

ABB ROBOTICS

YuMi® – IRB 14000

Overview



Agenda

Overview and vision

Technical data

Integration

Outline

Table mounting

Protection

Controller

Customer benefits

Key applications and segments

Summary

Differentiated value proposition

Overview and vision

No barrier

No cages

No zones

YuMi is the first truly collaborative robot solution.



Overview and vision

To meet the flexible and agile production needs required in the consumer electronics industry, and increasingly in other market sectors, ABB has developed a collaborative, dual-arm, small-parts assembly robot solution that includes flexible hands, parts-feeding systems, camera-based part location and state-of-the-art motion control.

The soft padded dual arms together with a light-weight construction and limited power contributes to the overall safety of human co-workers. Innovative technology allows for process robustness and added safety.

YuMi is a vision of the future. YuMi will change the way we think about assembly automation. YuMi is “you and me,” working together to create endless possibilities.



Demand from all industries

Overview and vision

Target Industry

3C / Electronics
Automotive electronics
Consumer products
Cosmetics
Toys
Other industries with small parts assembly

Market Demand

Human-robot collaboration
Safe by design
Small footprint / human sized
Suitable for fenceless installation
ESD compliance and CleanRoom
Easy to deploy into production
Easy to move and redeploy

Most common feedback

Safety fencing and peripherals are big part of the cell cost
Floor space is often limited
Labor shortage is driving the need for automation
Flexibility is important to support high variety small batch production
Robots that are easy to deploy and use

Filling a gap

Overview and vision

Small IRBs

Our market in the Small Parts Assembly, has reached great potentials

- Good market reputation
- Good performance in terms of accuracy and robustness
- One major drawback – working close to humans and collaboration

Aim of IRB 14000 is to fill this gap

IRB 14000

The goal is to provide a flexible and safe automation solution for tasks where robot need to work close to humans, features include:

- Inherent safety
- Flexible feeding parts management
- Vision-Guided Assembly
- Best in class accuracy
- Speed effective assembly

Leading the competition

Overview and vision



Ultra compact and lightweight design

High precision and High collaborative working speed

Equipped with an enclosed controller

SmartGrippers with integrated vision, vacuum and servo fingers

State of the art motion control

Ultra smooth lead through teaching

First safe robot by design

Universal parts feeding system (optional)

ABB's comprehensive robot portfolio

Overview and Vision



Strong robot offering from the IRB 120 to the IRB 8700

Main features

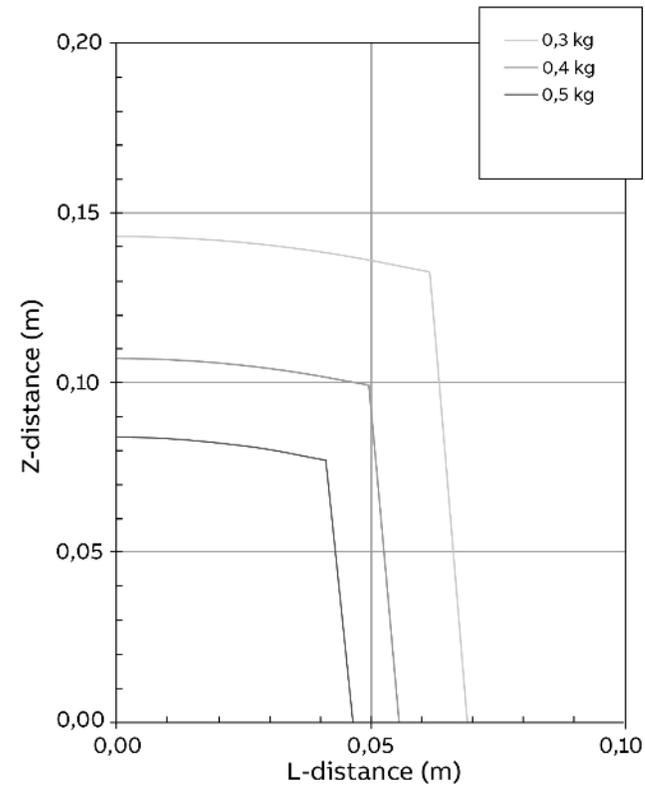
Technical data

IRB 14000 – 0.5/0.5

Payload	0.5 kg per arm
Reach	559 mm
Accuracy	0.02 mm
Footprint	339 mm * 497 mm
Mounting interface	Foot interface
Weight	38 kg
Mounting position	Table
Temperature	5 C – 40 C deg
IP Protection	IP 30
Clean room/Food grade	ISO lvl 5

