ROBOTICS

Product specification

IRB 7600

Trace back information:
Workspace 24A version a16
Checked in 2024-03-07
Skribenta version 5.5.019

Product specification

IRB 7600-500/2.55
IRB 7600-400/2.55
IRB 7600-340/2.8
IRB 7600-325/3.1
IRB 7600-150/3.5

OmniCore

Document ID: 3HAC087209-001

Revision: B

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Original instructions.

Table of contents

Overview of this product specification

About this product specification

t 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 requirements
- The load diagrams, mounting of extra equipment, the motion and the robot reach
- The specification of variant and options available

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.

Users

It is intended for:

- Product managers and Product personnel
- Sales and Marketing personnel
- Order and Customer Service personnel

References

Reference	Document ID
Product specification - OmniCore V line	*3HAC074671-001*
Product manual - IRB 7600	*3HAC022033-001*
Product manual - DressPack IRB 7600	*3HAC056372-001*

Revisions

Revision	Description
A	First edition.
B	Published in release 24A. The following updates are done in this revision: • Added DressPack options for CC-Link.

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1 Description

1.1 Structure

1.1.1 Introduction

General

The IRB 7600 is available in five variants, with 500 kg, 400 kg, 340 kg, 325 kg, and 150 kg handling capacity.

The IRB 7600 is ideal for heavy-weight applications, regardless of industry. Typical areas can be handling of heavy fixtures, turning car bodies, lifting engines, handling heavy parts, loading and unloading of machine cells, alternatively handling large and heavy pallet layers.

Software product range

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.

Process Options

There are a large number of process options for Spot Welding and Material Handling integrated in the robot.

Operating 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 *Product specification - OmniCore V line*.

The IRB 7600 manipulator can be connected to the following robot controllers:

- OmniCore V250XT
- OmniCore V400XT

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 gluing and welding, communication features - network communication - and advanced functions such as multitasking, sensor control etc. For a complete description on optional software, see *Product specification - OmniCore V line*.

Continues on next page

1.1.1 Introduction
Continued

Protection type Foundry Plus 2

Robots with the option Foundry Plus 2 are designed for harsh environments where the robot is exposed to sprays of coolants, lubricants and metal spits that are typical for die casting applications or other similar applications.

Typical applications are spraying insertion and part extraction of die-casting machines, handling in sand casting and gravity casting, etc. (Please refer to Foundry Prime robots for washing applications or other similar applications). Special care must be taken in regard to operational and maintenance requirements for applications in foundry are as well as in other applications areas. Please contact ABB Robotics Sales organization if in doubt regarding specific application feasibility for the Foundry Plus 2 protected robot.

The robot is painted with two-component epoxy on top of a primer for corrosion protection. To further improve the corrosion protection additional rust preventive are applied to exposed and crucial areas, e.g. has the tool flange a special preventive coating. Although, continuous splashing of water or other similar rust formation fluids may cause rust attach on the robots unpainted areas, joints, or other unprotected surfaces. Under these circumstances it is recommended to add rust inhibitor to the fluid or take other measures to prevent potential rust formation on the mentioned.

The entire robot is IP67 compliant according to IEC 60529 - from base to wrist, which means that the electrical compartments are sealed against water and solid contaminants. Among other things all sensitive parts are better protected than the standard offer.

Selected Foundry Plus 2 features:

- Improved sealing to prevent penetration into cavities to secure IP67
- Additional protection of cabling and electronics
- Special covers that protect cavities
- Well-proven connectors
- Nickel coated tool flange
- Rust preventives on screws, washers and unpainted/machined surfaces
- Extended service and maintenance program

The Foundry Plus 2 robot can be cleaned with appropriate washing equipment according to the robot product manual. Appropriate cleaning and maintenance is required to maintain the protection, for example can rust preventive be washed off with wrong cleaning method.

Available robot variants

The option Foundry Plus 2 might not be available for all robot variants.

See *Specification of variants and options on page 79* for robot versions and other options not selectable together with Foundry Plus 2.

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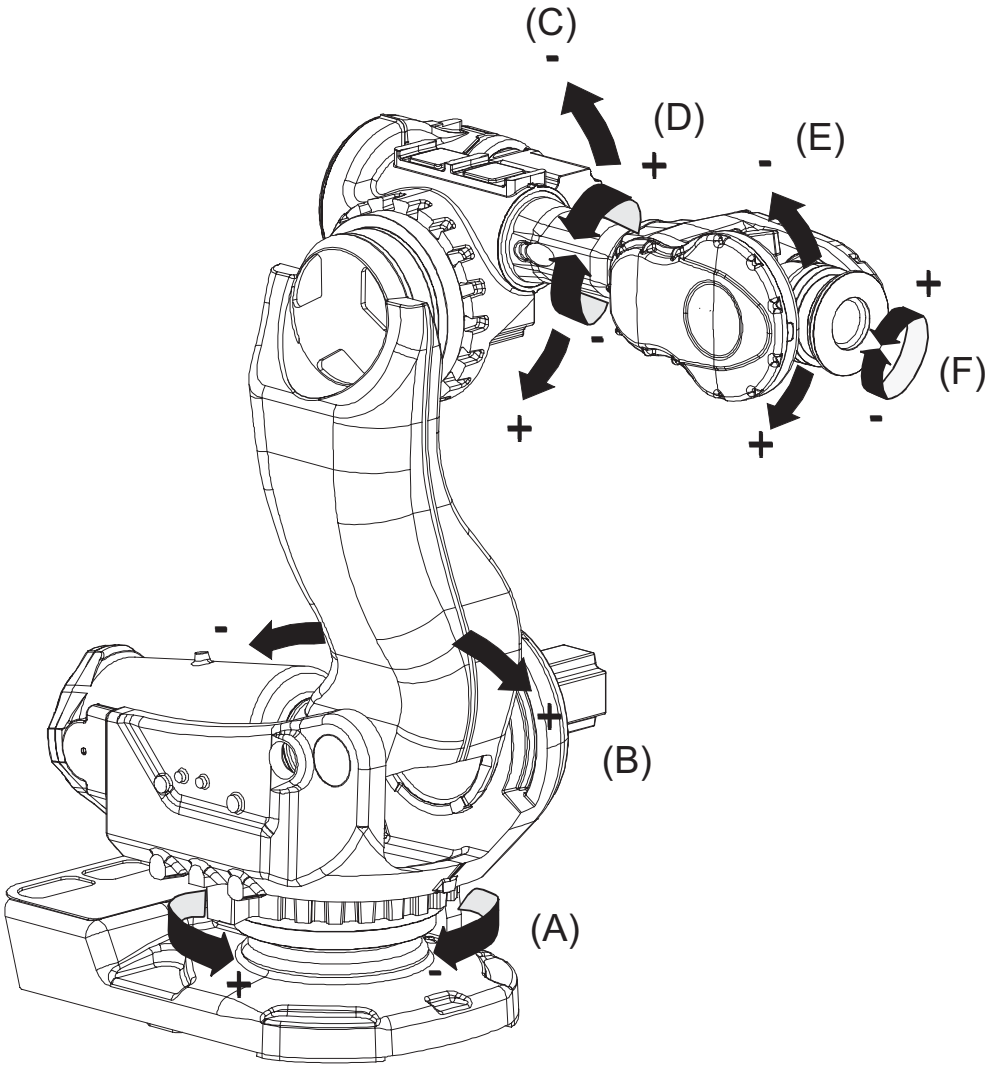
Axis movement



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Pos	Description	Pos	Description
A	Axis 1	D	Axis 4
B	Axis 2	E	Axis 5
C	Axis 3	F	Axis 6

1.1.2 Robot variants

Robot variants

The following standard robot variants are available.

Robot type	Handling capacity	Handling capacity for LeanID	Reach
IRB 7600	500 kg	-	2.55 m
IRB 7600	400 kg	390 kg	2.55 m
IRB 7600	340 kg	320 kg	2.8 m
IRB 7600	325 kg	290 kg	3.1 m
IRB 7600	150 kg	-	3.5 m

Note

For LeanID options, the payload will decrease as stated above. For detailed information, see *Load diagrams on page 31*.

1.1.3 Technical data

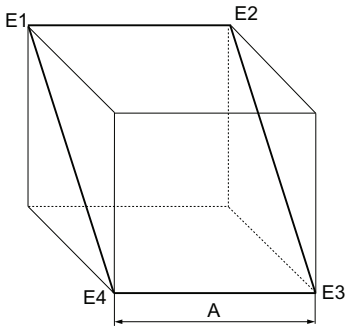
Manipulator weight

Manipulator	Weight (kg)[i]
IRB 7600 - 500/2.55	2400
IRB 7600 - 400/2.55	2400
IRB 7600 - 340/2.8	2425
IRB 7600 - 325/3.1	2440
IRB 7600 - 150/3.5	2450

i Without DressPack.

Power consumption at max load

Type of movement	Power consumption at maximum load (kW)
ISO Cube	3.1
Normal robot movements	4.5



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Pos	Description
A	1,000 mm

Power factor (cos φ)

The power factor is above 0.95 at a steady state power consumption higher than 2.0 kW, when the IRB 7600 is connected to the OmniCore V line.

Airborne noise level

Data	Description	Note
Airborne noise level	The sound pressure level outside the working space	73 dB (A) Leq (acc. to Machinery directive 2006/42/EG).

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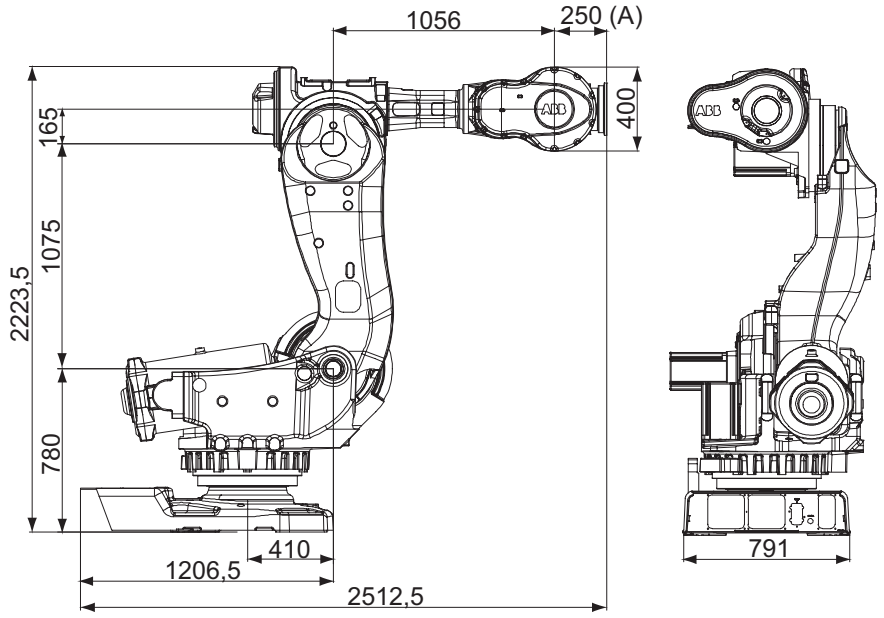
1.1.3 Technical data
Continued

IRB 7600 - 400/2.55 and IRB 7600 - 500/2.55



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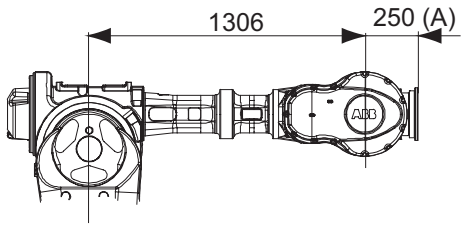
A	IRB 7600-400/2.55, 404 mm for LeanID

IRB 7600 - 340/2.8



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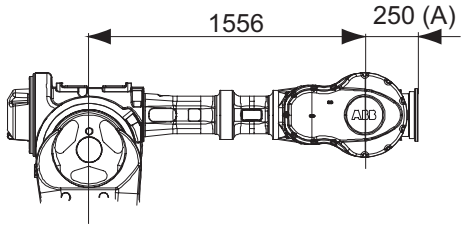
A	404 mm for LeanID

IRB 7600 - 325/3.1



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A	404 mm for LeanID

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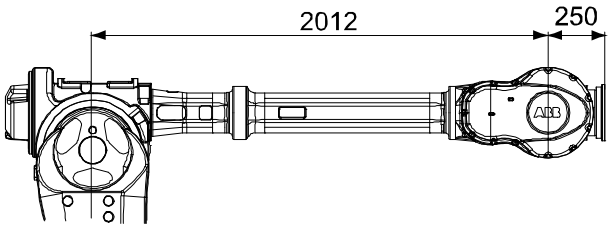
IRB 7600 - 150/3.5



