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Skribenta version 5.4.005

Product specification
IRB 5710
OmniCore

Document ID: 3HAC075188-001

Revision: A

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

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References

Documentation referred to in the product specification, is listed in the table below.

Document name	Document ID
Product manual - IRB 5710	*3HAC075184-001*
Product manual - OmniCore V250XT	*3HAC073447-001*
Circuit diagram - IRB 5710/IRB 5720	*3HAC080367-001*

Tip

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

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Revisions

Revision	Description
A	First edition.

1 Description of IRB 5710

1.1 About the IRB 5710

General introduction

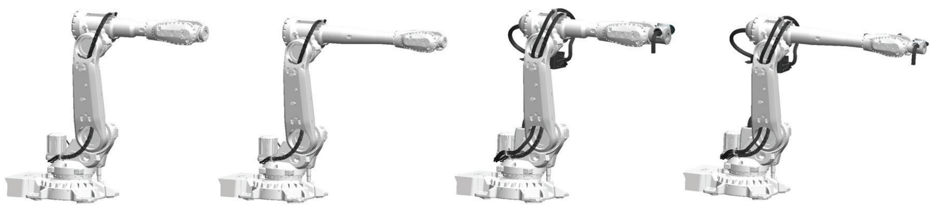
ABB is expanding its large size robot portfolio with IRB 5710, offering faster performance, more accurate, expanded mounting options, and advanced foundry protection than other competing robots in its class.

The IRB 5710 is available in four variants spanning various options for payload from 70kg to 110kg, reach from 2.3m to 2.7m.

IRB 5710 is ideal for use in material handling, machine tending, and high precision assembly applications in the Electric Vehicle (EV), automotive, and the general industries. For Electric Vehicles, robots can handlean array of tasks, including EV battery module picking and placing, high precision assembly, and parts handling.For general industries, the robots can be used for a wide range of tasks in die casting, material removal, cleaning, spraying, and general high precision applications.

Available variants

The IRB 5710 is available in the following variants



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Robot variant	Handling capacity (kg)	Reach (m)
IRB 5710-110/2.3	110 kg	2.3 m
IRB 5710-90/2.7	90 kg	2.7 m
IRB 5710-90/2.3 LID	90 kg	2.3 m
IRB 5710-70/2.7 LID	70 kg	2.7 m

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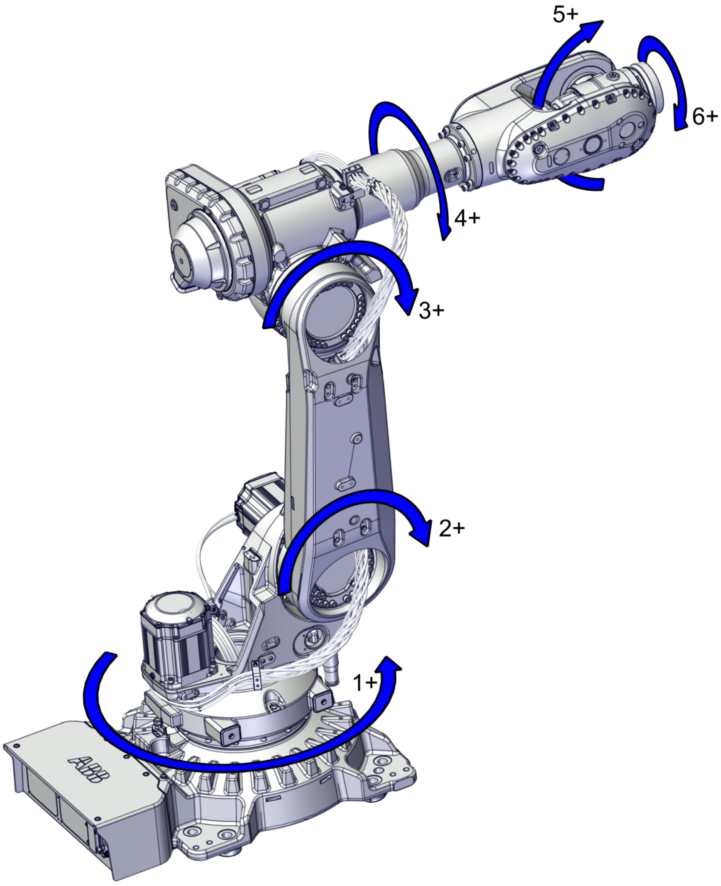
Robot axes



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Control system

The robot is equipped with the OmniCore 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*.

We have added a range of software products - all falling under the umbrella designation of Active Safety - to protect not only personnel in the unlikely event of an accident, but also robot tools, peripheral equipment and the robot itself.

The IRB 5710 manipulator can be connected to the following robot controllers:

- OmniCore V250XT

Safety

Safety standards valid for complete robot, manipulator and controller.

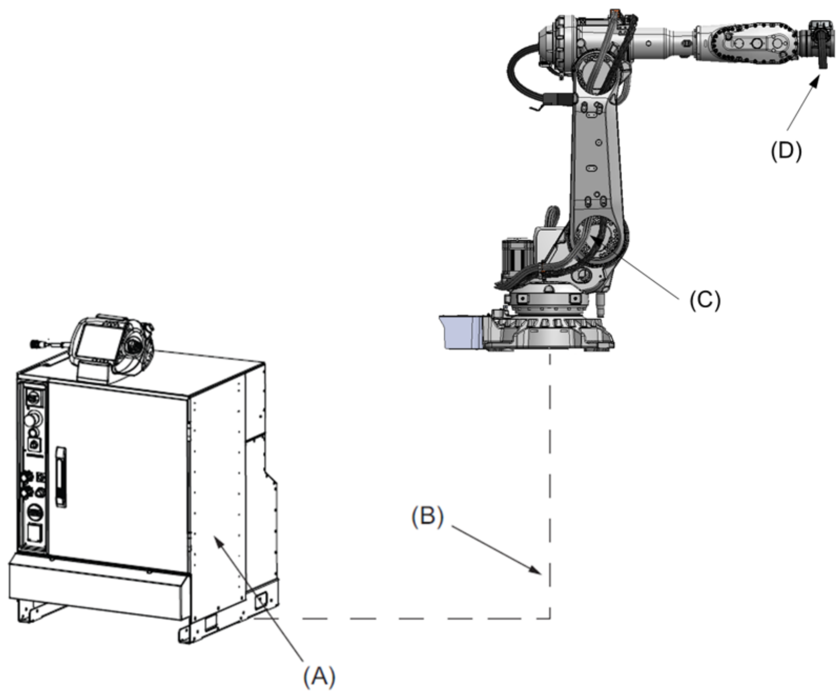
Additional functionality

For additional functionality, the robot can be equipped with optional software for application support - for example communication features - network communication - and advanced functions such as multitasking, sensor control etc. For a complete description on optional software, see the *Product manual - OmniCore V250XT*.

1.2 About the IRB 5710 LeanID

About the DressPack

The IRB 5710 can be equipped with different DressPacks. The DressPacks are modular built but with the aim to offer a complete solution. The DressPacks are designed to fit a wide variety of applications, like machine tending and material handling and are well integrated into the robot system to ensure long life length and large working range.



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Pos	Description
A	Robot controller
B	DressPack, floor
C	DressPack, lower arm
D	DressPack, upper arm

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Available DressPacks

The IRB 5710 is available with the DressPack variants stated in the table below. The lower arm DressPacks (base - axis 3) have the same routing and design whilst the upper arm DressPacks (axis 3 - 6) consists of two design solutions, LeanID - MH and MH3. The main difference between LeanID and MH3 is that LeanID is guided across the axis 6 center of rotation by utilizing a process turning disc instead of the standard turning disc. This allows for a controlled and predictable motion pattern of the DressPack. The MH3 DressPack is designed for less complex wrist movements and requires the integrator to manage the DressPack routing at axis 6.

Robot type	DressPack variants	
	Base - axis 3	axis 3 - 6
IRB 5710-110/2.3	MH	MH3
IRB 5710-90/2.7	MH	MH3
IRB 5710-90/2.3 LID	MH	LeanID - MH
IRB 5710-70/2.7 LID	MH	LeanID - MH

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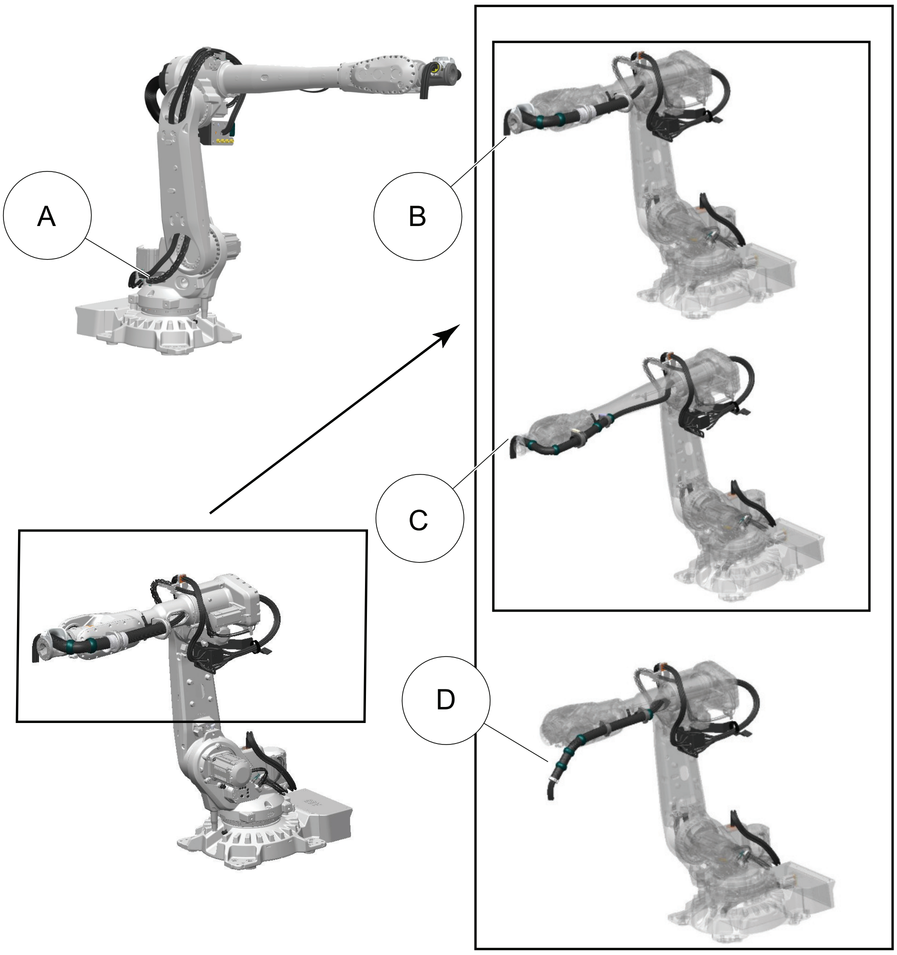

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Pos	Description	DressPack variant	Robot type
A	DressPack base - axis 3	MH	IRB 5710-110/2.3 IRB 5710-90/2.7 IRB 5710-90/2.3 LID IRB 5710-70/2.7 LID
B	DressPack axis 3 - 6	LeanID - MH	IRB 5710-90/2.3 LID
C	DressPack axis 3 - 6	LeanID - MH	IRB 5710-70/2.7 LID
D	DressPack axis 3 - 6	MH3	IRB 5710-110/2.3 IRB 5710-90/2.7

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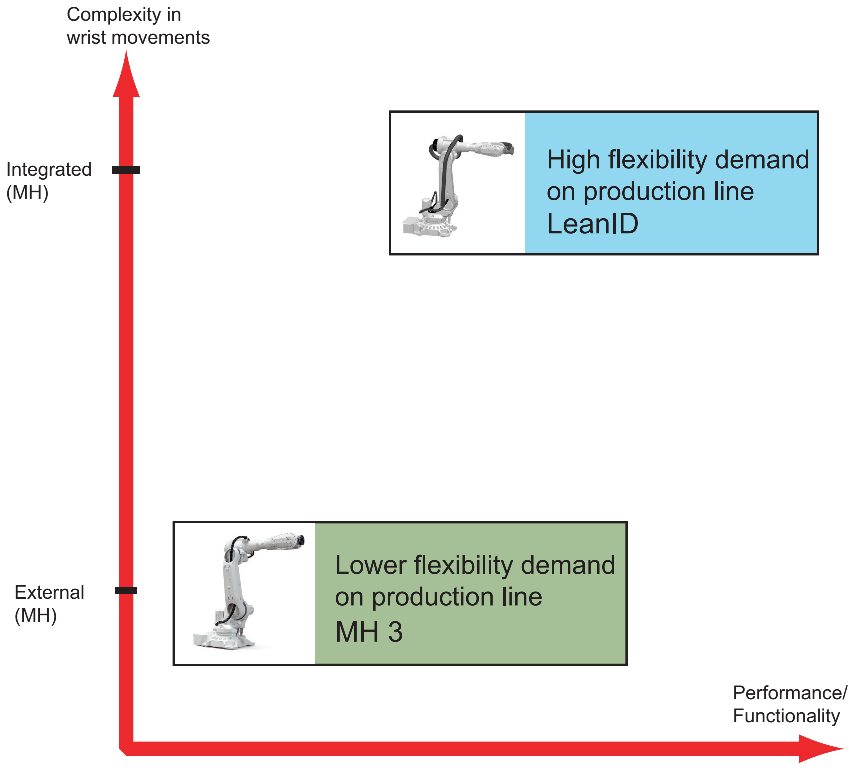
DressPack solutions for different users needs

The different robot types can be equipped with the well integrated cable and hose packages in theDressPack options. The DressPack is designed in close conjunction with the development of the manipulator and is therefore well synchronized with the robot.

As there is a big span between different users need of flexibility, depending of the complexity of the operation/wrist movements, there are two major levels of dress pack solutions available, see Figure below.



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1.3 Standards

1.3.1 Applicable standards

General

The product is compliant 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 deviation from ISO 10218-1:2011, these are listed in the declaration of incorporation. The declaration of incorporation is part of the delivery.

Robot standards

Standard	Description
ISO 9283	Manipulating industrial robots – Performance criteria and related test methods
ISO 9787	Robots and robotic devices – Coordinate systems and motion nomenclatures
ISO 9946	Manipulating industrial robots – Presentation of characteristics

Other standards used in design

Standard	Description
IEC 60204	Safety of machinery - Electrical equipment of machines - Part 1: General requirements, normative reference from ISO 10218-1
IEC 61000-6-2	Electromagnetic compatibility (EMC) – Part 6-2: Generic standards – Immunity standard for industrial environments
IEC 61000-6-4	Electromagnetic compatibility (EMC) – Part 6-4: Generic standards – Emission standard for industrial environments
ISO 13849-1:2006	Safety of machinery - Safety related parts of control systems - Part 1: General principles for design, normative reference from ISO 10218-1

Region specific standards and regulations

Standard	Description
ANSI/RIA R15.06	Safety requirements for industrial robots and robot systems
	Safety standard for robots and robotic equipment
CAN/CSA Z 434-14	Industrial robots and robot Systems - General safety requirements
EN ISO 10218-1	Robots and robotic devices — Safety requirements for industrial robots — Part 1: Robots

1.4 Maintenance and troubleshooting

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 gearboxes.
- The cabling is routed for longevity, and in the unlikely event of a failure.

Maintenance

The maintenance intervals depend on the use of the robot. The required maintenance activities also depend on the selected options. For detailed information on maintenance procedures, see the maintenance section in *Product manual - IRB 5710*.

Troubleshooting

The robot has built-in communication that shows information on the FlexPendant. These messages facilitates troubleshooting and are an integral part of the control system. Troubleshooting procedures are describes in the product manual for the manipulator and the controller respectively.

2 Technical data for IRB 5710

2.1 Technical data

2.1.1 Technical data

Weight, robot

The table shows the weight of the robot.

Robot model	Nominal weight [i]
IRB 5710-110/2.3	830 kg
IRB 5710-90/2.7	830 kg
IRB 5710-90/2.3 LID	890 kg
IRB 5710-70/2.7 LID	885 kg

i *Option Inverted (3317-1)* adds approximately 15 kg to the nominal weight.

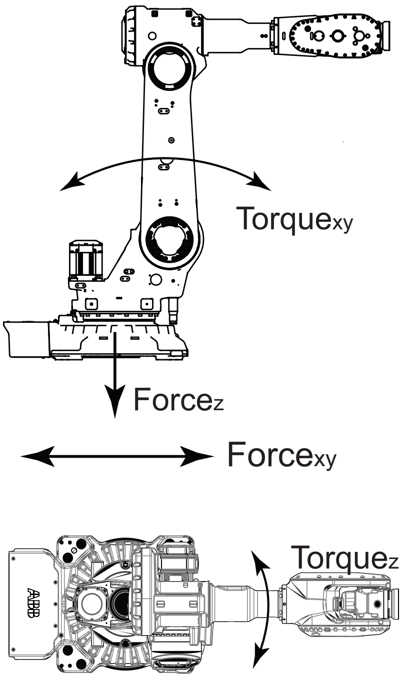
Note

The weight does not include additional options, tools and other equipment fitted on the robot.

Loads on foundation, robot

The illustration shows the directions of the robots stress forces.

The directions are valid for all floor mounted, tilted mounted and inverted robots.



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The table shows the various forces and torques working on the robot during different kinds of operation.

Note

These forces and torques are extreme values that are rarely encountered during operation. The values also never reach their maximum at the same time!

WARNING

The robot installation is restricted to the mounting options given in following load table(s).

Floor mounted

Force	Endurance load (in operation)	Maximum load (emergency stop)
Force xy	±6.7 kN	±14.1 kN
Force z	9.6 ±4.4 kN	9.6 ±10.7 kN
Torque xy	±13.9 kNm	±23.7 kNm
Torque z	±4.2 kNm	±10.2 kNm

Inverted

Force	Endurance load (in operation)	Max. load (emergency stop)
Force xy	±6.1 kN	±14.4 kN
Force z	-9.6 ±4.3 kN	-9.6 ±10.2 kN
Torque xy	±13 kNm	±23 kNm
Torque z	±4.2 kNm	±10.2 kNm

Tilted

Force	Endurance load (in operation)	Max. load (emergency stop)
Force xy	±9.4 kN	±16.5 kN
Force z	8.9 ±4.5 kN	8.9 ±11.1 kN
Torque xy	±14.7 kNm	±24.6 kNm
Torque z	±4.2 kNm	±10.4 kNm

Note

Values valid for maximum tilted robot.

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Requirements, foundation

The table shows the requirements for the foundation where the weight of the installed robot is included:

Requirement	Value	Note
Flatness of foundation surface	0.3 mm	Flat foundations give better repeatability of the resolver calibration compared to original settings on delivery from ABB. The value for levelness aims at the circumstance of the anchoring points in the robot base. In order to compensate for an uneven surface, the robot can be recalibrated during installation. If resolver/encoder calibration is changed this will influence the absolute accuracy.
Maximum tilt	20°	
Minimum resonance frequency	22 Hz **Note** It may affect the manipulator lifetime to have a lower resonance frequency than recommended.	The value is recommended for optimal performance. Due to foundation stiffness, consider robot mass including equipment.[i] For information about compensating for foundation flexibility, see *Application manual - Controller software OmniCore*, section *Motion Process Mode*.

i The minimum resonance frequency given should be interpreted as the frequency of the robot mass/inertia, robot assumed stiff, when a foundation translational/torsional elasticity is added, i.e., the stiffness of the pedestal where the robot is mounted. The minimum resonance frequency should not be interpreted as the resonance frequency of the building, floor etc. For example, if the equivalent mass of the floor is very high, it will not affect robot movement, even if the frequency is well below the stated frequency. The robot should be mounted as rigid as possibly to the floor.

Disturbances from other machinery will affect the robot and the tool accuracy. The robot has resonance frequencies in the region 10 – 20 Hz and disturbances in this region will be amplified, although somewhat damped by the servo control. This might be a problem, depending on the requirements from the applications. If this is a problem, the robot needs to be isolated from the environment.

Storage conditions, robot

The table shows the allowed storage conditions for the robot:

Parameter	Value
Minimum ambient temperature	-25°C
Maximum ambient temperature	55°C
Maximum ambient temperature (less than 24 hrs)	70°C
Maximum ambient humidity	95%

Operating conditions, robot

The table shows the allowed operating conditions for the robot:

Parameter	Value
Minimum ambient temperature	5°C [i]
Maximum ambient temperature	50°C

Continues on next page

Parameter	Value
Maximum ambient humidity	95% at constant temperature

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

Protection classes, robot

The table shows the available protection types of the robot, with the corresponding protection class.

Protection type	Protection class [i]
Manipulator, protection type Standard	IP67
Manipulator, protection type Foundry Plus 2	IP67

i According to IEC 60529.

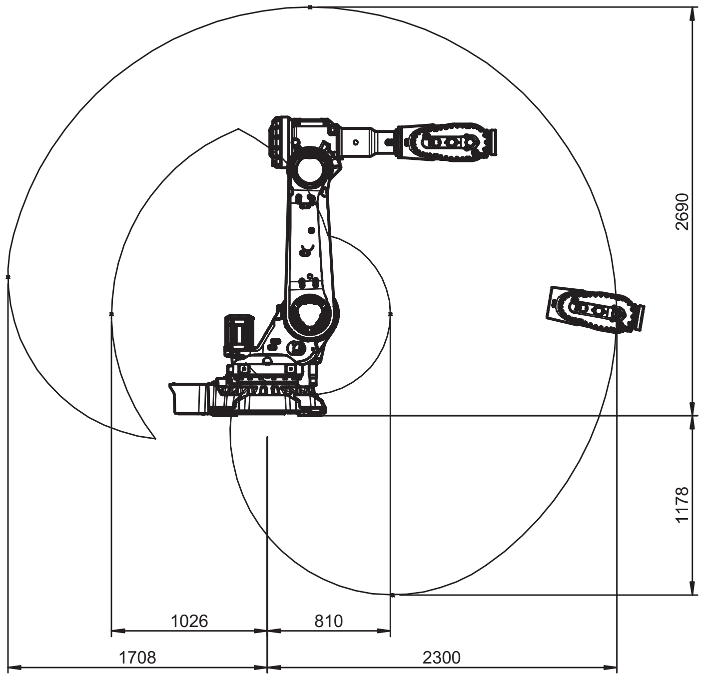
Environmental information

The product complies with IEC 63000. *Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances*.

2.1.2 Working range

Illustration, working range IRB 5710-110/2.3

This illustration shows the unrestricted working range of the robot.



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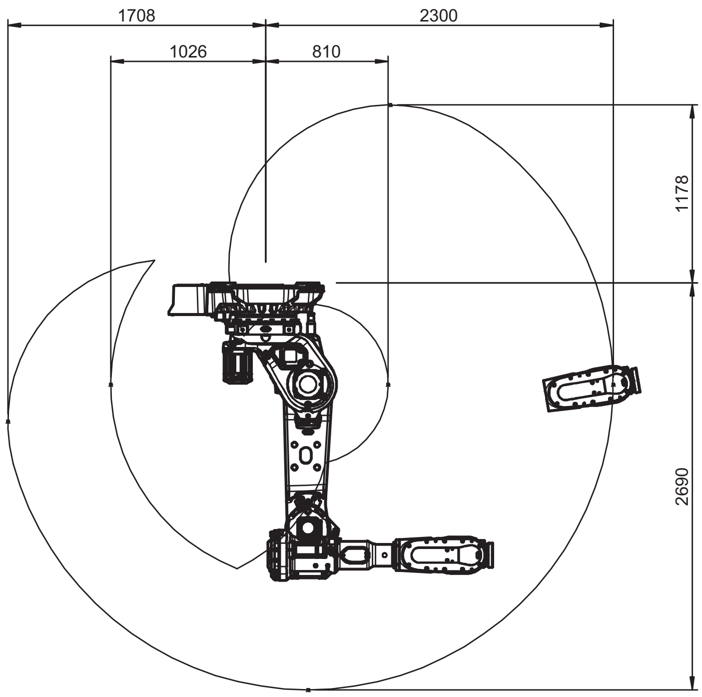
IRB 5710-110/2.3 inverted (with option 3317-1)



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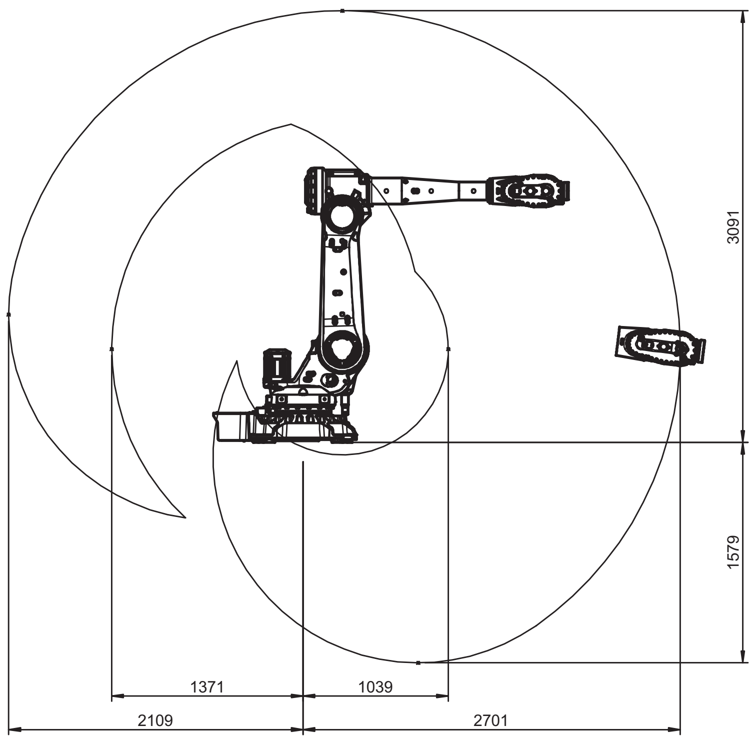
Illustration, working range IRB 5710-90/2.7

This illustration shows the unrestricted working range of the robot.