Payload

Technical data



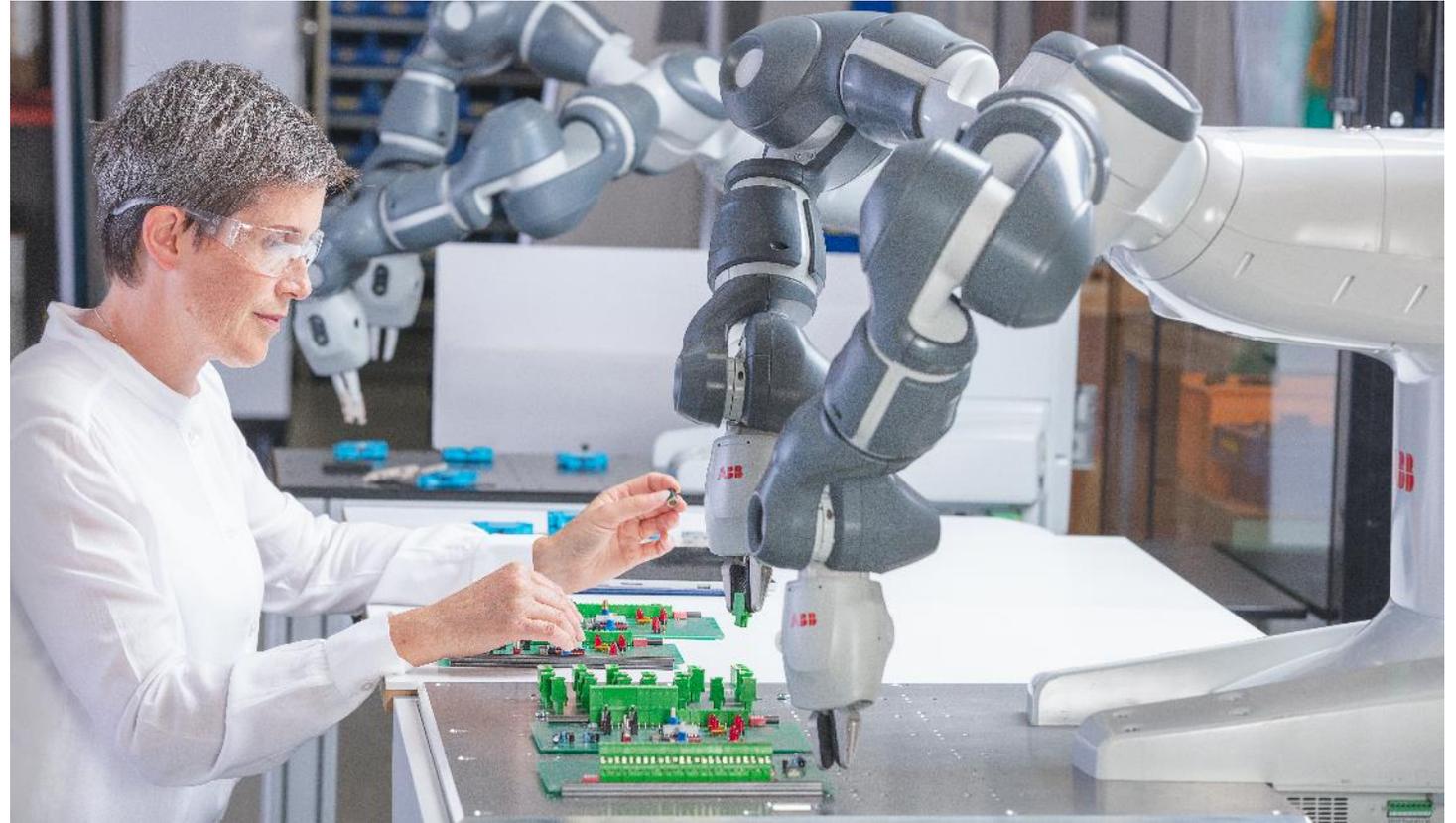
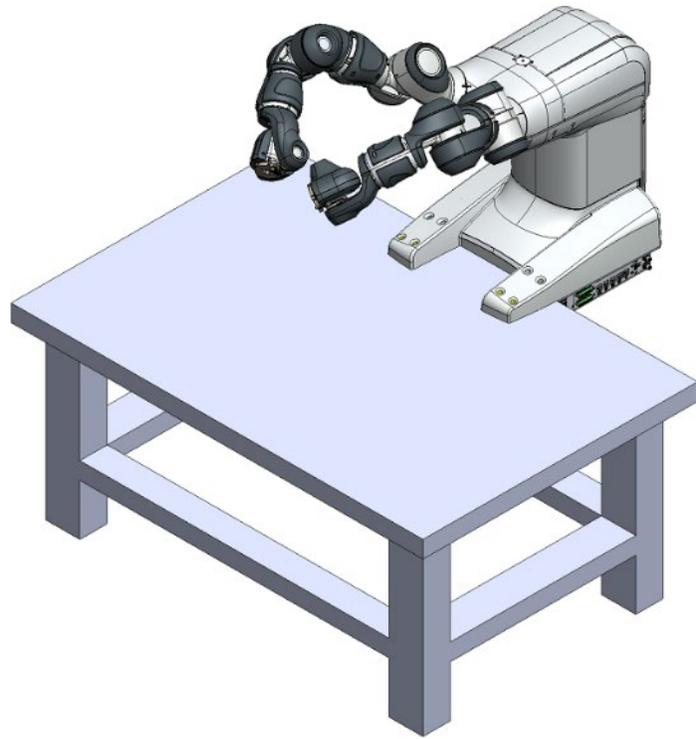
Maximum velocity

