

ROBOTICS

Product specification

IRB 7710



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Product specification

IRB 7710-500/2.85

IRB 7710-430/3.1

IRB 7710-360/3.3

IRB 7710-310/3.5

IRB 7710-400/2.85 LID

IRB 7710-390/3.1 LID

IRB 7710-325/3.3 LID

IRB 7710-280/3.5 LID

OmniCore

Document ID: 3HAC089603-001

Revision: H

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Original instructions.

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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
- Integrators and customers

References

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

Document name	Document ID
<i>Product manual - IRB 7710</i>	3HAC089600-001
<i>Circuit diagram - IRB 7710/IRB 7720</i>	3HAC089629-001
<i>Product manual - OmniCore V250XT Type B</i>	3HAC087112-001
<i>Product manual - OmniCore V400XT</i>	3HAC081697-001
<i>Technical reference manual - System parameters (RobotWare 7)</i>	3HAC065041-001
<i>Technical reference manual - System parameters (RobotWare 8)</i>	3HAC098390-001
<i>Application manual - Controller software OmniCore RobotWare 7</i>	3HAC066554-001
<i>Application manual - Controller software OmniCore RobotWare 8</i>	3HAC098393-001



Tip

All documents can be found via ABB Robotics One, <https://one.robots.abb.com/en/knowledge-hub>.

Revisions

Revision	Description
A	First edition.

Continues on next page

Revision	Description
B	Published in release 24C. The following updates are made in this revision: • Added image of end connectors at axis 6 for DressPack SW. • Added illustration for reduced working range on axis 1 with movable mechanical stops and corrected the limitation angles. • Added 22 m process cables.
C	Published in release 24D. The following updates are made in this revision: • Minor corrections.
D	Published in release 25A. The following updates are made in this revision: • Added information about limitations of axis-2 and axis-3 working ranges.
E	Published in release 25.2. The following updates are made in this revision: • Updated the dimension drawing for lower arm and frame. • Added OmniCore V250XT Type B as an available robot controller for the manipulator. • Added the section Impacting robot lifetime on page 16. • Updated the installation (mounting) angle for the manipulator.
F	Published in release 25.3. The following updates are done in this revision: • Clarified the installation (mounting) angle for the manipulator. • Company name updated to reflect current legal entities. • Updated portal name from myABB to ABB Robotics One. • Cable glands and additional information added in the manipulator connector kits.
G	Published in release 26.1. The following updates are done in this revision: • Added diagram and made other minor updates to section <i>Impacting robot lifetime</i> (previously called <i>Maximizing robot lifetime</i>) • Company name updated to reflect current legal entities. • Added support for RobotWare 8.
H	Published in release 26B. The following updates are done in this revision: • Added drilling pattern for the MH3 gripping clamp at the wrist.

1 Description of IRB 7710

1.1 About the IRB 7710

General introduction

ABB is expanding its large size robot portfolio with IRB 7710, offering faster performance, improved stiffness and accuracy together with reduced energy consumption.

The IRB 7710 is available in eight variants spanning various options for payload from 280 kg to 500 kg, reach from 2.85 m to 3.5 m.

Intended use

IRB 7710 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 handle an 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.

See [Impacting robot lifetime on page 16](#).

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1 Description of IRB 7710

1.1 About the IRB 7710

Continued

Available variants

The IRB 7710 is available in the following variants.

Variants with standard wrist

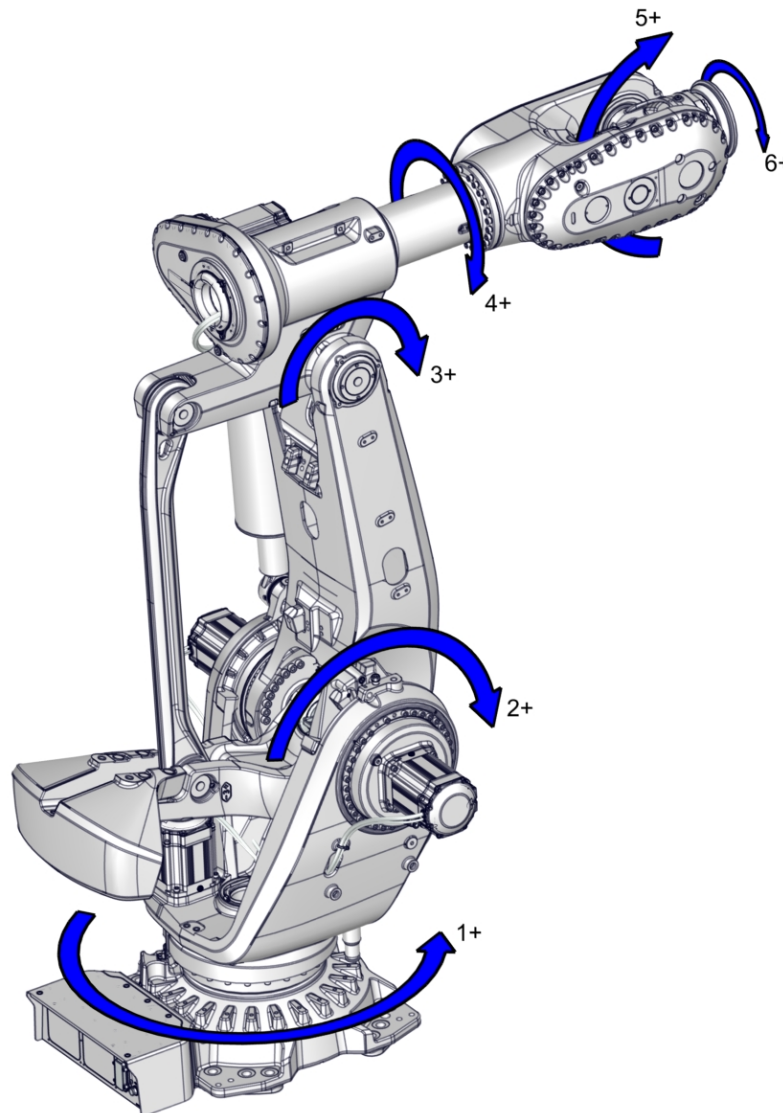
	 xx2300001498	 xx2300001499	 xx2300001500	 xx2300001501
Robot variant	IRB 7710-500/2.85	IRB 7710-430/3.1	IRB 7710-360/3.3	IRB 7710-310/3.5
Handling capacity	500 kg	430 kg	360 kg	310 kg
Reach	2.85 m	3.1 m	3.3 m	3.5 m

Variants with LeanID

	 xx2300001506	 xx2300001507	 xx2300001508	 xx2300001509
Robot variant	IRB 7710-400/2.85 LID	IRB 7710-390/3.1 LID	IRB 7710-325/3.3 LID	IRB 7710-280/3.5 LID
Handling capacity	400 kg	390 kg	325 kg	280 kg
Reach	2.85 m	3.1 m	3.3 m	3.5 m

Continues on next page

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 7710 manipulator can be connected to the following robot controllers:

- OmniCore V250XT Type B
- OmniCore V400XT

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1 Description of IRB 7710

1.1 About the IRB 7710

Continued

Safety

Safety standards valid for complete robot, manipulator and controller.

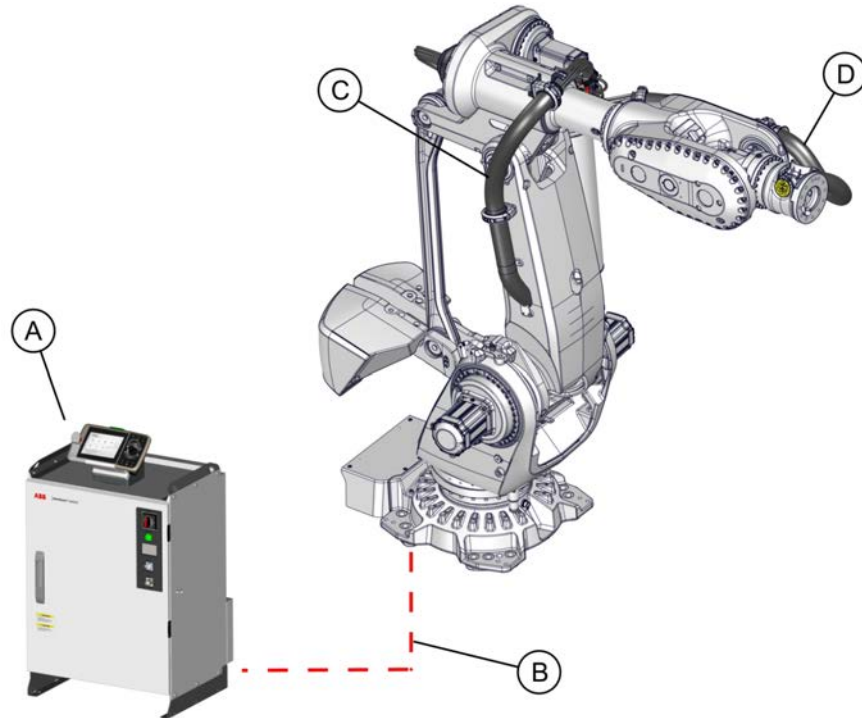
Additional functionality

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 specification for the robot controller, listed in [References on page 7](#).

1.2 About the IRB 7710 DressPack

About the DressPack

The IRB 7710 can be equipped with the well-integrated cable and hose packages in the DressPack options. The DressPack is designed together with the manipulator to offer a complete solution. The DressPack is designed to fit a wide variety of applications, and are well integrated into the robot system to ensure long life and large working range.



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

Continues on next page

1 Description of IRB 7710

1.2 About the IRB 7710 DressPack

Continued

Available DressPack for IRB 7710

To support the variety of complexity in the operation/wrist movements, there are different solutions available.

The lower arm DressPack (base - axis 3) has the same routing and design for all manipulator variants.

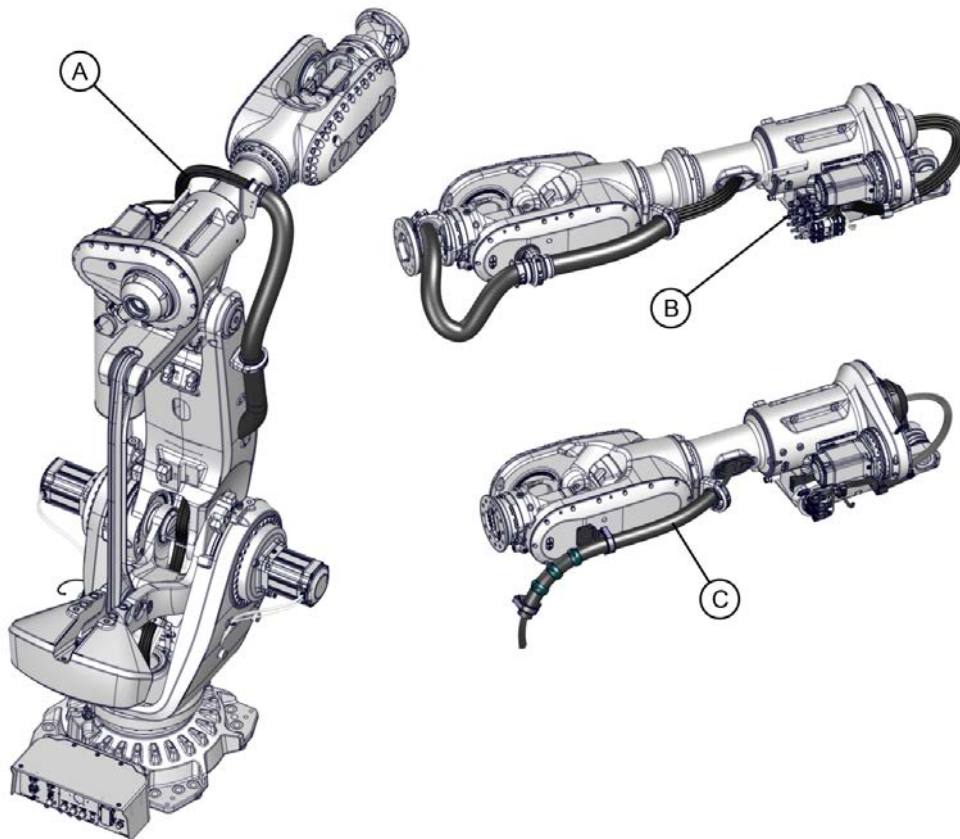
The upper arm DressPack options (axis 3 - 6) are available in different design solutions, *LeanID - MH*, *LeanID - SW* and *MH3*. The main difference between LeanID and MH3 is that LeanID is guided across the axis 6 center of rotation by utilizing a process turning disc instead of the standard turning 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.

The LeanID Empty Conduit is an empty casing without cabling.

Robot variant	DressPack variants	
	Base - axis 3	axis 3 - 6
IRB 7710-500/2.85	MH, SW	MH3
IRB 7710-430/3.1	MH, SW	MH3
IRB 7710-360/3.3	MH, SW	MH3
IRB 7710-310/3.5	MH, SW	MH3
IRB 7710-400/2.85 LID	MH, SW	LeanID - MH, LeanID - SW, LeanID Empty Conduit
IRB 7710-390/3.1 LID	MH, SW	LeanID - MH, LeanID - SW, LeanID Empty Conduit
IRB 7710-325/3.3 LID	MH, SW	LeanID - MH, LeanID - SW, LeanID Empty Conduit
IRB 7710-280/3.5 LID	MH, SW	LeanID - MH, LeanID - SW, LeanID Empty Conduit

Continues on next page

Illustration of DressPack designs



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	Description	DressPack variant	Robot variant
A	DressPack base - axis 3	MH, SW	All variants
B	DressPack axis 3 - 6	LeanID - MH LeanID - SW LeanID Empty Conduit	IRB 7710-400/2.85 LID IRB 7710-390/3.1 LID IRB 7710-325/3.3 LID IRB 7710-280/3.5 LID
C	DressPack axis 3 - 6	MH3	IRB 7710-500/2.85 IRB 7710-430/3.1 IRB 7710-360/3.3 IRB 7710-310/3.5

1.3 Impacting robot lifetime

Introduction

The expected lifetime of a robot is an important factor when planning an installation. This information is aiming to help you to maximize the lifetime of your robot and avoid unnecessary downtime or repair.

The lifetime of a robot is influenced by the following, but not limited to, factors:

- [Robot type selection on page 16](#)
- [Duty factor on page 16](#)
- [Environmental conditions on page 17](#)
- [Application and usage on page 17](#)
- [Design limitations on page 19](#)
- [Maintenance on page 19](#)
- [Individual lifetime variability on page 19](#)
- [Extreme usage on page 19](#)

Robot type selection

Selecting the right robot for the application is generally done based on payload and reach criteria, but other factors can influence the selection, such as the duty factor. Selecting the most suitable variant is crucial to achieve the expected high performance, uptime, and lifetime. Always select a robot in accordance with the intended use, see [Intended use on page 9](#).

ABB robots are capable of high accelerations and speeds. It is generally recommended to use RobotStudio to find out if a robot model is suitable for a specific application and duty factor. RobotStudio is an excellent tool to help with the assessment of the duty factor and the selection of the most suitable robot variant.

In the case of intense use of robots, optional cooling fans may be required, and the expected component life of gearboxes and motors may be affected. Contact ABB for cooling fan solution.

This robot is not specifically designed for use in demanding applications with a very high duty factor. If used in such conditions, a significant reduction in lifetime is possible for all axes, depending on the cycle. See [Extreme usage on page 19](#).

When selecting the robot variant, consider using application-specific robot, and suitable protection type.



Note

Use the Mechanical Analysis add-in in RobotStudio (see details below) for help with the assessment, or get technical support from ABB.

Duty factor

Duty factor is the percentage of time the robot is moving divided by the total time, including movement and wait time during the complete robot work cycle. It is a

Continues on next page

measurement of how much the robot is being used. Gearbox lifetime is reduced more rapidly by a higher duty cycle than by a lower one. See [Extreme usage on page 19](#).



Note

The duty factor impact on lifetime can be analyzed in the add-in *Mechanical Analysis* in RobotStudio (see details below) and *Service Information System* (SIS) data in the controller. Contact ABB to analyze the SIS data.

Environmental conditions

Following factors within environmental conditions of the robot has an impact on the robot lifetime:

- Temperature:

The robot usage at high temperatures or extreme usage can lead to gearbox and motor cooling problems. Observe operating temperature limits stated in manipulator product manual. Extreme usage normally requires means of reduction of motor and gearbox oil heat.

The option to add a cooling fan to some of the axes, will allow the robot to run even with an extreme usage. See the description of the available options in section [Motor cooling on page 161](#).



Note

The add-in Mechanical Analysis in RobotStudio (see details below) or technical support from ABB can provide recommendation on using fans.

- Exposure to chemicals might impact sealings, which can cause oil leakage.
- Vibrations caused by not following the foundation requirements might cause reduction of lifetime, for example for bearings. See [Requirements, foundation on page 27](#).
- Cleaning. Wrong cleaning can cause particles entering the sealings which can cause oil leakage. Proper cleaning is described in *Product manual - IRB 7710*.

Application and usage

Following factors within robot application and usage has an impact on the robot lifetime:

- Payload definition and overload:

It is important to define the payload within specification and correctly defined tool data. See section [Load diagrams on page 75](#), and *Technical reference manual - RAPID Overview*.

The service routine for load identification, *LoadIdentify*, is available to support tool data definition. See *Operating manual - OmniCore*.

- Acceleration/deceleration:

Continues on next page

1 Description of IRB 7710

1.3 Impacting robot lifetime

Continued

The gearbox lifetime is reduced more rapidly by high accelerations/decelerations than by lower ones.



Note

Smoother movements bring reduced energy consumption.



Note

Acceleration/deceleration can be modified with the instruction AccSet. See *Technical reference manual - RAPID Overview*.

Acceleration/deceleration is optimized by using automatic path planning functionality, either offline, or in RobotStudio, or using the online software.

- Limited movements:

If the range or the rotation angle for an axis is 10° or less, the expected life of the reduction gears may be reduced due to poor lubrication of internal parts or the internal parts being subject to a concentrated load. Add extra lubrication motion to the robot program or to maintenance schedule.



Note

Use RobotStudio *Signal Analyzer* or get technical support from ABB. An event message will be displayed on the FlexPendant if a limited movement is detected (RobotWare 7.20 and higher).

- High forces applied externally to the manipulator:

Some applications or not correctly programmed paths apply external forces to the manipulator, which might reduce its lifetime. Example of external force: gripper under constraint when gripping a part or load sharing between multiple robots.

- Number of collisions:

Collisions, especially at high speed and/or with high loads reduce the lifetime of the gearboxes. Avoid collisions and set collision detection sensitivity to the appropriate level.



Note

See the application manual for the controller software, section *Collision detection*, listed in [References on page 7](#).

- Number of emergency stops:

Emergency stops, especially at high speed and/or high loads reduce the lifetime of the gearboxes. Whenever permitted by risk assessment, set the robot stopping functions to stop category 1.

Continues on next page



Note

See the product manual for the robot controller, listed in [References on page 7](#).

Design limitations

See the section *Expected component life* in *Product manual - IRB 7710*.

Maintenance

The maintenance and use of the robot will affect the performance and lifetime. For example:

- Preventive maintenance will optimize the lifetime of the robot. The recommended maintenance activities and intervals are described in *Product manual - IRB 7710*.
- Observance of lubricant types and maintenance periods recommended by ABB.
- Possible pollution of the lubricant by an external cause, for example, water in the oil caused by high humidity.
- Extreme usage, for example high duty factor or environmental factors, will affect the maintenance schedule, for example, shorter intervals for oil change.

Contact your local ABB office to get technical support from ABB.

Individual lifetime variability

The lifetime varies with individual robots. For example, a cycle with a lower duty factor may fail earlier than one with a higher duty factor. But a cycle with a higher duty factor is more likely to fail earlier than a cycle with lower duty factor.

Extreme usage

Examples of extreme usage in regard to movement: a stress index range that shows up as red (51) in the RobotStudio add-in *Mechanical Analysis*, press tending application, very severe palletizing applications, major use of axis 1, 2, or 3 movement.

The controller can issue a duty factor warning on the FlexPendant, if applicable. See the chapter *Troubleshooting* in *Product manual - IRB 7710*.

Extreme usage normally requires usage of cooling fans.

Extreme usage requires specific maintenance, for example, shorter interval for oil change. See *Maintenance schedule* in *Product manual - IRB 7710*.

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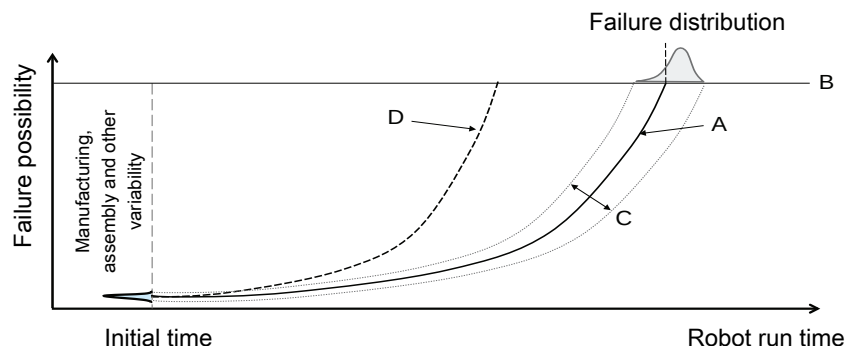
1 Description of IRB 7710

1.3 Impacting robot lifetime

Continued

Summary

The diagram illustrates the relationship between robot run time and failure possibility.



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A	Design lifetime
B	Failure threshold
C	Individual variability
D	Negatively affected lifetime

The curve (A) represents the design lifetime, showing how failure probability increases over time following a normal distribution pattern. The failure threshold (B) indicates the point at which component failure becomes likely.

Individual variability between robots is shown by the dotted lines (C), representing the natural variation in component life due to manufacturing, assembly, and other factors. This variability means that while most robots will follow the design lifetime curve, some individual units may experience earlier or later failures within the normal distribution.

As highlighted with the curve (D) in the diagram, robot lifetime can be negatively affected by not following best practices in the key areas discussed in this chapter:

- [Robot type selection on page 16](#)
- [Duty factor on page 16](#)
- [Environmental conditions on page 17](#)
- [Application and usage on page 17](#)
- [Maintenance on page 19](#)

By adhering to the recommendations outlined in each of these sections, users can maximize their robot's operational lifetime and ensure performance stays within the design lifetime curve, avoiding premature failure and unnecessary downtime.

Continues on next page

Available tools

There are several tools available throughout the lifecycle of an ABB robot, from support with selecting the most suitable manipulator and optimizing its lifetime, to operation, maintenance, and repair:

ABB toolbox	Type	Product lifecycle		
		Sales, pre-study	Installation, commissioning	Operation, maintenance, repair
Product specification	Document	x	x	
Product manual	Document		x	x
Mechanical Analysis add-in	Add-in in RobotStudio	x	x	x
Service Information System (SIS) / Condition Based Maintenance (CBM)	RobotWare functionality / Customer service analysis		x	x
Connected Services	Hardware and Software		x	x
Automatic Path Planning	RobotStudio functionality and online software	x	x	(x)
Signal Analyzer / TuneMaster	RobotStudio functionality / Software	x	x	x
ABB support	Customer support	x	x	x

1 Description of IRB 7710

1.4 Applicable standards

1.4 Applicable standards

General

This product is designed according to the global product standard ISO 10218-1:2025, *Robots for industrial environments - Safety requirements - Part 1 Robots*, In case of deviation from ISO 10218-1:2025, 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
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
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
IEC 61326-3-1	Immunity requirements for safety-related systems and for equipment intended to perform safety-related functions (functional safety) – General industrial applications

Region specific standards

Standard	Description
UL 1740 (option) CSA Z434 (option)	Standards For Safety - Robots and Robotic Equipment Industrial robots and robot Systems - General safety requirements Valid for USA and Canada.

1.5 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, its modular design makes it easy to change.

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 7710*.

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.

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2 Technical data for IRB 7710

2.1 Technical data

2.1.1 Technical data

Weight, robot

The table shows the weight of the robot.

Robot model	Nominal weight
IRB 7710-500/2.85	2,130 kg
IRB 7710-430/3.1	2,160 kg
IRB 7710-360/3.3	2,170 kg
IRB 7710-310/3.5	2,180 kg
IRB 7710-400/2.85 LID	2,210 kg
IRB 7710-390/3.1 LID	2,230 kg
IRB 7710-325/3.3 LID	2,240 kg
IRB 7710-280/3.5 LID	2,250 kg



Note

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

The weight includes the weight of the DressPack for LID variants.

Mounting positions

The table shows valid mounting positions and the installation (mounting) angle for the manipulator.

Mounting position	Installation angle
Floor mounted	0° ⁱ

ⁱ A tilt of up to 5° does not affect the payload or reach, but it can have a negative impact on performance and lifetime. The actual value must be set in the system parameters.



Note

The actual mounting angle must always be configured in the system parameters, otherwise the performance and lifetime is affected. See the product manual for details.

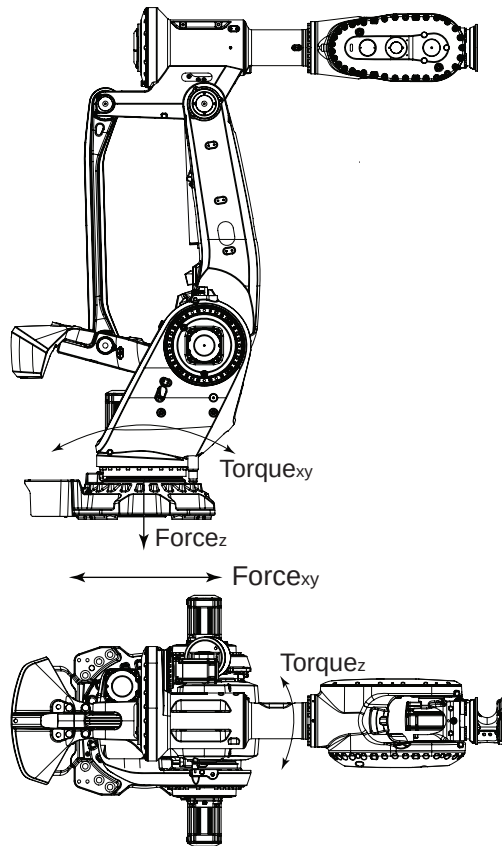
On robots running RobotWare 8, it is also possible to configure the mounting position on the FlexPendant, see the integrator's guide for the controller.

Continues on next page

2 Technical data for IRB 7710

2.1.1 Technical data
Continued

Loads on foundation, robot



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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	±9.4 kN	±24.8 kN
Force z	26.7 ±5 kN	26.7 ±16.8 kN
Torque xy	±37.5 kNm	±76.9 kNm
Torque z	±6.4 kNm	±19.4 kNm

Continues on next page

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
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 the description of <i>Motion Process Mode</i> in the manual that describes the controller software option, see References on page 7 .

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 possible 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
Maximum ambient humidity	95% at constant temperature

ⁱ At low environmental temperature < 10°C 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.

Continues on next page

2 Technical data for IRB 7710

2.1.1 Technical data

Continued

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

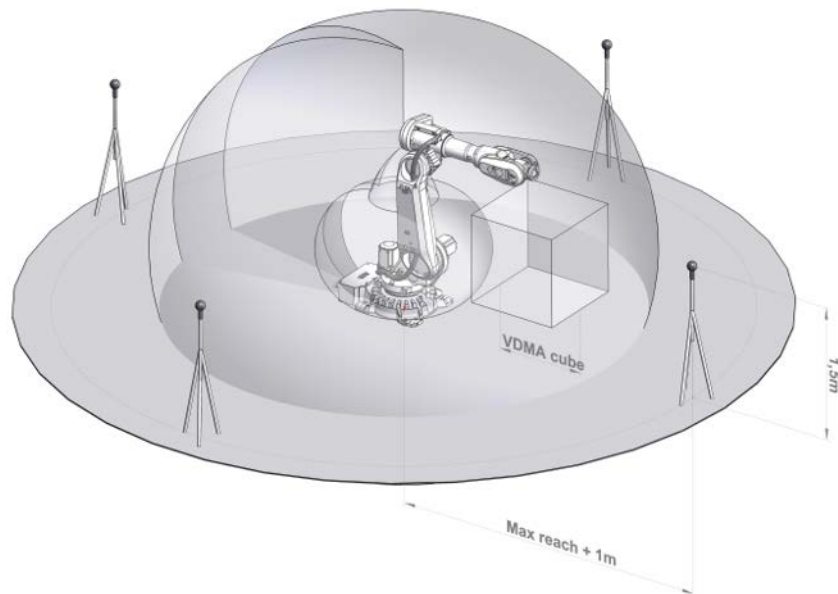
The product complies with IEC 63000. *Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances.*

2.1.2 Airborne noise level

Airborne noise level

Description	Note	Value
Airborne noise level	The sound pressure level outside the working space.	72 dB (A) Leq

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



xx2100002505



Note

The noise emission from a robot, in an actual application, depends on the programmed path, payload, cycle time, mounting position, environment, etc.

2 Technical data for IRB 7710

2.1.3 Power consumption

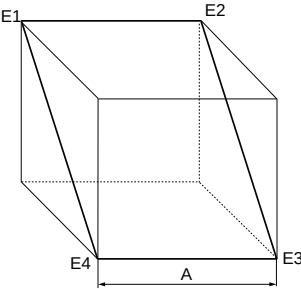
2.1.3 Power consumption

Power consumption at max load

Variant ⁱ	ISO cube	Robot in calibration position	
	Power consumption at maximum velocity (kW)	Power consumption at brakes engaged (kW)	Power consumption at brakes disengaged (kW)
IRB 7710-500/2.85	3.1	0.2	0.8
IRB 7710-430/3.1	2.8	0.2	0.8
IRB 7710-360/3.3	2.7	0.2	0.8
IRB 7710-310/3.5	2.7	0.2	0.8

ⁱ LID manipulator variants are considered to have the same data as specified variants with the same reach.

ISO cube



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Pos	Description
A	1,000 mm



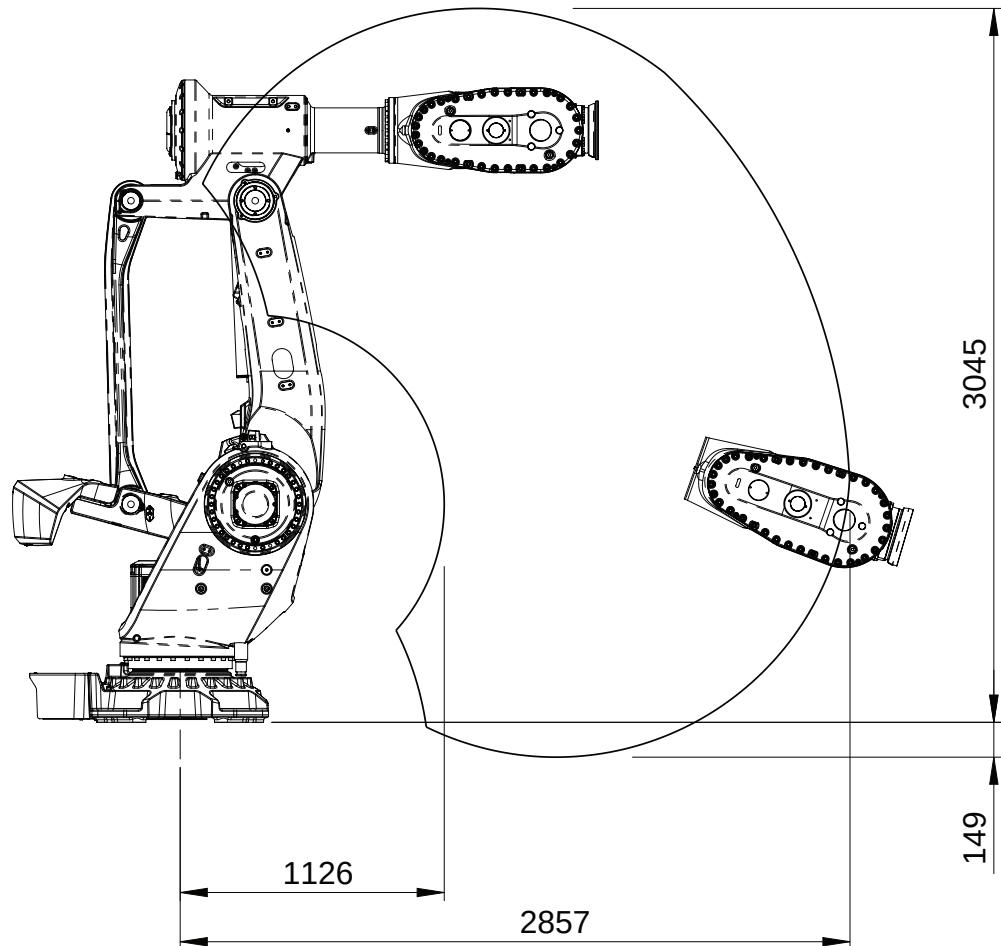
Note

If measuring the power consumption at the installation site, the returned power to the grid needs to be taken in to account.

2.1.4 Working range

Illustration, working range IRB 7710-500/2.85

This illustration shows the unrestricted working range of the robot.



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Continues on next page

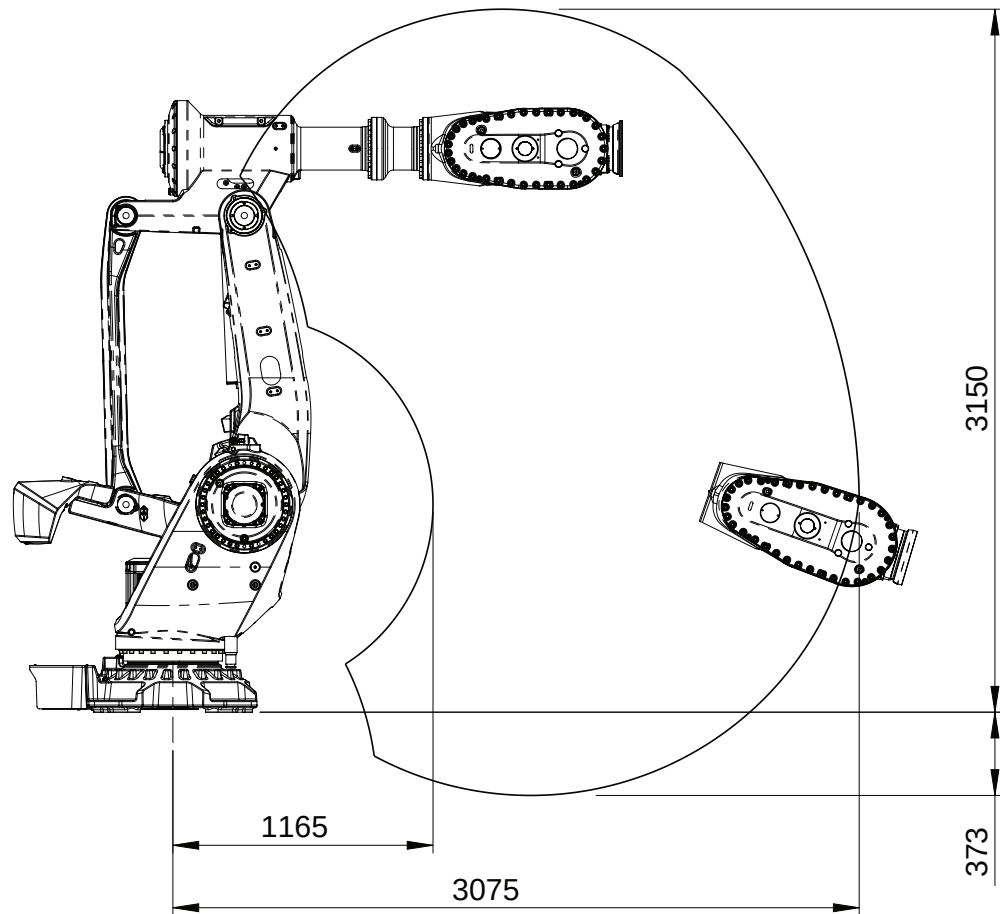
2 Technical data for IRB 7710

2.1.4 Working range

Continued

Illustration, working range IRB 7710-430/3.1

This illustration shows the unrestricted working range of the robot.

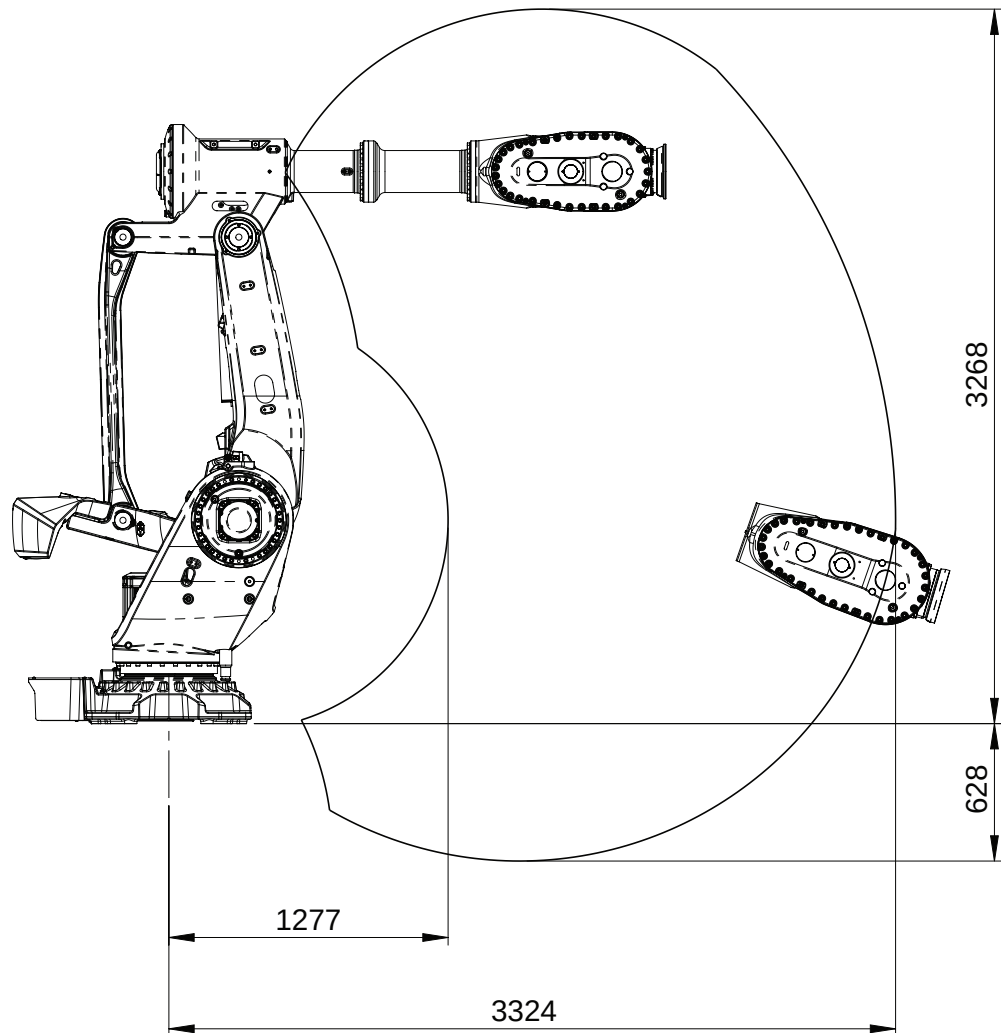


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Continues on next page

Illustration, working range IRB 7710-360/3.3

This illustration shows the unrestricted working range of the robot.



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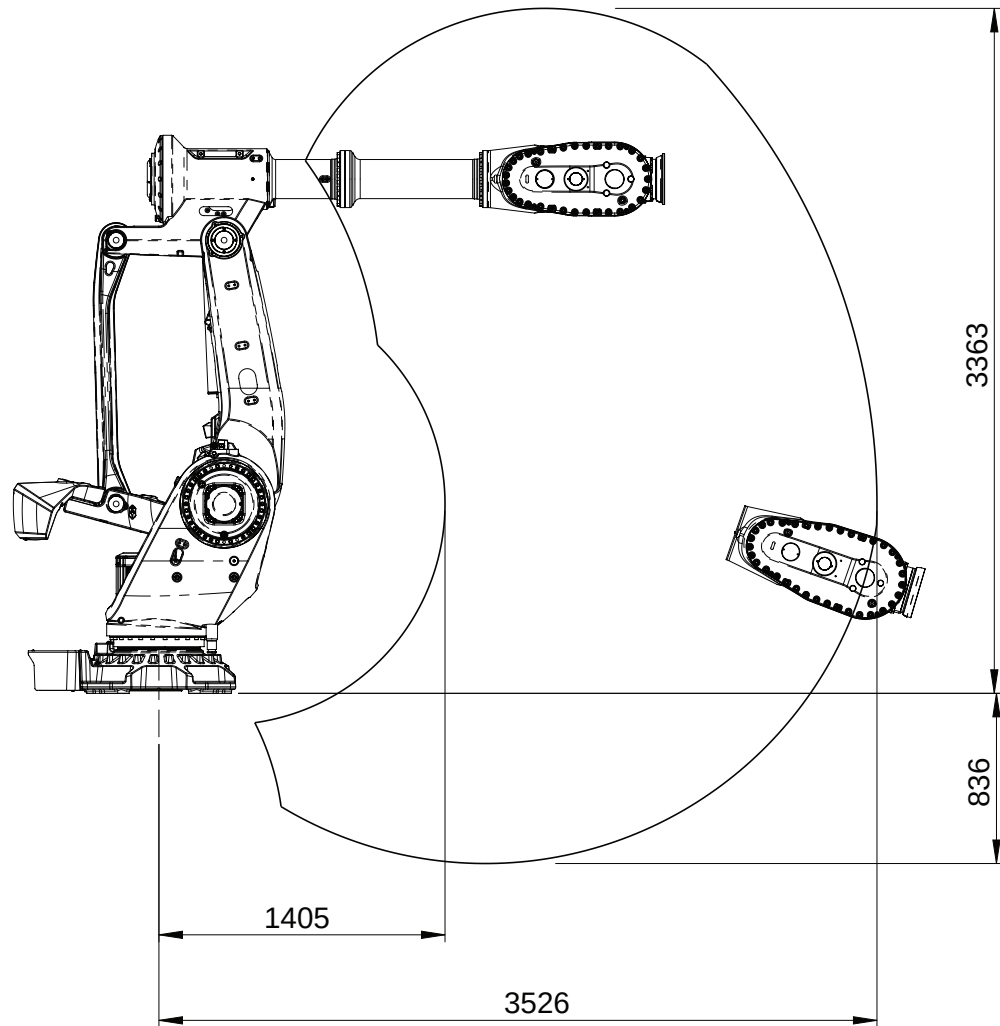
2 Technical data for IRB 7710

2.1.4 Working range

Continued

Illustration, working range IRB 7710-310/3.5

This illustration shows the unrestricted working range of the robot.

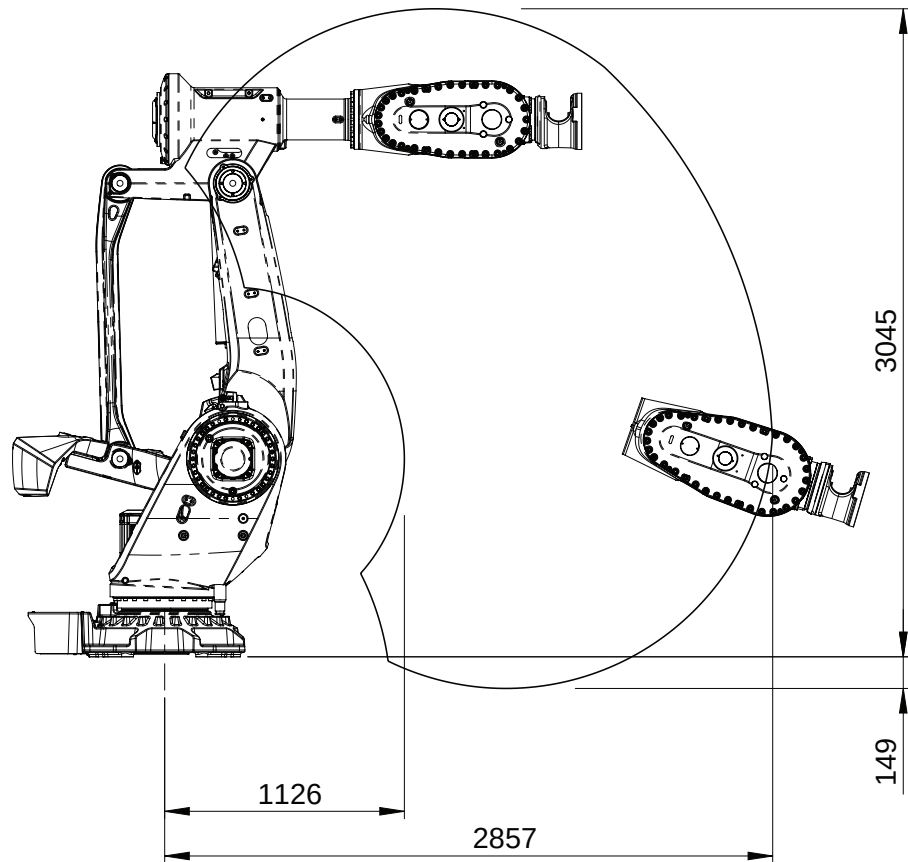


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Illustration, working range IRB 7710-400/2.85 LID

This illustration shows the unrestricted working range of the robot.



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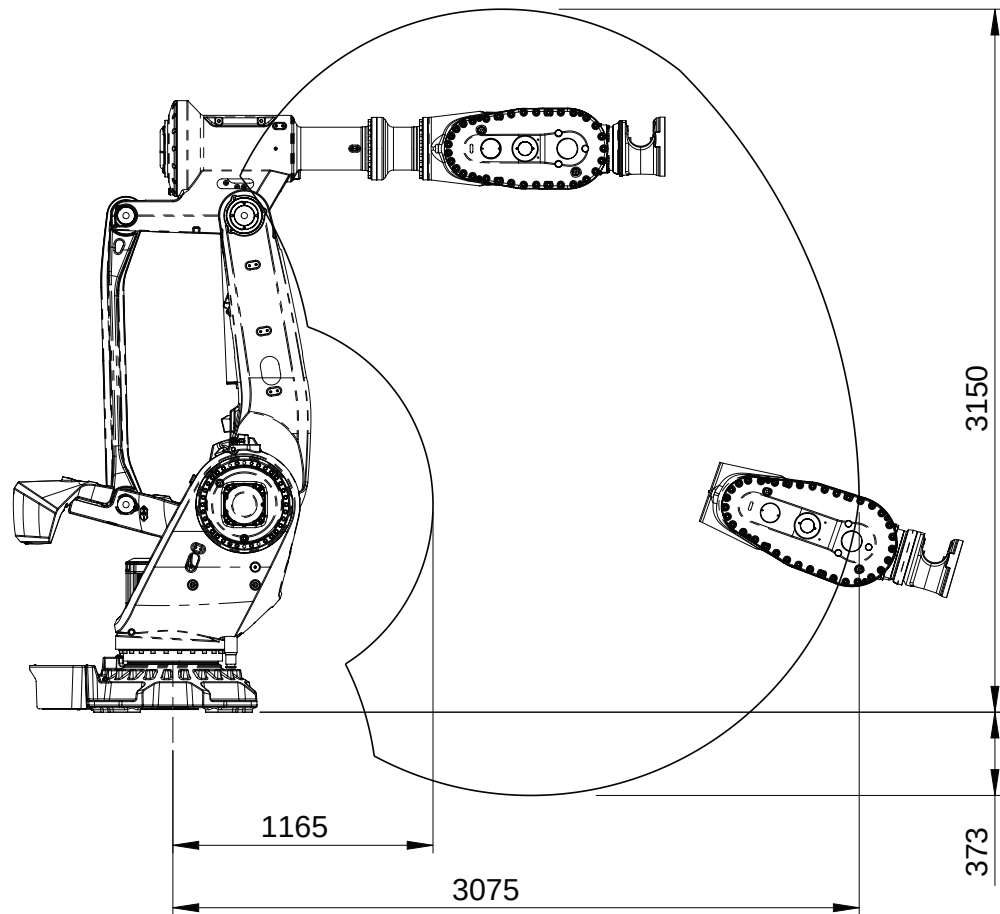
2 Technical data for IRB 7710

2.1.4 Working range

Continued

Illustration, working range IRB 7710-390/3.1 LID

This illustration shows the unrestricted working range of the robot.

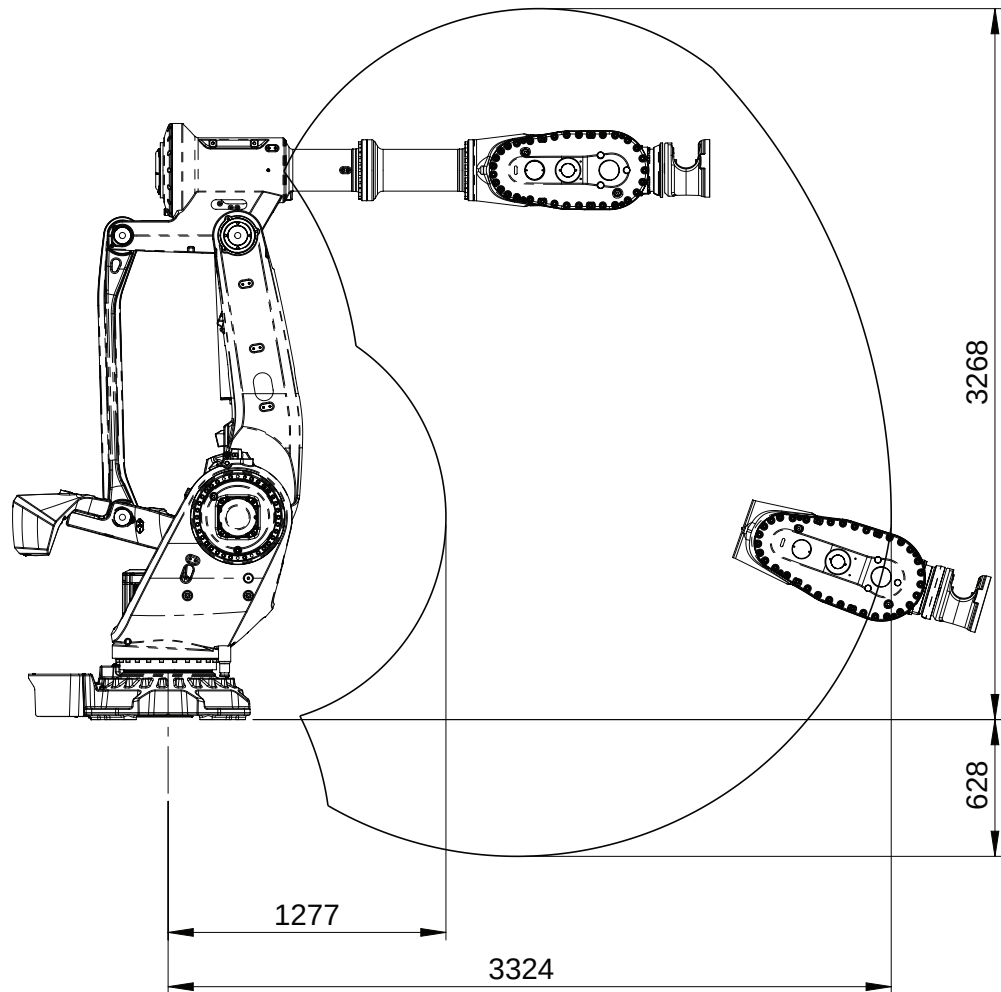


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Illustration, working range IRB 7710-325/3.3 LID

This illustration shows the unrestricted working range of the robot.



xx2400000311

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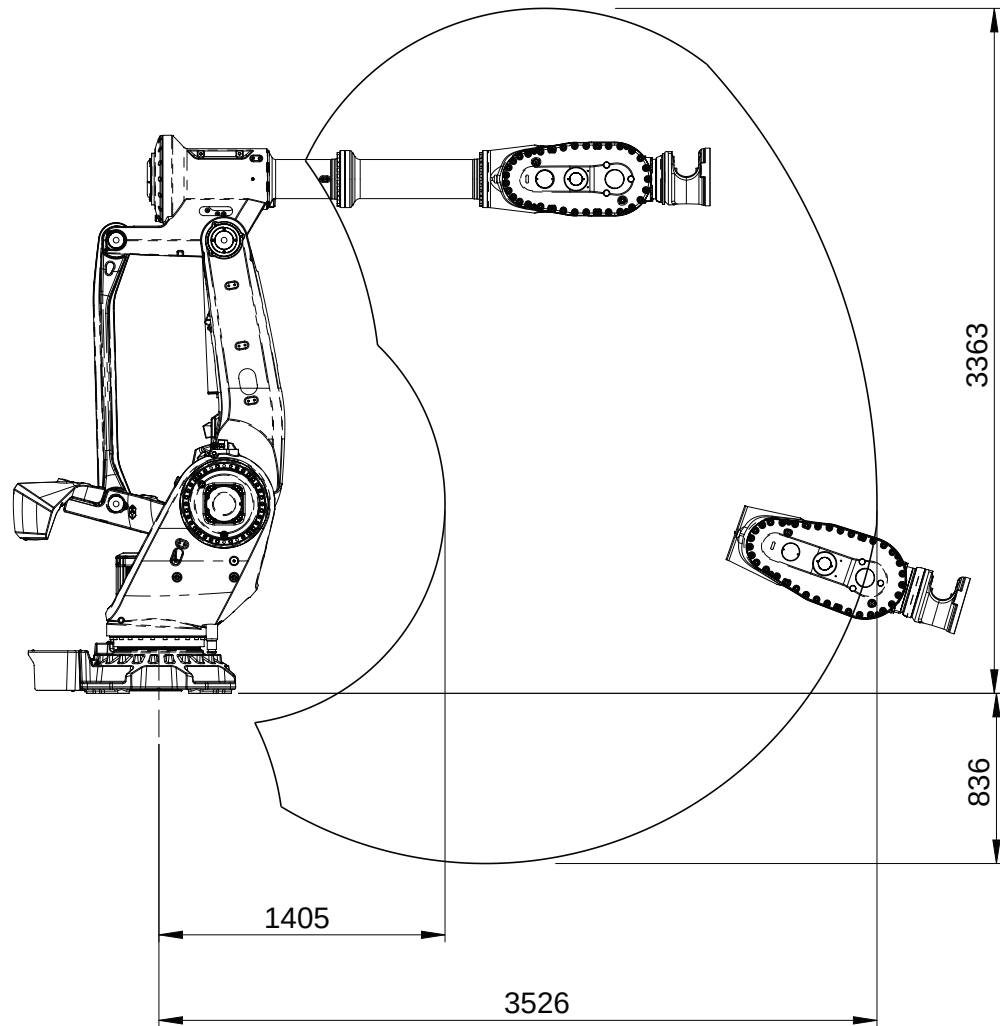
2 Technical data for IRB 7710

2.1.4 Working range

Continued

Illustration, working range IRB 7710-280/3.5 LID

This illustration shows the unrestricted working range of the robot.