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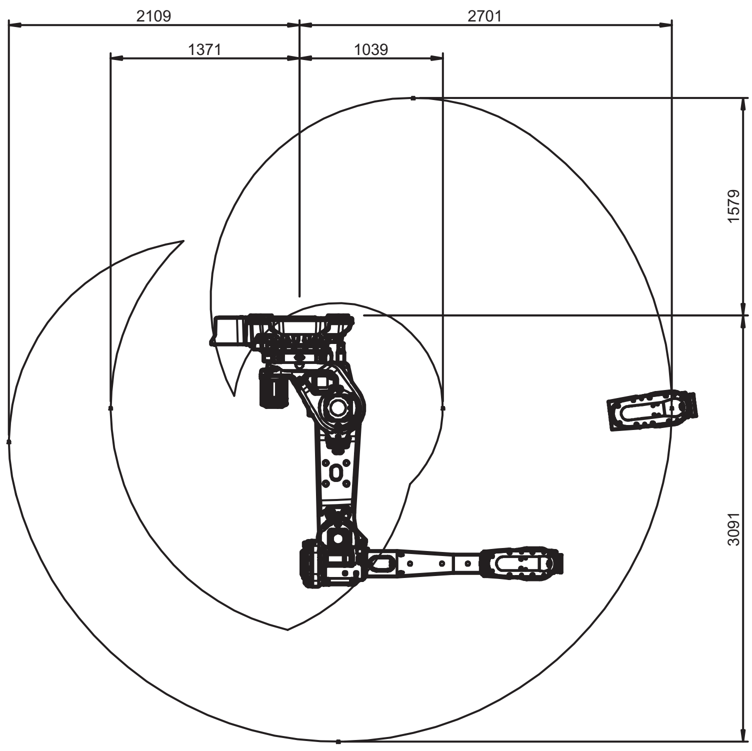
IRB 5710-90/2.7 inverted (with option 3317-1)



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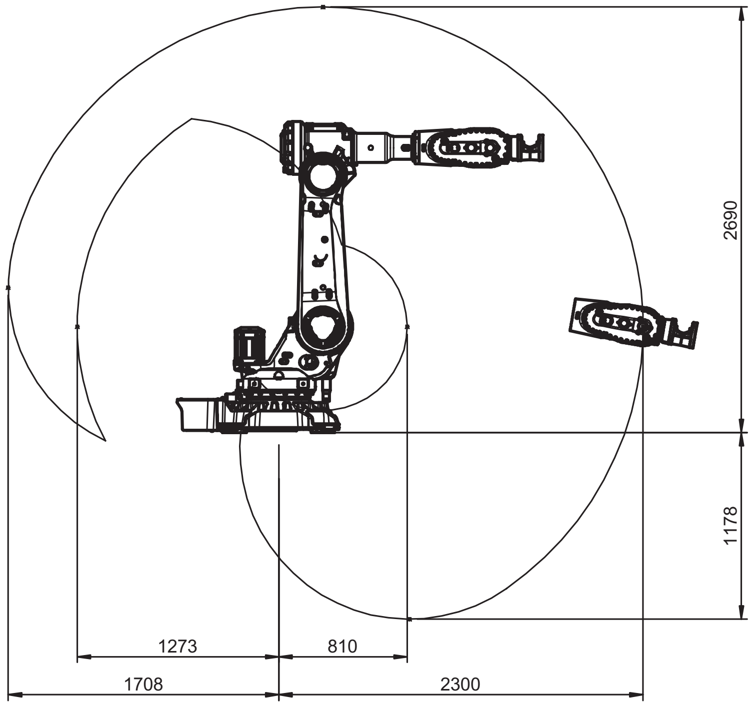
Illustration, working range IRB 5710-90/2.3 LID

This illustration shows the unrestricted working range of the robot.



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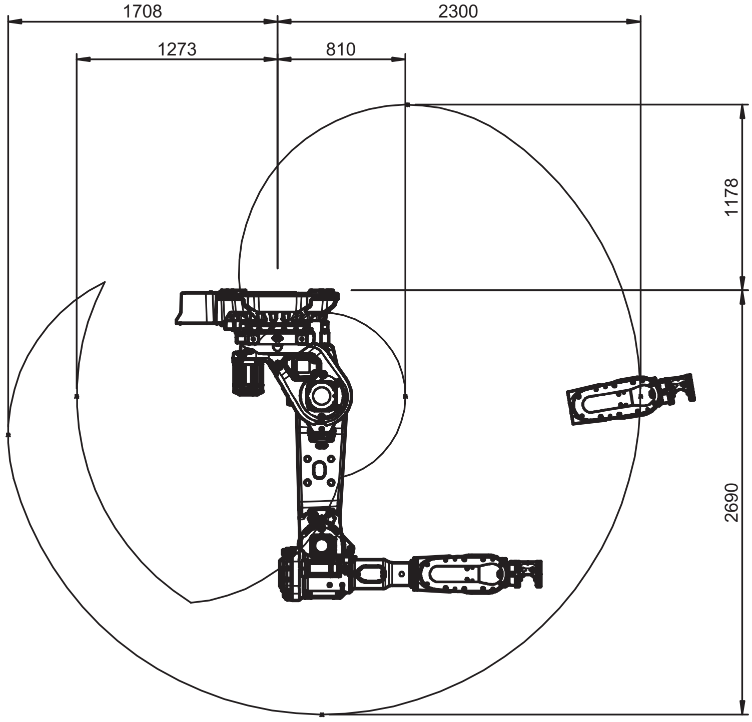
IRB 5710-90/2.3 LID inverted (with option 3317-1)



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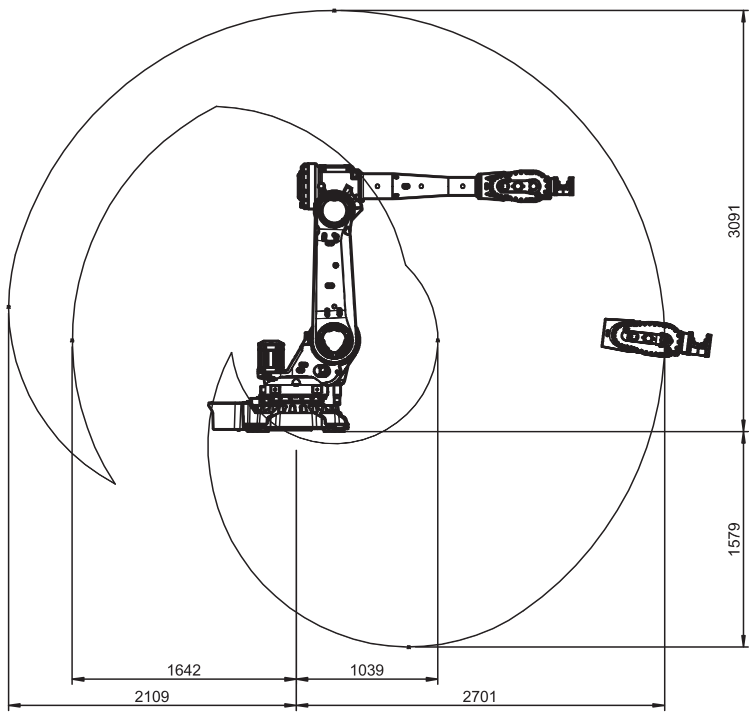
Illustration, working range IRB 5710-70/2.7 LID

This illustration shows the unrestricted working range of the robot.



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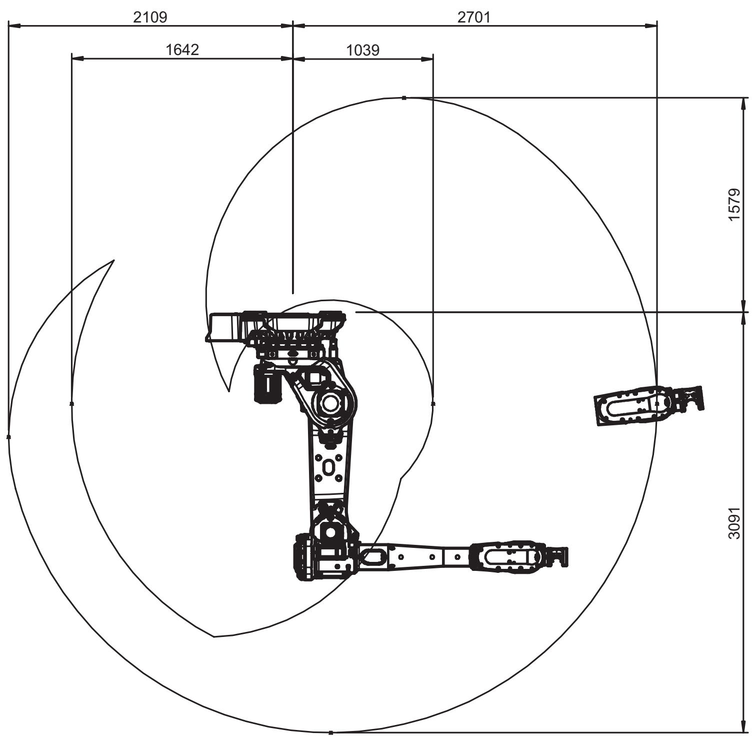
IRB 5710-70/2.7 LID inverted (with option 3317-1)



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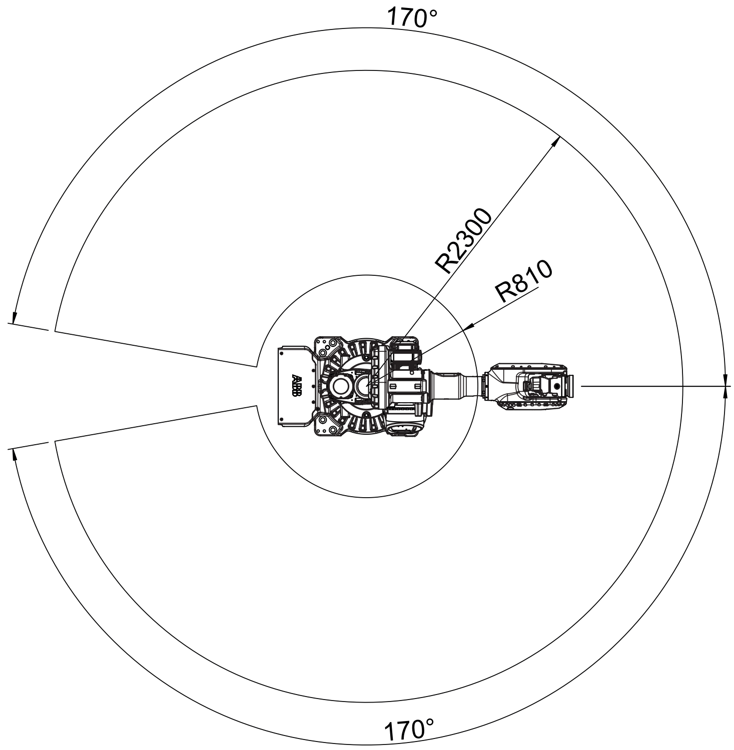
Top view of working range

IRB 5710-110/2.3, IRB 5710-90/2.3 LID



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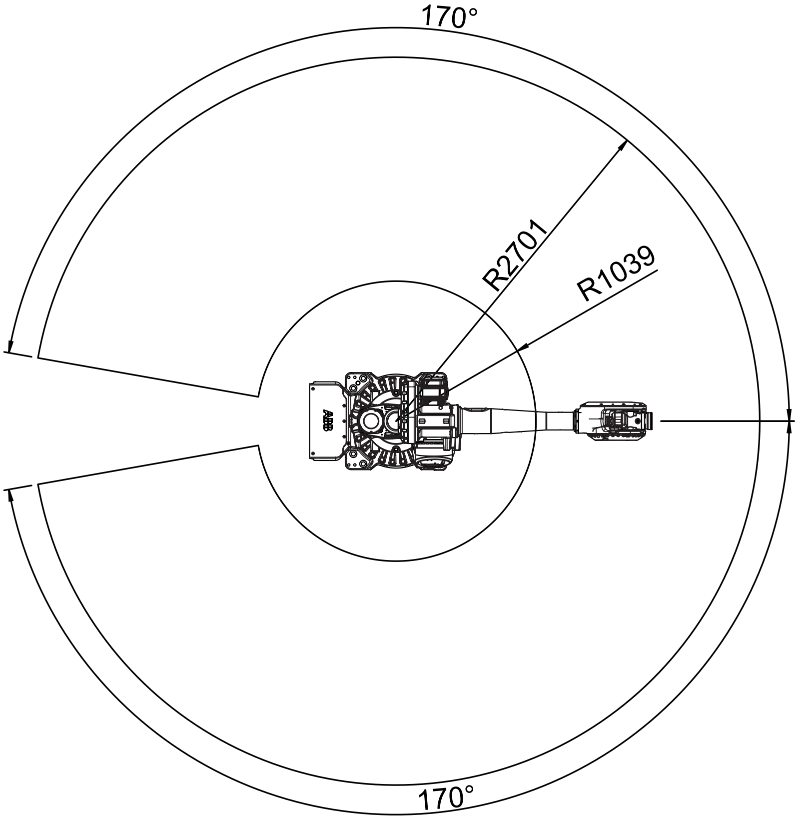
IRB 5710-90/2.7, IRB 5710-70/2.7 LID



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Working range

Axis	Working range	Note
Axis 1	±170°	
	±220° [i]	The default working range for axis 1 can be extended as an option.
Axis 2	-75°/+145°	
Axis 3	-180°/+70° (IRB 5710-110/2.3, IRB 5710-90/2.7) -160°/+70° (IRB 5710-90/2.3 LID, IRB 5710-70/2.7 LID)	
Axis 4	±300°	
Axis 5	±130° (IRB 5710-110/2.3, IRB 5710-90/2.7) ±120° [ii] (IRB 5710-90/2.3 LID, IRB 5710-70/2.7 LID)	
Axis 6	±360° (IRB 5710-110/2.3, IRB 5710-90/2.7) ±200° [ii] (IRB 5710-90/2.3 LID, IRB 5710-70/2.7 LID)	

i *Option Extended Working Range Axis 1 (3324-1)*
Not valid for option Inverted (3317-1)
Not valid with DressPack.

ii Maximum combined movements reduced.
See *Working range axis 5 and axis 6 for IRB 5710-90/2.3 LID, and IRB 5710-70/2.7 LID (option axis 3-6 [3326-x]) on page 27*.

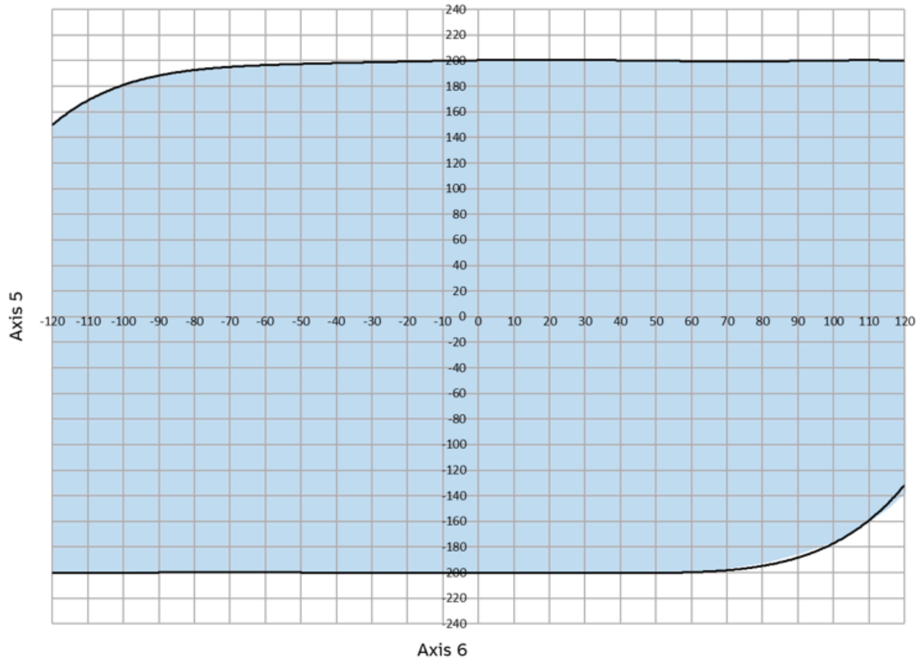
2.1.3 Robot motion

Limitations of robot movements for LeanID

Robot variants with LeanID will have restricted working range implemented in RobotWare. See *Working range on page 26*.

Working range axis 5 and axis 6 for IRB 5710-90/2.3 LID, and IRB 5710-70/2.7 LID (option axis 3-6 [3326-x])

Allowed working area for axis 6 related to axis 5 position is shown in the figure below.



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Note

The working range for LeanID variants is controlled and protected by software.

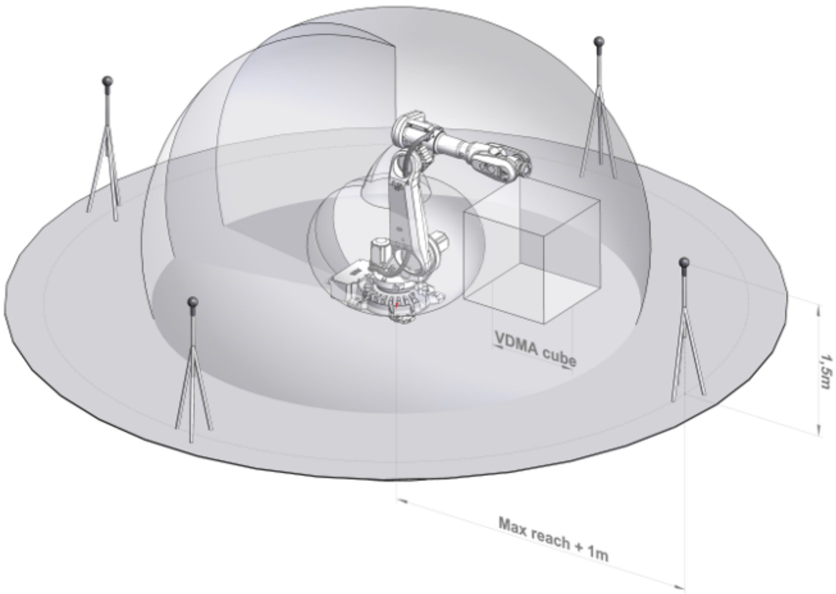
Working range limitation

The working range of axes 1 can be limited by mechanical stops as option. see *Working range alterations on page 51*.

Airborne noise level

Description	Note	Data
Airborne noise level	The sound pressure level outside the working space.	70 dB (A) Leq

The noise emission is measured at four points on a radius 1 m outside the robots maximum working range at 1.5m above the robot base level while the manipulator follow a defined cycle according to VDMA 24608, at max performance and payload.



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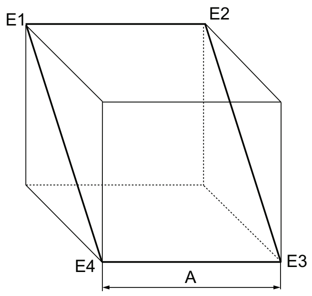
> **Note**
>
> The noise emission from a robot system, actual application, depends on programmed path, payload, cycle time, mounting position, environment etc.

Power consumption at max load

Type of movement	IRB 5710-110/2.3	IRB 5710-90/2.7
ISO Cube Max. velocity (kW)	2.9	2.3

Robot in calibration position	IRB 5710-110/2.3	IRB 5710-90/2.7
Brakes engaged (kW)	0.25	0.23
Brakes disengaged (kW)	0.66	0.68



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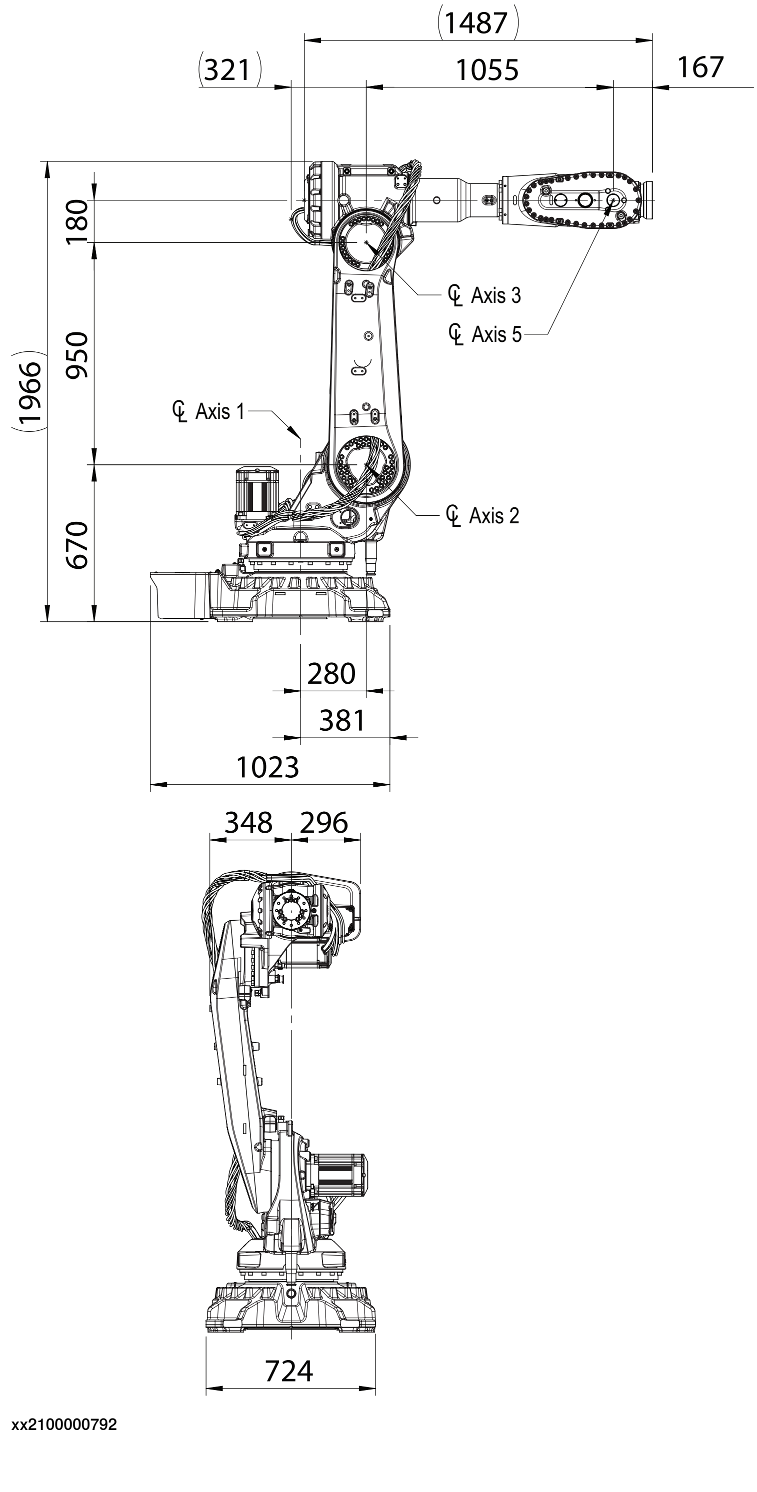
Pos	Description
A	1,000 mm

2.2 Fitting equipment on the robot (robot dimensions)

Robot dimensions

The figure shows the dimension of the robot. For more information regarding geometry, see CAD models online.