Technical data

	Motion Range	Max. Velocity
Axis 1 Rotation	+168.5° to -168.5°	180 °/s
Axis 2 Arm	+43.5° to -143.5°	180 °/s
Axis 7 Rotation	+168.5° to -168.5°	180 °/s
Axis 3 Arm	+80° to -123.5°	180 °/s
Axis 4 Wrist	+290° to -290°	400 °/s
Axis 5 Bend	+138° to -88°	400 °/s
Axis 6 Turn	+229° to -229°	400 °/s

YuMi: IRB 14000

Table mounting



Protection

IP Protection

IP 30 (Standard)

- It is sufficient for assembly



ESD Protection

It makes it possible to handle static sensitive parts



CleanRoom

YuMi IRB14000 has been certified by Fraunhofer institute (IPA) in Germany to fulfil CleanRoom requirements of ISO 5 level.



YuMi: IRB 14000

Controller



Embedded controller based on IRC5

Portable (38kg)

External connectors

Built-in 8 in /8 out

Customer benefits

1. **Padded arms** - Including internal wiring and air
2. **Integrated controller** - New in ABB portfolio
3. **Lightweight construction** - Makes the robot portable
4. **Ease-of-use** - Lead Through Programming
5. **Enclosed design** - Lower maintenance
6. **Integrated vision and integrated hands** - Built in to product and easy to integrate
7. **Safety certified** - Certified by an independent body

1. Padded arms

Customer benefits



Adds to safety of operators if there is an unlikely contact during operation

The robot can be run faster due to added protection

Faster robot means the ROI will be greater

2. Integrated controller

Customer benefits



Saves working space

Better cell layout

Equipment can be placed closer to, or around, robot without interference

Robot is more streamlined and easy to relocate

No floor cables or control cables

3. Lightweight construction

Customer benefits



Makes the robot portable

Increases safety of the robot

Smaller frame to mount the robot

4. Ease-of-use

Customer benefits

Lead-Through Programming makes the programming easy.

Integrated vision can pick parts without fixture.

Can use YuMi App for programming on a wireless tablet.

Standard IRC5 system as other ABB robots for uniform programming environment.

Can use RobotStudio for offline programming and simulation.



