IRB 1600
The highest performance general purpose 10 kg robot
IRB 1600 general presentation

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- Targeted applications
- Key differentiators
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- Summary
IRB 1600 in ABB Robotics product range
IRB 1600 position vs. smaller and larger robots

Robots in the 6-20 kg range
- IRB 140
- IRB 1600
- IRB 2600
Overview
IRB 1600 family has 2 upgraded variants

IRB 1600 - 6/1.2
IRB 1600 - **10/1.2**
IRB 1600 - 6/1.45
IRB 1600 - **10/1.45**

New! Upgraded to 10 kg
Overview

Highest performance general purpose 10 kg robot

Enhanced productivity in the toughest environments at the most demanding 24/7 duty cycles by

- Doubling the output with up to 50% shorter cycle times vs. the competition
- Superior work piece quality vs. the competition
Targeted applications
CNC machine tending

- Loading and unloading of diesel injectors inside a CNC machine.
- The machine has been tailor made for the IRB 1600-10/1.2 - the short arm variant.
- No other robot available with
  - High compactness
  - 1.2m reach
  - sufficient payload
  - the required performance
  - Foundry Plus 2 protection
Targeted applications
Machine tending – Spraying/extraction

- Payload 10 kg sufficient for both spraying and extraction applications.
- Reach 720 mm below the base is very useful in spraying applications.
- Short cycle times crucial for extraction application since the output can be increased significantly.
- Foundry Plus 2 protection increases the reliability and the lift expectancy of the robot.
Targeted applications
Arc welding

- IRB 1600-6/1.45 can handle up to 6kg torches and 15kg wire feeders on the upper arm plus 15 kg bobbin on axis 2.
- Offered with several process equipment packages from Fronius, Esab, Kemppi, SKS, Miller, Lincoln, ...
- Powerful software offers
  - Integrated power source with single-point-of-programming for FRONIUS and ESAB.
  - RobotWare Arc
  - RobotStudio Arc Welding PowerPac
- Wide program with external axis
  - IRBP Positioners
  - MTD and MID Gear units,
  - MU Motor units
  - RTT Track motion
Targeted applications
Waterjet cutting

IRB 1600-10/1.45

- Path repeatability (ISO) = 0.13 mm at 250 mm/sec
- Wall mounting possible
- Foundry Plus 2 protection
IRB 1600 key differentiators

1. Up to 50% shorter cycle times
   - QuickMove™
   - Highest accelerations / decelerations

2. Superior work piece quality
   - TrueMove™
   - Stiff design, low vibrations, low friction

3. Outstanding reliability
   - Unique protection offer
   - Robust design
   - Collision detection

4. Sustainable
   - Lowest power consumption
   - Lowest noise level

5. Easy to integrate
   - Fully flexible mounting
   - Can fit inside machines
   - Total load capacity up to 36 kg
Up to 50% shorter cycle times
In material handling / machine tending applications

- The unique and patented 2nd generation QuickMove™ motion control
  - Accurate dynamic model
  - Max accelerations and decelerations always utilized
- The maximum acceleration and deceleration are higher than the competition's
  - Powerful motors and very low friction losses in the spur gears
- Result: Up to 50% shorter cycle times in material handling, machine tending and process applications
- Benefit: Up to double production output.
1. Up to 50% shorter cycle times
Example from a material handling application
2. Superior and consistent work piece quality
In cutting and material removal applications

- The unique 2nd generation TrueMove™ motion control
- Stiff design, low vibrations, low friction
- Result:
  - The best position, path and speed accuracy control on the market
  - The path is the same at all speeds
  - “What you program is what you get”
2. Superior and consistent work piece quality
   In cutting and material removal applications

   Benefits:
   - Superior and consistent work piece quality
   - Higher yield and less rejects.
   - Higher work piece value
3. Outstanding reliability
Unique protection offer – Standard IP 54

- IP 54 for the entire manipulator
- Internal routing of cables
- IP 67 for sensitive areas:
  Covers, signal cable connector,
  motors with connectors and all
  moving axes
3. Outstanding reliability
Unique protection offer - Foundry Plus 2 (option)

For harsh environments
- Die casting and similar
- Sprays of coolants, lubricants and metal spits.
- High pressure steam washable