IRB 5710-110/2.3



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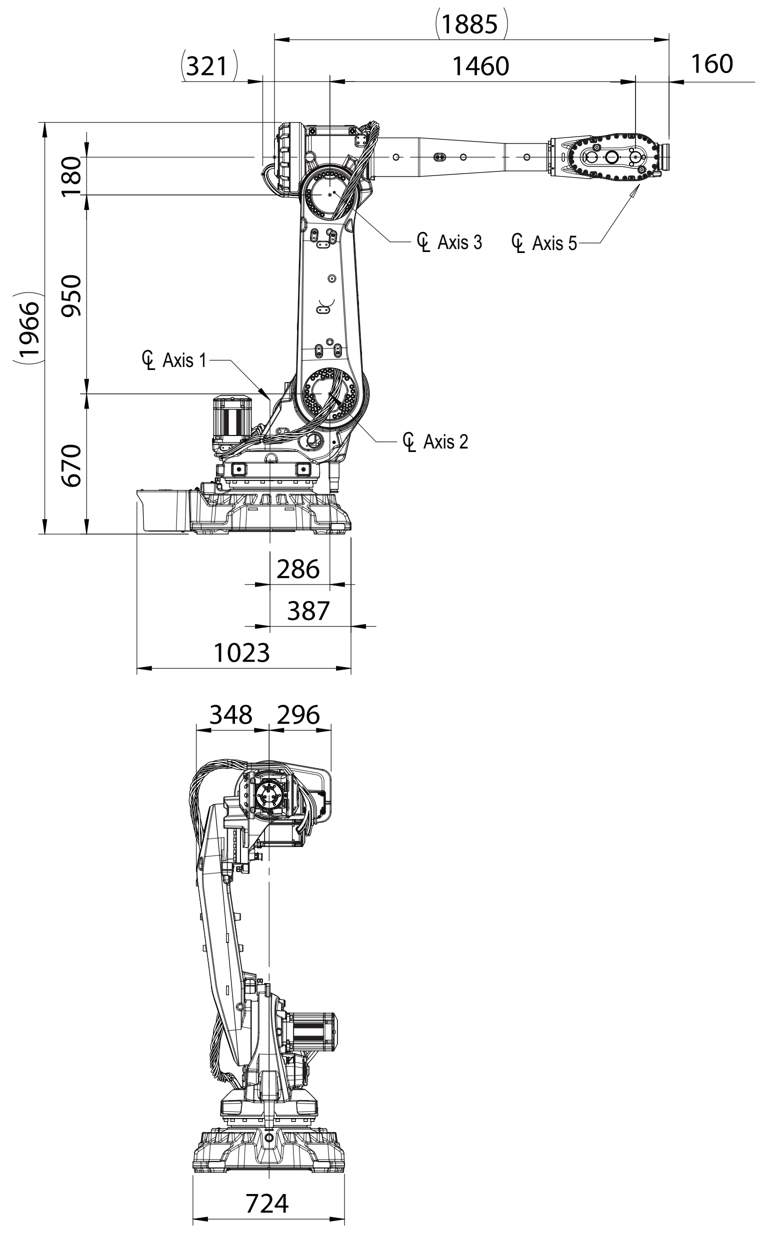
IRB 5710-90/2.7



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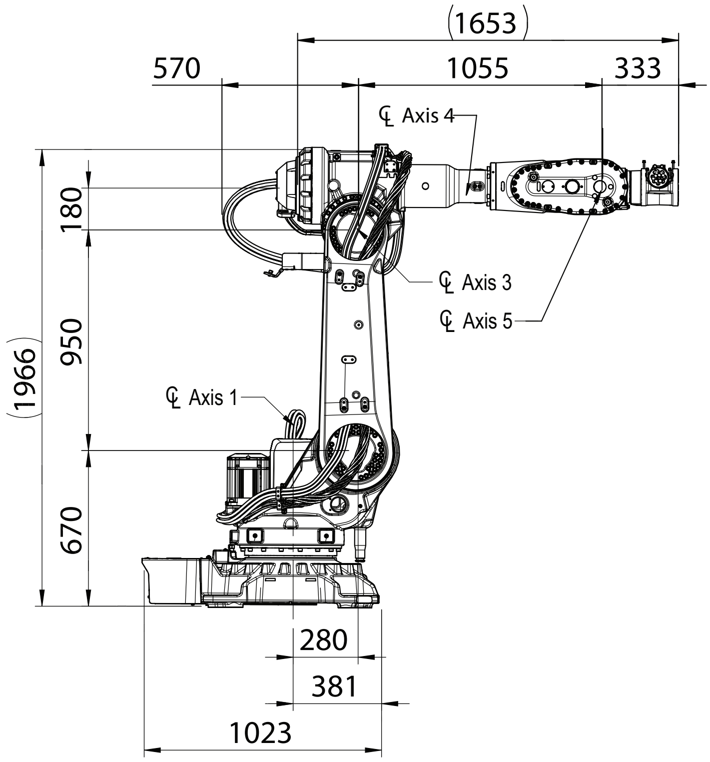
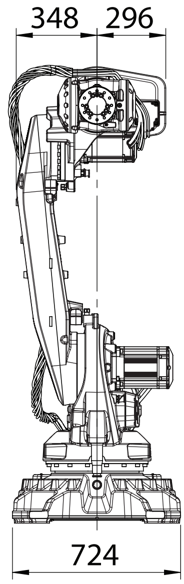
IRB 5710-90/2.3 LID





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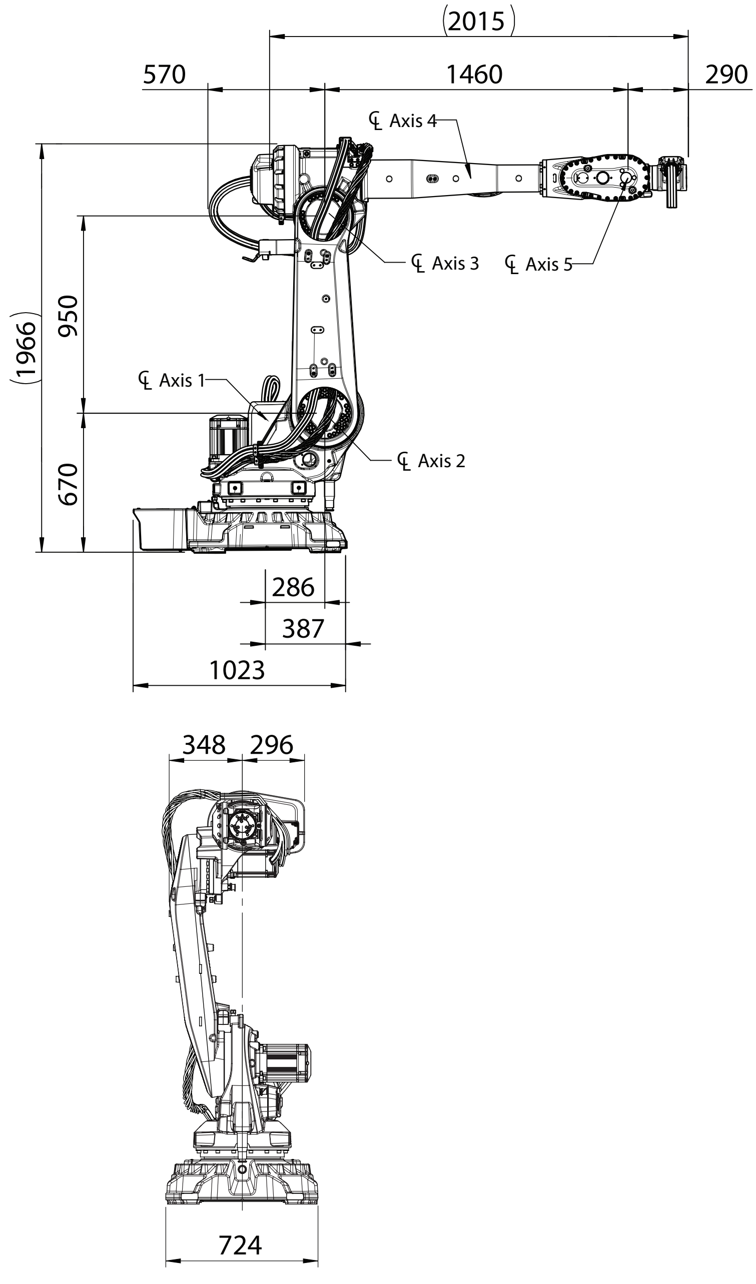
IRB 5710-70/2.7 LID



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Extra load on the robot

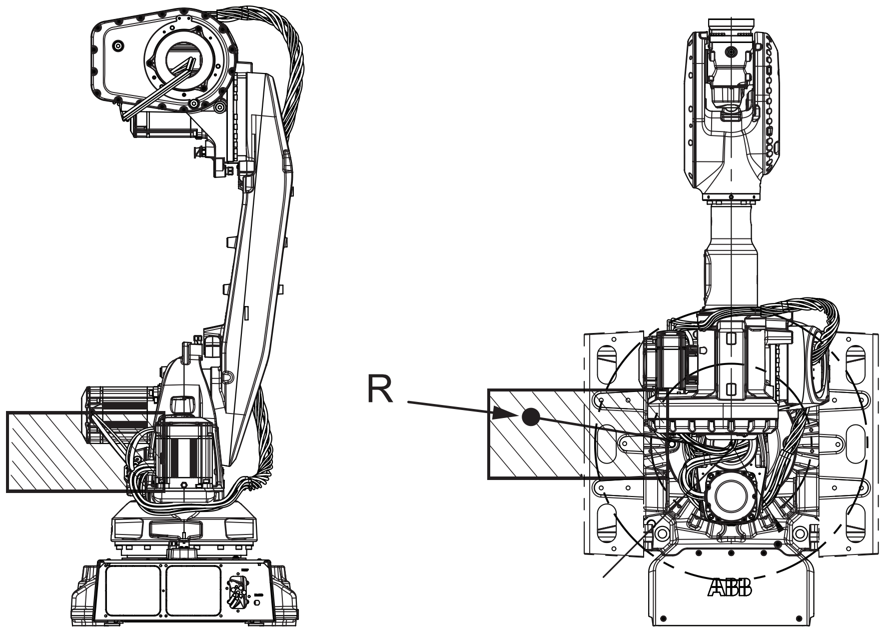
Extra loads can be mounted on robot. Definitions of dimensions and masses are shown in the following figures. The robot is supplied with holes for fitting extra equipment.

Maximum allowed arm load depends on center of gravity of arm load and robot payload.

Frame

The table and figure shows allowed extra load on the frame.

	Description
Permitted extra load on frame	$J_H = 100\ kgm^2$
Recommended position (see the following figure)	$J_H = J_{H0} + M4 \times R^2$ where: • J_{H0} is the moment of inertia of the equipment • R is the radius (m) from the center of axis 1 • M4 is the total mass (kg) of the equipment including bracket and harness (≤ 250 kg)



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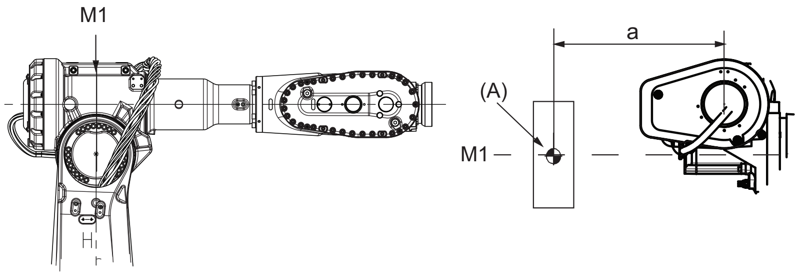
Upper arm

Allowed extra load on the upper arm housing, in addition to the nominal handling weight, is M1 ≤ 20 kg with a distance (a) ≤ 500 mm from the center of gravity in the axis-3 extension.



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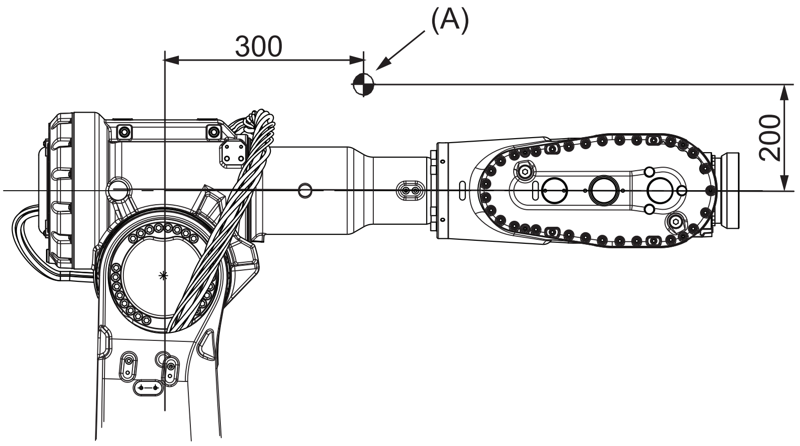
A	Mass center



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A	Center of gravity in the axis-3 extension

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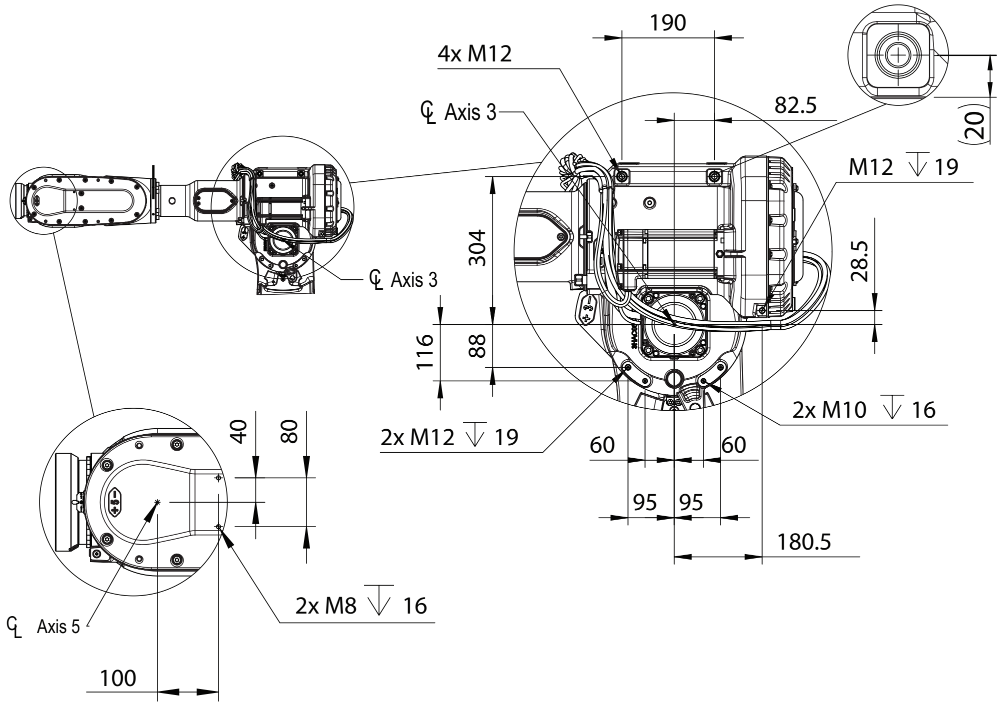
Attachment holes for fitting extra equipment

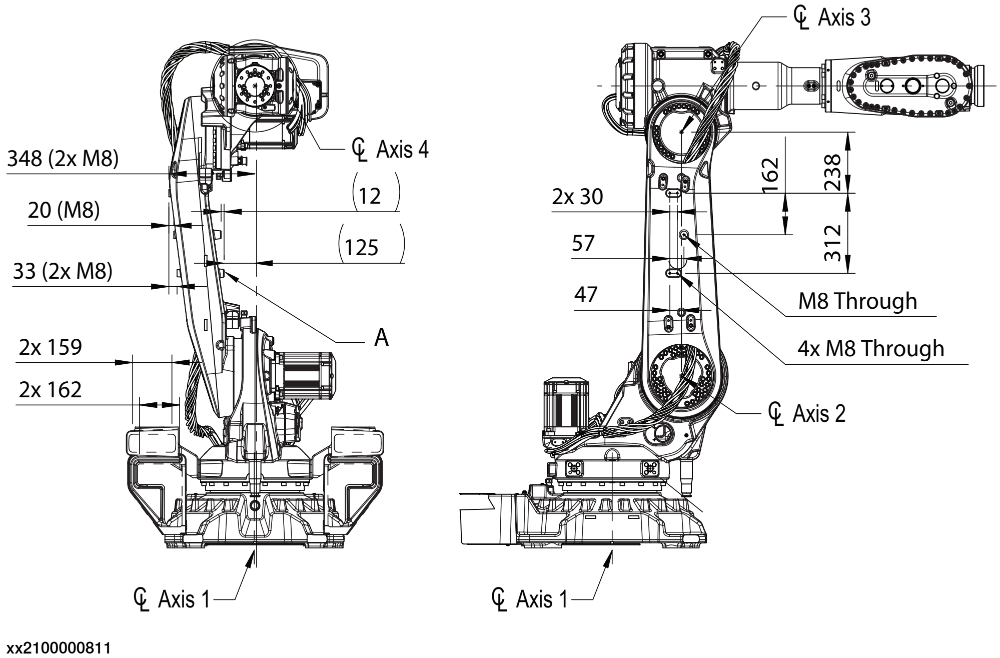
The robot is supplied with holes for fitting extra equipment.

Upper arm



xx2100000810

Lower arm

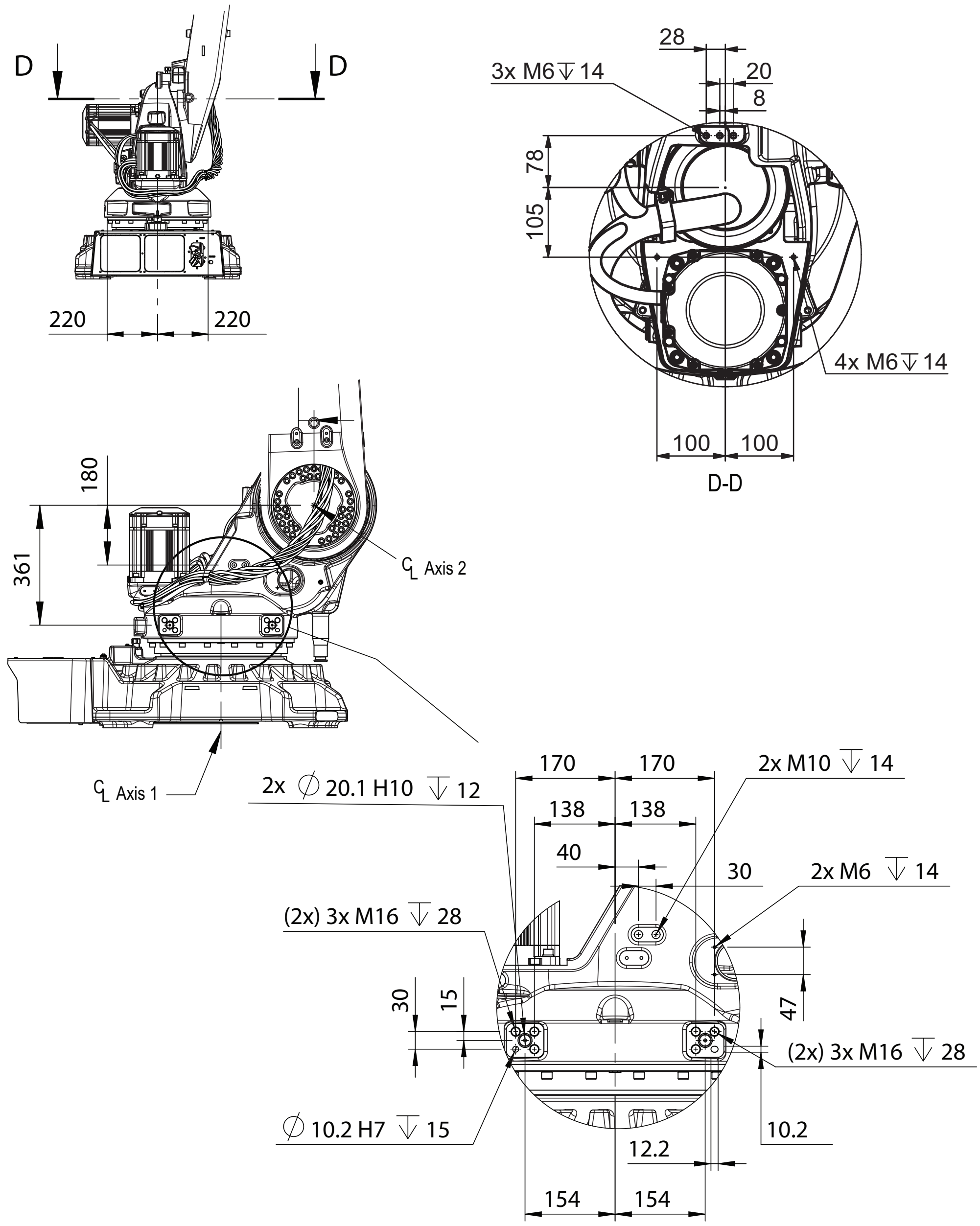


xx2100000811

A	Allowed positions for attachment holes. 4x M12 through. Avoid damaging cables when drilling.

Continues on next page

Frame



xx2100000812

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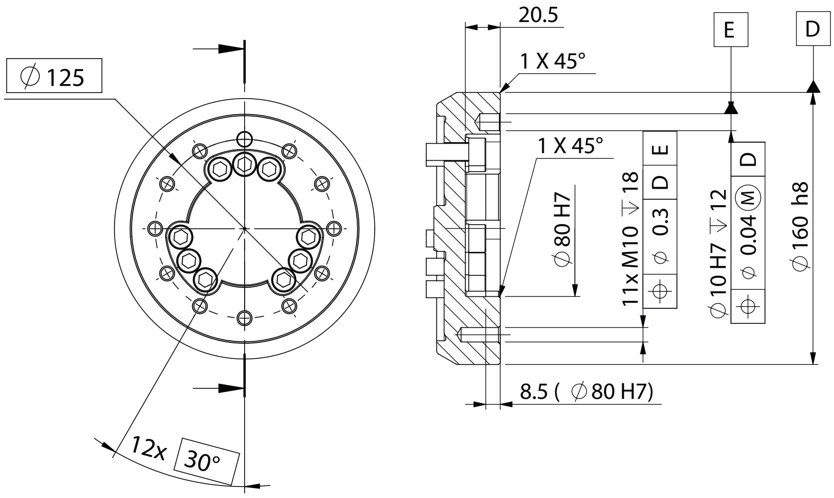
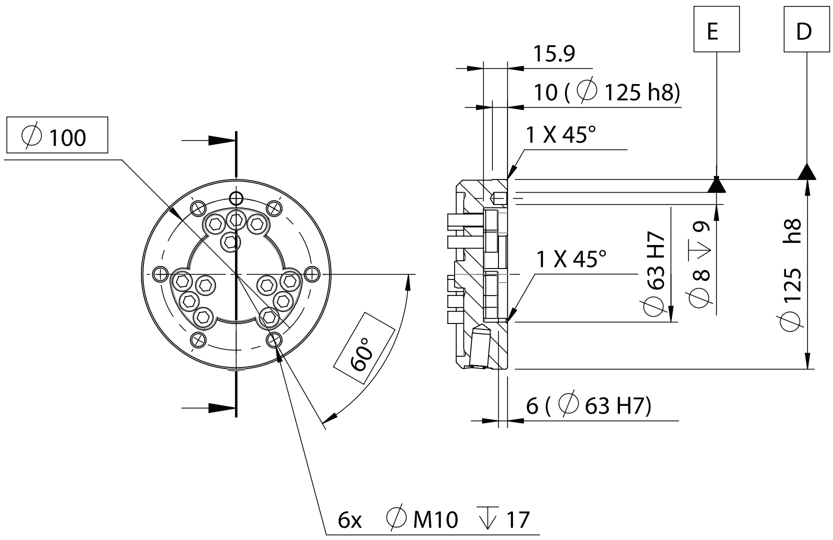
Tool flange dimensions

Robot variant	Tool flange dimension
IRB 5710-110/2.3	 xx2100000805
IRB 5710-90/2.7	 xx2100000806

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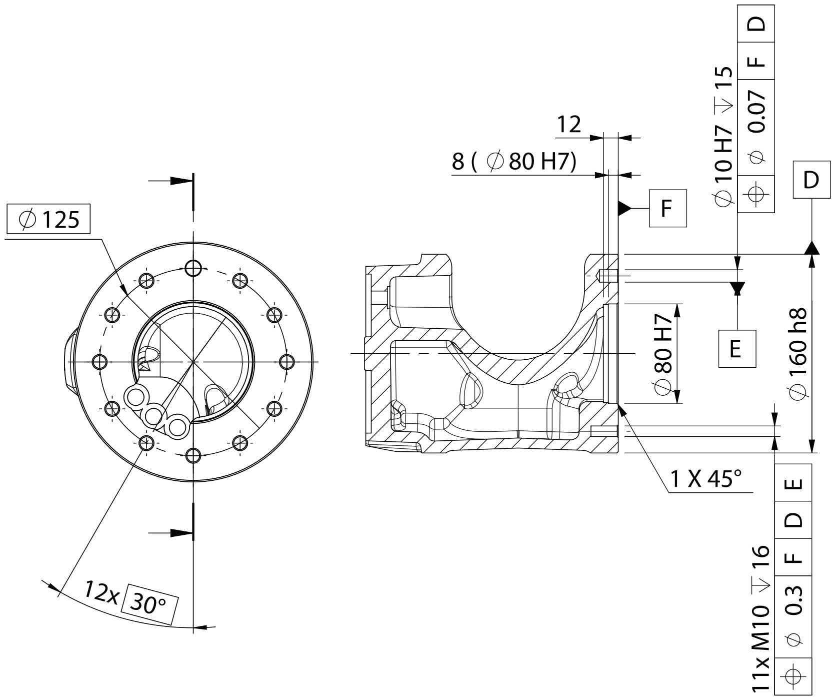
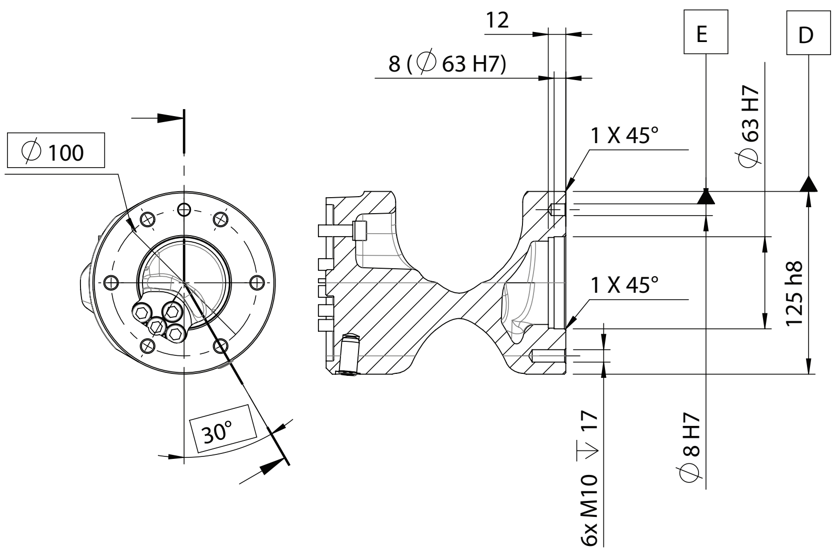
Robot variant	Tool flange dimension
IRB 5710-90/2.3 LID	 xx2100000807
IRB 5710-70/2.7 LID	 xx2100000808

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.

