IRB 140 Industrial Robot

Offering new opportunities in flexible automation

Small & Powerful
A powerful robot in a small package – the new IRB 140 industrial robot

Based on customer demands for a powerful robot in a small package, ABB introduces the new IRB 140. The new industrial robot is only 81 cm high and weighs 98 kg – but has a handling capacity of 5 kg, 6 working axes and a great reach. IRB 140 is also faster and more accurate than any other robot of its size and it has an outstanding flexibility in mounting. All together offering totally new opportunities to the world of flexible automation.
The standard IRB 140 can be foot or wall mounted at any angle, or ceiling mounted. This allows for great flexibility in arranging the layout of a production line.

Being easy to integrate with process equipment makes the IRB 140 a cost-effective solution. Special attention is paid to fast and flexible installation and start-up, easy programming of the workcycle and fast reprogramming for new tasks.

The IRB 140 matches the high performance of all ABB robots, and the same robot controller is used throughout the robot range.

A partnership approach
ABB has more than 25 years of experience in providing robotic solutions. Through close partnership with process equipment suppliers, machine builders, system suppliers and system integrators, ABB products and systems are supplied through different channels so that the end-user gets the benefits of the combined know-how of many expert suppliers.

Even more with the new S4Cplus robot controller
The latest S4Cplus robot controller is even more powerful than its predecessors. The robot controller allows easy integration and great communication possibilities between the robot and other equipment via digital signals or a number of available field busses. The two Ethernet interfaces allow PCs to be integrated into process information monitoring and adjustment.

Another key design factor is the open language and system configurability that allow for addition of new functionality and permit the functionality to be adapted to the user's specific needs.
Developed for specific processes

- Arc welding, polishing and press tending
- Aluminium die-spraying and deburring
- Small goods assembly, handling and packing
- Machine loading and unloading of inserts and parts, material handling and machine tending

A compact robot for compact arc welding cells

The FlexArc® Compact is a self-contained skid-mounted welding cell containing an IRB 140 robot and a cell management system. It is designed to fit quickly and easily into a small space on an existing production line. It provides immediate flexibility – removing a production bottleneck or facilitating rapid change-over between jobs.

The skid is designed to fit on a standard fork-lift truck and there are single connections for power, gas and air. The unit can start work 10 minutes after arriving at the production facility.

A totally enclosed robot for die spraying applications in Foundries

ABB offers a range of robots proven in harsh foundry environments. The new IRB 140 is available with foundry protection IP67 and is designed for mounting at any angle on foundry machines. The 5 kg load capacity and high load offset make it very suitable for die spraying in small and medium size die casting machines.
Clean Room 10 design for Electronic Goods

The IRB 140 moves at high speed and with very high repeatability. This together with the compact design, long reach and the ability to mount the robot in an inverted position, makes it ideal for assembly and testing lines for small electronic goods such as mobile telephones, radios etc. The robot is also suitable for packing the finished products.

A high performance robot for loading and unloading of plastics machines

The IRB 140 is a perfect robot for loading inserts and unloading the moulded parts from injection moulding machines. The 5 kg load capacity allows a double gripper to both insert and unload parts in the same work cycle, speeding up the production considerably.

The 6 axes allow high accessibility around the mould and increase the flexibility of the installation.
Hard facts that make a small robot powerful

The IRB 140 robot offers very high performance. The robot design together with the advanced control system give capacity and functionality previously associated with large robots. The IRB 140 is truly a powerful robot in a small package. Some features are listed below:

**QuickMove and TrueMove functions for very high performance**
These well established ABB robot functions are a result of using a dynamic model to control the robot. The robot is self-tuning and always achieves the highest performance.

**Software template program**
Software programs for fast and easy set-up of new welding programs are available.

**Add-on application specific software**
Dedicated software that is continuously updated, including ArcWare™, ArcWare plus™, GlueWare™.

**Programmed "interrupts"**
Can initiate in-loading of material, torch service and procedures for faults.

**Background programs**
Up to 10 background programs can run in accordance with chosen priority.

**Extensive communications**
1024 inputs/outputs, three serial channels, two Ethernet connections, two CAN/DeviceNet buses, PLC, Interbus and Profibus.

**Soft Safety Clutch**
The collision force-reduction software functions as a software safety clutch.
**Working range and Load diagram**

Working range to center of axis 5. All measurements in mm.

**Simulation**

Simulation programs which use the actual robot software are available on PC for equipment feasibility studies. The programs simulate motion and cycle-time with high accuracy. The programs also facilitate robot programming and program adjustments.

**Conveyor following**

The conveyor following function is useful for in-loading and packing applications.