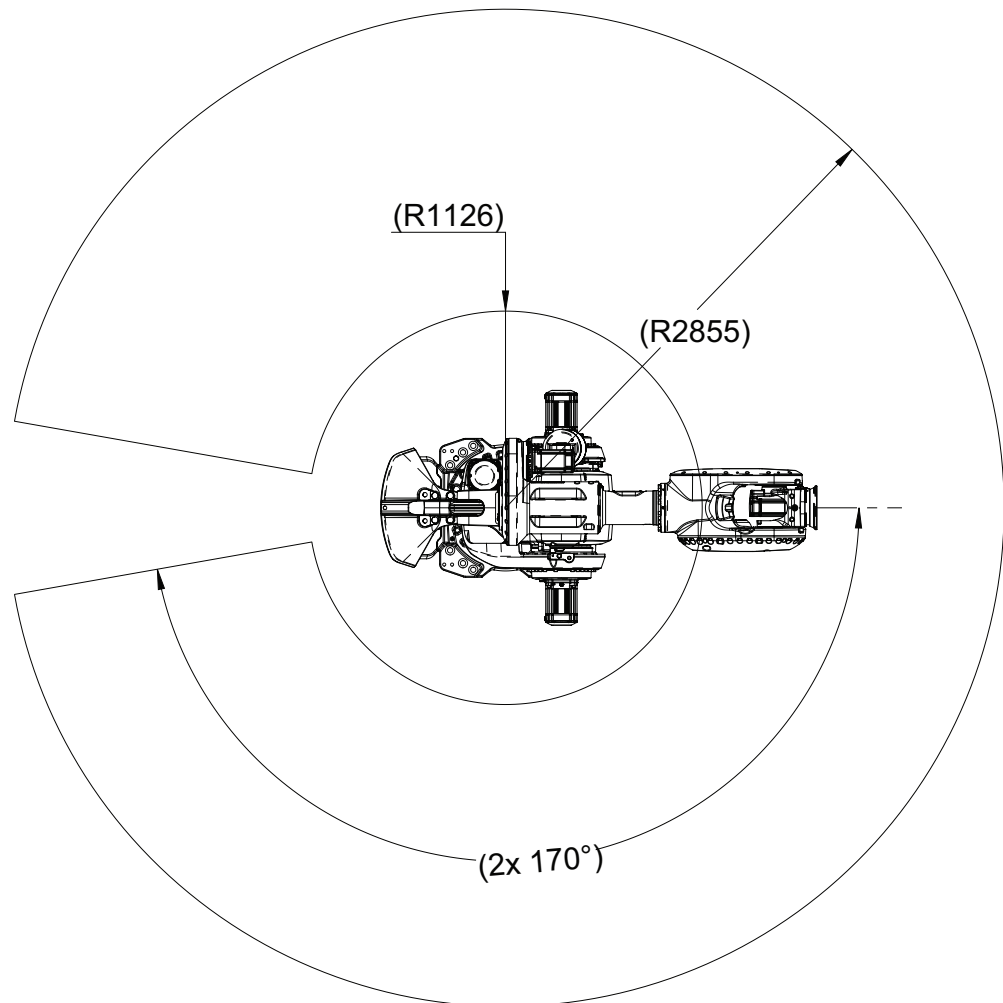


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Top view of working range

IRB 7710-500/2.85, IRB 7710-400/2.85 LID



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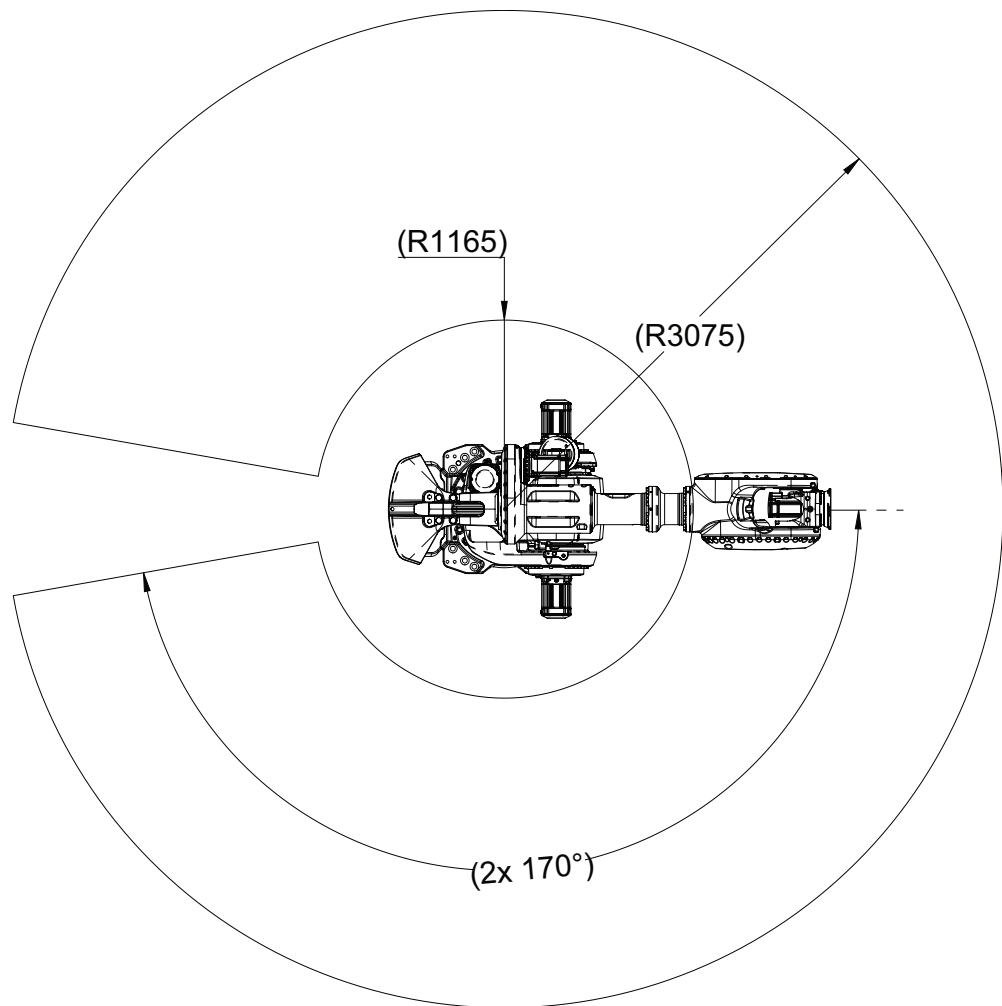
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2 Technical data for IRB 7710

2.1.4 Working range

Continued

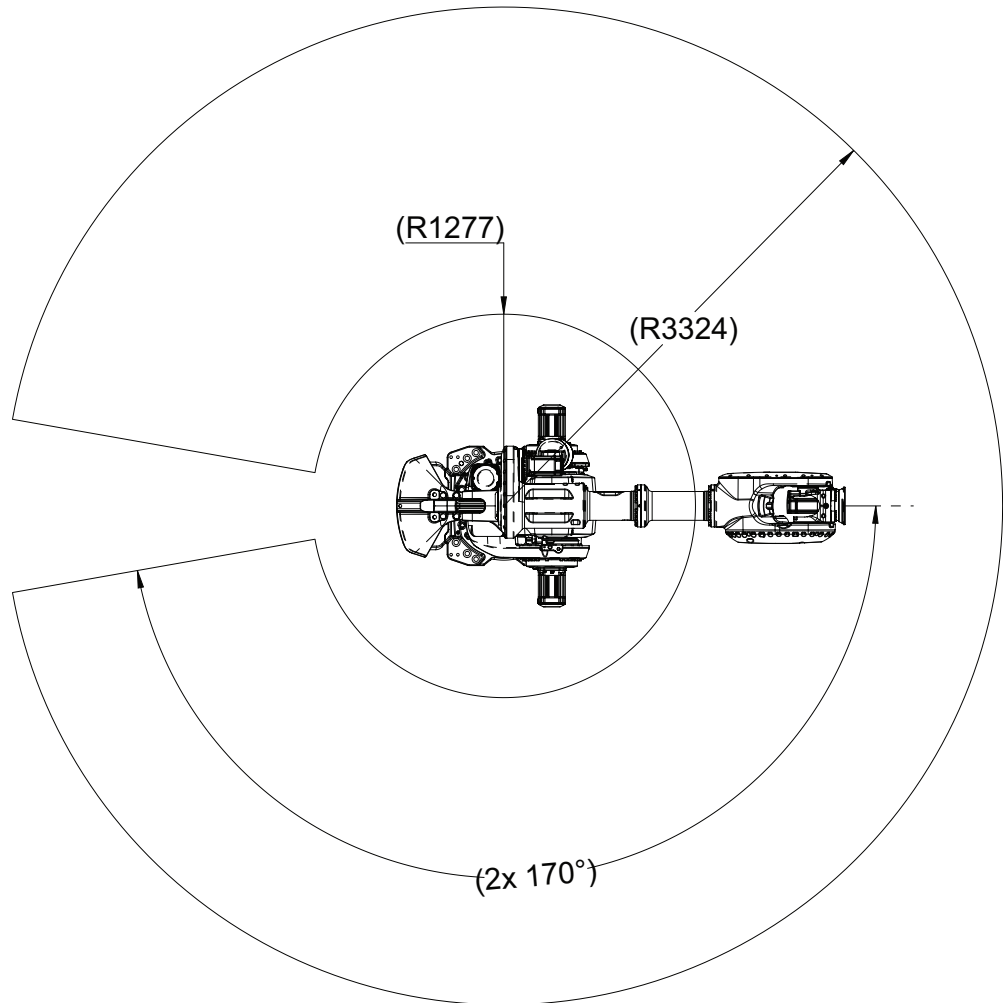
IRB 7710-430/3.1, IRB 7710-390/3.1 LID



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IRB 7710-360/3.3, IRB 7710-325/3.3 LID



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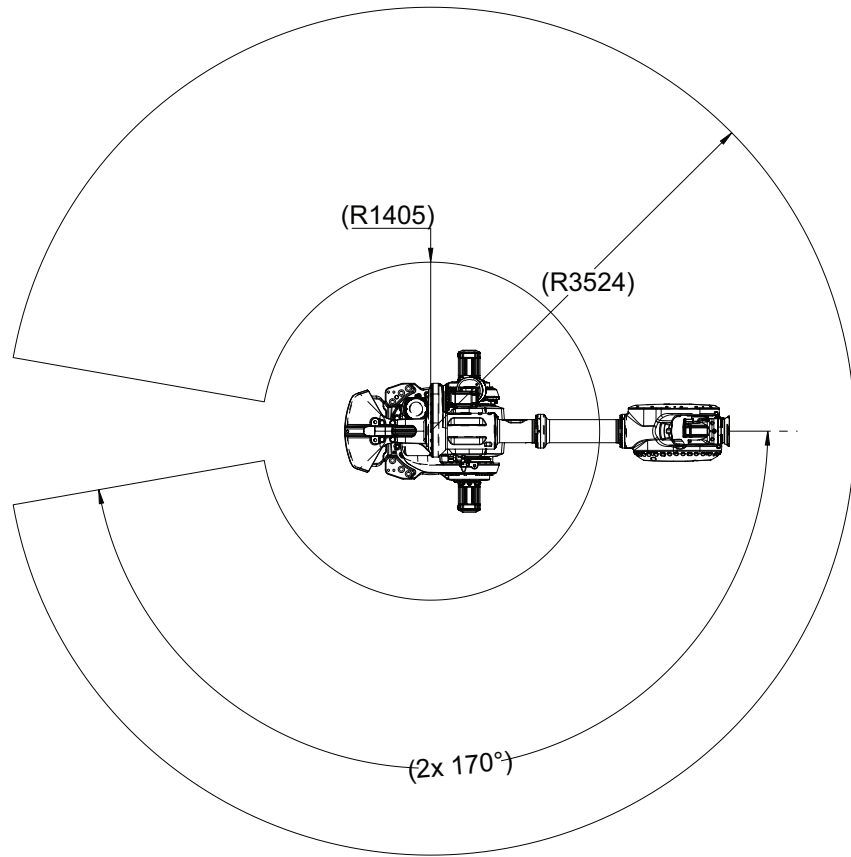
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2 Technical data for IRB 7710

2.1.4 Working range

Continued

IRB 7710-310/3.5, IRB 7710-280/3.5 LID



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Working range

Axis	Working range	Note
Axis 1	$\pm 170^\circ$	
	$\pm 220^\circ$ i, ii	The default working range for axis 1 can be extended as an option.
Axis 2	$-65^\circ / +82.2^\circ$ iii	
Axis 3	$-27^\circ / +130^\circ$ iii	
Axis 4	$\pm 300^\circ$	
Axis 5	$\pm 130^\circ$	IRB 7710-500/2.85, IRB 7710-430/3.1, IRB 7710-360/3.3, IRB 7710-310/3.5
	$\pm 120^\circ$ iv	IRB 7710-400/2.85 LID, IRB 7710-390/3.1 LID, IRB 7710-325/3.3 LID, IRB 7710-280/3.5 LID
Axis 6	$\pm 360^\circ$	IRB 7710-500/2.85, IRB 7710-430/3.1, IRB 7710-360/3.3, IRB 7710-310/3.5
	$\pm 220^\circ$ iv	IRB 7710-400/2.85 LID, IRB 7710-390/3.1 LID, IRB 7710-325/3.3 LID, IRB 7710-280/3.5 LID

i Option Extended Working Range Axis 1 (3324-1)

ii Not valid for DressPack SW.

iii Maximum combined movements reduced for IRB 7710-400/2.85 LID.
See [Working range limitations, axis 2 and axis 3 for IRB 7710-400/2.85 LID](#).

iv Maximum combined movements reduced.

Continues on next page

See [Working range limitations, axis 5 and axis 6 for IRB 7710-400/2.85 LID, IRB 7710-390/3.1 LID, IRB 7710-325/3.3 LID, IRB 7710-280/3.5 LID \(option axis 3-6 \[3326-x\]\) on page 44.](#)

Working range limitation

The working range of axis 1 can be reduced by altering the parameter values.
Installation of additional mechanical stops or safe supervision is recommended.
See [Working range alterations on page 62.](#)

2 Technical data for IRB 7710

2.1.5 Robot motion

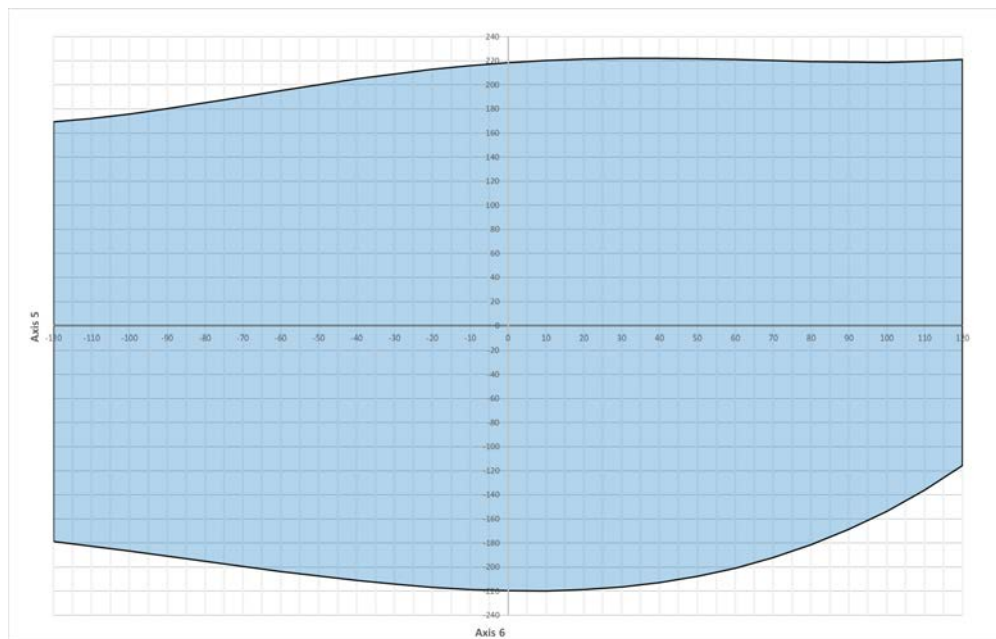
2.1.5 Robot motion

Limitations of robot movements for LeanID

Robot variants with LeanID have restricted working range implemented in RobotWare. See [Working range on page 42](#).

Working range limitations, axis 5 and axis 6 for IRB 7710-400/2.85 LID, IRB 7710-390/3.1 LID, IRB 7710-325/3.3 LID, IRB 7710-280/3.5 LID (option axis 3-6 [3326-x])

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



xx2400000285



Note

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

Working range limitations, axis 2 and axis 3 for IRB 7710-400/2.85 LID

When upper arm DressPack is installed on IRB 7710-400/2.85 LID, there is a collision risk between the cables and the lower arm. The working range is therefore

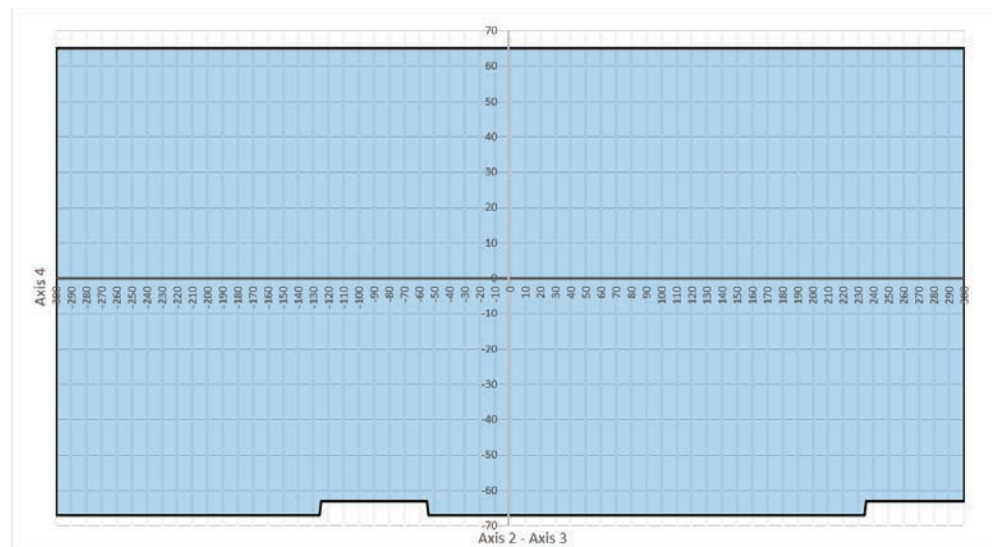
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limited for the combined movement of axes 2 and 3 depending on the axis 4 position.



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The allowed working area for axis 2 and 3 related to axis 4 position is shown in the figure below. The X-axis shows the angle of axis 4, and the Y-axis shows the difference between the angles of axis 2 and axis 3 (axis 2 minus axis 3).



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Note

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

Variant	A	B	C	D	E	F	G	H	R1a	R1b	R1c	R3	R4	R5
IRB 7710-430/3.1	1,448	245	398	475	225	362	100	132	774	647	720	601	258	518
IRB 7710-360/3.3	1,708	245	398	475	225	362	100	132	774	647	720	601	258	518
IRB 7710-310/3.5	1,918	245	398	475	225	362	100	132	774	647	720	601	258	518
IRB 7710-400/2.85 LID	1,218	400	398	475	225	362	100	132	774	647	720	601	258	518
IRB 7710-390/3.1 LID	1,448	400	398	475	225	362	100	132	774	647	720	601	258	518
IRB 7710-325/3.3 LID	1,708	400	398	475	225	362	100	132	774	647	720	601	258	518
IRB 7710-280/3.5 LID	1,918	400	398	475	225	362	100	132	774	647	720	601	258	518

Extra load on the robot

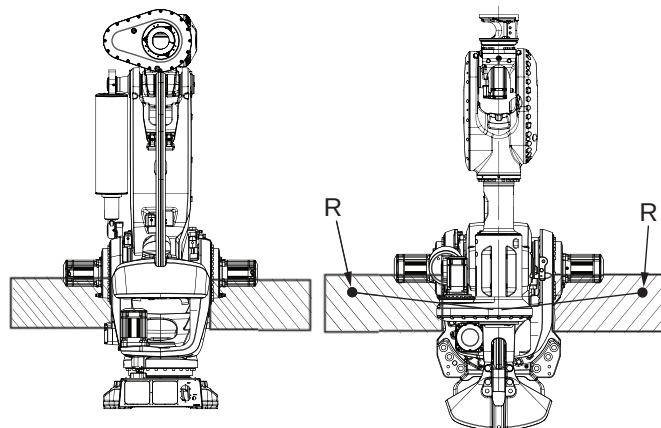
Extra loads can be mounted on robot. Definitions of dimensions and masses are shown in the following figures. The robot is supplied with holes for fitting extra equipment.

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	$J_H = 100 \text{ kgm}^2$
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 ($\leq 250 \text{ kg}$)



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Upper arm

The figure shows the position for a nominal extra load of 50 kg on the upper arm housing on a standard robot. For more precise calculations of allowed extra load

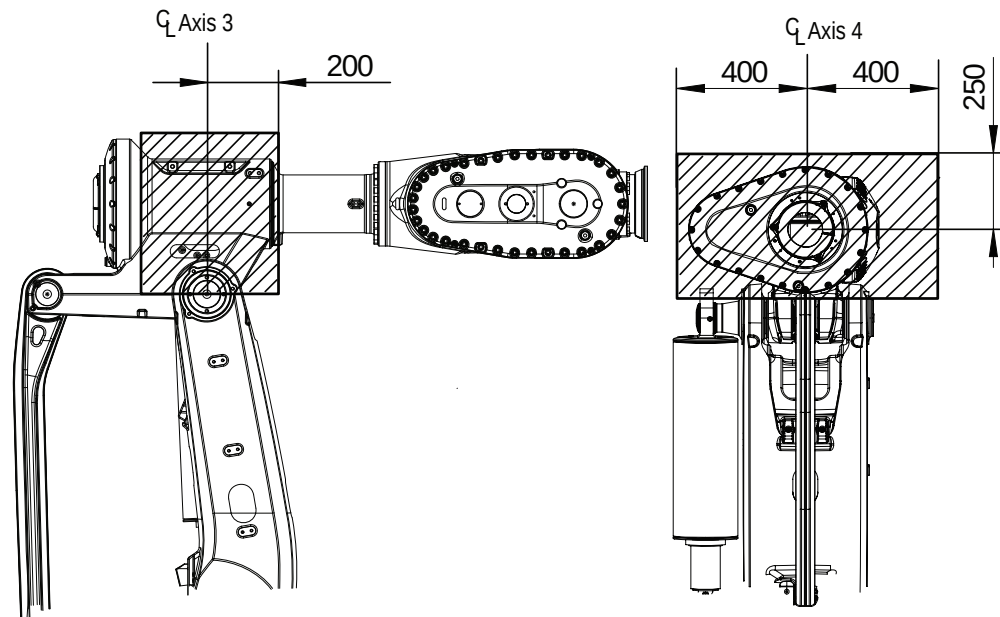
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2 Technical data for IRB 7710

2.2 Fitting equipment on the robot (robot dimensions)

Continued

up to maximum 200 kg in combination with the reduced payload, use RobotStudio add-in RobotLoad or contact ABB.



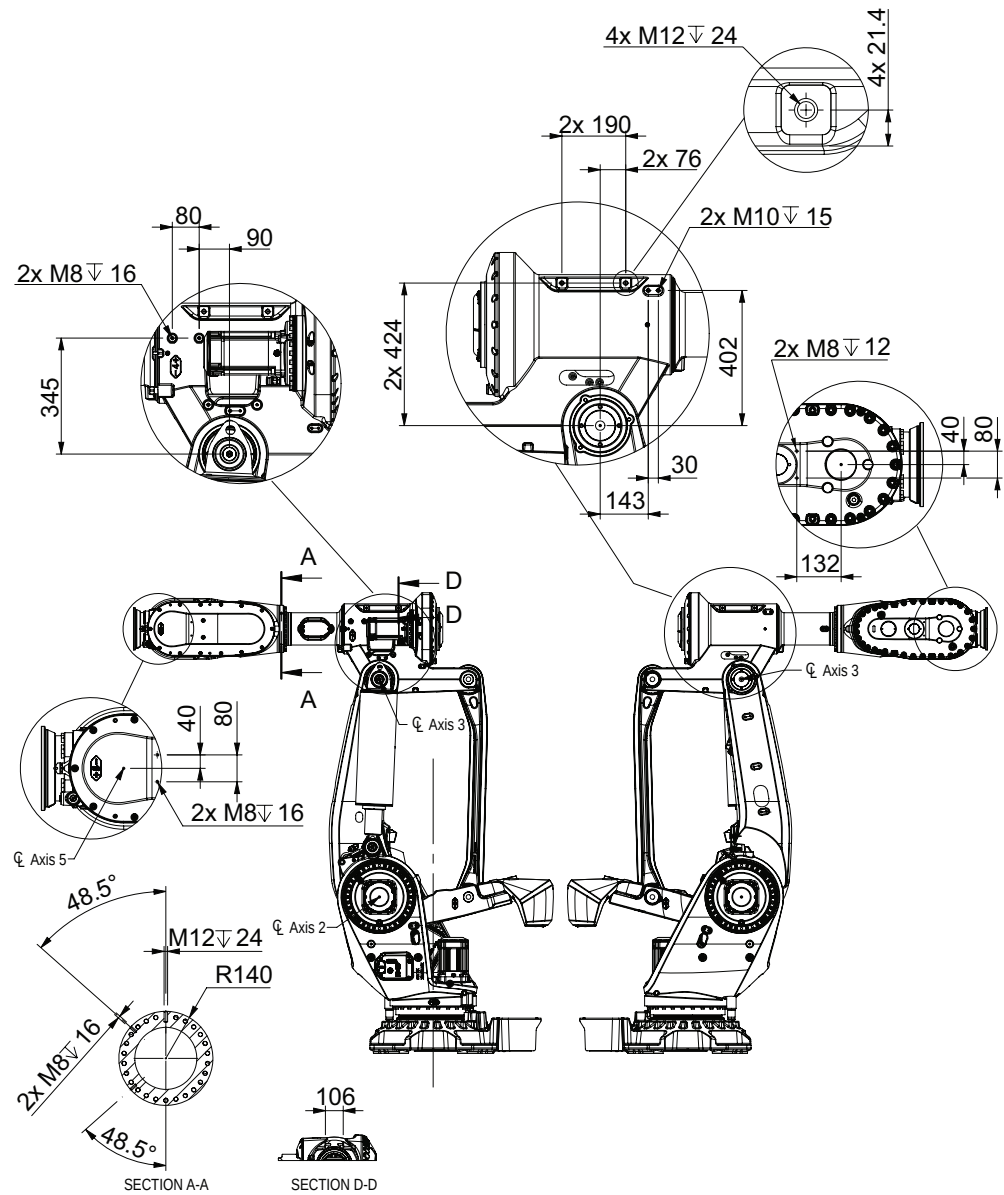
xx2400000248

Attachment holes for fitting extra equipment

The robot is supplied with holes for fitting extra equipment.

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Upper arm



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Tool flange dimensions

Robot variant	Tool flange dimension
IRB 7710-500/2.85 IRB 7710-430/3.1 IRB 7710-360/3.3 IRB 7710-310/3.5	xx2400000274
IRB 7710-400/2.85 LID IRB 7710-390/3.1 LID IRB 7710-325/3.3 LID IRB 7710-280/3.5 LID	xx2400000275

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 Technical data for IRB 7710

2.3 Mechanical data for installation

2.3 Mechanical data for installation

Detailed installation instructions

All detailed installation instructions are found in *Product manual - IRB 7710*.

Attachment screws

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

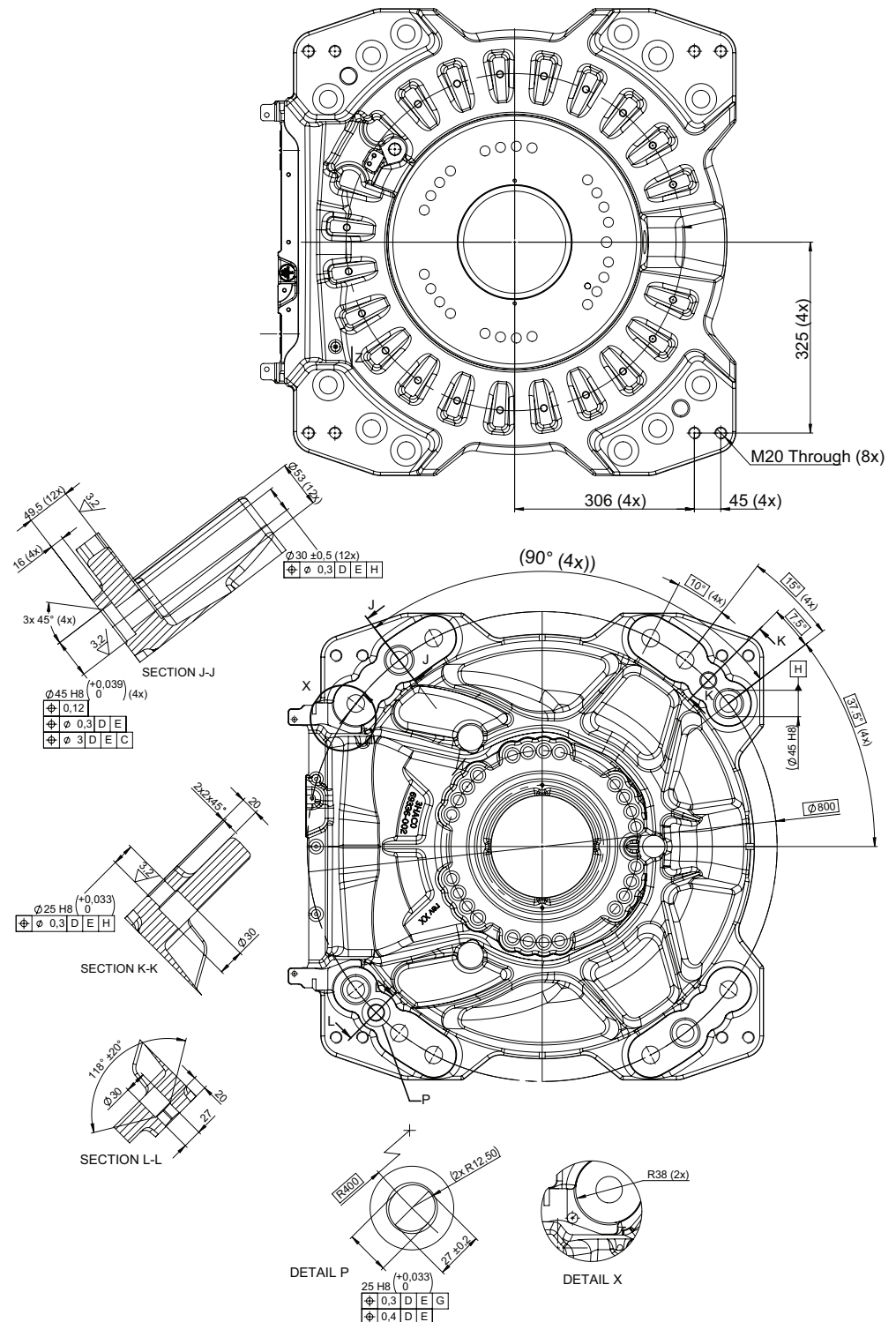
Suitable screws	M24 x 100
Quantity	12 pcs
Quality	8.8
Suitable washer	4 mm flat washer
Guide pins	Locating pin: 3HAC051645-001 (2 pcs) Locating pins are required if mounting the manipulator to a track motion or to a base plate. Locating pins are also required for robots with option Absolute Accuracy. For more information, see Base plate, locating pins on page 58 .
Tightening torque	550 Nm (screws lubricated with Molykote 1000) 600-725 Nm, typical 650 Nm (screws none or lightly lubricated)
Screw tightening yield point utilization factor (v) (according to VDI2230)	90% (v=0.9)
Level surface requirements	0.3 mm ⁱ

ⁱ See [Requirements, foundation on page 27](#).

Continues on next page

Hole configuration, base

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



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2.4 Installing a 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

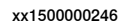


Note

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

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The following figure shows the dimensions for a base plate (dimensions in mm).



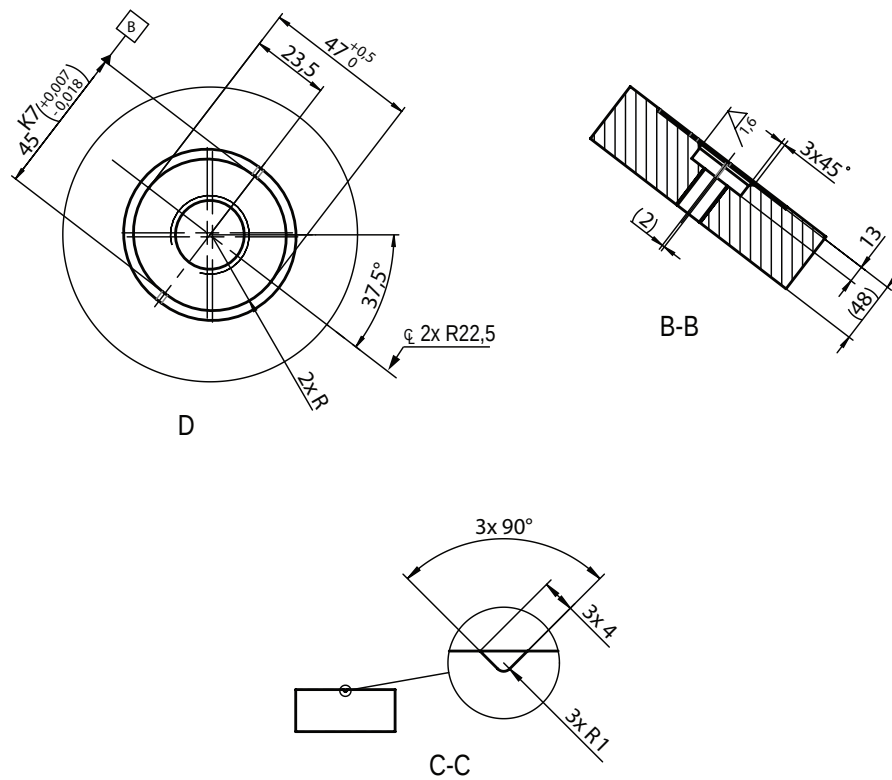
Pos	Description
A, B	Hole for locating pins, see <i>Base plate, locating pins on page 58</i>
E, F, G, H	Common tolerance zone (accuracy all over the base plate from one contact surface to the other)

Product specification - IRB 7710
3HAC089603-001 Revision: H

2 Technical data for IRB 7710

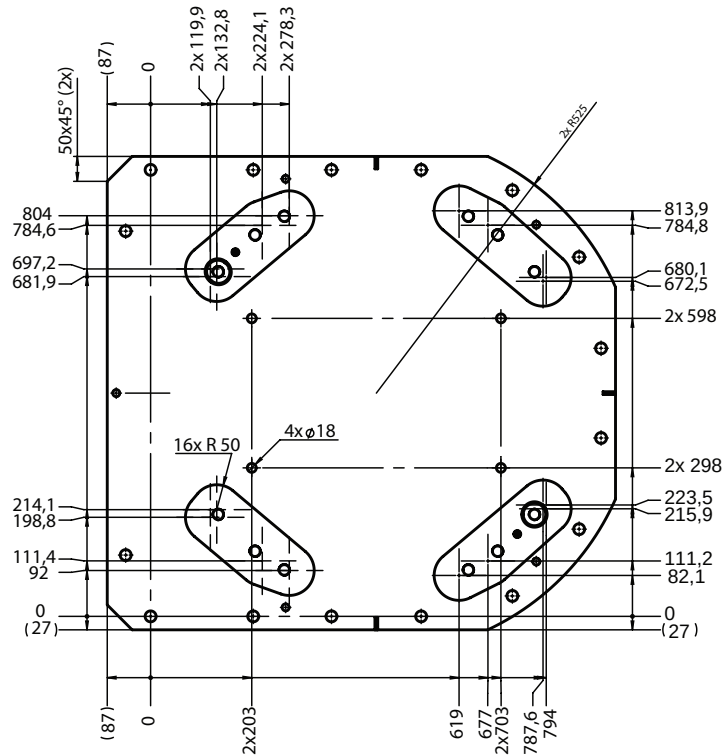
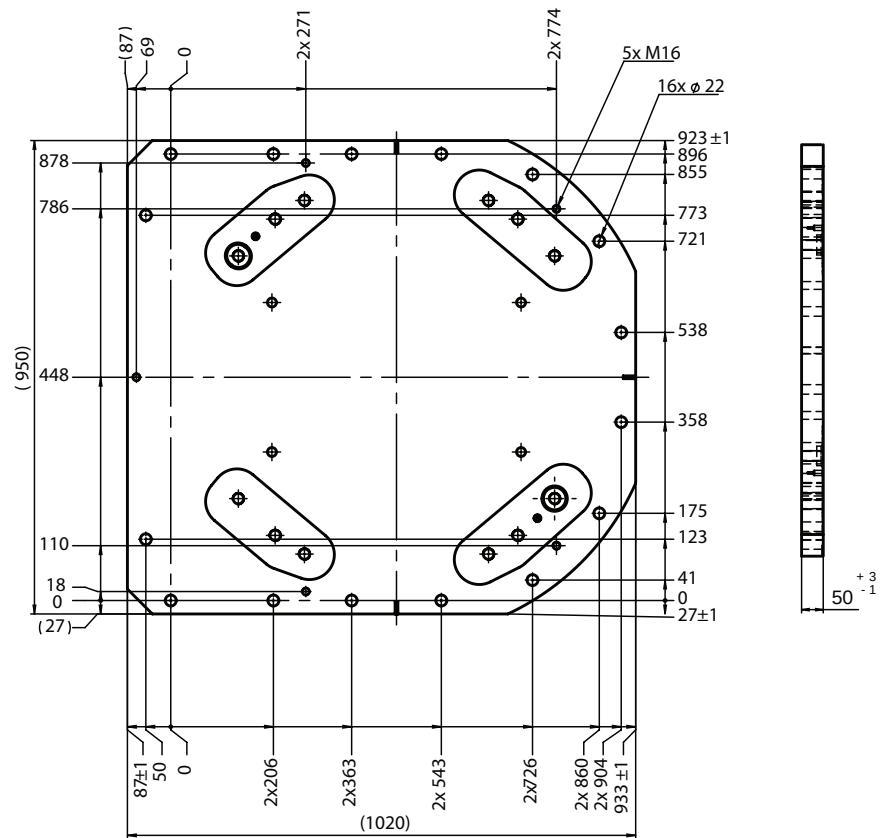
2.4 Installing a base plate

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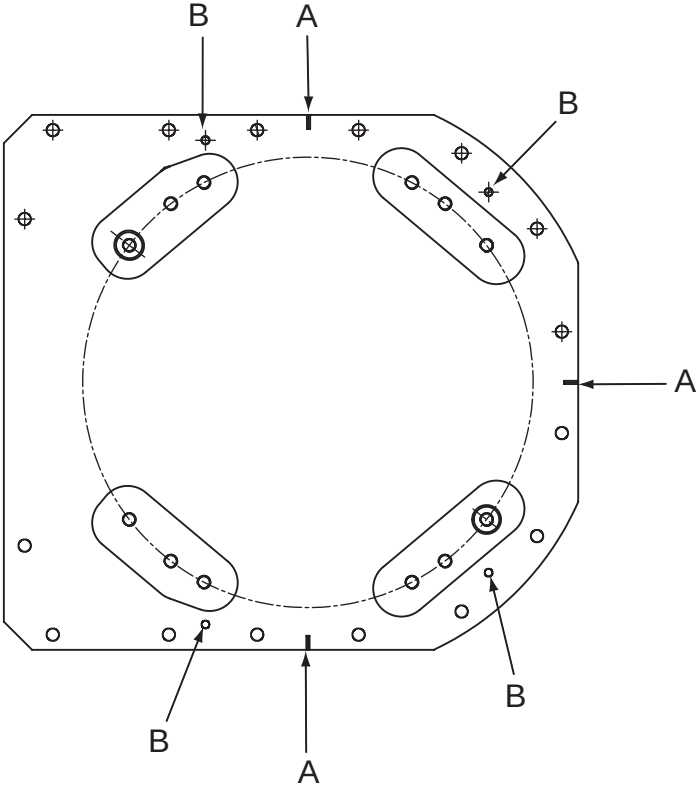
2 Technical data for IRB 7710

2.4 Installing a base plate

Continued

Base plate, orienting grooves and leveling bolts

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



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

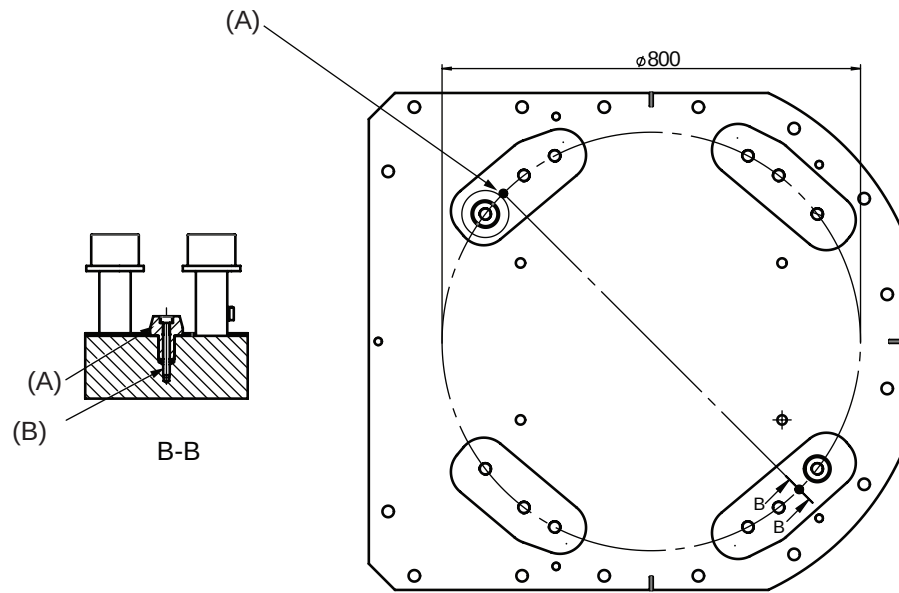
Base plate, locating pins

Locating pins are the recommended positioning components and especially required for robots with option Absolute Accuracy.

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Assembly of locating pins

The figure below shows the locating pins installed in the base plate.



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Pos	Description
A	Locating pin: 3HAC051645-001 (2 pcs)
B	M5 x 40. Tightening torque 6 Nm. (x2)

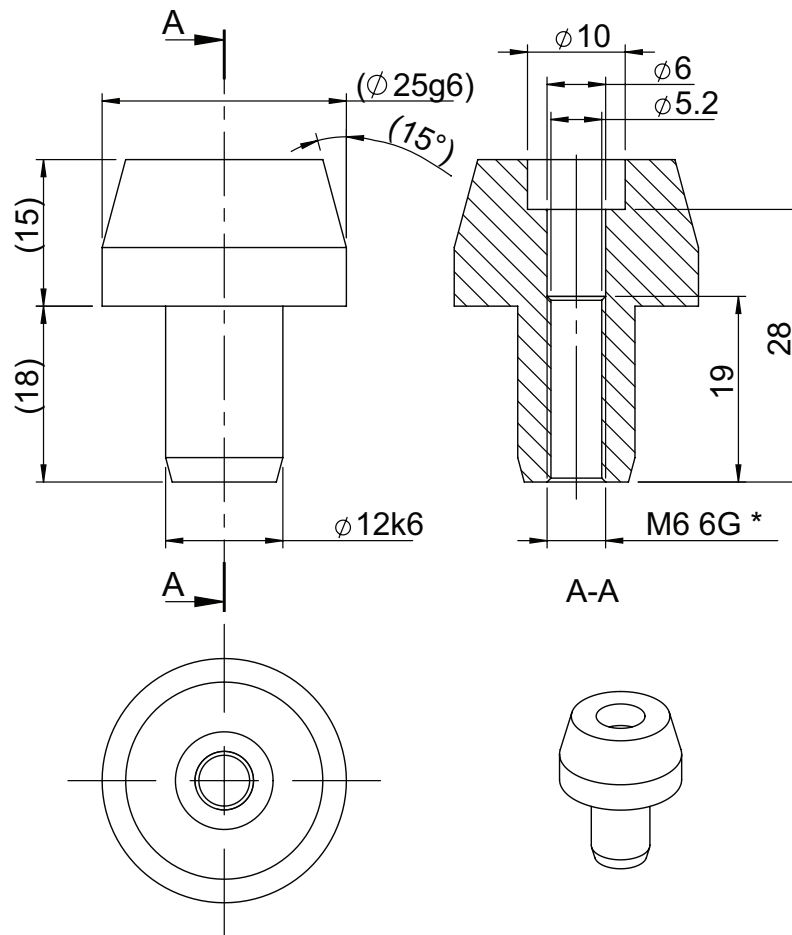
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2 Technical data for IRB 7710

2.4 Installing a base plate

Continued

Dimension of locating pins (guide pins)



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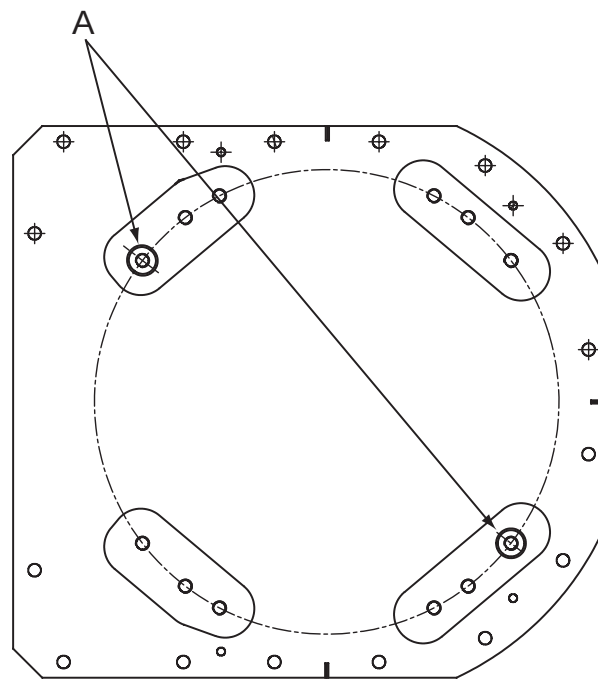
Pos	Description
-	Cylindrical guide pin (Requires attachment screws, see Assembly of locating pins on page 59.)
*	Threaded M6 hole that can be used for removal of the locating pin, for example with a slide hammer.

Base plate, guide sleeve holes

Guide sleeves are not recommended for robots with option Absolute Accuracy.

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

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A	Guide sleeve holes (2 pcs)
---	----------------------------

2.5 Working range alterations

2.5.1 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.



Note

If safe supervision is used, then use the robot stopping distance and time data to determine the requirements on restricted space. See the product specification for the manipulator.

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 42](#).

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

Continues on next page

Axis	Fixed mechanical stop ⁱ	Movable mechanical stop ⁱⁱ
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.