2.3 Additional installation information

General

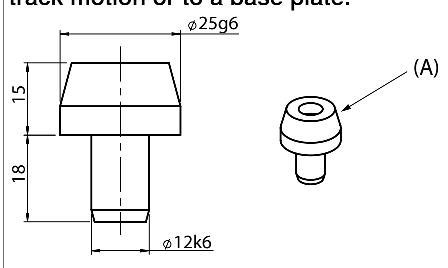
IRB 5710 is available in four variants and all variants can be floor mounted, inverted, or tilted mounted.

Detailed installation instructions

All detailed installation instructions are described in *Product manual - IRB 5710*.

Attachment screws base plate

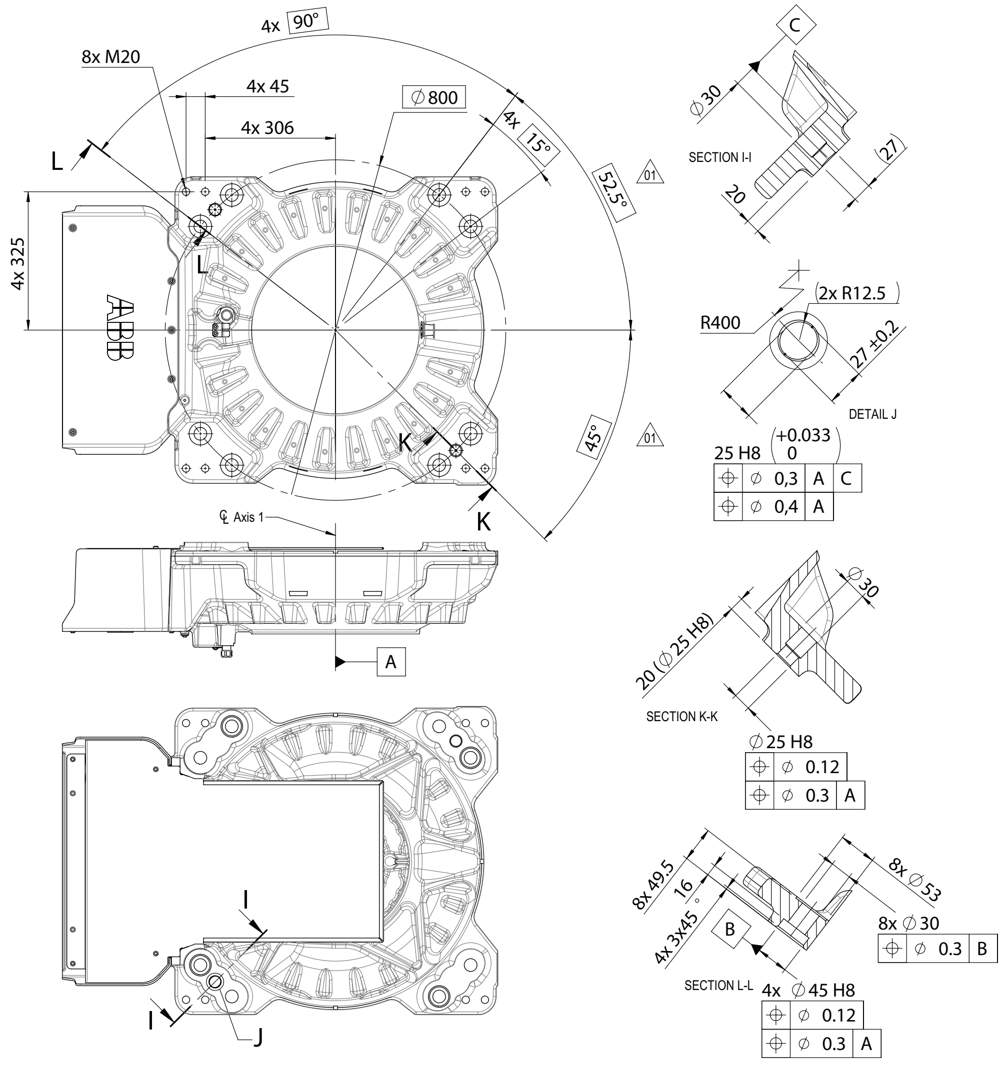
The table below specifies the type of securing screws and washers to be used for securing the robot to the base plate/foundation.

Suitable screws	M24 x 100
Quantity	8 pcs
Quality	8.8
Screw tightening yield point utilization factor (v) (according to VDI2230)	90% (v=0.9)
Suitable washer	4 mm flat washer
Guide pins	Guide pins are required if mounting the manipulator to a track motion or to a base plate.  XX1500000248 A: Cylindrical guide pin
Tightening torque	550 Nm (screws lubricated with Molykote 1000) 600-725 Nm, typical 650 Nm (screws none or lightly lubricated)
Level surface requirements	0.3 mm, see *Requirements, foundation on page 19* for detailed explanation.

Continues on next page

Hole configuration, base

This illustration shows the hole configuration used when securing the robot.



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Continues on next page

2.3.1 Base plate

Advantages of using a base plate

Instead of installing the robot directly on the floor, a base plate can be manufactured and used as an adapter between the floor and the robot base. This list specifies some of the advantages of using a base plate:

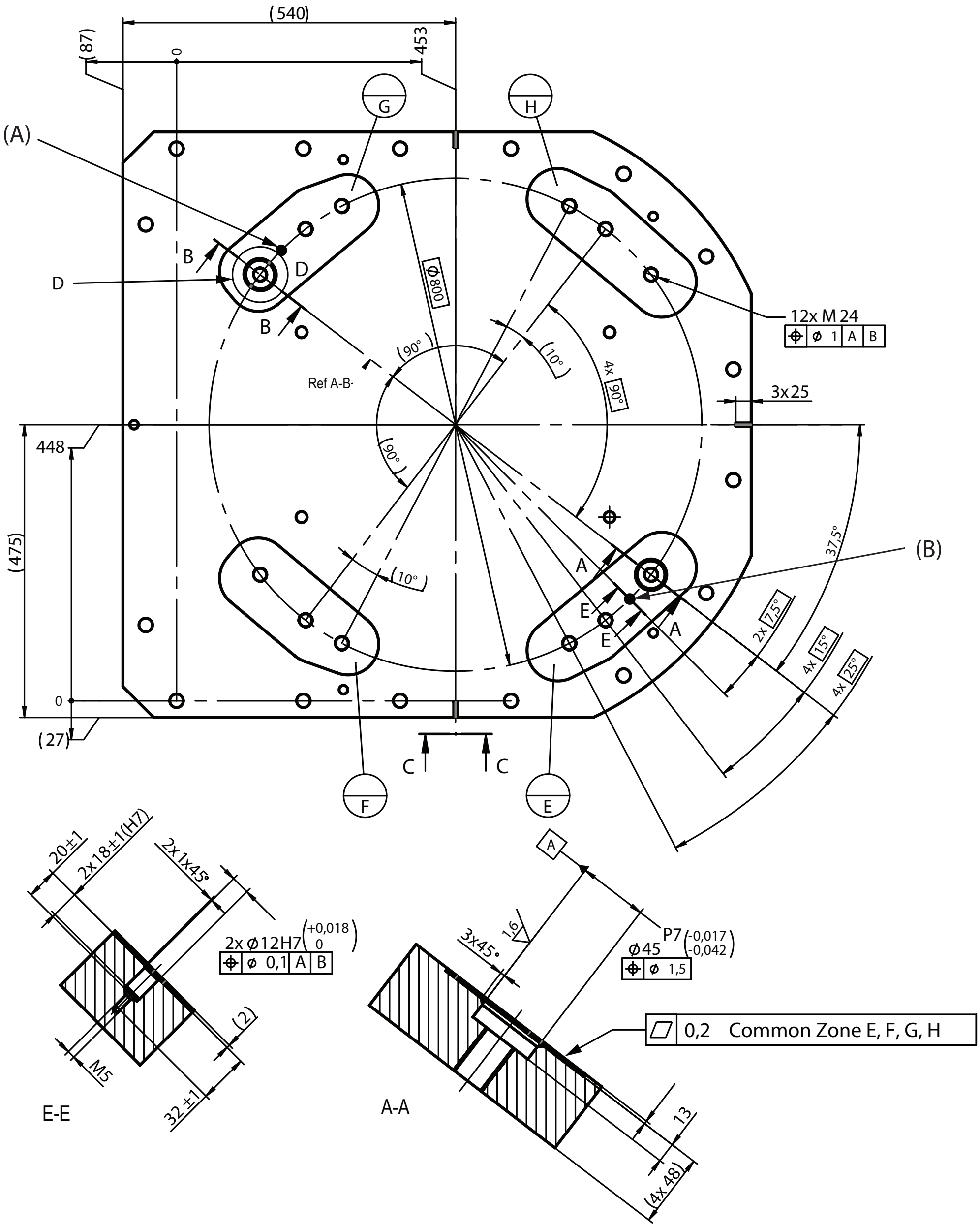
- to ensure a plain surface with a high precision of the robot base hole configuration
- to simplify adjustment of levelness by machined surfaces or by using shims
- to distribute the press force from the robot to a larger foot print
- to compensate poor floor quality that might not be suitable for fastening the robot base directly onto. The base plate has a greater number of fastening points to the foundation and makes a larger footprint, which reduces the load on each fastening point.
- to reduce surface pressure on the foundation contact points, which minimizes the risk of wearing down an uneven surface and thereby causing changes in the robot fastening tightening torque
- to be able to prepare the installation site before robot delivery
- to increase the precision between the positions of an installed robot and other equipment

> **Note**
>
> Do **not** use a base plate for installation of an inverted robot.

Continues on next page

Base plate drawing

The following figure shows an example of base plate (dimensions in mm).

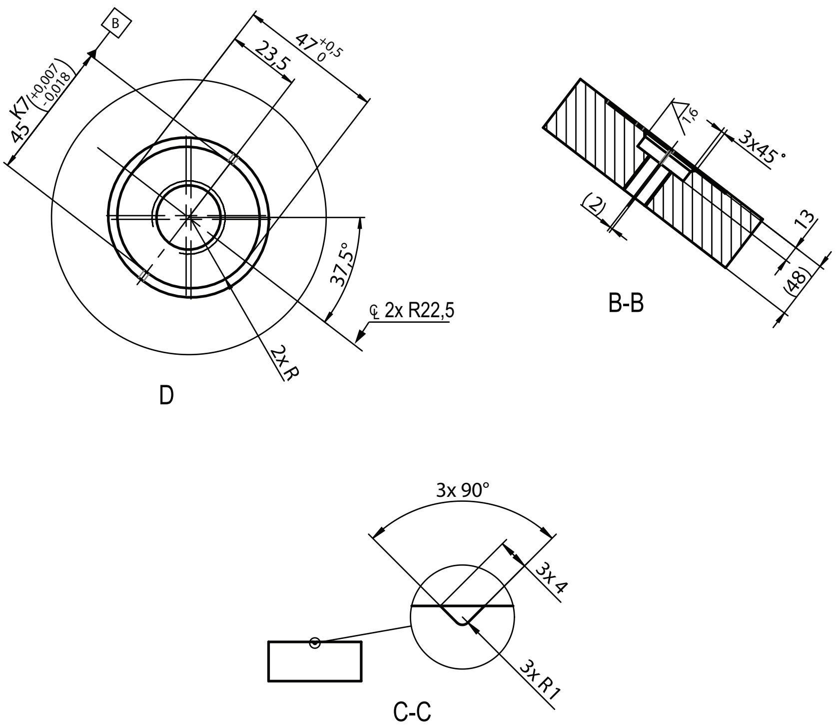


xx1500000246

Pos	Description
A, B	Hole for guide pin, cylindrical, see *Guide pins on page 45*
E, F, G, H	Common tolerance zone (accuracy all over the base plate from one contact surface to the other)

Continues on next page

2.3.1 Base plate
Continued



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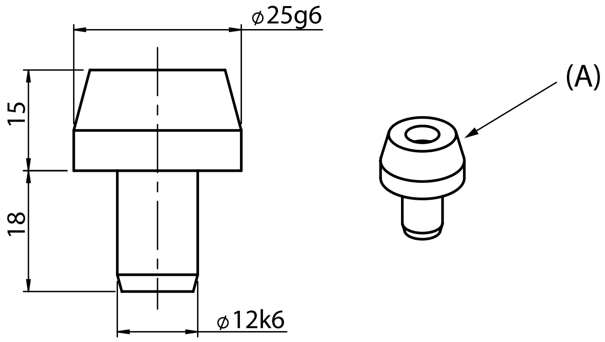
xx1500000249

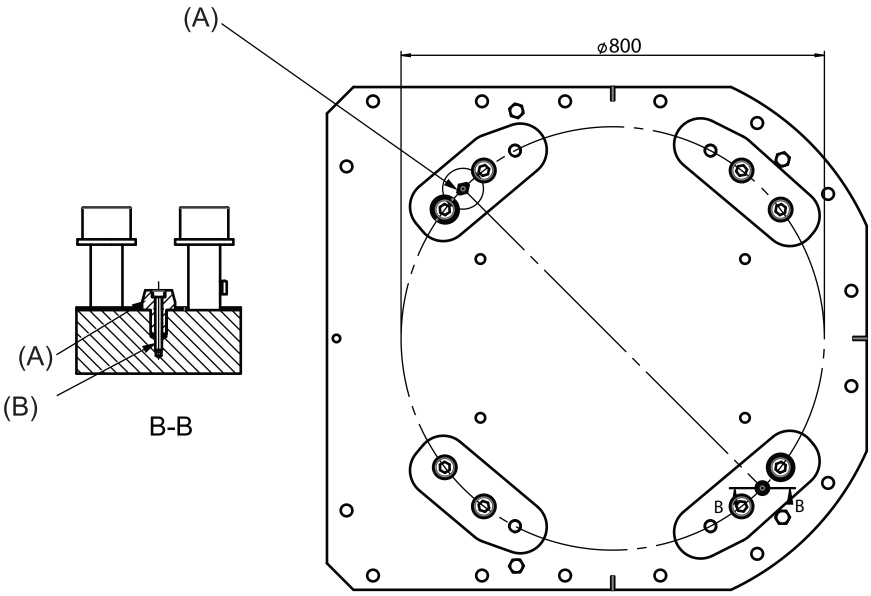
Guide pins



XX1500000248

Pos	Description
A	Cylindrical guide pin (x2)

Assembly of guide pins

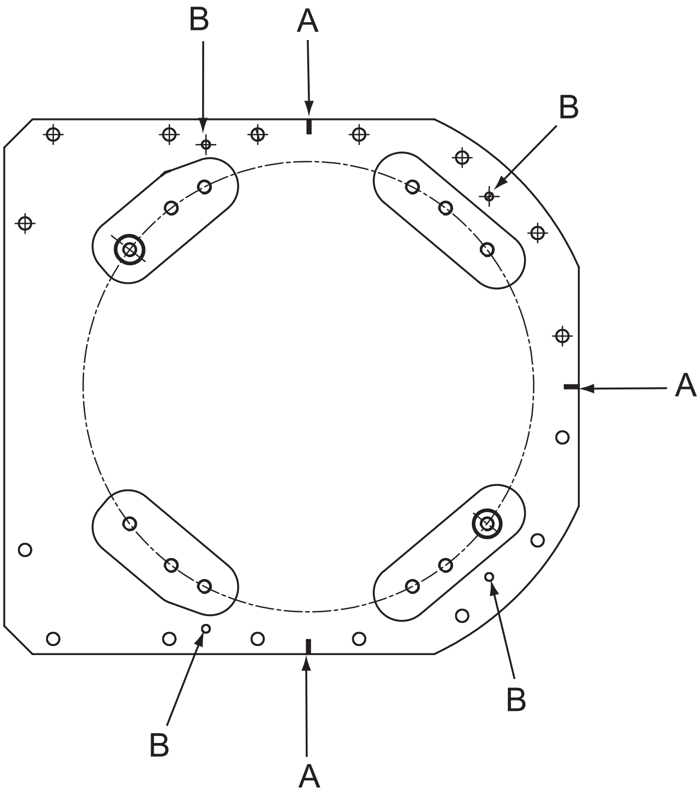


Pos	Description
A	Cylindrical guide pin (x2)
B	M5 x 40. Tightening torque 6 Nm. (x2)

Continues on next page

Base plate, orienting grooves and leveling bolts

The illustration below shows the orienting grooves and attachment holes for leveling bolts in the base plate.



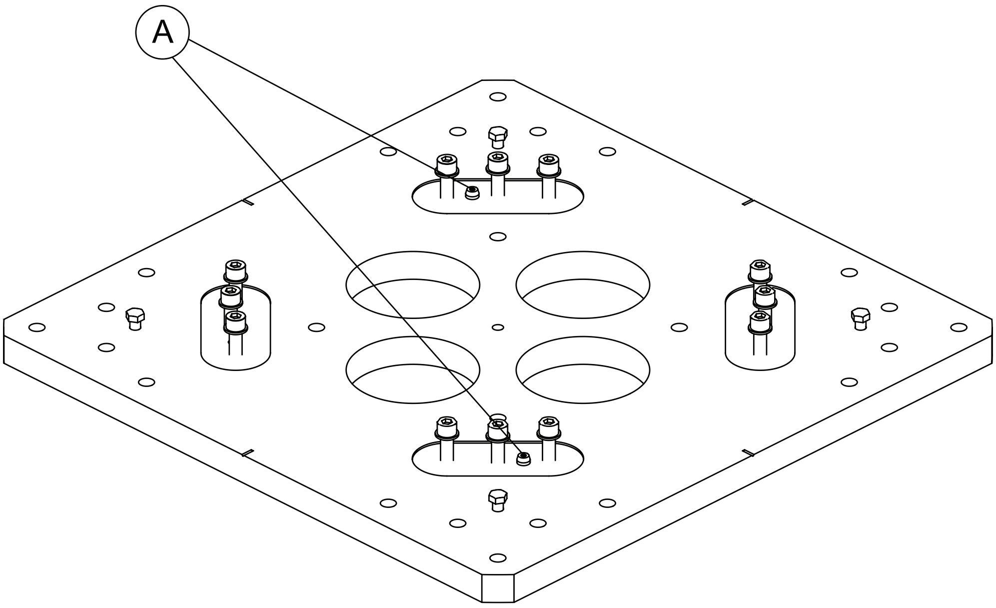
xx1500000312

A	Orienting grooves (3 pcs)
B	Levelling bolts, attachment holes (4 pcs)

Continues on next page

Base plate, locating pins

The illustration below shows the orienting grooves and the locating pins in the base plate.



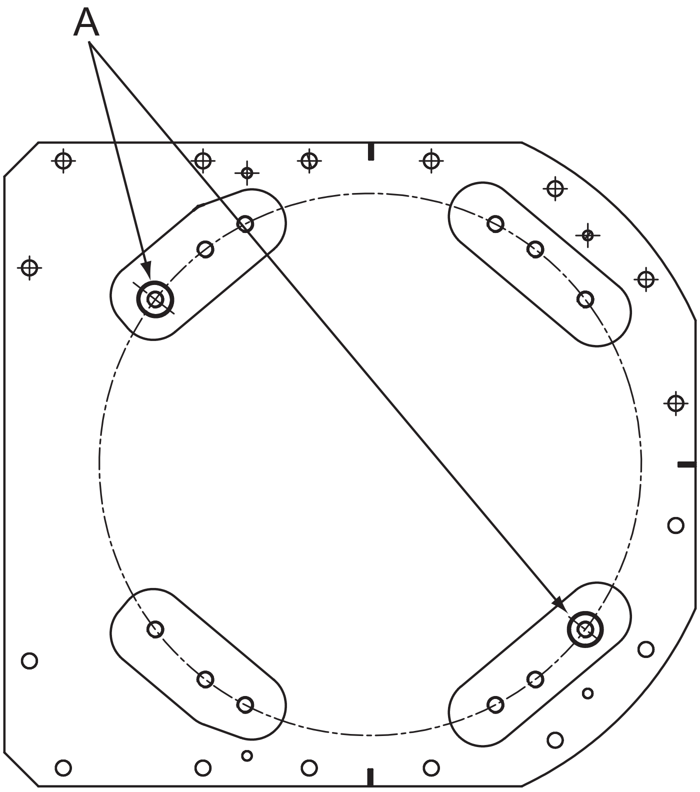
xx1700001591

A	Locating pins (2 pcs)

Continues on next page

Base plate, guide sleeve holes

The illustration below shows the orienting grooves and guide sleeve holes in the base plate.



xx0300000045

A	Guide sleeve holes (2 pcs)

2.3.2 Setting the system parameters for an inverted or a tilted robot

General

The robot is configured for mounting parallel to the floor, without tilting, on delivery. The method for mounting the robot in a inverted (upside down) or tilted position is basically the same as for floor mounting, but the system parameters that describe the mounting angle (how the robot is oriented relative to the gravity) must be re-defined.

Note

With inverted installation, make sure that the gantry or corresponding structure is rigid enough to prevent unacceptable vibrations and deflections, so that optimum performance can be achieved.

Note

The allowed mounting positions are described in the product specification for the robot. The requirements on the foundation are described in *Requirements, foundation on page 19*.

System parameters

Note

The mounting angle must be configured correctly in the system parameters so that the robot system can control the movements in the best possible way. An incorrect definition of the mounting angle will result in:

- Overloading the mechanical structure.
- Lower path performance and path accuracy.
- Some functions will not work properly, for example *Load Identification* and *Collision detection*.

Gravity Beta

When the robot is mounted other than floor-standing (rotated around the y-axis), the robot base frame and the system parameter *Gravity Beta* must be redefined.

If the robot is mounted upside down (inverted), then *Gravity Beta* should be π (+3.141593).

The *Gravity Beta* is a positive rotation direction around the y-axis in the base coordinate system. The value is set in radians.

Gamma Rotation

Gamma Rotation defines the orientation of the robot foot on the travel carriage (track motion).

Continues on next page

Mounting angles and values

The parameter *Gravity Beta* (or *Gravity Alpha*) specifies the mounting angle of the robot in radians. It is calculated in the following way.

`Gravity Beta = A° x 3.141593/180 = B radians`, where `A` is the mounting angle in degrees and `B` is the mounting angle in radians.

Example of position	Mounting angle (A°)	Gravity Beta
Floor mounted	0°	0.000000 (Default)
Tilted mounting	Example: 20°	Corresponds to: 0.349066 rad
Inverted mounting	180°	3.141593

Defining the system parameters in RobotWare

The value of the system parameters that define the mounting angle must be redefined when changing the mounting angle of the robot. The parameters belong to the type *Robot*, in the topic *Motion*.

The system parameters are described in *Technical reference manual - System parameters*.

The system parameters are configured in RobotStudio or on the FlexPendant.

2.3.3 Working range alterations

2.3.3.1 Adjusting the working range

Reasons for adjusting the manipulator working range

The working range of each manipulator axis is configured in the software. If there is a risk that the manipulator may collide with other objects at installation site, its working space should be limited. The manipulator must always be able to move freely within its entire working space.

Working range configurations

The parameter values for the axes working range can be altered within the allowed working range and according to available options for the robot, either to limit or to extend a default working range. Allowed working ranges and available options for each manipulator axis are specified in *Working range on page 26*.

Mechanical stops on the manipulator

Mechanical stops are and can be installed on the manipulator as limiting devices to ensure that the manipulator axis does not exceed the working range values set in the software parameters.

Note

The mechanical stops are only installed as safety precaution to physically stop the robot from exceeding the working range set. A collision with a mechanical stop always requires actions for repair and troubleshooting.

