ABB

ROBOTICS

# Product specification

# IRB 360

Product specification

IRB 360-1/1130
IRB 360-3/1130
IRB 360-8/1130
IRB 360-1/1600
IRB 360-6/1600

OmniCore

Document ID: 3HAC079010-001

Revision: B

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Original instructions.

# Table of contents

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# Overview of this specification

**About this product specification**

This product specification describes the performance of the manipulator or a complete family of manipulators in terms of:

- The structure and dimensional prints
- The fulfilment of standards, safety, and operating equipment
- The load diagrams, mounting or extra equipment, the motion, and the robot reach
- The specification of available variants and options

The specification covers the manipulator using the OmniCore controller.

**Usage**

Product specifications are used to find data and performance about the product, for example to decide which product to buy. How to handle the product is described in the product manual.

The specification is intended for:

- Product managers and product personnel
- Sales and marketing personnel
- Order and customer service personnel

**References**

| Reference | Document ID |
|-----------|-------------|
|  |  |
|  |  |
| *Product manual - IRB 360* | *3HAC030005-001* |

> 💡 **Tip**
>
> All documents can be found via myABB Business Portal, *www.abb.com/myABB*.

**Revisions**

| Revision | Description |
|----------|-------------|
| A | First edition. |
| B | Published in release 21C. The following updates are done in this revision:<br>• Text regarding fastener quality is updated. |

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# 1 Description

## 1.1 Structure

### 1.1.1 Introduction to structure

**Robot family**

The IRB 360 is ABB Robotics' latest generation of high performance industrial robots. Based on the famous IRB 340 robot family in a modular design. It is specially designed for industries with a great need for flexible automation, such as pick and place operations and assembly.The IRB 360 is extremely powerful with an acceleration of up to 10 g's, and a handling capacity of up to 8 kg. Thanks to optimized drive-chains and ABB's patented QuickMove$^{TM}$ functions it is the fastest robot in its class, up to 200 picks per minute (defined by cycle and load).

**Operating system**

The robot is equipped with the OmniCore C30 controller and robot control software, RobotWare. RobotWare supports every aspect of the robot system, such as motion control, development and execution of application programs, communication etc. See *Operating manual - OmniCore*.

**Safety**

Safety standards valid for complete robot, manipulator and controller.

**Additional functionality**

For additional functionality, the robot can be equipped with optional software for application support - communication features - network communication - and advanced functions such as multi-tasking, sensor control, etc. For a complete description on optional software, see .

PickMaster$^®$ Twin is a PC and robot controller based application software for vision guided picking of random flow products on the fly. It is providing a task-oriented programming and executions of fast pick and place operations performed up to 10 robots, see *Product specification - PickMaster Twin*.

**Clean room robots**



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The clean room robots are classified for room class 5 according to ISO 14644-1.

For options not selectable together with Clean Room, see *Specification of variants and options on page 41*.

**Washdown statement**

All components for Stainless WashDown protection class have been found to comply with USDA/FDA, Code of Federal Regulations Title 21 regarding choice of material, material behavior, and sanitary operations, as per 31 December 2007. Changes in the USDA/FDA regulations will be incorporated in the specification when appropriate. (Relevant chapters of CFR are part 100-199). The intended use is incidental food contact. Any gripper to be used must be investigated separately.

**Manipulator axes**
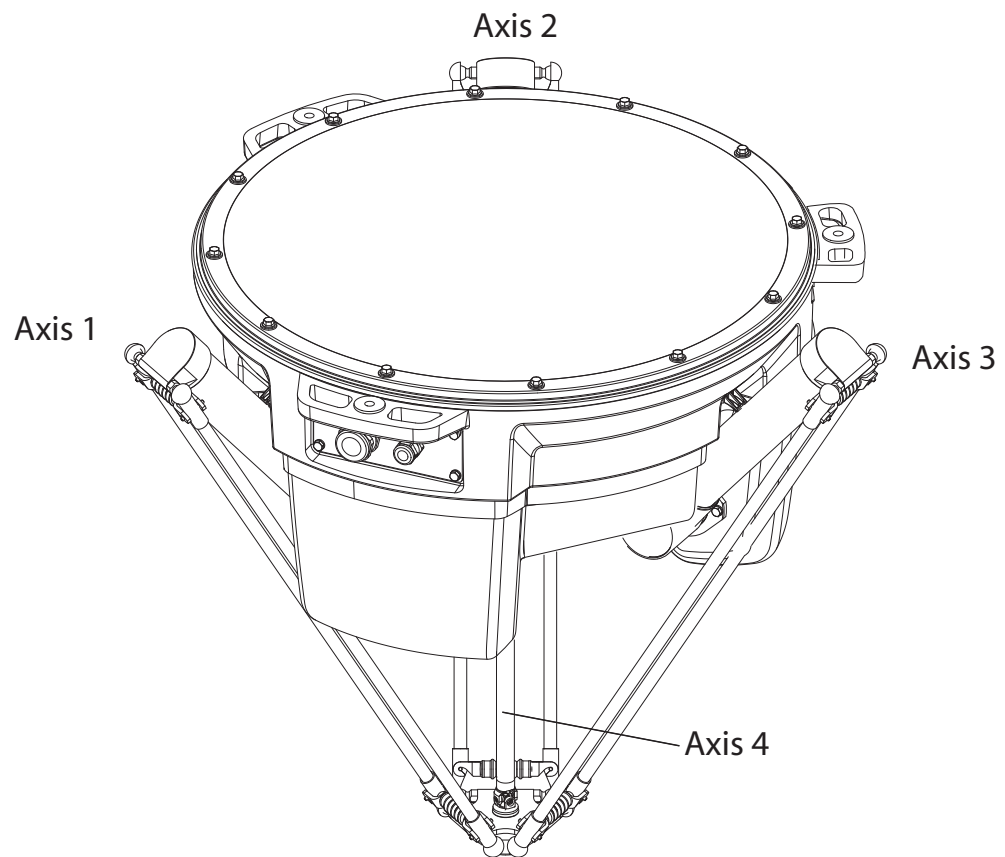


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## 1.1.2 Different robot version

**Robot types**

The following different standard robot types are available:

| Robot type | Handling capacity (kg) |
|---|---|
| IRB 360-1/1130 | 1 kg |
| IRB 360-3/1130 | 3 kg |
| IRB 360-8/1130 | 8 kg |
| IRB 360-1/1600 | 1 kg |
| IRB 360-6/1600 | 6 kg |

## 1.1.3 Definition of version designation

**Weight**

| Manipulator | Weight |
|---|---|
| Standard<br>Wash Down | 120 kg |

**Other technical data**

| Data | Description | Note |
|---|---|---|
| Airborne noise level | The sound pressure level outside the working space | < 70 dB (A) Leq (acc. to Machinery directive 2006/42/EG) |

**Power consumption at max load**

| Type of movement | IRB 360/1 |
|---|---|
| Typical pick - and - place cycle with 1 kg payload | 0.477 kW |

**IRB 360-1, IRB 360-3, 360-8, 360-1/800, IRB 360-1/1600 and IRB 360-6/1600**



R483,5 IRB 360/1(3) 1130
R 720 IRB 360/1 1600
R 375 IRB 360/8 1130
R 600 IRB 360/6 1600
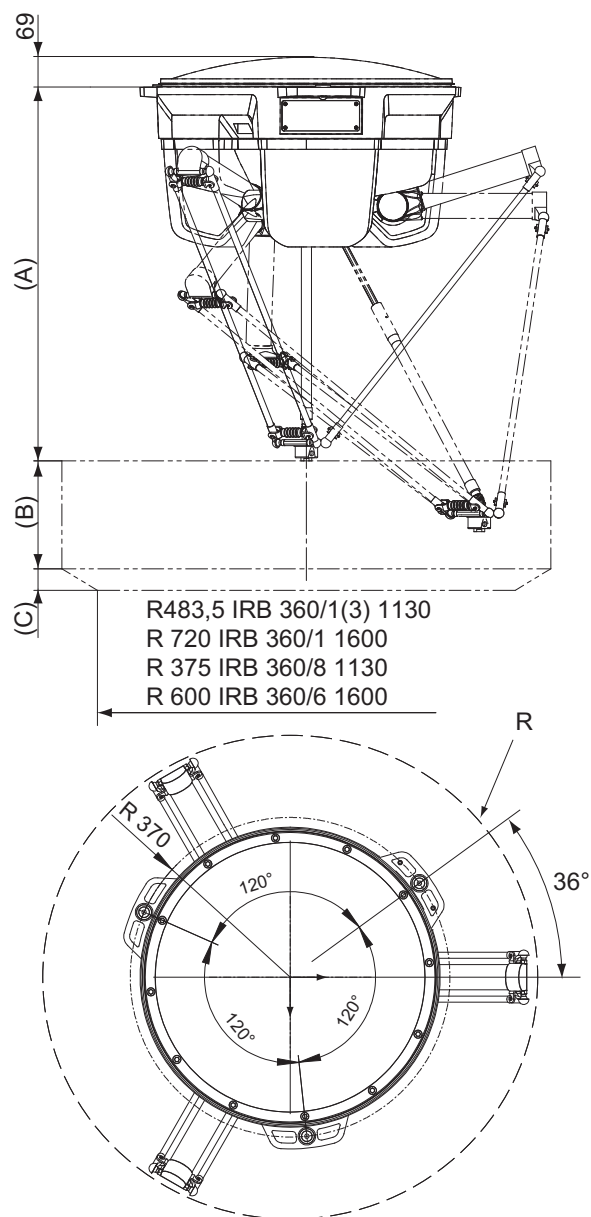
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| Robot variant | A | B | C | R |
|---|---|---|---|---|
| IRB 360-1/800 | 960 | 200 | - | 400 |
| IRB 360-1/1130 | 865 | 250 | 50 | 565 |
| IRB 360-3/1130 | 865 | 250 | 50 | 565 |
| IRB 360-8/1130 | 892 | 250 | 100 | 565 |
| IRB 360-1/1600 | 1112 | 300 | 50 | 800 |
| IRB 360-6/1600 | 1107.5 | 305 | 155 | 800 |