2.5.2 Installing movable mechanical stops on axis 1 (option 3323-1)

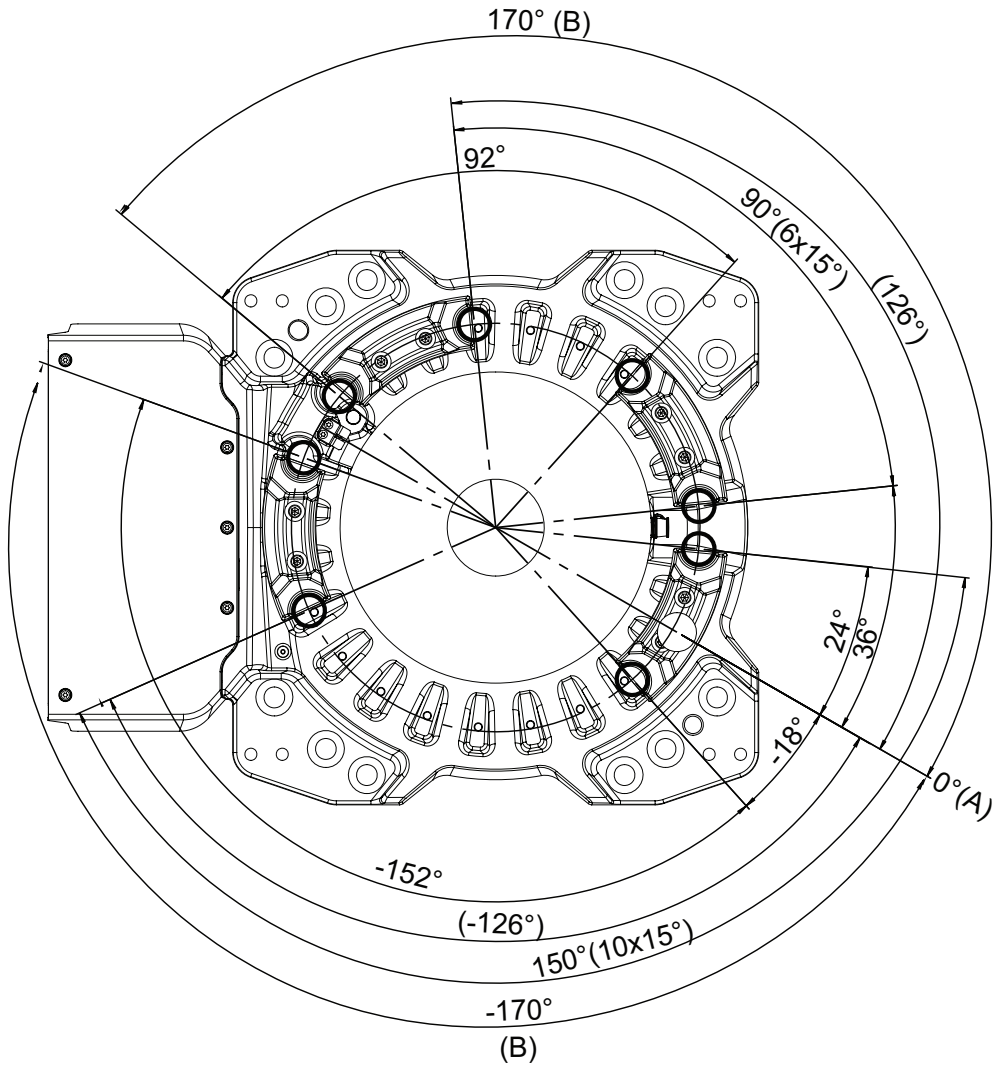
Reduction of the axis-1 working range

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°	between +24° to +126° in one direction, and -18° to -126° in the other direction

Illustration, reduced working range



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A	Axis 1 position
B	Standard working range without limitations

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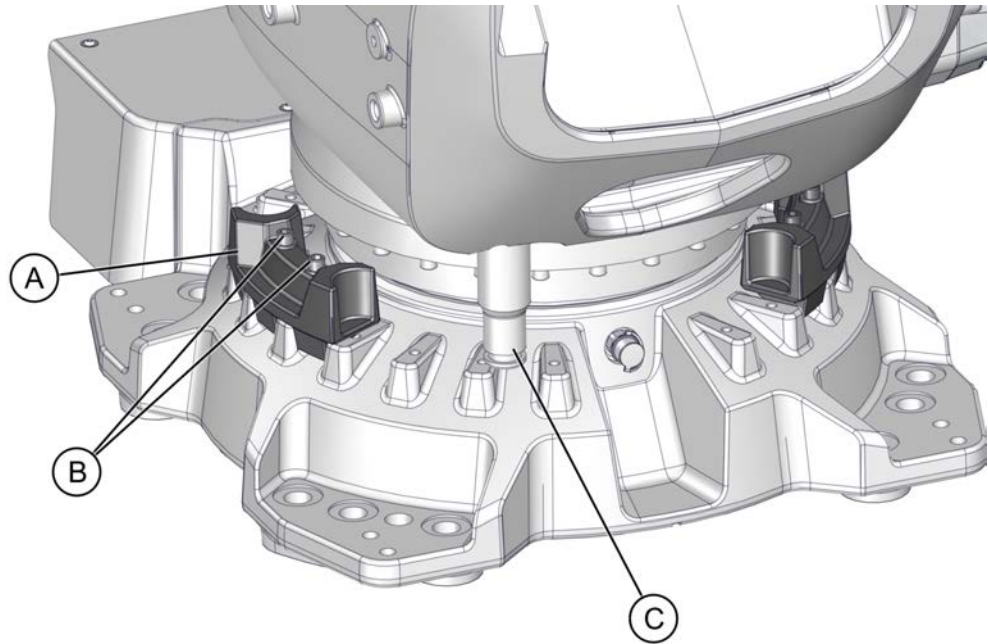


WARNING

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.

Location of the mechanical stops

The mechanical stops are located as shown in the figure.



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A	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

Installing the movable mechanical stops

See the product manual for installation procedure.

2 Technical data for IRB 7710

2.6.1 Calibration methods

2.6 Calibration and references

2.6.1 Calibration methods

Overview

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

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 serial measurement board (SMB) or other robot memory. A robot calibrated with Absolute accuracy has the option information printed on its name plate (OmniCore). To regain 100% Absolute accuracy performance, the robot must be recalibrated for absolute accuracy after repair or maintenance that affects the mechanical structure.	CalibWare
Optimization	Optimization of TCP reorientation performance. The purpose is to improve reorientation accuracy for continuous processes like welding and gluing. Wrist optimization will update standard calibration data for axes 4 and 5.  Note For advanced users, it is also possible to do the wrist optimization using the RAPID instruction <code>WristOpt</code> , see <i>Technical reference manual - RAPID Instructions, Functions and Data types</i> . This instruction is only available for OmniCore robots.	Wrist Optimization

Continues on next page

Brief description of calibration methods

Axis Calibration method

Axis Calibration is a standard calibration method for calibration of IRB 7710. 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.

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.

Wrist Optimization method

Wrist Optimization is a method for improving reorientation accuracy for continuous processes like welding and gluing and is a complement to the standard calibration method.

The actual instructions of how to perform the wrist optimization procedure is given on the FlexPendant.

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 Technical data for IRB 7710

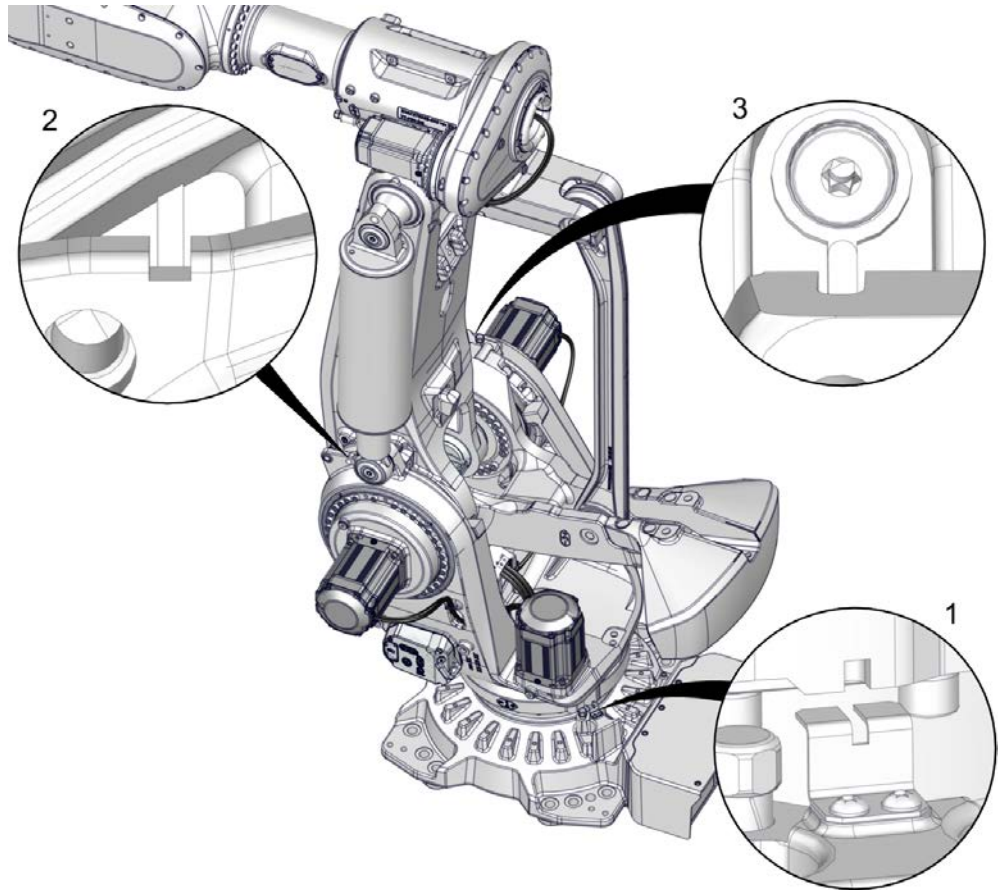
2.6.2 Synchronization marks and synchronization position for axes

2.6.2 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 7710, IRB 7720

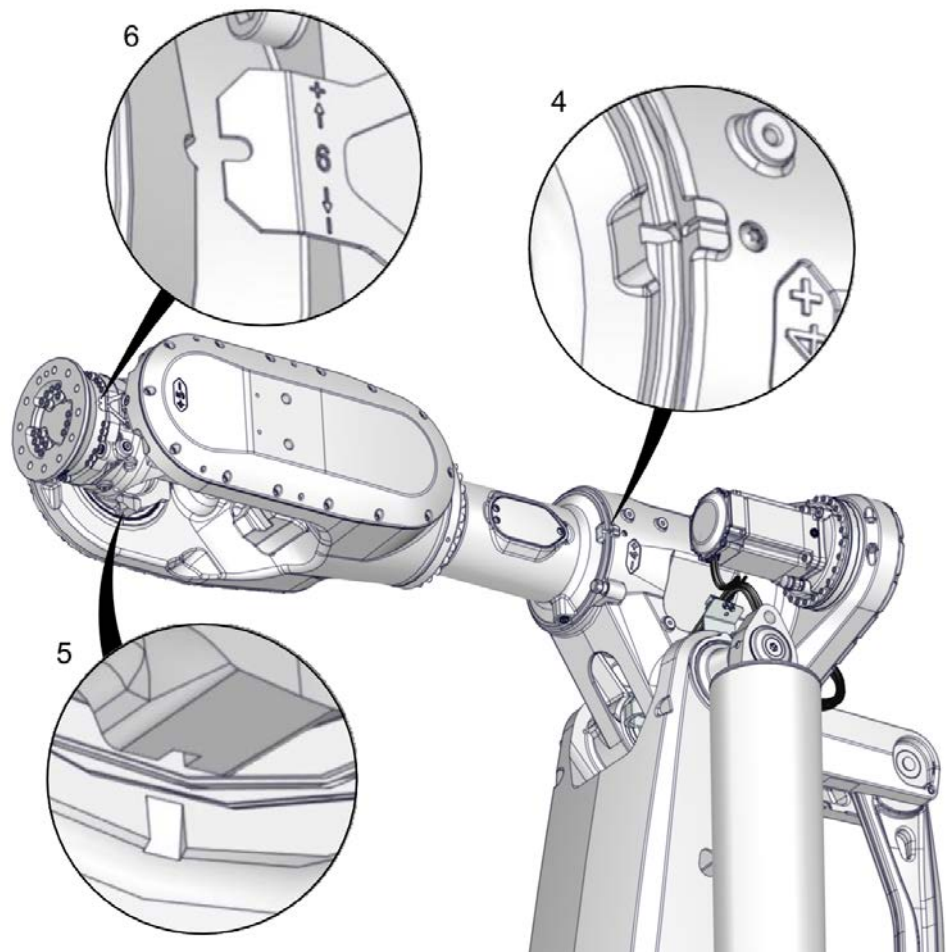


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2.6.2 Synchronization marks and synchronization position for axes

Continued



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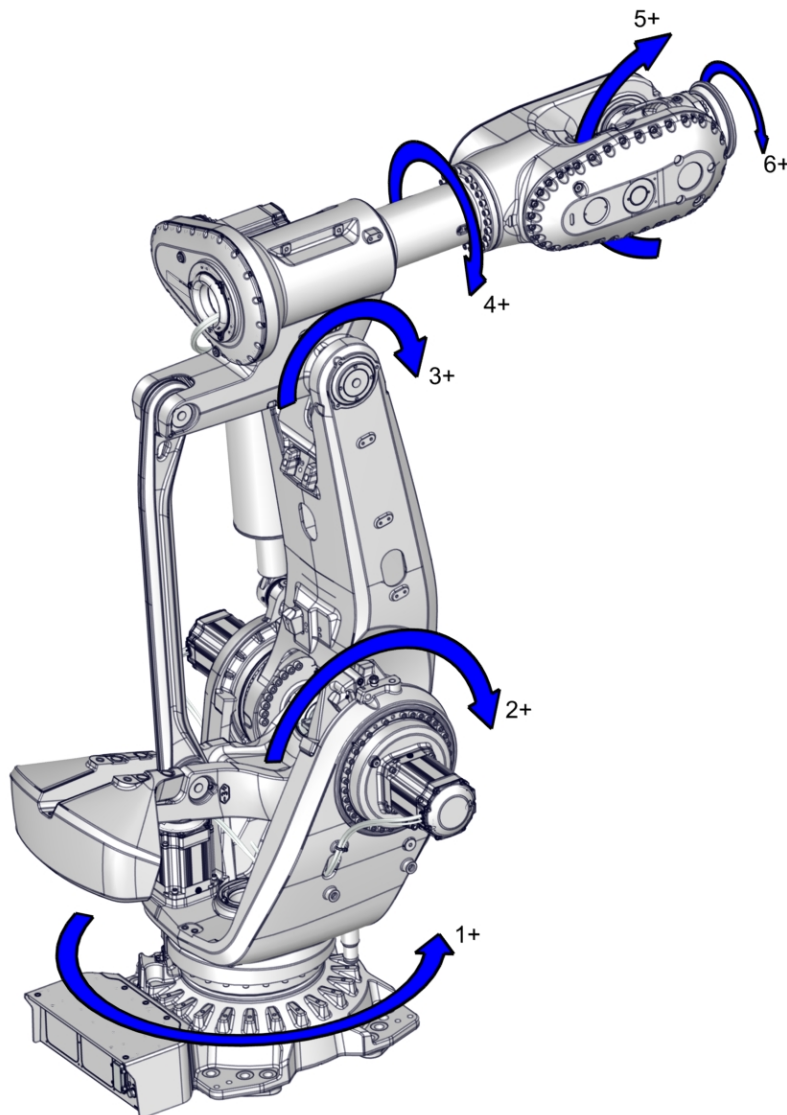
2.6.3 Calibration movement directions for all axes

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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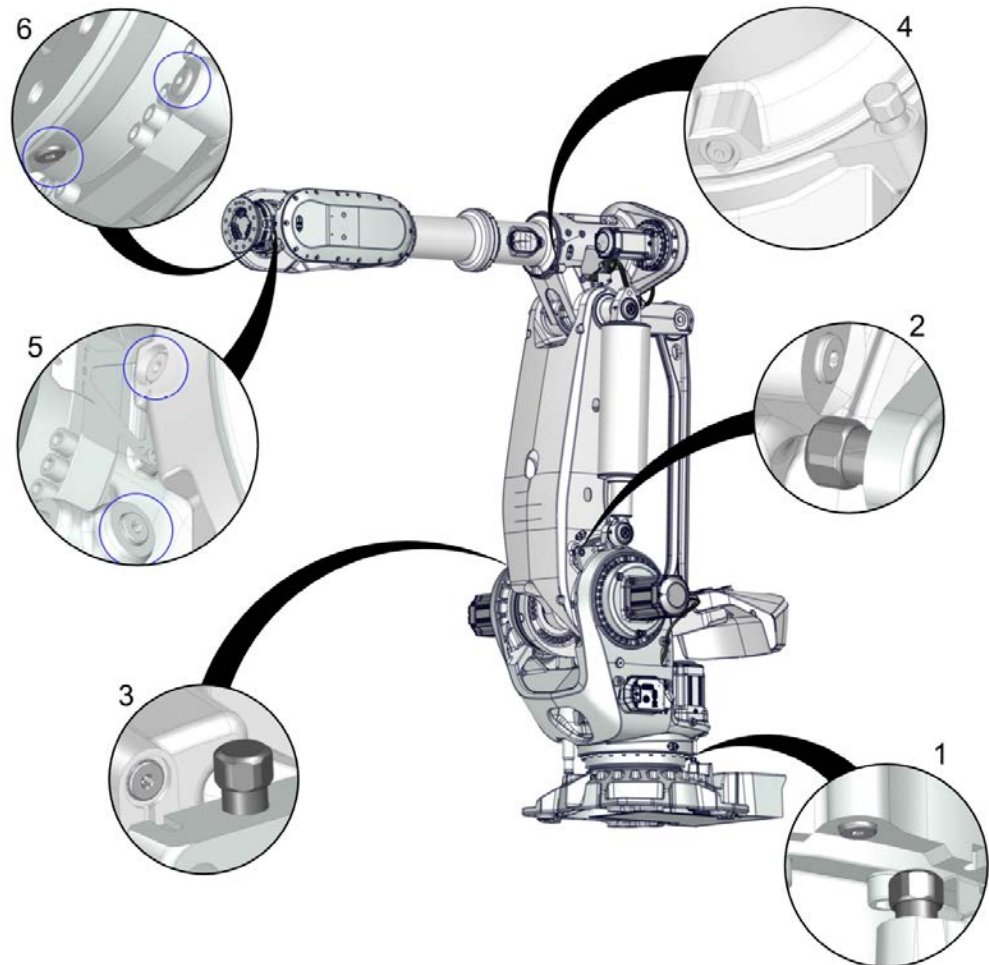
2.6.4 Fine calibration

Recommended method

Fine calibration for the IRB 7710 is done with the Axis Calibration method.

Installation locations for the calibration tools

The figure shows the locations for the fixed calibration pins and/or bushings on each axis. Installed calibration tools are not shown.



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More information about the Axis Calibration method is found in the product manual for the manipulator.

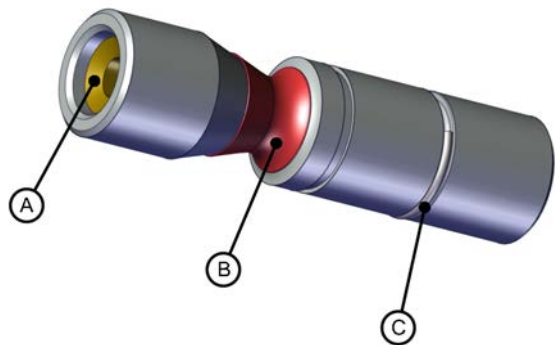
2.6.5 Calibration tools for Axis Calibration

Calibration tools



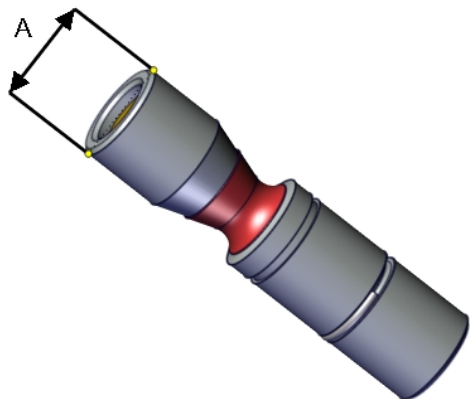
WARNING

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 $\varnothing 12g4$ mm, $\varnothing 8g4$ mm or $\varnothing 6g5$ mm (depending on calibration tool size).
- Straightness within 0.005 mm.

2.6.6 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:

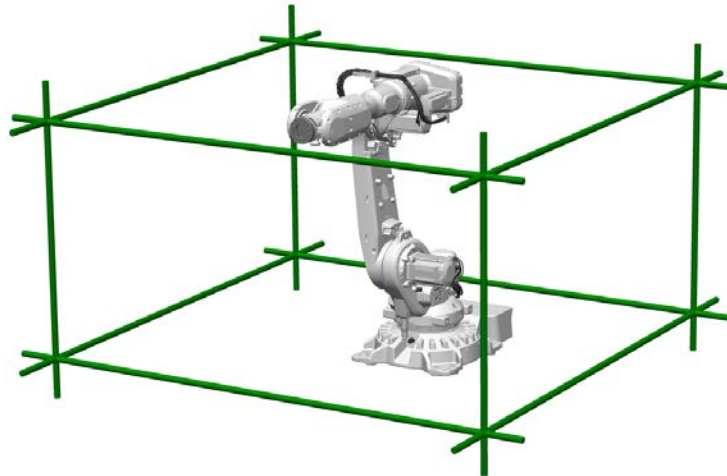
- Exchangeability of robots
- Offline programming with no or minimum touch-up
- Online programming with accurate movement and reorientation of tool
- Programming with accurate offset movement in relation to eg. vision system or offset programming
- Re-use of programs between applications

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.



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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

2 Technical data for IRB 7710

2.6.6 Absolute Accuracy calibration

Continued

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.

2.7 Load diagrams

2.7.1 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
- controller drive system



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.

Nominal payload inertia and extra load

The load diagram for each robot variant includes a nominal payload inertia (J_0), as specified in the table.

Robot variant	Nominal payload inertia, J_0	Extra load
IRB 7710-500/2.85 IRB 7710-430/3.1 IRB 7710-360/3.3 IRB 7710-310/3.5	35 kgm ²	50 kg
IRB 7710-400/2.85 LID IRB 7710-390/3.1 LID IRB 7710-325/3.3 LID IRB 7710-280/3.5 LID	35 kgm ²	LeanID SW

At different moment of inertia the load diagram will be changed.

Continues on next page

2 Technical data for IRB 7710

2.7.1 Introduction

Continued

Control of load case by "RobotLoad"

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

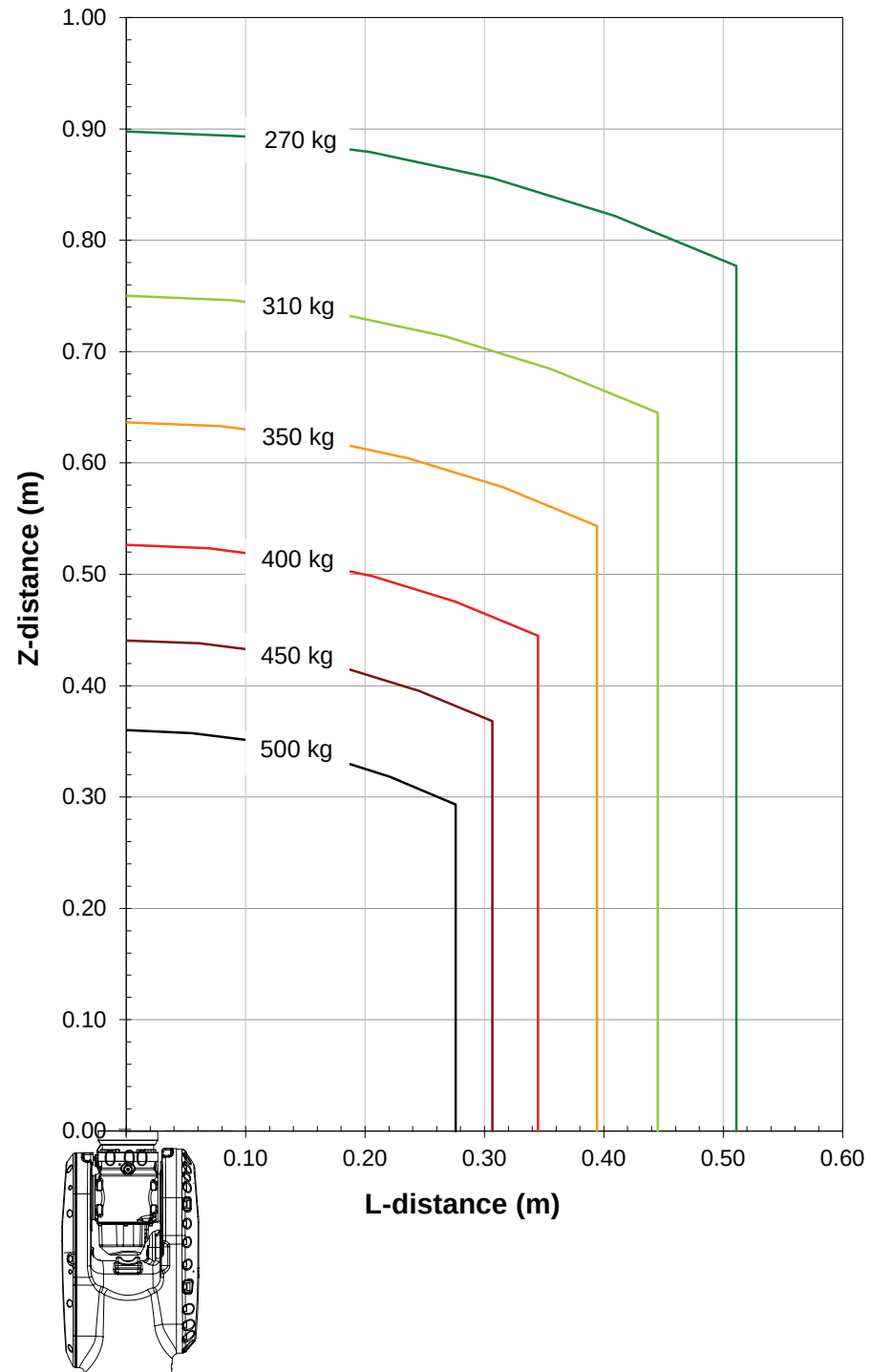
The result from RobotLoad is only valid within the maximum loads and tilt angles.

There is no warning if the maximum permitted arm load is exceeded. For over-load cases and special applications, contact ABB for further analysis.

2.7.2 Diagrams

Diagrams of IRB 7710-500/2.85

Arm load for upper arm: 50 kg.



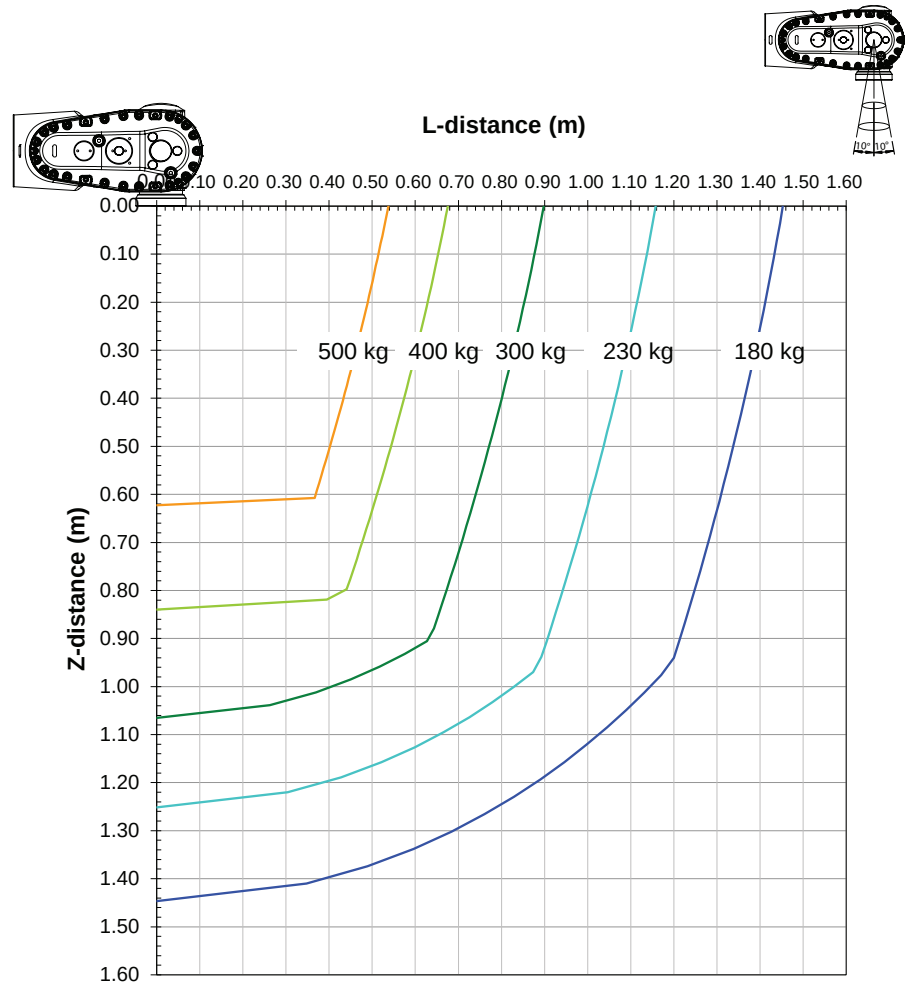
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2 Technical data for IRB 7710

2.7.2 Diagrams
Continued

Diagrams of IRB 7710-500/2.85"Vertical Wrist" ($\pm 10^\circ$)
Arm load for upper arm: 50 kg.



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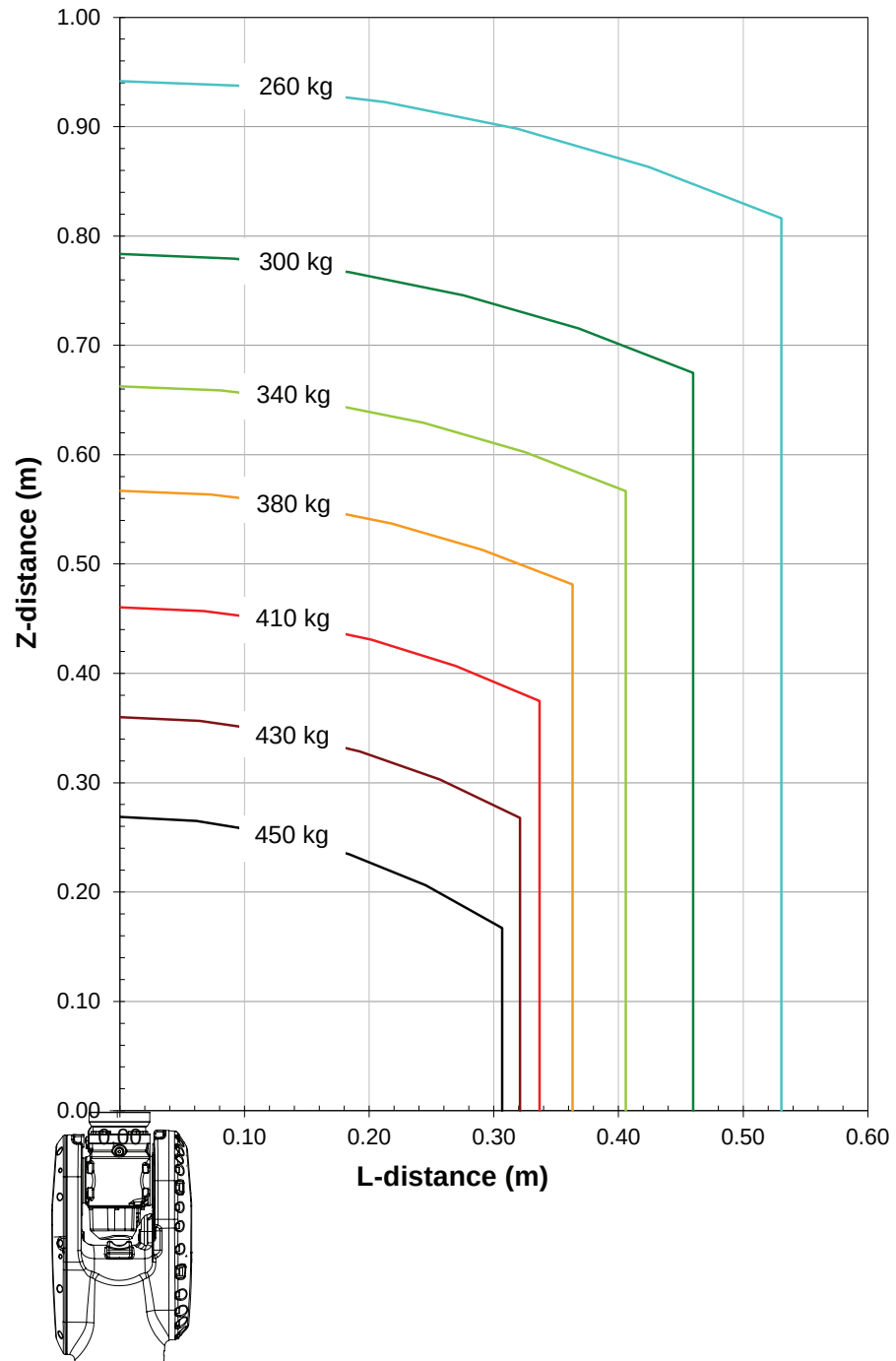
For wrist down (0° deviation from the vertical line).

	Description
Max load	550 kg
Z _{max}	0.544 m
L _{max}	0.473 m

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Diagrams of IRB 7710-430/3.1

Arm load for upper arm: 50 kg.



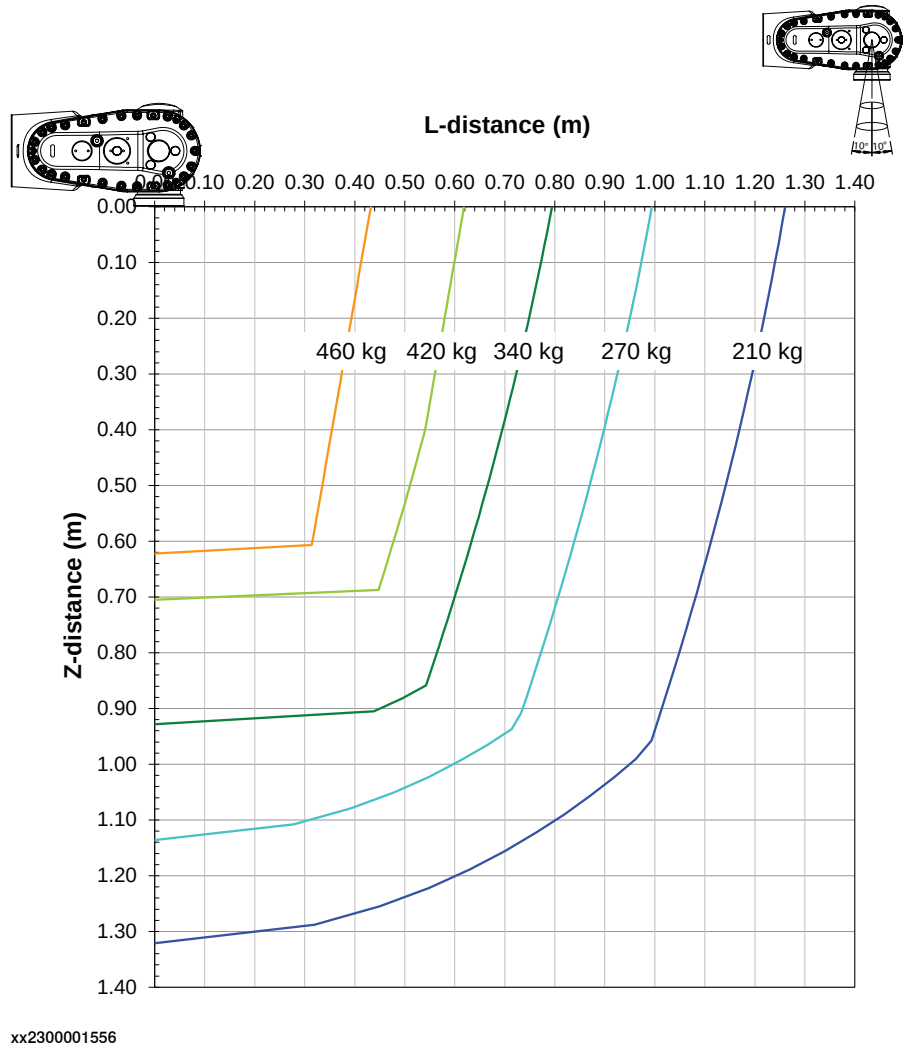
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2 Technical data for IRB 7710

2.7.2 Diagrams
Continued

Diagrams of IRB 7710-430/3.1"Vertical Wrist" ($\pm 10^\circ$)
Arm load for upper arm: 50 kg.



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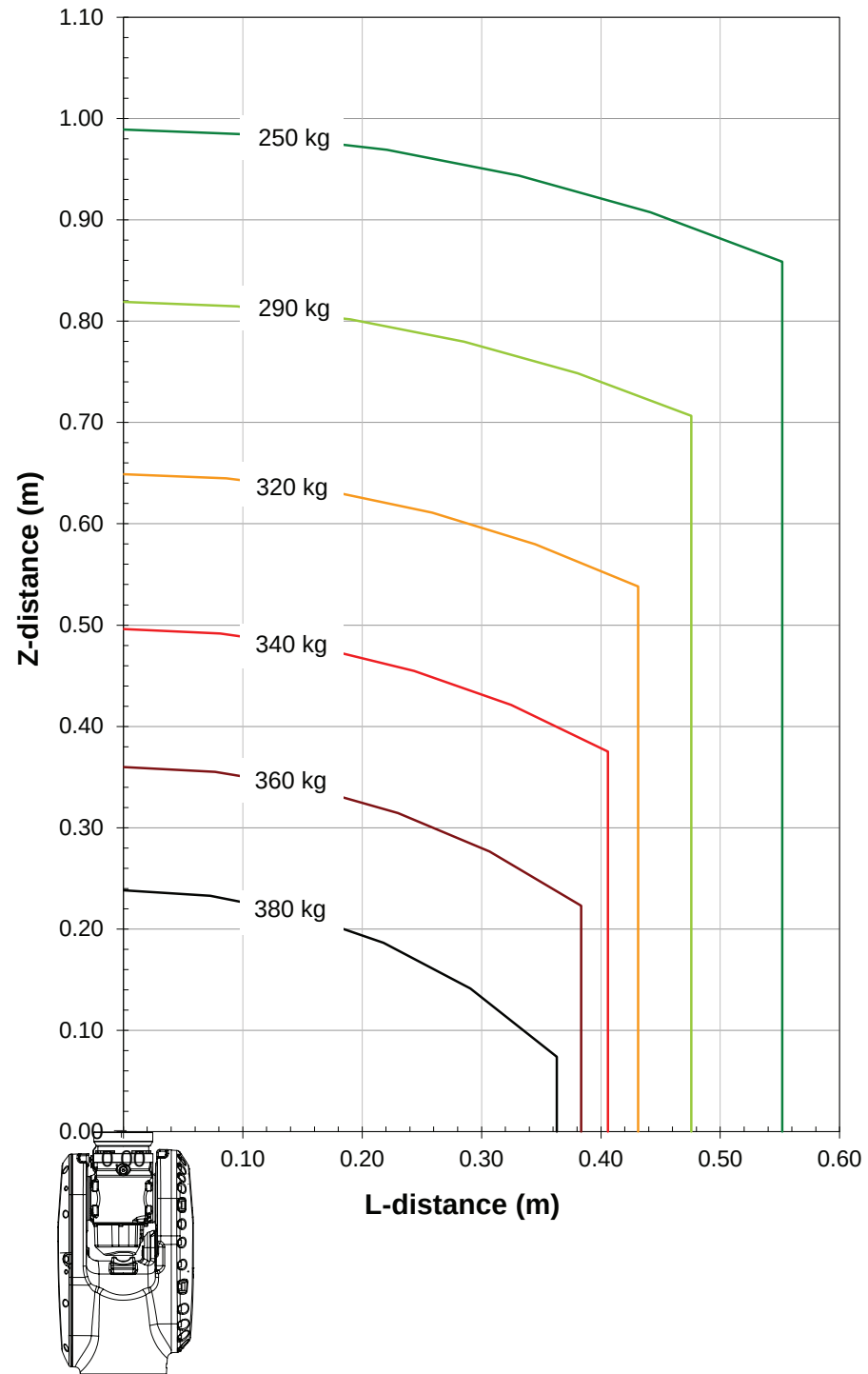
For wrist down (0° deviation from the vertical line).

	Description
Max load	520 kg
Z _{max}	0.522 m
L _{max}	0.283 m

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Diagrams of IRB 7710-360/3.3

Arm load for upper arm: 50 kg.



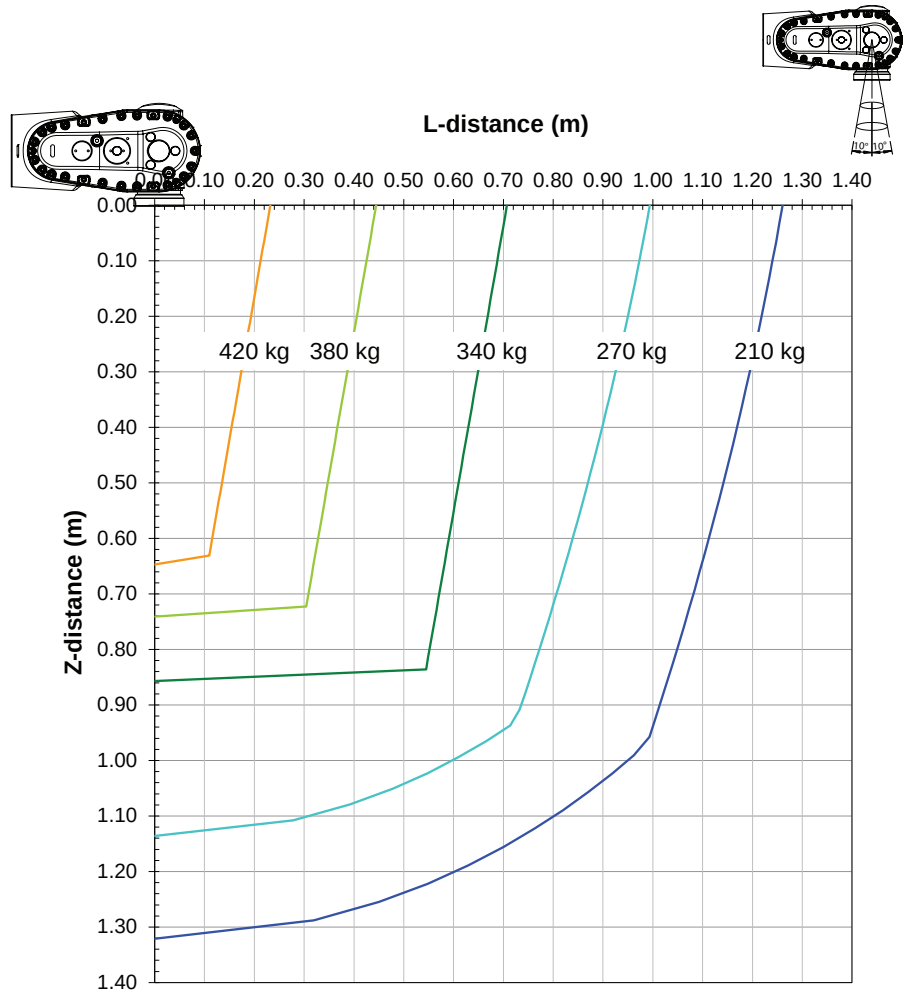
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2 Technical data for IRB 7710

2.7.2 Diagrams
Continued

Diagrams of IRB 7710-360/3.3 ("Vertical Wrist" ($\pm 10^\circ$))
Arm load for upper arm: 50 kg.



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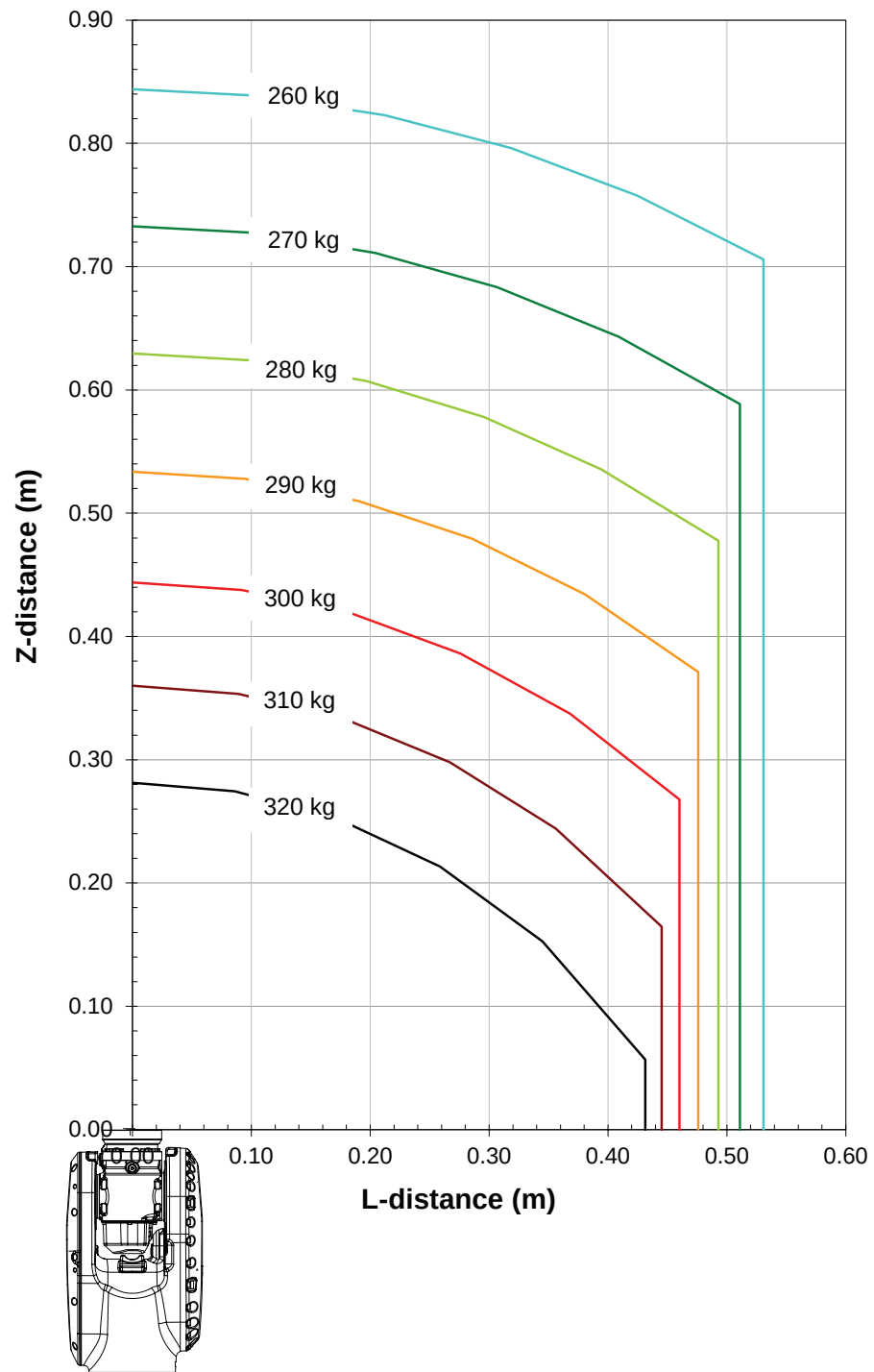
For wrist down (0° deviation from the vertical line).

	Description
Max load	485 kg
Z _{max}	0.528 m
L _{max}	0.043 m

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Diagrams of IRB 7710-310/3.5

Arm load for upper arm: 50 kg.



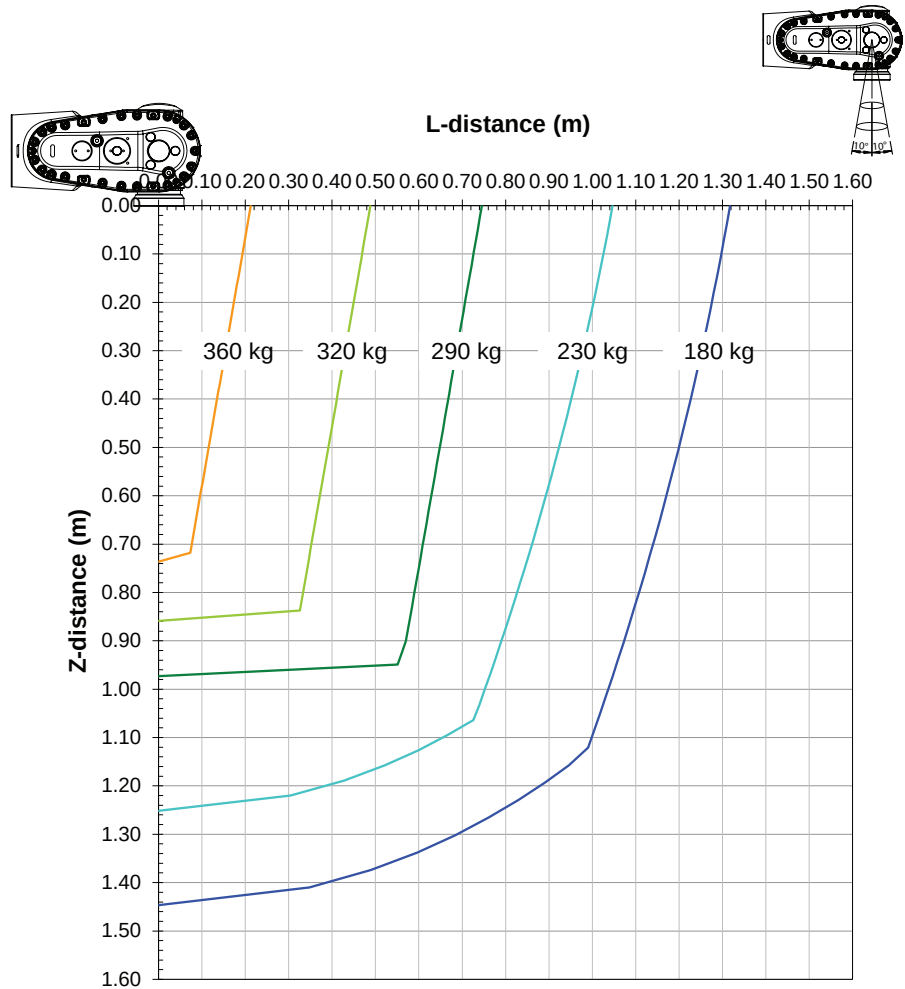
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2 Technical data for IRB 7710

2.7.2 Diagrams
Continued

Diagrams of IRB 7710-310/3.5 ("Vertical Wrist" ($\pm 10^\circ$))
Arm load for upper arm: 50 kg.



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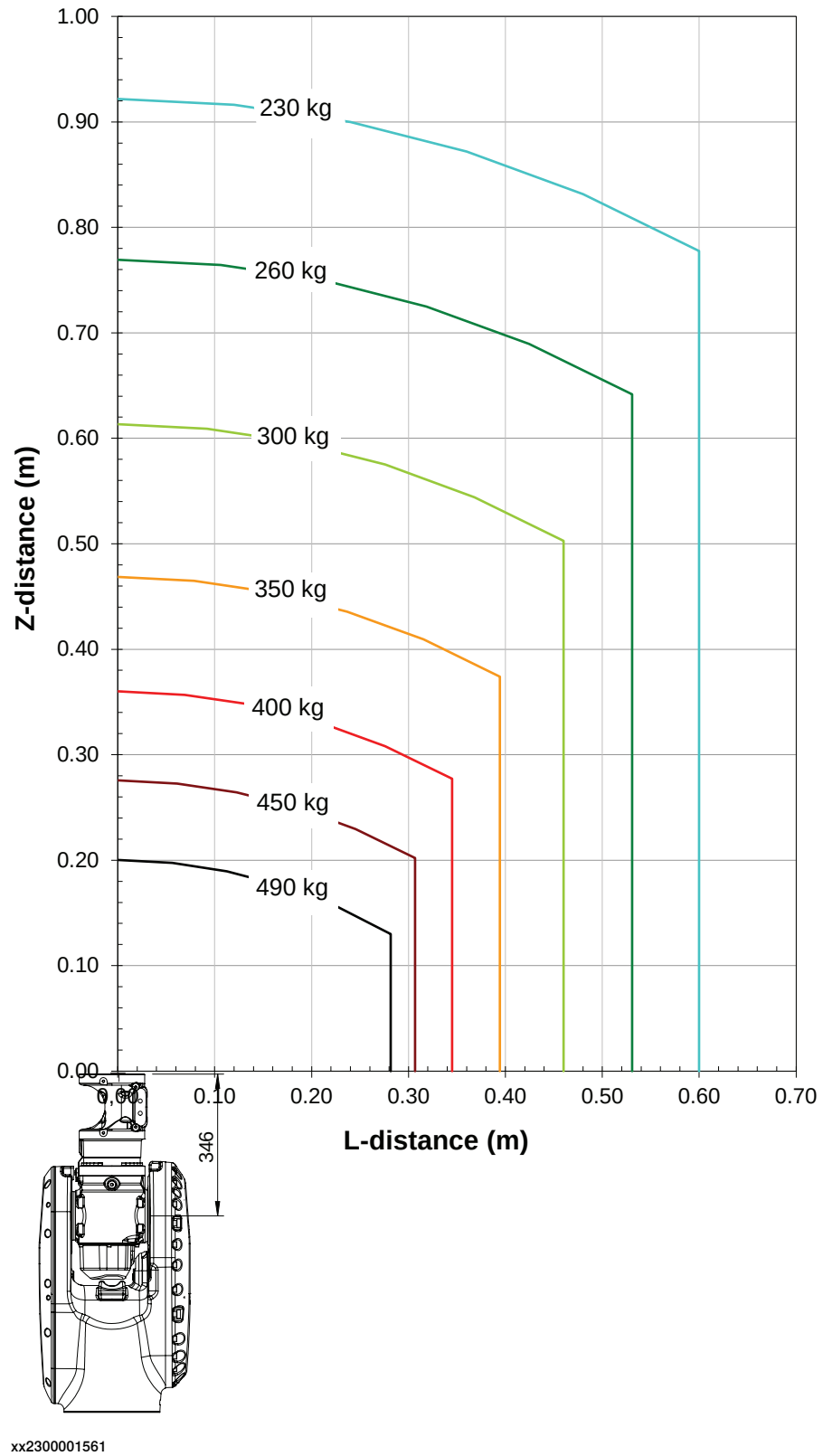
For wrist down (0° deviation from the vertical line).