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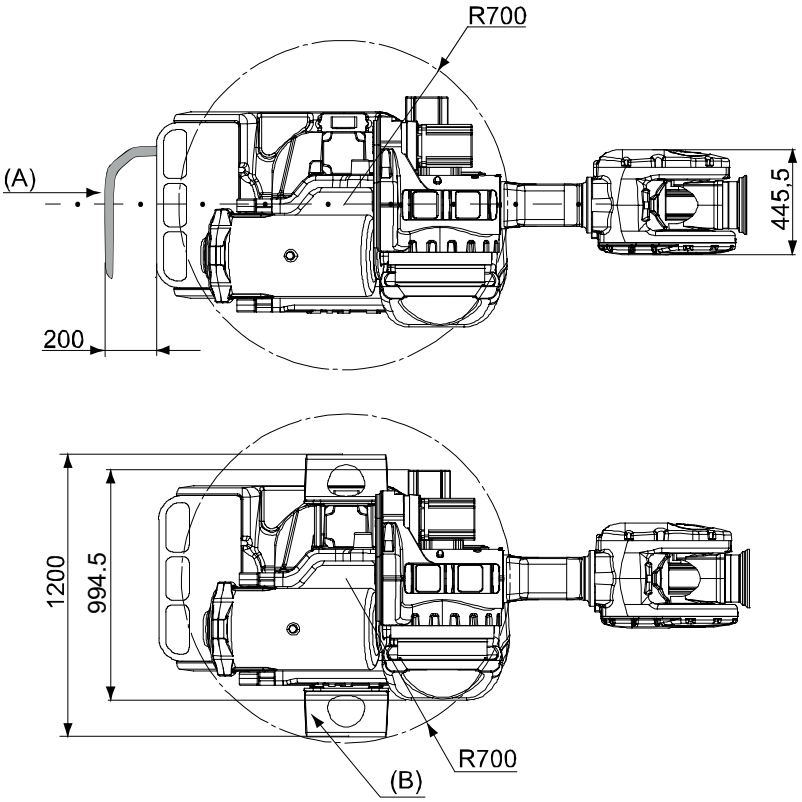

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Pos	Description
A	Robot power cable
B	Fork lift device

1.2 Standards

1.2.1 Applicable standards

General

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

Robot standards

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

Other standards used in design

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

Region specific standards and regulations

Standard	Description
ANSI/RIA R15.06	Safety requirements for industrial robots and robot systems
ANSI/UL 1740	Safety standard for robots and robotic equipment
CAN/CSA Z 434-03	Industrial robots and robot Systems - General safety requirements
EN ISO 10218-1	Robots and robotic devices — Safety requirements for industrial robots — Part 1: Robots

1.3 Installation

1.3.1 Introduction

General

All versions of IRB 7600 are designed for floor mounting (no tilting allowed around X-axis or Y-axis). Depending on the robot version, an end effector with max. weight of 150 to 500 kg including payload, can be mounted on the mounting flange (axis 6). See *Load diagrams on page 31* for IRB 7600 generation robots.

Extra loads

Extra loads (valve packages, transformers) can be mounted on the upper arm with a maximum weight of 50 kg. On all versions an extra load of 500 kg can also be mounted on the frame of axis 1. For more information see *Mounting equipment on page 49*.

Working range

The working range of axes 1-3 can be limited by mechanical stops.

1.3.2 Operating requirements

Protection standards

Robot version/ Protection standard	IEC60529
All variants, manipulator	IP67

Explosive environments

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

Ambient temperature

Description	Standard/Option	Temperature
Manipulator during operation	Standard	+ 5 °C [i] (+ 41 °F) to + 50 °C (+ 122 °F)
For the controller	Standard/Option	See Product specification - Controller IRC5 with FlexPendant
For the spot welding cabinet	Standard	+5 °C (41 °F) to + 45 °C (+ 113 °F)
Complete robot during transportation and storage, for short periods (not exceeding 24 hours)	Standard	- 25 °C (- 13 °F) to + 55 °C (+ 131 °F) up to + 70 °C (+ 158 °F)

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

Relative humidity

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

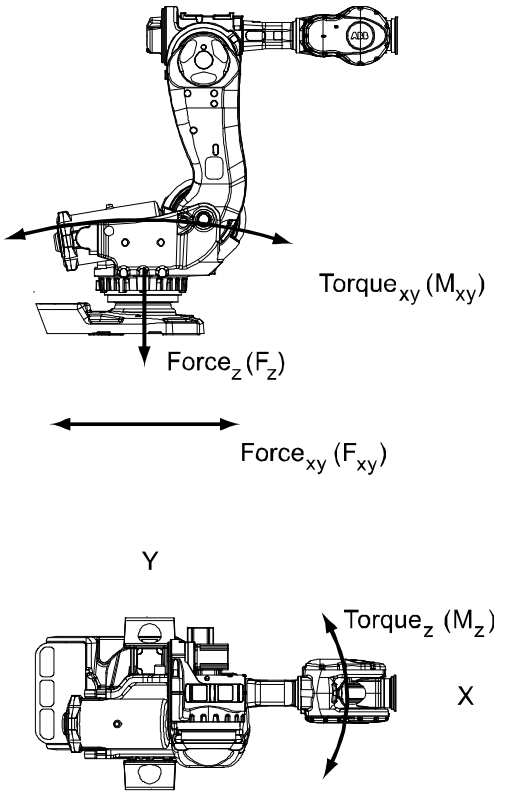
1.3.3 Mounting the manipulator

General

Maximum load in relation to the base coordinate system.

Floor Mounted

Force	Endurance load (in operation)	Max. load (emergency stop)
Force xy	± 14 kN	± 31 kN
Force z	+32 ± 10 kN	+39 ± 16 kN
Torque xy	± 42 kNm	± 72 kNm
Torque z	± 11 kNm	± 19.5 kNm



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Note regarding Mxy and Fxy

The bending torque (Mxy) can occur in any direction in the XY-plane of the base coordinate system.

The same applies to the transverse force (Fxy).

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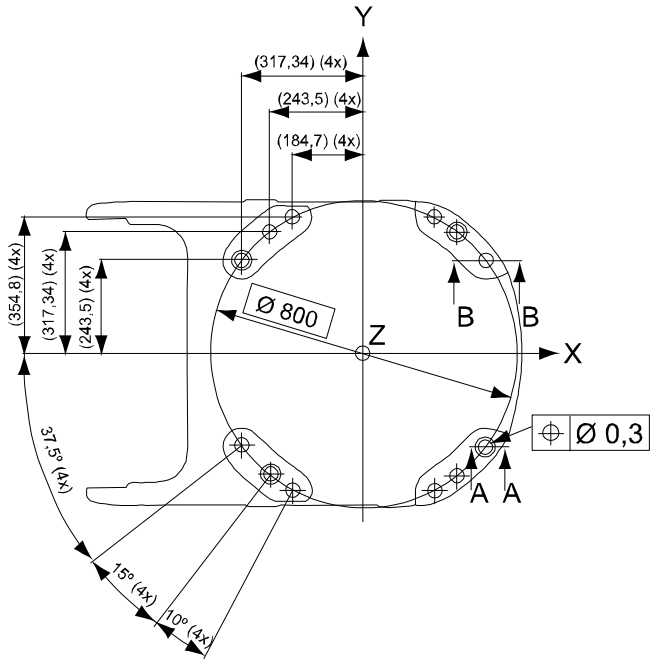
1.3.3 Mounting the manipulator
Continued

Fastening holes robot base



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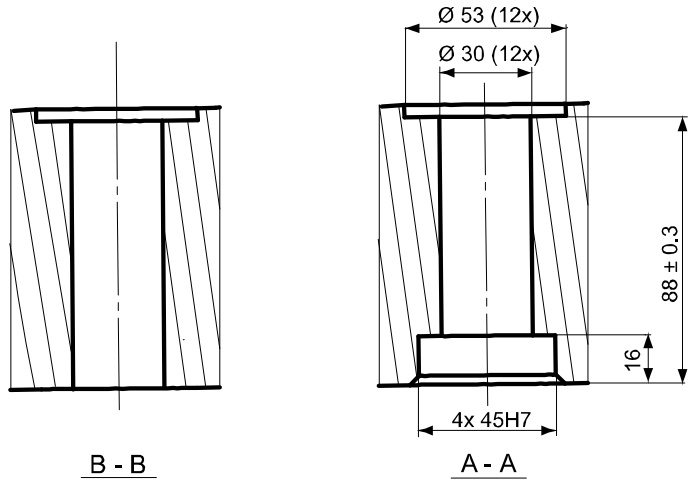

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Recommended screws for fastening the manipulator to the base	M24 x 140 8.8 with 4 mm flat washer.
Torque value	725 Nm

Two guiding sleeves required, dimension see Figures in this chapter.

Note

Only two guiding sleeves shall be used. The corresponding holes in the base plate shall be circular and oval according to next two Figures below. Regarding AbsAcc performance, the chosen guide holes are to be recommended according to next two Figures below.

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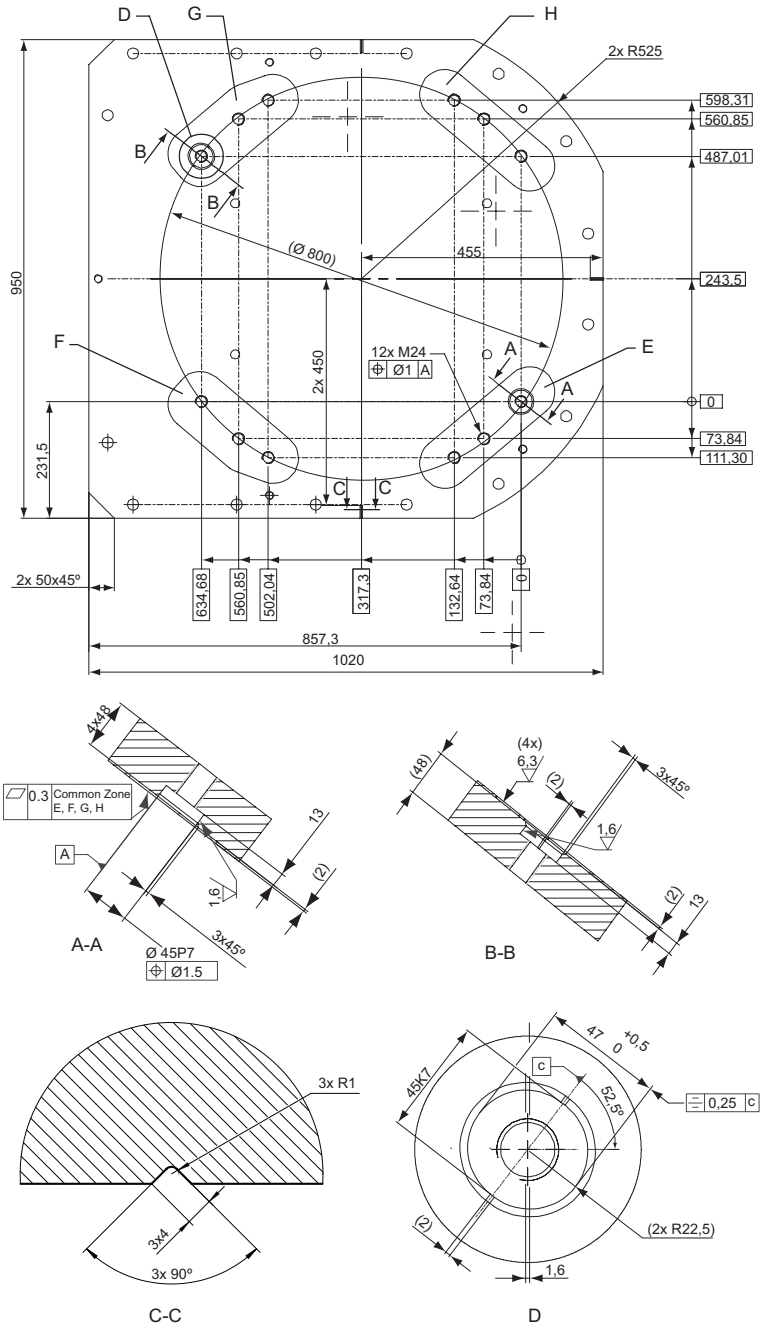
Base plate drawing

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



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E, F, G, H	Common tolerance zone (accuracy all over the base plate from one contact surface to the other)