# 1 Description

## 1.2 Safety standards

## 1.2.1 Applicable standards

> **ℹ Note**
>
> The listed standards are valid at the time of the release of this document. Phased out or replaced standards are removed from the list when needed.

**General**

The product is designed in accordance with ISO 10218-1:2011, Robots for industrial environments - Safety requirements -Part 1 Robots, and applicable parts in the normative references, as referred to from ISO 10218-1:2011. In case of deviations from ISO 10218-1:2011, these are listed in the declaration of incorporation which is part of the product delivery.

**Normative standards as referred to from ISO 10218-1**

| Standard | Description |
|---|---|
| ISO 9283:1998 | Manipulating industrial robots - Performance criteria and related test methods |
| ISO 10218-2 | Robots and robotic devices - Safety requirements for industrial robots - Part 2: Robot systems and integration |
| ISO 12100 | Safety of machinery - General principles for design - Risk assessment and risk reduction |
| ISO 13849-1:2006 | Safety of machinery - Safety related parts of control systems - Part 1: General principles for design |
| ISO 13850 | Safety of machinery - Emergency stop - Principles for design |
| IEC 60204-1:2005 | Safety of machinery - Electrical equipment of machines - Part 1: General requirements |
| IEC 62061:2005 | Safety of machinery - Functional safety of safety-related electrical, electronic and programmable electronic control systems |

**Region specific standards and regulations**

| Standard | Description |
|---|---|
| ANSI/RIA R15.06 | Safety requirements for industrial robots and robot systems |
| ANSI/UL 1740 | Safety standard for robots and robotic equipment |
| CAN/CSA Z 434-14 | Industrial robots and robot Systems - General safety requirements |

**Other standards used in design**

| Standard | Description |
|---|---|
| ISO 9787:2013 | Robots and robotic devices -- Coordinate systems and motion nomenclatures |
| IEC 61000-6-2 | Electromagnetic compatibility (EMC) – Part 6-2: Generic standards – Immunity standard for industrial environments |

*Continues on next page*

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| Standard | Description |
|---|---|
| IEC 61000-6-4 (option 129-1) | Electromagnetic compatibility (EMC) – Part 6-4: Generic standards – Emission standard for industrial environments |
| ISO 13732-1:2006 | Ergonomics of the thermal environment - Part 1 |
| IEC 60974-1:2012 [i] | Arc welding equipment - Part 1: Welding power sources |
| IEC 60974-10:2014 [i] | Arc welding equipment - Part 10: EMC requirements |
| ISO 14644-1:2015 [ii] | Classification of air cleanliness |
| IEC 60529:1989 + A2:2013 | Degrees of protection provided by enclosures (IP code) |

[i] Only valid for arc welding robots. Replaces IEC 61000-6-4 for arc welding robots.

[ii] Only robots with protection Clean Room.

## 1.3 Installation

### 1.3.1 Introduction to installation

**General**

Depending on robot version an end effector of max weight 1 to 8 kg including payload, can be mounted on the robot mounting flange. See *Load diagrams on page 22*. Other equipment, such as a hose, can be mounted on the upper and lower arm, max weight 300g/m. See *Hose set mounted on the manipulator arms on page 30*.

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## 1.3.2  Operating requirements

**Protection standards**

| Description | Protection standard IEC529 |
|---|---|
| Standard | IP54 |
| Wash Down | IP67 |
| Clean Room | IP54 |

**Clean room standards**

| Description | Protection standard DIN ISO 14644 |
|---|---|
| Standard | Class 7 |
| Clean Room | Class 5 |
| Stainless Clean Room | Class 5 |

**Explosive environments**

The robot must not be located or operated in an explosive environment.

**Ambient temperature**

| Description | Standard/Option | Temperature |
|---|---|---|
| Manipulator during operation | Standard | 0°C [i] (+32°F) to +45°C (+113°F) |
| For the controller | Standard/Option | |
| Complete robot during transportation and storage | Standard | -25°C (-13°F) to +55°C (+131°F) |

[i] At low environmental temperature < 10° C is, as with any other machine, a warm-up phase recommended to be run with the robot. Below 5° C this warm-up phase is mandatory. Otherwise there is a risk that the robot stops or run with lower performance due to temperature dependent oil- and grease viscosity.

**Relative humidity**

| Description | Relative humidity |
|---|---|
| Complete robot during transportation and storage | Max. 95% at constant temperature |
| Complete robot during operation | Max. 95% at constant temperature |

## 1.3.3 Mounting the manipulator

**General**

Maximum load in relation to the base coordinate system. See Figure below.

Robot version IRB 360-1/800, IRB 360-1/1130, IRB 360-1/1600, IRB 360-3/1130

| Force N | Max. load in operation |
|---|---|
| Fx | ±330 N |
| Fy | ±260 N |
| Fz | -1500 ±170 N |

| Torque Nm | Max. load in operation |
|---|---|
| Mx | ±200 Nm |
| My | ±230 Nm |
| Mz | ±100 Nm |

Robot version IRB 360-8/1130, IRB 360-6/1600

| Force N | Max. load in operation |
|---|---|
| Fx | ±550 N |
| Fy | ±500 N |
| Fz | -1500 ±460 N |

| Torque Nm | Max. load in operation |
|---|---|
| Mx | ±380 Nm |
| My | ±440 Nm |
| Mz | ±180 Nm |

Robot frame is not included in the delivery.

**Stiffness of robot frame**

The stiffness of the robot frame must be designed to minimize the influence on the dynamic behavior of the robot. It is recommended that a frame with a lowest natural frequency (with the robot mounted in the frame) higher than 17 Hz is used for robot versions IRB 360-1/1130, IRB 360-3/1130, IRB 360-1/1600 and a frame with a lowest natural frequency higher than 40 Hz is used for robot version IRB 360-8/1130, IRB 360-6/1600. TuneServo can be used for adapting the robot tuning to a non-optimal foundation.

> **Note**
>
> The working space is shown in the first figure in *Robot motion on page 35*.