	Description
Max load	405 kg
Z _{max}	0.627 m
L _{max}	0.056 m

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Diagrams of IRB 7710-400/2.85 LID

With option [3326-x]. Arm load: LeanID SW.

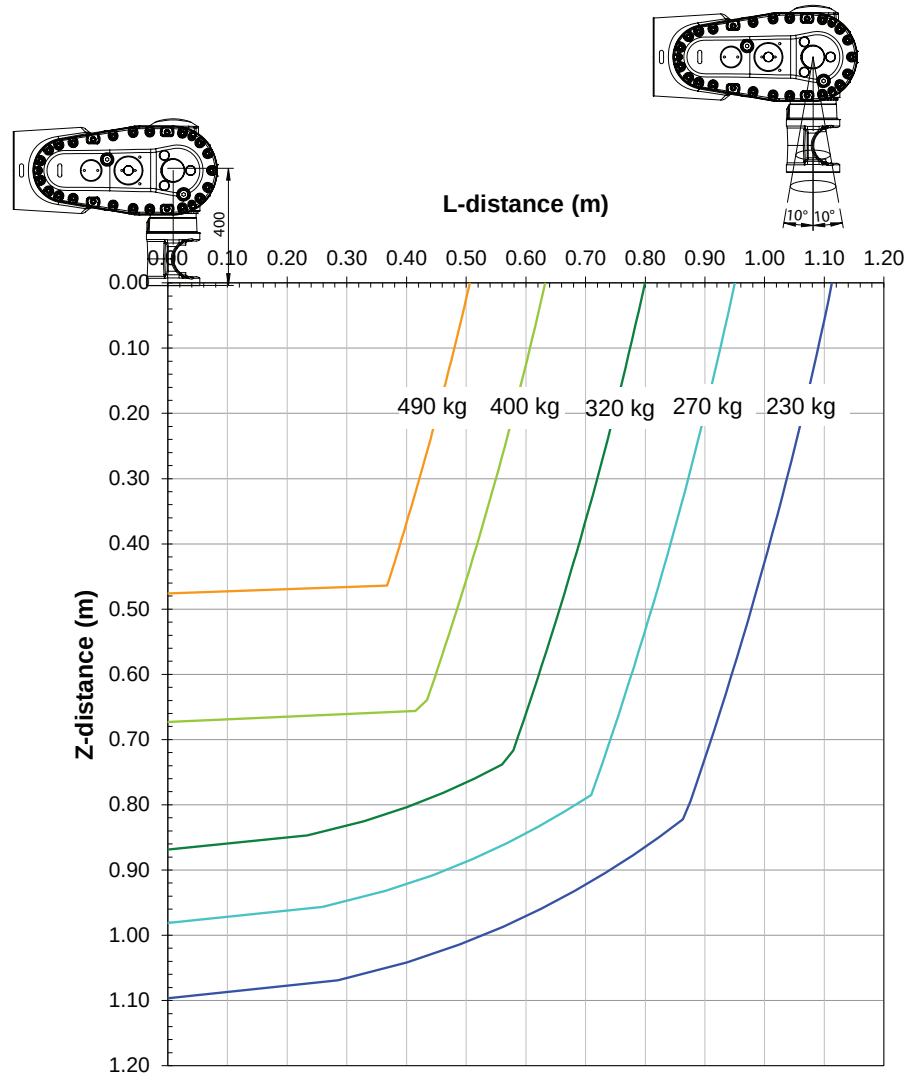


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2 Technical data for IRB 7710

2.7.2 Diagrams
Continued

Diagrams of IRB 7710-400/2.85 LID ("Vertical Wrist" ($\pm 10^\circ$))
With option [3326-x]. Arm load: LeanID SW.



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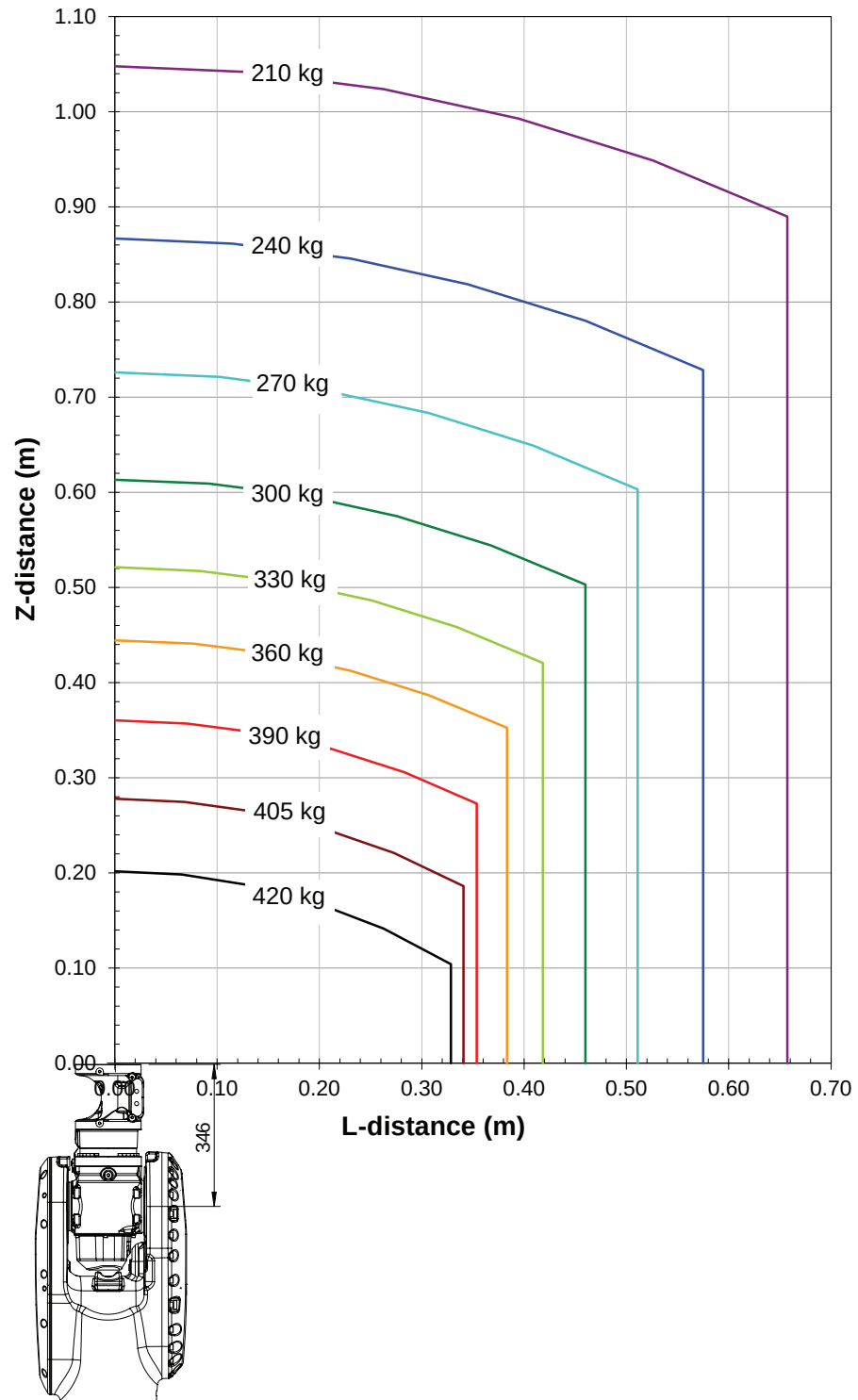
For wrist down (0° deviation from the vertical line).

	Description
Max load	490 kg
Z _{max}	0.476 m
L _{max}	0.56 m

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Diagrams of IRB 7710-390/3.1 LID

With option [3326-x]. Arm load: LeanID SW.



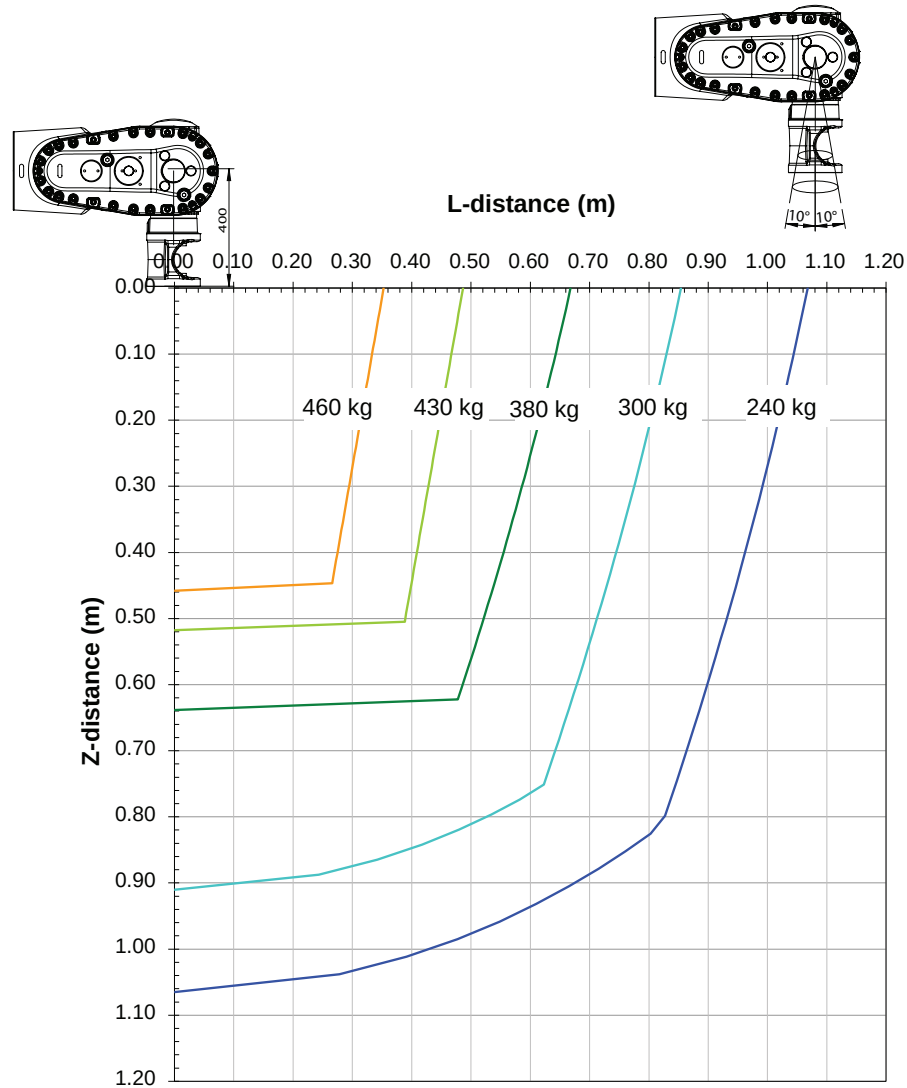
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2 Technical data for IRB 7710

2.7.2 Diagrams
Continued

Diagrams of IRB 7710-390/3.1 LID ("Vertical Wrist" ($\pm 10^\circ$))
With option [3326-x]. Arm load: LeanID SW.



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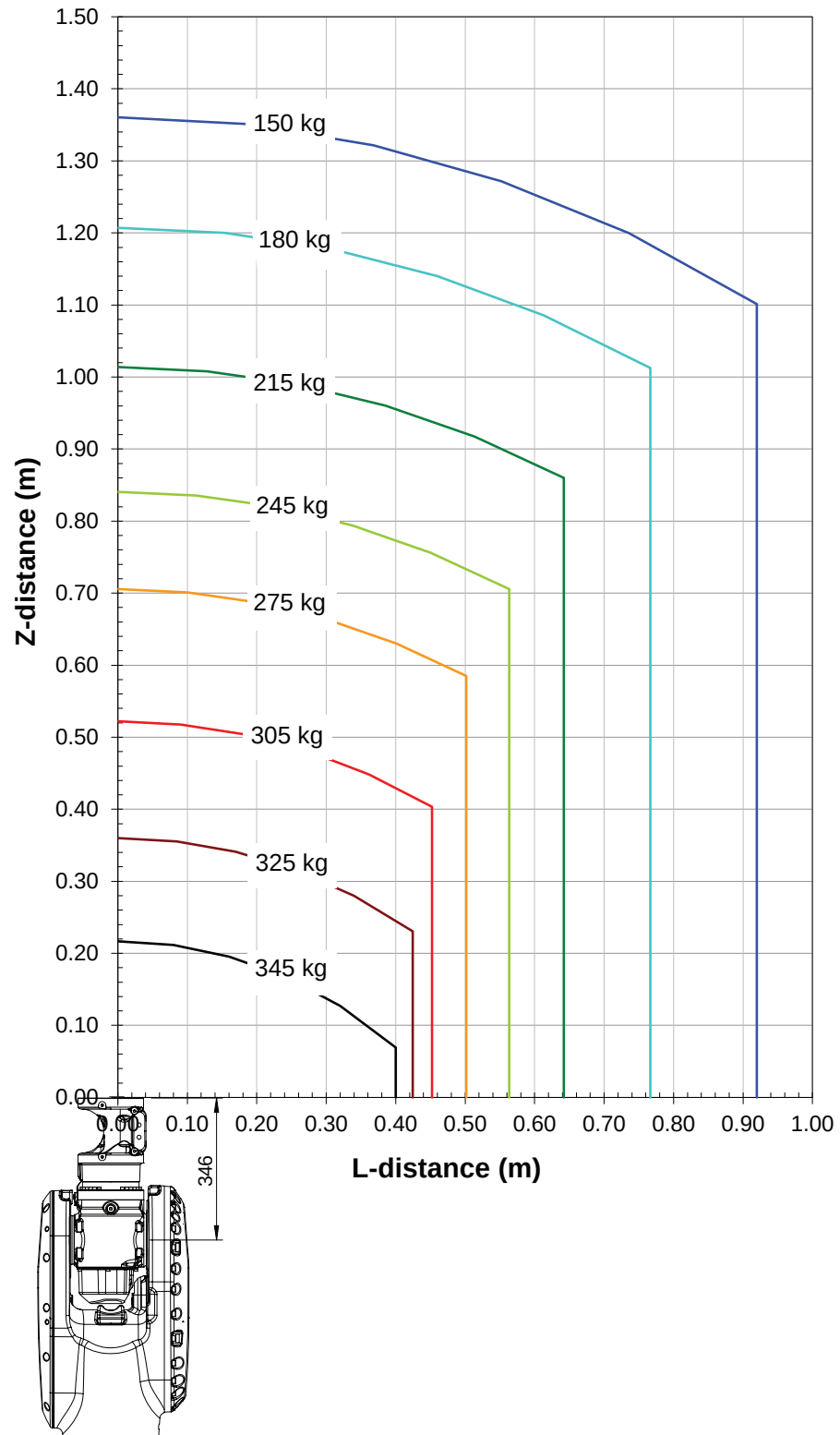
For wrist down (0° deviation from the vertical line).

	Description
Max load	460 kg
Z _{max}	0.458 m
L _{max}	0.416 m

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Diagrams of IRB 7710-325/3.3 LID

With option [3326-x]. Arm load: LeanID SW.



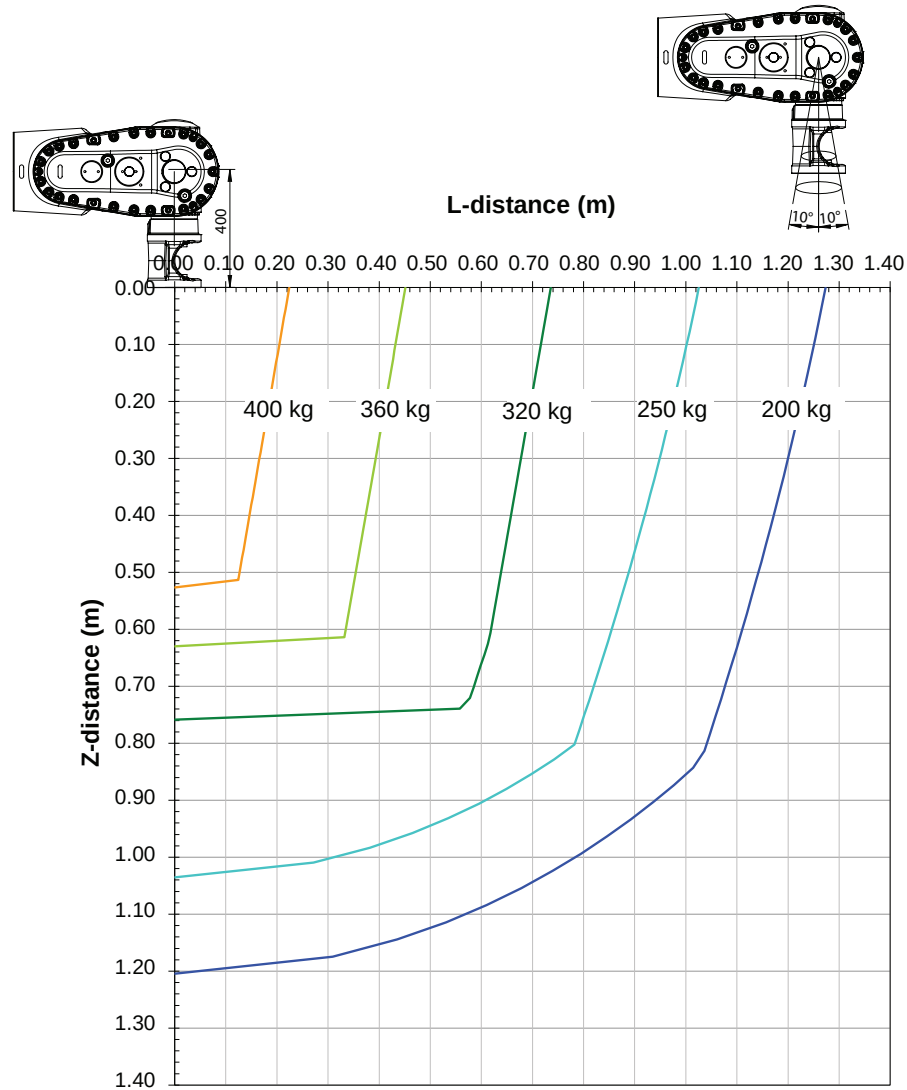
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2 Technical data for IRB 7710

2.7.2 Diagrams
Continued

Diagrams of IRB 7710-325/3.3 LID ("Vertical Wrist" ($\pm 10^\circ$))
With option [3326-x]. Arm load: LeanID SW.



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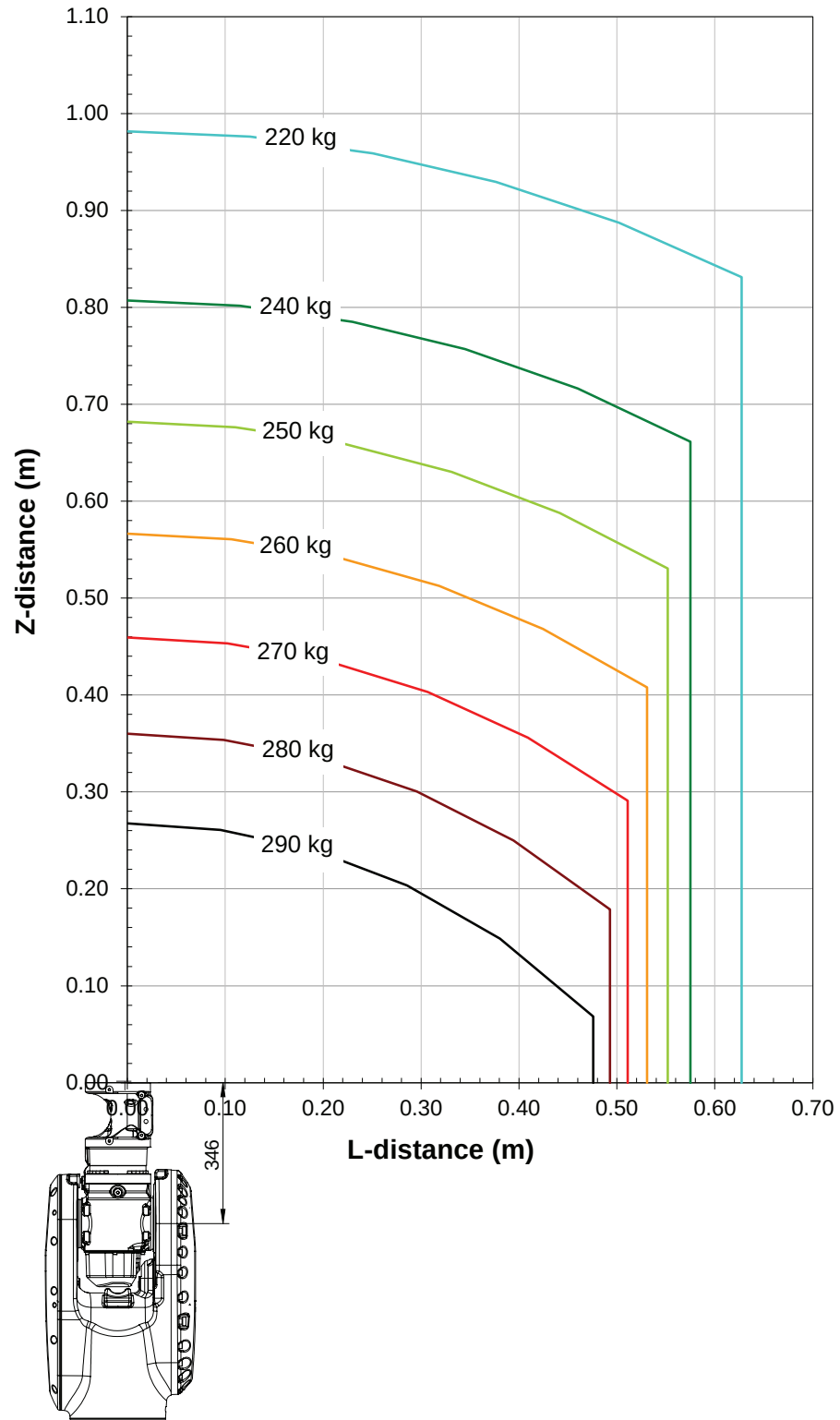
For wrist down (0° deviation from the vertical line).

	Description
Max load	430 kg
Z _{max}	0.462 m
L _{max}	0.149 m

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Diagrams of IRB 7710-280/3.5 LID

With option [3326-x]. Arm load: LeanID SW.



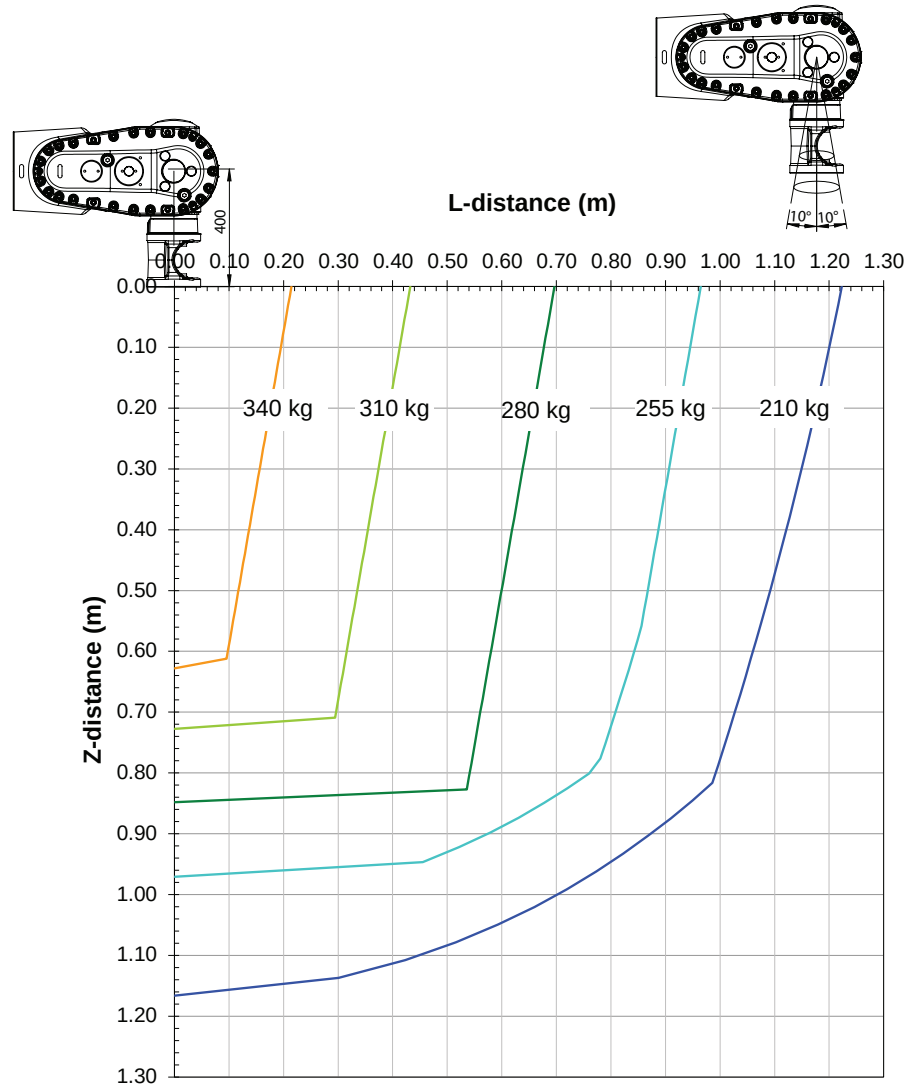
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2 Technical data for IRB 7710

2.7.2 Diagrams
Continued

Diagrams of IRB 7710-280/3.5 LID ("Vertical Wrist" ($\pm 10^\circ$))
With option [3326-x]. Arm load: LeanID SW.



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

	Description
Max load	375 kg
Z _{max}	0.532 m
L _{max}	0.074 m

Continues on next page

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

Continued

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

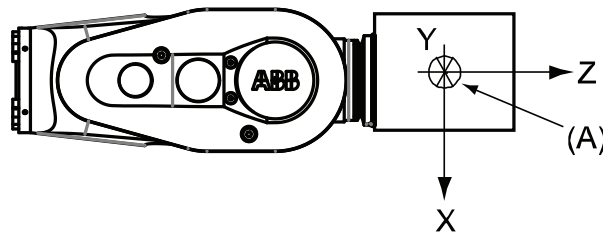


Note

Total load given as: mass in kg, center of gravity (Z and L) in meters and moment of inertia (J_{0x} , J_{0y} , J_{0z}) in kgm^2 . $L = \sqrt{X^2 + Y^2}$, see the following figure.

Full movement of axis 5 ($\pm 130^\circ$)

Robot variant	Maximum load and moment of inertia	
	Axis 5	Axis 6
IRB 7710-500/2.85	$J_{a5} = \text{Load} \times (Z + 0.245)^2 + \max(J_{0x}, J_{0y}) \leq 500 \text{ kgm}^2$	$J_{a6} = \text{Load} \times L^2 + J_{0z} \leq 315 \text{ kgm}^2$
IRB 7710-430/3.1	$J_{a5} = \text{Load} \times (Z + 0.245)^2 + \max(J_{0x}, J_{0y}) \leq 500 \text{ kgm}^2$	$J_{a6} = \text{Load} \times L^2 + J_{0z} \leq 315 \text{ kgm}^2$
IRB 7710-360/3.3	$J_{a5} = \text{Load} \times (Z + 0.245)^2 + \max(J_{0x}, J_{0y}) \leq 500 \text{ kgm}^2$	$J_{a6} = \text{Load} \times L^2 + J_{0z} \leq 315 \text{ kgm}^2$
IRB 7710-310/3.5	$J_{a5} = \text{Load} \times (Z + 0.245)^2 + \max(J_{0x}, J_{0y}) \leq 500 \text{ kgm}^2$	$J_{a6} = \text{Load} \times L^2 + J_{0z} \leq 315 \text{ kgm}^2$
IRB 7710-400/2.85 LID	$J_{a5} = \text{Load} \times (Z + 0.4)^2 + \max(J_{0x}, J_{0y}) \leq 500 \text{ kgm}^2$	$J_{a6} = \text{Load} \times L^2 + J_{0z} \leq 315 \text{ kgm}^2$
IRB 7710-390/3.1 LID	$J_{a5} = \text{Load} \times (Z + 0.4)^2 + \max(J_{0x}, J_{0y}) \leq 500 \text{ kgm}^2$	$J_{a6} = \text{Load} \times L^2 + J_{0z} \leq 315 \text{ kgm}^2$
IRB 7710-325/3.3 LID	$J_{a5} = \text{Load} \times (Z + 0.4)^2 + \max(J_{0x}, J_{0y}) \leq 500 \text{ kgm}^2$	$J_{a6} = \text{Load} \times L^2 + J_{0z} \leq 315 \text{ kgm}^2$
IRB 7710-280/3.5 LID	$J_{a5} = \text{Load} \times (Z + 0.4)^2 + \max(J_{0x}, J_{0y}) \leq 500 \text{ kgm}^2$	$J_{a6} = \text{Load} \times L^2 + J_{0z} \leq 315 \text{ kgm}^2$



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	Description
A	Center of gravity

Continues on next page

2 Technical data for IRB 7710

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

Continued

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

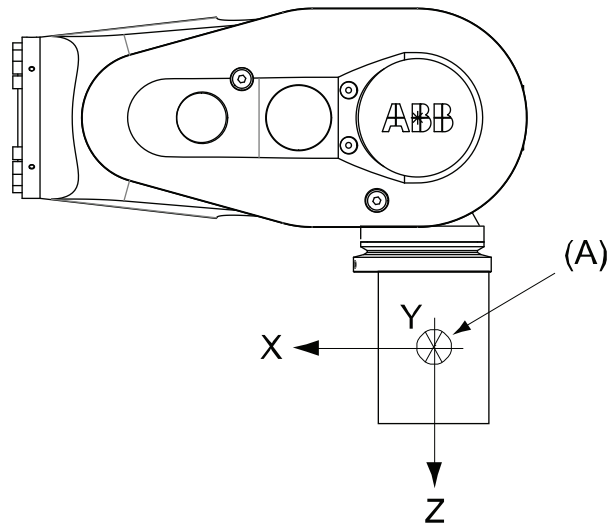
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2.7.3 Maximum load and moment of inertia for full and limited axis 5 (center line down) movement

Continued

Limited axis 5, center line down

Robot variant	Maximum load and moment of inertia	
	Axis 5	Axis 6
IRB 7710-500/2.85	$Ja_5 = \text{Load} \times (Z + 0.245)^2 + \max(J_{0x}, J_{0y}) \leq 550 \text{ kgm}^2$	$Ja_6 = \text{Load} \times L^2 + J_{0z} \leq 500 \text{ kgm}^2$
IRB 7710-430/3.1	$Ja_5 = \text{Load} \times (Z + 0.245)^2 + \max(J_{0x}, J_{0y}) \leq 550 \text{ kgm}^2$	$Ja_6 = \text{Load} \times L^2 + J_{0z} \leq 500 \text{ kgm}^2$
IRB 7710-360/3.3	$Ja_5 = \text{Load} \times (Z + 0.245)^2 + \max(J_{0x}, J_{0y}) \leq 550 \text{ kgm}^2$	$Ja_6 = \text{Load} \times L^2 + J_{0z} \leq 500 \text{ kgm}^2$
IRB 7710-310/3.5	$Ja_5 = \text{Load} \times (Z + 0.245)^2 + \max(J_{0x}, J_{0y}) \leq 550 \text{ kgm}^2$	$Ja_6 = \text{Load} \times L^2 + J_{0z} \leq 500 \text{ kgm}^2$
IRB 7710-400/2.85 LID	$Ja_5 = \text{Load} \times (Z + 0.4)^2 + \max(J_{0x}, J_{0y}) \leq 550 \text{ kgm}^2$	$Ja_6 = \text{Load} \times L^2 + J_{0z} \leq 500 \text{ kgm}^2$
IRB 7710-390/3.1 LID	$Ja_5 = \text{Load} \times (Z + 0.4)^2 + \max(J_{0x}, J_{0y}) \leq 550 \text{ kgm}^2$	$Ja_6 = \text{Load} \times L^2 + J_{0z} \leq 500 \text{ kgm}^2$
IRB 7710-325/3.3 LID	$Ja_5 = \text{Load} \times (Z + 0.4)^2 + \max(J_{0x}, J_{0y}) \leq 550 \text{ kgm}^2$	$Ja_6 = \text{Load} \times L^2 + J_{0z} \leq 500 \text{ kgm}^2$
IRB 7710-280/3.5 LID	$Ja_5 = \text{Load} \times (Z + 0.4)^2 + \max(J_{0x}, J_{0y}) \leq 550 \text{ kgm}^2$	$Ja_6 = \text{Load} \times L^2 + J_{0z} \leq 500 \text{ kgm}^2$



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	Description
A	Center of gravity

Continues on next page

2 Technical data for IRB 7710

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

Continued

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

2.7.4 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.

Permissible torque

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

Robot variant	Maximum wrist torque axis 4 and 5	Maximum wrist torque axis 6	Load at which the maximum torques are valid
IRB 7710-500/2.85	3,027 Nm	1,354 Nm	495 kg
IRB 7710-430/3.1	3,027 Nm	1,354 Nm	396 kg
IRB 7710-360/3.3	3,027 Nm	1,354 Nm	306 kg
IRB 7710-310/3.5	3,027 Nm	1,354 Nm	246 kg
IRB 7710-400/2.85 LID	2,994 Nm	1,354 Nm	400 kg
IRB 7710-390/3.1 LID	2,994 Nm	1,354 Nm	388 kg
IRB 7710-325/3.3 LID	2,994 Nm	1,354 Nm	295 kg
IRB 7710-280/3.5 LID	2,994 Nm	1,354 Nm	236 kg

2 Technical data for IRB 7710

2.7.5 Maximum TCP acceleration

2.7.5 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 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 7710-500/2.85	37	16
IRB 7710-430/3.1	35	16
IRB 7710-360/3.3	38	17
IRB 7710-310/3.5	43	19
IRB 7710-400/2.85 LID	36	17
IRB 7710-390/3.1 LID	40	17
IRB 7710-325/3.3 LID	43	19
IRB 7710-280/3.5 LID	44	20



Note

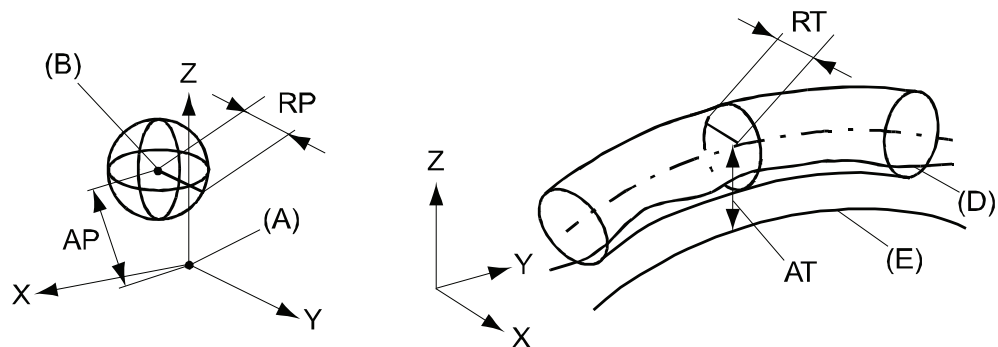
Acceleration levels for emergency stop and controlled motion includes acceleration due to gravitational forces. Nominal load is defined with nominal mass and cog with max offset in Z and L (see the load diagram).

2.8 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 result of measurements using the robots Accuracy mode. 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 and 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

Pose data and path accuracy

Data ⁱ	IRB 7710-500/2.85	IRB 7710-430/3.1	IRB 7710-360/3.3	IRB 7710-310/3.5
Pose accuracy, AP (mm) ⁱⁱ	0.05	0.05	0.04	0.05
Pose repeatability, RP (mm)	0.06	0.10	0.07	0.06
Pose stabilization time, PSt (s) within 0.5 mm of the position	0.1	0.1	0.2	0.1
Path accuracy, AT (mm)	0.7	0.8	0.8	1.0
Path repeatability, RT (mm)	0.10	0.14	0.21	0.23

ⁱ LID manipulator variants are considered to have the same data as specified variants with the same reach.

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

2 Technical data for IRB 7710

2.9 Velocity

2.9 Velocity

Maximum axis speed

Robot variant	Axis 1	Axis 2	Axis 3	Axis 4	Axis 5	Axis 6
All variants	90 °/s	60 °/s	60 °/s	100 °/s	100 °/s	160 °/s

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

2.10 Robot stopping distances and times

2.10.1 Robot stopping distances according to ISO 10218-1

About the data for robot stopping distances and times

All measurements and calculations of stopping distances and times are done according to ISO 10218-1, with single axis motion on axes 1, 2, and 3. If more than one axis is used for the movement, then the stopping distance and time can be longer or shorter. The movement of the axes does not necessarily represent the actual application. Therefore, the braking distance must be validated for each application.

Normal delays of the hardware and software are taken into account. See more about the delays and their impact on the results, [Reading the data on page 103](#).

The stopping distances and times are presented using the tool data and extension zones presented for the respected robot variant. These variables are 100%, 66%, and 33% of the maximum values for the robot.

The stop categories 0 and 1 are according to IEC 60204-1.



Note

The category 0 stop is not necessarily the worst case (depending on load, speed, application, wear, etc.).



Note

The stop category 1 is a controlled stop and will therefore have less deviation from the programmed path compared with a stop category 0.

Loads

The tool data that is used is presented for the respective robot variant.

The used loads represent the rated load. No arm load is used. See the [Load diagrams on page 75](#).

Continues on next page

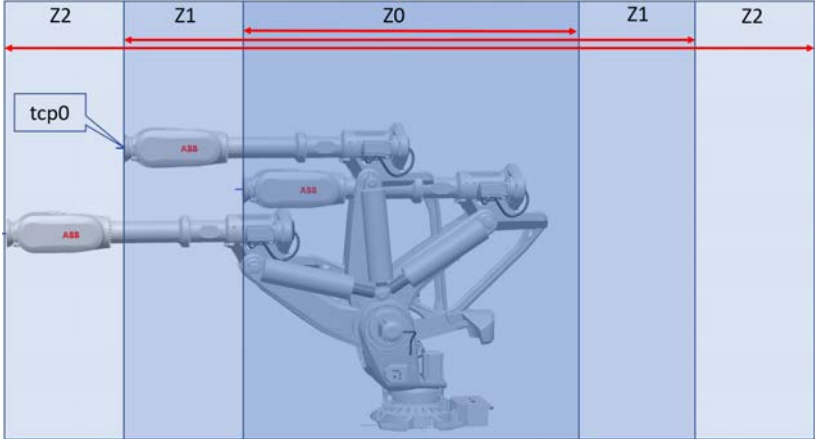
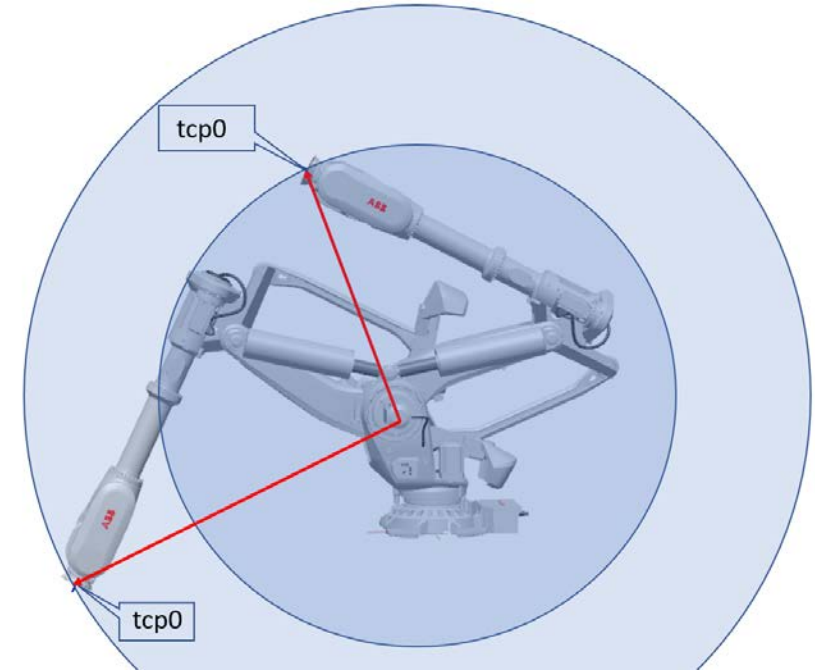
2 Technical data for IRB 7710

2.10.1 Robot stopping distances according to ISO 10218-1
Continued

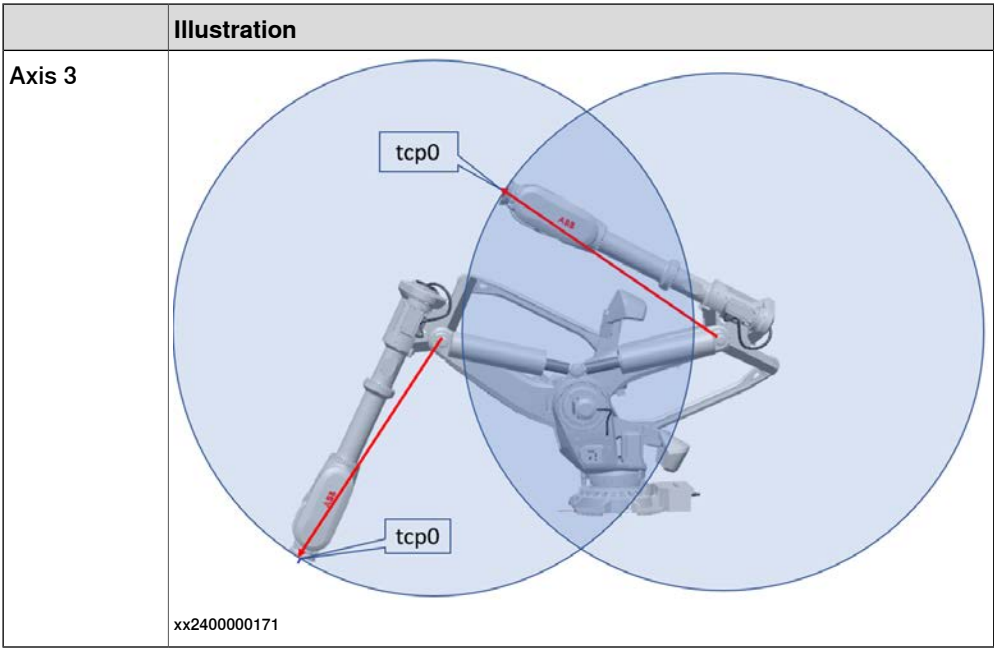
Extension zones

The extension zone for the stop category 1 is based on the tool mounting interface (tool flange) with the axis angles according to the following illustrations. The zone data is presented for the respective robot variant.

The extension zone outer limits are defined by the TCP0 position for the stated angles.

	Illustration
Axis 1	 xx2400000169
Axis 2	 xx2400000170

Continues on next page



Speed

The speed in the simulations is based on TCP0.
The TCP0 speed is measured in meters per second when the stop is triggered.

Stopping distances

The stopping distance is measured in degrees.

Stopping times

The stopping time is measured in seconds.

Limitations

The stopping distance can vary depending on additional loads on the robot.
The stopping distance for category 0 stops can vary depending on the individual brakes and the joint friction.

Reading the data

The data for stop category 0 is presented in tables, with distance and time for each axis.

The data for stop category 1 is presented as graphs with curves representing the different loads.

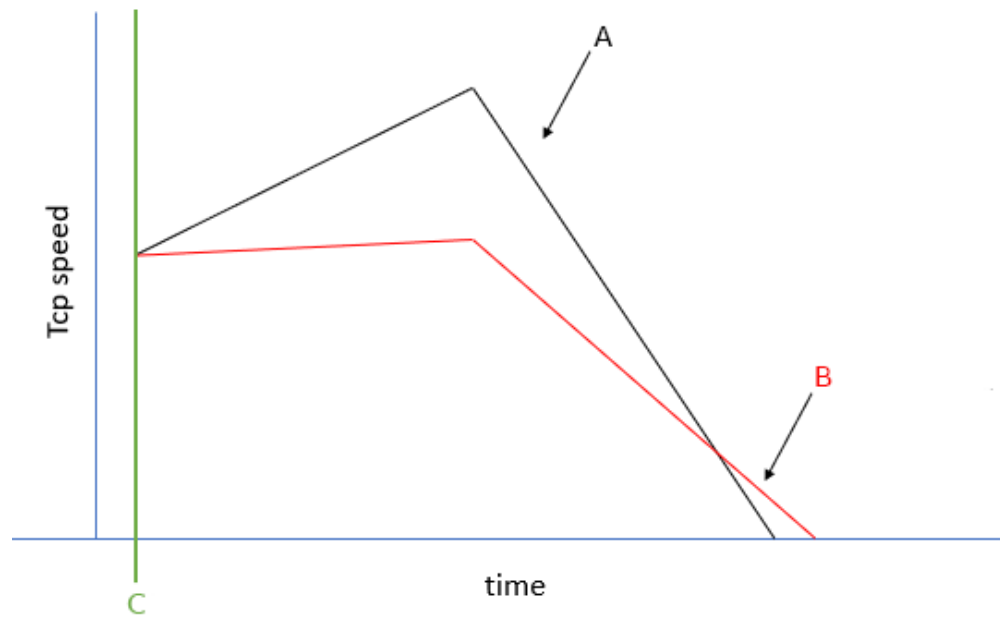
There is a short delay in the stop, which means that if the axis is accelerating when the stop is initiated (C), it will continue to accelerate during this delay time. This can result in graphs where a higher load (A) gives shorter stopping distance than a smaller load (B).

Continues on next page

2 Technical data for IRB 7710

2.10.1 Robot stopping distances according to ISO 10218-1

Continued



xx2300001041

The tcp speed is the actual speed when the stop is initiated, which is not necessarily the programmed speed.

2.10.2 Measuring stopping distance and time

Preparations before measuring

For measurement and calculation of overall system stopping performance, see ISO 13855:2010.

The measurement shall be done for the selected stop category. The emergency stop button on the robot controller is configured for stop category 0 on delivery. A risk assessment can conclude the need for another stop category. The stop category can be changed through the system parameter *Function* (topic *Controller*, type *Safety Run Chain*). In case of deviations of the default configuration of stop category 0, then this is detailed in the product specification for the respective manipulator.



CAUTION

The measurement and calculation of overall stopping performance for a robot must be tested with its correct load, speed, and tools, in its actual environment, before the robot is taken into production.

All load and tool data must be correctly defined (weight, CoG, moment of inertia). The load identification service routine can be used to identify the data.

The measurement and calculation can also be included in a yearly maintenance.



CAUTION

Follow the safety instructions in the respective product manual for the robot.

Measuring with TuneMaster

The software TuneMaster can be used to measure stopping distances and times for ABB robots. The TuneMaster software contains documentation on how to use it.

- 1 Download TuneMaster from www.abb.com/robotics, section **RobotStudio - Downloads - RobotWare Tools and Utilities**.
- 2 Install TuneMaster on a computer. Start the TuneMaster app and select **Log Signals**.
- 3 Connect to the robot controller.
- 4 Define the I/O stop signal to use for measurement, for example, ES1 for emergency stop.
- 5 Define the signal number to use for measurement, 1298 for axis position. The value is given in radians.
- 6 Start the logging in TuneMaster.
- 7 Start the test program on the controller.



Tip

Use the tool and zone definitions for the respective variant in this document to get results that are comparable with this document.

Continues on next page

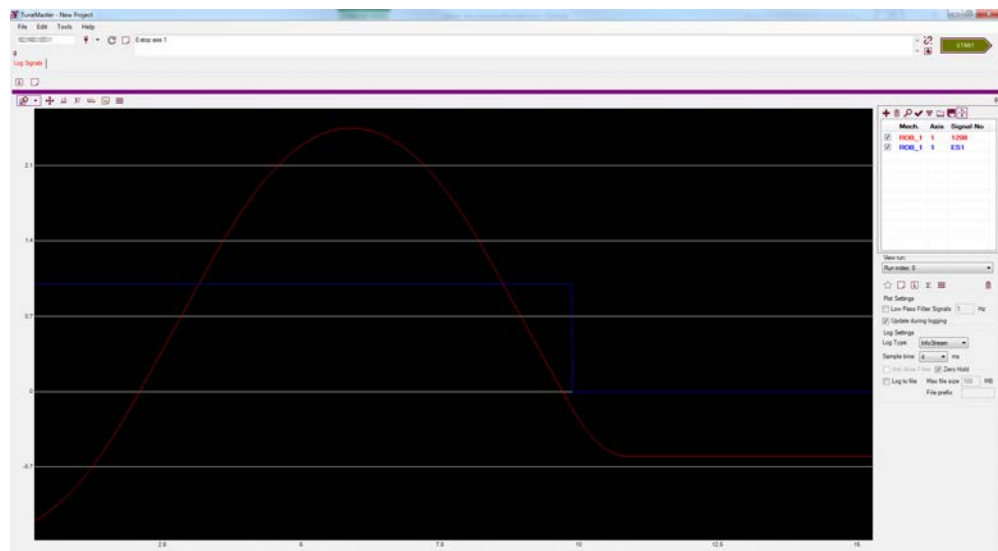
2 Technical data for IRB 7710

2.10.2 Measuring stopping distance and time

Continued

- 8 When the axis has reached maximum speed, press the emergency stop button.
- 9 In TuneMaster, measure the stopping distance and time.
- 10 Repeat for all installed emergency stop buttons until the identified hazards due to stopping distance and time for axes have been verified.

Example from TuneMaster



xx1600000386

2.10.3 IRB 7710-500/2.85

Used tooldata

```

PERS tooldata P100:= [ TRUE, [[0, 0, 0], [1, 0, 0, 0]], [500, [0,
0, 360], [1, 0, 0, 0], 11, 11, 11]];
PERS tooldata P66:= [ TRUE, [[0, 0, 0], [1, 0, 0, 0]], [333, [0,
0, 240], [1, 0, 0, 0], 4.8, 4.8, 4.8]];
PERS tooldata P33:= [ TRUE, [[0, 0, 0], [1, 0, 0, 0]], [167, [0,
0, 120], [1, 0, 0, 0], 1.2, 1.2, 1.2]];

```

Category 0

The following table describes the stopping distance and time for category 0 stop.

Axis	Distance	Stop time
1	38.4°	0.82 s
2	10.7°	0.24 s
3	11.6°	0.26 s

Category 1, extension zones

For definitions of the zones, see [Extension zones on page 102](#).

The zone border is the mounting interface location for axis 2 and axis 3.

Axis 1

Zone border	Axis 2	Axis 3
z0-z1	-45°	0°
z1-z2	6°	0°

Axis 2

Only one zone exists.

Axis 3

Only one zone exists.