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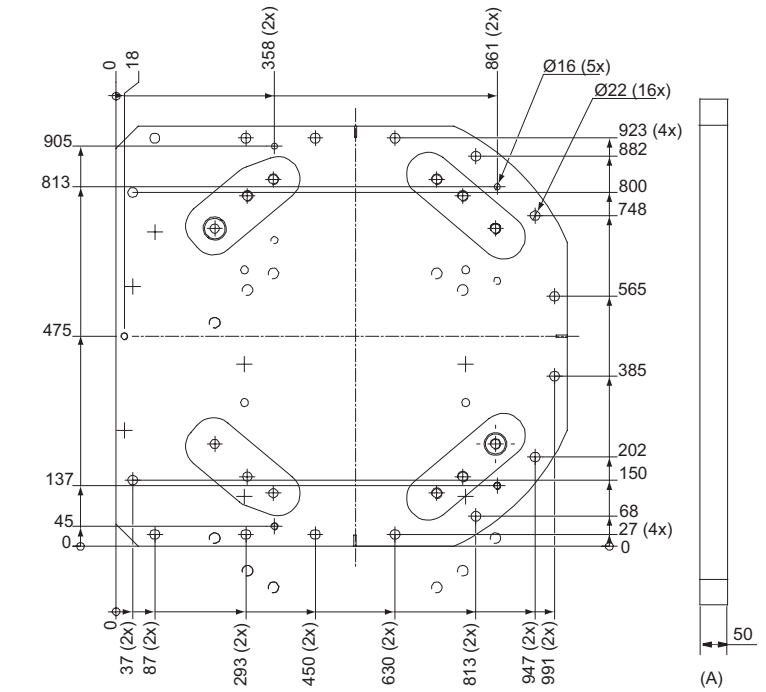
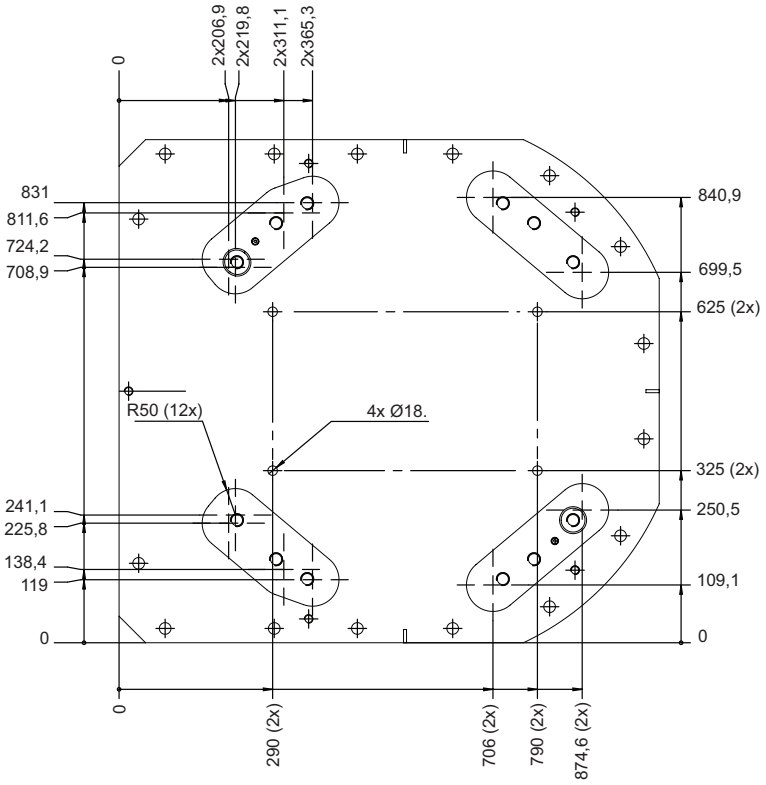
1.3.3 Mounting the manipulator

Continued





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Pos	Description
A	Color: RAL 9005 Thickness: 80-100 µm

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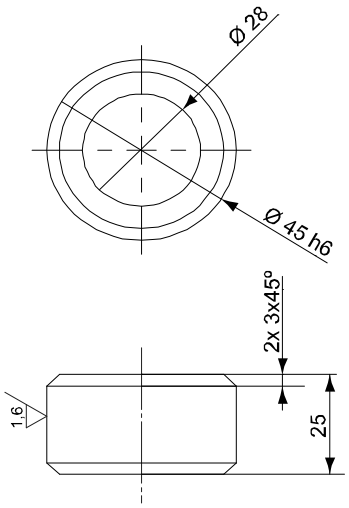

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Pos	Description
A	Guide sleeve protected from corrosion

Fastener quality

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

1.4 Calibration and references

1.4.1 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 or Calibration Pendulum [i] Levelmeter calibration (alternative method)
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 use the do the wrist optimization using the RAPID instruction `WristOpt`, see *Technical reference manual - RAPID Instructions, Functions and Data types*. This instruction is only available for OmniCore robots.	Wrist Optimization

[i] The robot is calibrated by either Calibration Pendulum or Axis Calibration at factory. Always use the same calibration method as used at the factory.

Continues on next page

Information about valid calibration method is found on the calibration label or in the calibration menu on the FlexPendant.
If no data is found related to standard calibration, contact the local ABB Service.

Brief description of calibration methods

Calibration Pendulum method

Calibration Pendulum is a standard calibration method for calibration of some ABB robots. On OmniCore, this calibration method is only used on IRB 1510, IRB 1520, IRB 2400, and IRB 4400.

Two different routines are available for the Calibration Pendulum method:

- Calibration Pendulum II
- Reference calibration

The calibration equipment for Calibration Pendulum is delivered as a complete toolkit, including the *Operating manual - Calibration Pendulum*, which describes the method and the different routines further.

Axis Calibration method

Axis Calibration is a standard calibration method for calibration of IRB 7600. 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*.

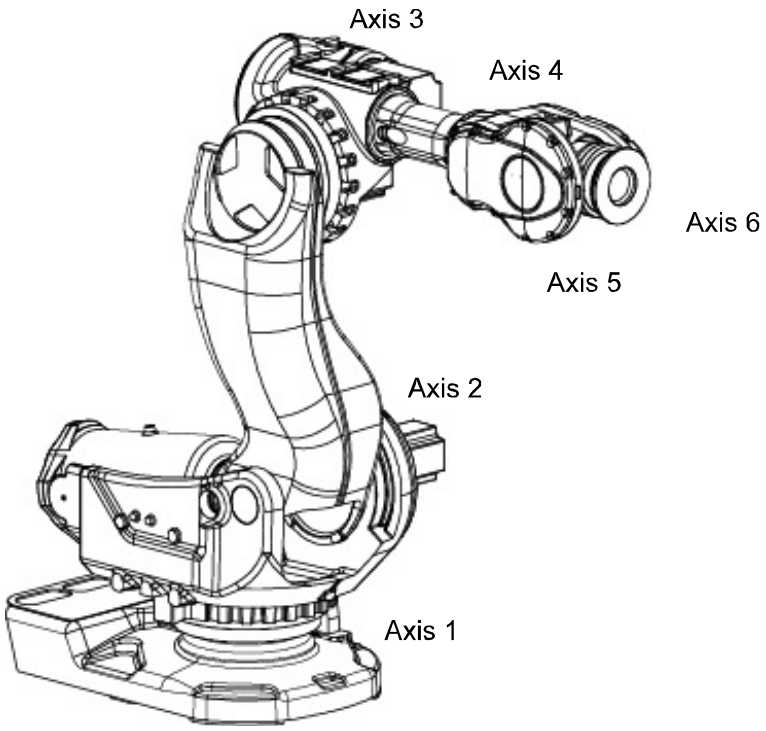
If a service operation is done to a robot with the option Absolute Accuracy, a new absolute accuracy calibration is required in order to establish full performance. For most cases after replacements that do not include taking apart the robot structure, standard calibration is sufficient.

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.

1.4.2 Fine calibration

General

Fine calibration is made using the Calibration Pendulum, see *Operating manual - Calibration Pendulum* or Axis calibration, see *Product manual - IRB 7600*.



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Calibration	Position
Calibration of all axes	All axes are in zero position
Calibration of axis 1 and 2	Axis 1 and 2 in zero position
	Axis 3 to 6 in any position
Calibration of axis 1	Axis 1 in zero position
	Axis 2 to 6 in any position

1.4.3 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.

What is included

Every *Absolute Accuracy* robot is delivered with:

- compensation parameters saved in the robot memory
- 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.

Absolute Accuracy supports floor mounted, wall mounted, and ceiling mounted installations. The compensation parameters that are saved in the robot memory differ depending on which Absolute Accuracy option is selected.

When is *Absolute Accuracy* being used

Absolute Accuracy works on a robot target in Cartesian coordinates, not on the individual joints. Therefore, joint based movements (e.g. `MoveAbsJ`) will not be affected.

If the robot is inverted, the Absolute Accuracy calibration must be performed when the robot is inverted.

Absolute Accuracy active

Absolute Accuracy will be active in the following cases:

- Any motion function based on robtargets (e.g. `MoveL`) and ModPos on robtargets
- Reorientation jogging

Continues on next page

1.4.3 Absolute Accuracy calibration
Continued

- Linear jogging
- Tool definition (4, 5, 6 point tool definition, room fixed TCP, stationary tool)
- Work object definition

Absolute Accuracy not active

The following are examples of when Absolute Accuracy is not active:

- Any motion function based on a jointtarget (`MoveAbsJ`)
- Independent joint
- Joint based jogging
- Additional axes
- Track motion

Note

In a robot system with, for example, an additional axis or track motion, the Absolute Accuracy is active for the manipulator but not for the additional axis or track motion.

RAPID instructions

There are no RAPID instructions included in this option.

Production data

Typical production data regarding calibration are:

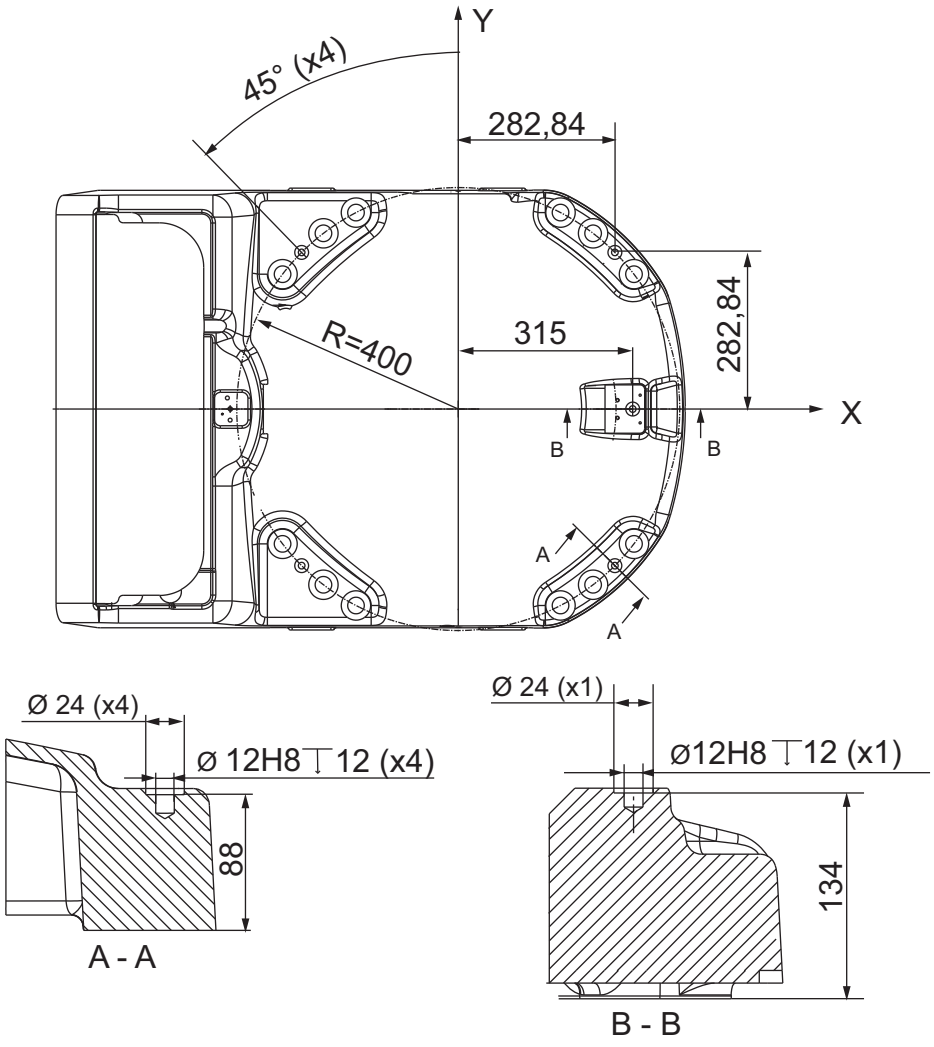
Robot	Positioning accuracy (mm)		
	Average	Max	% Within 1 mm
IRB 7600-150/3.50 IRB 7600-340/2.80 IRB 7600-325/3.1 IRB 7600-400/2.55 IRB 7600-500/2.55	0.55	1.20	95

1.4.4 Robot reference

Base

The holes shown in figure below arte used for measuring the robot position when integrated in a production cell.

The holes are not available for option Foundry Plus.