*Continues on next page*

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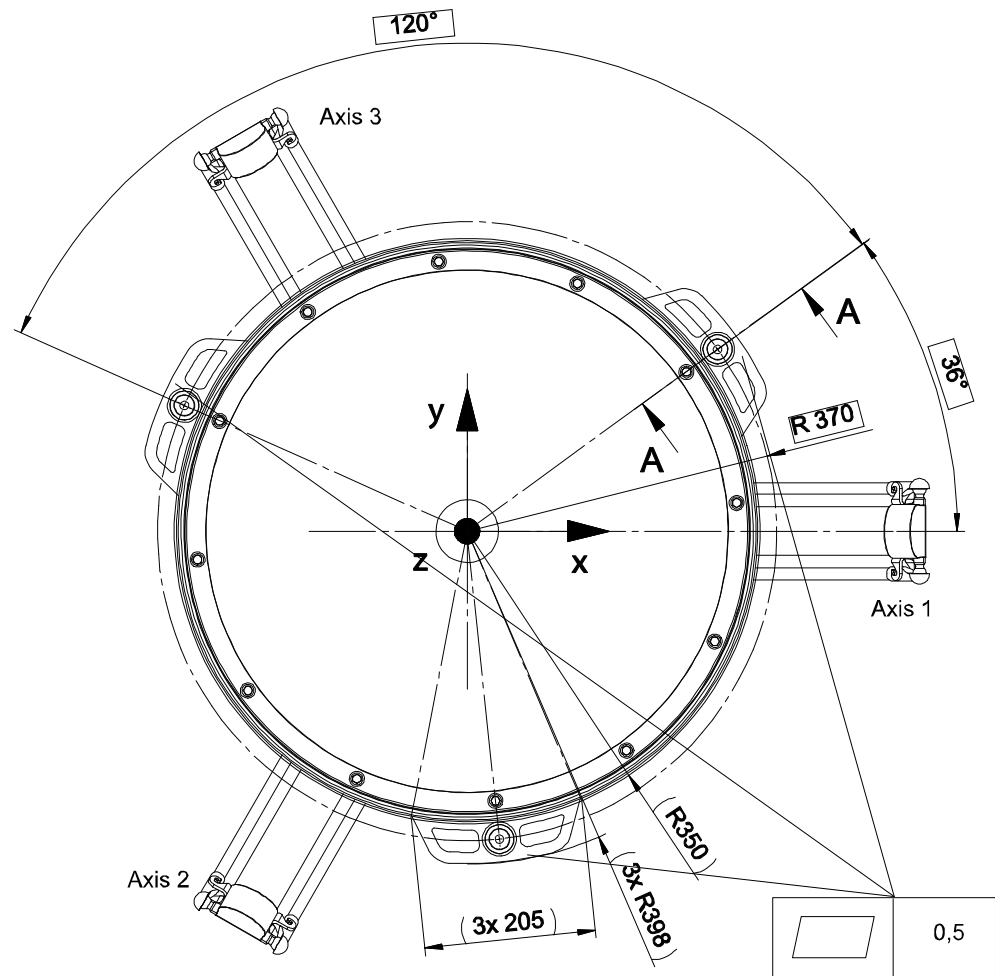
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The three support points of the manipulator base box shall be mounted against three flat surfaces within the specification above. Shims is used if necessary.
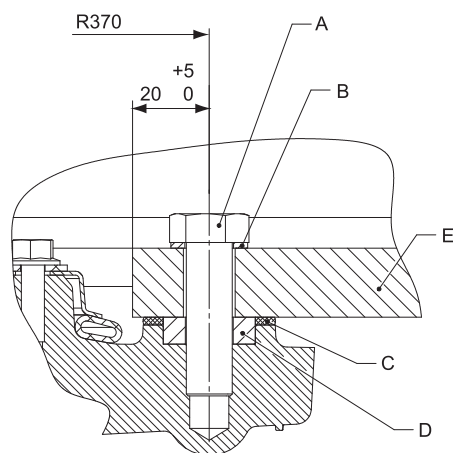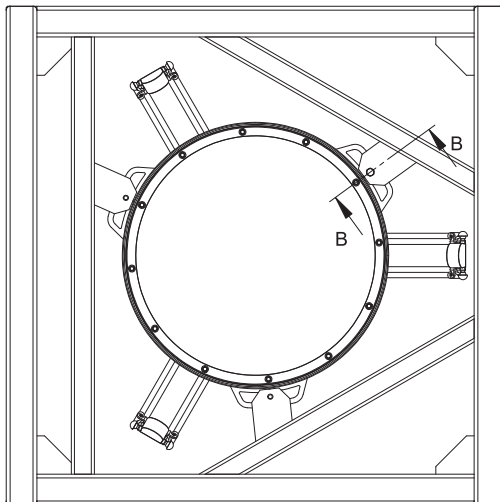
**Fastening the robot**



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| Position | Description |
|----------|-------------|
| A | M12 screw |
| B | Bonded seal washer, rubber/metal, if not a waterproof joint is required a plain washer can be used |
| C | Washer, EPDM-rubber, compressed 50%, If no need for waterproof joint is required you can disregard the rubber washer. |
| D | Spacer, metal |
| E | Robot frame |

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3x Ø 24 H8 $\left(\begin{array}{c}+0,033\\0\end{array}\right)$   ⌖ Ø 0,5

3x M12 ▽ 13,5

z=0

3x5 ±0,7
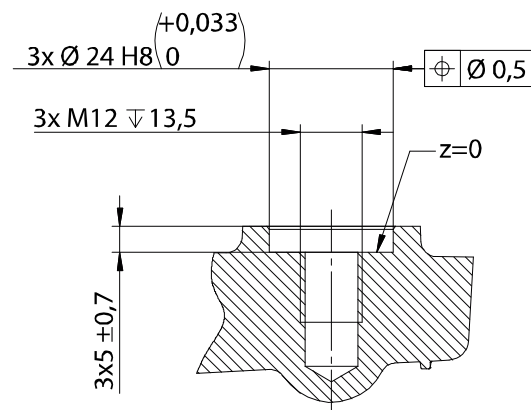
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| Recommended screws for fastening the robot to the frame | M12 x (50) 8.8 screw with yield strength 640 N/mm2 or |
|---|---|
| | M12 x (50) screw A2-70 with yield strength 450N/mm2 |
| | The length of the screws depend on the design of the robot frame. |
| Torque value | 70 Nm |

## Detection of collisions

The IRB 360 has a basic feature that can detect a collision. This is a system that detects divergence between calculated and actual motor torques. The controller can also stop the robot if load parameters are defined incorrectly, due to that the moment of the torque deviates from the calculated. An advanced option that includes the possibility to manually setting parameters is called *Collision Detection*.

For more detailed information see .

## Fastener quality

When fitting tools on the tool flange, only use screws with quality 12.9. For other equipment use suitable screws and tightening torque for your application.

## 1.4 Load diagrams

## 1.4.1 Introduction to load diagrams

**General**

> ⚠️ **WARNING**
>
> It is very important to always define correct actual load data and correct payload of the robot. Incorrect definitions of load data can result in overloading of the robot.
>
> If incorrect load data is used, and/or if loads outside the load diagram are used, the following parts can be damaged due to overload:
>
> • motors
> • gearboxes
> • mechanical structure

> ⚠️ **WARNING**
>
> Robots running with incorrect load data and/or with loads outside the load diagram, will not be covered by robot warranty.
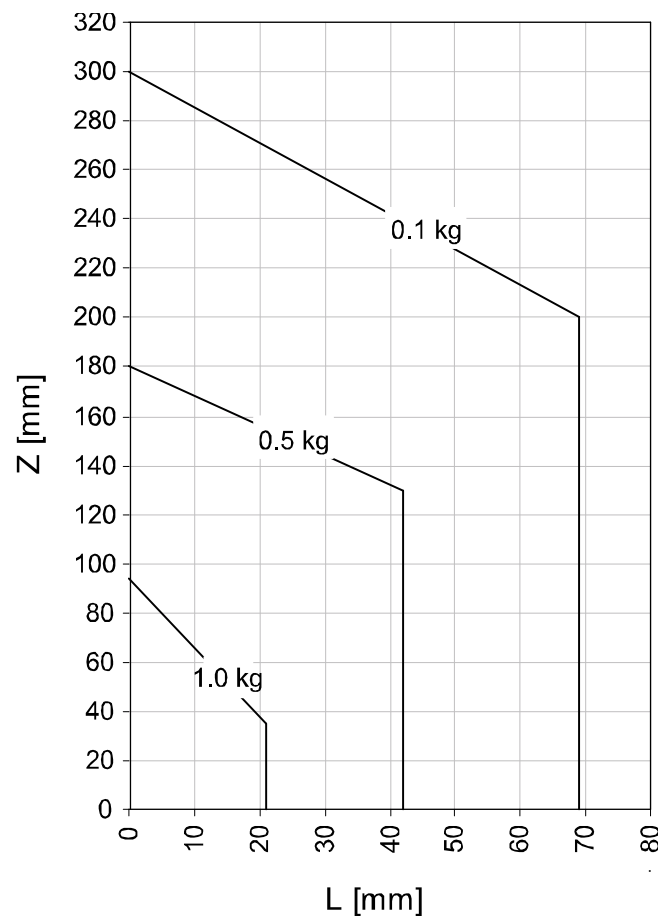
## 1.4.2 Load diagrams

> **Note**
>
> The weight permitted for loads includes grippers etc.
>
> The data types `loaddata` and `tooldata` with moment of inertia must be used!