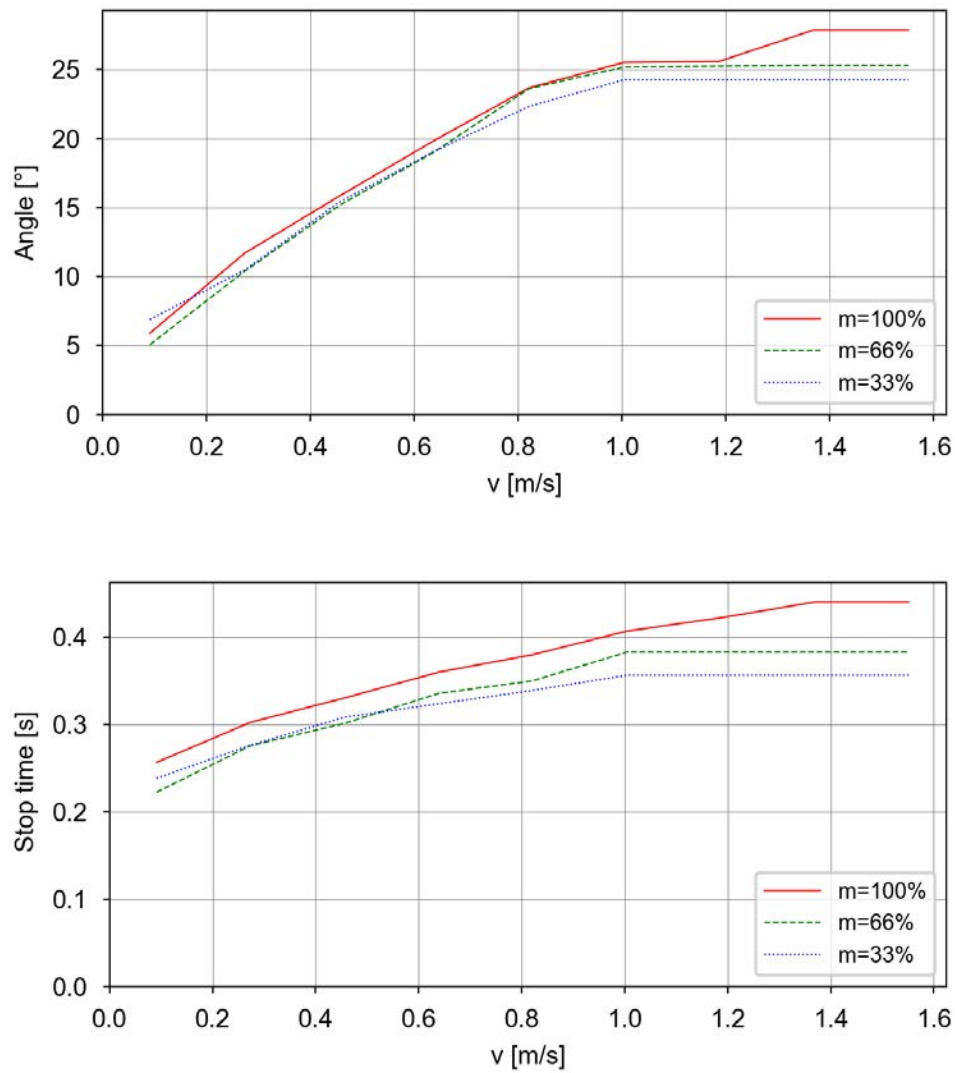
Continues on next page

2 Technical data for IRB 7710

2.10.3 IRB 7710-500/2.85

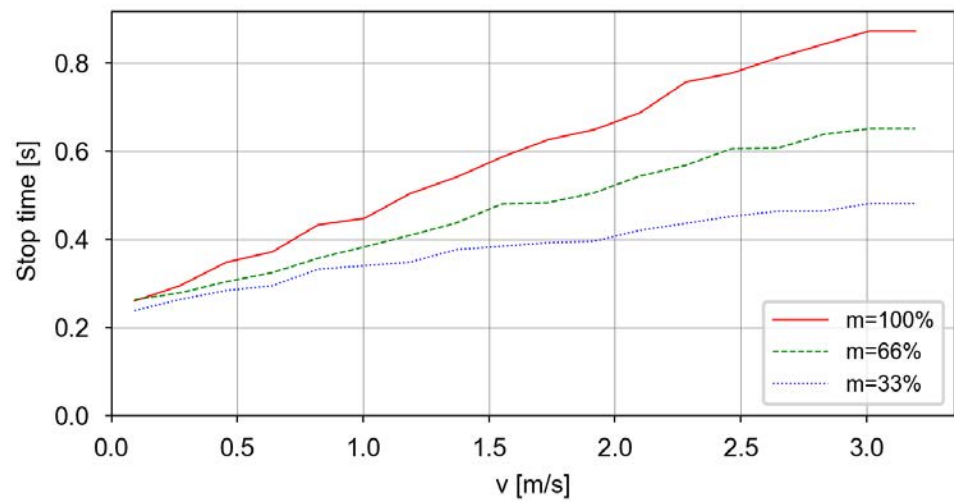
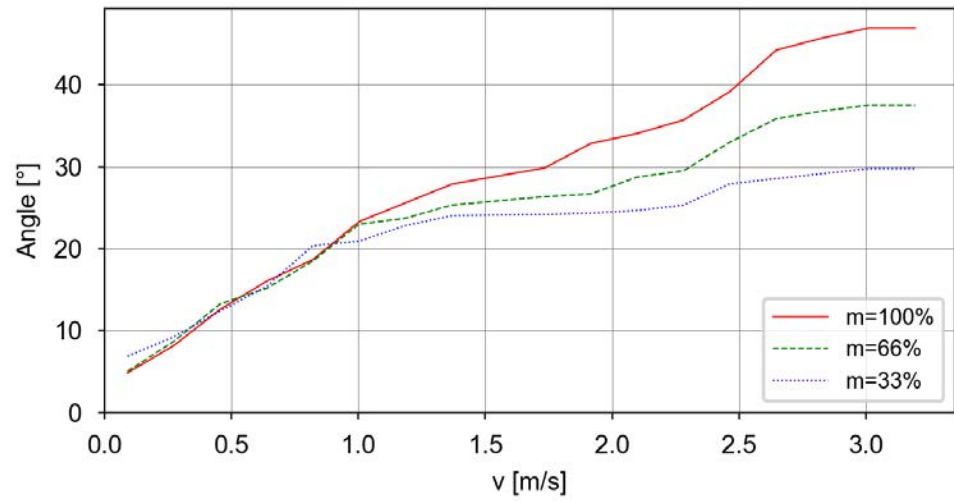
Continued

Category 1, Axis 1, Extension zone 0, stopping distance and stopping time



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Category 1, Axis 1, Extension zone 1, stopping distance and stopping time



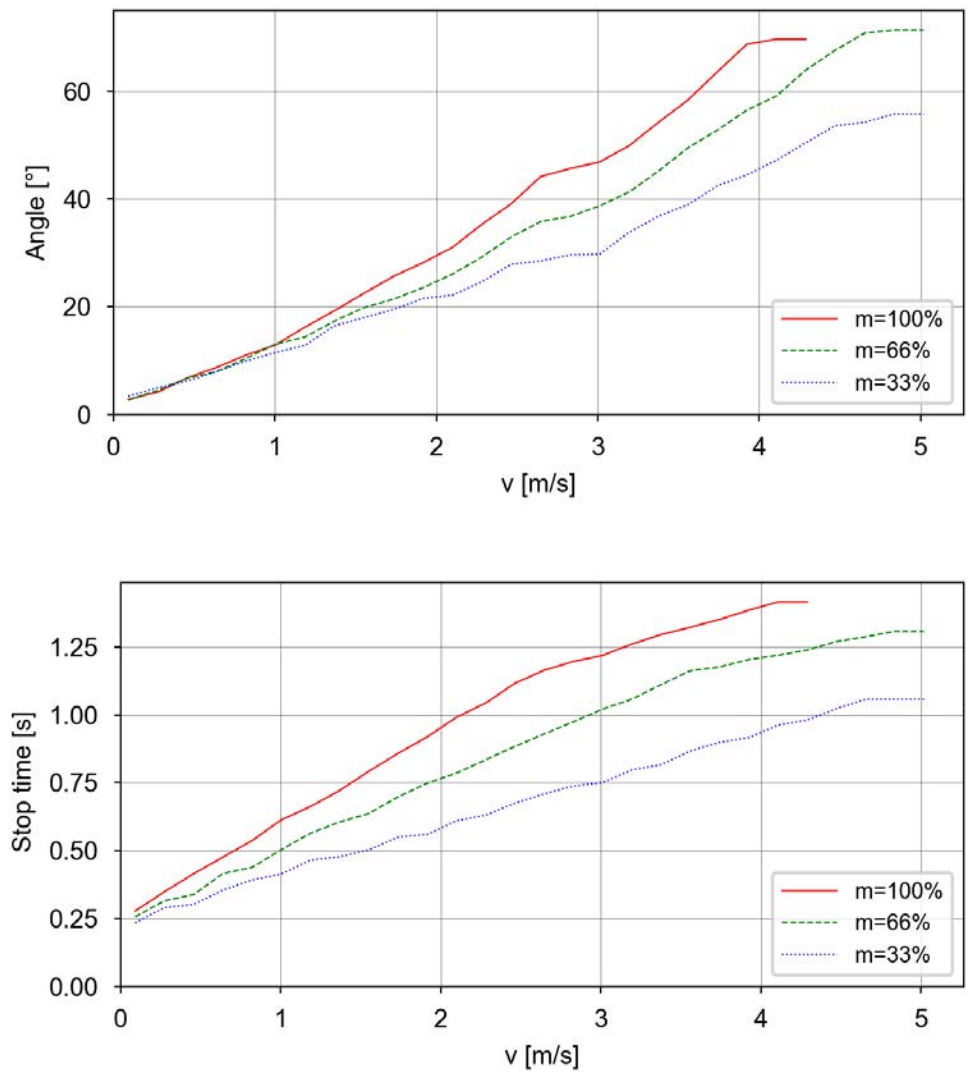
Continues on next page

2 Technical data for IRB 7710

2.10.3 IRB 7710-500/2.85

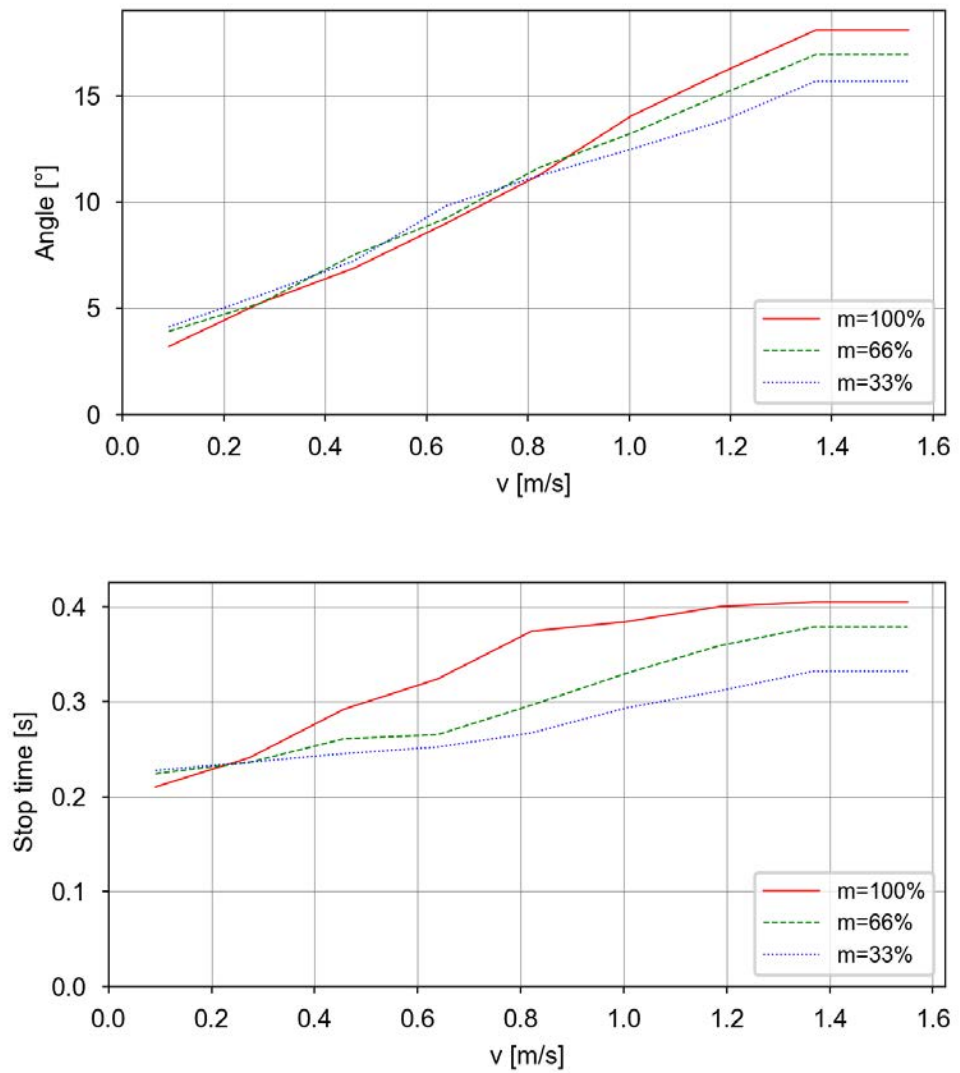
Continued

Category 1, Axis 1, Extension zone 2, stopping distance and stopping time



Continues on next page

Category 1, Axis 2, Extension zone 0, stopping distance and stopping time



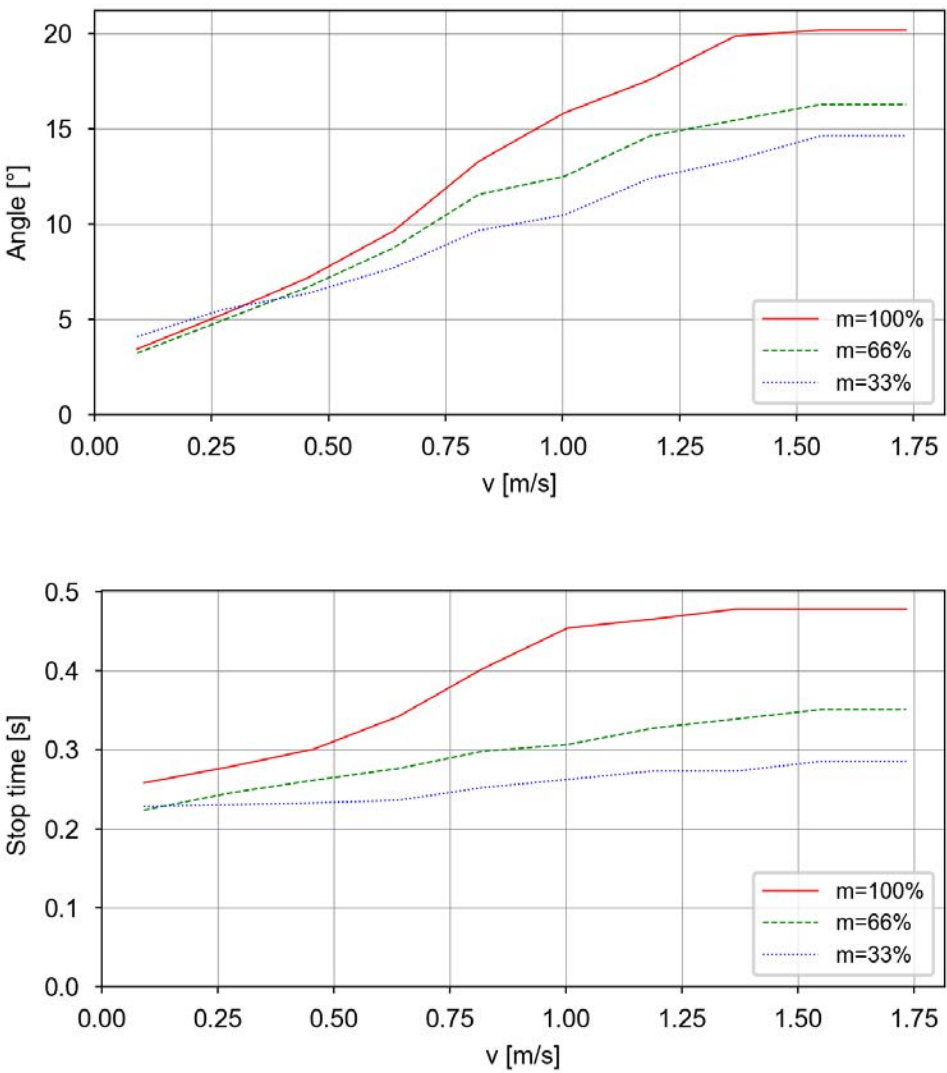
Continues on next page

2 Technical data for IRB 7710

2.10.3 IRB 7710-500/2.85

Continued

Category 1, Axis 3, Extension zone 0, stopping distance and stopping time



2.10.4 IRB 7710-430/3.10

Used tooldata

```

PERS tooldata P100:= [ TRUE, [[0, 0, 0], [1, 0, 0, 0]], [430, [0,
0, 360], [1, 0, 0, 0], 9.3, 9.3, 9.3]];
PERS tooldata P66:= [ TRUE, [[0, 0, 0], [1, 0, 0, 0]], [287, [0,
0, 240], [1, 0, 0, 0], 4.1, 4.1, 4.1]];
PERS tooldata P33:= [ TRUE, [[0, 0, 0], [1, 0, 0, 0]], [143, [0,
0, 120], [1, 0, 0, 0], 1, 1, 1]];

```

Category 0

The following table describes the stopping distance and time for category 0 stop.

Axis	Distance	Stop time
1	38.4°	0.82 s
2	10.7°	0.24 s
3	12.0°	0.28 s

Category 1, extension zones

For definitions of the zones, see [Extension zones on page 102](#).

The zone border is the mounting interface location for axis 2 and axis 3.

Axis 1

Zone border	Axis 2	Axis 3
z0-z1	-45°	0°
z1-z2	6°	0°

Axis 2

Only one zone exists.

Axis 3

Only one zone exists.

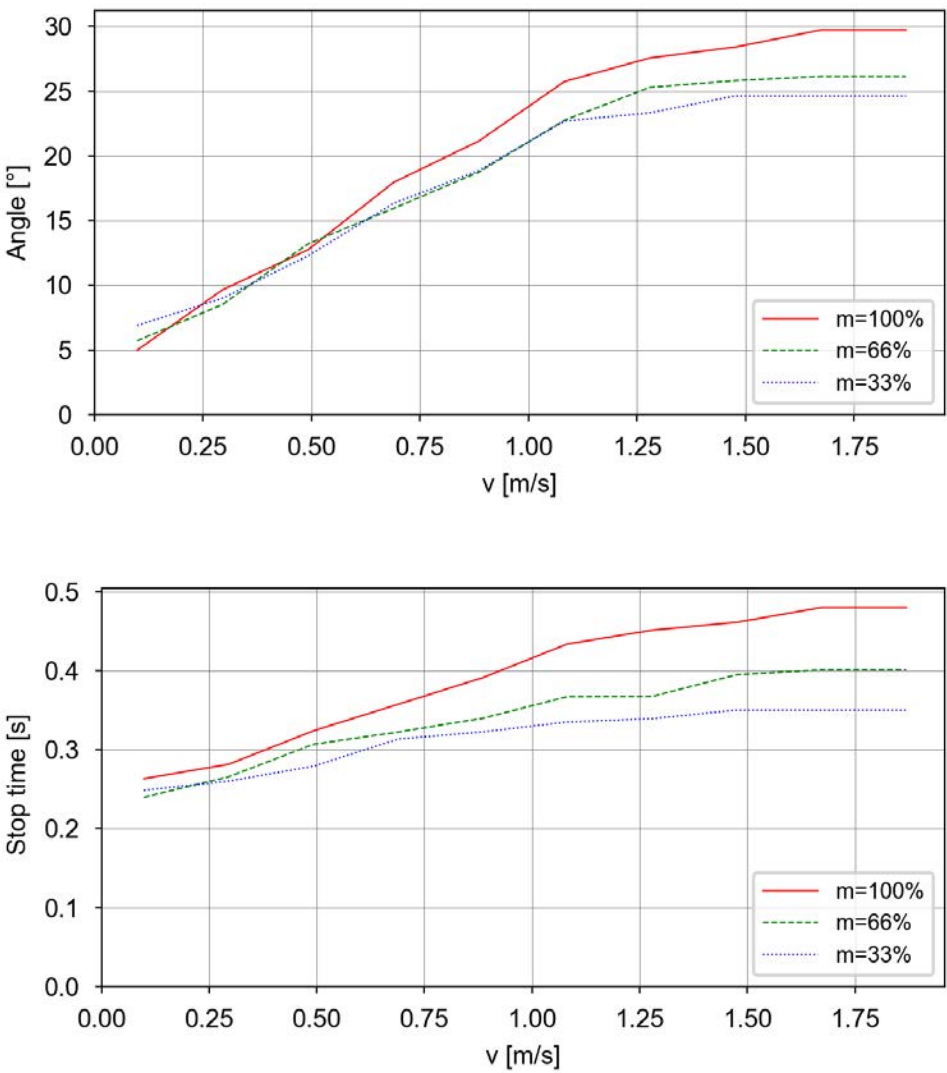
Continues on next page

2 Technical data for IRB 7710

2.10.4 IRB 7710-430/3.10

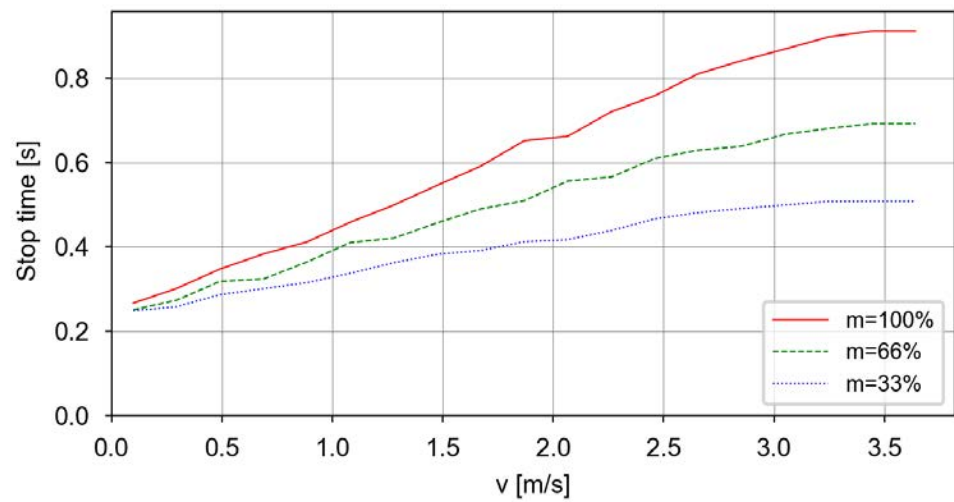
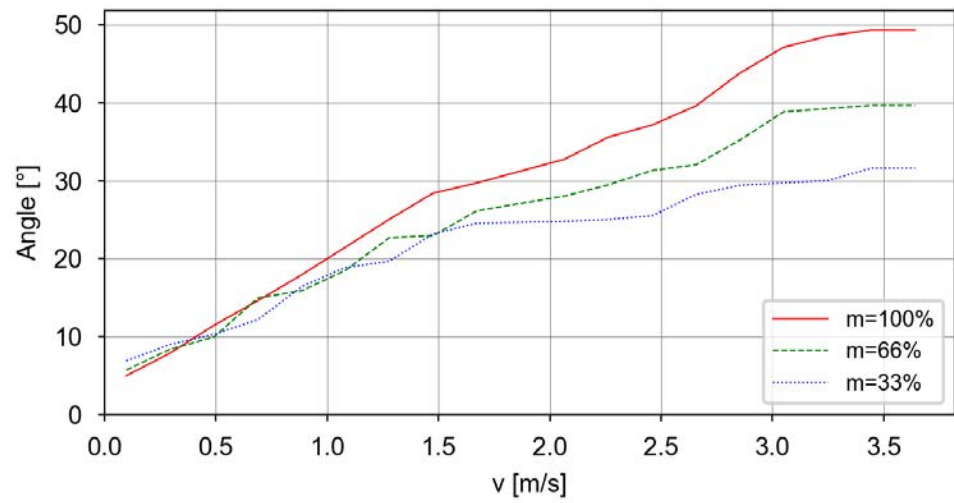
Continued

Category 1, Axis 1, Extension zone 0, stopping distance and stopping time



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Category 1, Axis 1, Extension zone 1, stopping distance and stopping time



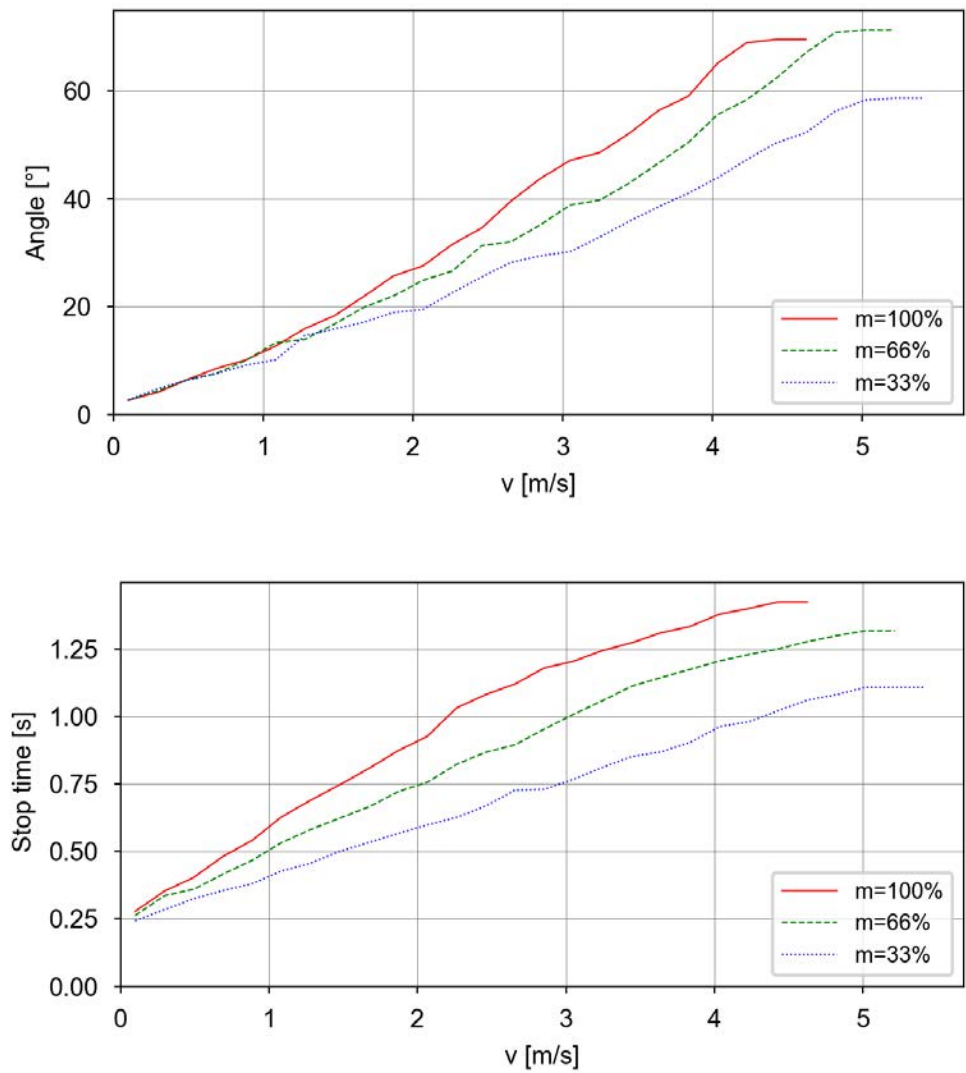
Continues on next page

2 Technical data for IRB 7710

2.10.4 IRB 7710-430/3.10

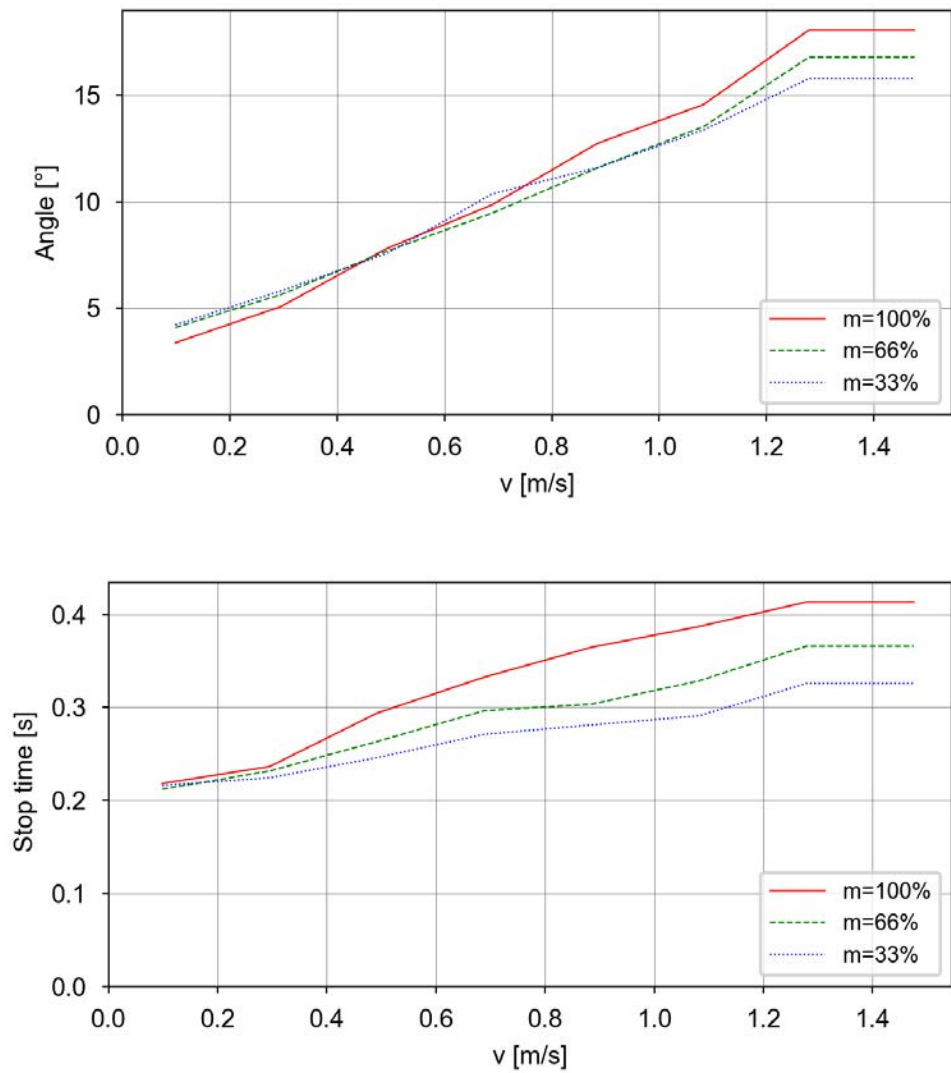
Continued

Category 1, Axis 1, Extension zone 2, stopping distance and stopping time



Continues on next page

Category 1, Axis 2, Extension zone 0, stopping distance and stopping time



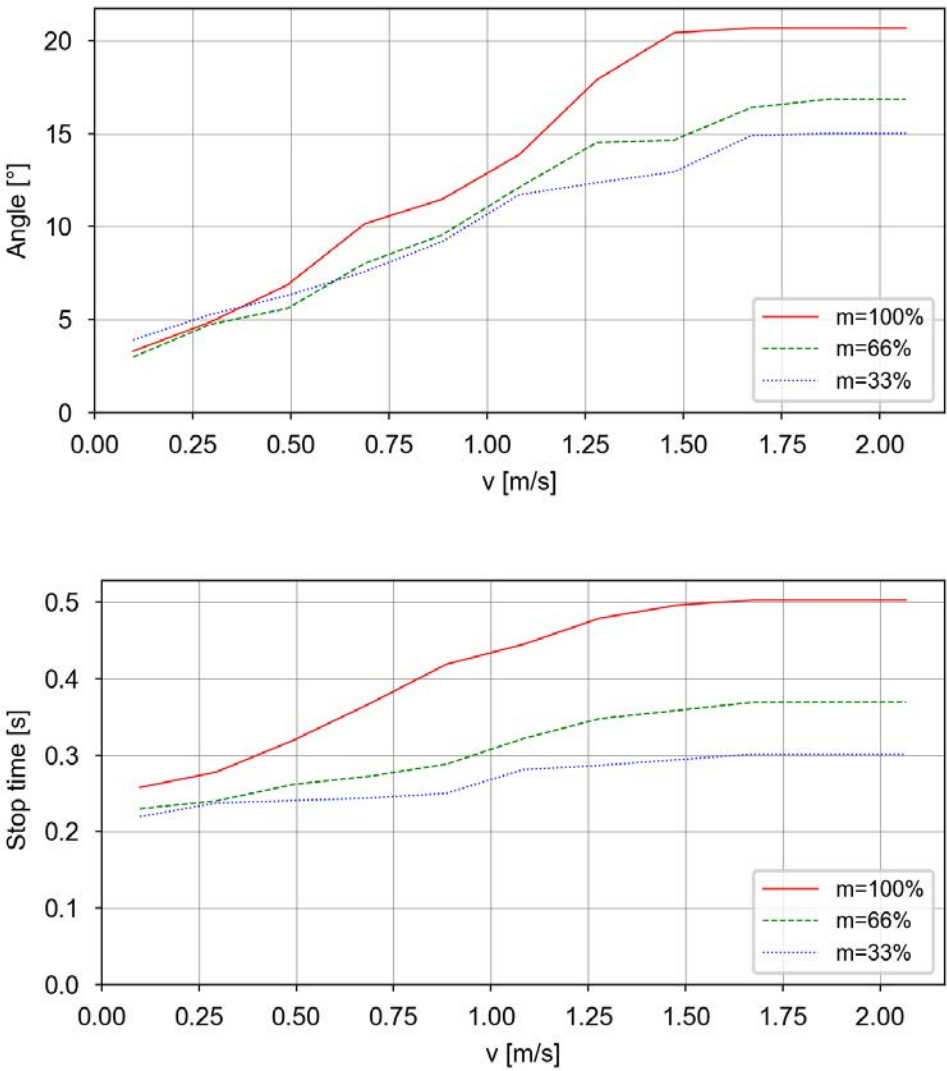
Continues on next page

2 Technical data for IRB 7710

2.10.4 IRB 7710-430/3.10

Continued

Category 1, Axis 3, Extension zone 0, stopping distance and stopping time



2.10.5 IRB 7710-360/3.30

Used tooldata

```
PERS tooldata P100:= [ TRUE, [[0, 0, 0], [1, 0, 0, 0]], [360, [0,
0, 360], [1, 0, 0, 0], 7.8, 7.8, 7.8]];
PERS tooldata P66:= [ TRUE, [[0, 0, 0], [1, 0, 0, 0]], [240, [0,
0, 240], [1, 0, 0, 0], 3.5, 3.5, 3.5]];
PERS tooldata P33:= [ TRUE, [[0, 0, 0], [1, 0, 0, 0]], [120, [0,
0, 120], [1, 0, 0, 0], 0.86, 0.86, 0.86]];
```

Category 0

The following table describes the stopping distance and time for category 0 stop.

Axis	Distance	Stop time
1	38.4°	0.83 s
2	10.5°	0.23 s
3	12.5°	0.29 s

Category 1, extension zones

For definitions of the zones, see [Extension zones on page 102](#).

The zone border is the mounting interface location for axis 2 and axis 3.

Axis 1

Zone border	Axis 2	Axis 3
z0-z1	-45°	0°
z1-z2	6°	0°

Axis 2

Only one zone exists.

Axis 3

Only one zone exists.

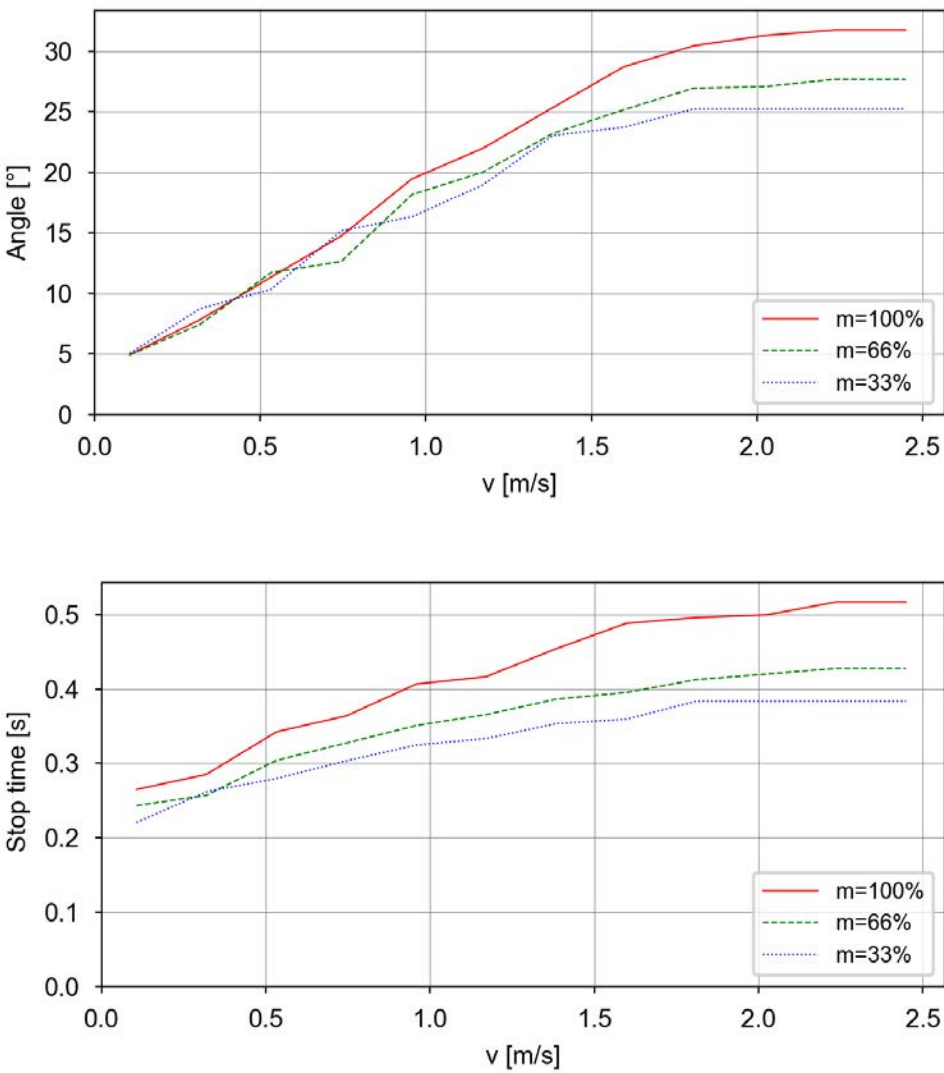
Continues on next page

2 Technical data for IRB 7710

2.10.5 IRB 7710-360/3.30

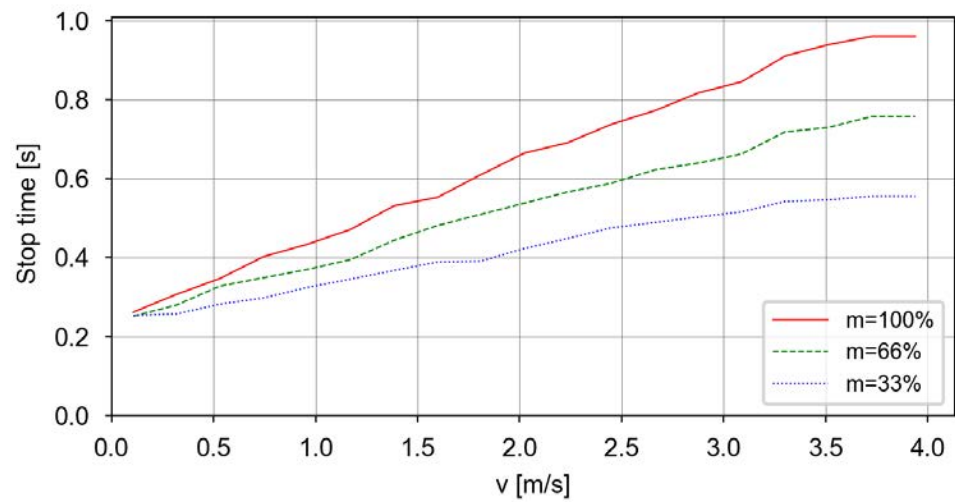
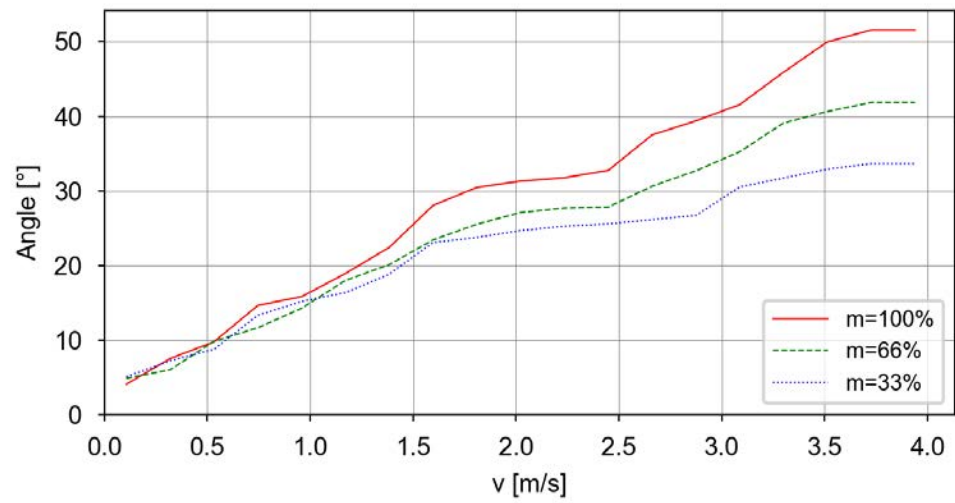
Continued

Category 1, Axis 1, Extension zone 0, stopping distance and stopping time



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Category 1, Axis 1, Extension zone 1, stopping distance and stopping time

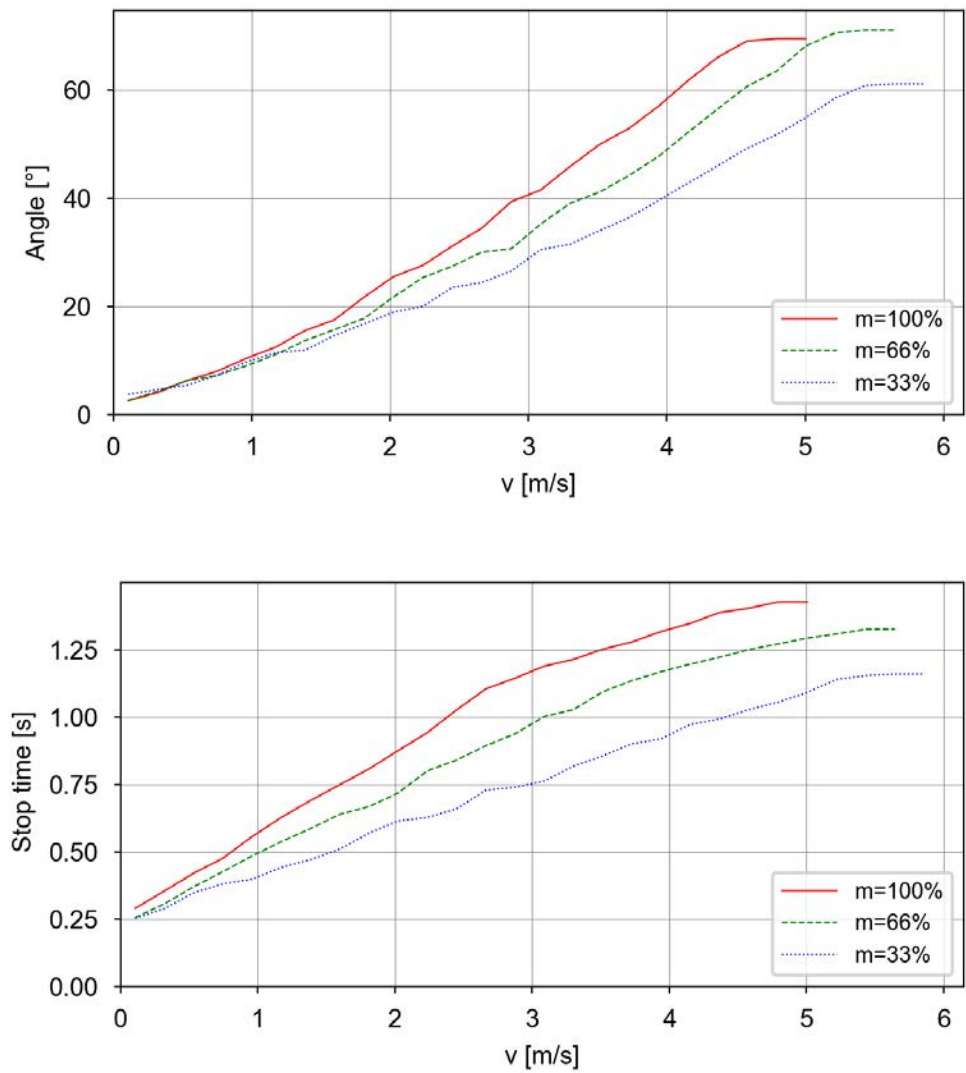


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2 Technical data for IRB 7710

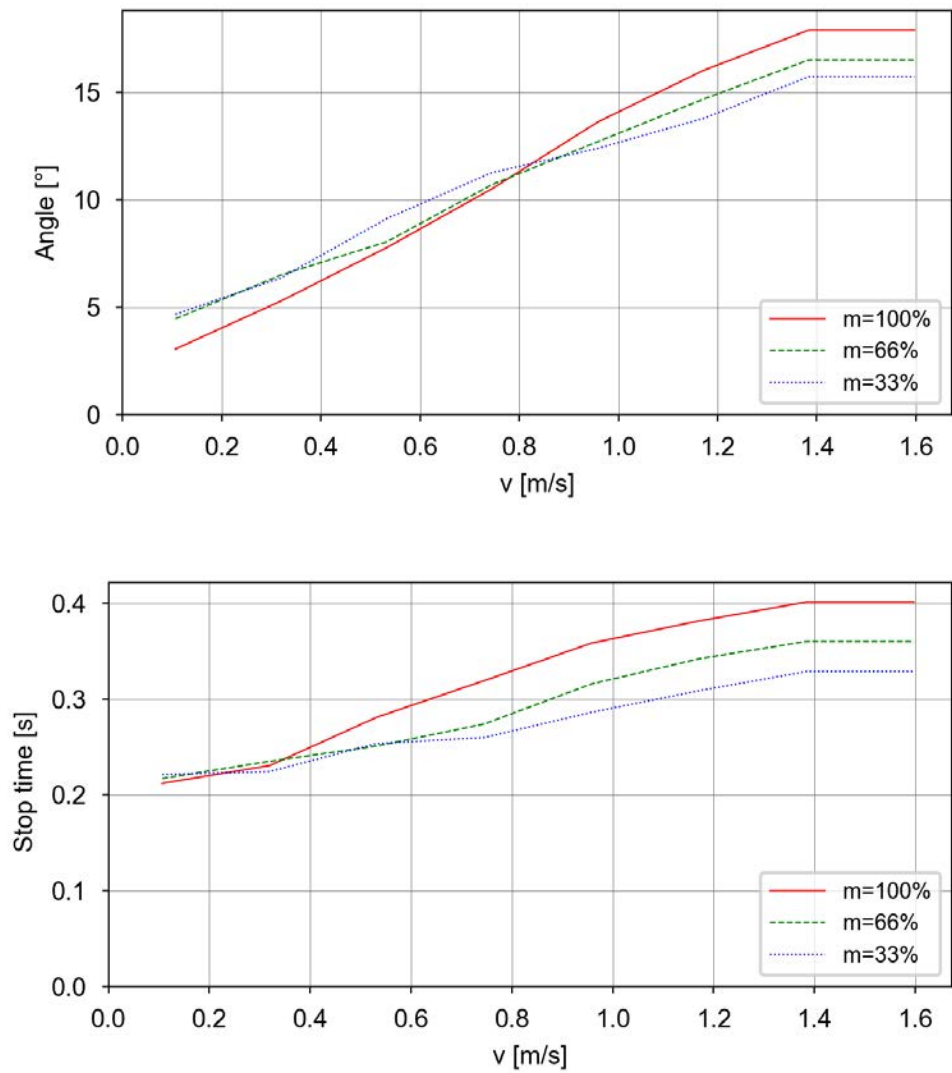
2.10.5 IRB 7710-360/3.30
Continued

Category 1, Axis 1, Extension zone 2, stopping distance and stopping time



Continues on next page

Category 1, Axis 2, Extension zone 0, stopping distance and stopping time



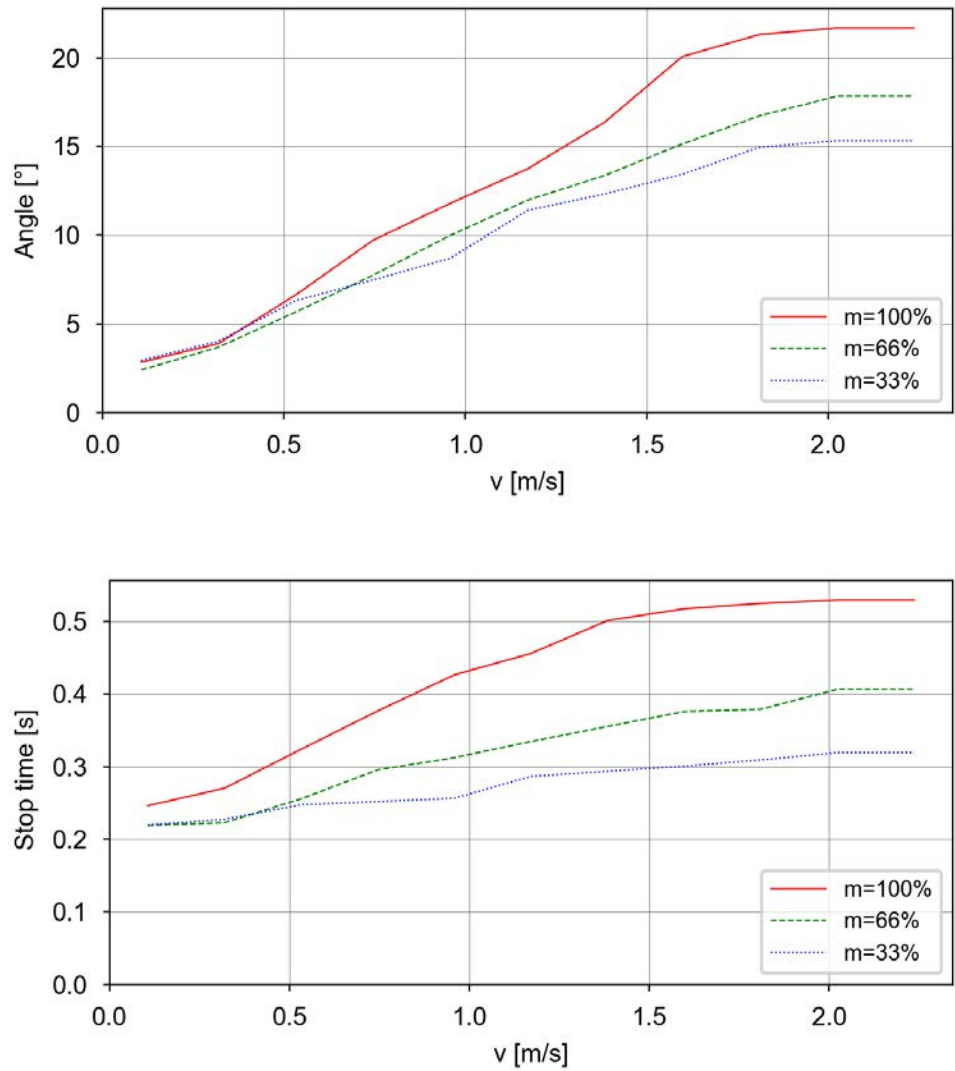
Continues on next page

2 Technical data for IRB 7710

2.10.5 IRB 7710-360/3.30

Continued

Category 1, Axis 3, Extension zone 0, stopping distance and stopping time



2.10.6 IRB 7710-310/3.50

Used tooldata

```
PERS tooldata P100:= [ TRUE, [[0, 0, 0], [1, 0, 0, 0]], [310, [0,
0, 360], [1, 0, 0, 0], 6.7, 6.7, 6.7]];
PERS tooldata P66:= [ TRUE, [[0, 0, 0], [1, 0, 0, 0]], [207, [0,
0, 240], [1, 0, 0, 0], 3, 3, 3]];
PERS tooldata P33:= [ TRUE, [[0, 0, 0], [1, 0, 0, 0]], [103, [0,
0, 120], [1, 0, 0, 0], 0.74, 0.74, 0.74]];
```

Category 0

The following table describes the stopping distance and time for category 0 stop.