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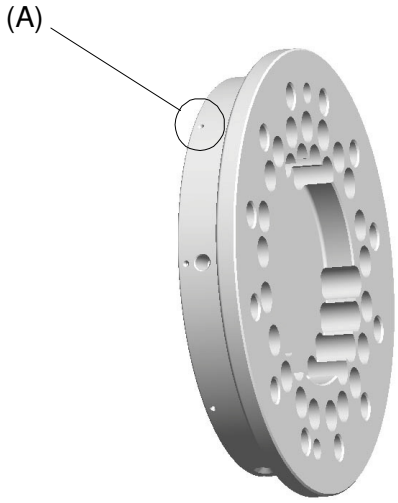
1.4.4 Robot reference
Continued

Tool Flange



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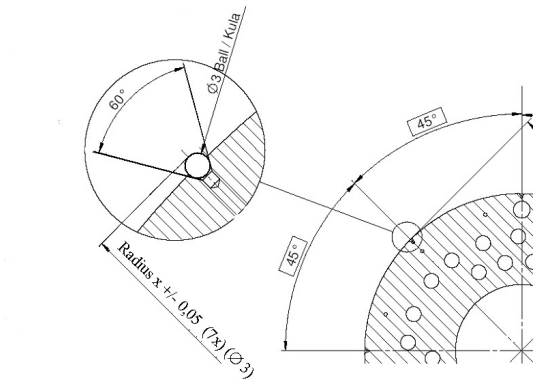

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Robot	Radius X (mm) for references on tool flange
IRB 7600-150/3.50 IRB 7600-325/3.10 IRB 7600-340/2.80 IRB 7600-400/2.55 IRB 7600-500/2.55	R=113.5

1.5 Load diagrams

1.5.1 Introduction

Information

WARNING

It is very important to always define correct actual load data and correct payload of the robot. Incorrect definitions of load data can result in overloading of the robot.

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

- motors
- gearboxes
- mechanical structure

WARNING

In RobotWare, the service routine LoadIdentify can be used to determine correct load parameters. The routine automatically defines the tool and the load.

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

WARNING

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

General

The load diagrams include a nominal payload inertia, J_0 of 15 kgm^2, and an extra load of 50 kg at the upper arm housing.

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

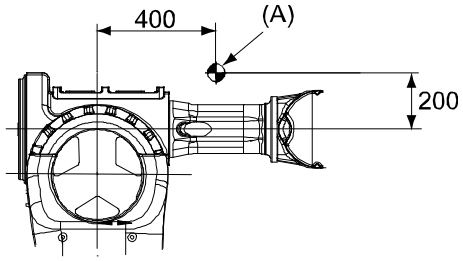
Continues on next page

1.5.1 Introduction
Continued

Control of load case with 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.



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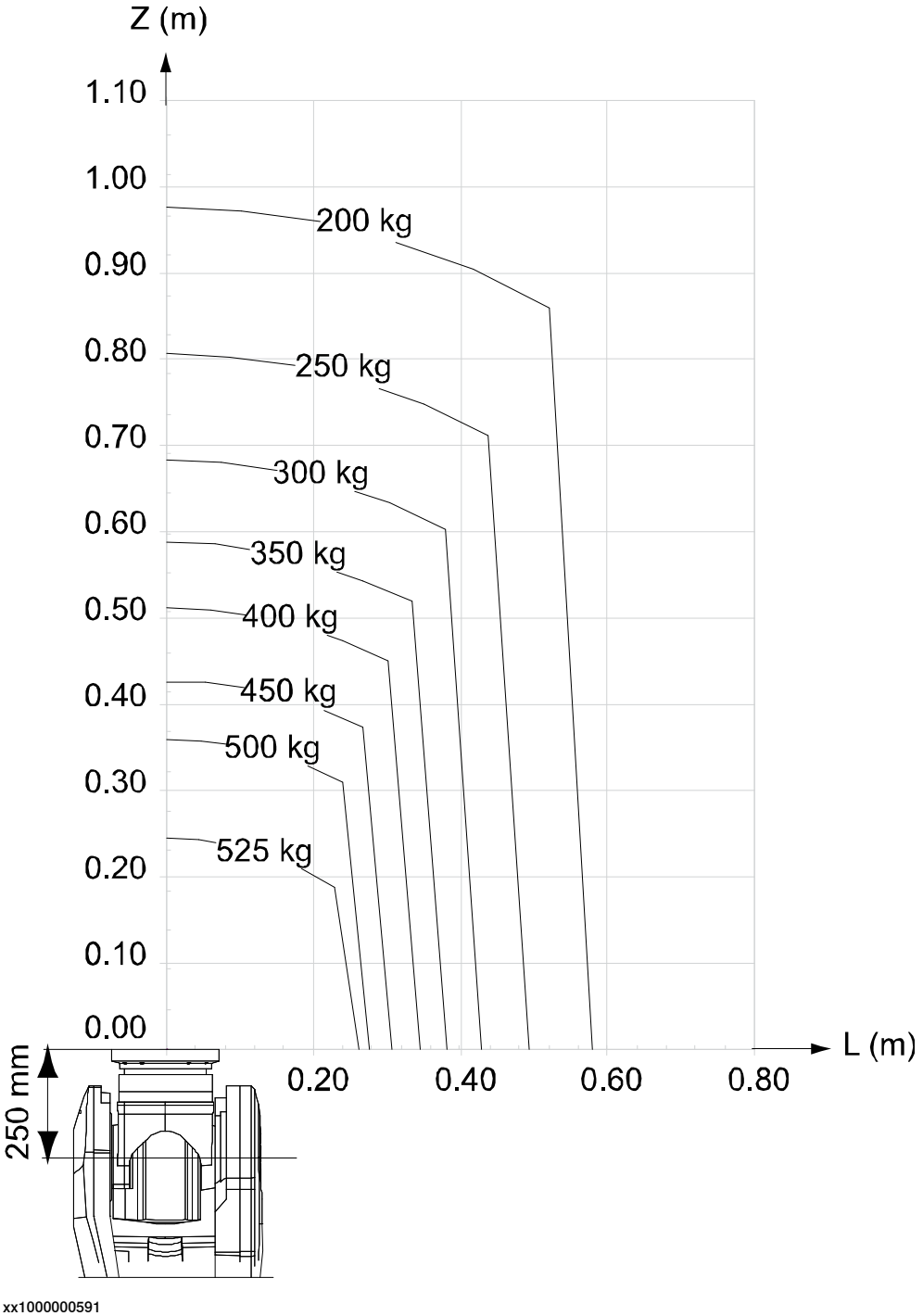
Pos	Description
A	Center of gravity 50 kg

1.5.2 Load diagrams

IRB 7600 - 500/2.55



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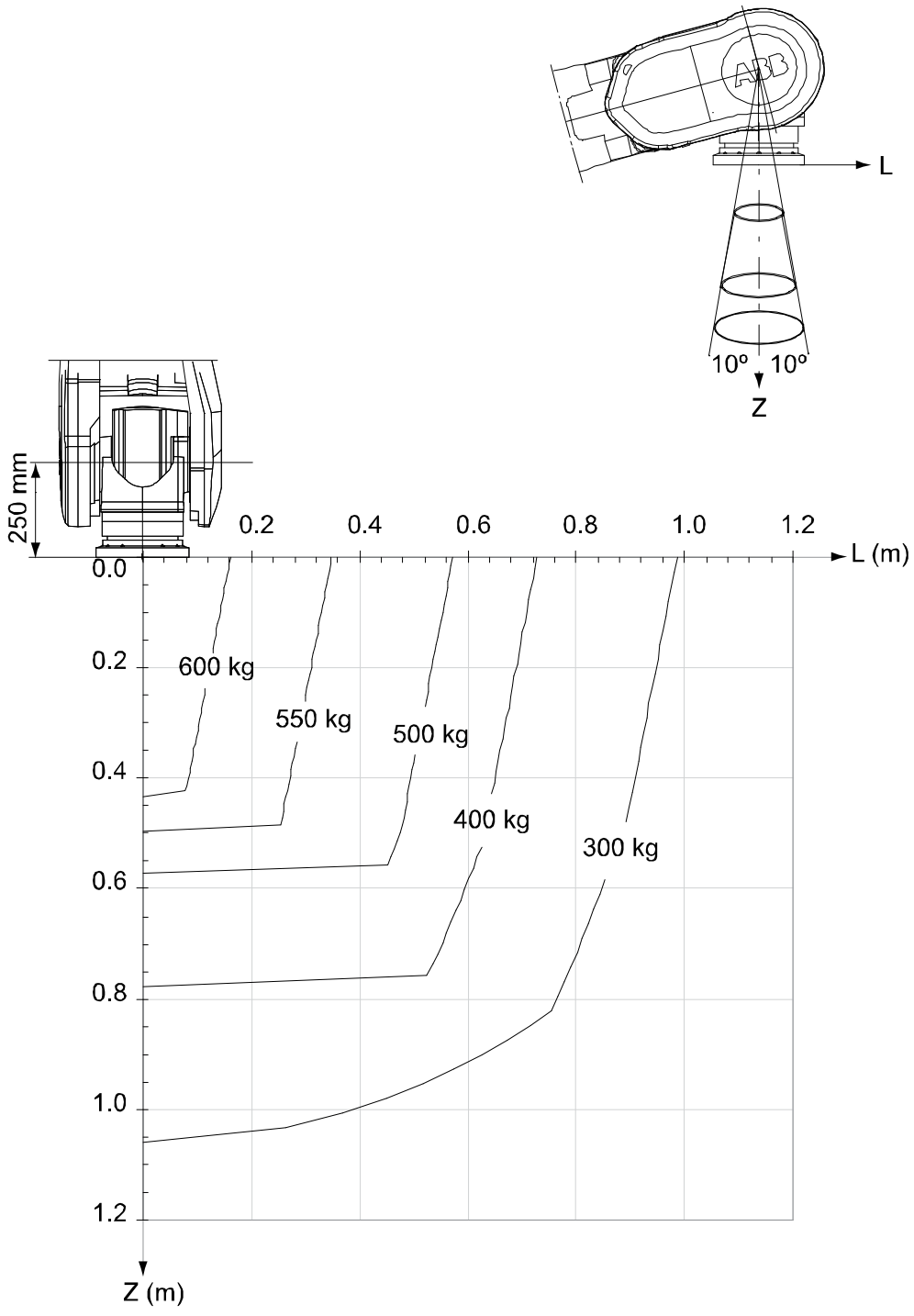
1.5.2 Load diagrams
Continued

IRB 7600 - 500/2.55 “Vertical Wrist” (±10º)



xx1000000586

	Description
Max load	630 kg
Z_{max}	0,392 m
L_{max}	0,099 m

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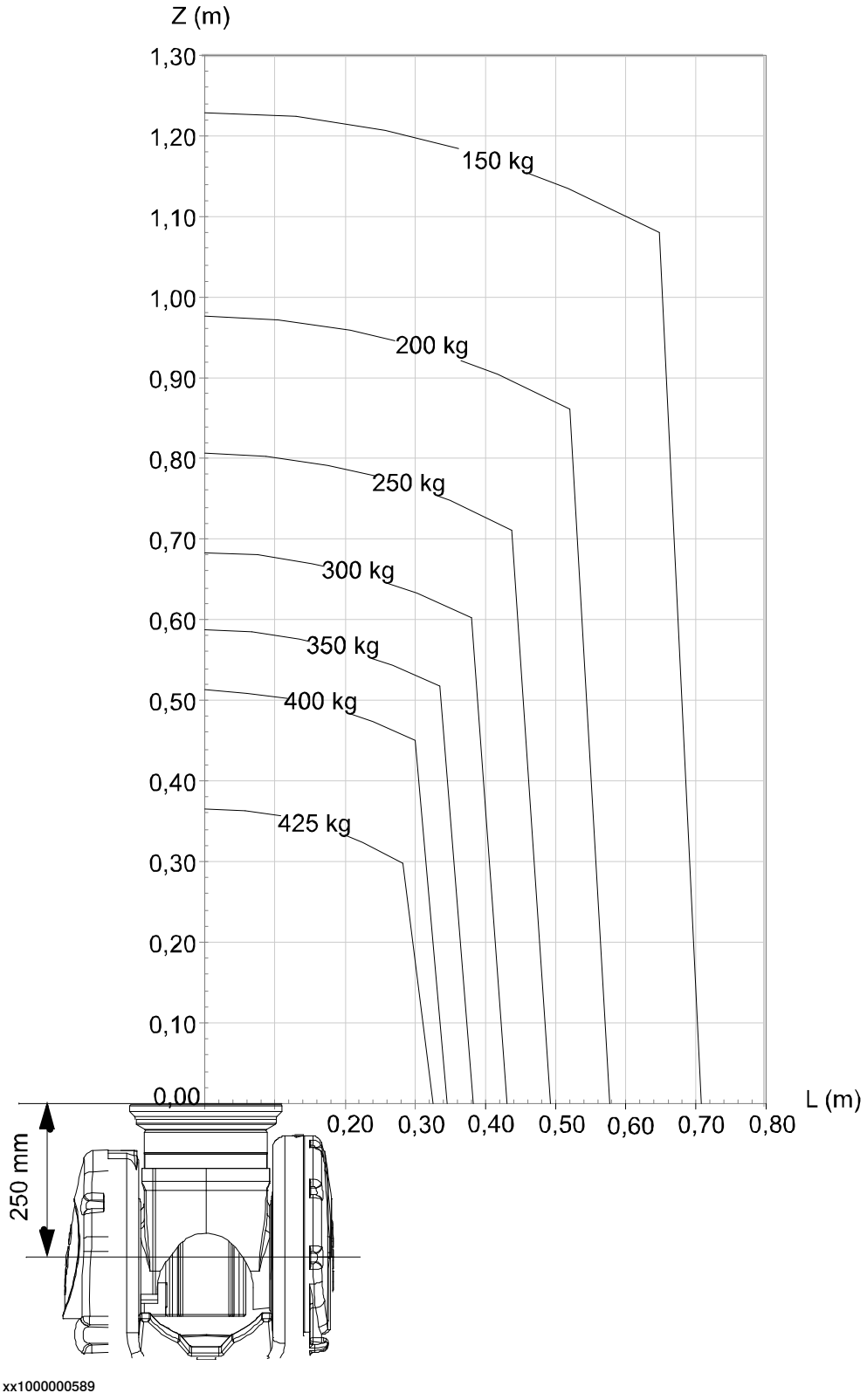
IRB 7600 - 400/2.55