**IRB360-1/1130, IRB 360-1/1600 and IRB 360-1/800**

Loads 0.1 kg, 0.5 kg and 1.0 kg:



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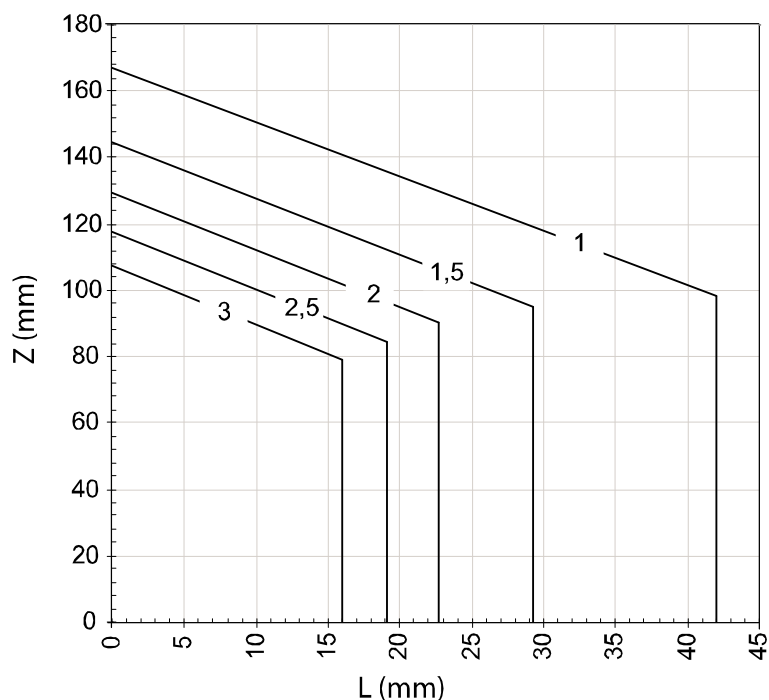| | Description |
|---|---|
| Z | See the above diagram and the coordinate system in . |
| L | Distance in X-Y plane from Z-axis to the mass center of gravity of the load. |
| `tooldata` | Weight of the gripper (kg).<br>The center of gravity of the gripper (mm).<br>The moment of inertia of the gripper ($kgm^2$).<br>No value or wrong value may damage the robot.<br>For more information see *Technical reference manual - RAPID Instructions, Functions and Data types* |

*Continues on next page*

# 1 Description

|  | Description |
|---|---|
| `loaddata` | Weight of the product (kg).<br>The center of gravity of the product (mm).<br>The moment of inertia of the product ($kgm^2$).<br>No value or wrong value may damage the robot.<br>For more information see *Technical reference manual - RAPID Instructions, Functions and Data types* |
|  | For large off-sets in z-direction some combinations of $J_o$ and movement of robot requires use of RAPID commands `AccSet` and/or `TuneServo` to minimize vibration of tool. This applies for limited inherent gripper stiffness and the backlash of the picked load, for example a shaking bag.<br><br>ℹ️ **Note**<br><br>Best possible performance of the IRB 360 is achieved when the gripper's center of gravity is close to axis 4 (L= 0 mm in load diagram).<br>$J_o$=own moment of inertia of the total handle weight. |

## IRB360-3/1130

Load 1.0 kg - 3.0 kg



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Load diagram above is valid for $J_{o\,zz}$ from 0 - 0.0212 $kgm^2$.

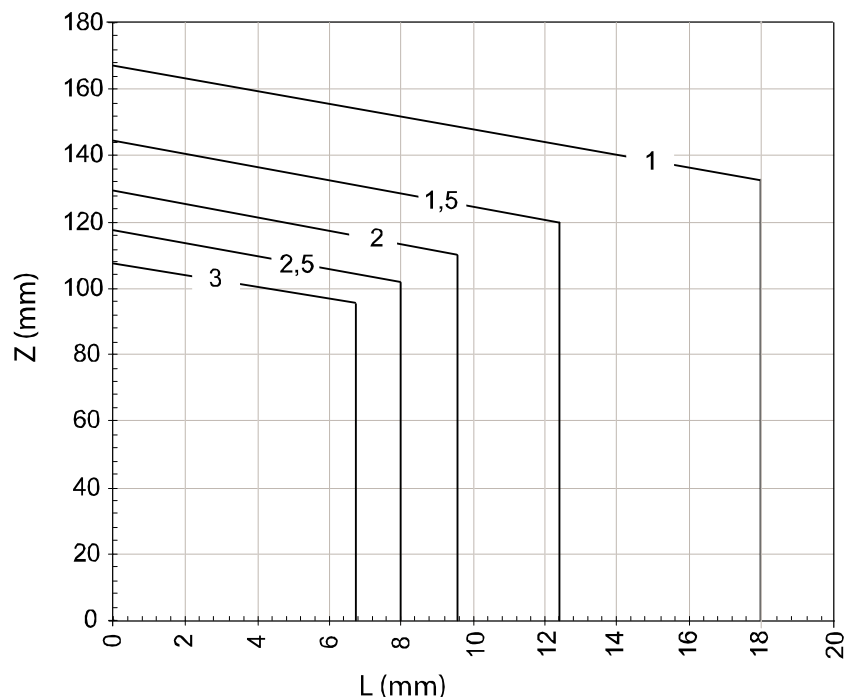|  | Description |
|---|---|
| Z | See the above diagram and the coordinate system in . |
| L | Distance in X-Y plane from Z-axis to the mass center of gravity of the load. |

*Continues on next page*

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| | Description |
|---|---|
| `tooldata` | Weight of the gripper (kg). |
| | The center of gravity of the gripper (mm). |
| | The moment of inertia of the gripper ($kgm^2$). |
| | No value or wrong value may damage the robot. |
| | For more information see *Technical reference manual - RAPID Instructions, Functions and Data types* |
| `loaddata` | Weight of the product (kg). |
| | The center of gravity of the product (mm). |
| | The moment of inertia of the product ($kgm^2$). |
| | No value or wrong value may damage the robot. |
| | For more information see *Technical reference manual - RAPID Instructions, Functions and Data types* |
| | Max. allowed mass moments of inertia is $J_{o\,zz}$ = 0.055 $kgm^2$. |
| | For increasing values of $J_{o\,zz}$ the allowed L-offset of the center of gravity decreases linearly from the values in load diagrams down to zero. For an example of high inertia see diagram on next page. |
| | For large off-sets in z-direction some combinations of $J_o$ and movement of robot requires use of RAPID commands `AccSet` and/or `TuneServo` to minimize vibration of tool. This applies for limited inherent gripper stiffness and the backlash of the picked load, for example a shaking bag. |
| | **i** **Note** |
| | Best possible performance of the IRB 360 is achieved when the gripper's center of gravity is close to axis 4 (L= 0 mm in load diagram). |
| | $J_o$=own moment of inertia of the total handle weight. |

Figure below shows load diagrams for $J_{o\,zz}$ = 0.04 $kgm^2$.