5. Enclosed design

Customer benefits



Enclosed design allows all wiring and air to go through the inside of the robot

- Reduced maintenance
- Less risk of cable and air hose damaged
- Can be used in confined spaces
- Easy to keep clean
- No risk of dust collecting on cables

6. Integrated vision and integrated hands

Customer benefits

Integrated vision

Cameras embedded in gripper

Integrated hands makes it possible to use the hand for vision guided picking

Can be used for simple inspection

Integrated hands

No need to design your own hand

Multi-option hand with five options

Integrated communications and air

Servo

Vacuum

Camera

7. Safety certified

Customer benefits

**FUNCTIONAL
SAFETY**



LISTED

No need to certify the robot

Can be included in your risk assessment of the cell

Independent body has certified the robot

PL b Cat b

Key applications and segments

Applications

Suitable for

- Small Parts Assembly
- Collaborative Assembly
- Accurate and fast assembly
- Testing and packaging
- Material handling
- Inspection

Not suitable for

- Harsh environments
- Handling naked food

Segments

Electronics assembly

Automotive Electronics

Consumer products and general industry

Medical Equipment

Toys

Other small parts manufacturing

Small Parts Assembly

Key applications and segments



IRB 14000 is the perfect alternative/complementary for IRB 120 or IRB 1200 in small parts assembly

Safe collaborative assembly

Precise 0.02 repeatability for small tasks

Vision Guided-Assembly

Key applications and segments



Vision included in hands as package

Vision can also be connected to robot for external devices like flex feeders

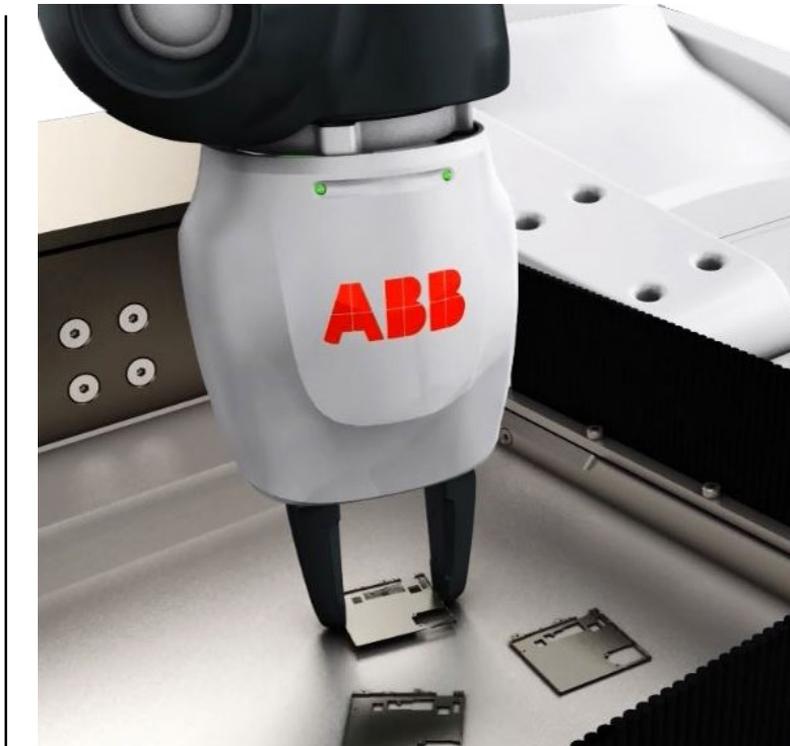
This makes it possible to have less jigging and move to a more flexible cell design

Small Parts Assembly using the FlexFeeder™s and ABB gripper

Key applications and segments

Gripper and FlexFeeders make it possible to have a complete solution from part handling to assembly

Odd sorted parts can be placed in FlexFeeders and presented to the robot in a two dimensional plane



Small Parts Material Handling

Key applications and segments

After the assembly process is complete the robot can place the finished product in box ready for shipment.



YuMi working side-by-side handing finished parts to be packed.



Summary



Safe and collaborative

No cages needed
Padded arms and light weight design
Designed to be inherently safe

Increased ROI

Fast accurate assembly,
lower changeover costs

Ease-of-integration

Wide range of communications interfaces
Integrated hand equipped with vision
Integrated controller
Light weight and portable

Ease-of-use

Lead-Through Programming

ABB