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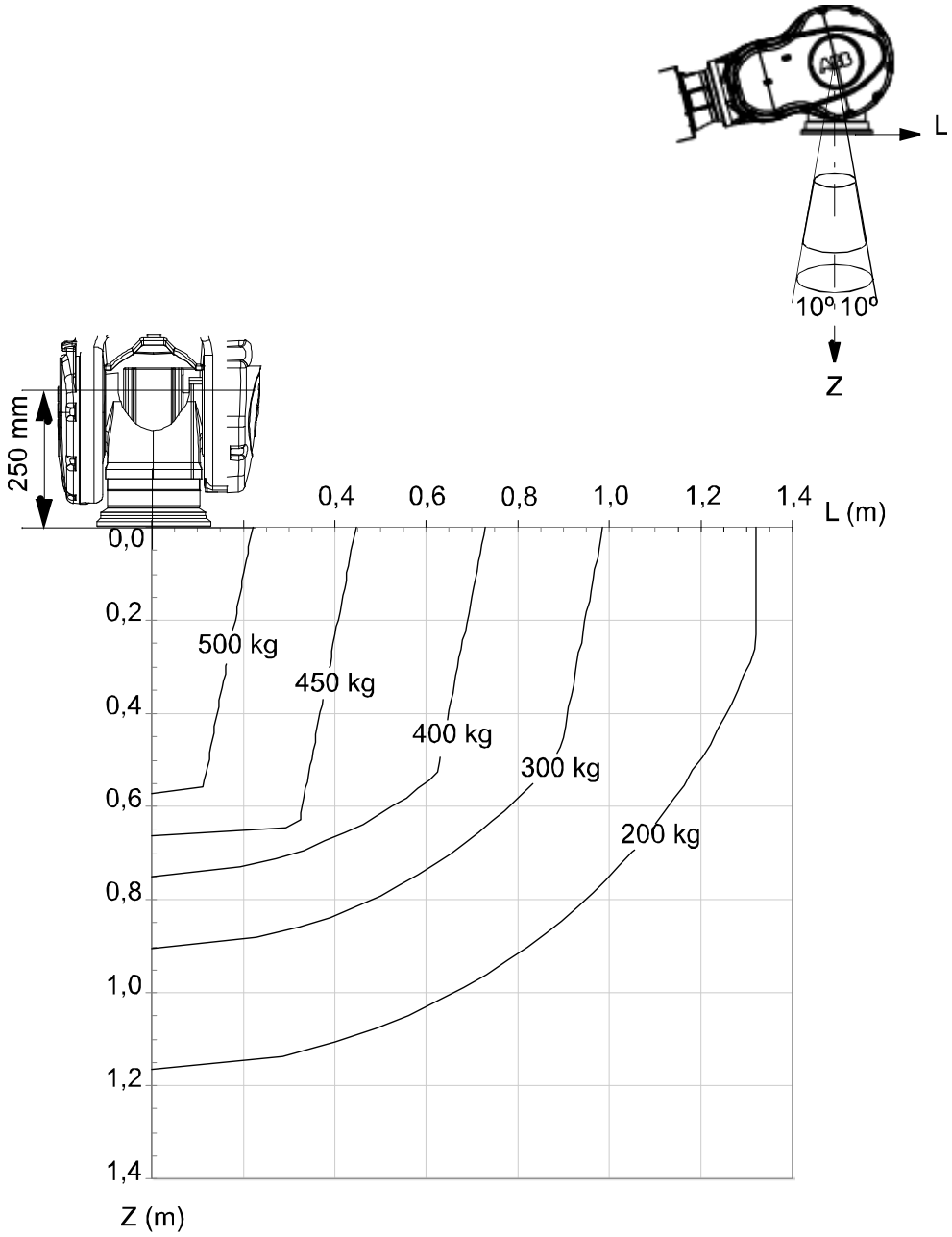
1.5.2 Load diagrams
Continued

IRB 7600 - 400/2.55 “Vertical Wrist” (±10°)



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	Description
Max load	540 kg
Z_{max}	0,498 m
L_{max}	0,103 m

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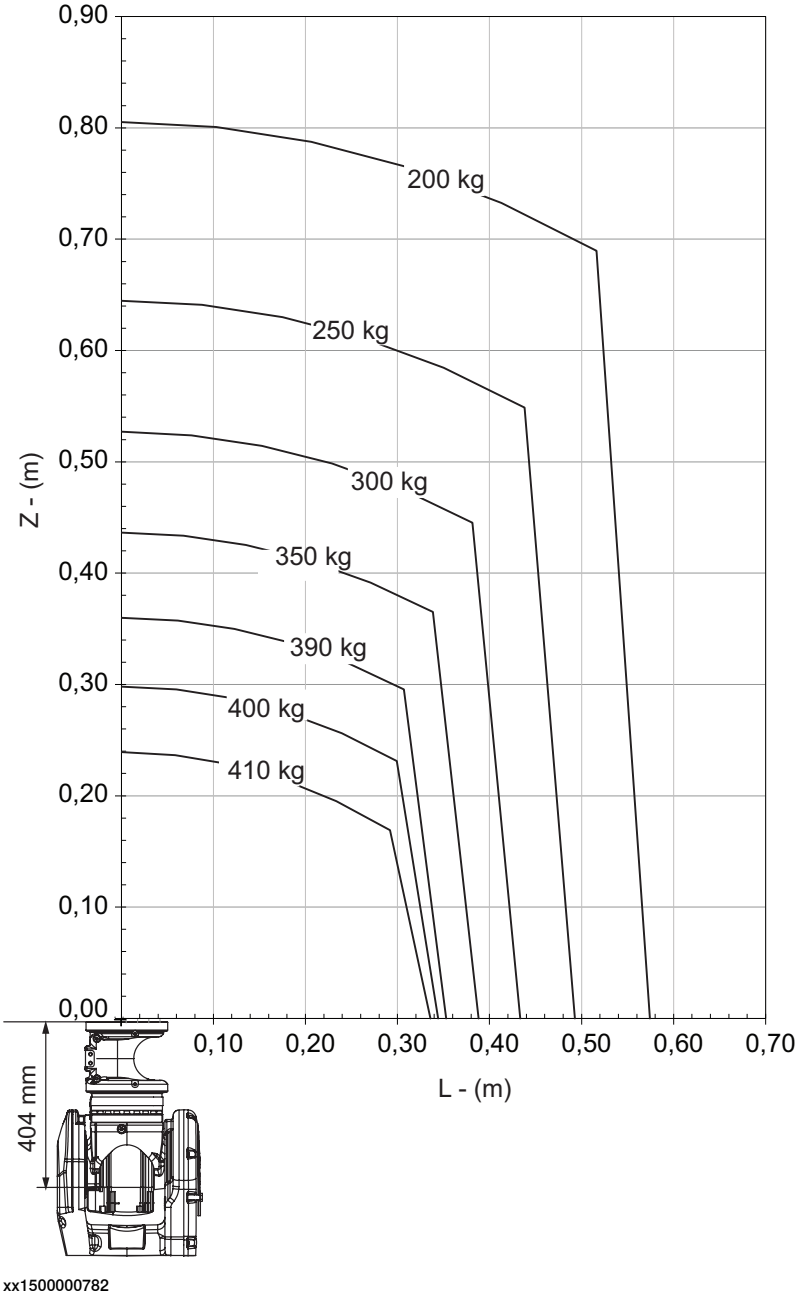
IRB 7600 - 400/2.55 “LeanID”, option 780-4



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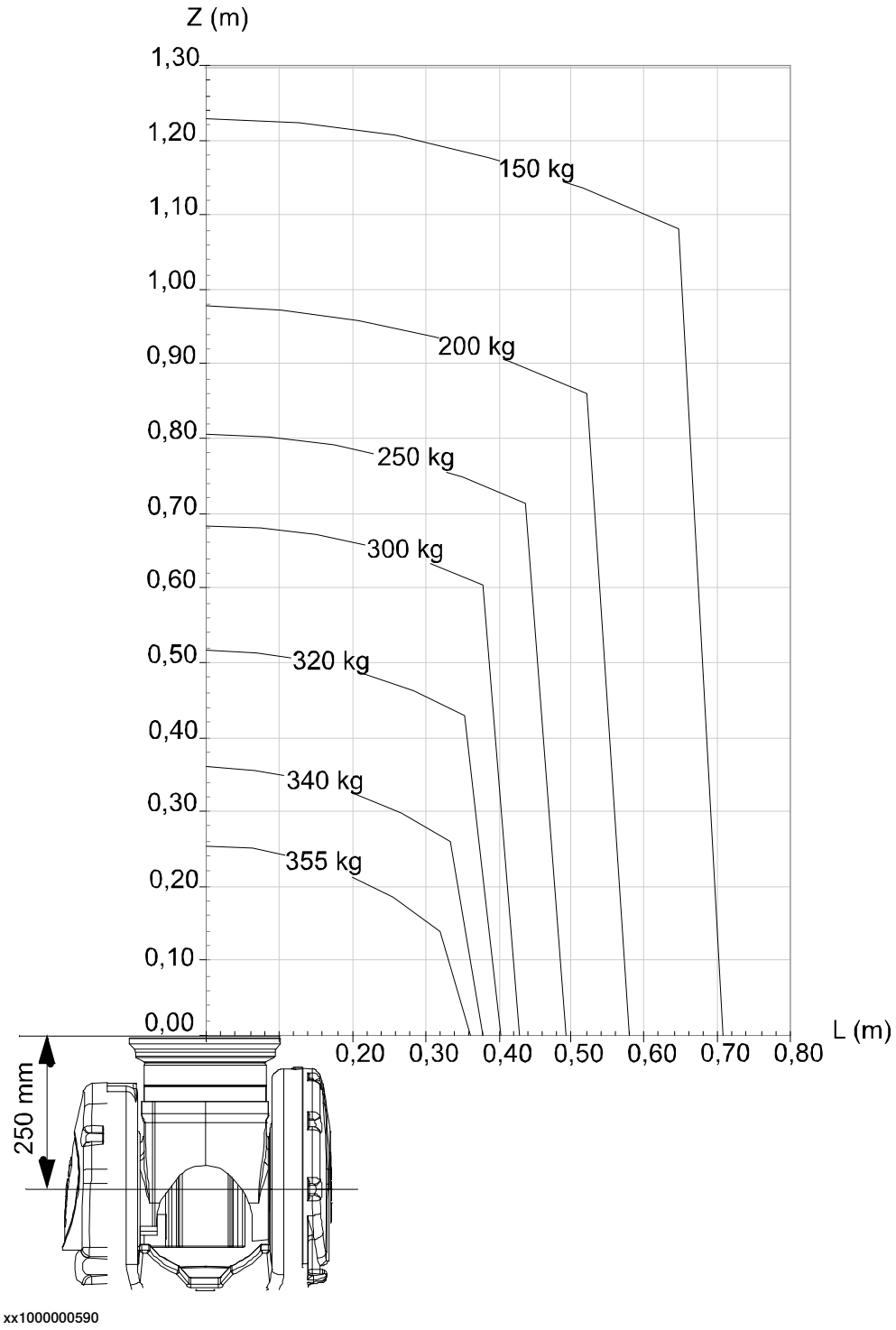
1.5.2 Load diagrams
Continued