xx1100000102

**IRB360-8/1130**

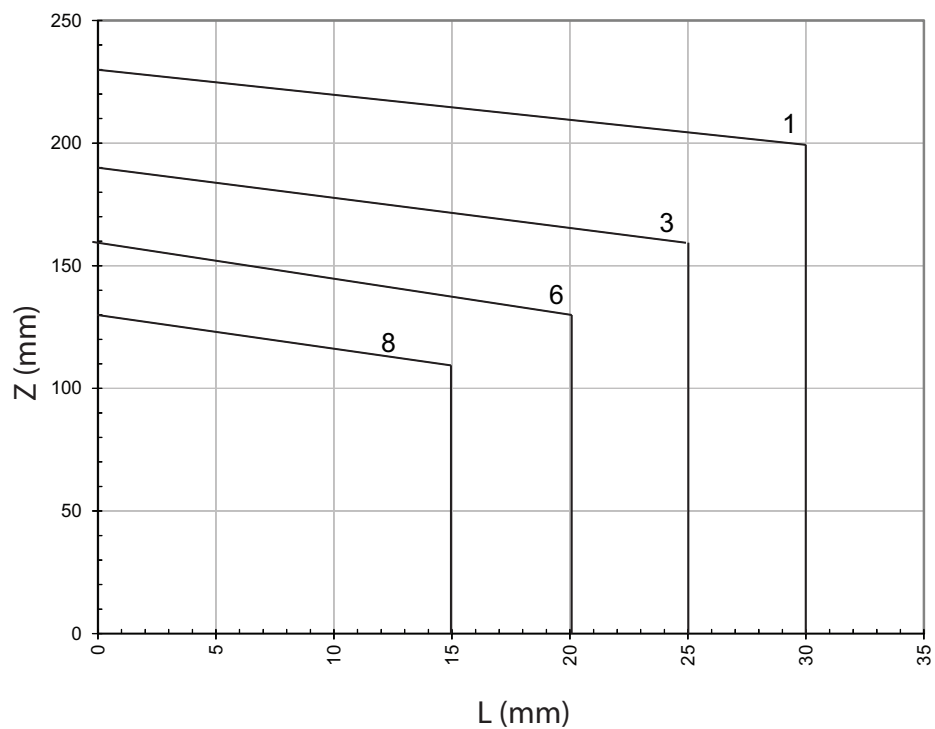Load 1.0 kg - 8.0 kg



xx1200001391

Load diagram above is valid for $J_{o\,zz}$ from 0 - 0.1kgm$^2$.
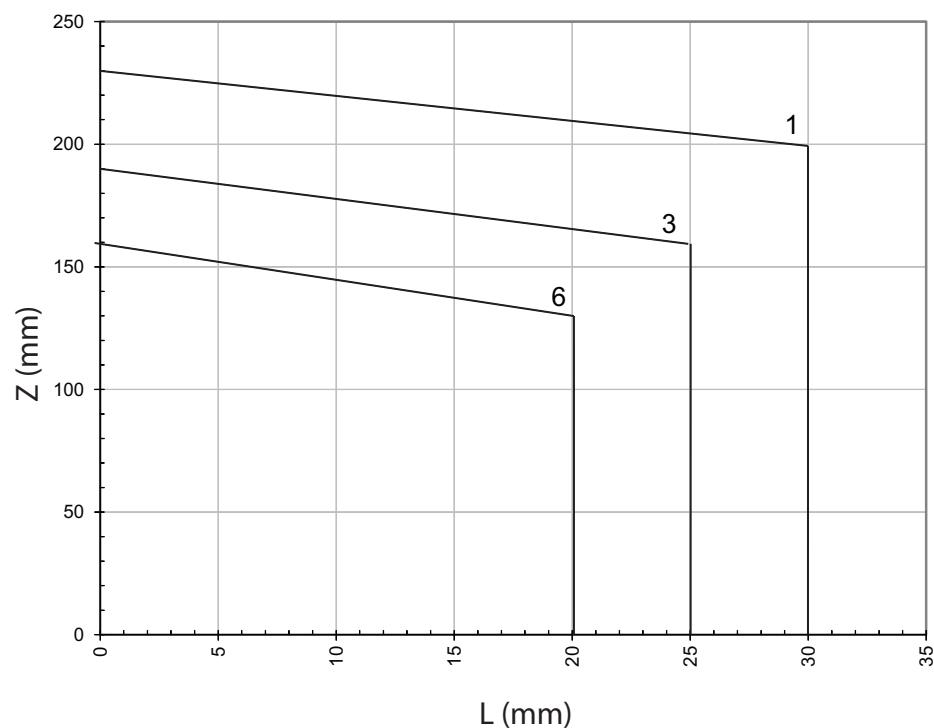
| | Description |
|---|---|
| Z | See the above diagram and the coordinate system in . |
| L | Distance in X-Y plane from Z-axis to the mass center of gravity of the load. |
| tooldata | Weight of the gripper (kg).<br>The center of gravity of the gripper (mm).<br>The moment of inertia of the gripper (kgm$^2$).<br>No value or wrong value may damage the robot.<br>For more information see *Technical reference manual - RAPID Instructions, Functions and Data types* |
| loaddata | Weight of the product (kg).<br>The center of gravity of the product (mm).<br>The moment of inertia of the product (kgm$^2$).<br>No value or wrong value may damage the robot.<br>For more information see *Technical reference manual - RAPID Instructions, Functions and Data types* |

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| | Description |
|---|---|
| | Max. allowed mass moments of inertia is $J_{o\,zz}$ = 0.15 kgm$^2$. |
| | For large off-sets in z-direction some combinations of $J_o$ and movement of robot requires use of RAPID commands `AccSet` and/or `TuneServo` to minimize vibration of tool. This applies for limited inherent gripper stiffness and the backlash of the picked load, for example a shaking bag. |
| | ![i] **Note** |
| | Best possible performance of the IRB 360 is achieved when the gripper's center of gravity is close to axis 4 (L= 0 mm in load diagram). |
| | $J_o$=own moment of inertia of the total handle weight. |

**IRB360-6/1600**

**Load 1.0 kg - 6.0 kg**



xx1300000861

Load diagram above is valid for $J_{o\,zz}$ from 0 - 0.1kgm$^2$.

| | Description |
|---|---|
| Z | See the above diagram and the coordinate system in . |
| L | Distance in X-Y plane from Z-axis to the mass center of gravity of the load. |
| tooldata | Weight of the gripper (kg). The center of gravity of the gripper (mm). The moment of inertia of the gripper (kgm$^2$). No value or wrong value may damage the robot. For more information see *Technical reference manual - RAPID Instructions, Functions and Data types* |

## 1.4.2 Load diagrams
*Continued*

| | Description |
|---|---|
| loaddata | Weight of the product (kg). |
| | The center of gravity of the product (mm). |
| | The moment of inertia of the product ($kgm^2$). |
| | No value or wrong value may damage the robot. |
| | For more information see *Technical reference manual - RAPID Instructions, Functions and Data types* |
| | Max. allowed mass moments of inertia is $J_{o\,zz}$ = 0.15 $kgm^2$. |
| | For large off-sets in z-direction some combinations of $J_o$ and movement of robot requires use of RAPID commands AccSet and/or TuneServo to minimize vibration of tool. This applies for limited inherent gripper stiffness and the backlash of the picked load, for example a shaking bag. |
| | ![Note] **Note** |
| | Best possible performance of the IRB 360 is achieved when the gripper's center of gravity is close to axis 4 (L= 0 mm in load diagram). |
| | $J_o$=own moment of inertia of the total handle weight. |

### Extra equipment mounted on the manipulator arms
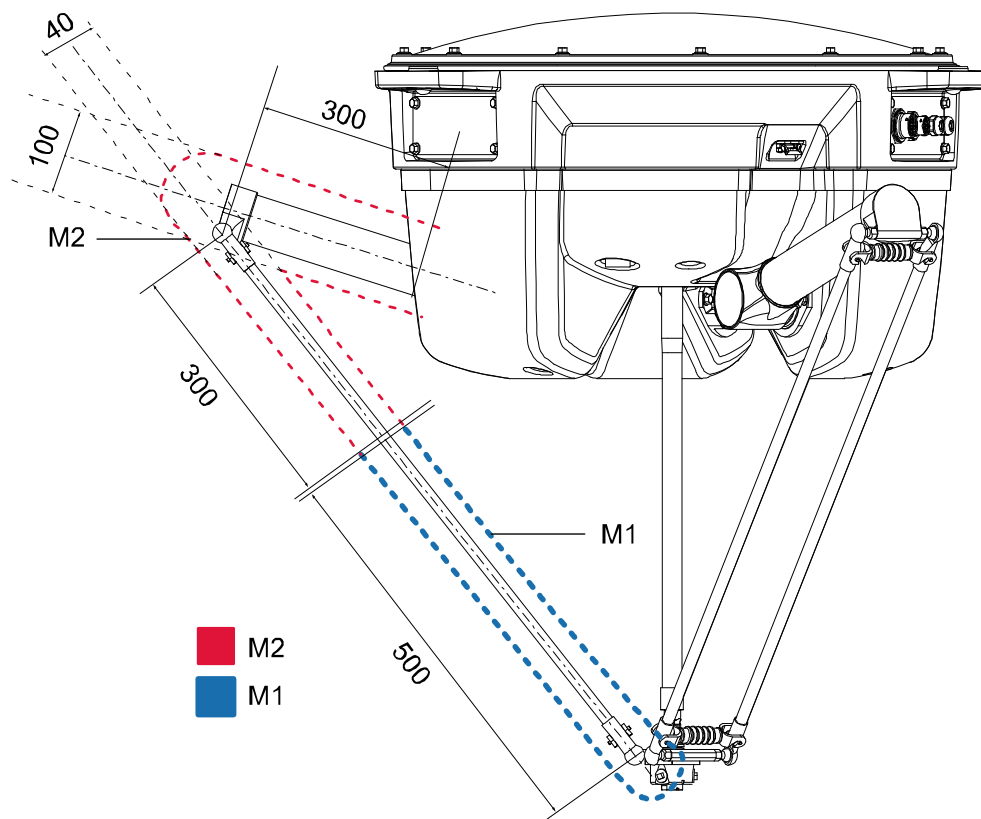


xx0900000420

| M1 | Limitation lines for center of gravity for M1 |
|---|---|
| M2 | Limitation lines for center of gravity for M2 |

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The robot is tuned for the Vacuum system or medium sized hose (options). If one of these options is used no extra load should be defined. If neither the vacuum system nor the medium sized hose is chosen:

- and both M1 and M2 are less than 175 g each, the robot can run with full performance and no extra load should be defined.

- and M1 is more than 175 g, an extra load should be defined in the load definition. The extra load should be M1-175 g. Maximum extra load allowed is 175 g (M1 max = 350g).

- and M2 is more than 175 g, an extra load should be defined in the load definition. The extra load should be M2-175 g. Maximum extra load allowed is 175 g (M2 max = 350 g).