**Instant access to all software**

Instant access to all supported field-buses and all editions of installed software programs.
# Technical data

## IRB 140 industrial robot

### SPECIFICATION

<table>
<thead>
<tr>
<th>Robot version</th>
<th>Handling capacity</th>
<th>Reach of arm</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>IRB 140</td>
<td>5 kg</td>
<td>810 mm</td>
<td></td>
</tr>
<tr>
<td>IRB 140C</td>
<td>5 kg</td>
<td>810 mm</td>
<td>Extra protection</td>
</tr>
<tr>
<td>IRB 140CR</td>
<td>5 kg</td>
<td>810 mm</td>
<td>Clean Room</td>
</tr>
</tbody>
</table>

**Supplementary load (on upper arm):** 1 kg on wrist, 0.5 kg.

**Number of axes:**
- Robot manipulator: 6
- External devices: 6

**Integrated signal supply:** 12 signals on upper arm

**Integrated air supply:**
- Unlim. (400°C, default)
- Unlim. (800°C, default)

**Movement on ISO test plane:**
- Max. TCP velocity: 2.5 m/s
- Max. TCP acceleration: 20 m/s²
- Acceleration time: 0.15 sec.

### ELECTRICAL CONNECTIONS

**Supply voltage:** 200–600 V, 50/60 Hz

**Rated power:**
- Transformer rating: 4.5 kVA
- Transformer rating: 250 kW

### PHYSICAL

**Robot mounting:**
- Floor, wall and suspended

**Dimensions:**
- Robot base: 400 x 400 mm
- Robot controller: H x W x D = 950 x 800 x 620 mm

**Weight:**
- Robot manipulator: 98 kg
- Robot controller: 250 kg

### ENVIRONMENT

**Ambient temperature:**
- Robot controller: 5 °C to 52 °C
- Robot manipulator: 5 °C to 45 °C

**Relative humidity:**
- Max. 95% relative humidity

### ELECTRONIC SPECIFICATIONS

**Process equipment:**
- Weld power sources
- Welding torches
- Workpiece manipulators

**Example of process signal interface:**
- Status of arc, voltage, current, water, gas, wire feed (digital input)
- On/off of power, gas, wire feed, error information (digital output)

**Example of ArcWare™ functions:**
- General power source interface
- Process tuning of welding parameters during program execution (hot edit)
- Weld-retry including “go-to-service” routine
- Weld error report and logging
- Arc start/stop
- Material pre-heating/cooling
- Scrape start
- Crater filing
- Wire burnback
- Weaving pattern definition
- Monitoring of arc data, seam coordinates, wire, water, voltage, current, gas

**Robot vision:**
- Interface for vision

**Diskette drive:**
- 3.5” MS-DOS

**Robot controller:**
- Interface for vision

**Networks:**
- 2 x Ethernet
- 2 x CAN/Device Net
- Interbus-S
- Profibus DP

**Process interfaces:**
- Media and signals on upper arm

**Integration:**
- Totally enclosed
- Sealed computer, air-over manipulator

**Robot vision Interface for vision:**
- Diskette drive 3.5” MS-DOS

### EXAMPLE OF ARC WELDING EQUIPMENT AND FUNCTIONALITY

**Process equipment:**
- Weld power sources
- Welding torches
- Workpiece manipulators

**Example of process signal interface:**
- Status of arc, voltage, current, water, gas, wire feed (digital input)
- On/off of power, gas, wire feed, error information (digital output)
- Value of wire feed velocity, voltage, current, (analogue output)

**Example of ArcWare™ functions:**
- General power source interface
- Process tuning of welding parameters during program execution (hot edit)
- Weld-retry including “go-to-service” routine
- Weld error report and logging
- Arc start/stop
- Material pre-heating/cooling
- Scrape start
- Crater filing
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### EMERGENCY STOP

**Emergency stop:**
- Stop all axes

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**Safety:**
- Double circuits with supervision, emergency stops and safety functions, 3-position enable device

### MAN-MACHINE-INTERFACES

**Operators’ panel:**
- In cabinet or external

**Teach pendant:**
- Portable with joystick and keypad, Display 16 lines x 40 characters, Window style communication, 3 position

**Languages:**
- Choice of 11 national languages

**PC, off-line:**
- “The S4Plus software on your PC”
- Quick/Teach training on PC
- RobotStudio™, ProgramMaker™
- VirtualRobot simulation

**PC, on-line:**
- Monitor and control of robots, FactoryWare™

**IEEE Simulation:**
- From simulation companies

### MACHINE INTERFACES

**Inputs/outputs:**
- Up to 2 x 1 024 signals
- 120 V AC or relay outputs
- +10 V and 4-20 mA

**Networks:**
- 2 x Ethernet
- 2 x CAN/Device Net
- Interbus-S
- Profibus DP

**Process interfaces:**
- Media and signals on upper arm

### SPECIFICATION

**IRB 140 industrial robot**

**Technical data**

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ABB

ABB Automation Centers and Contact Offices