IRB 7600 - 340/2.8



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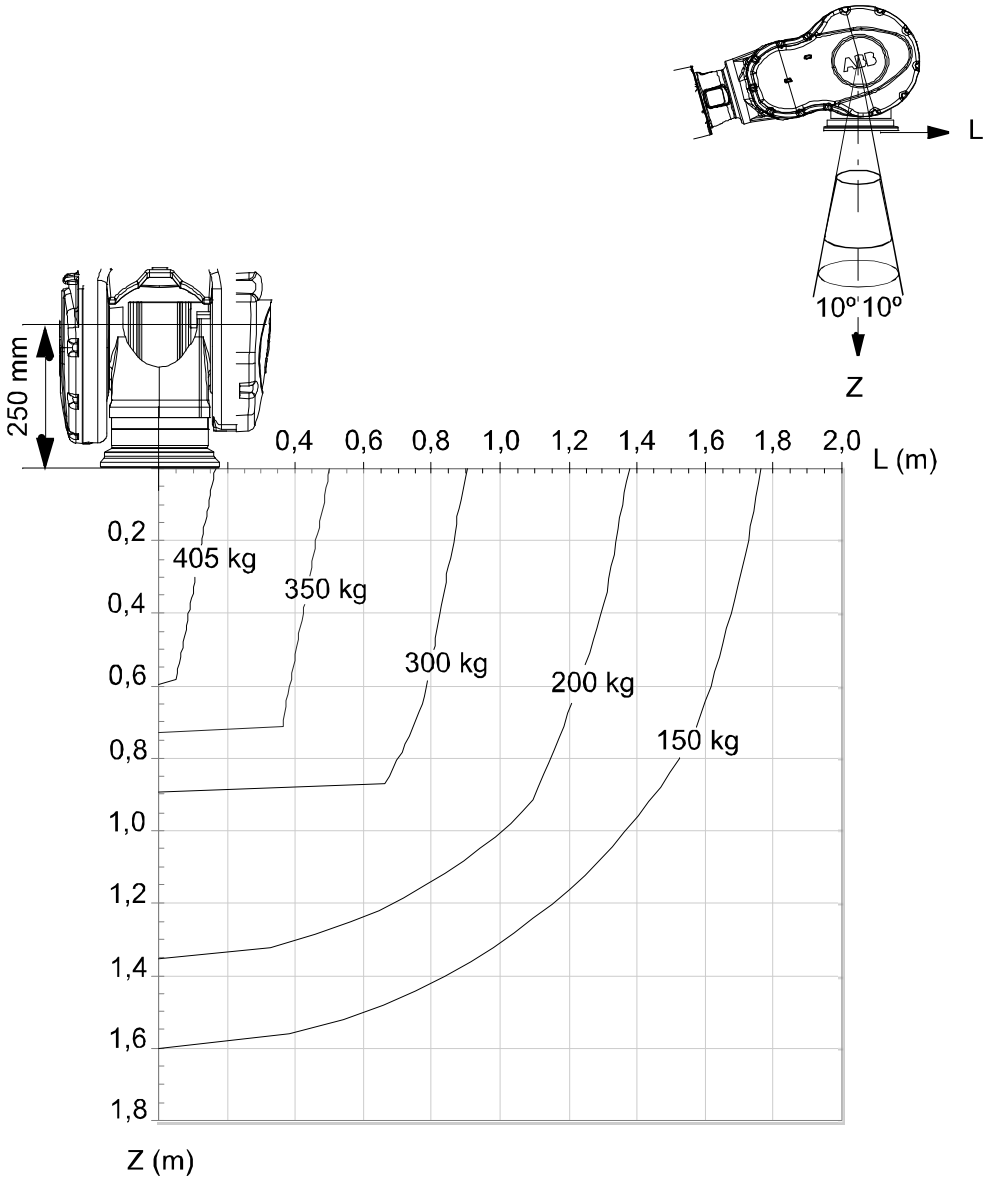
IRB 7600 - 340/2.8 “Vertical Wrist” (±10°)



xx1000000583

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

	DescriptionDescription
Max load	420 kg
Z_{max}	0,553 m
L_{max}	0,121 m

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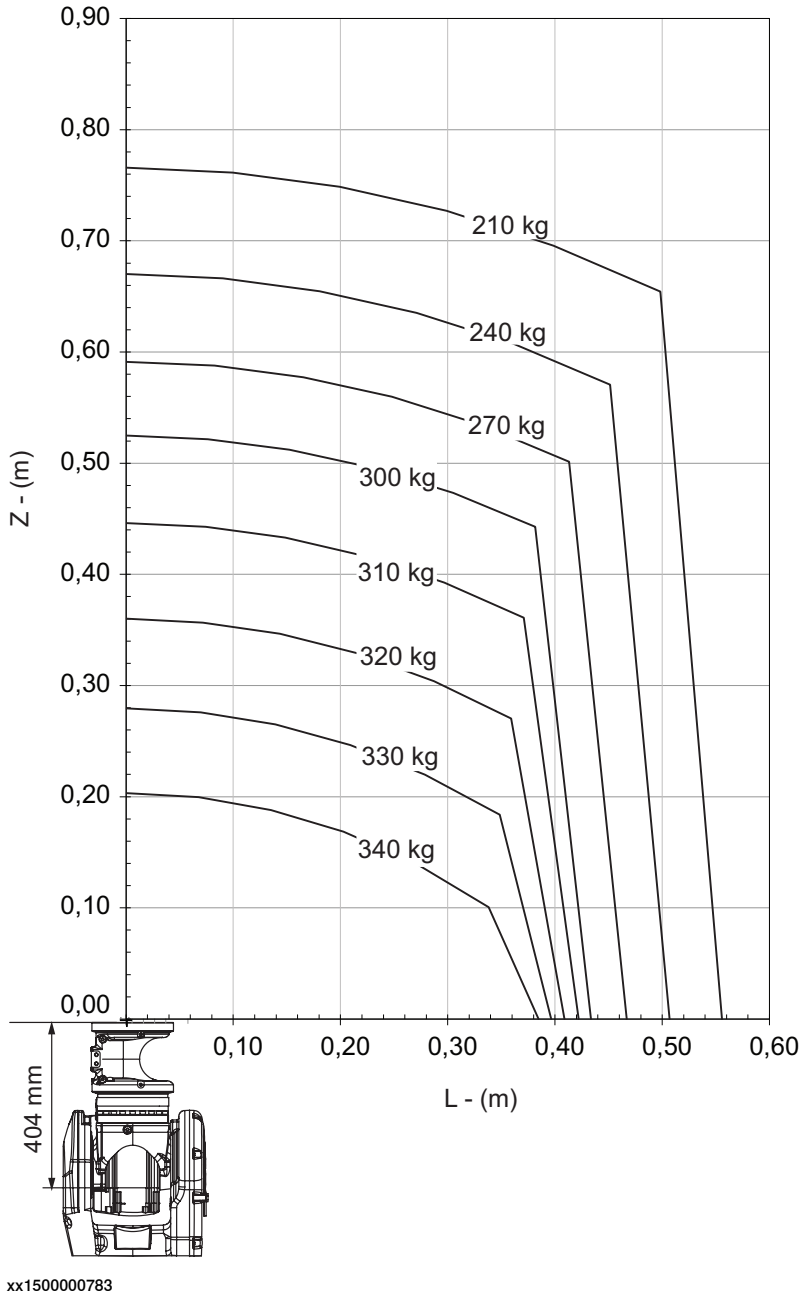
1.5.2 Load diagrams
Continued

IRB 7600 - 340/2.8 “LeanID”, option 780-4



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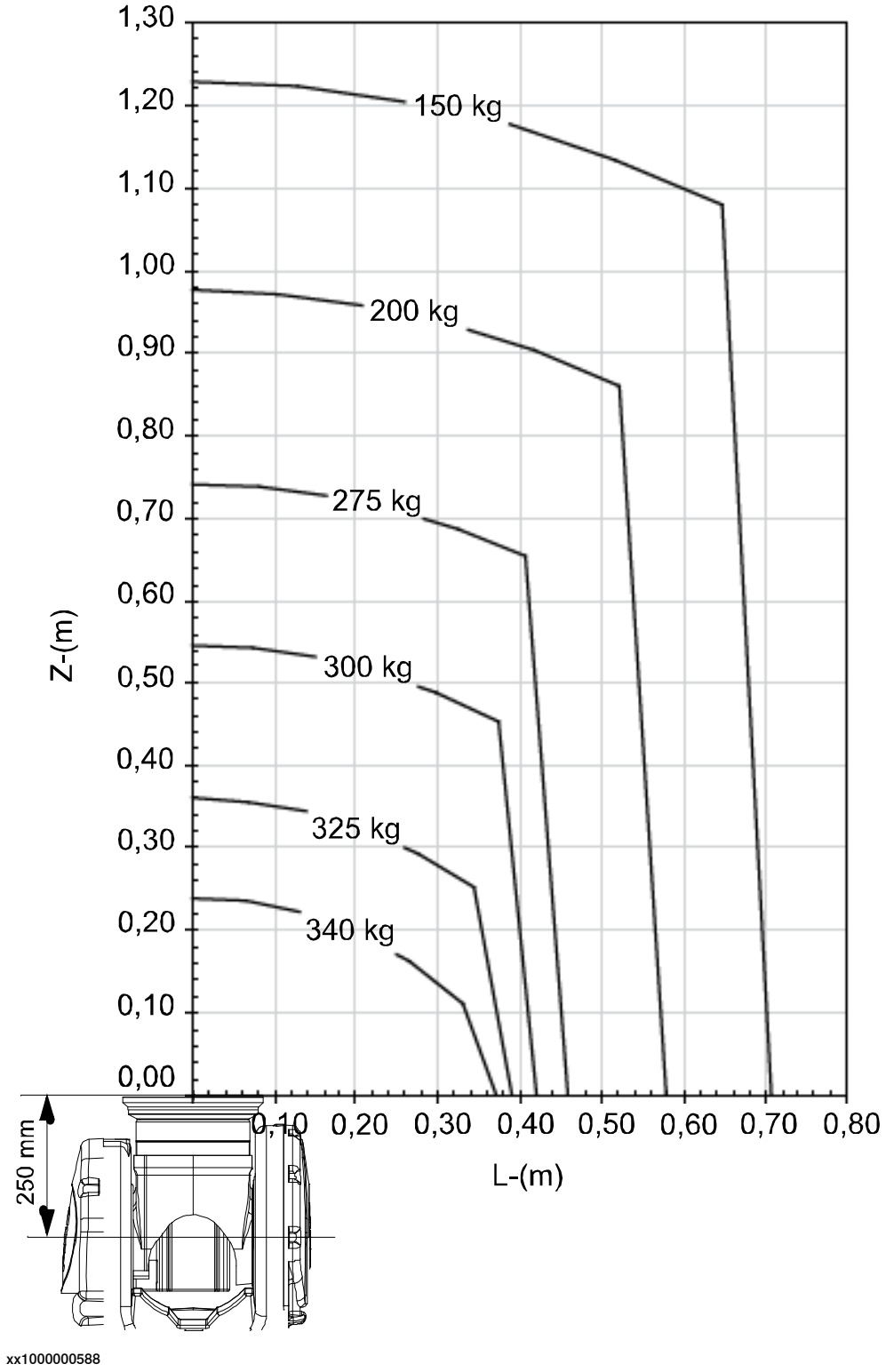
IRB 7600 - 325/3.1



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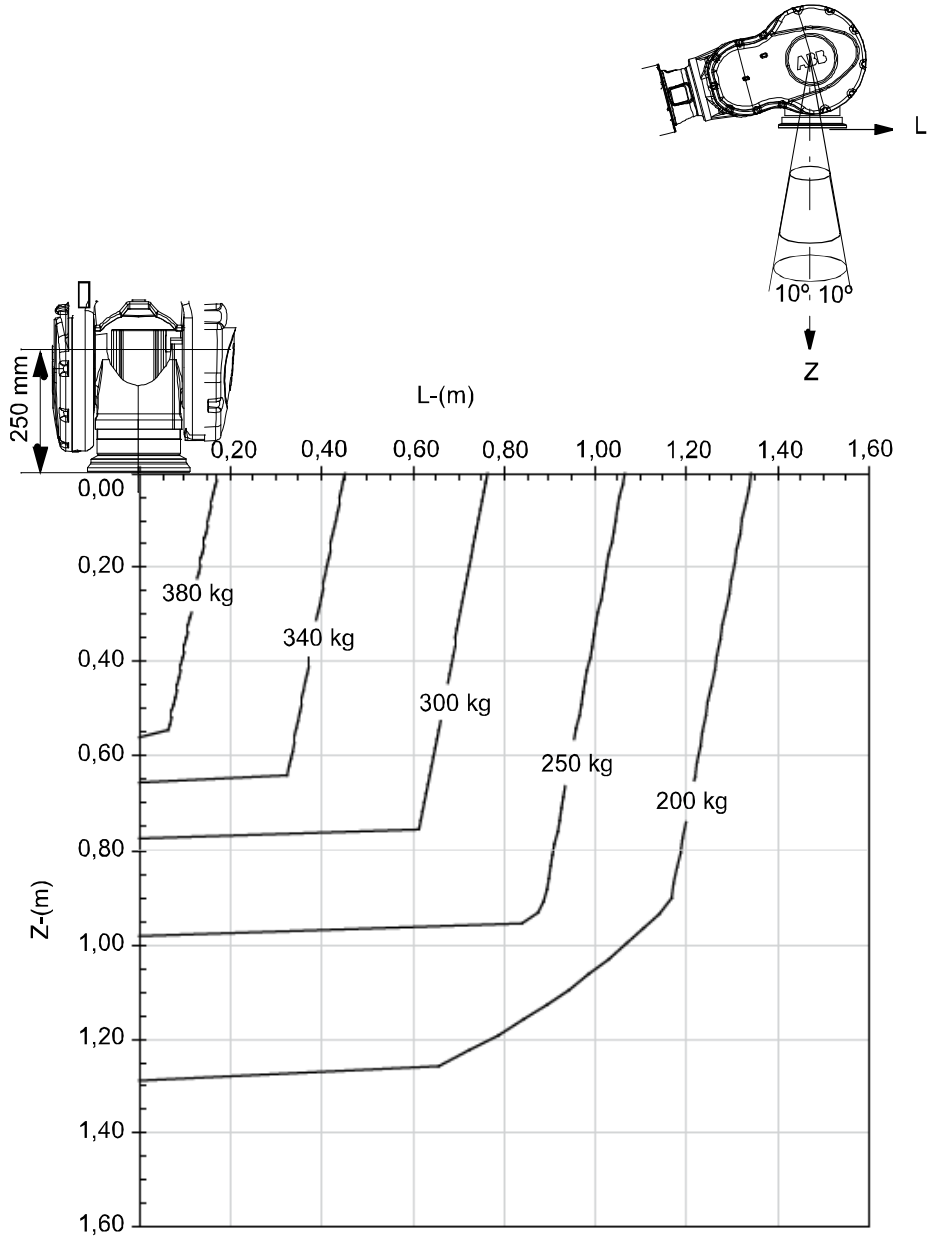
1.5.2 Load diagrams
Continued