- The extra load should be defined in TCP 0

## 1.4.3  Hose set mounted on the manipulator arms

**General**
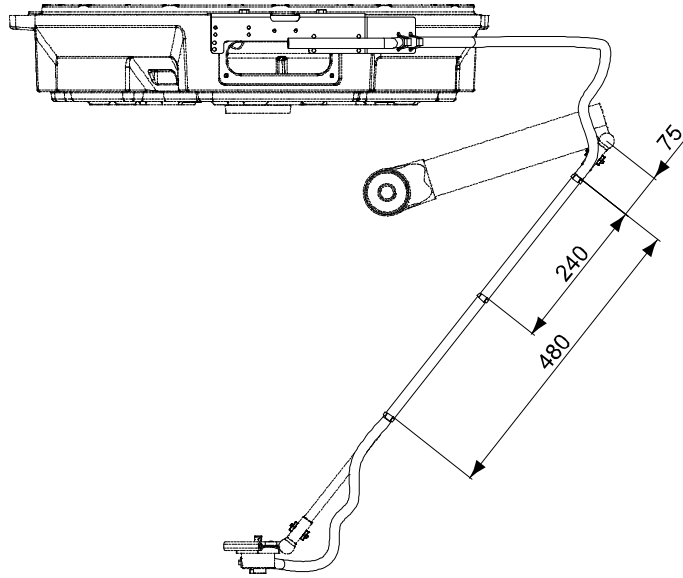


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## 1.4.4 Mechanical interface

**IRB 360-1/1130, IRB 360-3/1130, IRB 360-1/1600**
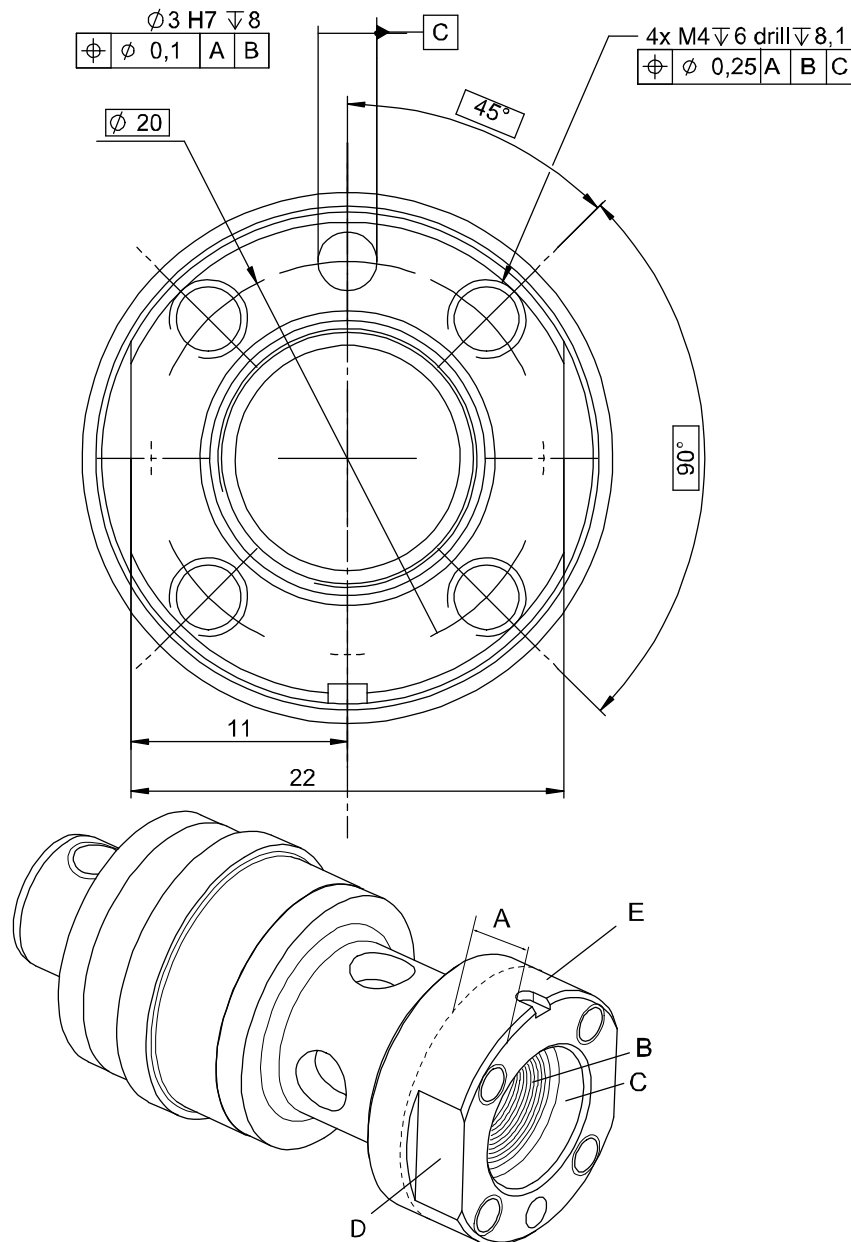


xx0700000471

| Position | Description |
|----------|-------------|
| A | Free space, depth 6 mm |
| B | R1/4" |
| C | Ø 14 H8 depth 4 mm |
| D | Key grip = width 22 mm height 5,5 mm |
| E | Ø 25 h8 depth 6 mm |

**IRB 360-8/1130, IRB 360-6/1600**



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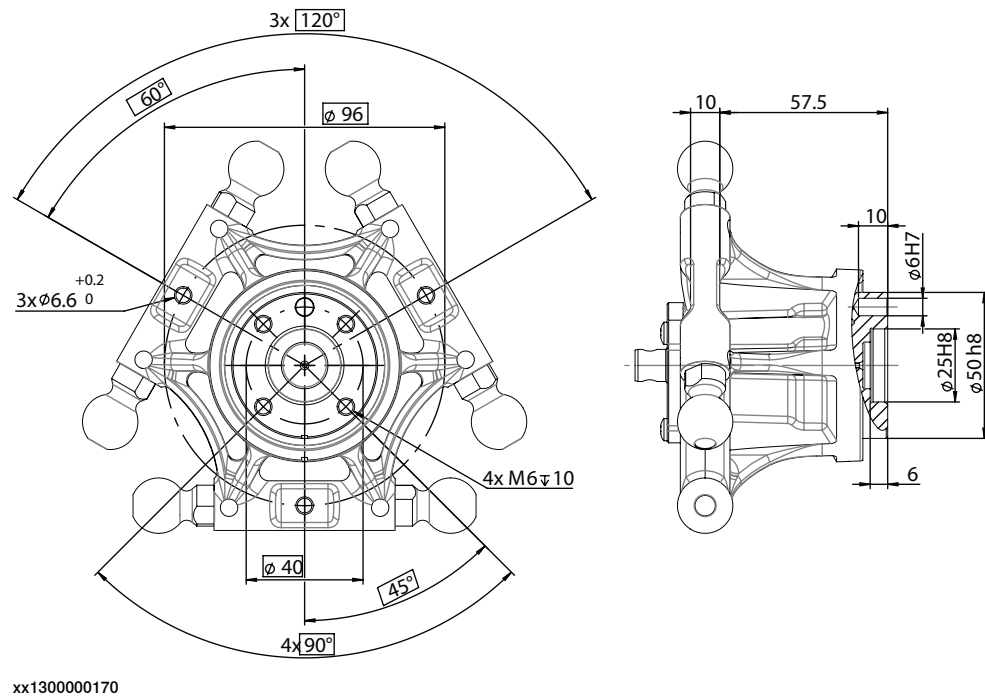
**Interface without axis 4**

### IRB 360-1/1130, IRB 360-3/1130, IRB 360-1/800



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SECTION A-A
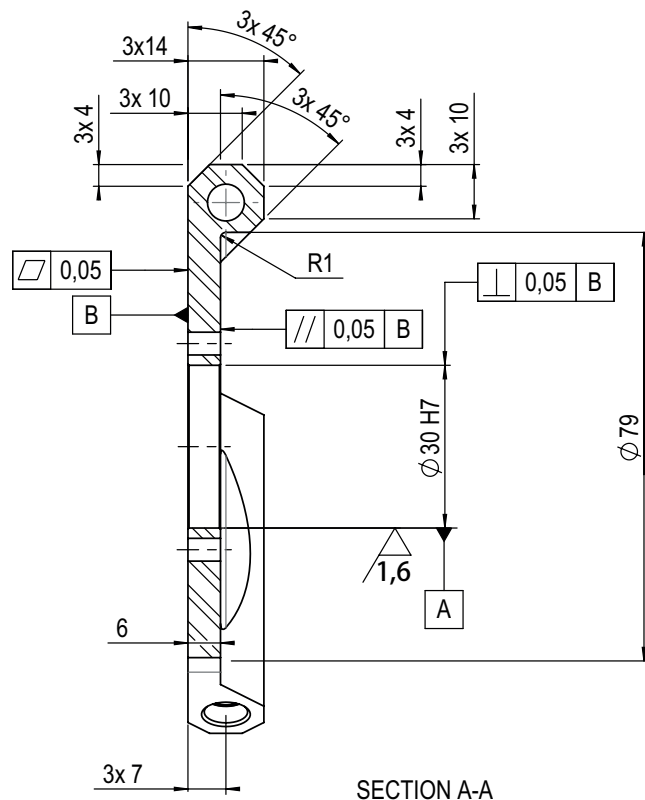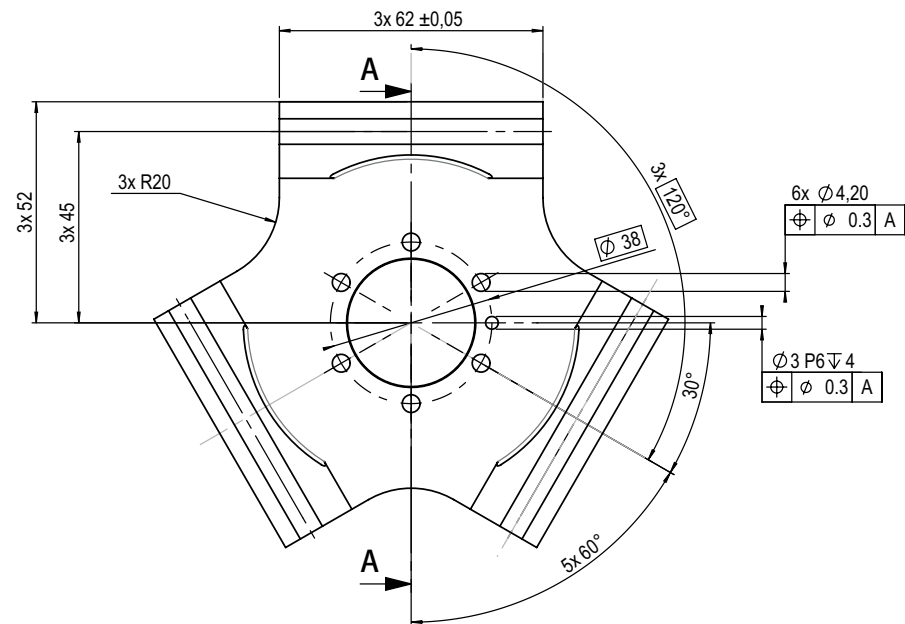
## 1.5 Maintenance and troubleshooting