Axis	Distance	Stop time
1	38.4°	0.83 s
2	10.2°	0.22 s
3	12.9°	0.3 s

Category 1, extension zones

For definitions of the zones, see [Extension zones on page 102](#).

The zone border is the mounting interface location for axis 2 and axis 3.

Axis 1

Zone border	Axis 2	Axis 3
z0-z1	-45°	0°
z1-z2	6°	0°

Axis 2

Only one zone exists.

Axis 3

Only one zone exists.

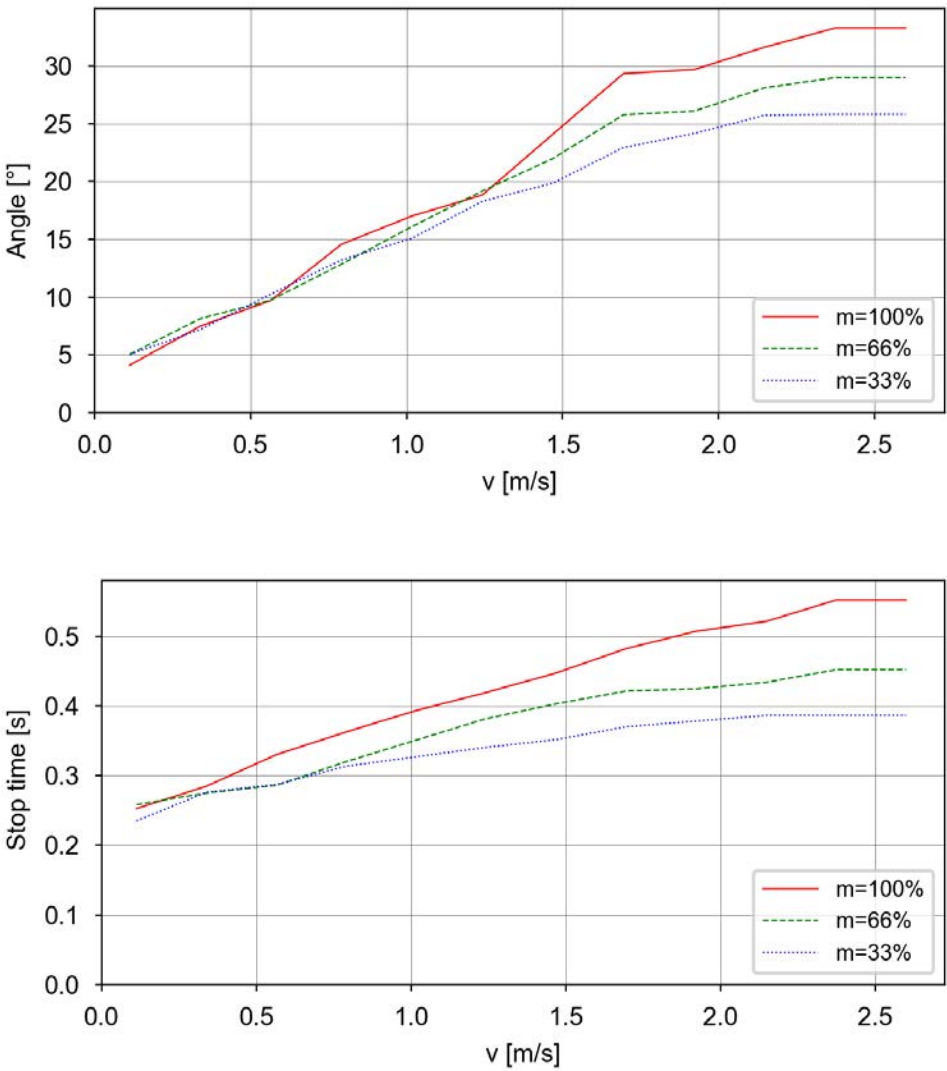
Continues on next page

2 Technical data for IRB 7710

2.10.6 IRB 7710-310/3.50

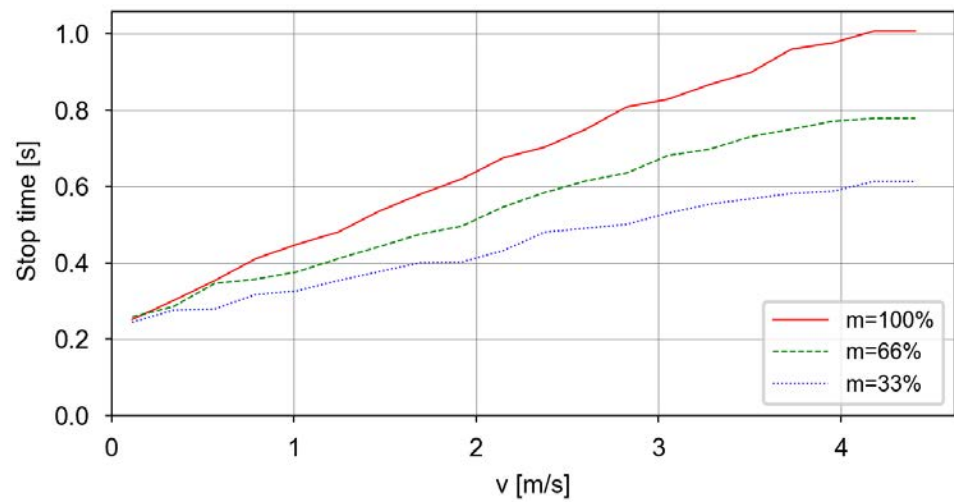
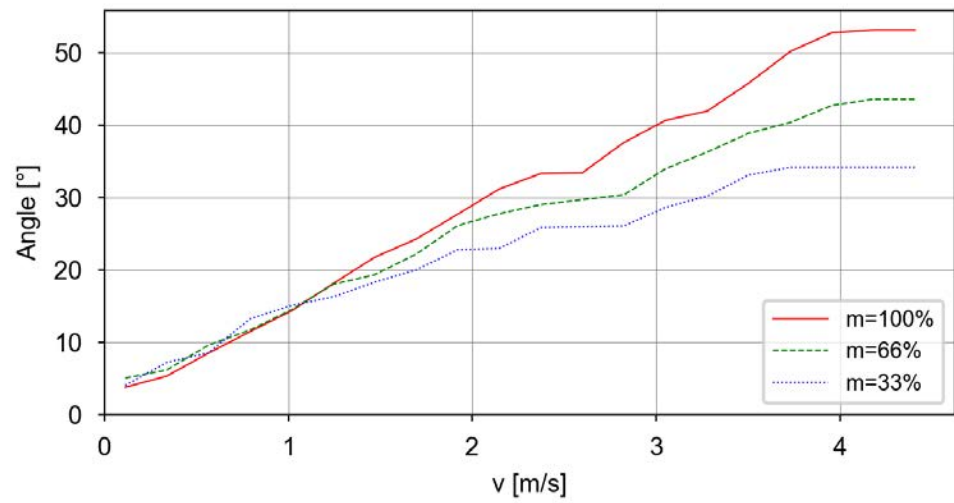
Continued

Category 1, Axis 1, Extension zone 0, stopping distance and stopping time



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Category 1, Axis 1, Extension zone 1, stopping distance and stopping time



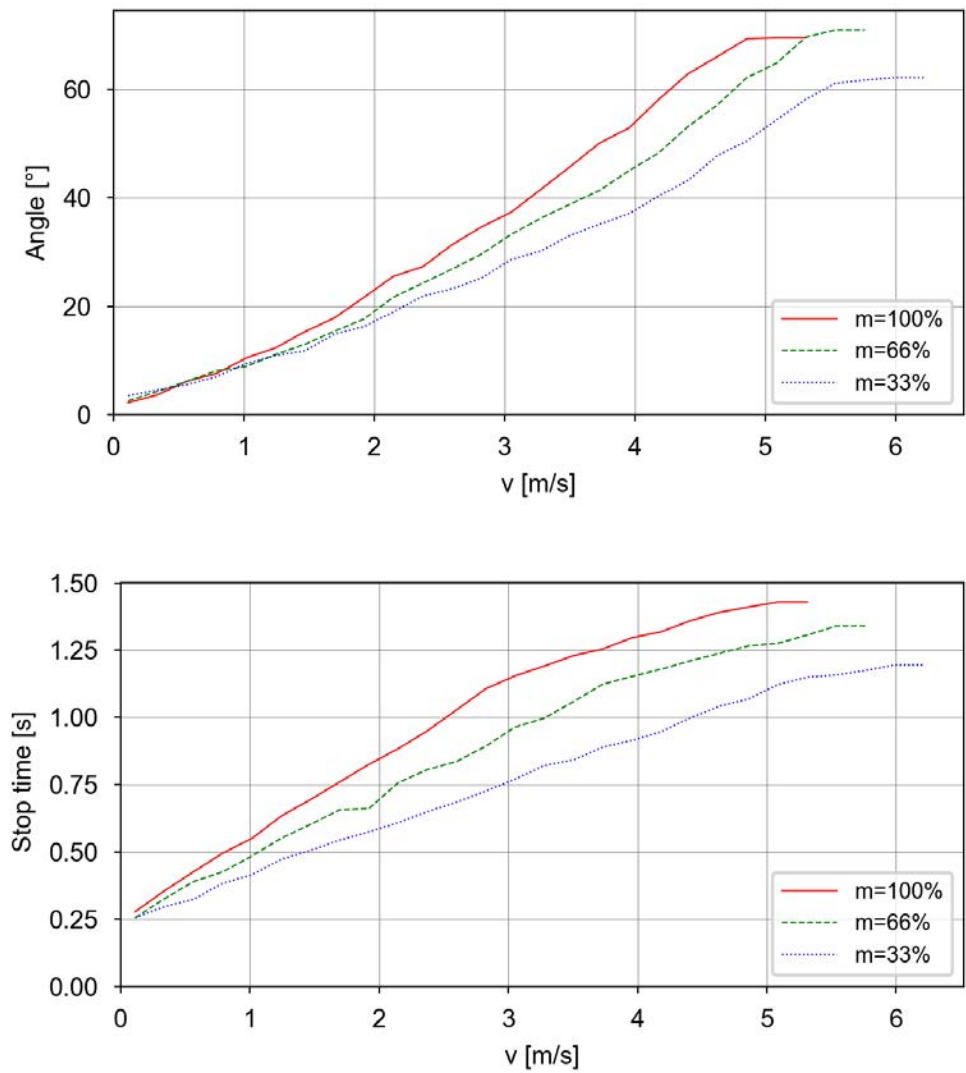
Continues on next page

2 Technical data for IRB 7710

2.10.6 IRB 7710-310/3.50

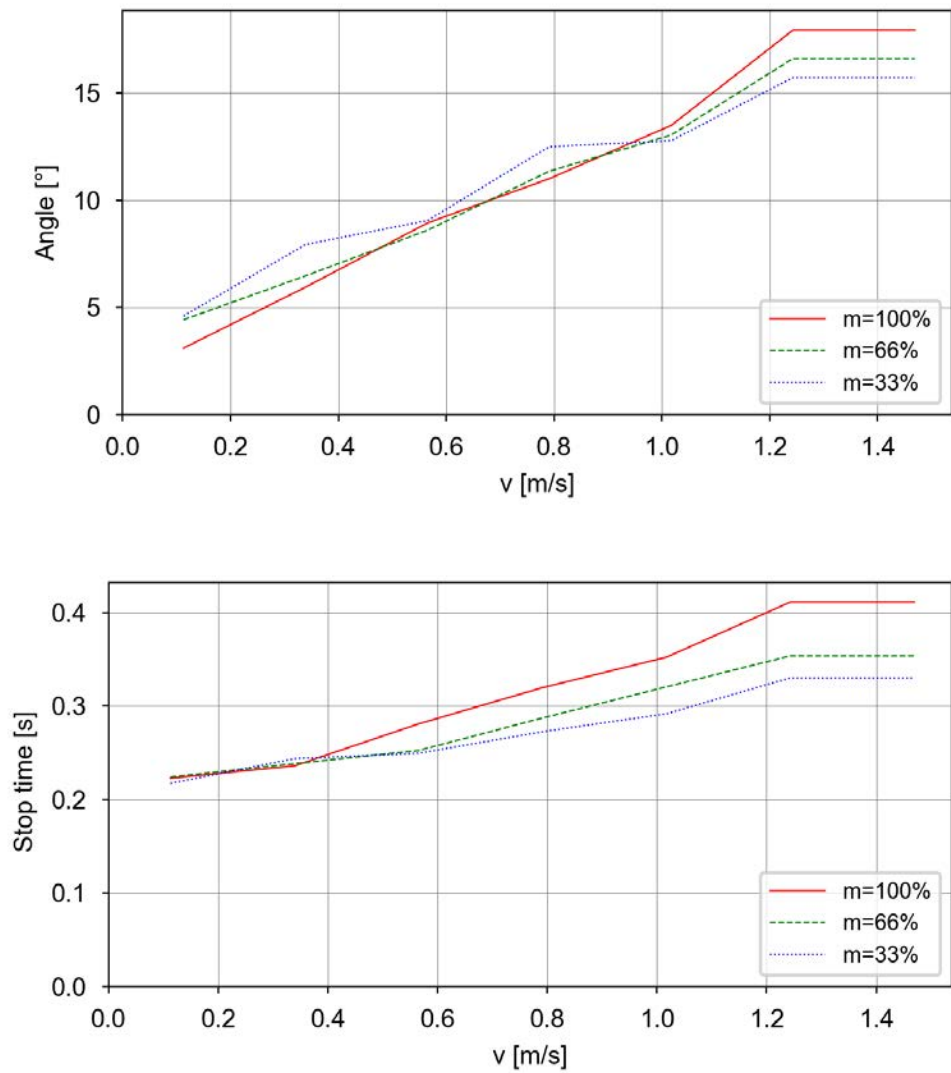
Continued

Category 1, Axis 1, Extension zone 2, stopping distance and stopping time



Continues on next page

Category 1, Axis 2, Extension zone 0, stopping distance and stopping time



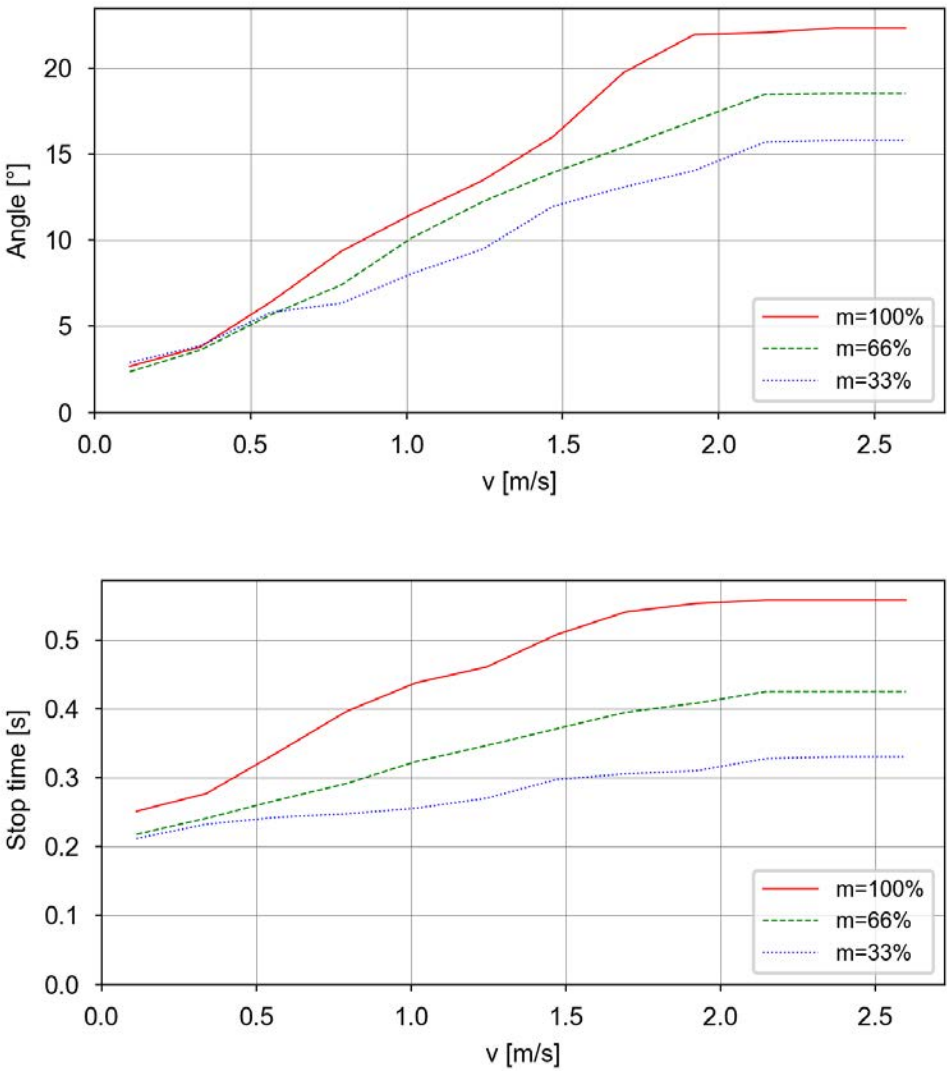
Continues on next page

2 Technical data for IRB 7710

2.10.6 IRB 7710-310/3.50

Continued

Category 1, Axis 3, Extension zone 0, stopping distance and stopping time



2.10.7 IRB 7710-400/2.85 LID

Used tooldata

```

PERS tooldata P100:= [ TRUE, [[0, 0, 0], [1, 0, 0, 0]], [400, [0,
0, 360], [1, 0, 0, 0], 8.6, 8.6, 8.6]];
PERS tooldata P66:= [ TRUE, [[0, 0, 0], [1, 0, 0, 0]], [267, [0,
0, 240], [1, 0, 0, 0], 3.8, 3.8, 3.8]];
PERS tooldata P33:= [ TRUE, [[0, 0, 0], [1, 0, 0, 0]], [133, [0,
0, 120], [1, 0, 0, 0], 0.96, 0.96, 0.96]];

```

Category 0

The following table describes the stopping distance and time for category 0 stop.

Axis	Distance	Stop time
1	38.3°	0.8 s
2	10.7°	0.24 s
3	11.5°	0.26 s

Category 1, extension zones

For definitions of the zones, see [Extension zones on page 102](#).

The zone border is the mounting interface location for axis 2 and axis 3.

Axis 1

Zone border	Axis 2	Axis 3
z0-z1	-45°	0°
z1-z2	6°	0°

Axis 2

Only one zone exists.

Axis 3

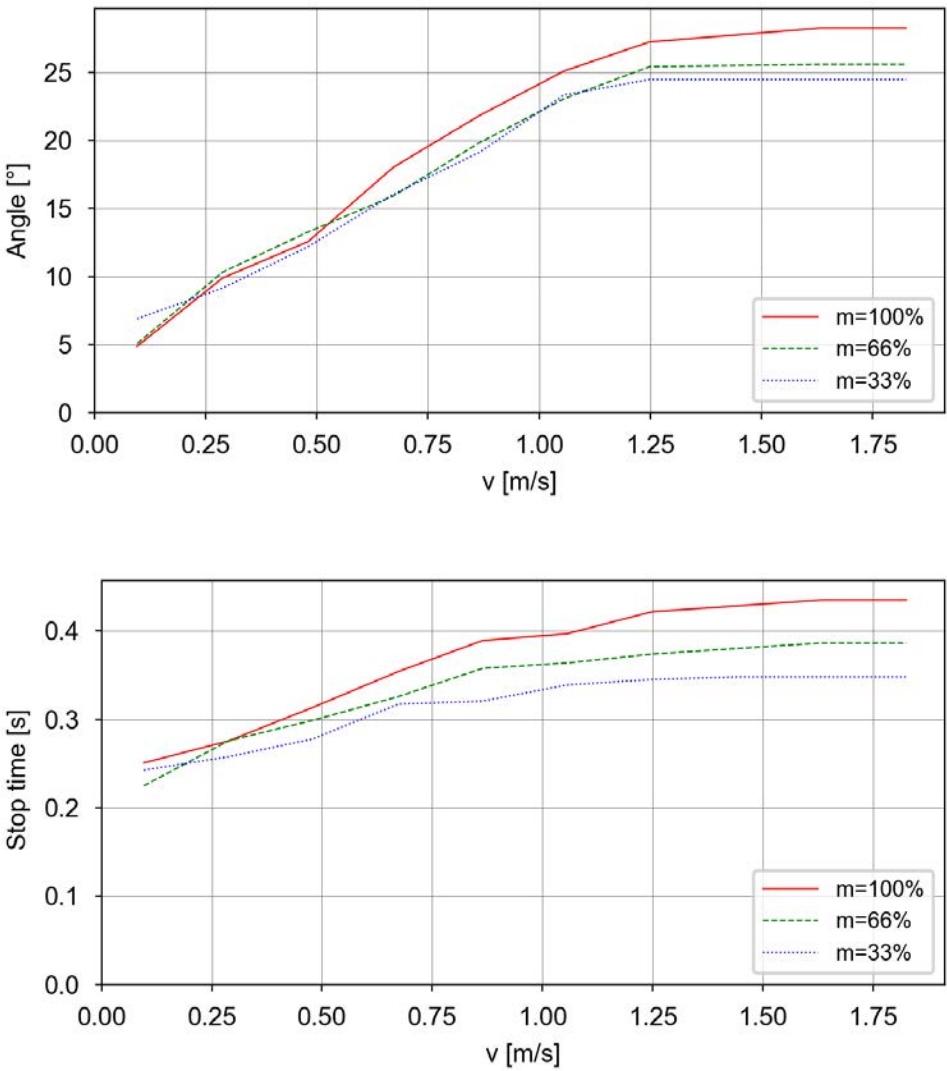
Only one zone exists.

Continues on next page

2 Technical data for IRB 7710

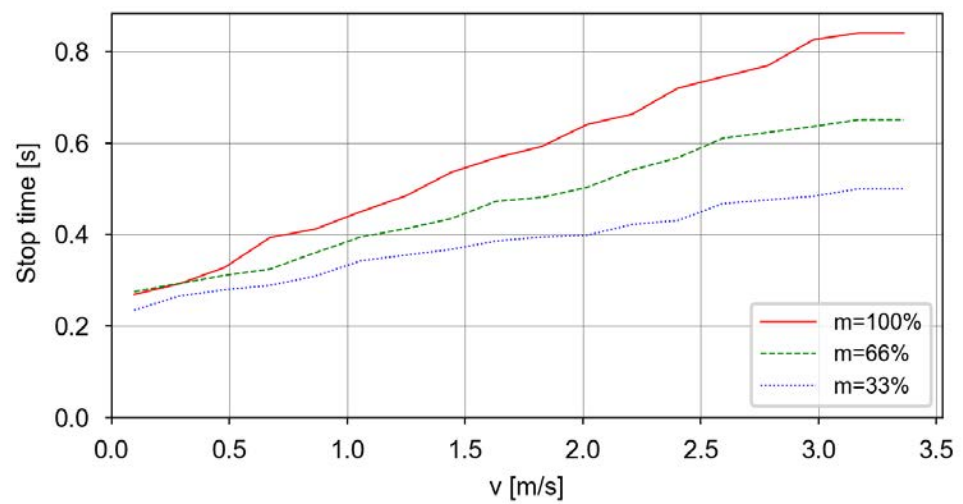
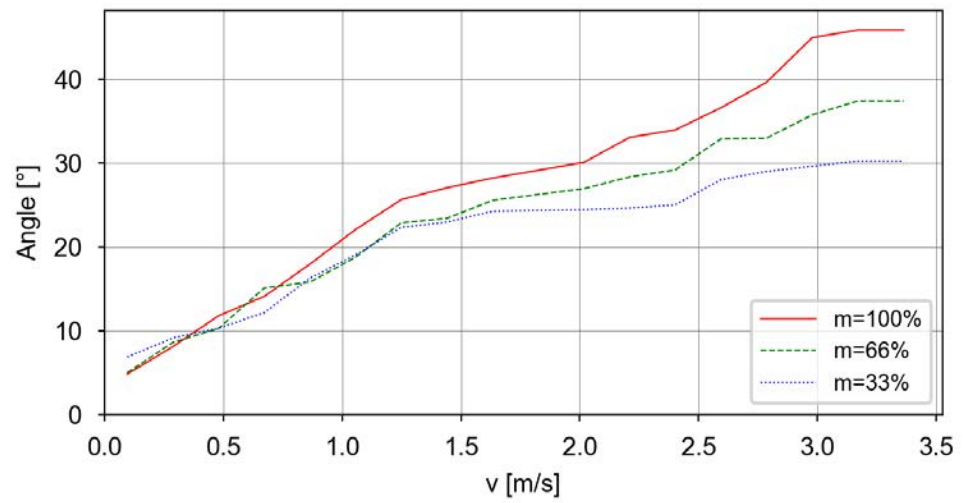
2.10.7 IRB 7710-400/2.85 LID
Continued

Category 1, Axis 1, Extension zone 0, stopping distance and stopping time



Continues on next page

Category 1, Axis 1, Extension zone 1, stopping distance and stopping time

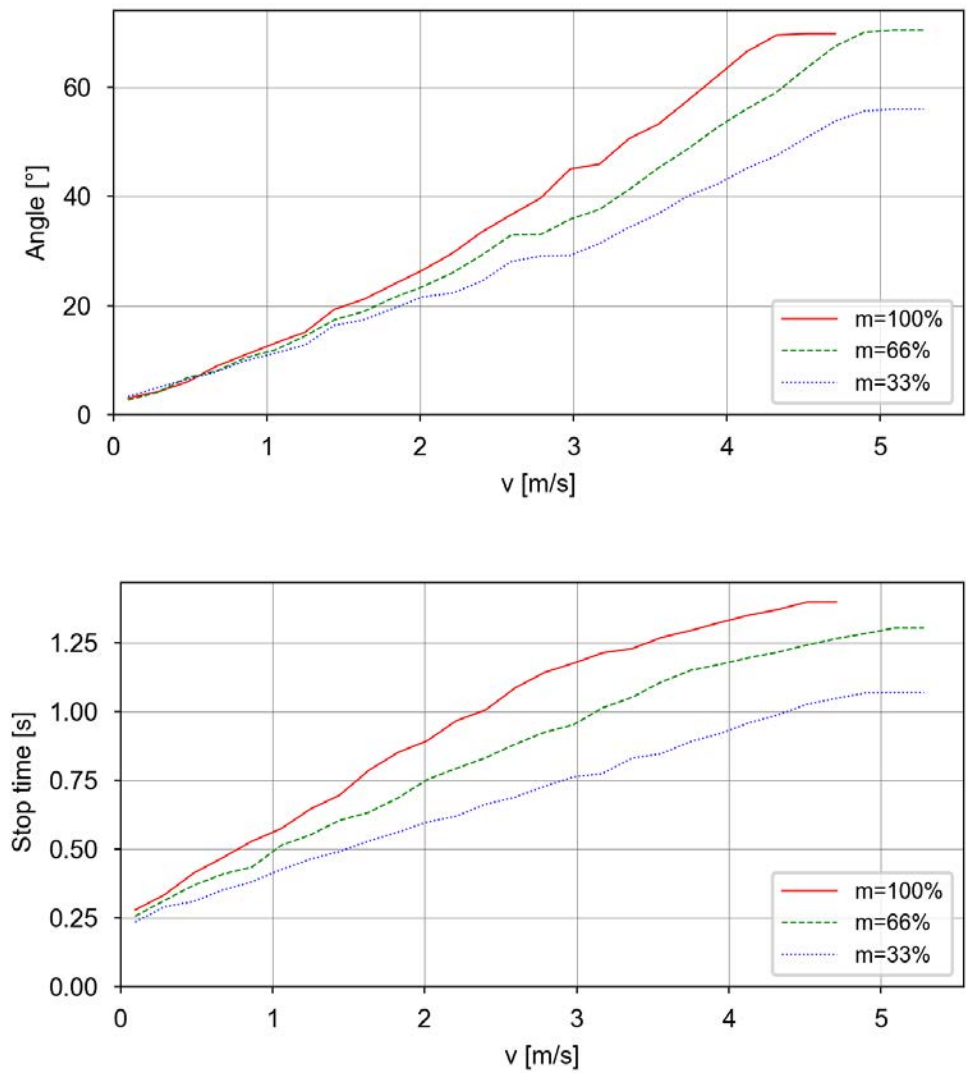


Continues on next page

2 Technical data for IRB 7710

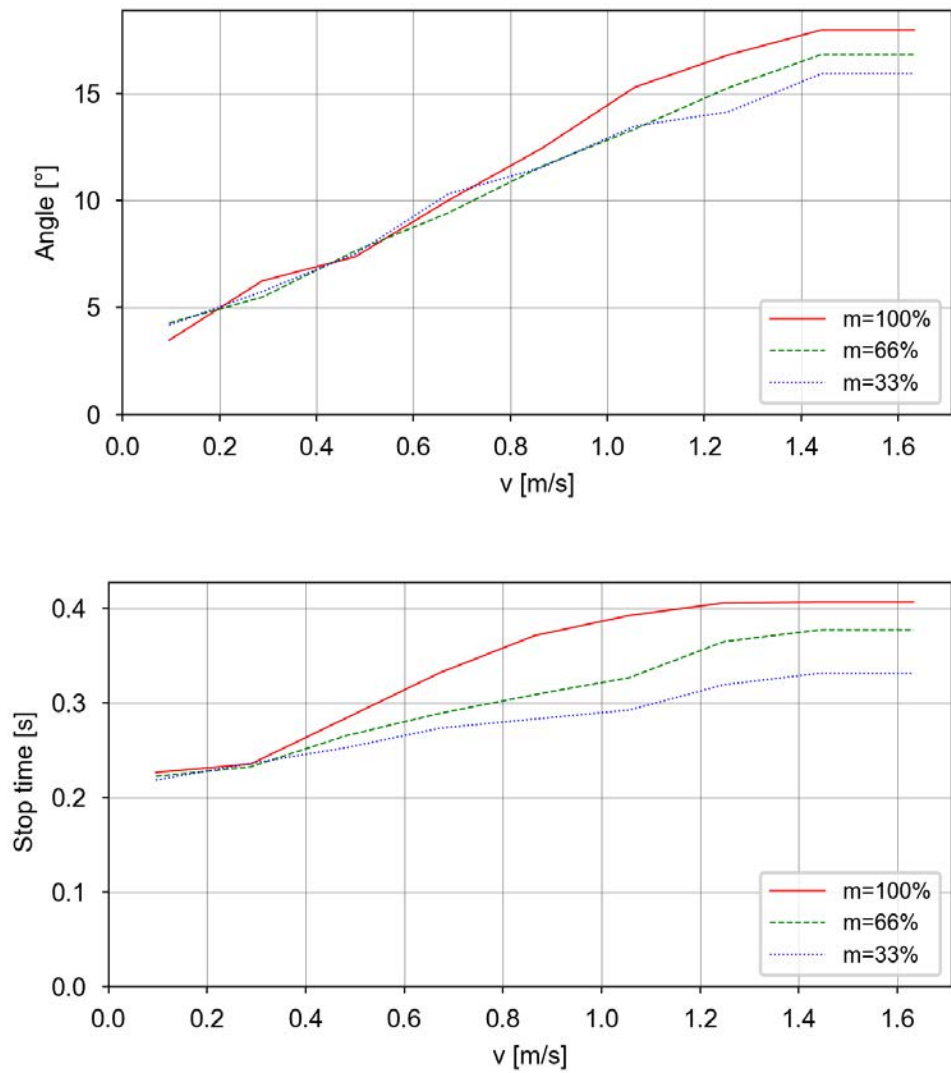
2.10.7 IRB 7710-400/2.85 LID
Continued

Category 1, Axis 1, Extension zone 2, stopping distance and stopping time



Continues on next page

Category 1, Axis 2, Extension zone 0, stopping distance and stopping time



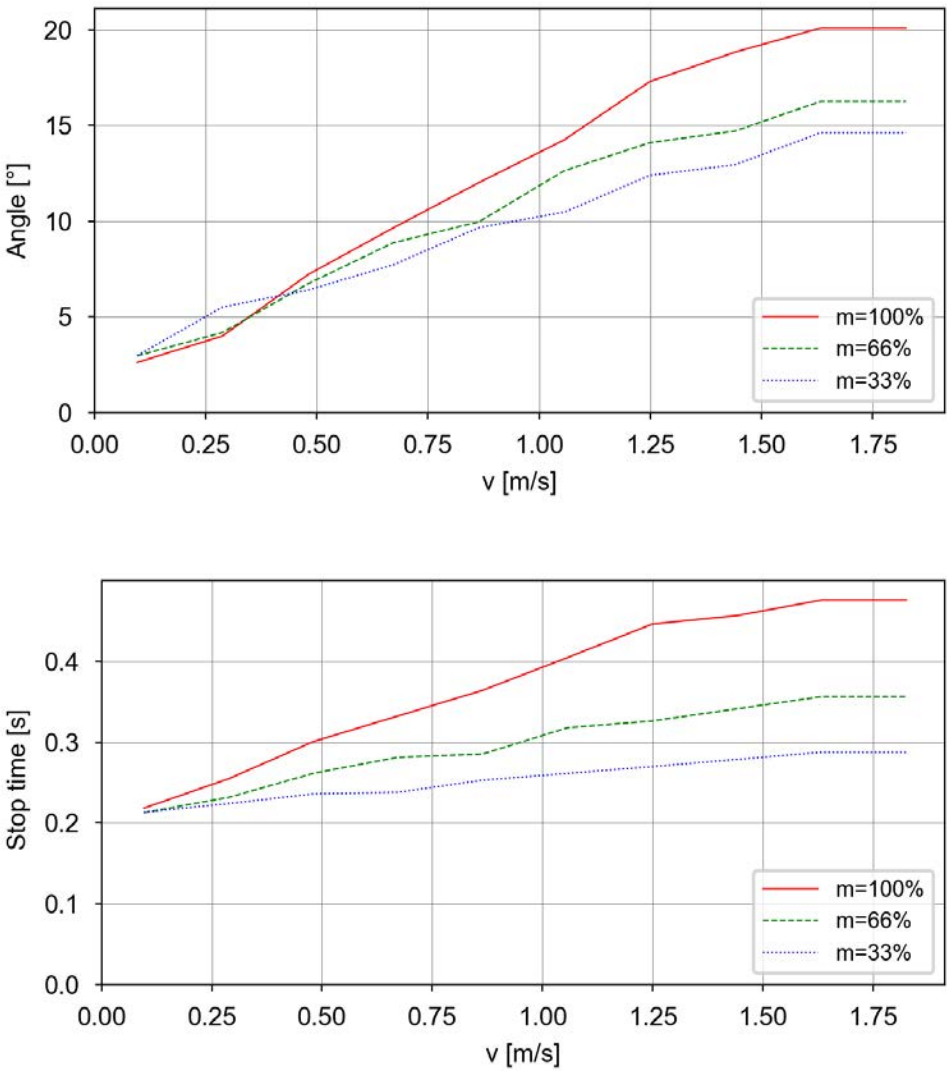
Continues on next page

2 Technical data for IRB 7710

2.10.7 IRB 7710-400/2.85 LID

Continued

Category 1, Axis 3, Extension zone 0, stopping distance and stopping time



2.10.8 IRB 7710-390/3.10 LID

Used tooldata

```

PERS tooldata P100:= [ TRUE, [[0, 0, 0], [1, 0, 0, 0]], [390, [0,
0, 360], [1, 0, 0, 0], 8.4, 8.4, 8.4]];
PERS tooldata P66:= [ TRUE, [[0, 0, 0], [1, 0, 0, 0]], [260, [0,
0, 240], [1, 0, 0, 0], 3.7, 3.7, 3.7]];
PERS tooldata P33:= [ TRUE, [[0, 0, 0], [1, 0, 0, 0]], [130, [0,
0, 120], [1, 0, 0, 0], 0.94, 0.94, 0.94]];

```

Category 0

The following table describes the stopping distance and time for category 0 stop.

Axis	Distance	Stop time
1	38.4°	0.84 s
2	10.7°	0.24 s
3	12.3°	0.29 s

Category 1, extension zones

For definitions of the zones, see [Extension zones on page 102](#).

The zone border is the mounting interface location for axis 2 and axis 3.

Axis 1

Zone border	Axis 2	Axis 3
z0-z1	-45°	0°
z1-z2	6°	0°

Axis 2

Only one zone exists.

Axis 3

Only one zone exists.

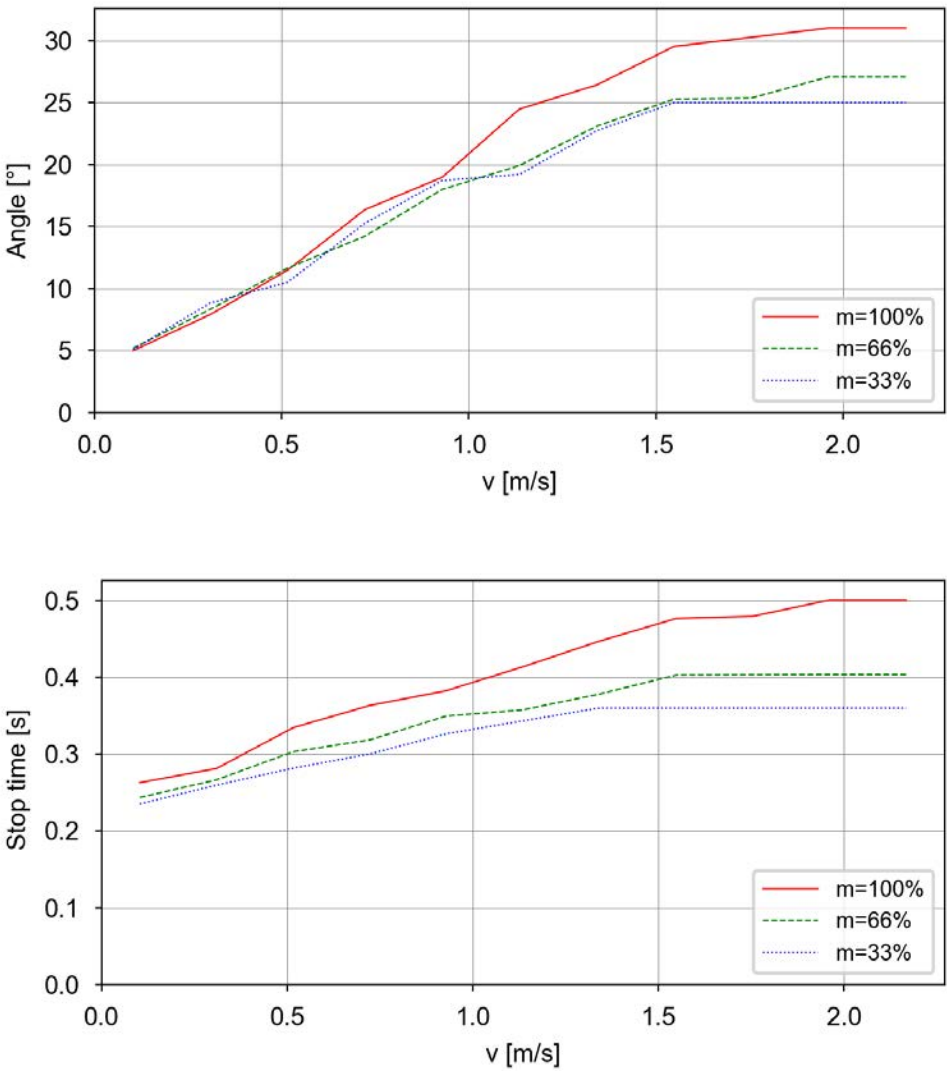
Continues on next page

2 Technical data for IRB 7710

2.10.8 IRB 7710-390/3.10 LID

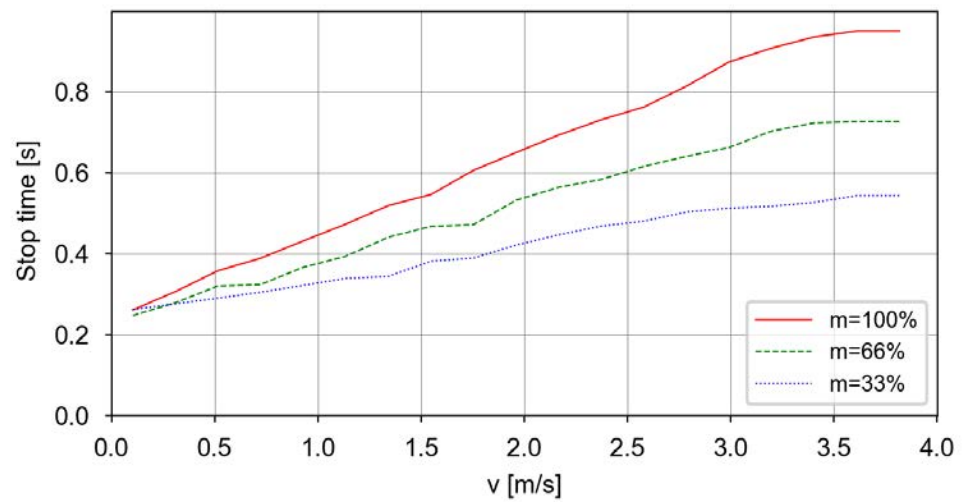
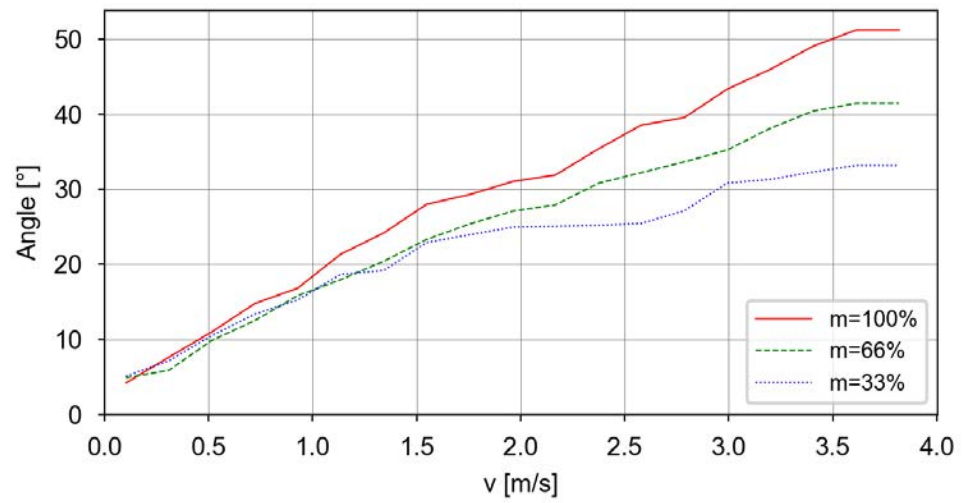
Continued

Category 1, Axis 1, Extension zone 0, stopping distance and stopping time



Continues on next page

Category 1, Axis 1, Extension zone 1, stopping distance and stopping time

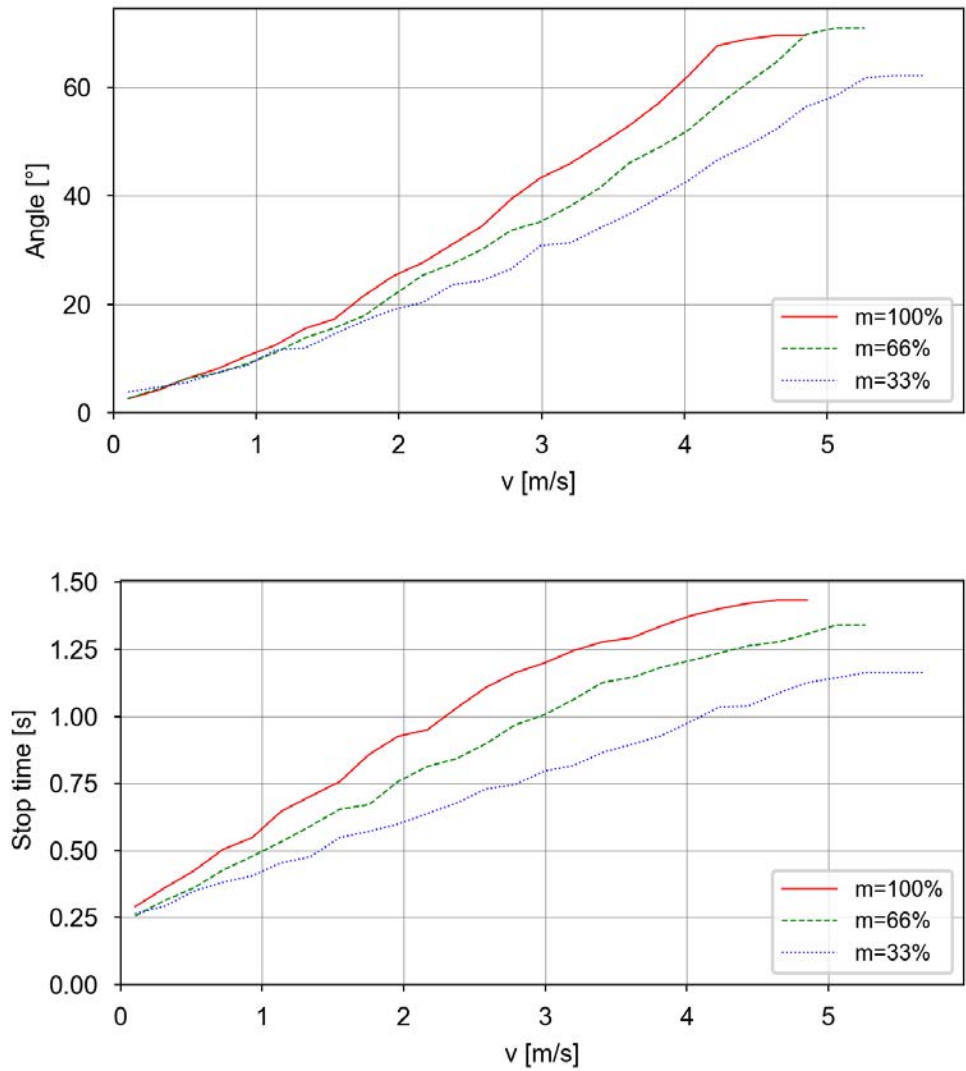


Continues on next page

2 Technical data for IRB 7710

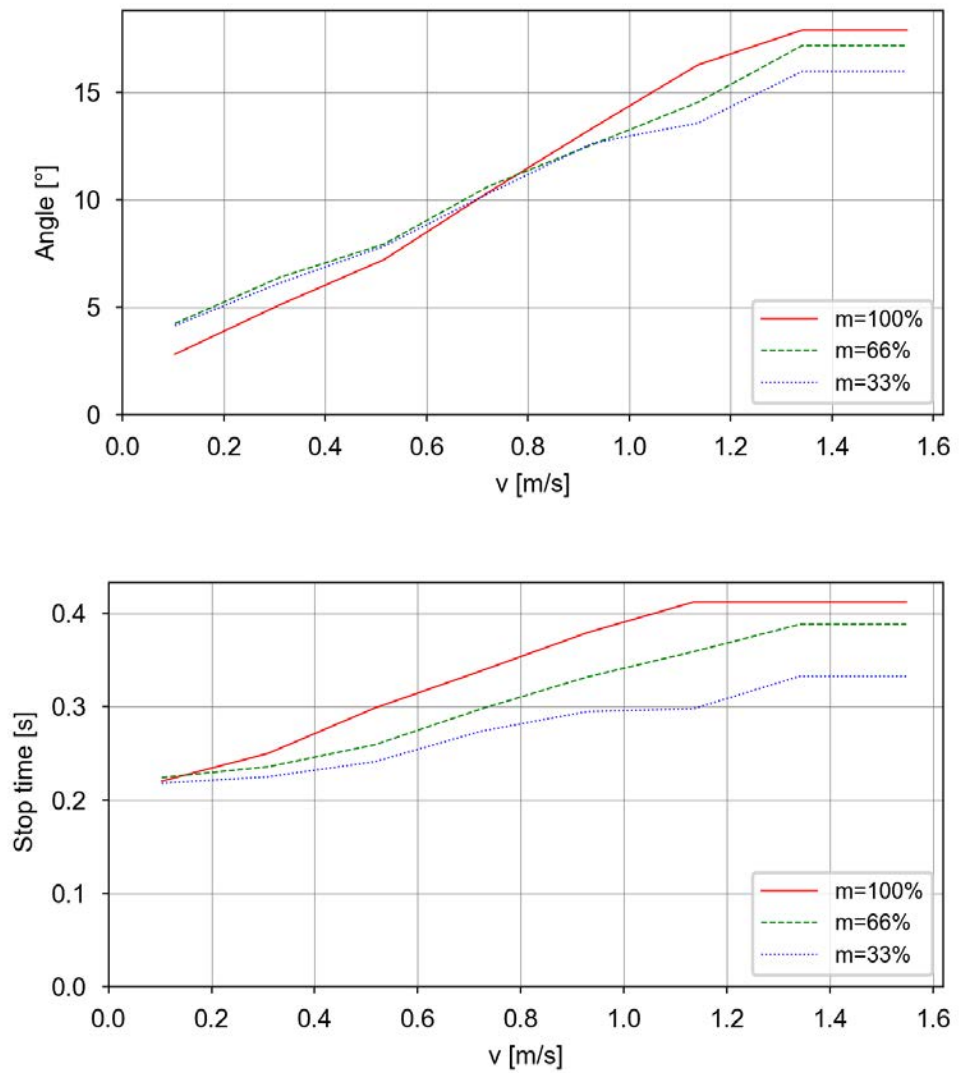
2.10.8 IRB 7710-390/3.10 LID
Continued

Category 1, Axis 1, Extension zone 2, stopping distance and stopping time



Continues on next page

Category 1, Axis 2, Extension zone 0, stopping distance and stopping time

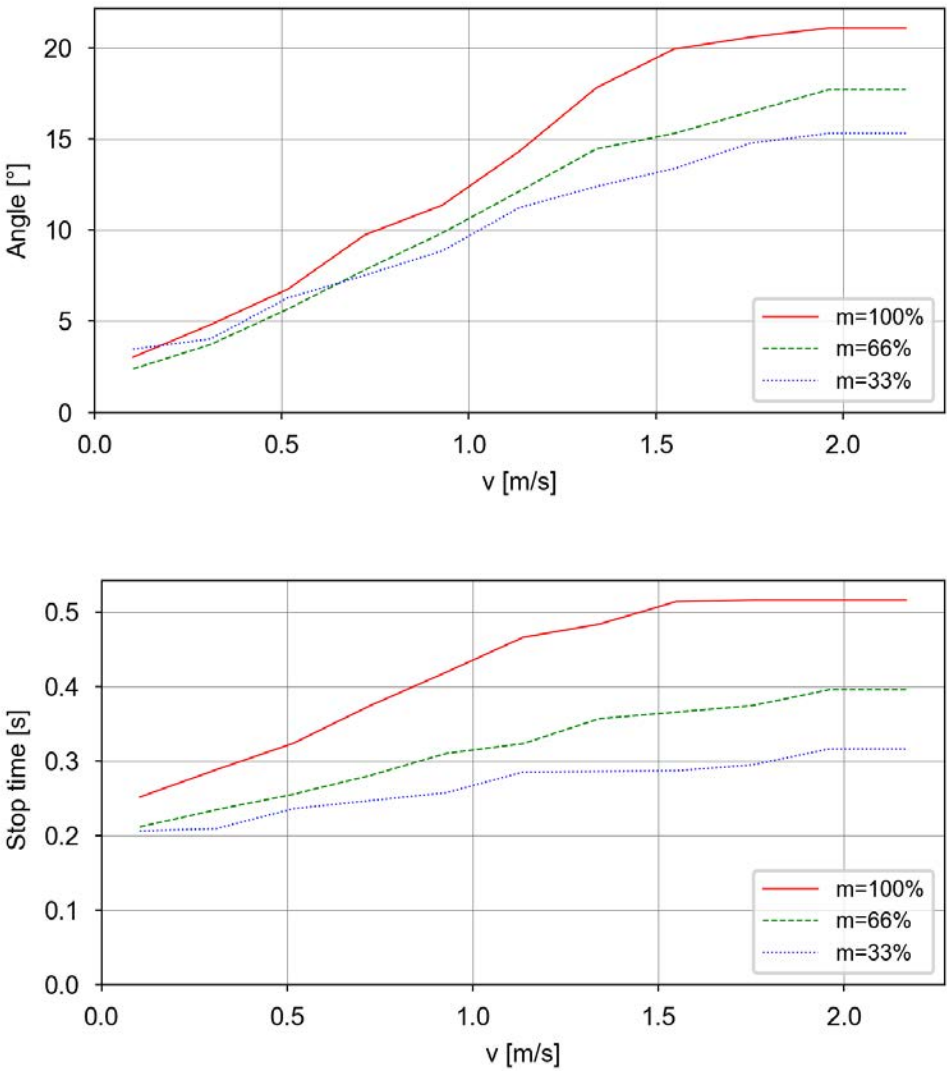


Continues on next page

2 Technical data for IRB 7710

2.10.8 IRB 7710-390/3.10 LID
Continued

Category 1, Axis 3, Extension zone 0, stopping distance and stopping time



2.10.9 IRB 7710-325/3.30 LID

Used tooldata

```

PERS tooldata P100:= [ TRUE, [[0, 0, 0], [1, 0, 0, 0]], [325, [0,
0, 360], [1, 0, 0, 0], 7, 7, 7]];
PERS tooldata P66:= [ TRUE, [[0, 0, 0], [1, 0, 0, 0]], [217, [0,
0, 240], [1, 0, 0, 0], 3.1, 3.1, 3.1]];
PERS tooldata P33:= [ TRUE, [[0, 0, 0], [1, 0, 0, 0]], [108, [0,
0, 120], [1, 0, 0, 0], 0.78, 0.78, 0.78]];

```

Category 0

The following table describes the stopping distance and time for category 0 stop.