Axis	Fixed mechanical stop[i]	Movable mechanical stop[ii]
Axis 1	yes	yes The working range can be reduced by altering the parameter values. Installation of additional mechanical stops is recommended. The working range can be extended (option 3324-1) by altering the parameter values and removing the movable mechanical stop pin.
Axis 2	yes	no
Axis 3	yes	no
Axis 4	no	no
Axis 5	yes	no
Axis 6	no	no

i Part of the casting or fixed on the casting and can not /should not be removed.

ii Can be installed in one or more than one position, to ensure a reduced working range, or be removed to allow extended working range.

2.3.3.2 Installing movable mechanical stops on axis 1

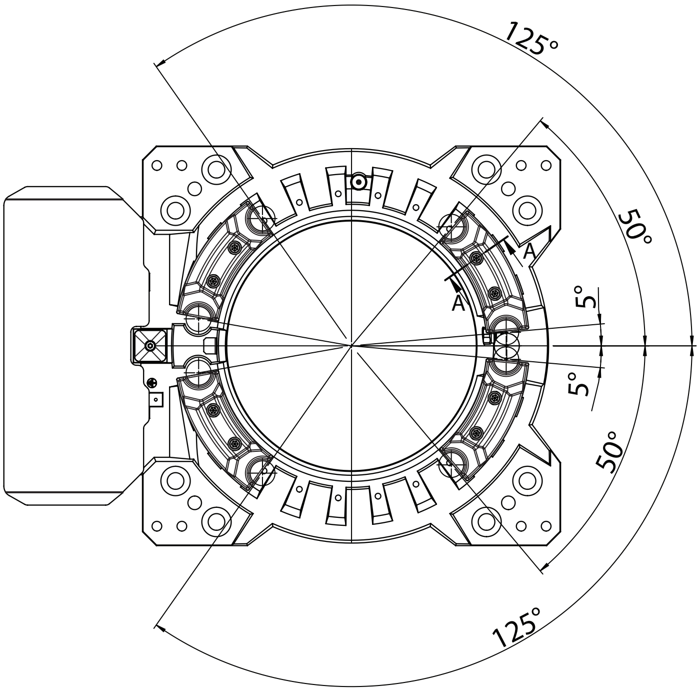
Reduction of the axis-1 working range

The working range of axis 1 is limited by system parameter configuration. To reduce the working range from default range, first adjust the parameter values and then install additional mechanical stops as a safety measure.

The movable mechanical stops reduce the working range according to the table.

Graduation of limited working range	Reduction of working range
15°	from ±5° and ±125° in both directions

Illustration, reduced working range



xx2100000973

WARNING

If the mechanical stop pin is deformed after a hard collision, it must be replaced!

Deformed movable stops and/or additional stops as well as deformed attachment screws must also be replaced after a hard collision.

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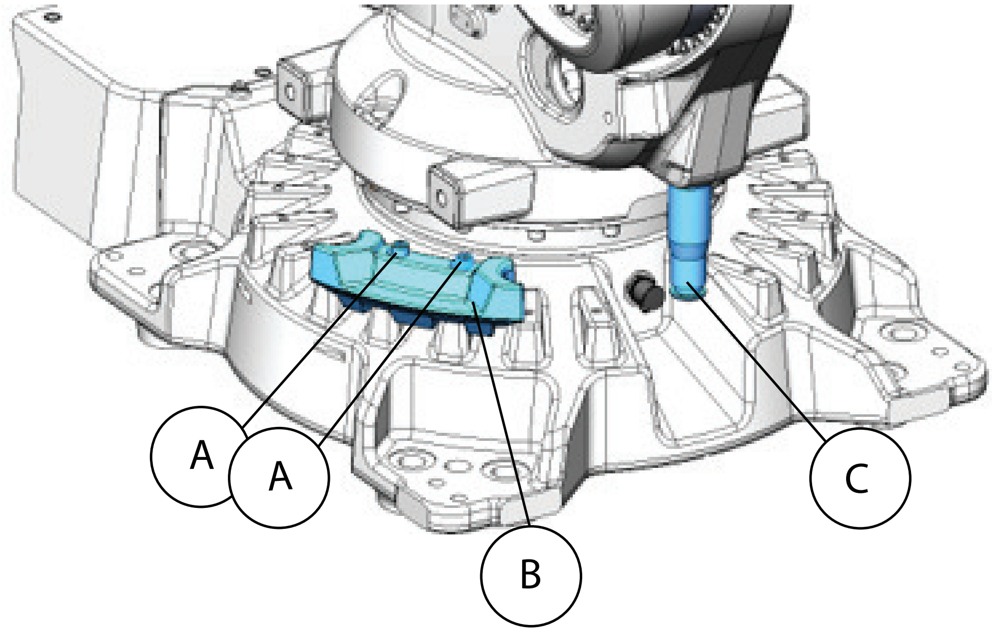
Location of the mechanical stops

The mechanical stops are located as shown in the figure.



xx2100002647

A[i]	Attachment screws M12x70 quality 12.9 and washers DIN 125 (2 pcs per additional mechanical stop); Tightening torque 60 Nm
B	Movable mechanical stop
C	Mechanical stop pin axis-1

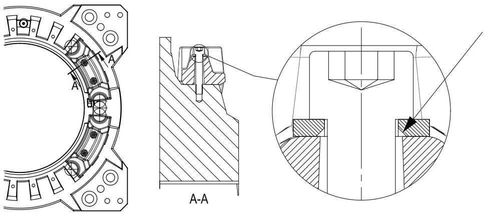
i Need to drill and make threaded M12 holes in base.

Installing the movable mechanical stops

Use this procedure to fit the additional mechanical stops.

	Action	Note
1	**DANGER** Turn off all: • electric power supply • hydraulic pressure supply • air pressure supply to the robot, before entering the safeguarded space.	
2	Use the additional mechanical stop as a template and drill fastening holes with dimension M12 at the base.	See *Location of the mechanical stops on page 53*.

Continues on next page

	Action	Note
3	Fit the additional mechanical stop according to the figure *Location of the mechanical stops on page 53*. **Note** Install the washer with the chamfer turned downwards.  xx2100000974	Tightening torque: 60 Nm.
4	Adjust the software working range limitations (system parameter configuration) to correspond to the mechanical limitations.	The system parameters that must be changed (*Upper joint bound* and *Lower joint bound*) are described in *Technical reference manual - System parameters*.
5	**DANGER** Make sure all safety requirements are met when performing the first test run.	

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.

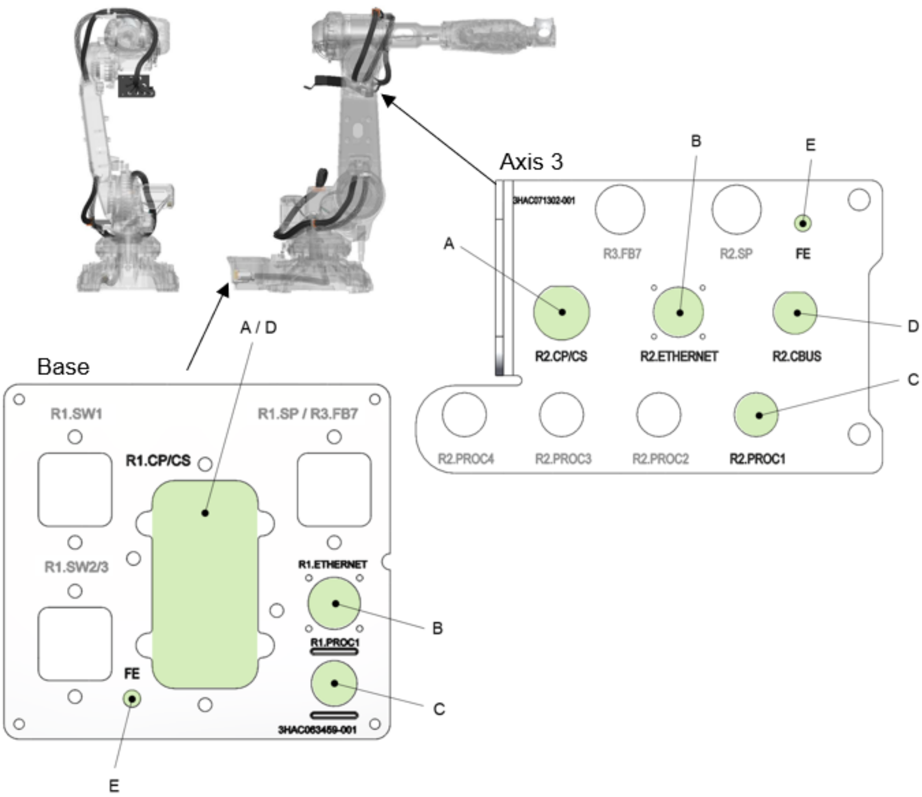
2.4 Customer connections - DressPack

General

The DressPack is built in sections with connection interfaces in between. The cables for customer connection are partly integrated in the robot and the connectors are placed at axis 6, axis 3 and at the base. Depending on what signals the customer orders there are three variants (Parallel, DeviceNet & EtherNet) available with corresponding connections at axis 6, axis 3 and at the base interface.

For further details see options *Application manipulator - DressPack on page 96* and *Connector kits on page 102*.

DressPack base - axis 3 - Material Handling

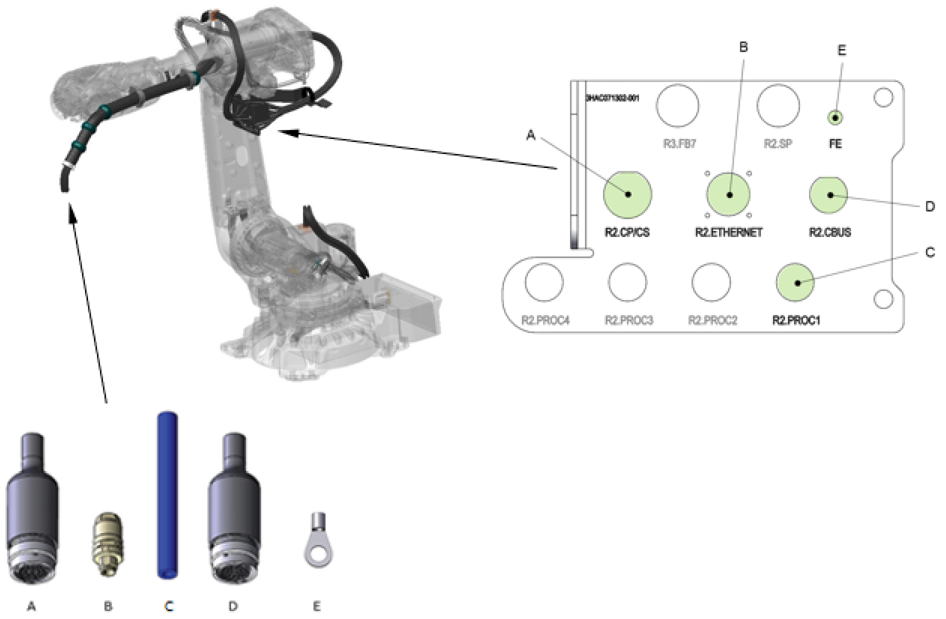


xx2100002612

Position	Description
A	Customer Power/ Customer Signals (CP/CS)
B	ETHERNET
C	PROC 1 (1/2" Hose)
D	CBUS
E	FE (Functional Earth)

Continues on next page

DressPack axis 3 - axis6 - MH3

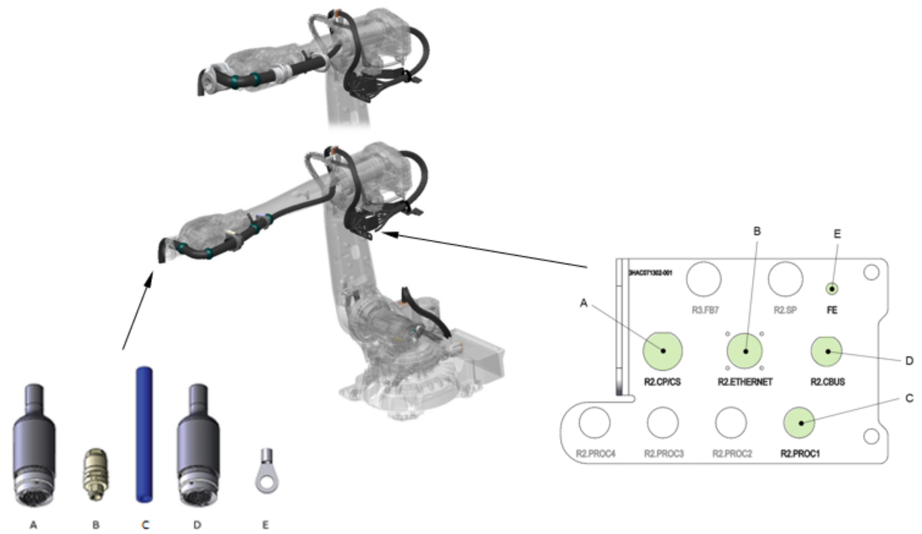


xx2100002613

Position	Description
A	Customer Power/ Customer Signals (CP/CS)
B	ETHERNET
C	PROC 1 (1/2" Hose)
D	CBUS
E	FE (Functional Earth)

Continues on next page

DressPack axis 3 - axis6 - LeanID MH



xx2100002614

Position	Description
A	Customer Power/ Customer Signals (CP/CS)
B	ETHERNET
C	PROC 1 (1/2" Hose)
D	CBUS
E	FE (Functional Earth)

2.5 Calibration and references

2.5.1 Calibration methods

Overview

This section specifies the different types of calibration and the calibration methods that are supplied by ABB.

The original calibration data delivered with the robot is generated when the robot is floor mounted. If the robot is not floor mounted, then the robot accuracy could be affected. The robot needs to be calibrated after it is mounted.

More information is available in the product manual.

Types of calibration

Type of calibration	Description	Calibration method
Standard calibration	The calibrated robot is positioned at calibration position. Standard calibration data is found on the SMB (serial measurement board) or EIB in the robot.	Axis Calibration
Absolute accuracy calibration (optional)	Based on standard calibration, and besides positioning the robot at synchronization position, the Absolute accuracy calibration also compensates for: • Mechanical tolerances in the robot structure • Deflection due to load Absolute accuracy calibration focuses on positioning accuracy in the Cartesian coordinate system for the robot. Absolute accuracy calibration data is found on the SMB (serial measurement board) in the robot. A robot calibrated with Absolute accuracy has the option information printed on its name plate. To regain 100% Absolute accuracy performance, the robot must be recalibrated for absolute accuracy after repair or maintenance that affects the mechanical structure.	CalibWare

Brief description of calibration methods

Axis Calibration method

Axis Calibration is a standard calibration method for calibration of IRB 5710. It is the recommended method in order to achieve proper performance.

The following routines are available for the Axis Calibration method:

- Fine calibration
- Update revolution counters
- Reference calibration

The calibration equipment for Axis Calibration is delivered as a toolkit.

Continues on next page

The actual instructions of how to perform the calibration procedure and what to do at each step is given on the FlexPendant. You will be guided through the calibration procedure, step by step.

CalibWare - Absolute Accuracy calibration

The CalibWare tool guides through the calibration process and calculates new compensation parameters. This is further detailed in the *Application manual - CalibWare Field*.

If a service operation is done to a robot with the option Absolute Accuracy, a new absolute accuracy calibration is required in order to establish full performance. For most cases after replacements that do not include taking apart the robot structure, standard calibration is sufficient.

The Absolute Accuracy option varies according to the robot mounting position. This is printed on the robot name plate for each robot. The robot must be in the correct mounting position when it is recalibrated for absolute accuracy.

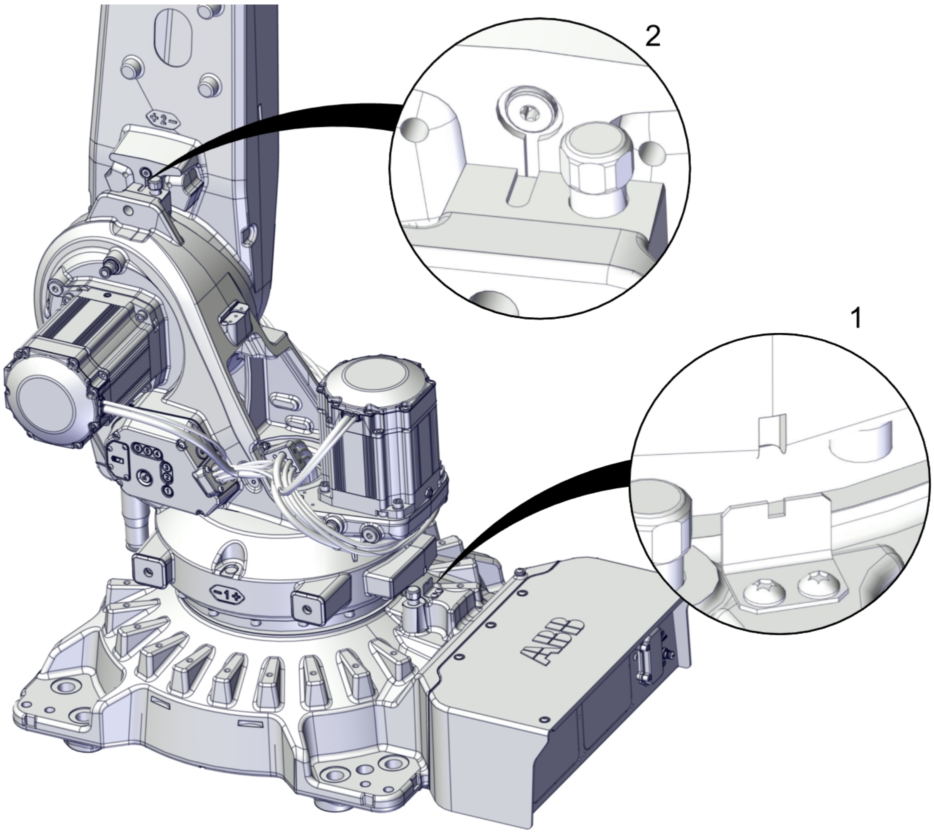
2.5.2 Synchronization marks and axis movement directions

2.5.2.1 Synchronization marks and synchronization position for axes

Introduction

This section shows the position of the synchronization marks and the synchronization position for each axis.

Synchronization marks, IRB 5710



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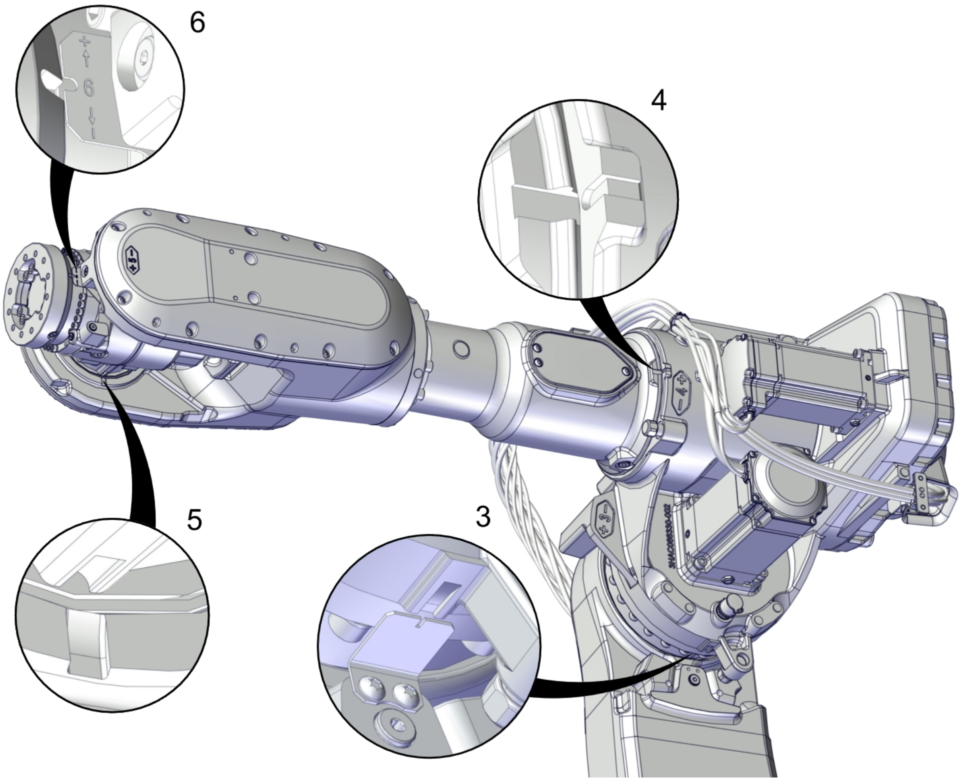


xx2100002318

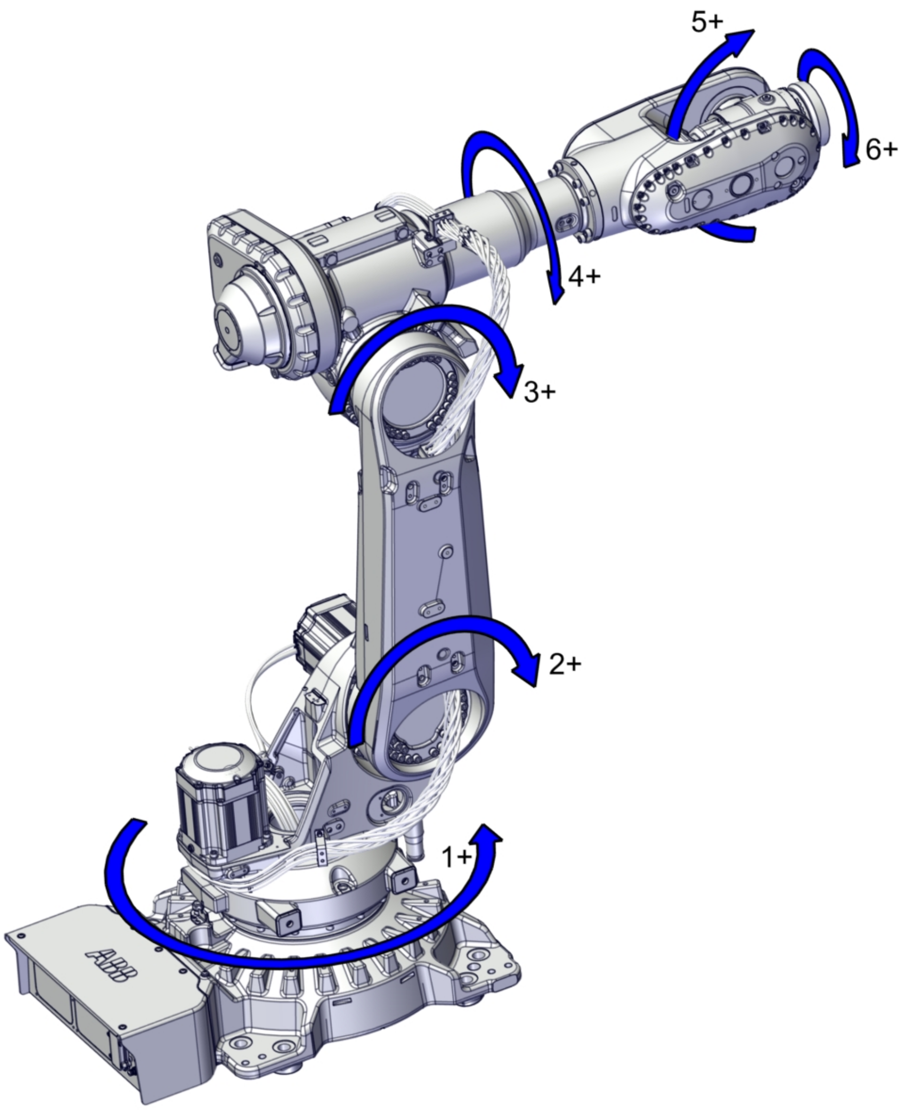
2.5.2.2 Calibration movement directions for all axes

Overview

When calibrating, the axis must consistently be run towards the calibration position in the same direction in order to avoid position errors caused by backlash in gears and so on. Positive directions are shown in the graphic below.

Calibration service routines will handle the calibration movements automatically and these might be different from the positive directions shown below.