## 1.5.1 Introduction to maintenance and trouble shooting

**General**

The robot requires only minimum maintenance during operation. It has been designed to make it as easy to service as possible:

- Maintenance-free AC motors are used.
- Oil is used for the gear boxes.
- All cabling is fixed, no movements. In the unlikely event of a failure, its modular design makes it easy to change.

**Maintenance**

The maintenance intervals depend on the use of the robot, the required maintenance activities also depends on selected options. For detailed information on maintenance procedures, see *Product manual - IRB 360*.

## 1.6 Robot motion

### 1.6.1 Introduction to robot motion

**General**

> **ℹ Note**
>
> The extreme position of the robot arm is shown in *Extreme position on page 36*.



892 IRB 360/8
865 IRB 360/1 (3)
960 IRB 360/1 800
1112 IRB 360/1 1600
1107,5 IRB 360/6 1600

1115 IRB 360/1 (3)
1160 IRB 360/1 800
1412 IRB 360/1 1600
1142 IRB 360/8
1412,5 IRB 360/6 1600

1165 IRB 360/1 (3)
1242 IRB 360/8
1462 IRB 360/1 1600
1567,5 IRB 360/6 1600

R = 483.5 IRB 360/1 (3)
R = 720 IRB 360/1 1600
R = 375 IRB 360/8
R = 600 IRB 360/6 1600

R 370

120°  120°  120°

36°
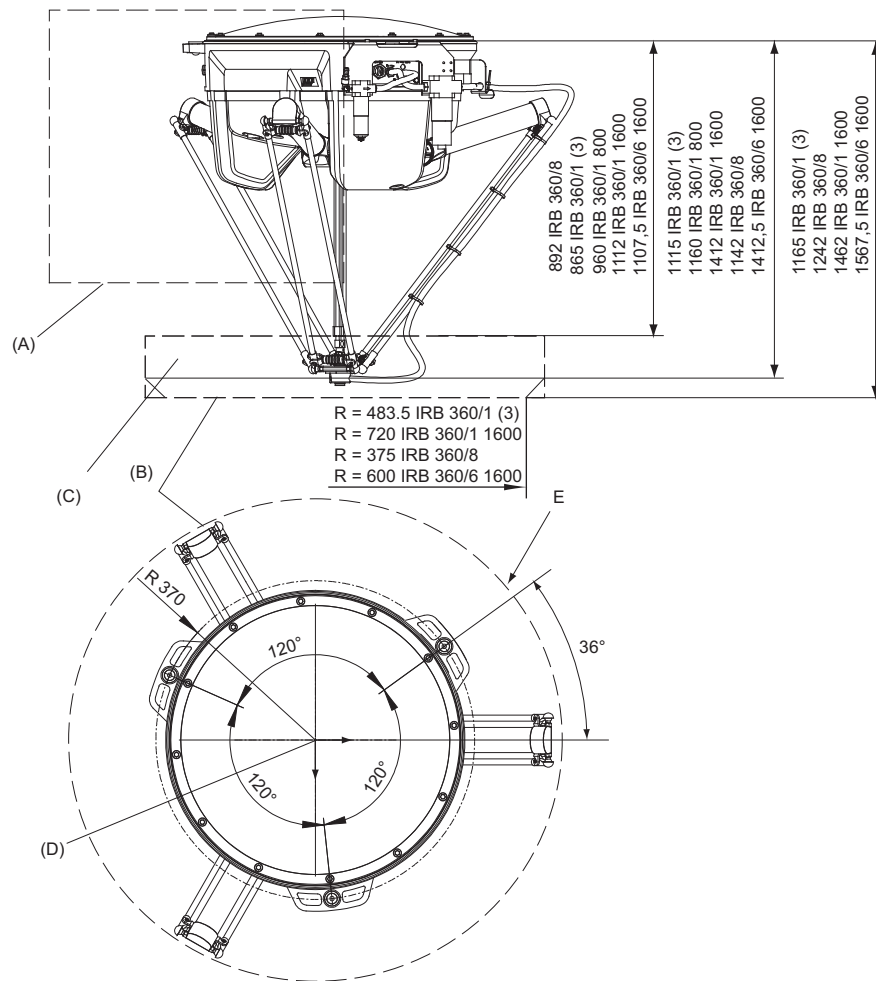
xx0900000426

| Position | Description |
|----------|-------------|
| A | Extreme position, see *Extreme position on page 36*. |
| B | Maximum working space inside cylinder.<br>Working space can be reduced in x-y-z coordinates. |
| C | Marked area = actual working area |
| D | Base coordinate system |
| E | Radius 565 mm for IRB 360-1(3, 8)/1130, 400 for IRB 360-1/800 and 800 for IRB 360-1(6)/1600 |

**Extreme position**



xx0900000427

| Position | Description |
|----------|-------------|
| A | TCP (this position x=0, y=0, z=865) |
|   | TCP (this position x=0, y=0, z=892) Valid for IRB 360-8/1130 |

|                    | A      | B      | C   | D     | E     | F   | R   |
|--------------------|--------|--------|-----|-------|-------|-----|-----|
| IRB 360-1/800      | 1160   | 960    | 480 | -     | -     | 275 | 251 |
| IRB 360-1(3)/1130  | 1115   | 865    | 646 | 28.5  | 389,5 | 275 | 366 |
| IRB 360-1/1600     | 1412   | 1112   | 880 | 95    | 438   | 275 | 447 |
| IRB 360-8/1130     | 1142   | 892    | 650 | 28,5  | 389.5 | 275 | 366 |
| IRB 360-6/1600     | 1412.5 | 1107.5 | 883 | 148.3 | 478.9 | 275 | 515 |

## 1.6.2 Performance according to ISO 9283

**General**

At rated load and 0.8 m/s velocity on ISO test plane with all four robot axes in motion, with different payload. Values in the table below are the average result of measurements on a small number of robots. The result may differ depending on where in the working range the robot is positioning, velocity, arm configuration, from which direction the position is approached, the load direction of the arm system. Backlashes in gearboxes also affect the result.

The figures for AP, RP, AT and RT are measured according to figure below.
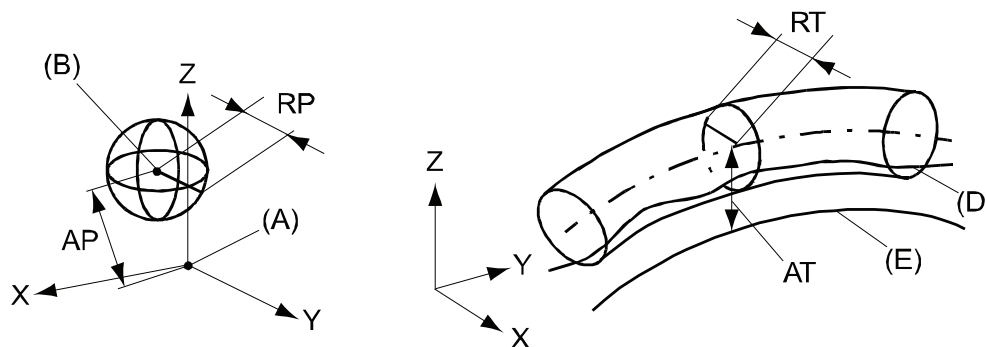


xx0800000424

| Position | Description | Position | Description |
|---|---|---|---|
| A | Programmed position | E | Programmed path |
| B | Mean position at program execution | D | Actual path at program execution |
| AP | Mean distance from programmed position | AT | Max deviation from E to average path |
| RP | Tolerance of position B at repeated positioning | RT | Tolerance of the path at repeated program execution |

| IRB 360-1/1130, IRB 360-3/1130 and IRB 360-8/1130 | At 0.1 kg | At 1.0 kg | At 3.0 kg | At 8.0 kg |
|---|---|---|---|---|
| Pose accuracy, AP (mm) | 0.01 | 0.04 | 0.10 | 0.04 |
| Pose repeatability, RP (mm) | 0.10 | 0.09 | 0.06 | 0.07 |
| Pose stabilization time, Pst (s) within 0.2 mm of the position | i | 0.03 | 0.05 | 0.05 |
| Path accuracy, AT (mm) | 0.51 | 0.52 | 1.00 | 2.32 |
| Path repeatability, RT (mm) | 0.30 | 0.21 | 0.14 | 0.10 |

i    Data not yet available.