Main features
- IP67 on the entire robot
- Wear resistant paint
- Cable connector protections
- Rust preventives on screws, washers and unpainted / machined surfaces

Benefits
- Higher up-time
- Less maintenance
- Longer life expectancy

Nickel coated mounting flange
3. Outstanding reliability

Foundry Plus 2 (option) – IP 67 measures

- IP67 connector
- Sealed cover
- IP67 motors & connectors
- IP67 axis sealings
- IP67 connectors
3. Outstanding reliability

Robust design

- Rigid design, the weight of the robot is 250 kg, higher than the competition.
- Well proven spur gears on all axes.
- Internal routing of cables for better protection.
3. Outstanding reliability
Collision detection software (option)

Functions
- Quickly detects a collision
- Stops the robot, backs up along the path
- Detection in all directions
- No mechanical parts or cabling

Benefits
- Protects robot and equipment from damages
4. Sustainable
Power consumption less than half of the competition

Features:
- Spur gears with very low friction.
- Efficient motion control with QuickMove™ and TrueMove™, avoiding unnecessary moves.

Benefits:
- Power consumption at max speed is only 0.57 – 0.58 kW (active power) or 1.08 kVA (apparant power)!
- Competition consumes at least 40% more in kVA at max speeds.
- You can calculate your power consumption in Robot Studio.

<table>
<thead>
<tr>
<th>Speed (mm/s)</th>
<th>Power consumption (kW)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>IRB 1600-x/1.2</td>
</tr>
<tr>
<td>Max.</td>
<td>0.57</td>
</tr>
<tr>
<td>1000</td>
<td>0.46</td>
</tr>
<tr>
<td>500</td>
<td>0.39</td>
</tr>
<tr>
<td>100</td>
<td>0.34</td>
</tr>
</tbody>
</table>
4. Sustainable
Lowest noise level

Features:
- Airborne noise level < 70 dB (A)

Benefits:
- Less hazardous working environment.
- The operators can stay more alert.

<table>
<thead>
<tr>
<th>Data</th>
<th>Description</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Airborne noise level</td>
<td>The sound pressure level outside the working space</td>
<td>&lt; 70 dB (A) Leq (acc. to Machinery directive 2006/42/EG)</td>
</tr>
</tbody>
</table>
5. Easy to integrate
Fully flexible mounting at max load and full speed

- **Shelf**
  - 720 mm reach below the base

- **Tilted**
  - Up to 55° with full working range on axis 1

- **Inverted**
  - Excellent working range

- **Wall**
  - Up to 60° working range on axis 1
5. Easy to integrate
Can fit inside machines: Ex KMT Lidköping

- Loading and unloading of diesel injectors inside a CNC machine.
- The machine has been tailor made for the IRB 1600-10/1.2 - the short arm variant.
- No other robot with available with
- High compactness
- 1.2 m reach
- sufficient payload
- the required performance
- Foundry Plus 2 protection
5. Easy to integrate
Total load up to 36 kg at full speed

<table>
<thead>
<tr>
<th>Variant</th>
<th>Payload (kg)</th>
<th>Max Armload (kg)</th>
<th>Total load (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>IRB 1600-6/x</td>
<td>6</td>
<td>30.5</td>
<td>36.5</td>
</tr>
<tr>
<td>IRB 1600-10/x</td>
<td>10</td>
<td>20.5</td>
<td>30.5</td>
</tr>
</tbody>
</table>

Please see the product manual for further information regarding how the extra loads can be placed.
Technical data
IRB 1600-x/1.2 – the robot for compact cells
Technical data
IRB 1600-x/1.45 – wide working range
Technical data
Increase from 8 to 10 kg payload
Summary
Two major benefits for our end users and integrators

Significant productivity gains
- Increased output
  - up to 50% shorter cycle times
  - outstanding reliability
- Consistent high quality and reduced waste
- Sustainable and healthy production environment
  - lowest power consumption
  - lowest noise level

Efficient integration of a compact cell
- Full freedom to place the robot in the most efficient position
  - fully flexible mounting
  - can fit inside machines
  - up to 36 kg total load capacity
Summary

The highest performance general purpose 10 kg robot

- Wide range of applications
- The short arm is unique
- The clear winner vs. the competition
- Enables significant productivity gains
- Highly efficient to integrate
Power and productivity for a better world™