Manual movement directions



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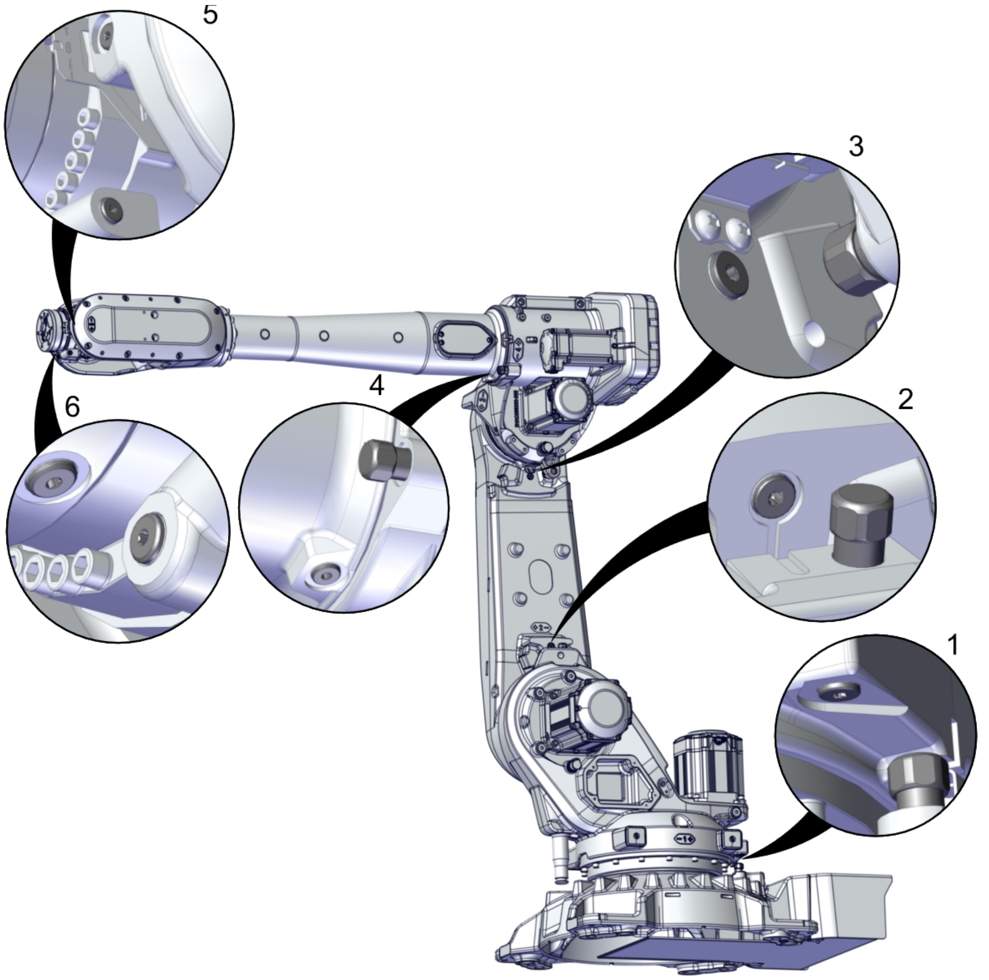
2.5.3 Fine calibration

General

The fine calibration is done with the Axis calibration method.



xx2100002320

2.5.4 Absolute Accuracy calibration

Purpose

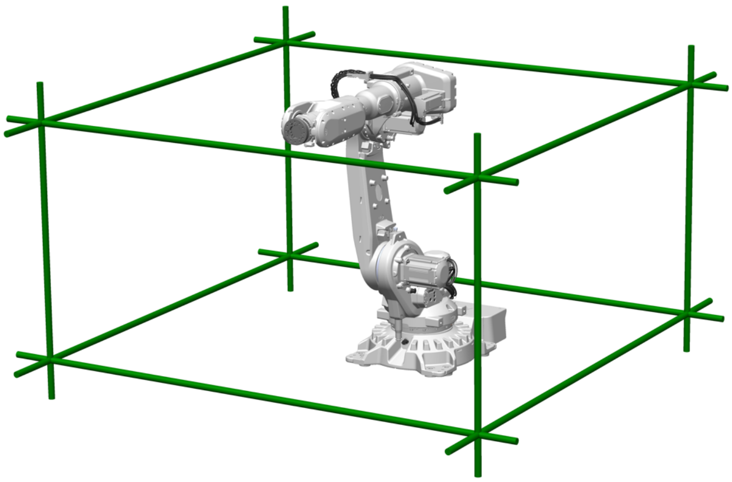
Absolute Accuracy is a calibration concept that improves TCP accuracy. The difference between an ideal robot and a real robot can be several millimeters, resulting from mechanical tolerances and deflection in the robot structure. *Absolute Accuracy* compensates for these differences.

Here are some examples of when this accuracy is important:

- Exchangeability of robots
- Offline programming with no or minimum touch-up
- Online programming with accurate movement and reorientation of tool
- Programming with accurate offset movement in relation to eg. vision system or offset programming
- Re-use of programs between applications

The option *Absolute Accuracy* is integrated in the controller algorithms and does not need external equipment or calculation.

> **Note**
>
> The performance data is applicable to the corresponding RobotWare version of the individual robot.



xx2100002472

What is included

Every *Absolute Accuracy* robot is delivered with:

- compensation parameters saved on the robot's serial measurement board
- a birth certificate representing the *Absolute Accuracy* measurement protocol for the calibration and verification sequence.

A robot with *Absolute Accuracy* calibration has a label with this information on the manipulator.

Continues on next page

Absolute Accuracy supports floor mounted installations. Compensation parameters saved in the robot's serial measurement board differ depending on which Absolute Accuracy option is selected.

RAPID instructions

There are no RAPID instructions included in this option.

2.5.5 Axis Calibration on axis 6

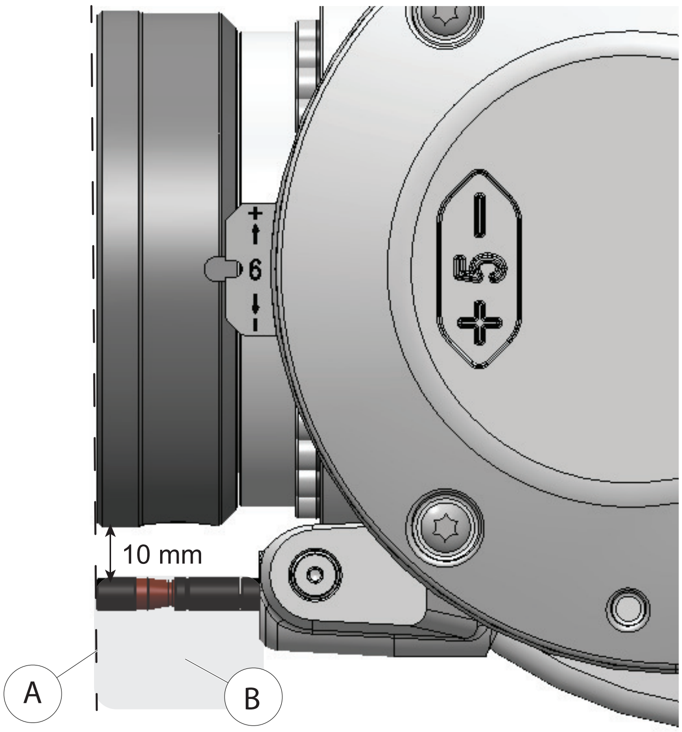
General

Consideration of the customer tool design is required in order to be able to perform calibrations, without disassemble the customer tool. The tool can enclose the outside of the turning disc if it is not thicker than 10 mm (radial distance) in the position where preparation is done.

Note

Space needed to mount the Calibration tool for IRB 5710-90/2.7.

Customer interface plane



xx2100001145

Position	Description
A	Customer inteface plane
B	Space needed to mount the Calibration tool

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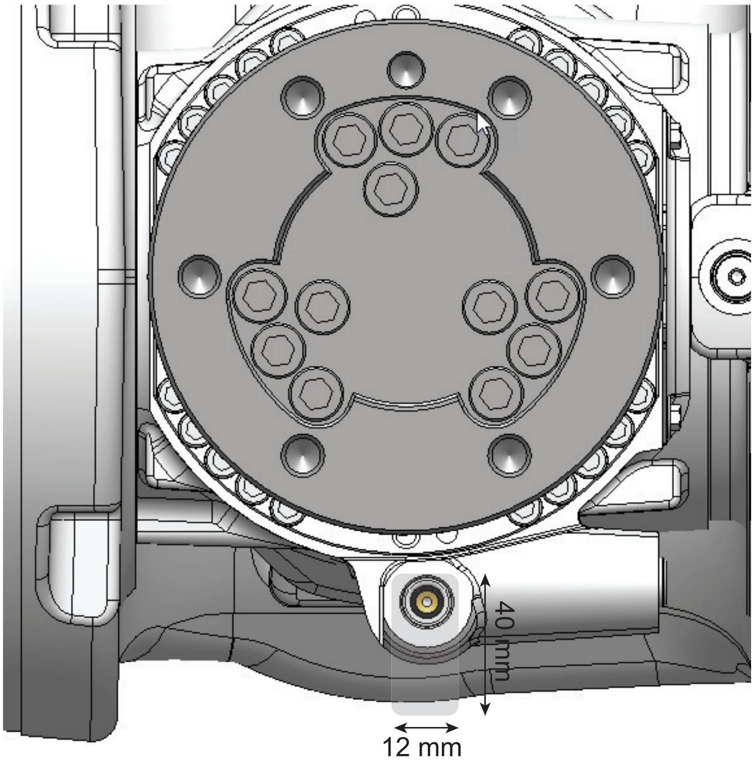

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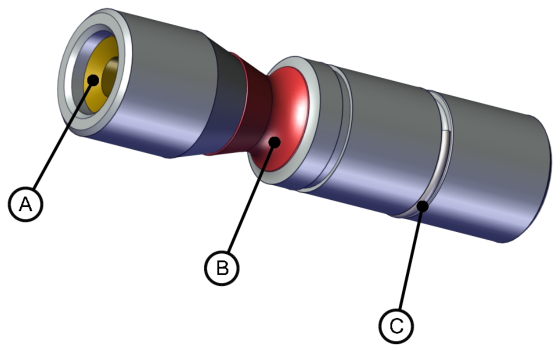
2.5.6 Calibration tools for Axis Calibration

Calibration tools

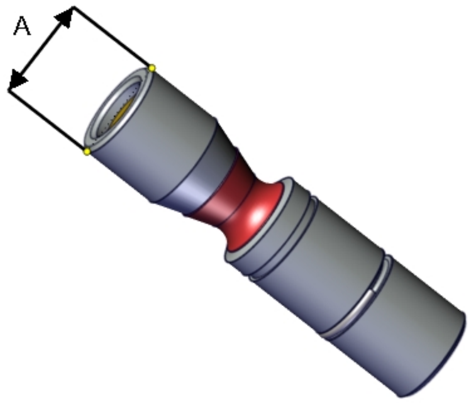
WARNING

If any part is missing or damaged, the tool must be replaced immediately.



xx1500001914

A	Tube insert
B	Plastic protection
C	Steel spring ring



xx1500000951

A	Outer diameter

If including the calibration tool in a local periodic check system, the following measures should be checked.

- Outer diameter within Ø12g4 mm, Ø8g4 mm or Ø6g5 mm (depending on calibration tool size).
- Straightness within 0.005 mm.

2.6 Load diagrams

2.6.1 Introduction

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 and/or loads are outside load diagram is used the following parts can be damaged due to overload:

- motors
- gearboxes
- mechanical structure

WARNING

In the robot system the service routine LoadIdentify is available, which allows the user to make an automatic definition of the tool and load, to determine correct load parameters.

See *Operating manual - OmniCore*, for detailed information.

WARNING

Robots running with incorrect load data and/or with loads outside diagram, will not be covered by robot warranty.

General

The load diagrams include a nominal payload inertia, J_0 of 10 kgm^2 for IRB 5710-110/2.3 and IRB 5710-90/2.3 LID, 3 kgm^2 for IRB 5710-90/2.7 and IRB 5710-70/2.7 LID, and an extra load of 20 kg or complete dressing for the LeanID versions.

At different moment of inertia the load diagram will be changed. For robots that are allowed floor, tilted or inverted mounted, the load diagrams as given are valid and thus it is also possible to use RobotLoad within those tilt and axis limits.

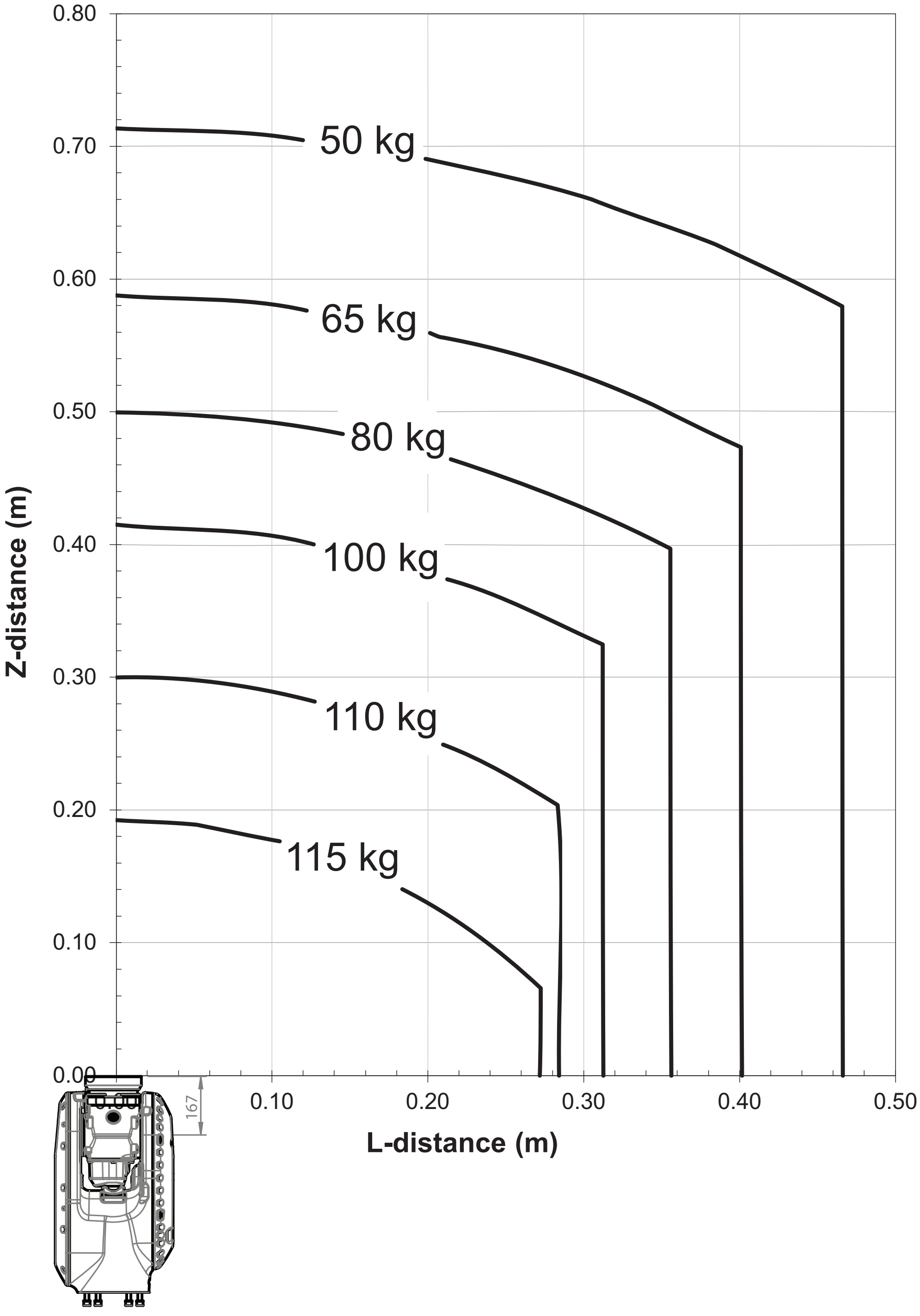
Control of load case by "RobotLoad"

To verify a specific load case, use the RobotStudio add-in RobotLoad.

The result from RobotLoad is only valid within the maximum loads and tilt angles. There is no warning if the maximum permitted arm load is exceeded. For over-load cases and special applications, contact ABB for further analysis.

2.6.2 Diagrams

Diagrams of IRB 5710-110/2.3



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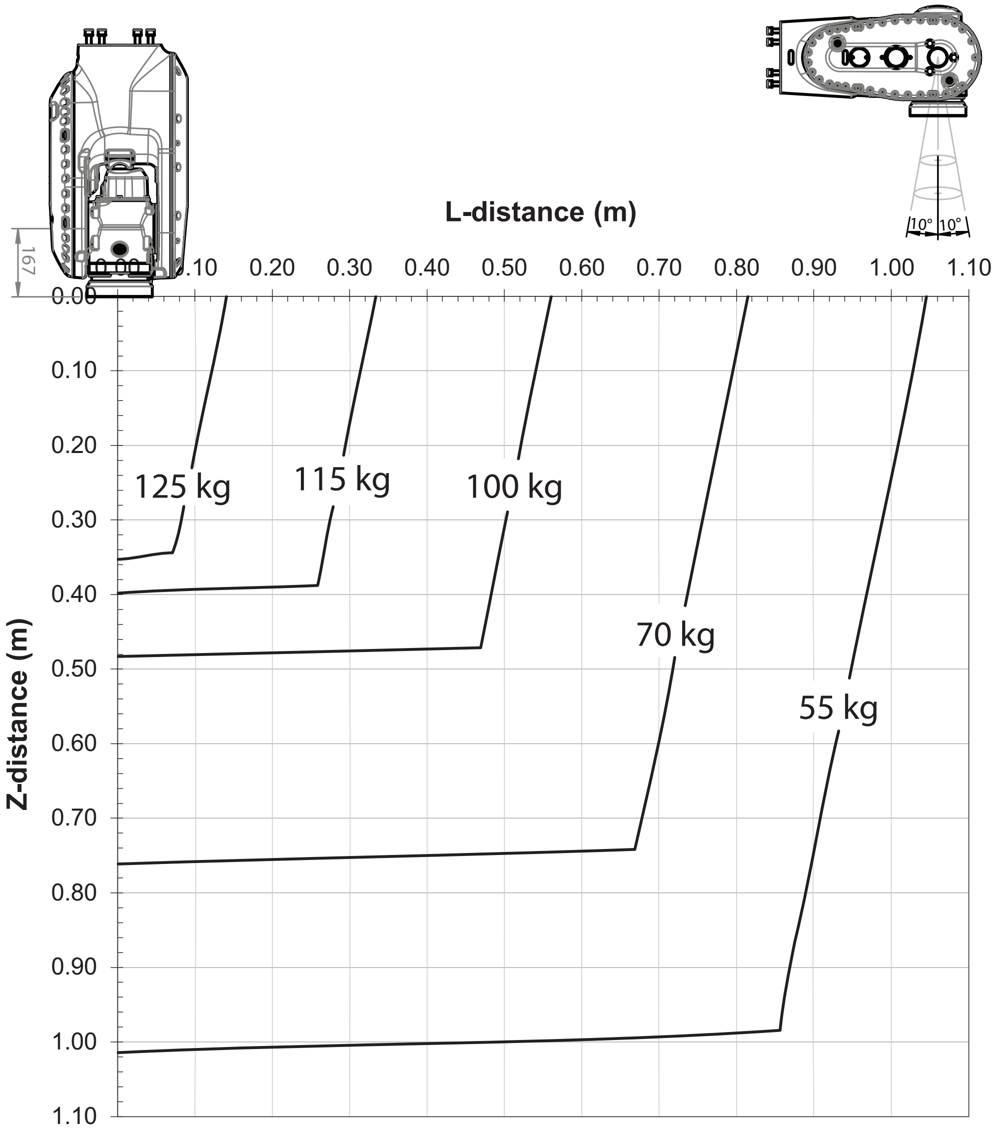
Diagrams of IRB 5710-110/2.3"Vertical Wrist" (±10°)



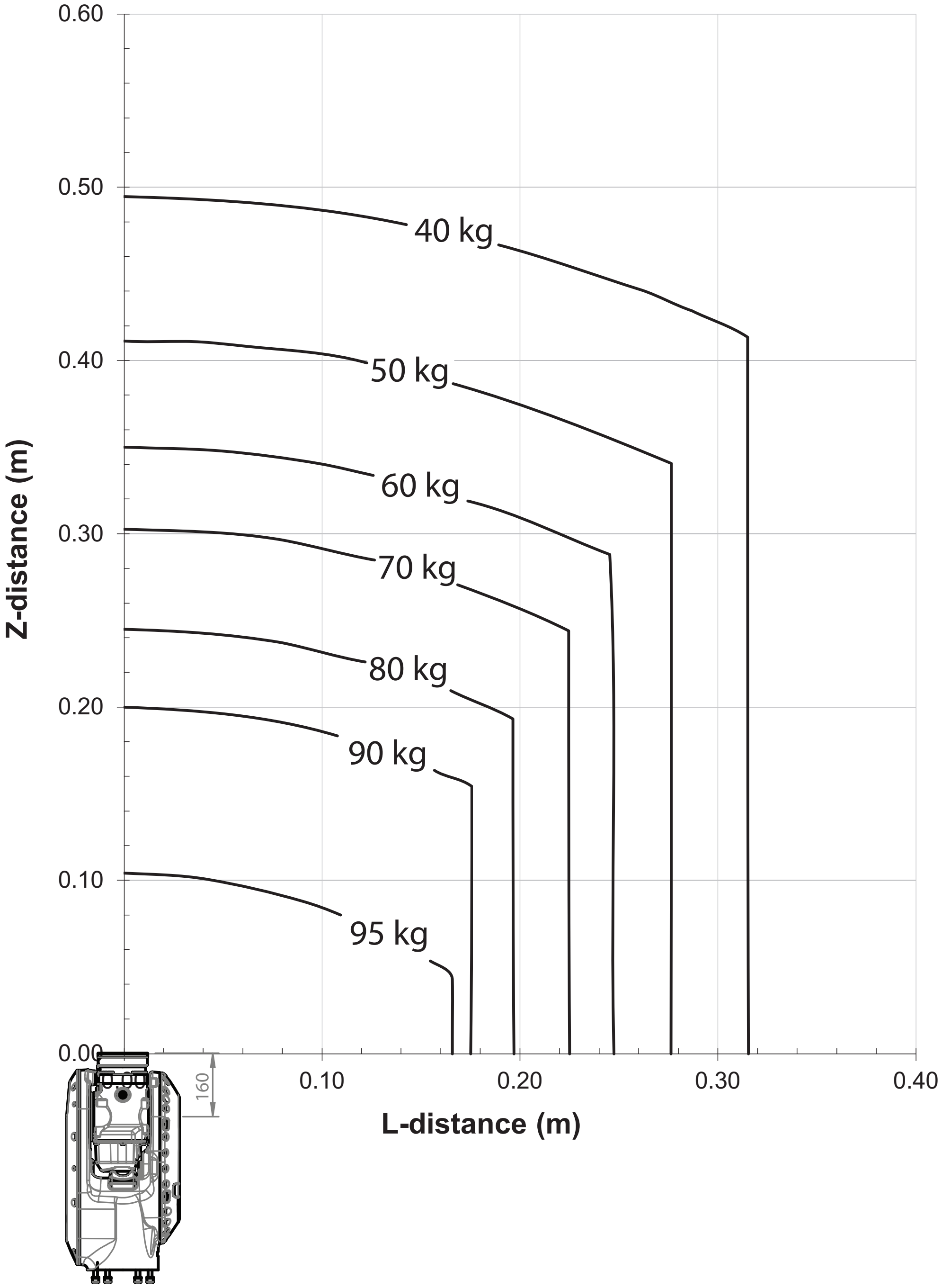
xx2100001497

For wrist down (0° deviation from the vertical line).

	Description
Max load	145 kg
Z_{max}	0.281 m
L_{max}	0.053 m

Continues on next page

Diagrams of IRB 5710-90/2.7



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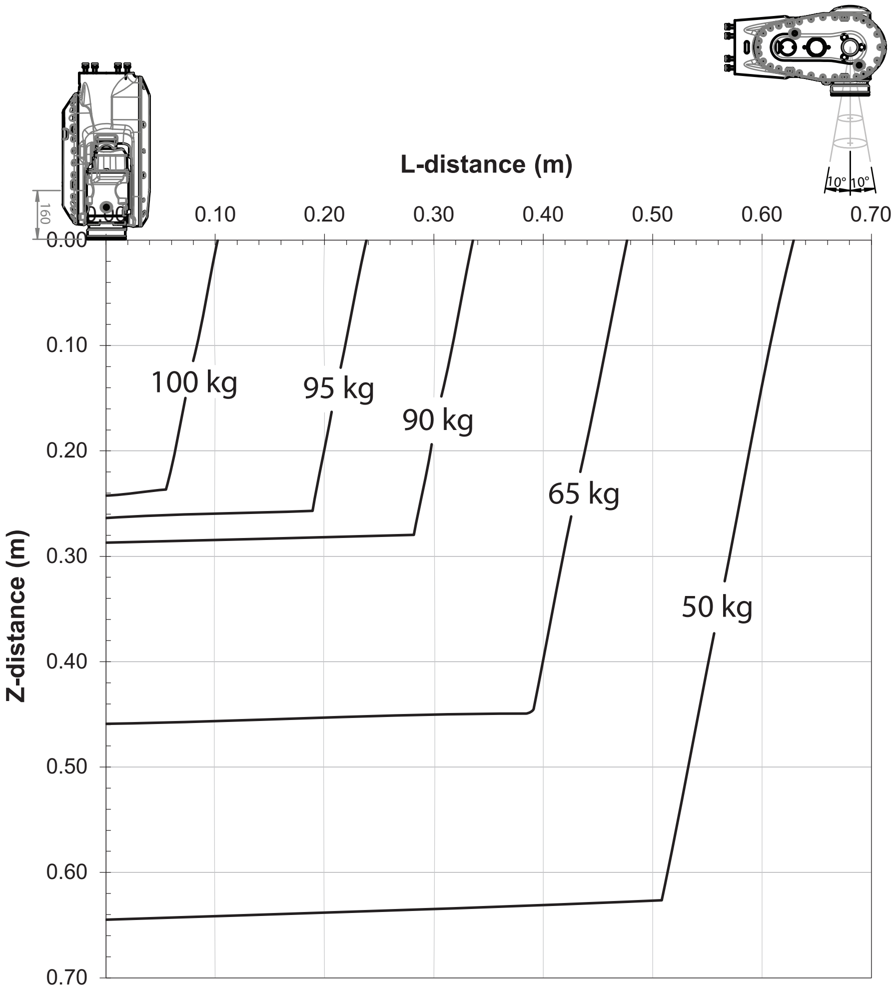
Diagrams of IRB 5710-90/2.7"Vertical Wrist" (±10°)



xx2100001501

For wrist down (0° deviation from the vertical line).