| IRB 360-1/800 | At 1.0 kg |
|---|---|
| Pose accuracy, AP (mm) | 0.07 |
| Pose repeatability, RP (mm) | 0.04 |
| Pose stabilization time, Pst (s) | 0.03 |
| Path accuracy, AT (mm) | 0.22 |

| IRB 360-1/800 | At 1.0 kg |
|---|---|
| Path repeatability, RT (mm) | 0.15 |

| IRB 360-1(6)/1600 | At 1.0 kg | At 6.0 kg |
|---|---|---|
| Pose accuracy, AP (mm) | 0.04 | 0.01 |
| Pose repeatability, RP (mm) | 0.03 | 0.03 |
| Pose stabilization time, Pst (s) | 0.08 | 0.38 |
| Path accuracy, AT (mm) | 0.42 | 1.91 |
| Path repeatability, RT (mm) | 0.33 | 0.13 |

**Backlash axis 4**

| Protection class | Value |
|---|---|
| Standard | 0.8° |
| WashDown | 1.0° |

**Velocity**

| Direction | Description |
|---|---|
| x, y, z | 10 m/s |
| θ | 2880 º/s |

## 1.6.3  Acceleration

**General**

| Direc-tion | IRB 360-1/800 | IRB 360-1/1130 | IRB 360-3/1130 | IRB 360-8/1130 | IRB 360-1/1600 |
|---|---|---|---|---|---|
| x, y, z | 150 m/s$^2$ | 150 m/s$^2$ | 100 m/s$^2$ | 100 m/s$^2$ | [i] rad/s$^2$ |
| θ | 1200 rad/s$^2$ | 1200 rad/s$^2$ | 1200 rad/s$^2$ | 1200 rad/s$^2$ | *i* rad/s$^2$ |

[i]  Data not yet available.

| Direction | IRB 360-6/1600 |
|---|---|
| x, y, z | 100 m/s$^2$ |
| θ | 1200 rad/s$^2$ |

## 1.7 Typical cycle times

### 1.7.1 Introduction to typical cycle times

**General**

Both cycles incorporate an air activation time of 35 ms for picking and 35 ms for placing. Air activation takes place during the cycle time.

| Description of typical cycles |
|---|
| Cycle 1 is a 25 - 305 - 25 movement, with 90 degrees rotation of axis 4. |
| Cycle 2 is a 90 - 400 - 90 movement, with 90 degrees rotation of axis 4. |

**Approximate cycle times**

Performance (ppm= pick per minute) in the table below is valid for robots with protection class Standard and WashDown.

| | IRB 360-1/1130 | | IRB 360-3/1130 | | |
|---|---|---|---|---|---|
| Payload | 0.1 kg | 1.0 kg | 0.1 kg | 1.0 kg | 3.0 kg |
| Cycle 1 | 200 | 170 | 150 | 150 | 115 |
| Cycle 2 | 135 | 120 | 100 | 100 | 80 |

| | IRB 360-8/1130 | | |
|---|---|---|---|
| Payload | 1.0 kg | 4.0 kg | 8.0kg |
| Cycle 1 | 160 | 140 | 100 |
| Cycle 2 | 110 | 90 | 65 |

| | IRB 360-1/800 | | IRB 360-1/1600 | |
|---|---|---|---|---|
| Payload | 0.1 kg | 1.0 kg | 0.1 kg | 1.0 kg |
| Cycle 1 | 180 | 155 | 170 | 150 |
| Cycle 2 | 120 | 115 | 120 | 110 |

| | IRB 360-6/1600 | | |
|---|---|---|---|
| Payload | 1.0 kg | 3.0 kg | 6.0kg |
| Cycle 1 | 140 | 125 | 100 |
| Cycle 2 | 105 | 95 | 75 |

**1-phase power supply**

No noticeable reduction in cycle time has been observed for typical pick and place cycles (25/305/25) for an IRB 360-3/1130 with 3 kg payload with 220 V and default settings. To test the cycle time RobotStudio can be used. For detailed information see the system parameter *Mains tolerance min*, in *Technical reference manual - System parameters*.

# 2 Specification of variants and options

## 2.1 Introduction to variants and options

**General**

The different variants and options for the IRB 360 are described in the following sections. The same option numbers are used here as in the specification form.

The variants and options related to the robot controller are described in the product specification for the controller.

## 2.2 Manipulator

**Variants**

| Option | Description | Note |
|---|---|---|
| 3300-22 | IRB 360-1/1130 | |
| 3300-23 | IRB 360-3/1130 | |
| 3300-24 | IRB 360-1/1600 | Not together with options 3328-2, 3328-3, and 3329-1 |
| 3300-25 | IRB 360-8/1130 | Not together with options 3351-5, 3328-2, 3328-3, and 3329-1 |
| 3300-26 | IRB 360-6/1600 | Not together with options 3351-5, 3328-2, 3328-3, and 3329-1 |

**Protection class**

| Option | Description | Note |
|---|---|---|
| 3351-5 | Clean Room | ISO Class 5 |

**Arm system**

| Option | Protection class | Note |
|---|---|---|
| 3328-1 | Standard | Not together with option 3351-5 |
| 3328-2 | WashDown | |

**Axis 4**

No telescopic shaft and a delta plate without swivel are delivered.

| Option | Description | Note |
|---|---|---|
| 3329-1 | No axis 4 | Not together with option 3328-3 |

**Warranty**

For the selected period of time, ABB will provide spare parts and labour to repair or replace the non-conforming portion of the equipment without additional charges. During that period, it is required to have a yearly Preventative Maintenance according to ABB manuals to be performed by ABB. If due to customer restrains no data can be analyzed in the ABB Ability service *Condition Monitoring & Diagnostics* for robots with OmniCore controllers, and ABB has to travel to site, travel expenses are not covered. The Extended Warranty period always starts on the day of warranty expiration. Warranty Conditions apply as defined in the Terms & Conditions.

> **Note**
>
> This description above is not applicable for option *Stock warranty* [438-8]

*Continues on next page*

Product specification - IRB 360
3HAC079010-001 Revision: B

| Option | Type | Description |
|--------|------|-------------|
| 438-1 | Standard warranty | Standard warranty is 12 months from *Customer Delivery Date* or latest 18 months after *Factory Shipment Date*, whichever occurs first. Warranty terms and conditions apply. |
| 438-2 | Standard warranty + 12 months | Standard warranty extended with 12 months from end date of the standard warranty. Warranty terms and conditions apply. Contact Customer Service in case of other requirements. |
| 438-4 | Standard warranty + 18 months | Standard warranty extended with 18 months from end date of the standard warranty. Warranty terms and conditions apply. Contact Customer Service in case of other requirements. |
| 438-5 | Standard warranty + 24 months | Standard warranty extended with 24 months from end date of the standard warranty. Warranty terms and conditions apply. Contact Customer Service in case of other requirements. |
| 438-6 | Standard warranty + 6 months | Standard warranty extended with 6 months from end date of the standard warranty. Warranty terms and conditions apply. |
| 438-7 | Standard warranty + 30 months | Standard warranty extended with 30 months from end date of the standard warranty. Warranty terms and conditions apply. |
| 438-8 | Stock warranty | Maximum 6 months postponed start of standard warranty, starting from factory shipment date. Note that no claims will be accepted for warranties that occurred before the end of stock warranty. Standard warranty commences automatically after 6 months from *Factory Shipment Date* or from activation date of standard warranty in WebConfig.<br><br>**Note**<br><br>Special conditions are applicable, see *Robotics Warranty Directives*. |

## 2.3 Floor cables

**Manipulator cable - length**

| Option | Description |
|--------|-------------|
| 3200-1 | 3 m |
| 3200-2 | 7 m |
| 3200-3 | 15 m |
| 3200-4 | 22 m |
| 3200-5 | 30 m |

# 3 Accessories

## 3.1 Introduction to accessories

**General**

There is a range of tools and equipment available, especially designed for the manipulator.

**Basic software and software options for robot and PC**

For more information, see .

**PickMaster and vision system**

For more information, see *Product specification - PickMaster Twin*.

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