Axis	Distance	Stop time
1	38.5°	0.84 s
2	10.6°	0.24 s
3	12.7°	0.3 s

Category 1, extension zones

For definitions of the zones, see [Extension zones on page 102](#).

The zone border is the mounting interface location for axis 2 and axis 3.

Axis 1

Zone border	Axis 2	Axis 3
z0-z1	-45°	0°
z1-z2	6°	0°

Axis 2

Only one zone exists.

Axis 3

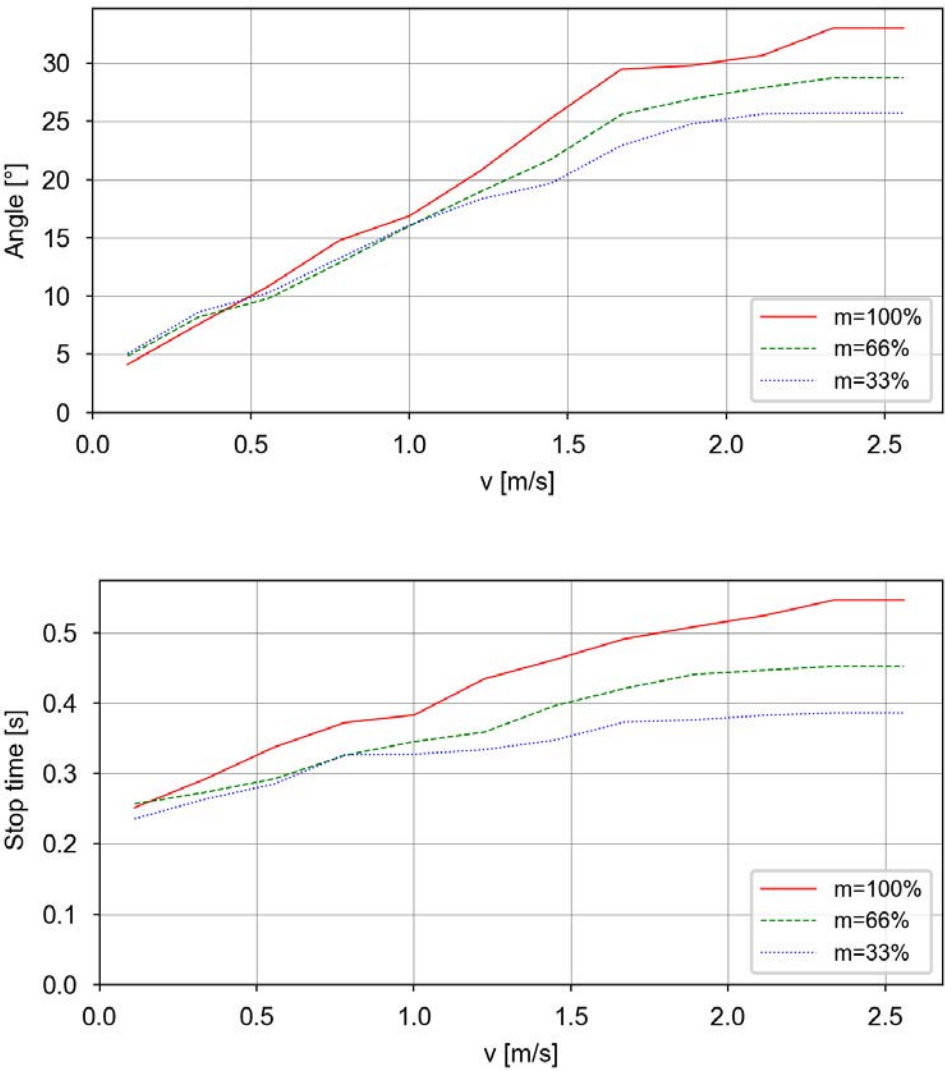
Only one zone exists.

Continues on next page

2 Technical data for IRB 7710

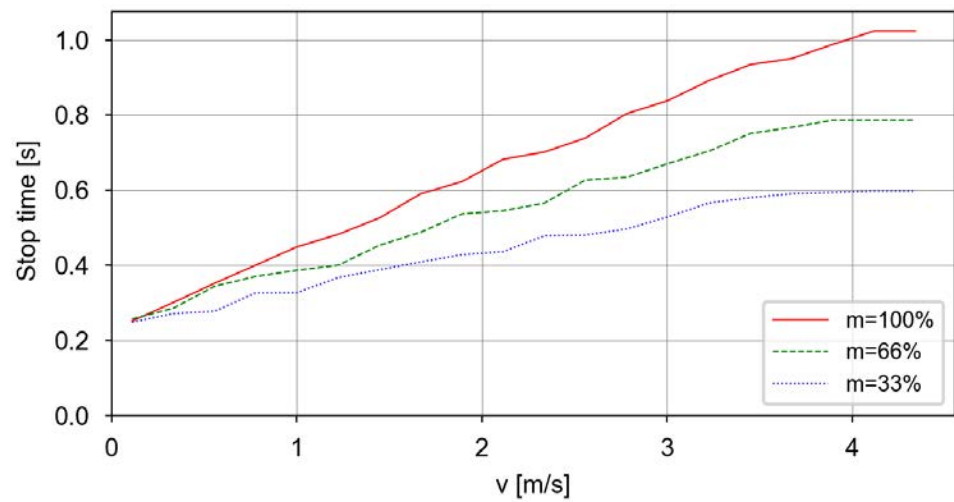
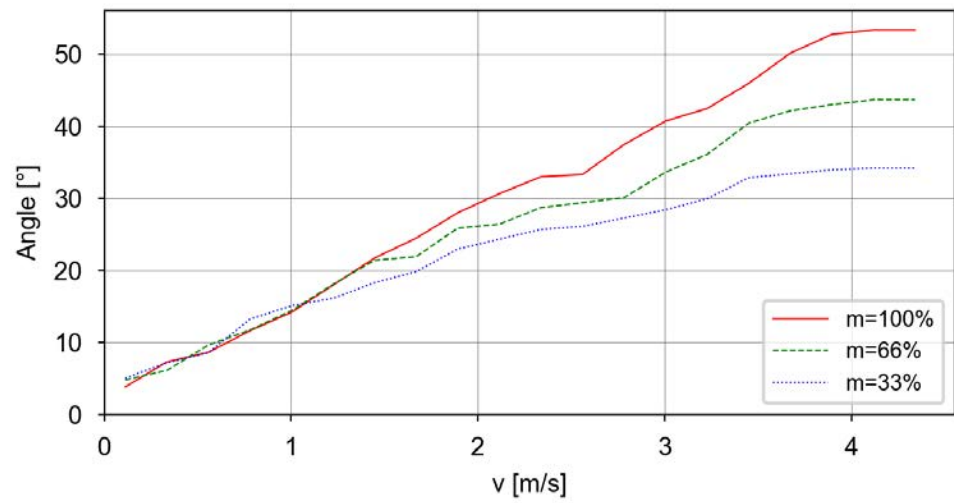
2.10.9 IRB 7710-325/3.30 LID
Continued

Category 1, Axis 1, Extension zone 0, stopping distance and stopping time



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Category 1, Axis 1, Extension zone 1, stopping distance and stopping time

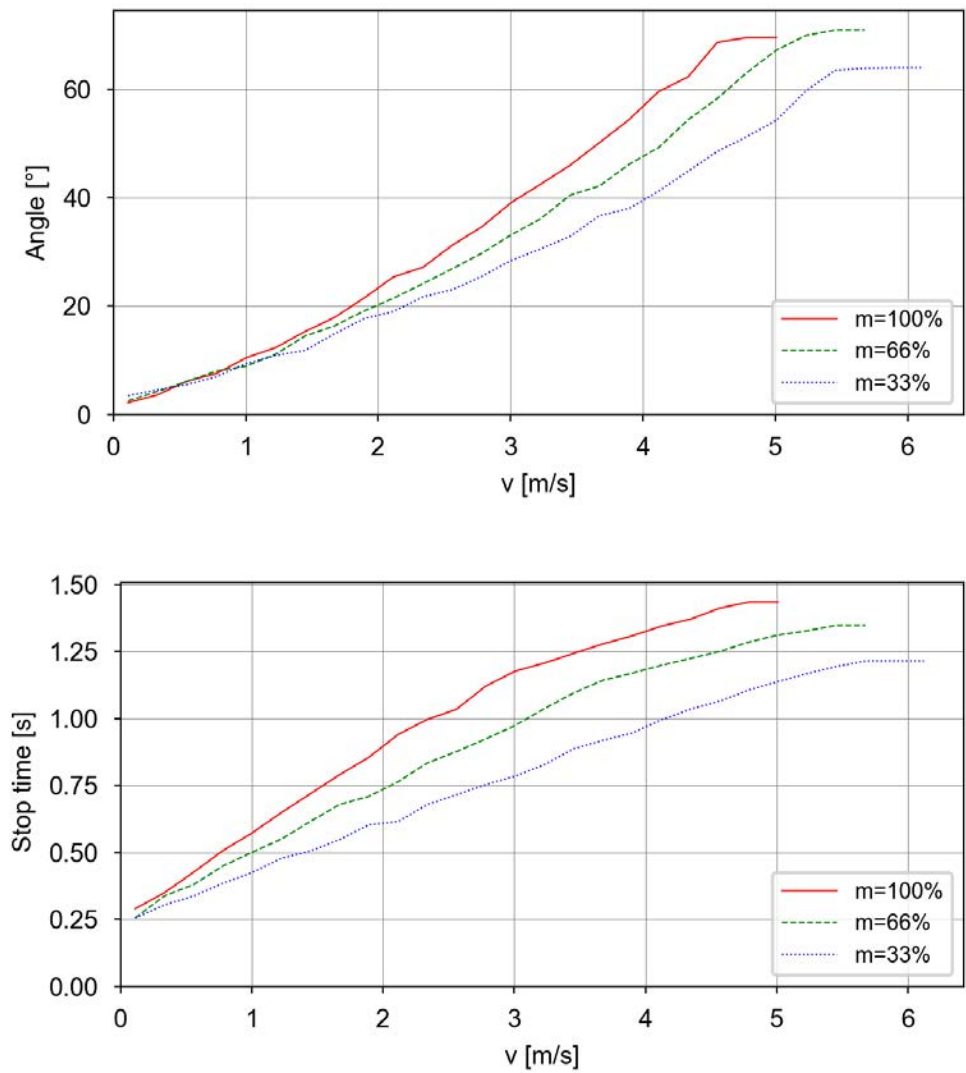


Continues on next page

2 Technical data for IRB 7710

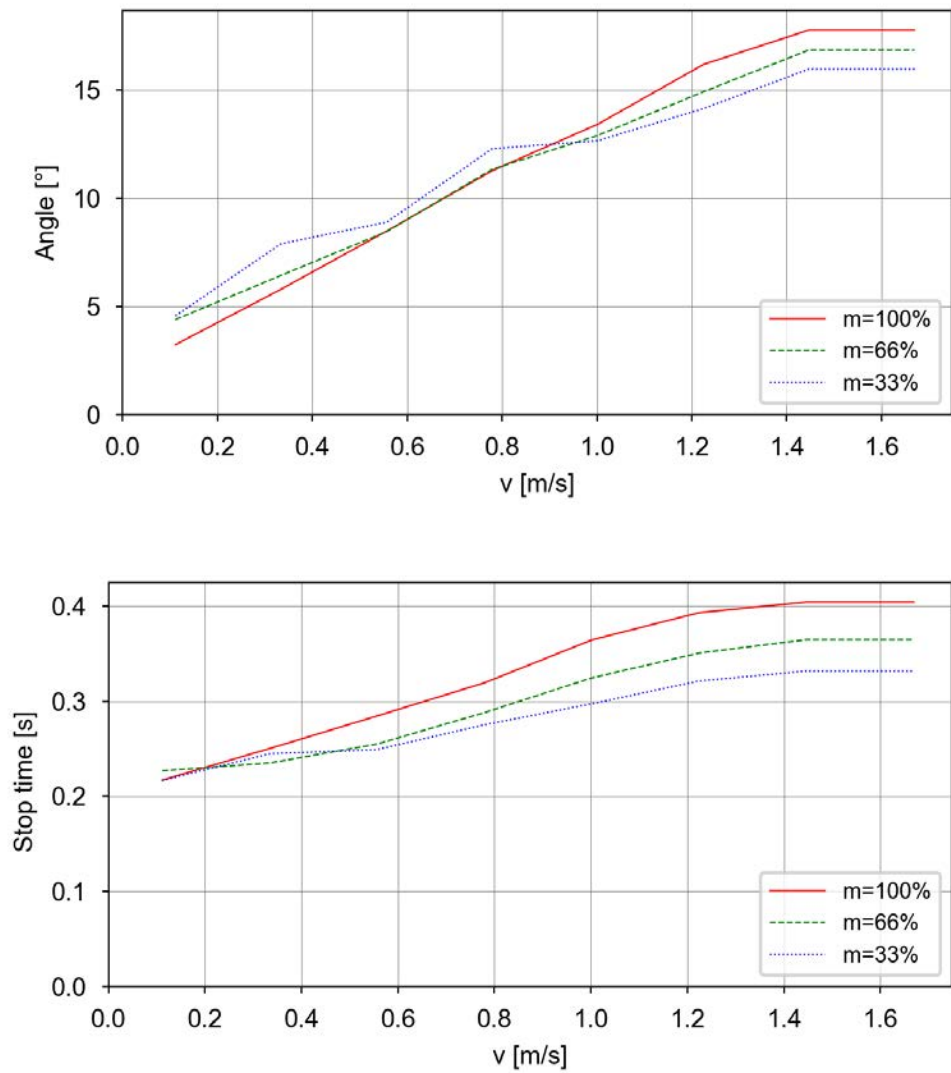
2.10.9 IRB 7710-325/3.30 LID
Continued

Category 1, Axis 1, Extension zone 2, stopping distance and stopping time



Continues on next page

Category 1, Axis 2, Extension zone 0, stopping distance and stopping time

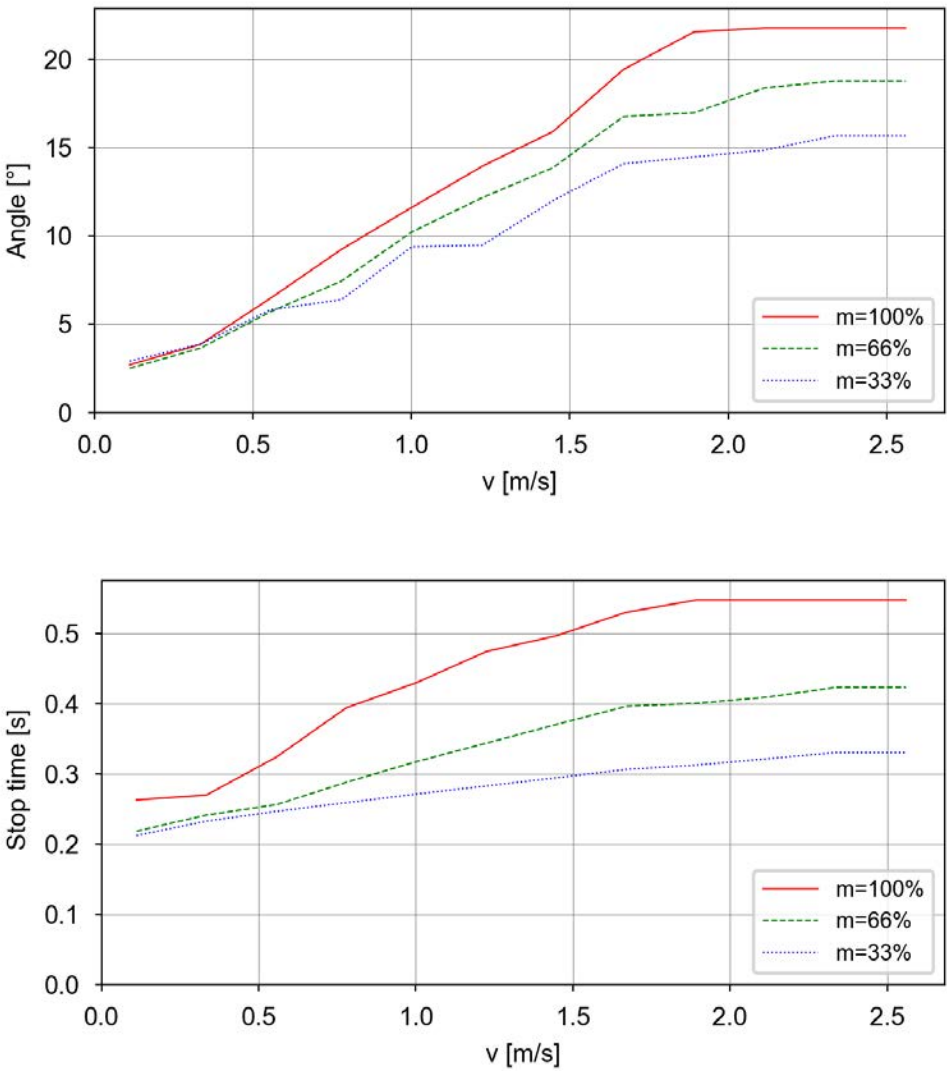


Continues on next page

2 Technical data for IRB 7710

2.10.9 IRB 7710-325/3.30 LID
Continued

Category 1, Axis 3, Extension zone 0, stopping distance and stopping time



2.10.10 IRB 7710-280/3.50 LID

Used tooldata

```

PERS tooldata P100:= [ TRUE, [[0, 0, 0], [1, 0, 0, 0]], [280, [0,
0, 360], [1, 0, 0, 0], 6, 6, 6]];
PERS tooldata P66:= [ TRUE, [[0, 0, 0], [1, 0, 0, 0]], [187, [0,
0, 240], [1, 0, 0, 0], 2.7, 2.7, 2.7]];
PERS tooldata P33:= [ TRUE, [[0, 0, 0], [1, 0, 0, 0]], [93, [0, 0,
120], [1, 0, 0, 0], 0.67, 0.67, 0.67]];

```

Category 0

The following table describes the stopping distance and time for category 0 stop.

Axis	Distance	Stop time
1	38.4°	0.84 s
2	10.4°	0.23 s
3	13.1°	0.31 s

Category 1, extension zones

For definitions of the zones, see [Extension zones on page 102](#).

The zone border is the mounting interface location for axis 2 and axis 3.

Axis 1

Zone border	Axis 2	Axis 3
z0-z1	-45°	0°
z1-z2	6°	0°

Axis 2

Only one zone exists.

Axis 3

Only one zone exists.

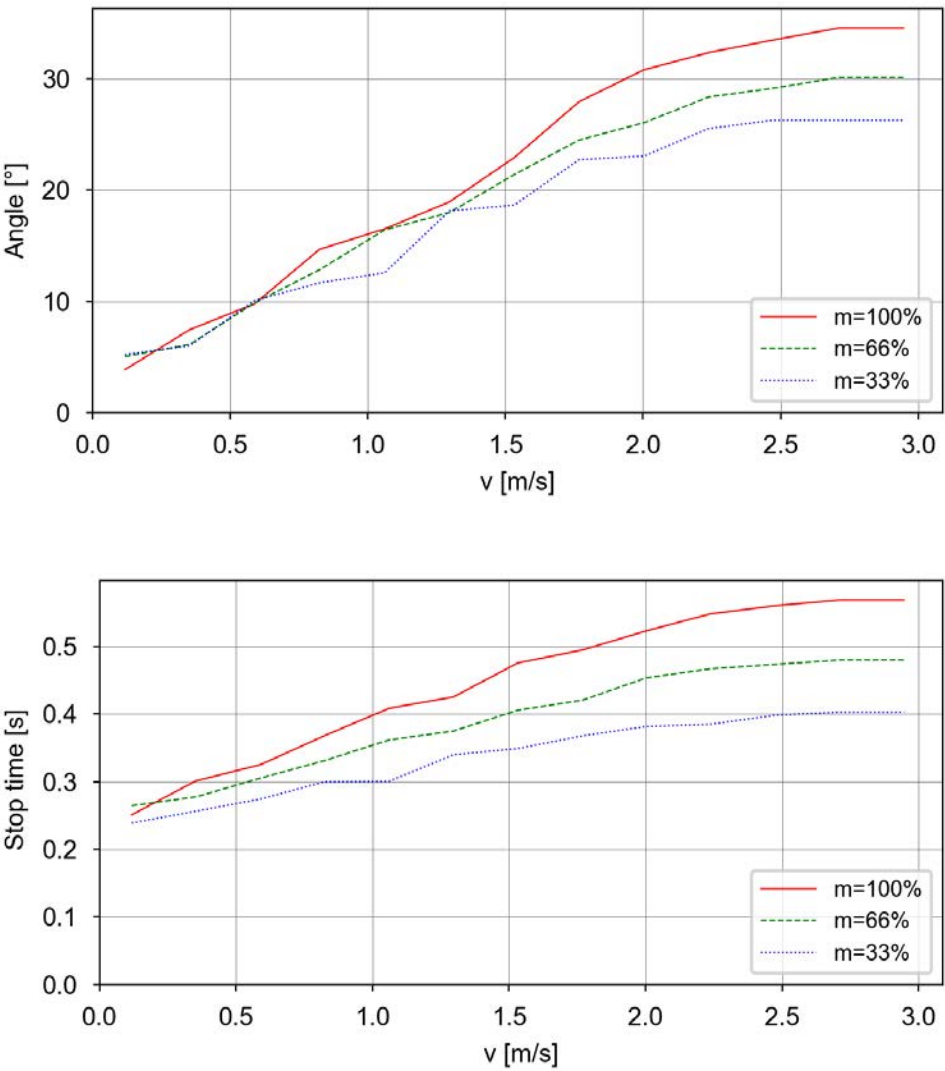
Continues on next page

2 Technical data for IRB 7710

2.10.10 IRB 7710-280/3.50 LID

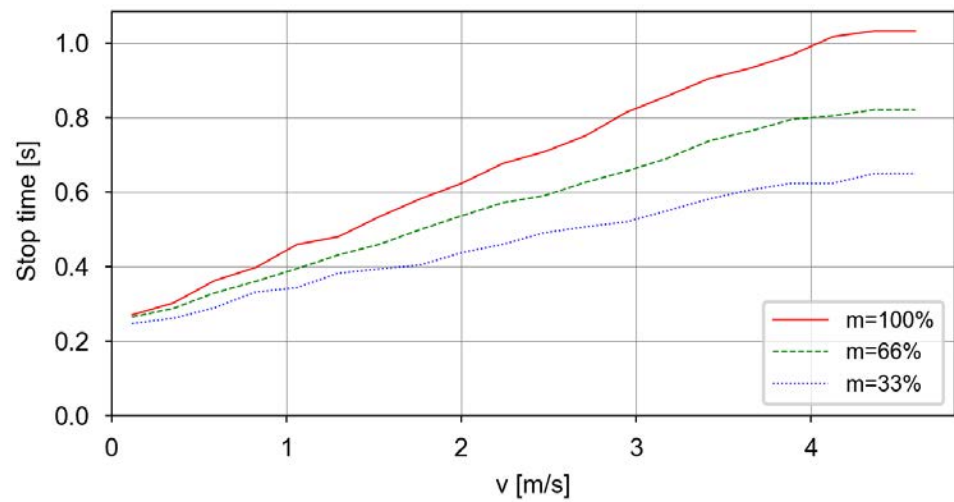
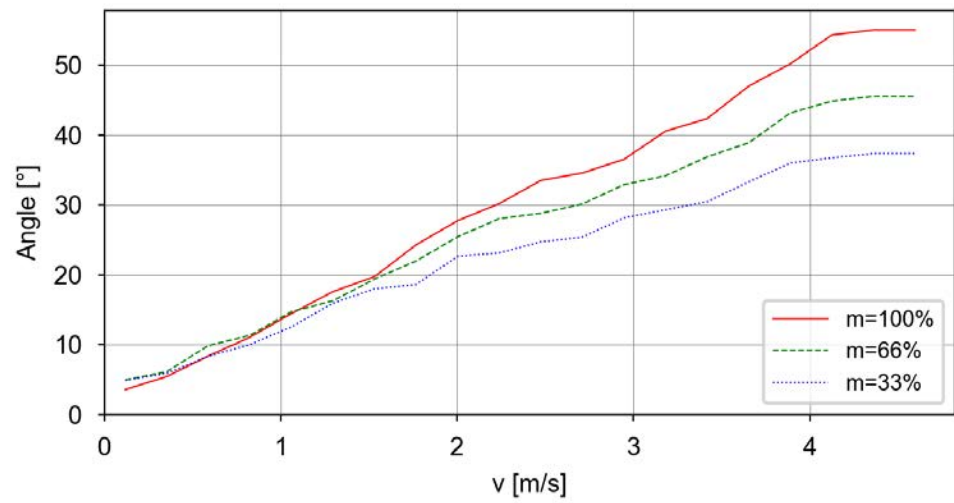
Continued

Category 1, Axis 1, Extension zone 0, stopping distance and stopping time



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Category 1, Axis 1, Extension zone 1, stopping distance and stopping time



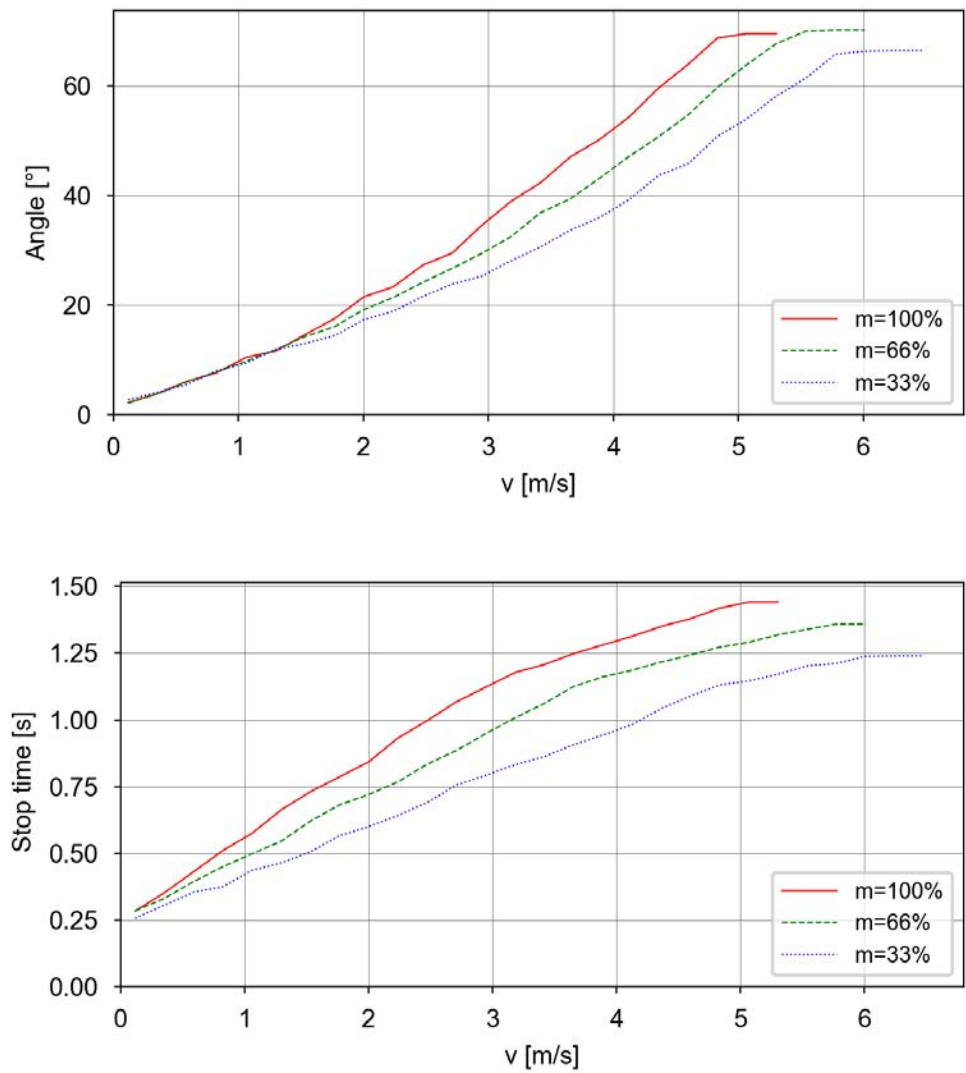
Continues on next page

2 Technical data for IRB 7710

2.10.10 IRB 7710-280/3.50 LID

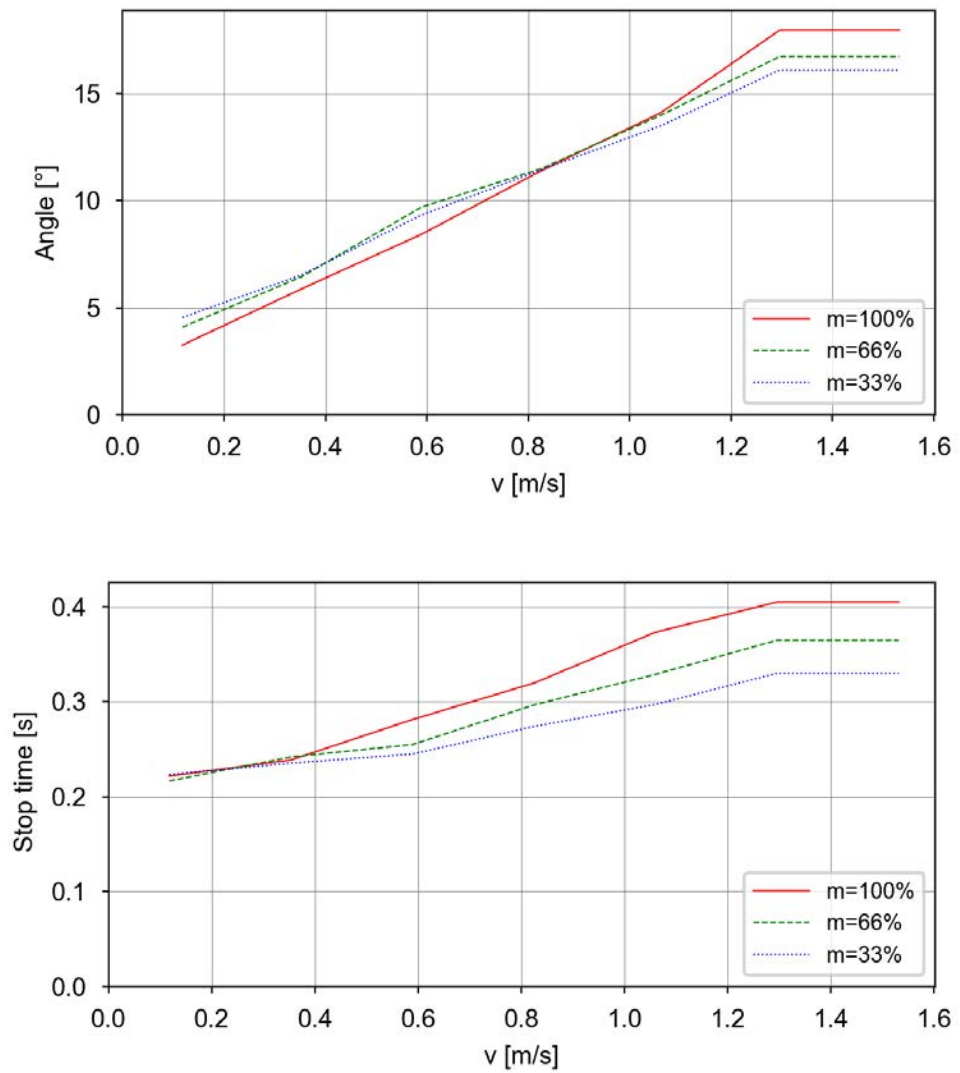
Continued

Category 1, Axis 1, Extension zone 2, stopping distance and stopping time



Continues on next page

Category 1, Axis 2, Extension zone 0, stopping distance and stopping time



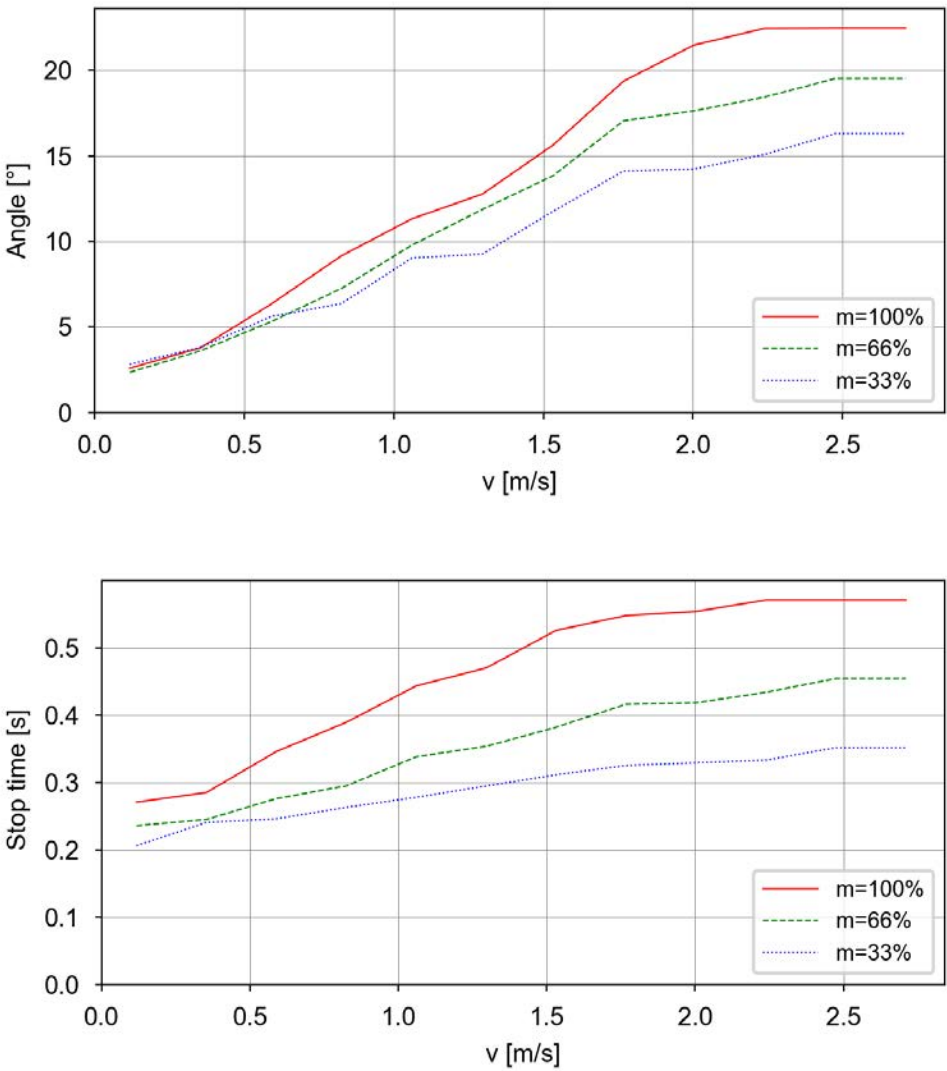
Continues on next page

2 Technical data for IRB 7710

2.10.10 IRB 7710-280/3.50 LID

Continued

Category 1, Axis 3, Extension zone 0, stopping distance and stopping time



3 Specification of variants and options

3.1 Introduction to variants and options

General

The different variants and options for the IRB 7710 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 Specification of variants and options

3.2 Manipulator

3.2 Manipulator

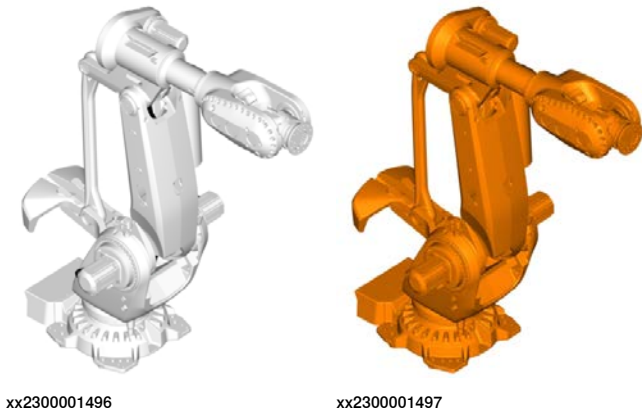
Variants

Option number	IRB	Handling capacity (kg)	Reach (m)	Remark
3300-369	7710	500 kg	2.85 m	
3300-370	7710	430 kg	3.1 m	
3300-371	7710	360 kg	3.3 m	
3300-372	7710	310 kg	3.5 m	
3300-373 ⁱ	7710	400 kg	2.85 m	LID (LeanID)
3300-374 ⁱ	7710	390 kg	3.1 m	LID (LeanID)
3300-375 ⁱ	7710	325 kg	3.3 m	LID (LeanID)
3300-376 ⁱ	7710	280 kg	3.5 m	LID (LeanID)

ⁱ The options 3300-373, 3300-374, 3300-375 and 3300-376 require option DressPack axis 3-6 [3326-x]

Color options

For our robots, Graphite White is the standard default color, option 209-202. Colors according to the RAL color system are available.



Option	Color	RAL code ⁱ
209-202	ABB Graphite White std Standard color with protection option 3350-670 Base 67	RAL 7035
209-1	ABB orange standard Standard color with protection option 3352-10 Foundry Plus2 67	NCS 2070-Y60R
209-2	ABB white standard	RAL 9003
209 ⁱⁱ	RAL code should be specified (ABB non-standard colors)	

ⁱ The colors can differ depending on supplier and the material on which the paint is applied.

ⁱⁱ Only for robots with protection type *Base* 67.

Continues on next page



Note

The colors stated in the table above are valid for manipulators. The accessories and spare parts are normally available in the standard color.

The orange color is recommended for foundry applications or other extra tough environments where there is a risk of color changes over time. This is not affecting the function, only the visual impression.



Note

The delivery time for painted spare parts is longer for non-standard colors.

Manipulator protection

The manipulator is available with the following protection types.

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

Base 67

The basic design (IP67) 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.

Foundry Plus2 67

For the extra tough environment, for example foundry industries, the option *Foundry Plus2 67* is recommended as protection type. It adds extra cable protection, extra

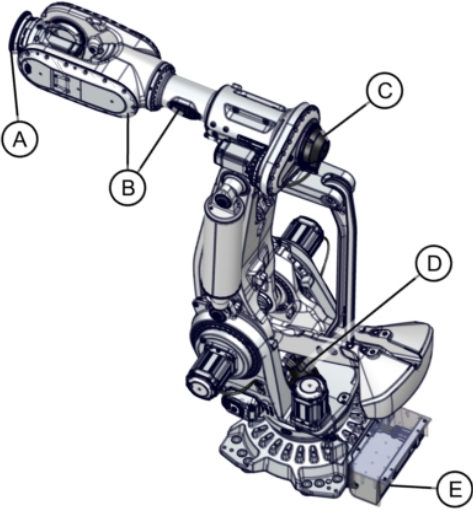
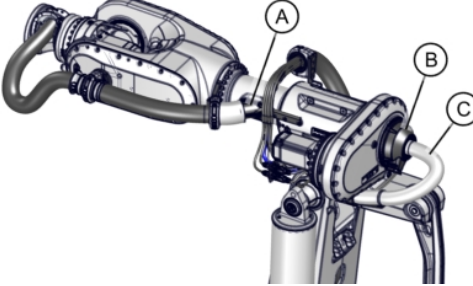
Continues on next page

3 Specification of variants and options

3.2 Manipulator Continued

sealings, protection plugs in unused holes, added rust preventive, and special paint/surface treatment, compared to protection type *Base 67*.

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

Additional parts for manipulator	Additional parts for DressPack
 xx2400000289 - A Turning disc with Nickel-phosphorus coating - B Rubber gasket - C Protective cover - D Cable protection - E Sheet metal in stainless steel	 xx2400000290 - A Cable inlet and cable protection - B Protective cover - C Cable protection

Requirements

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

Foundry cable guard

Option	Description
3315-1	Foundry cable guard

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

The option *Foundry Cable Guard* is recommended for *Foundry Plus2*.

Limitations

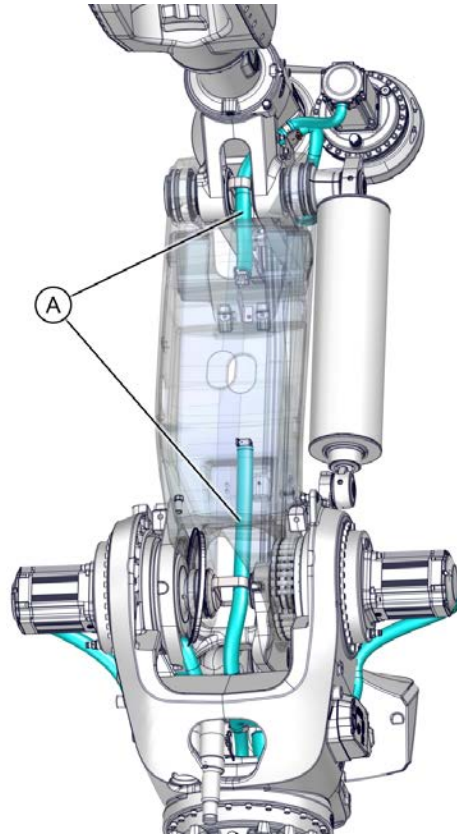
The option *Foundry Cable Guard* is not compatible with *DressPack SW*.

Requirements

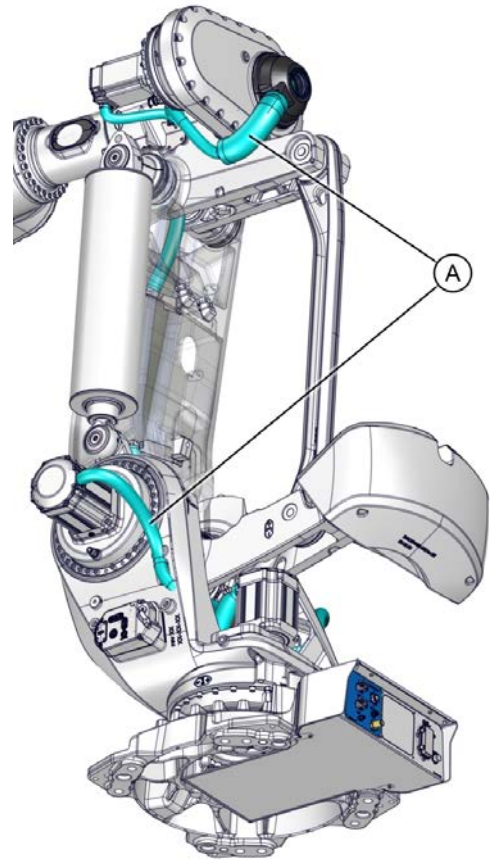
The option *Foundry Cable Guard* requires option *Upper arm cover* [3316-1].

Continues on next page

Foundry cable guards for manipulator cable harness



xx2400000292



xx2400000293

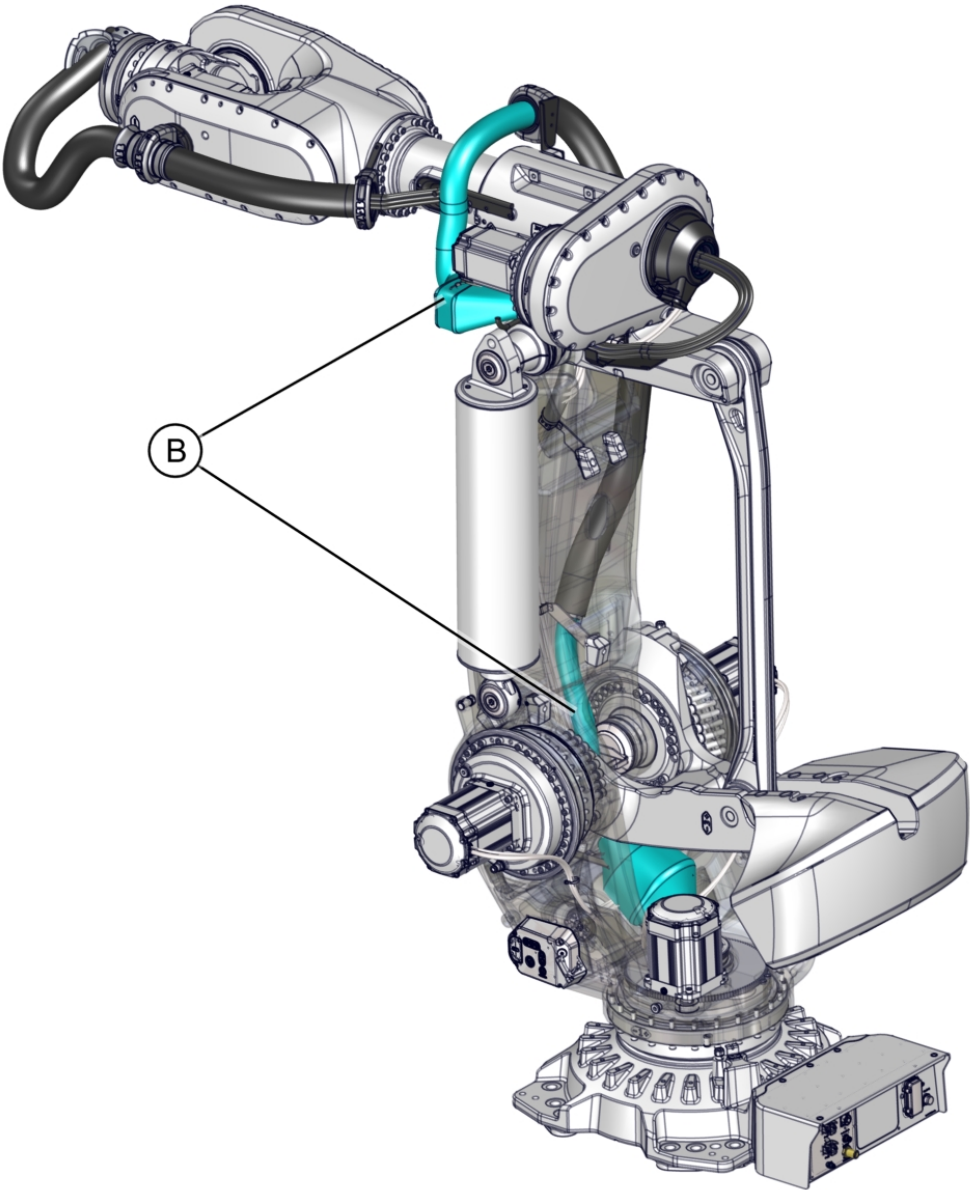
A	Foundry cable guard for manipulator cable harness
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Continues on next page

3 Specification of variants and options

3.2 Manipulator
Continued

Foundry cable guard for DressPack

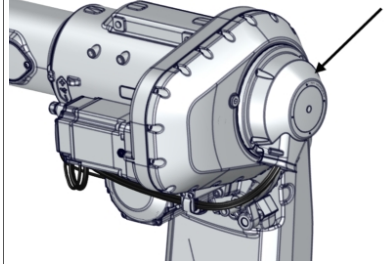


xx2400000294

B	Foundry cable guard for DressPack
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Continues on next page

Upper arm cover

Option	Description	Image
3316-1	Upper arm cover The manipulator can be equipped with additional upper arm covers for environmental conditions, where you want to further seal off the upper arm in wet or dirty conditions. These additional covers will prolong the lifetime of the cables, and simplify service/maintenance as the robot is kept more clean under the covers.	 xx2500000237

Requirements

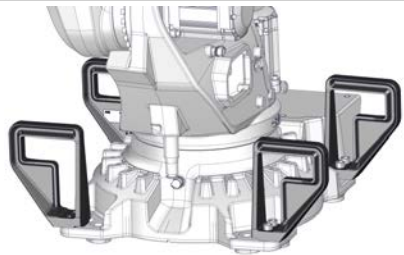
This option is mandatory to order with the option *Foundry Plus2* [3352-10].

This option is mandatory to order with the option *Foundry Cable Guard* [3315-1].

This option is mandatory to order with the option *DressPack axis 3-6* [3326-x].

Forklift device

The manipulator can be delivered with forklift devices, allowing a forklift to be used when moving the manipulator.

Option	Description	Image
3318-1	Forklift device on base Forklift pockets placed on the base gives a low lifting point.	 xx2300001244

Motor cooling

To be used to avoid overheating of motors and gears in applications with intensive motion (high average speed and/or high average torque and/or short wait time) of the axes on the lower arm.

Option	Description
3320-1	Cooling fan axis 1
3321-1	Cooling fan axis 2
3346-1	Cooling fan axis 3

The cooling fan has protection class IP54.

To determine the need of cooling fans on the motors, use the add-in **Mechanical Analysis** in RobotStudio. For more information, contact your local ABB office.

Limitations

Cannot be combined with protection type *Foundry Plus2* 67.

Continues on next page

3 Specification of variants and options

3.2 Manipulator

Continued

Only two cooling fans can be used simultaneously.

Cannot be combined with track motion.

Resolver connection 7th axis

Option	Description
3322-1	On base
3322-2	In servo DressPack This option is required for the option 3325-x DressPack base-axis 3 including servo.

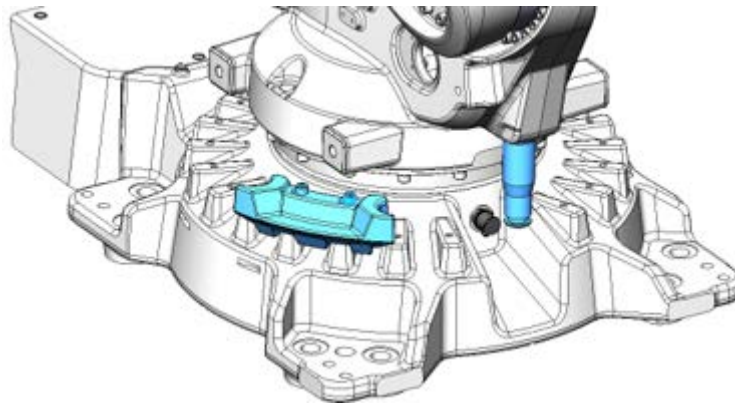
Option 3222-2 In servo DressPack adds a connection point for the 7th axis servo feedback on the frame of the robot to be used in servo DressPack.