	Description
Max load	112 kg
Z_{max}	0.199 m
L_{max}	0.068 m

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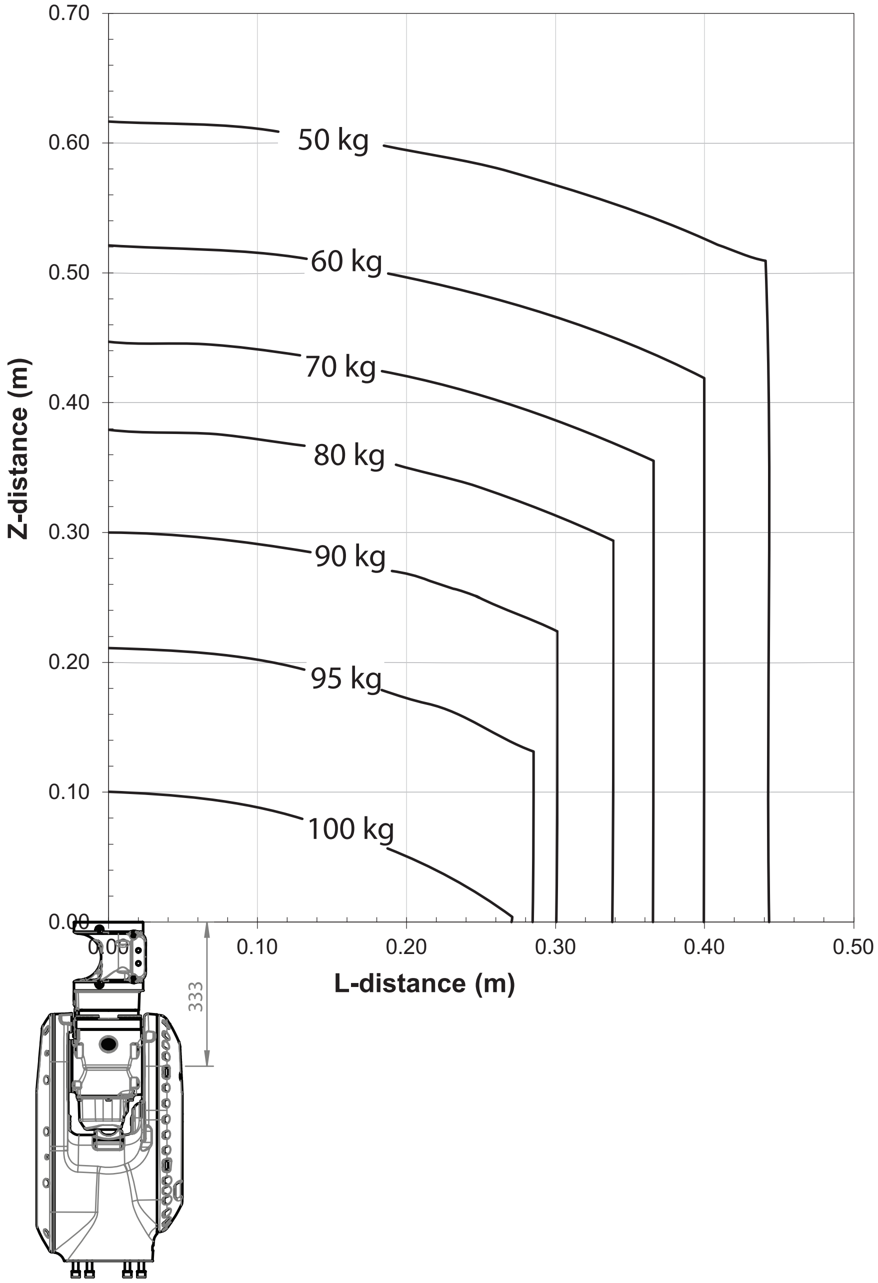
Diagrams of IRB 5710-90/2.3 LID (option [3326-x])



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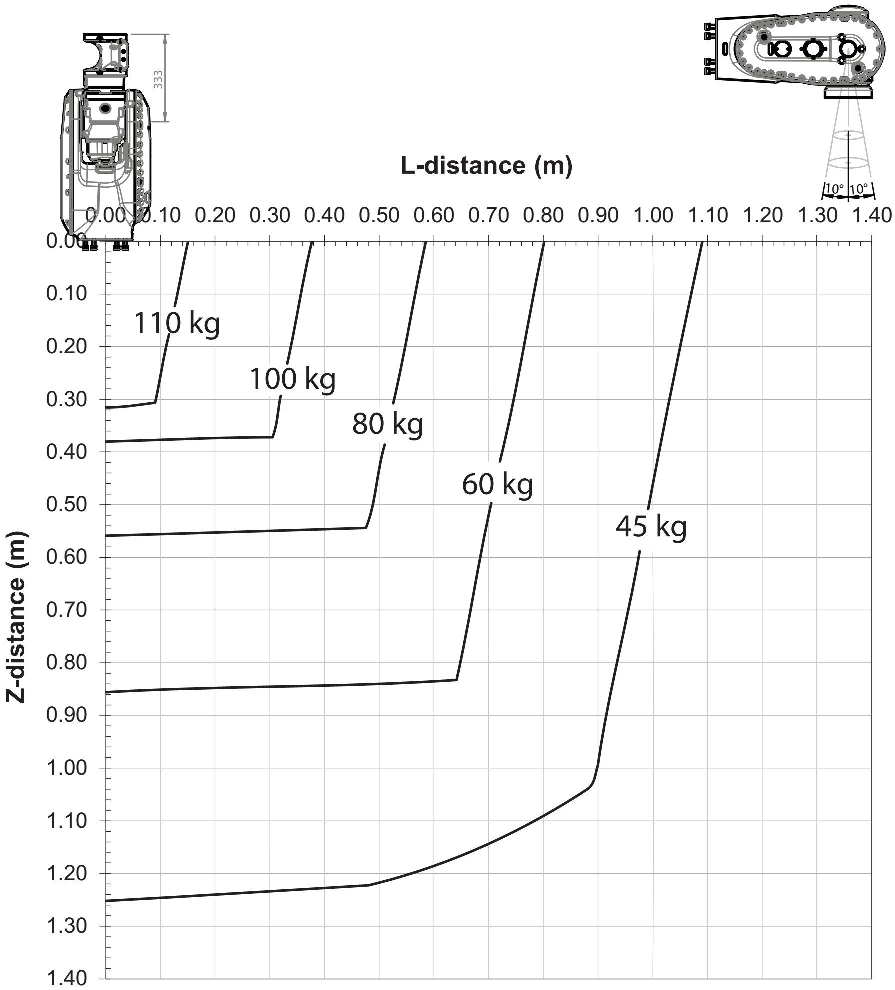
Diagrams of IRB 5710-90/2.3 LID (option [3326-x])"Vertical Wrist" (±10°)



xx2100001499

For wrist down (0° deviation from the vertical line).

	Description
Max load	118 kg
Z_{max}	0.271 m
L_{max}	0.054 m

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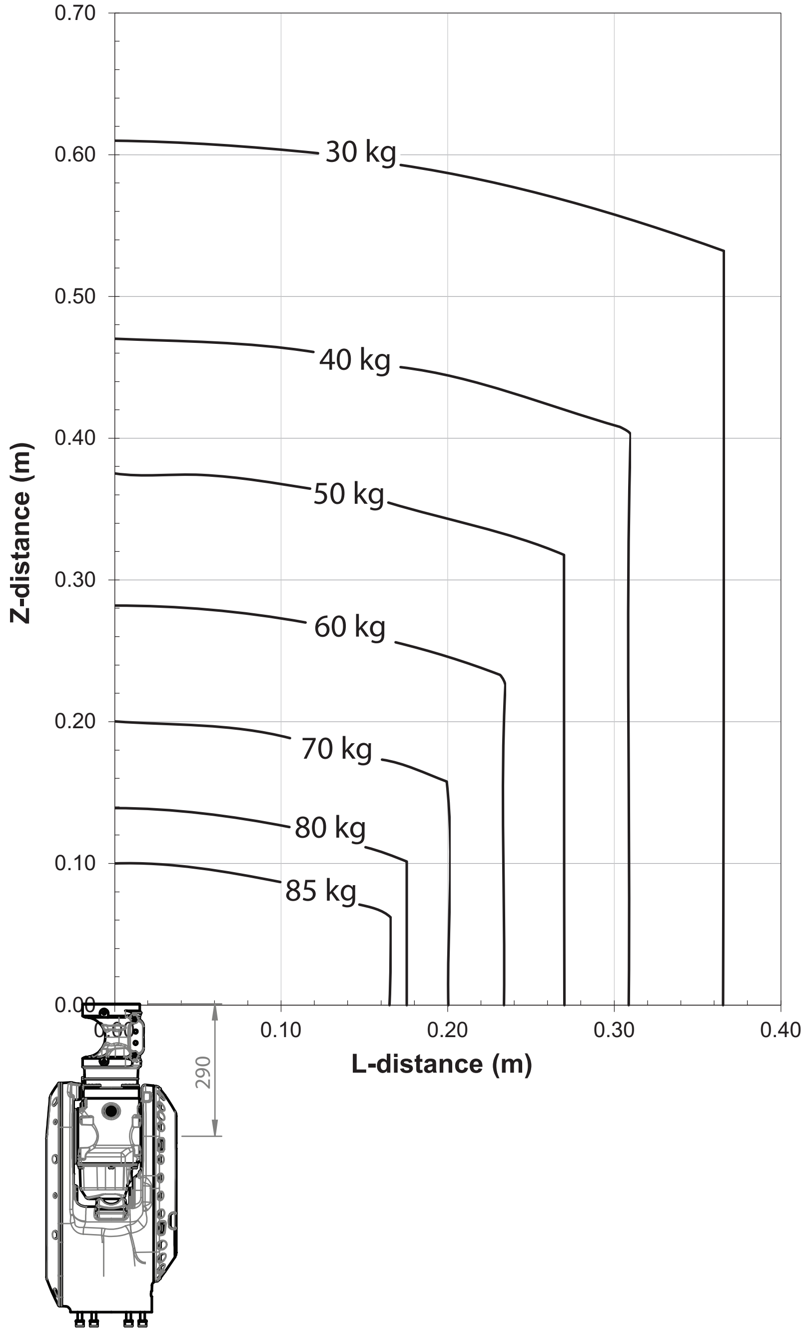
Diagrams of IRB 5710-70/2.7 LID (option [3326-x])



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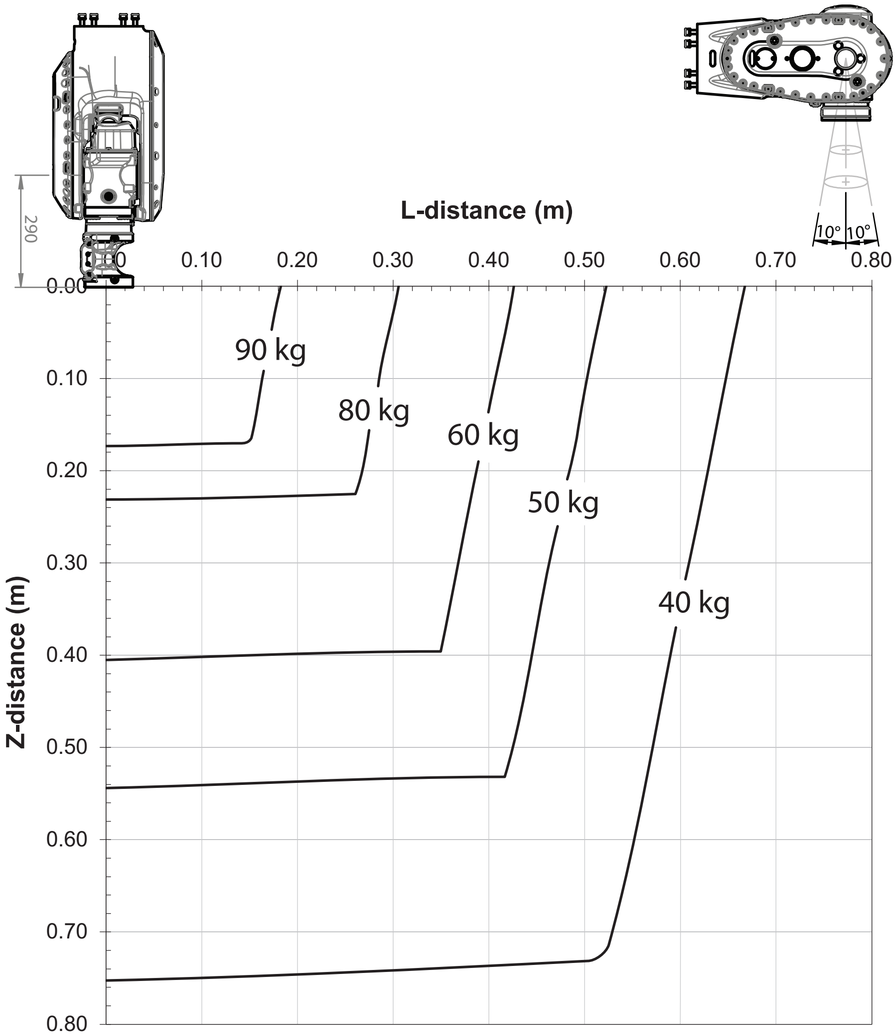
Diagrams of IRB 5710-70/2.7 LID (option [3326-x])"Vertical Wrist" (±10°)



xx2100001503

For wrist down (0° deviation from the vertical line).

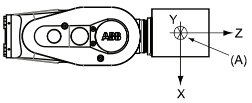
	Description
Max load	97 kg
Z_{max}	0.14 m
L_{max}	0.038 m

2.6.3 Maximum load and moment of inertia for full and limited axis 5 (center line down) movement

> **Note**
>
> Total load given as: mass in kg, center of gravity (Z and L) in meters and moment of inertia (J_{ox}, J_{oy}, J_{oz}) in kgm^2. L= sqr ($X^2 + Y^2$), see the following figure.

Full movement of axis 5 (±130°)

5	IRB 5710-110/2.3	Ja_5 = Load x $(Z + 0.167)^2$ + max (J_{0x}, J_{0y}) ≤ 120 kgm^2
	IRB 5710-90/2.7	Ja_5 = Load x $(Z + 0.16)^2$ + max (J_{0x}, J_{0y}) ≤ 50 kgm^2
	IRB 5710-90/2.3 LID	Ja_5 = Load x $(Z + 0.333)^2$ + max (J_{0x}, J_{0y}) ≤ 120 kgm^2
	IRB 5710-70/2.7 LID	Ja_5 = Load x $(Z + 0.29)^2$ + max (J_{0x}, J_{0y}) ≤ 50 kgm^2
6	IRB 5710-110/2.3	Ja_6 = Load x L^2 + J_{0Z} ≤ 90 kgm^2
	IRB 5710-90/2.7	Ja_6 = Load x L^2 + J_{0Z} ≤ 35 kgm^2
	IRB 5710-90/2.3 LID	Ja_6 = Load x L^2 + J_{0Z} ≤ 90 kgm^2
	IRB 5710-70/2.7 LID	Ja_6 = Load x L^2 + J_{0Z} ≤ 35 kgm^2



xx1400002028

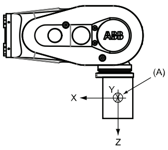
Pos	Description
A	Center of gravity

	Description
J_{ox}, J_{oy}, J_{oz}	Max. moment of inertia around the X, Y and Z axes at center of gravity.

Continues on next page

Limited axis 5, center line down

5	IRB 5710-110/2.3	Ja_5 = Load x $(Z + 0.167)^2$ + max $(J_{0x}, J_{0y}) \leq 130$ kgm^2
	IRB 5710-90/2.7	Ja_5 = Load x $(Z + 0.16)^2$ + max $(J_{0x}, J_{0y}) \leq 55$ kgm^2
	IRB 5710-90/2.3 LID	Ja_5 = Load x $(Z + 0.333)^2$ + max $(J_{0x}, J_{0y}) \leq 130$ kgm^2
	IRB 5710-70/2.7 LID	Ja_5 = Load x $(Z + 0.29)^2$ + max $(J_{0x}, J_{0y}) \leq 55$ kgm^2
6	IRB 5710-110/2.3	Ja_6 = Load x $L^2 + J_{0Z} \leq 115$ kgm^2
	IRB 5710-90/2.7	Ja_6 = Load x $L^2 + J_{0Z} \leq 45$ kgm^2
	IRB 5710-90/2.3 LID	Ja_6 = Load x $L^2 + J_{0Z} \leq 115$ kgm^2
	IRB 5710-70/2.7 LID	Ja_6 = Load x $L^2 + J_{0Z} \leq 45$ kgm^2



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Pos	Description
A	Center of gravity

	Description
J_{ox}, J_{oy}, J_{oz}	Max. moment of inertia around the X, Y and Z axes at center of gravity.

2.6.4 Wrist torque

Note

The wrist torque values are for reference only, and should not be used for calculating permitted load offset (position of center of gravity) within the load diagram, since those also are limited by main axes torques as well as dynamic loads. Furthermore, arm loads will influence the permitted load diagram. To find the absolute limits of the load diagram, use the RobotStudio add-in RobotLoad.

Torque

The table below shows the maximum permissible torque due to payload.

Robot variant	Max wrist torque axis 4 and 5	Max wrist torque axis 6	Max torque valid at load
IRB 5710-110/2.3	571 Nm	307 Nm	100 kg
IRB 5710-90/2.7	318 Nm	155 Nm	70 kg
IRB 5710-90/2.3 LID	569 Nm	265 Nm	80 kg
IRB 5710-70/2.7 LID	340 Nm	138 Nm	55 kg

2.6.5 Maximum TCP acceleration

General

Higher values can be reached with lower loads than the nominal because of our dynamical motion control QuickMove2. For specific values in the unique customer cycle, or for robots not listed in the table below, we recommend then to use RobotStudio.

Maximum Cartesian design acceleration for nominal loads

Robot variant	E-stop Max acceleration at nominal load COG [m/s^2]	Controlled Motion Max acceleration at nominal load COG [m/s^2]
IRB 5710-110/2.3	53	36
IRB 5710-90/2.7	60	38
IRB 5710-90/2.3 LID	65	37
IRB 5710-70/2.7 LID	65	38

Note

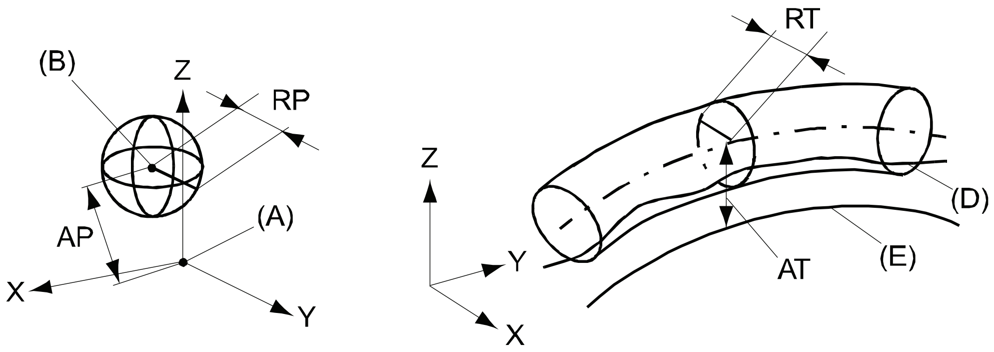
Acceleration levels for emergency stop and controlled motion includes acceleration due to gravitational forces. Nominal load is defined with nominal mass and cog with max offset in Z and L (see the load diagram).

2.7 Performance according to ISO 9283

General

At rated maximum load, maximum offset and 1.6 m/s velocity on the inclined ISO test plane, with all six axes in motion. 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.



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Pos	Description	Pos	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 5710	IRB 5710-110/2.3	IRB 5710-90/2.7
Pose accuracy, AP[i] (mm)	0.04	0.04
Pose repeatability, RP (mm)	0.04	0.05
Pose stabilization time, PSt (s) within 0.2 mm of the position	0.4	0.3
Path accuracy, AT (mm)	1.2	1.0
Path repeatability, RT (mm)	0.12	0.16

i AP according to the ISO test above, is the difference between the teached position (position manually modified in the cell) and the average position obtained during program execution.

2.8 Velocity

Maximum axis speed

Robot variant	Axis 1	Axis 2	Axis 3	Axis 4	Axis 5	Axis 6
IRB 5710-110/2.3	140°/s	125 °/s	140 °/s	250 °/s	200 °/s	250 °/s
IRB 5710-90/2.7	140 °/s	125 °/s	140 °/s	300 °/s	250 °/s	360 °/s
IRB 5710-90/2.3 LID	140 °/s	125 °/s	140 °/s	250 °/s	200 °/s	250 °/s
IRB 5710-70/2.7 LID	140 °/s	125 °/s	140 °/s	300 °/s	250 °/s	360 °/s

There is a supervision function to prevent overheating in applications with intensive and frequent movements (high duty cycle).

2.9 Robot stopping distances and times

Introduction

The stopping distances and times for category 0 and category 1 stops, as required by EN ISO 10218-1 Annex B, are listed in *Product specification - Robot stopping distances according to ISO 10218-1* (*3HAC048645-001*).

3 Specification of variants and options

3.1 Introduction to variants and options

General

The different variants and options for the IRB 5710 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.

3.2 Manipulator

Variants

Option	IRB Type	Handling capacity (kg)	Reach (m)	Remark
3300-122	5710	110	2.3	
3300-123	5710	90	2.7	
3300-124	5710	90	2.3	LeanID
3300-125	5710	70	2.7	LeanID

Requirements

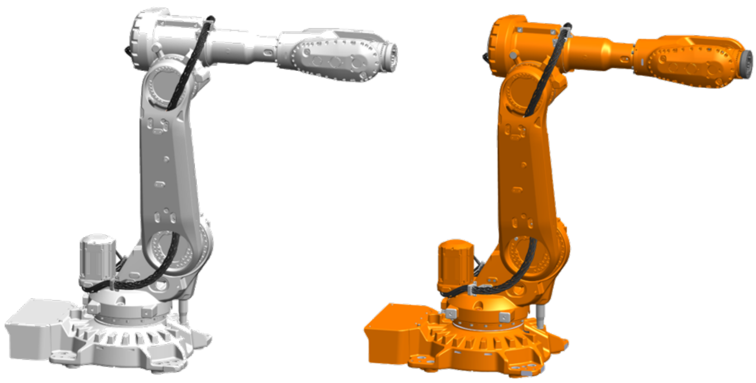
The option 3300-124 and 3300-125 requires option DressPack axis 3-6 [3326-x].

Manipulator color

Option	Description	Note
209-1	ABB Orange standard	
209-202	ABB Graphite White standard	Standard color
209		RAL code should be specified

General

The manipulator could be offered with different colours. The manipulator painted with ABB Graphite White is the standard.



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Note

Notice that delivery time for painted spare parts will increase for none standard colors.

Continues on next page

Manipulator protection

Option	Description	Note
3350-670	Base 67	IP67
3352-10	Foundry Plus2 67	IP67

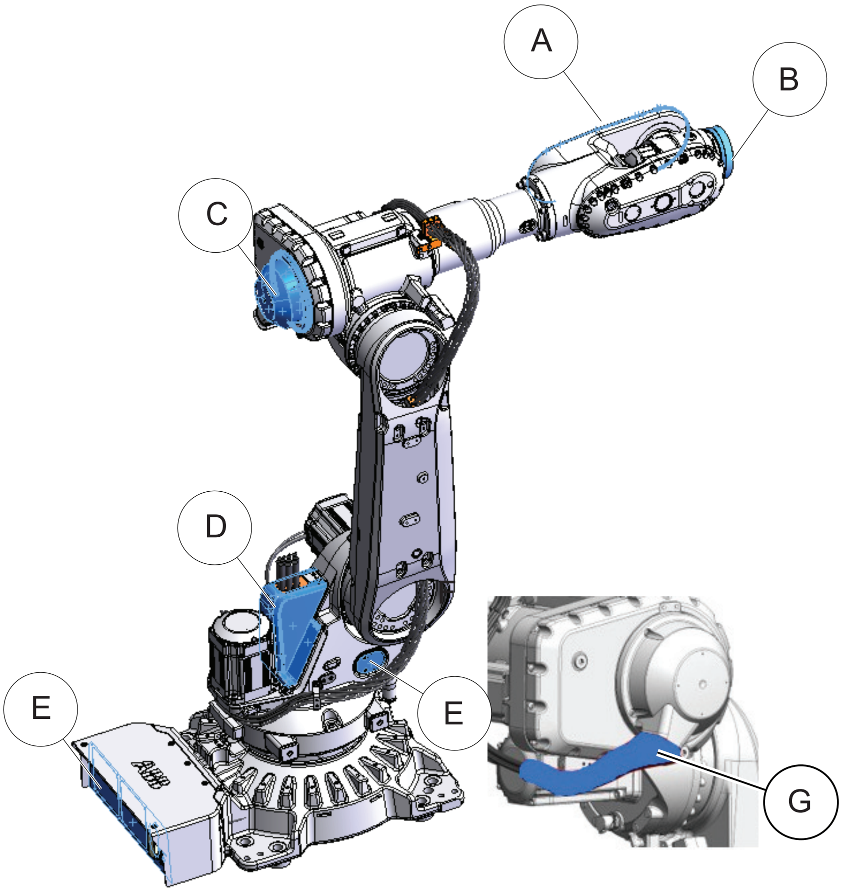
General

The manipulator could be offered with different protection level. The basic design (option Base 67) is well prepared for normal or tough environment. This includes electrical design following the IP67 standard and stainless steel screw used for all add-on parts after painting.

