Automation software (StampWare)
- Screen Maker (Production Windows)
- SpotPac
- Assembly Software
- Wizard Easy Programming
- Etc.

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Software: Robot CAM & Simulation Sofware

Delivering Power and Value

- SprutCAM
- RobotMaster
- RoboDK
- PowerMill Robot
- IRBCAM
- NX CAM Robotics
- Tecnomatix Process Simulation
- Visual Components
- Delmia
- Etc.

Software: Software Option

Delivering Power and Value

- RobotWare OS
- Robot Web Service
- Advance Robot Motion
- Advance Shape Tuning
- Absolute Accuracy
- MultiMove
- Conveyor Tracking
- Indexing Conveyor
- Sensor synchronization
- Analog Synchronization
- WorldZone
- Multitasking
- Independent Axis
- Path Offset
- Path Recovery
- SoftMove
- Collision Detection
- Collision Avoidance
- FPT Client
- PC Interface
- Flexpendant Interface
- Socket Messaging
- Multitasking
- Integrated Vision
- Application option
- Fronius TPSi
- Kempi Interface
- SmarTac
- Touch Sensing
- BullEye
- Spot 6
- Bosch Interface
- Dispensing
- Force Control Base
- RobotWare Cutting
- RobotWare Machine Tending
- Etc

Software: Field Bus Option

Delivering Power and Value

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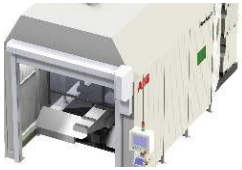
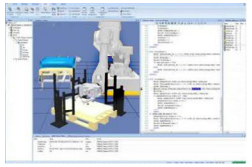
Robotics

Robot-selection

Working range	Payload	Speed	Application	Environment/ Protection	Software	Service
						
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Robot in Industries

Service

Delivering Power and Value

Features	RoboCare II Year 1	RoboCare III Year 2	RoboCare III Year 3
Parts	x	x	x
Labor	x	x	x
Travel cost *	x	x	x
Technical Support Office Hours	x	x	x
Remote Support & Analysis	x	x	x
Incident & Failure Status	x	x	x
Remote Back up on demand	x	x	x
Preventative Maintenance	required	required	required

*) Certain limitations may apply subject to local conditions

Standard offer
With RoboCare

- Local Field service onsite supprt
- Spare Part Support / Delivery
- Service Agreement RoboCare
- Service Maintenance
- Connected Service
- Spare Part Upgrade package
- System Service
- Training
- Etc

Summary

Robot-selection

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			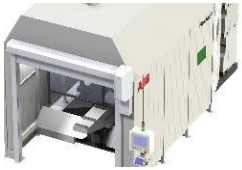		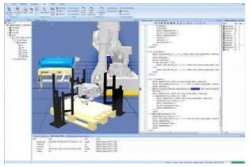	
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Robot in Industries

Q&A