Limited working range

Option	Description
3323-1	Axis 1 adjustable 15°

The manipulator can be equipped with adjustable mechanical stops. This is to mechanically limit the working range on axis 1. The mechanical stops are delivered alongside the robot (not installed). The stops can be placed in steps according to the option.

For detailed information see [Installing movable mechanical stops on axis 1 \(option 3323-1\) on page 64](#).



xx2100002595



Tip

An alternative to mechanical stops is to use safe supervision of the working range limitations. This requires the option *SafeMove Standard+*. See the product specification for the respective robot controller.

Extended working range

Option	Description	
3324-1	Axis 1 to $\pm 220^\circ$	The option extends the working range on axis 1 from $\pm 170^\circ$ to $\pm 220^\circ$.

Continues on next page



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 compatible with *DressPack SW*.

Requirements

This option requires the option *SafeMove* [3043-x].

3 Specification of variants and options

3.3 Floor cables

3.3 Floor cables



Note

To comply with the EMC directive, the total cable length (including cables for the motor connection box) must not exceed 30 m between:

Controller and robot (IRB)

Controller and motor & gear units (MU/GU) or track motion (IRT)

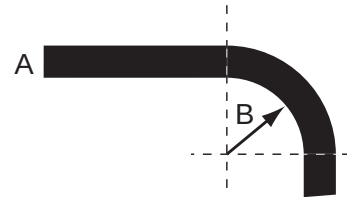
Controller and positioner (IRP)

Manipulator cable - Length

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

Bending radius for static floor cables

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



xx1600002016

A	Diameter
B	Diameter x10

3.4 Application

3.4.1 Overview of DressPack options

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 are required, there are different variants available (Parallel, EtherNet, CC link, EtherCAT) with corresponding connections at axis 6, axis 3, and at the base interface.

Parallel	PROC1 (1/2" Hose for compressed air) & CP/CS Hose (1/2") for compressed air is included in all DressPack variants. There is one inlet at the base (M22x1.5), one outlet at axis 3 (M22x1.5), and a free end at axis 6.
EtherNet	PROC1, CP/CS, EtherNet & FE (functional earth)
CC link	PROC1, CP/CS, EtherNet & FE (functional earth)
EtherCAT	PROC1, CP/CS, EtherNet & FE (functional earth)

Requirements

Upper arm DressPack requires lower arm DressPack.

LID manipulator variants can only use LID DressPack.

LID manipulator variants require both lower and upper arm DressPack.

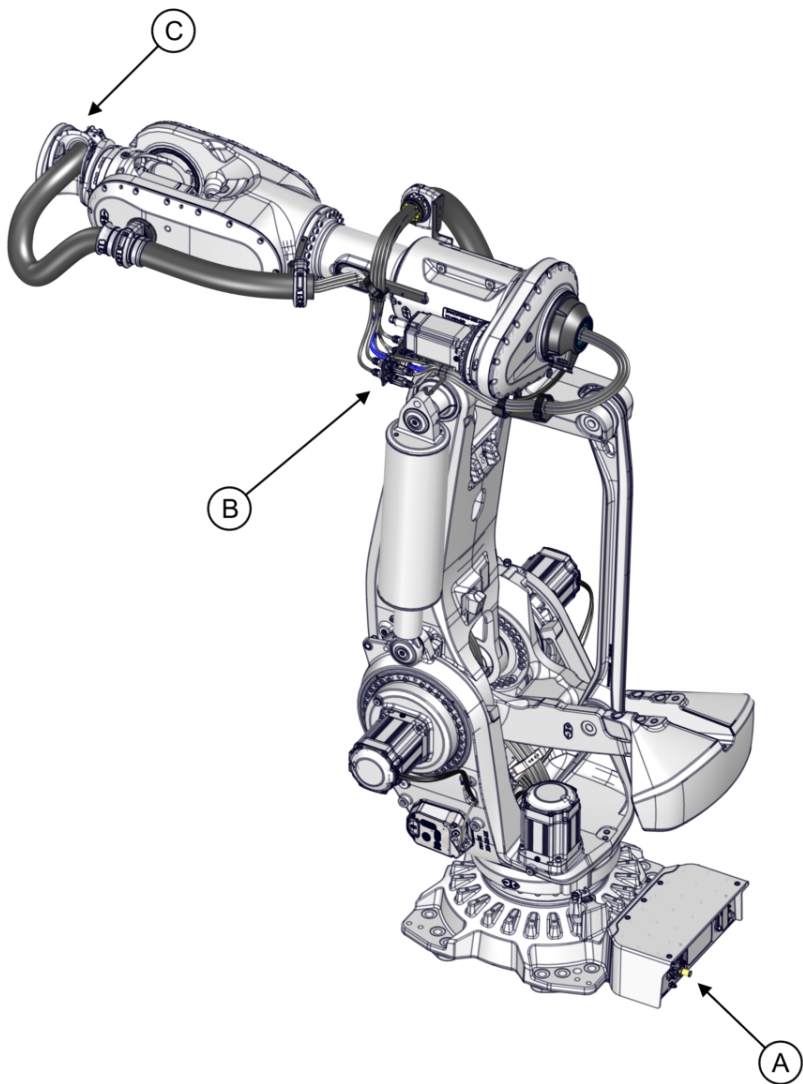
3 Specification of variants and options

3.4.2 DressPack for material handling

3.4.2 DressPack for material handling

Connection interfaces

Below is an overview showing the DressPack connection points. For detailed information see *Circuit diagram - DressPack IRB 7710 / IRB 7720*, listed in [References on page 7](#).



xx2400000295

A	Base
B	Axis 3
C	Axis 6

Continues on next page

3 Specification of variants and options

3.4.2 DressPack for material handling

Continued

Manipulator DressPack MH

Base to axis 3	Axis 3 to axis 6
3325-11 MH Parallel	3326-11 MH3 Parallel
	3326-30 MH LID empty conduit
	3326-31 MH LID Parallel
3325-13 MH Ethernet	3326-13 MH3 EtherNet
	3326-30 MH LID empty conduit
	3326-33 MH LID EtherNet
3325-14 MH CC-Link	3326-14 MH3 CC-Link
	3326-30 MH LID empty conduit
	3326-34 MH LID CC-Link
3325-15 MH EtherCat	3326-15 MH3 EtherCat
	3326-30 MH LID empty conduit
	3326-35 MH LID EtherCat

DressPack MH base to axis 3

Option	Description	Note	Connectors
3325-11	MH Parallel	Lower arm MH	Customer power (CP), customer signal (CS), and PROC1
3325-13	MH EtherNet	Lower arm MH Includes parallel signals. Supports ProfiNet, EtherNet/IP.	Customer power (CP), customer signal (CS), ETHERNET, PROC1, and functional earth (FE)
3325-14	MH CC-Link	Lower arm MH Includes parallel signals.	Customer power (CP), customer signal (CS), ETHERNET, PROC1, and functional earth (FE)
3325-15	MH EtherCat	Lower arm MH Includes parallel signals.	Customer power (CP), customer signal (CS), ETHERNET, PROC1, and functional earth (FE)

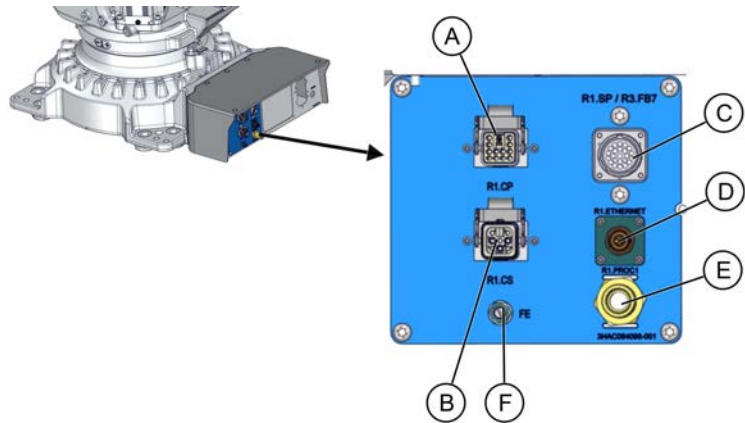
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3 Specification of variants and options

3.4.2 DressPack for material handling

Continued

Connection plate at base for DressPack MH



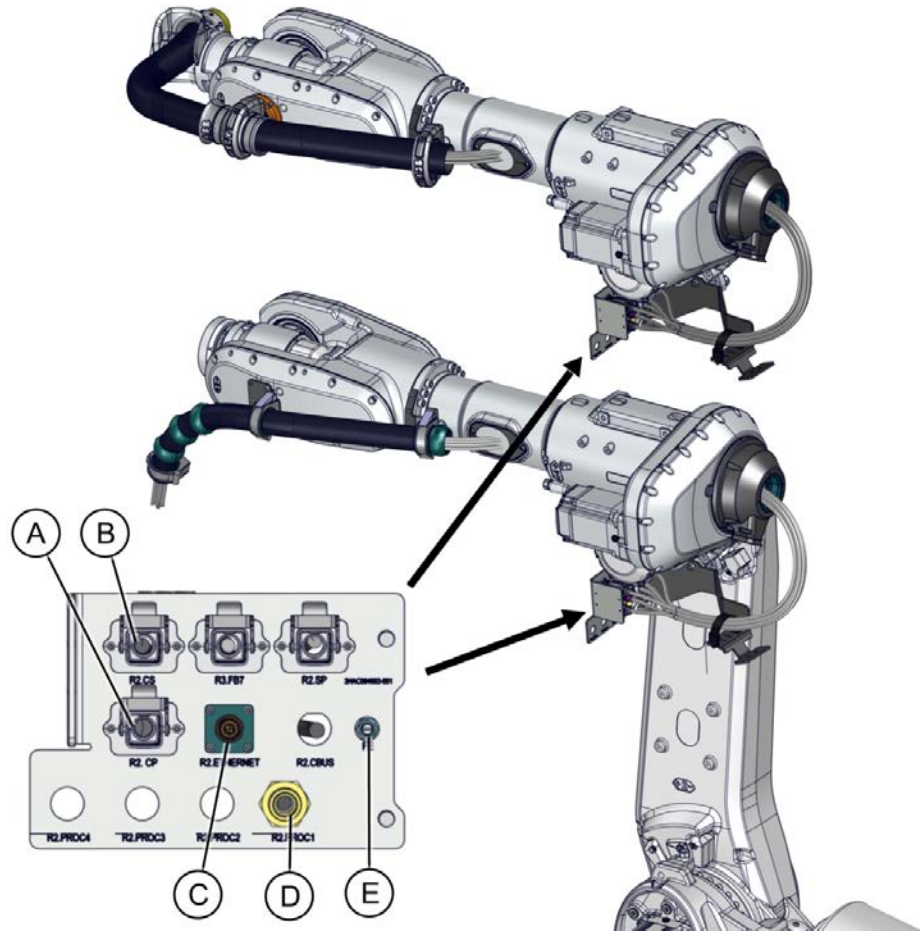
xx2300000241

A	Customer power (CP)
B	Customer signal (CS)
C	Resolver connection
D	ETHERNET
E	PROC1 (1/2" hose)
F	Functional earth (FE)

For corresponding parts of the tool, see [Connector kits manipulator on page 181](#).

Continues on next page

Connection plate at axis 3 for DressPack MH



xx2300000246

A	Customer power (CP)
B	Customer signal (CS)
C	ETHERNET
D	PROC 1 (1/2" hose)
E	Functional earth (FE)

For corresponding parts of the tool, see [Connector kits manipulator on page 181](#).

DressPack axis 3 to axis 6

Option	Description	Note	Connectors
3326-11	MH3 Parallel	Upper arm MH3	Customer power (CP), customer signal (CS), and PROC1
3326-13	MH3 EtherNet	Upper arm MH3 Includes parallel signals. Supports ProfiNet, EtherNet/IP.	Customer power (CP), customer signal (CS), ETHERNET, PROC1, and functional earth (FE)

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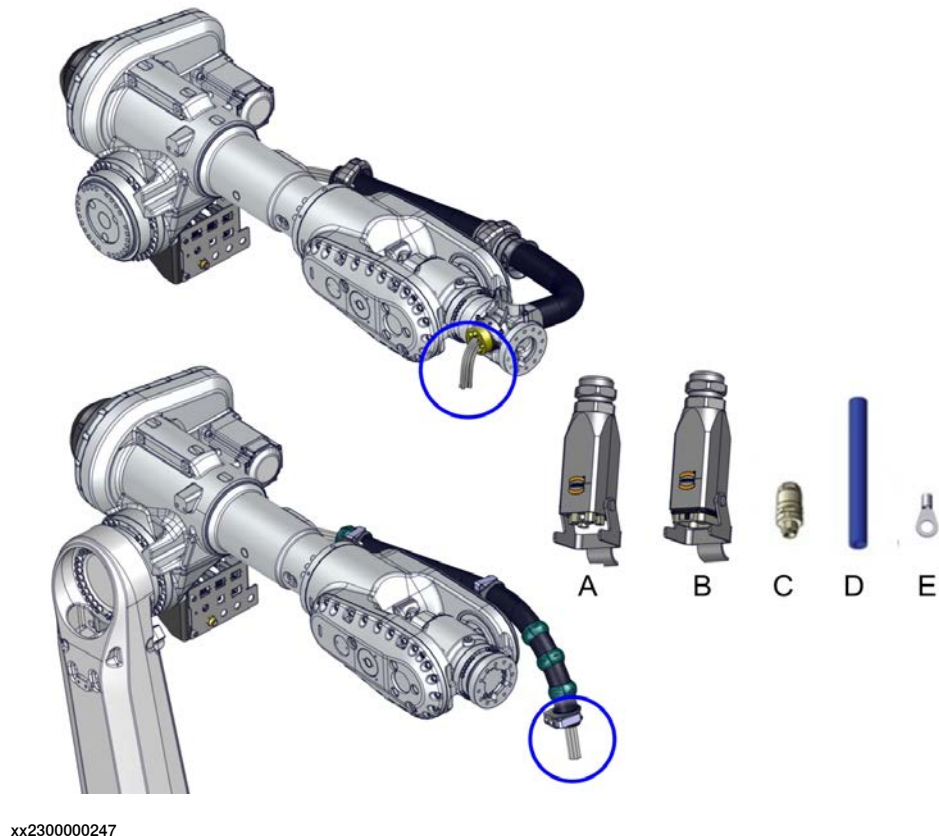
3 Specification of variants and options

3.4.2 DressPack for material handling

Continued

Option	Description	Note	Connectors
3326-14	MH3 CC-Link	Upper arm MH3 Includes parallel signals.	Customer power (CP), customer signal (CS), ETHERNET, PROC1, and functional earth (FE)
3326-15	MH3 EtherCat	Upper arm MH3 Includes parallel signals.	Customer power (CP), customer signal (CS), ETHERNET, PROC1, and functional earth (FE)
3326-30	MH LID Empty Conduit	LeanID	
3326-31	MH LID Parallel	LeanID MH	Customer power (CP), customer signal (CS), and PROC1
3326-33	MH LID EtherNet	LeanID MH Includes parallel signals. Supports ProfiNet, EtherNet/IP.	Customer power (CP), customer signal (CS), ETHERNET, PROC1, and functional earth (FE)
3326-34	MH LID CC-Link	LeanID MH Includes parallel signals.	Customer power (CP), customer signal (CS), ETHERNET, PROC1, and functional earth (FE)
3326-35	MH LID EtherCat	LeanID MH Includes parallel signals.	Customer power (CP), customer signal (CS), ETHERNET, PROC1, and functional earth (FE)

End connectors at axis 6 for DressPack MH



Continues on next page

3 Specification of variants and options

3.4.2 DressPack for material handling

Continued

A	Customer power (CP)
B	Customer signal (CS)
C	ETHERNET
D	PROC 1 (1/2" hose)
E	FE (functional earth)

MH3: Hose and cable free length, 1,000 mm

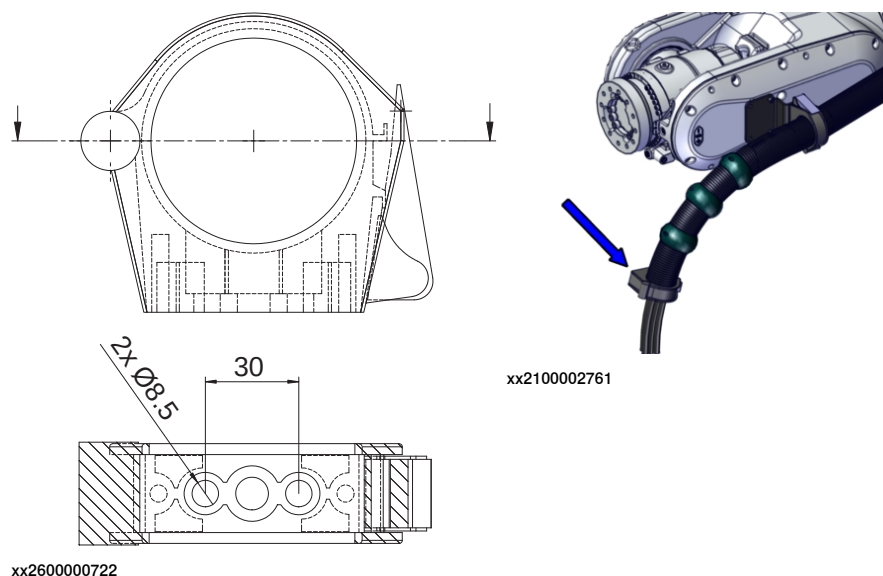
LID: Hose and cable free length, 1,000 mm

For corresponding parts of the tool, see [Connector kits manipulator on page 181](#).

Drilling pattern for MH3 gripping clamp

Drilling pattern for the MH3 gripping clamp is shown below.

Attachment screws M8x16 (2 pcs) are included in the delivery.



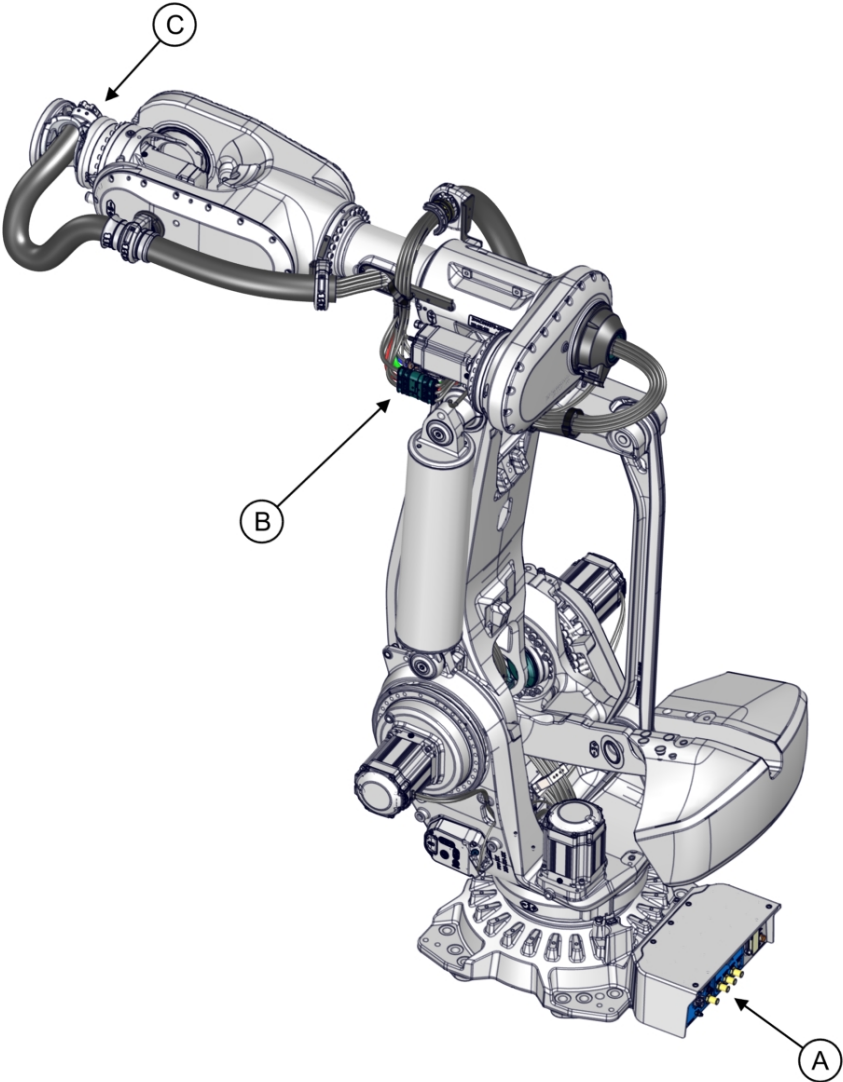
3 Specification of variants and options

3.4.3 DressPack for spotwelding

3.4.3 DressPack for spotwelding

Connection interfaces

Below is an overview showing the DressPack connection points. For detailed information see *Circuit diagram - DressPack IRB 7710 / IRB 7720*, listed in [References on page 7](#).



xx2400000296

A	Base
B	Axis 3
C	Axis 6

Manipulator DressPack SW

Base to axis 3	Axis 3 to axis 6
3325-51 SW Parallel	3326-51 SW LID Parallel
	3326-50 SW LID Empty Conduit

Continues on next page

3 Specification of variants and options

3.4.3 DressPack for spotwelding

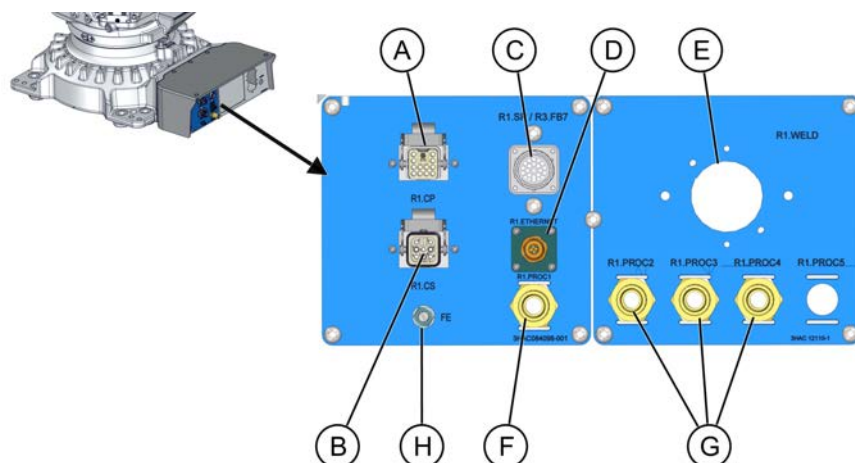
Continued

Base to axis 3	Axis 3 to axis 6
3325-61 SW Parallel-Servo	3326-61 SW LID Parallel-Servo
	3326-50 SW LID Empty Conduit
3325-63 SW Ethernet-Servo	3326-63 SW LID EtherNet-Servo
	3326-50 SW LID Empty Conduit
3325-64 SW LID CC-Link-Servo	3326-64 SW LID CC Link-Servo
	3326-50 SW LID Empty Conduit
3325-65 SW LID EtherCat-Servo	3326-65 SW LID EtherCat-Servo
	3326-50 SW LID Empty Conduit

DressPack SW base to axis 3

Option	Description	Note	Connectors
3325-61	SW Parallel-Servo	Lower arm SW	Customer power (CP), customer signal (CS), Servo power (SP), Servo feedback (FB)
3325-63	SW Ethernet-Servo	Lower arm SW Includes parallel signals. Supports ProfiNet, EtherNet/IP	Customer power (CP), customer signal (CS), Servo power (SP), Servo feedback (FB)
3325-64	SW CC Link-Servo	Lower arm SW Includes parallel signals.	Customer power (CP), customer signal (CS), Servo power (SP), Servo feedback (FB)
3325-65	SW EtherCat Link-Servo	Lower arm SW Includes parallel signals.	Customer power (CP), customer signal (CS), Servo power (SP), Servo feedback (FB)

Connection plate at base for DressPack SW



xx2300000250

A	Customer power (CP)
B	Customer signal (CS)

Continues on next page

3 Specification of variants and options

3.4.3 DressPack for spotwelding

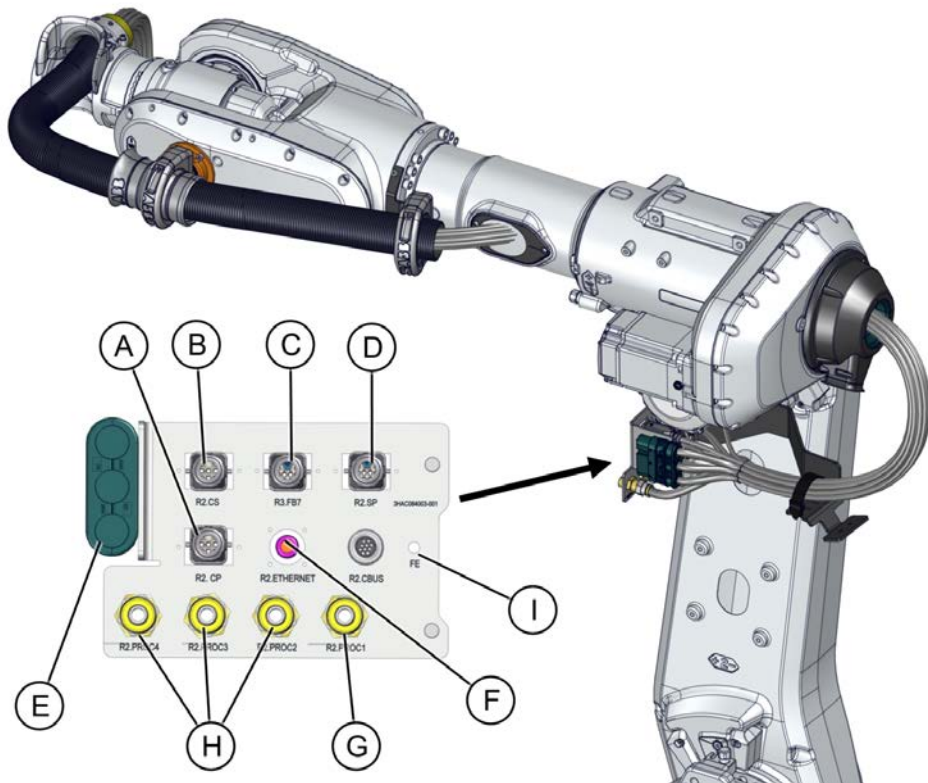
Continued

C	Servo Power (SP)
D	ETHERNET
E	WELD3 x 35 mm ² (spot welding)
F	PROC1 (1/2" hose)
G	PROC2-4 (spot welding 1/2", M22 x 1.5, 24 degree seal)
H	Functional earth (FE)

For corresponding parts of the tool, see [Connector kits manipulator on page 181](#).

Continues on next page

Connection plate at axis 3 for DressPack SW and LeanID SW



xx2300000251

A	Customer power (CP)
B	Customer signal (CS)
C	Servo feedback (FB)
D	Servo power (SP)
E	ETHERNET
F	WELD3 x 25 mm ² (spot welding)
G	PROC1 (1/2" hose)
H	PROC2-4 (spot welding 1/2", M22 x 1.5, 24 degree seal)
I	Functional earth (FE)

For corresponding parts of the tool, see [Connector kits manipulator on page 181](#).

DressPack axis 3 to axis 6

Option	Description	Note	Connectors
3326-50	SW LID Empty Conduit	Upper arm SW LID	
3326-61	SW LID Parallel-Servo	Upper arm SW LID	Customer power (CP), customer signal (CS)

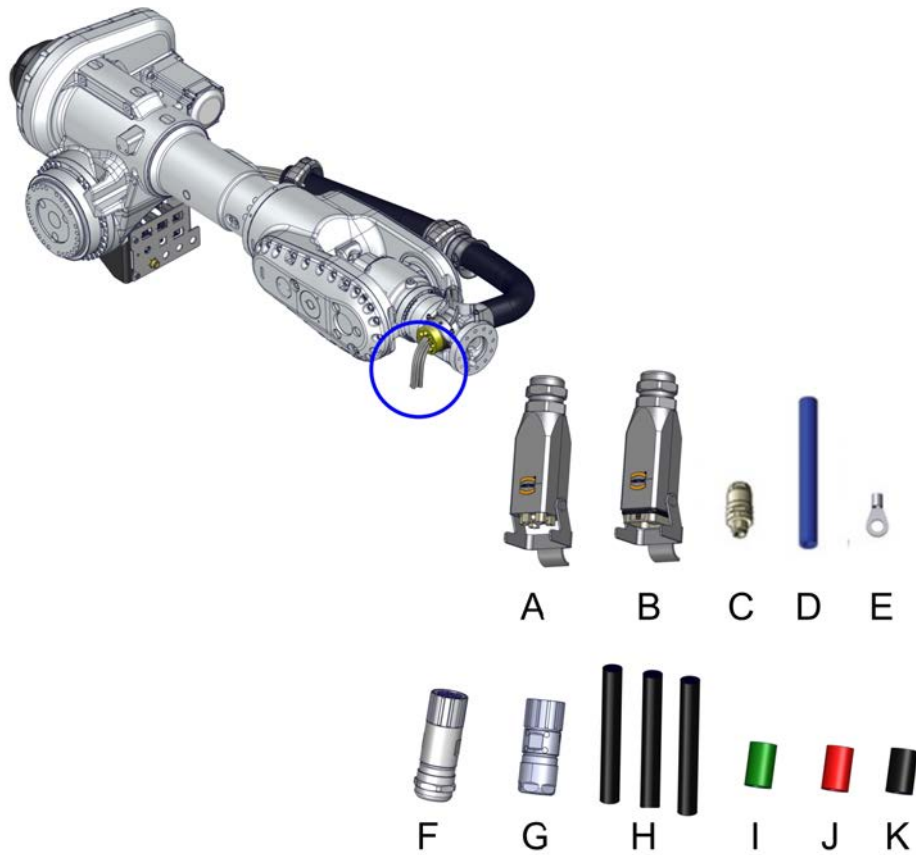
Continues on next page

3 Specification of variants and options

3.4.3 DressPack for spotwelding
Continued

Option	Description	Note	Connectors
3326-63	SW LID EtherNet-Servo	Upper arm SW LID Includes parallel signals. Supports ProfiNet, EtherNet/IP	Customer power (CP), customer signal (CS)
3326-64	SW LID CC Link-Servo	Upper arm SW LID Includes parallel signals.	Customer power (CP), customer signal (CS)
3326-65	SW LID EtherCat-Servo	Upper arm SW LID Includes parallel signals.	Customer power (CP), customer signal (CS)

End connectors at axis 6 for DressPack LeanID SW



xx2400001297

A	Customer power (CP)
B	Customer signal (CS)
C	ETHERNET
D	PROC 1 (1/2" hose)
E	FE (functional earth)
F	Servo power (SP)
G	Servo feedback (FB)
H	Weld x 3
I	PROC 2 (1/2" hose)

Continues on next page

J	PROC 3 (1/2" hose)
K	PROC 4 (1/2" hose)

For corresponding parts of the tool, see [Connector kits manipulator on page 181](#).

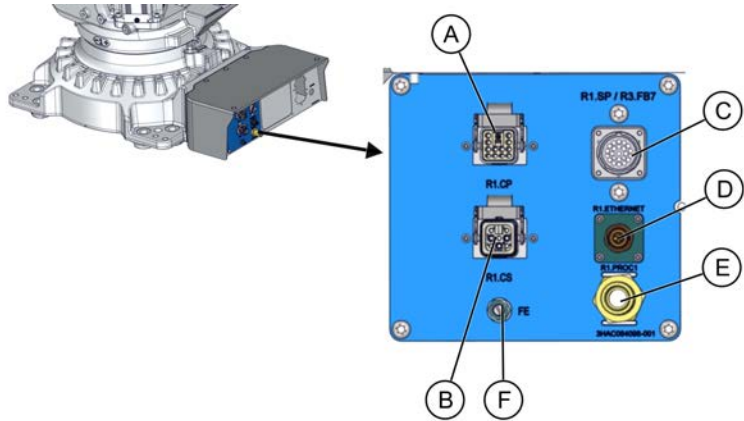
3 Specification of variants and options

3.4.4 Configuration result of DressPack options

3.4.4 Configuration result of DressPack options

DressPack options for material handling (MH)

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



xx2300000241

A	Customer power (CP)
B	Customer signal (CS)
C	Resolver connection
D	ETHERNET
E	PROC1 (1/2" hose)
F	Functional earth (FE)

	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	3	3	1.5 mm ²	250 V AC, 10 A rms
	Protective earth	1	1	1.5 mm ²	250 V AC
	Utility power	4	4	0.5 mm ²	50 V DC, 1 A rms
B	Customer Signal (CS)				
	Signals shielded		8 (4x2)	0.24 mm ²	30 V AC, 42 V DC, 1 A rms
D	Customer bus (Ethernet)				
	Bus signals	4	4	0.4 mm ²	Ethernet CAT 5e, 100 Mbit ⁱ
E	Media				
	Air (PROC 1)		1	12.5 mm inner diameter	Max. air pressure 16 bar/230 PSI
F	Functional Earthⁱⁱ		1	10 mm ²	600 V AC RMS

ⁱ Ethernet with wire colors according to PROFINET standard, M12-connectors.

ⁱⁱ When EtherNet is selected.

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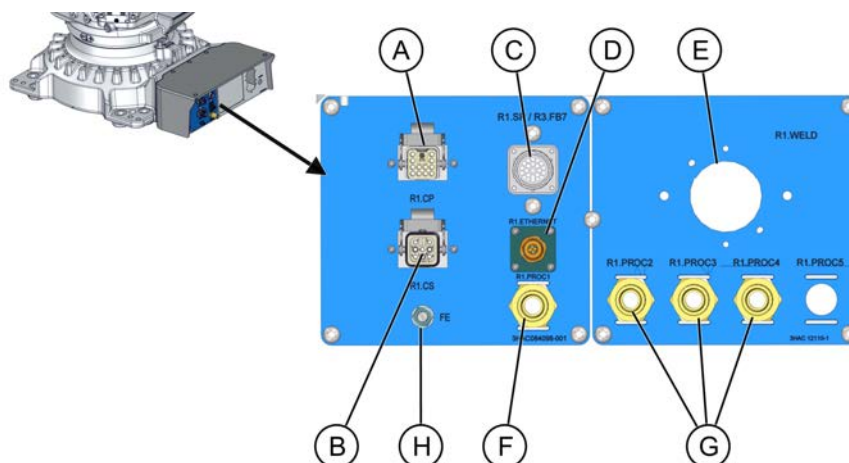
3 Specification of variants and options

3.4.4 Configuration result of DressPack options

Continued

DressPack options for spotwelding (SW)

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



xx2300000250

A	Customer power (CP)
B	Customer signal (CS)
C	Servo Power (SP)
D	ETHERNET
E	WELD3 x 35 mm ² (spot welding)
F	PROC1 (1/2" hose)
G	PROC2-4 (spot welding 1/2", M22 x 1.5, 24 degree seal)
H	Functional earth (FE)

	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	3	3	1.5 mm ²	250 V AC, 10 A rms
	Protective earth	1	1	1.5 mm ²	250 V AC
	Utility power	4	4	0.5 mm ²	50 V DC, 1 A rms
B	Customer Signal (CS)				
	Signals shielded		8 (4x2)	0.24 mm ²	30 V AC, 42 V DC, 1 A rms
C	Servo motor signals (SP)				
	Servo motor power	At drive	3	1.5 mm ²	600 VAC, 12 A rms
	Protective earth	At drive	1	1.5 mm ²	600 VAC
	Brake		2	0.5 mm ²	50 V DC, 1 A rms
	Temperature control/PTC		2	0.5 mm ²	50 V DC, 1 A rms

Continues on next page

3 Specification of variants and options

3.4.4 Configuration result of DressPack options

Continued

	Type	At terminals in cabinet	At connection point; base, axis 3, or axis 6	Cable/part area	Allowed capacity
D	Customer bus (Ethernet)				
	Bus signals	4	4	0.4 mm ²	Ethernet CAT 5e, 100 Mbit ⁱ
E	Welding power (WELD3 x 35 mm ²)				
	Lower and upper arm		2	35 mm ² ⁱⁱ	600 VAC, 150 A rms at 20 °C (68 °F)
	Protective earth (lower and upper arm)		1		
F	Media				
	Air (PROC 1)		1	12.5 mm in- ner diameter	Max. air pressure 16 bar/230 PSI
G	Media				
	(PROC2-4)		3	12.5 mm in- ner diameter M22 x 1.5, 24 degree seal	Max. air pressure 16 bar/230 PSI
H	Functional Earth ⁱⁱⁱ		1	10 mm ²	600 V AC RMS

ⁱ Ethernet with wire colors according to PROFINET standard, M12-connectors.

ⁱⁱ For LeanID upper arm 25 mm², 135 A rms

ⁱⁱⁱ When EtherNet is selected.

Empty conduit options

The dimension and requirements for empty cable conduit options are described in the product manual for the DressPack, see [References on page 7](#).

3.4.5 Connector kits manipulator

3.4.5.1 Base - Connector kits

Available options

		DressPack options	
Option	Name	3325-11/13	3325-61/63
3330-2	CP/CS bus, Proc 1 base	X	X
3331-1	Weld Proc 2-4 base		X
3332-1	FB7 on base	X	



Note

Servo power connector kits are not available.

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

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



xx2400000941

CP

Amount	Description	Size, material, etc.	Brand
1	Hood pegs, Han 3A		Harting
1	Insert, female, 12p		Harting
8	Crimp contact female ⁱ	For 0.5 mm ² Han D, silver plated	Harting
8	Crimp contact female ⁱ	For 1.0 mm ² Han D, silver plated	Harting

Continues on next page

3 Specification of variants and options

3.4.5.1 Base - Connector kits

Continued

Amount	Description	Size, material, etc.	Brand
8	Crimp contact female ⁱ	For 1.5 mm ² Han D, silver plated	Harting
8	Crimp contact female ⁱ	For 2.5 mm ² Han D, silver plated	Harting
2	Coding pin, Han		Harting
1	Screw M3 with seal		Harting
1	Cable gland	For cable diameter 9-13 mm	

ⁱ For recommended crimp tool, see manufacturer website.

CS

Amount	Description	Size, material, etc.	Brand
1	Hood pegs, Han 3A		Harting
1	Insert, female, 8p		Harting
8	Crimp contact female ⁱ	For 0.14– 0.37 mm ² Han D, silver plated	Harting
1	Screw M3 with seal		Harting
1	Cable gland	For cable diameter 6.5-9.5 mm	

ⁱ For recommended crimp tool, see manufacturer website.

Media

Amount	Description	Size, material, etc.	Brand
1	Hose coupling	1/2", M22 x 1.5 Brass	

Ethernet

Amount	Description	Size, material, etc.	Brand
1	M12 Connector, Male, D-code ⁱ	For 0.14–0.34 mm ² , for cable diameter 4.5-8.8 mm	

ⁱ Assembly instruction is included in delivery.

Continues on next page

3 Specification of variants and options

3.4.5.1 Base - Connector kits

Continued

Option 3331-1, Weld Proc 2-4 base

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



xx2400000942

WELD

Amount	Description	Size, material, etc.	Brand
1	Welding connector socket	TSB150/L-UR	Stäubli
3	Socket ⁱ	For 35 mm ²	Stäubli
1	Form shroud welding conn.	202K174-3/42-0, for cable diameter 15.7-35 mm	Raychem

ⁱ For recommended crimp tool, see manufacturer website.

Media

Amount	Description	Size, material, etc.	Brand
4	Hose coupling	1/2", M22 x 1.5 Brass	

Continues on next page

3 Specification of variants and options

3.4.5.1 Base - Connector kits

Continued

Option 3332-1, FB7 on base

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



xx2400000943

FB

Amount	Description	Size, material, etc.	Brand
1	Connector, 8p, Male	UTOW	
15	Pin	For 0.13–0.26 mm ²	
1	Shrink boot adapter		
1	Bottle shaped shrink boot		

3.4.5.2 Axis 3 - Connector kits

Available options

Option	Name	DressPack options	
		3326-11/13	3326-61/63
3333-2	CP/CS bus, Proc 1 axis 3	X	X
3333-3	CP/CS Proc1, Servo & FB		X

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

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



xx2400000944

CP

Amount	Description	Size, material, etc.	Brand
1	Hood pegs, Han 3A		Harting
1	Insert, male, 12p		Harting
8	Crimp contact male ⁱ	For 0.5 mm ² Han D, silver plated	Harting
8	Crimp contact male ⁱ	For 1.0 mm ² Han D, silver plated	Harting
8	Crimp contact male ⁱ	For 1.5 mm ² Han D, silver plated	Harting
8	Crimp contact male ⁱ	For 2.5 mm ² Han D, silver plated	Harting
2	Coding pin, Han		Harting
1	Screw M3 with seal		Harting

Continues on next page

3 Specification of variants and options

3.4.5.2 Axis 3 - Connector kits
Continued

Amount	Description	Size, material, etc.	Brand
1	Cable gland	For cable diameter 9-13 mm	

i For recommended crimp tool, see manufacturer website.

CS

Amount	Description	Size, material, etc.	Brand
1	Hood pegs, Han 3A		Harting
1	Insert, male, 8p		Harting
8	Crimp contact male ⁱ	For 0.14– 0.37 mm ² Han D, silver plated	Harting
1	Screw M3 with seal		Harting
1	Cable gland	For cable diameter 6.5-9.5 mm	

i For recommended crimp tool, see manufacturer website.

Media

Amount	Description	Size, material, etc.	Brand
1	Hose coupling Parker Push lock	1/2", M22 x 1.5 Brass	

Ethernet

Amount	Description	Size, material, etc.	Brand
1	M12 Connector, Male, D-code ⁱ	For 0.14–0.34 mm ² , for cable diameter 4.5-8.8 mm	

i Assembly instruction is included in delivery.

Option 3333-3, CP/CS Proc1, Servo & FB

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



xx2400000945

Continues on next page

3 Specification of variants and options

3.4.5.2 Axis 3 - Connector kits

Continued

CP

Amount	Description	Size, material, etc.	Brand
1	Hood pegs, Han 3A		Harting
1	Insert, male, 12p		Harting
8	Crimp contact male ⁱ	For 0.5 mm ² Han D, silver plated	Harting
8	Crimp contact male ⁱ	For 1.0 mm ² Han D, silver plated	Harting
8	Crimp contact male ⁱ	For 1.5 mm ² Han D, silver plated	Harting
8	Crimp contact male ⁱ	For 2.5 mm ² Han D, silver plated	Harting
2	Coding pin, Han		Harting
1	Screw M3 with seal		Harting
1	Cable gland	For cable diameter 9-13 mm	

ⁱ For recommended crimp tool, see manufacturer website.

CS

Amount	Description	Size, material, etc.	Brand
1	Hood pegs, Han 3A		Harting
1	Insert, male, 8p		Harting
8	Crimp contact male ⁱ	For 0.14– 0.37 mm ² Han D, silver plated	Harting
1	Screw M3 with seal		Harting
1	Cable gland	For cable diameter 6.5-9.5 mm	

ⁱ For recommended crimp tool, see manufacturer website.

Media

Amount	Description	Size, material, etc.	Brand
1	Hose coupling Parker Push lock	1/2", M22 x 1.5 Brass	

Ethernet

Amount	Description	Size, material, etc.	Brand
1	M12 Connector, Male, D-code ⁱ	For 0.14–0.34 mm ² , for cable diameter 4.5-8.8 mm	

ⁱ Assembly instruction is included in delivery.

SP

Amount	Description	Size, material, etc.	Brand
1	Hood pegs, Han 3A		Harting
1	Insert, male, 12p		Harting

Continues on next page

3 Specification of variants and options

3.4.5.2 Axis 3 - Connector kits

Continued

Amount	Description	Size, material, etc.	Brand
8	Crimp contact male ⁱ	For 0.5 mm ² Han D, silver plated	Harting
8	Crimp contact male ⁱ	For 1.0 mm ² Han D, silver plated	Harting
8	Crimp contact male ⁱ	For 1.5 mm ² Han D, silver plated	Harting
8	Crimp contact male ⁱ	For 2.5 mm ² Han D, silver plated	Harting
2	Coding pin, Han		Harting
1	Screw M3 with seal		Harting
1	Cable gland	For cable diameter 9-13 mm	

ⁱ For recommended crimp tool, see manufacturer website.

FB

Amount	Description	Size, material, etc.	Brand
1	Hood pegs, Han 3A		Harting
1	Insert, male, 8p		Harting
8	Crimp contact male ⁱ	For 0.14– 0.37 mm ² Han D, silver plated	Harting
1	Screw M3 with seal		Harting
1	Coding pin, Han D, female		Harting
1	Cable gland	For cable diameter 6.5-9.5 mm	

ⁱ For recommended crimp tool, see manufacturer website.

3.4.5.3 Axis 6 - Connector kits

Available options

		DressPack options	
Option	Name	3326-11/13	3326-61/63
3334-2	CP/CS bus axis 6	X	X
3334-3	CP/CS Proc1, Servo & FB		X
3335-1	Weld Proc 2-4 axis6		X

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

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



xx2400000946

CP

Amount	Description	Size, material, etc.	Brand
1	Hood pegs, Han 3A		Harting
1	Insert, male, 12p		Harting
8	Crimp contact male ⁱ	For 0.5 mm ² Han D, silver plated	Harting
8	Crimp contact male ⁱ	For 1.0 mm ² Han D, silver plated	Harting
8	Crimp contact male ⁱ	For 1.5 mm ² Han D, silver plated	Harting
8	Crimp contact male ⁱ	For 2.5 mm ² Han D, silver plated	Harting
2	Coding pin, Han		Harting

Continues on next page

3 Specification of variants and options

3.4.5.3 Axis 6 - Connector kits

Continued

Amount	Description	Size, material, etc.	Brand
1	Screw M3 with seal		Harting
1	Cable gland	For cable diameter 9-13 mm	

ⁱ For recommended crimp tool, see manufacturer website.

CS

Amount	Description	Size, material, etc.	Brand
1	Hood pegs, Han 3A		Harting
1	Insert, male, 8p		Harting
8	Crimp contact male ⁱ	For 0.14– 0.37 mm ² Han D, silver plated	Harting
1	Screw M3 with seal		Harting
1	Cable gland	For cable diameter 6.5-9.5 mm	

ⁱ For recommended crimp tool, see manufacturer website.

Media

Amount	Description	Size, material, etc.	Brand
1	Hose coupling Parker Push lock	1/2", M22 x 1.5 Brass	

Ethernet

Amount	Description	Size, material, etc.	Brand
1	M12 Connector, Female, D-code	For cable diameter 5.7– 8.8 mm	Harting
4	Socket ⁱ	D-sub, FE AWG 22-26	Harting

ⁱ For recommended crimp tool, see manufacturer website.

Continues on next page

3 Specification of variants and options

3.4.5.3 Axis 6 - Connector kits

Continued

Option 3334-3, CP/CS Proc 1, Servo & FB

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



xx2400000947

CP

Amount	Description	Size, material, etc.	Brand
1	Hood pegs, Han 3A		Harting
1	Insert, male, 12p		Harting
8	Crimp contact male ⁱ	For 0.5 mm ² Han D, silver plated	Harting
8	Crimp contact male ⁱ	For 1.0 mm ² Han D, silver plated	Harting
8	Crimp contact male ⁱ	For 1.5 mm ² Han D, silver plated	Harting
8	Crimp contact male ⁱ	For 2.5 mm ² Han D, silver plated	Harting
2	Coding pin, Han		Harting
1	Screw M3 with seal		Harting
1	Cable gland	For cable diameter 9-13 mm	

ⁱ For recommended crimp tool, see manufacturer website.

CS

Amount	Description	Size, material, etc.	Brand
1	Hood pegs, Han 3A		Harting
1	Insert, male, 8p		Harting
8	Crimp contact male ⁱ	For 0.14–0.37 mm ² Han D, silver plated	Harting

Continues on next page

3 Specification of variants and options

3.4.5.3 Axis 6 - Connector kits

Continued

Amount	Description	Size, material, etc.	Brand
1	Screw M3 with seal		Harting
1	Cable gland	For cable diameter 6.5-9.5 mm	

ⁱ For recommended crimp tool, see manufacturer website.

Media

Amount	Description	Size, material, etc.	Brand
1	Hose coupling Parker Push lock	1/2", M22 x 1.5 Brass	

Ethernet

Amount	Description	Size, material, etc.	Brand
1	M12 Connector, Female, D-code	For cable diameter 5.7–8.8 mm	Harting
4	Socket ⁱ	D-sub, FE AWG 22-26	Harting

ⁱ For recommended crimp tool, see manufacturer website.

SP

Amount	Description	Size, material, etc.	Brand
1	M23 Hybrid Panel Connector, 8p, Male	For cable diameter 7.0–12.0 mm	Hummel
4	Crimp pin 1 mm, AWG 24-17 ⁱ	For 0.25–1.0 mm ²	Hummel
4	Crimp pin 2 mm, AWG 18-24 ⁱ	For 0.75–2.5 mm ²	Hummel
4	Crimp pin 2 mm, AWG 14-12 ⁱ	For 2.5–4.0 mm ²	Hummel

ⁱ For recommended crimp tool, see manufacturer website.

FB

Amount	Description	Size, material, etc.	Brand
1	M23 Signal Panel Connector, 12p, Male	For cable diameter 7.0–12.0 mm	Hummel
12	Pin AWG 28-20 ⁱ	For 0.08–0.56 mm ²	Hummel
12	Pin AWG 26-17 ⁱ	For 0.14–1.0 mm ²	Hummel
12	Pin AWG 18-16 ⁱ	For 0.75–1.5 mm ²	Hummel

ⁱ For recommended crimp tool, see manufacturer website.

Continues on next page

3 Specification of variants and options

3.4.5.3 Axis 6 - Connector kits

Continued

Option 3335-1, Weld Proc 2-4 axis6

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



xx2400000948

WELD

Amount	Description	Size, material, etc.	Brand
1	Welding connector	RobiFix-B-L	Stäubli
3	Socket ⁱ	For 25 mm ²	Stäubli

ⁱ For recommended crimp tool, see manufacturer website.

Media

Amount	Description	Size, material, etc.	Brand
4	Hose coupling Parker Push lock	1/2", M22 x 1.5 Brass	

3 Specification of variants and options

3.4.6 Application floor cables

3.4.6 Application floor cables

Parallel cable - Length

Option	Description	Note
3201-2	7 m	
3201-3	15 m	
3201-4	22 m	
3201-5	30 m	

Ethernet cable - Length



Note

Occupies 1 Ethernet port.

Option	Description	Note
3202-2	7 m	Includes Parallel cable
3202-3	15 m	Includes Parallel cable
3202-4	22 m	Includes Parallel cable
3202-5	30 m	Includes Parallel cable

CC-Link cable - Length

Option	Description	Note
3205-2	7 m	Includes Parallel cable
3205-3	15 m	Includes Parallel cable
3205-4	22 m	Includes Parallel cable
3205-5	30 m	Includes Parallel cable

Servo cable 1 axis - Length

Option	Description	Note
3206-2	7 m	
3206-3	15 m	
3206-4	22 m	
3206-5	30 m	

EtherCat cable - Length



Note

Occupies 1 Ethernet port.

Option	Description	Note
3210-2	7 m	Includes Parallel cable

Continues on next page

3 Specification of variants and options

3.4.6 Application floor cables

Continued

Option	Description	Note
3210-3	15 m	Includes Parallel cable
3210-4	22 m	Includes Parallel cable
3210-5	30 m	Includes Parallel cable

MCB Servo cable 1 axis

Option	Description	Note
3212-2	7 m	

Requirements

This option requires options DressPack base-axis 3 and Motor Connection Kit [3069-x].

3 Specification of variants and options

3.5 Warranty

3.5 Warranty

Warranty

For the selected period of time, ABB will provide spare parts and labor 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 with ABB Connected Services 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 <i>Customer Delivery Date</i> or latest 18 months after <i>Factory Shipment Date</i> , 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 <i>Factory Shipment Date</i> or from activation date of standard warranty in WebConfig.  Note Special conditions are applicable, see <i>Robotics Warranty Directives</i>.

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