For the extra tough environment like Foundry industries the option Foundry Plus2 67 is recommended. This has on top of the basic robot also added extra protection of cables, extra sealings, protection plugs in customers or unused holes, added rust preventive and special paint / surface treatment.

Continues on next page

The below picture shows additional parts when choosing Foundry Plus2 67.



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Pos	Description
A	Rubber gasket
B	Turning disc with Nickel-phosphorus coating
C	Upgraded protective cover (polymer)
D	Protective cover (polymer)
E	Sheet metal in stainless steel
F	Cover (polymer)
G	Cable protection

Requirements

The option *Foundry Plus2* requires option *Upper arm cover* [3316-1].

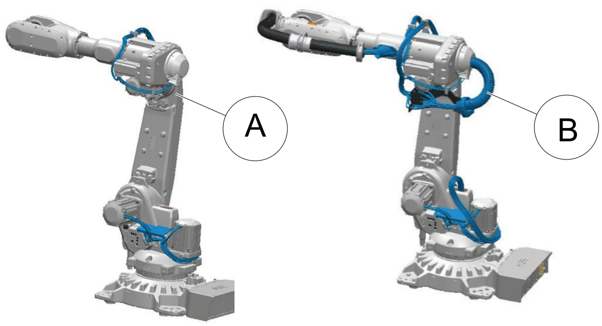
Continues on next page

Foundry cable guard

Option	Description
3315-1	Foundry cable guard

General

The manipulator could be equipped with additional cable guards for extra tough environmental conditions with as example metals spits, frequent weld spatter. These additional cover will prolong cable lifetime and simplify service/maintenance as the robot are kept more clean under the covers.



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Pos	Description
A	Foundry cable guard without DressPack
B	Foundry cable guard with DressPack

Continues on next page

Upper arm cover

Option	Description
3316-1	Upper arm cover

General

The manipulator could be equipped with additional upper arm covers for environmental conditions where you want to further seal of the upper arm in wet or dirty conditions. These additional cover will prolong cable lifetime and simplify service / maintenance as the robot are kept more clean under the covers.

xx2100002592

Limitations

This option is not possible to order with *DressPack axis 3-6 options* [3326-x].

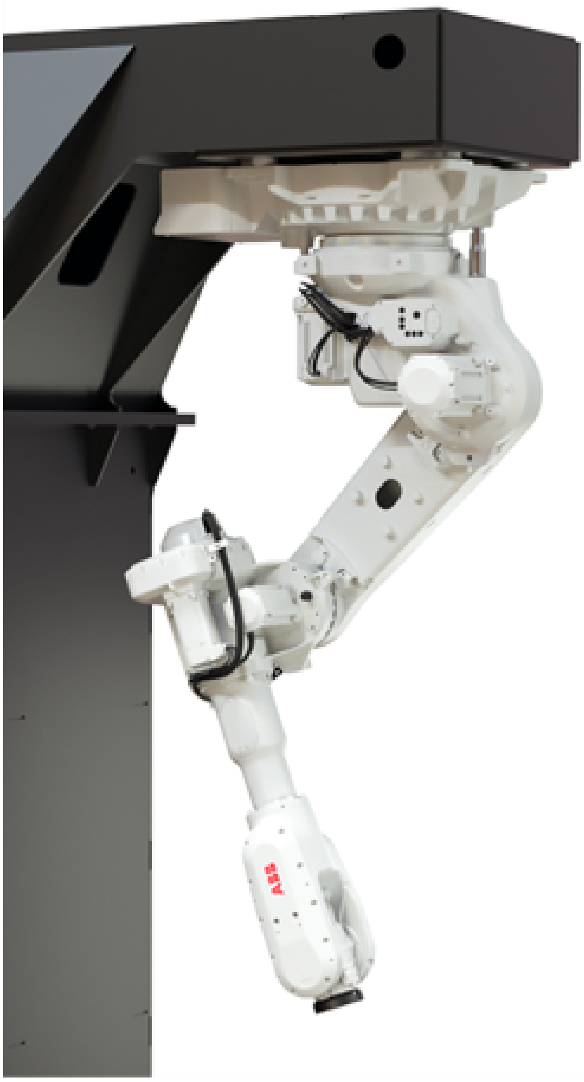
Continues on next page

Mounting position

Option	Description
3317-1	Inverted

General

The manipulator could be placed inverted to add more flexibility in layout design. The option is prepared for inverted assembly from factory.



xx2100002593

Limitations

This option is not possible to order with *AbsAcc Floor mounted* [3101-1].

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Fork lift device

Option	Description
3318-1	Fork lift on base
3318-2	Fork lift on frame

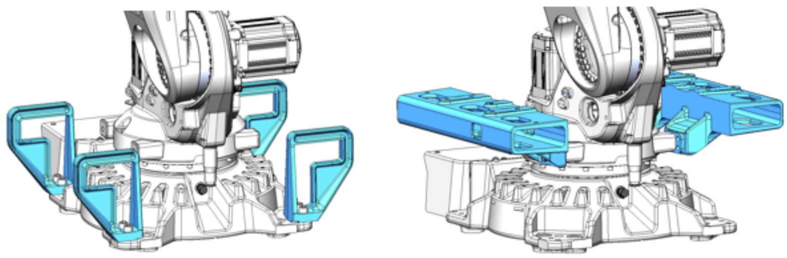
General

The manipulator could be delivered with Fork lift devices. When the manipulator has to be moved, these devices allow a fork lift to be used.

There are two different alternatives.

Fork lift pockets placed on the base (option 3318-1, Fork lift on base) which allows low lifting point.

Fork lift pockets placed on the frame (option 3318-2, Fork lift on frame) which allows a more balanced lifting point. This could be used together with special tool to invert a robot.



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Limitations

The option *Fork lift on base* [3318-1] is not possible to order with *Inverted* [3317-1].

Continues on next page

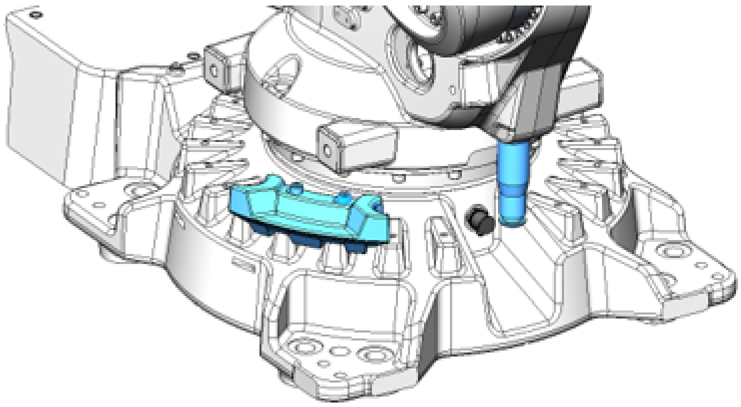
Limited working range

Option	Description
3323-1	Axis 1 adjustable 15°

General

The manipulator could be equipped with adjustable mechanical stops to mechanically limit the working range of axis 1.

For detailed information see *Reduction of the axis-1 working range on page 52*.



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Extended working range

Option	Description
3324-1	The option extends the working range on axis 1 from ±170° to ±220°. Requires options SafeMove or EPS (Electronic Position Switches).

CAUTION

The option *Extended work range* enables an extension of the working range for axis 1, through a software configuration. With this option installed, the working range can exceed the range limited by the mechanical stop on axis 1. The working range shall be limited through the option SafeMove.

A risk analysis must be done to ensure that no risks remain when using option *Extended work range*, to limit the working range, and before removing the mechanical stops.

For information about the option SafeMove, see *Application manual - Functional safety and SafeMove*.

If the mechanical stop is removed, then the manipulator should have a marking for this, for example, a label. If the robot is delivered with the option *Extended work range*, then such a label is included on delivery.

Limitations

This option is not possible to order with *Inverted* [3317-1].

Continues on next page

Requirements

This option requires option *SafeMove* [3043-x] or EPS (Electronic Position Switches).

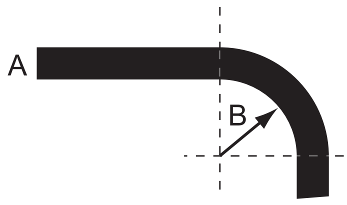
3.3 Floor cables

Manipulator cable - Length

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

Bending radius for static floor cables

The minimum bending radius is 10 times the cable diameter for static floor cables.



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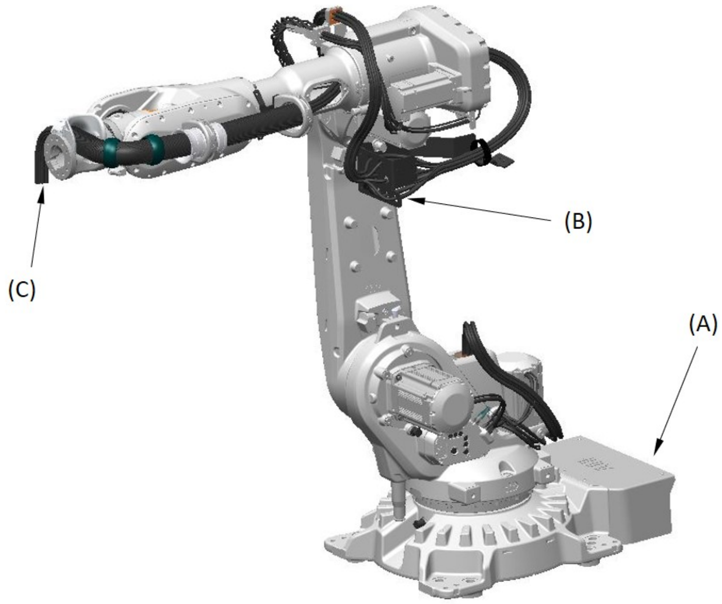
A	Diameter
B	Diameter x10

3.4 Application manipulator - DressPack

General

Below is an overview showing the different DressPack connection points. For detailed information see the circuit diagram, *Product manual - DressPack IRB 5710*.



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Pos	Location
A	Base
B	Axis 3
C	Axis 6

Manipulator DressPack MH

Base to Axis 3	Axis 3 to Axis 6
3325-11; 3325-12	3326-11; 3326-12 (MH3)
	3326-31; 3326-32 (LeanID - MH)

Base to Axis 3	Axis 3 to Axis 6
3325-13 + include 3325-11	3326-13 + include 3325-11 (MH3)
	3326-33 + 3326-31 (LeanID - MH)

DressPack base-axis 3

Option	Description	Note
3325-11	MH Parallel	Lower arm MH
3325-12	MH DeviceNet	Includes parallel signals, lower arm MH
3325-13	MH EtherNet	Includes parallel signals. Supports ProfiNet, EthernetIP, lower arm MH

Continues on next page

Base

Material handling (option 3325-11), see figure below:

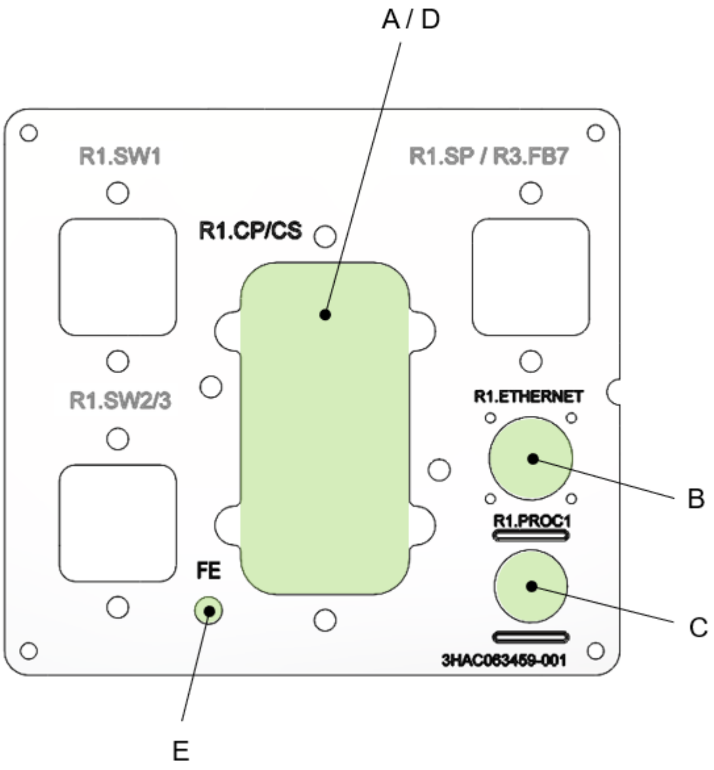
- Included are: A & C (Proc 1).

Material handling (option 3325-12), see figure below:

- Included are: A, C & D.

Material handling (option 3325-13), see figure below:

- Included are: A, B, C & E.



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Position	Description
A	CP/CS
B	ETHERNET (M12 connector, when EtherNet communication is selected)
C	PROC 1 (1/2 Hose)
D	CBUS (UTOW connector when DeviceNet communication is selected)
E	FE (Functional Earth, when EtherNet communication is selected)

For corresponding parts of the tool, see *Connector kits on page 102*.

Continues on next page

Axis 3

Material handling (option 3325-11), see figure below:

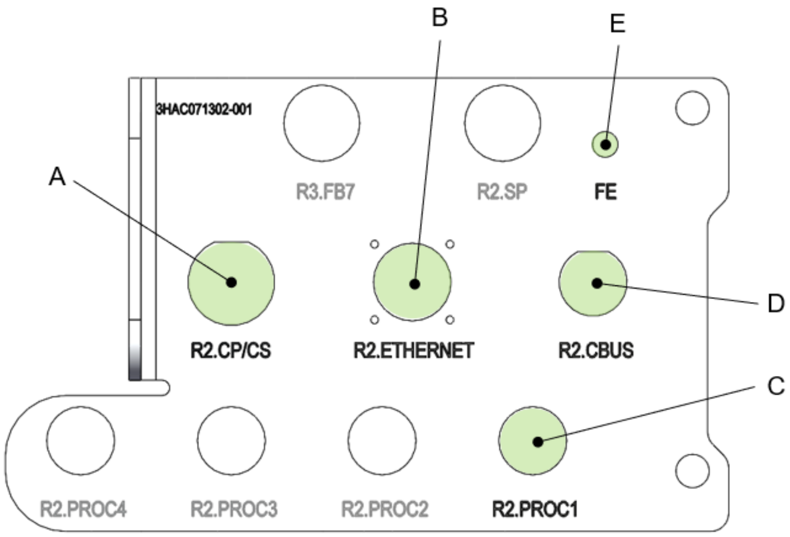
- Included are: A & C (Proc 1).

Material handling (option 3325-12), see figure below:

- Included are: A, C & D.

Material handling (option 3325-13), see figure below:

- Included are: A, B, C & E.



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Position	Description
A	Customer Power/ Customer Signals (CP/CS)
B	ETHERNET
C	PROC 1 (1/2" Hose)
D	CBUS
E	FE (Functional Earth)

For corresponding parts of the tool, see *Connector kits on page 102*.

Continues on next page

DressPack axis 3-6

Option	Description	Note
3326-11	MH3 Parallel	Upper arm MH3
3326-12	MH3 DeviceNet	Includes parallel signals, upper arm MH3
3326-13	MH3 EtherNet	Includes parallel signals, Supports ProfiNet, EtherNetIP, upper arm MH3
3326-31	MH LID Parallel	LeanID MH
3326-32	MH LID DeviceNet	Includes parallel signals, LeanID MH
3326-33	MH LID EtherNet	Includes parallel signals, Supports ProfiNet, EtherNetIP, LeanID MH

Limitations

The option *DressPack axis 3-6* [3326-x] is not possible to select with option *Upper arm cover* [3316-1].

Axis 6

MH3

Hose and cable free length, min. 1000 mm.

Material handling (option 3326-11), see figure below:

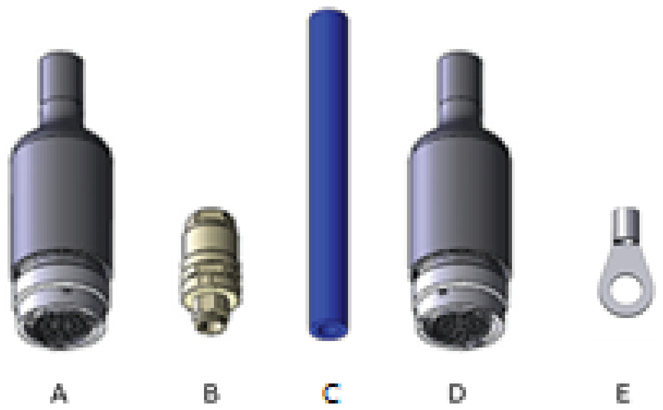
- Included are: A & C (Proc 1).

Material handling (option 3326-12), see figure below:

- Included are: A, C & D.

Material handling (option 3326-13), see figure below:

- Included are: A, B, C & E.



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Position	Description
A	Customer Power/ Customer Signals (CP/CS)
B	ETHERNET
C	PROC 1 (1/2" Hose)
D	CBUS
E	FE (Functional Earth)

Continues on next page

For corresponding parts of the tool, see *Connector kits on page 102*.

LeanID MH

Hose and cable free length, min. 950 mm.

Material handling (option 3326-31), see figure below:

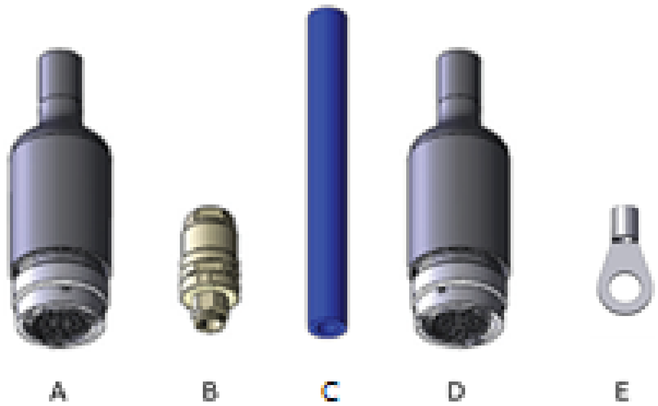
- Included are: A & C (Proc 1).

Material handling (option 3326-32), see figure below:

- Included are: A, C & D.

Material handling (option 3326-33), see figure below:

- Included are: A, B, C & E.



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Position	Description
A	Customer Power/ Customer Signals (CP/CS)
B	ETHERNET
C	PROC 1 (1/2" Hose)
D	CBUS
E	FE (Functional Earth)

For corresponding parts of the tool, see *Connector kits on page 102*.

3.5 Configuration result - DressPack options

General

The DressPack contents will differ depending on selected options. See table for signal content below.

DressPack variants

Pos	Type	At terminals in cabinet	At connection point. Base, Axis 3 or axis 6	Cable/part area	Allowed capacity
A	**Customer Power (CP)**				
	Utility Power	2+2	2+2	0.75 mm^2	250 V AC, 5 A rms
	Protective earth		1	0.75 mm^2	250 V AC
	Customer Signals (CS)				
	Signals	13	13	0.2 mm^2	50 V DC, 1 A rms
	Signals separate shielded	8	8 (4x2)	0.2 mm^2	50 V DC, 1 A rms
B	**Customer bus (Ethernet)**				
	Bus signals	4	4	0.4 mm^2	Ethernet CAT 5e, 100 Mbit [i]
C	**Media**				
	Air (PROC 1)		1	12.5 mm inner diameter	Max. air pressure 16 bar/230 PSI
D	**Customer bus (CBus)**				
	Bus signals	At bus board	2	0.14 mm^2	DeviceNet spec
	Bus signals	At bus board	2	0.2 mm^2	50 V DC, 1 A rms
E	**Functional Earth** [ii]		1	10 mm^2	600 V AC RMS

i Ethernet with wire colors according to PROFINET standard, M12-connectors.
ii When EtherNet is selected.

3.6 Connector kits

General

Below is an example of how a connector kit and its parts can look like.

xx1300000223

Continues on next page

3.6.1 Base - Connector kits

Available options

		DressPack options	Description
Option	Name	3325-11/12/13	
3330-2	CP/CS, Proc 1 base	X	

Note

Servo power connection kits not available.

Option 3330-2, CP/CS, Proc 1 on base

R1. CP/CS and Proc 1 on base for option 3325-11/12/13.

This option offers a kit with connectors. This must be assembled by the customer. The kit contains:

- 1 Hose fittings (Swivel nut adapter, (½", M22x1,5 Brass, 24 degree seal))
- Connector with:

1 pcs Hood Foundry (Harting)	HAN EMC / M 40
1 pcs Hinged frame (Harting)	Shell size 16
2 pcs Multicontact, female (Harting)	Type HD (25 pin)
1 pcs Multicontact, female (Harting)	Type DD (12 pin)
1 pcs Multicontact, female (Harting)	Type EE (8 pin)
10 pcs Female crimp contacts	For 1.5 mm^2
10 pcs Female crimp contacts	For 0.5 mm^2
10 pcs Female crimp contacts	For 1.0 mm^2
10 pcs Female crimp contacts	For 2.5 mm^2
12 pcs Female crimp contacts	For 0.14– 0.37 mm^2
45 sockets	For 0.2– 0.56 mm^2
1 pcs M12 Connector, Male	
Assembly Accessories to complete connector	
Assembly instruction	

3.6.2 Axis 3 - Connector kits

Available options

		DressPack options	Description
Option	Name	3325-11/12/13	
3333-2	CP/CS bus, Proc 1 axis 3	X	UTOW

Option 3333-2, CP/CS/CBus, Proc 1 axis 3

CP/CS/CBus, Proc 1 axis 3 on tool side for option 3326-11/12/13 and 3326-31/32/33.

This kit offers a kit with connectors to be mounted at toolside of axis 3.

This must be assembled by the customer.

The kit contains:

- 1 Hose fitting (Parker Push lock (1/2”, M22x1,5 Brass, 24 degree seal))
- Connector with:

CP/CS	
1 pcs UTOW Pin connector 26p, bayonet	UTOW61626PH, Shell size 16
26 pcs Pin	5 pcs RM18W3K and 21 pcs RM24W3K 0.13-0.25 mm^2
CBUS	
1 pcs UTOW Pin connector 10p, bayonet	UTOW61210PH Shell size 12
10 pcs Pin	RM24W3K 0.13-0.25 mm^2
Ethernet	
1 pcs Pin connector M12	Harting 2103 88
4 pcs Pin	Harting, 0.13-0.33 mm^2

3.6.3 Axis 6 - Connector kits

Available options

		DressPack options	DressPack options	Description
Option	Name	3326-11/12/13	3326-30/31/32/33	
3334-2	CP/CS bus axis 6	X	X	UTOW

Option 3334-2, CP/CS/CBus, Proc 1 axis 6

CP/CS/CBus/SP/SS, Proc 1 axis 6 on tool side for option 3326-11/12/13 and 3326-31/32/33.

This kit offers a kit with connectors to be mounted at toolside of axis 6.

This must be assembled by the customer.

The kit contains:

- 1 Hose fitting (Swivel nut adapter (1/2", M22x1,5 Brass, 24 degree seal))
- Connector with:

CP/CS	
1 pcs UTOW Pin connector 26p, bulkhead	UTOW71626PH05, Shell size 16
26 pcs Pin	5 pcs RM18W3K and 21 pcs RM24W3K 0.13-0.25 mm^2
CBUS	
1 pcs UTOW Pin connector 10p, bulkhead	UTOW71210PH05 Shell size 12
10 pcs Pin	RM24W3K, 0.13-0.25 mm^2
Ethernet	
1 pcs Socket connector M12	Harting 2103 88
4 pcs Socket	Harting, 0.13-0.33 mm^2

3.7 Application floor cables

Parallel cable - Length

Option	Description
3201-2	7m
3201-3	15m
3201-5	30m

Ethernet cable - Length

Note

Occupies 1 Ethernet port.

Option	Description	Note
3202-2	7m	Includes Parallel cable
3202-3	15m	Includes Parallel cable
3202-5	30m	Includes Parallel cable

DeviceNet™ cable - Length

Option	Description	Note
3204-2	7m	Includes Parallel cable
3204-3	15m	Includes Parallel cable
3204-5	30m	Includes Parallel cable

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]

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.

Option	Type	Description
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. **Note** Special conditions are applicable, see *Robotics Warranty Directives*.

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