IRB 7600 - 325/3.1 “Vertical Wrist” (±10°)



xx1000000582

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

	Description
Max load	400 kg
Z_{max}	0,519 m
L_{max}	0,095 m

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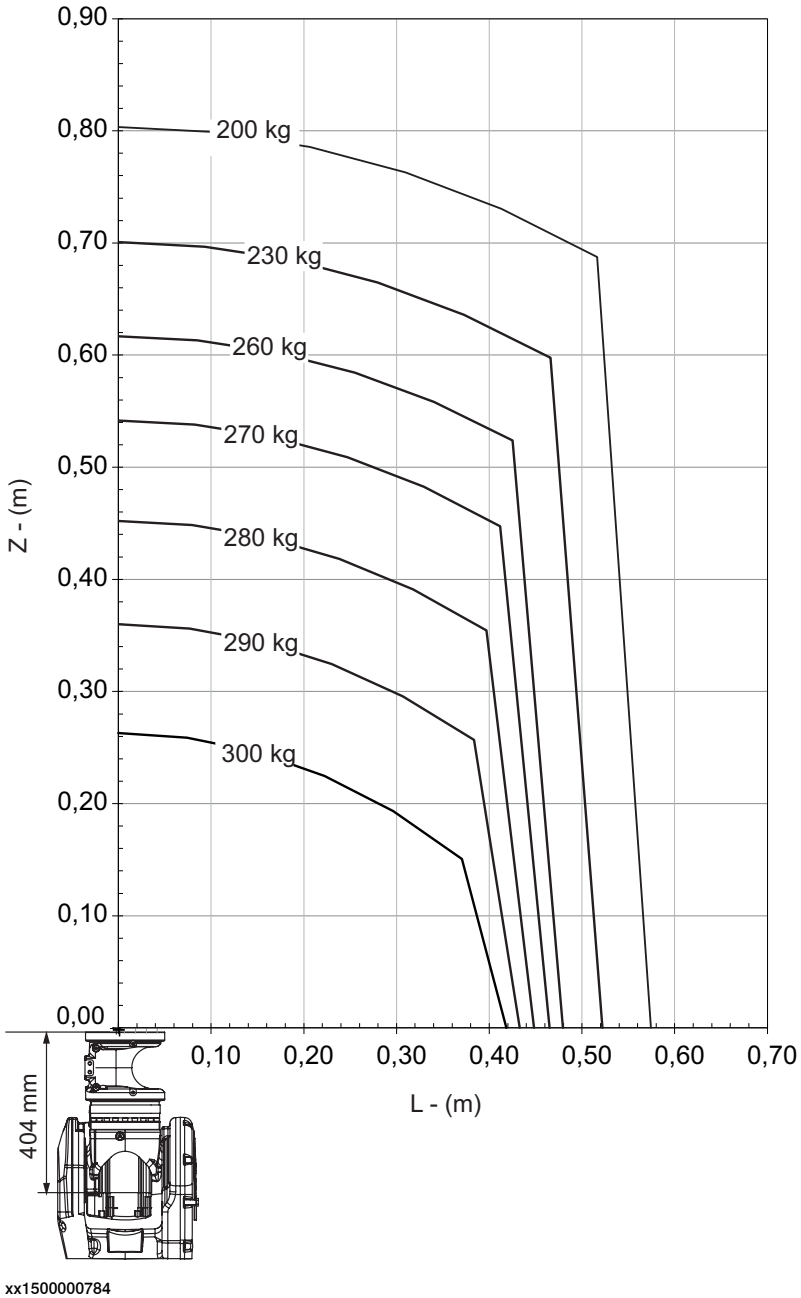
IRB 7600 - 325/3.1 “LeanID”, option 780-4



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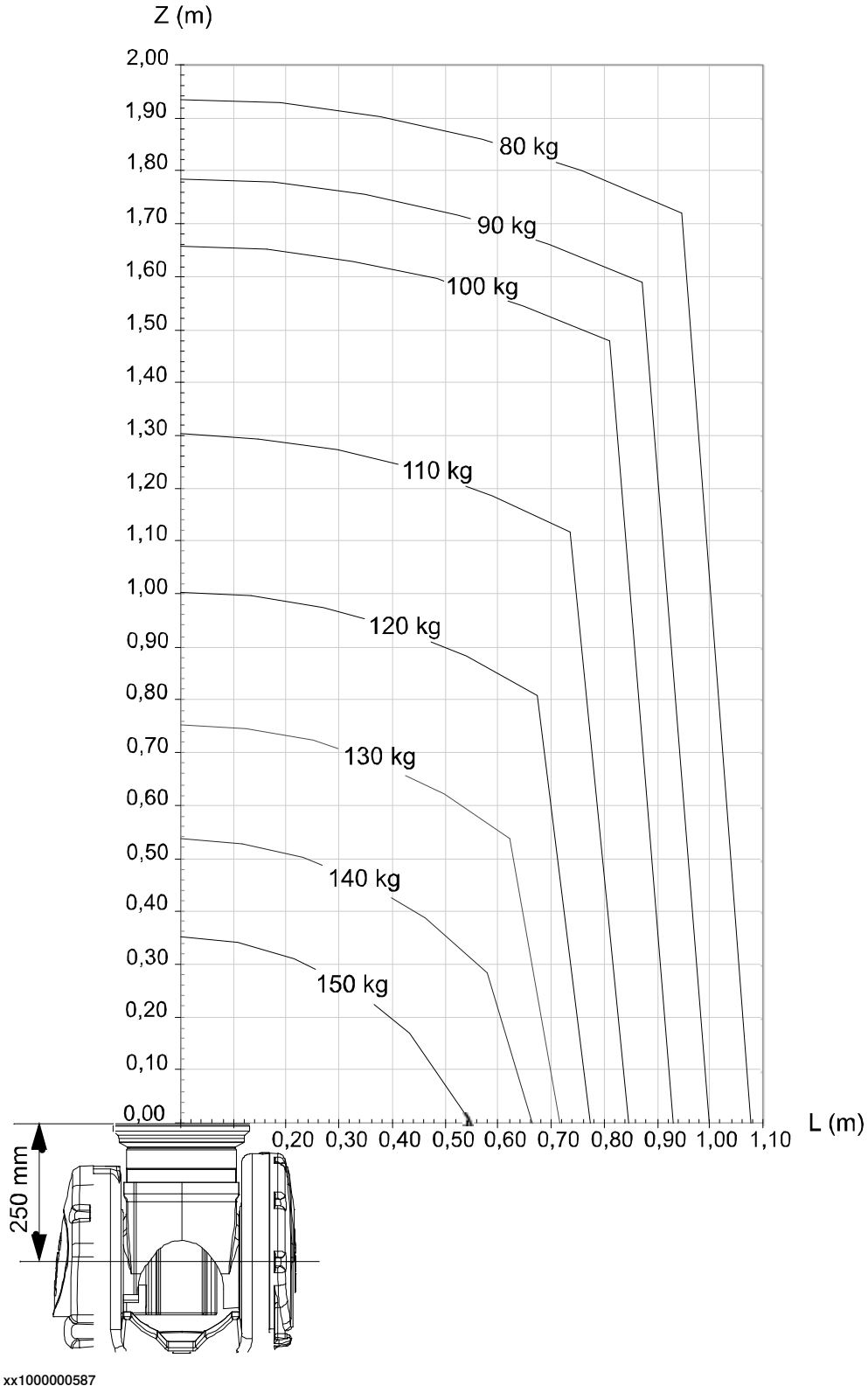
1.5.2 Load diagrams
Continued

IRB 7600 - 150/3.5



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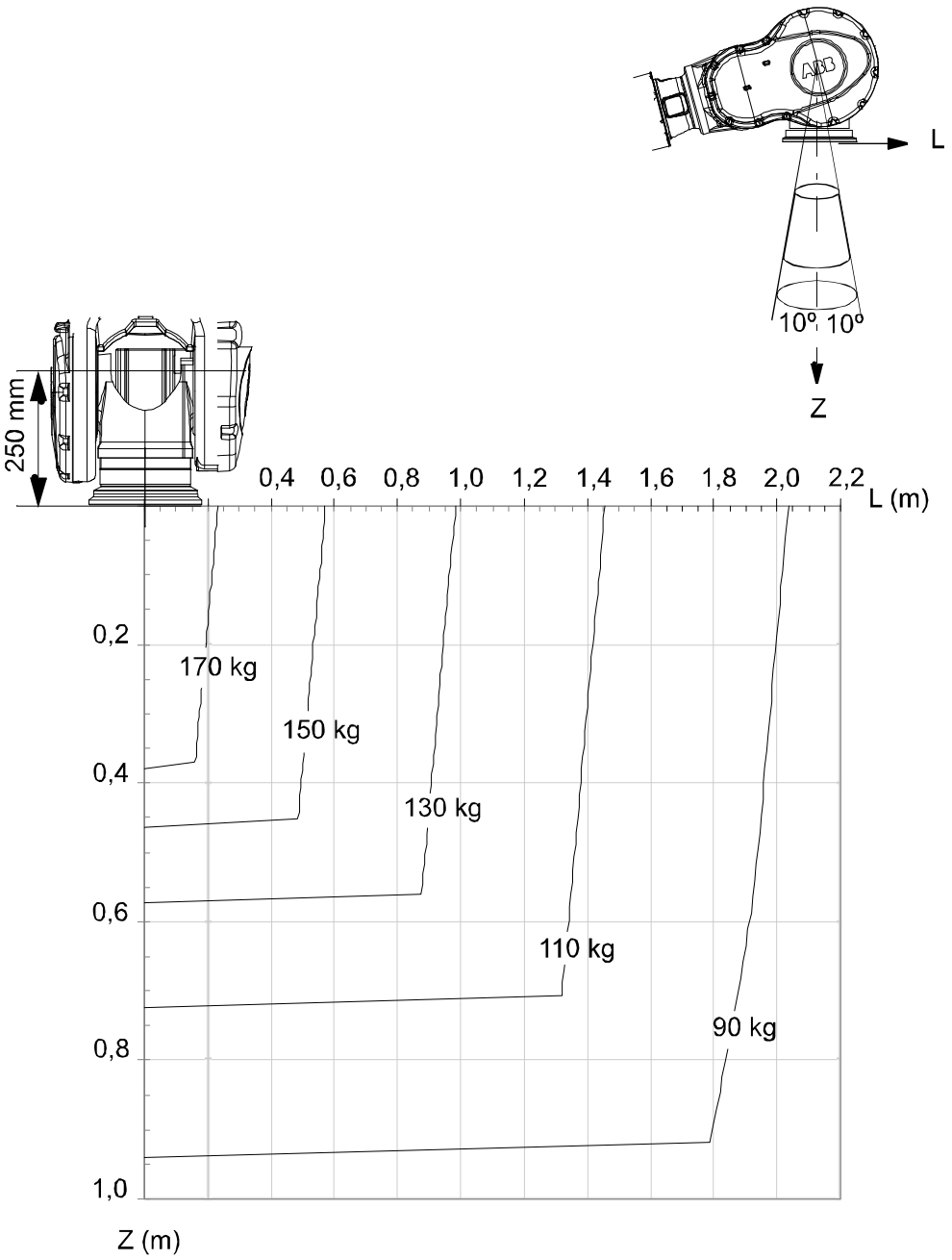
IRB 7600 - 150/3.5 “Vertical Wrist” (±10°)



xx1000000581

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

	Description
Max load	180 kg
Z_{max}	0,337 m
L_{max}	0,126 m

1.5.3 Max. load and moment of inertia for full and limited axis 5 (center down line) movement

Note

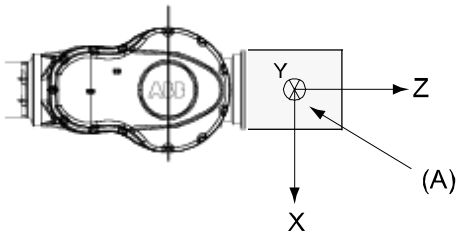
Total load given as: Mass in kg, center of gravity (Z and L) in meter and moment of inertia (J_{ox}, J_{oy}, J_{oz}) in kgm^2 . L= $\div(X^2 + Y^2)$, see Figure below

Full movement of axis 5 (±100°)

Axis	Maximum moment of inertia
5	Ja_5 = Mass x $((Z+0.250^{i})^2 + L^2)$ + max (J_{0x}, J_{0y}) ≤ 500 kgm^2
6	Ja_6 = Mass x L^2 + J_{0Z} ≤ 315 kgm^2

i For option 780-4, LeanID=0,404 m

	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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Pos	Description
A	Center of gravity

Limited axis 5, center line down

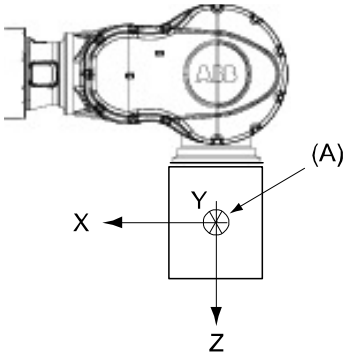
Axis	Maximum moment of inertia
5	Ja_5 = Load x $((Z+0.250^{i})^2 + L^2)$ + (J_{0x}, J_{0y}) ≤ 550 kgm^2
6	Ja_6 = Load x L^2 + J_{0Z} ≤ 500 kgm^2

i For option 780-4, LeanID=0,404 m

	Description
J_{0x}, J_{0y}, J_{0Z}	Max. moment of inertia around the X, Y and Z axes at center of gravity.

Continues on next page

1.5.3 Max. load and moment of inertia for full and limited axis 5 (center down line) movement
Continued



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Pos	Description
A	Center of gravity

1.5.4 Wrist torque

General

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

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.

Robot type	Max wrist torque axis 4 and 5	Max wrist torque axis 6	Max torque valid at load
IRB 7600 - 500/2.55	2990 Nm	1354 Nm	500 kg
IRB 7600 - 400/2.55	2990 Nm	1354 Nm	400 kg
IRB 7600 - 340/2.8	2746 Nm	1265 Nm	300 kg
IRB 7600 - 325/3.1	2681 Nm	1241 Nm	278 kg
IRB 7600 - 150/3.5	1700 Nm	800 Nm	100 kg

1.5.5 Mounting equipment

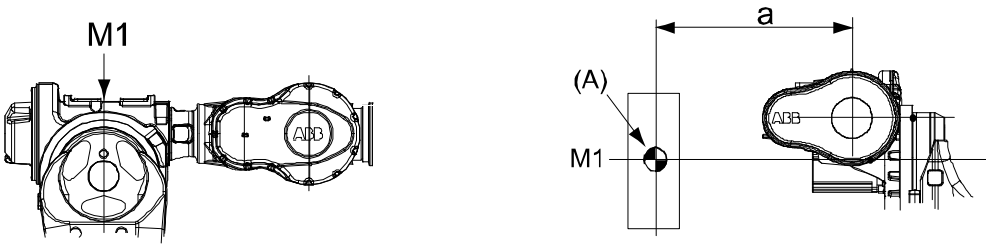
General

Extra loads can be mounted on the upper arm housing, the lower arm, and on the frame. Definitions of distances and masses are shown in Figure below and Figure on next page. The robot is supplied with holes for mounting extra equipment (see Figure in next chapter). Maximum permitted arm load depends on center of gravity of arm load and robot payload.

Upper arm

Permitted extra load on upper arm housing plus the maximum handling weight (see Figure below):

M1 ≤ 50 kg with distance a ≤ 500 mm, center of gravity in axis 3 extension.



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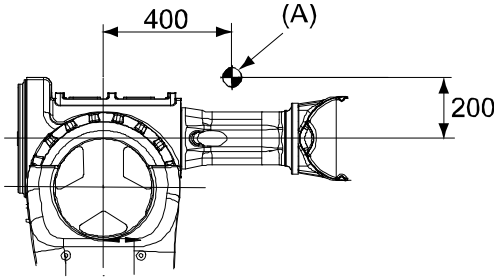
Pos	Description
A	Mass center



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Pos	Description
A	Center of gravity 50 kg

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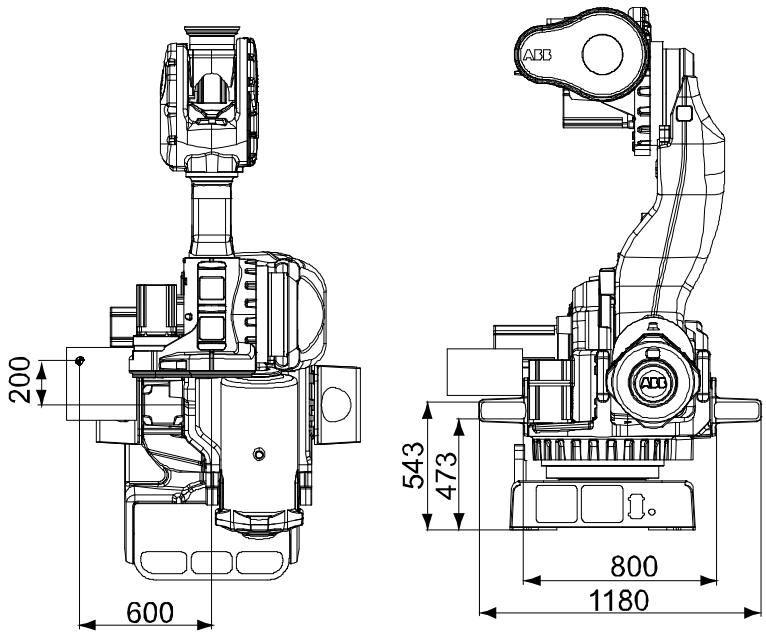
1.5.5 Mounting equipment
Continued

Frame (Hip Load)

Permitted extra load on frame	J_H = 200 kgm^2
Recommended position (see Figure below)	J_{H0} + M4 x R^2 whereJ_H+ is the moment of inertia of the equipmentR is the radius (m) from the center of axis 1M4 is the total mass (kg) of the equipment including bracket and harness (≤ 500 kg).

View from above



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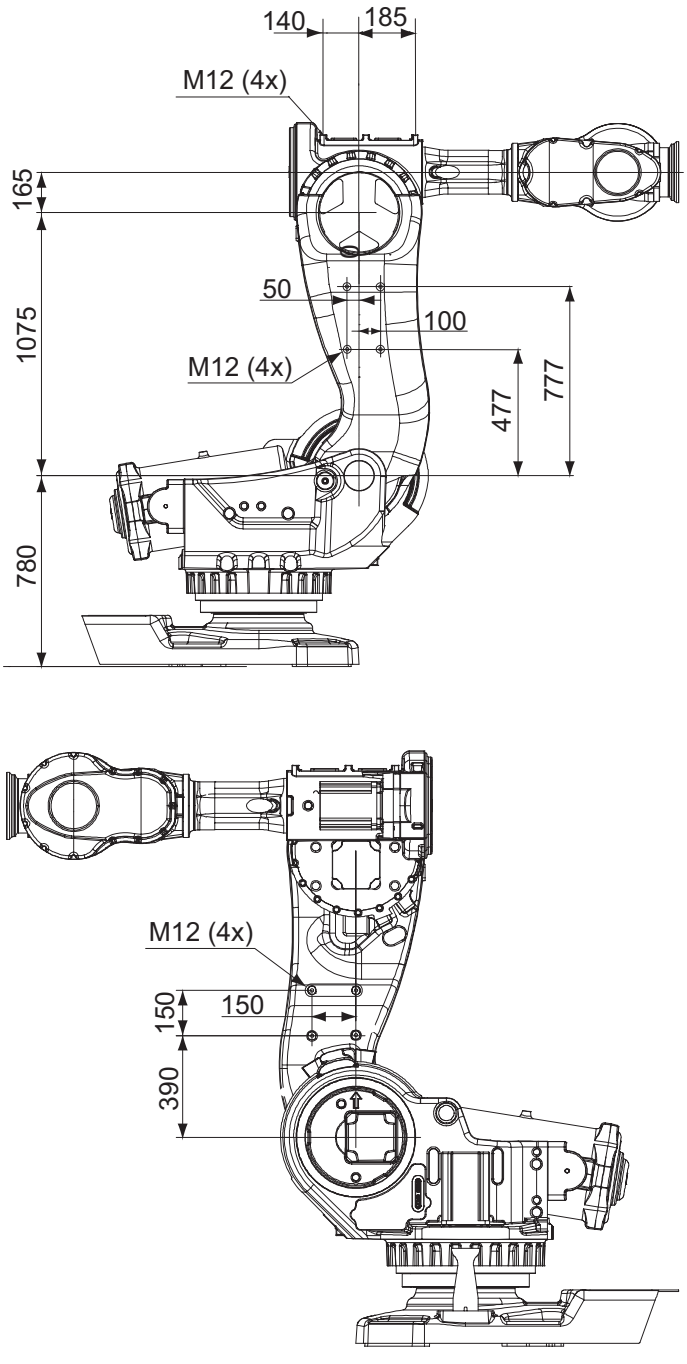
1.5.6 Mounting of hip load

General

The extra load can be mounted on the frame. Holes for mounting see Figure below. When mounting on the frame all the four holes (2x2, Ø16) on one side must be used.

Holes for mounting extra equipment



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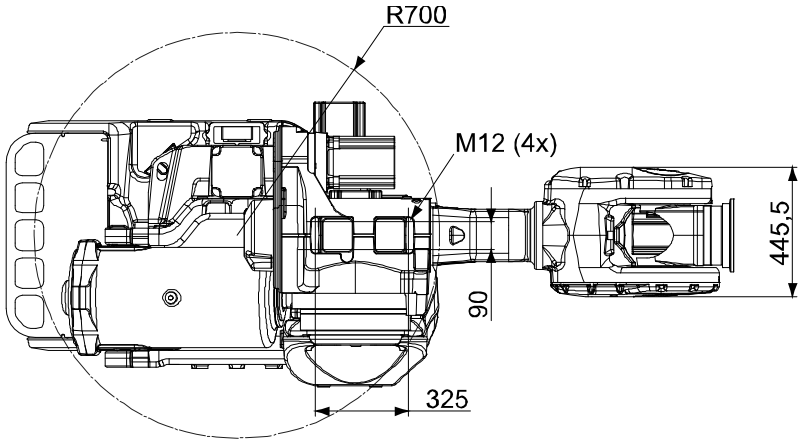
1.5.6 Mounting of hip load
Continued



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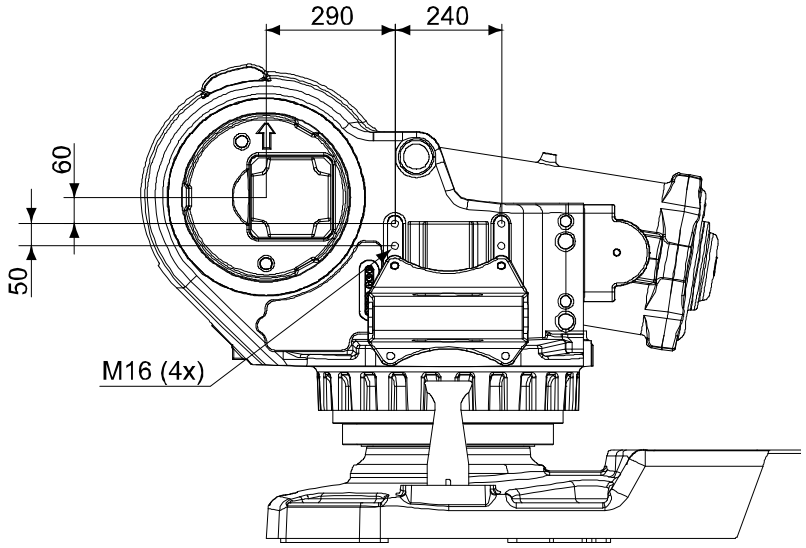

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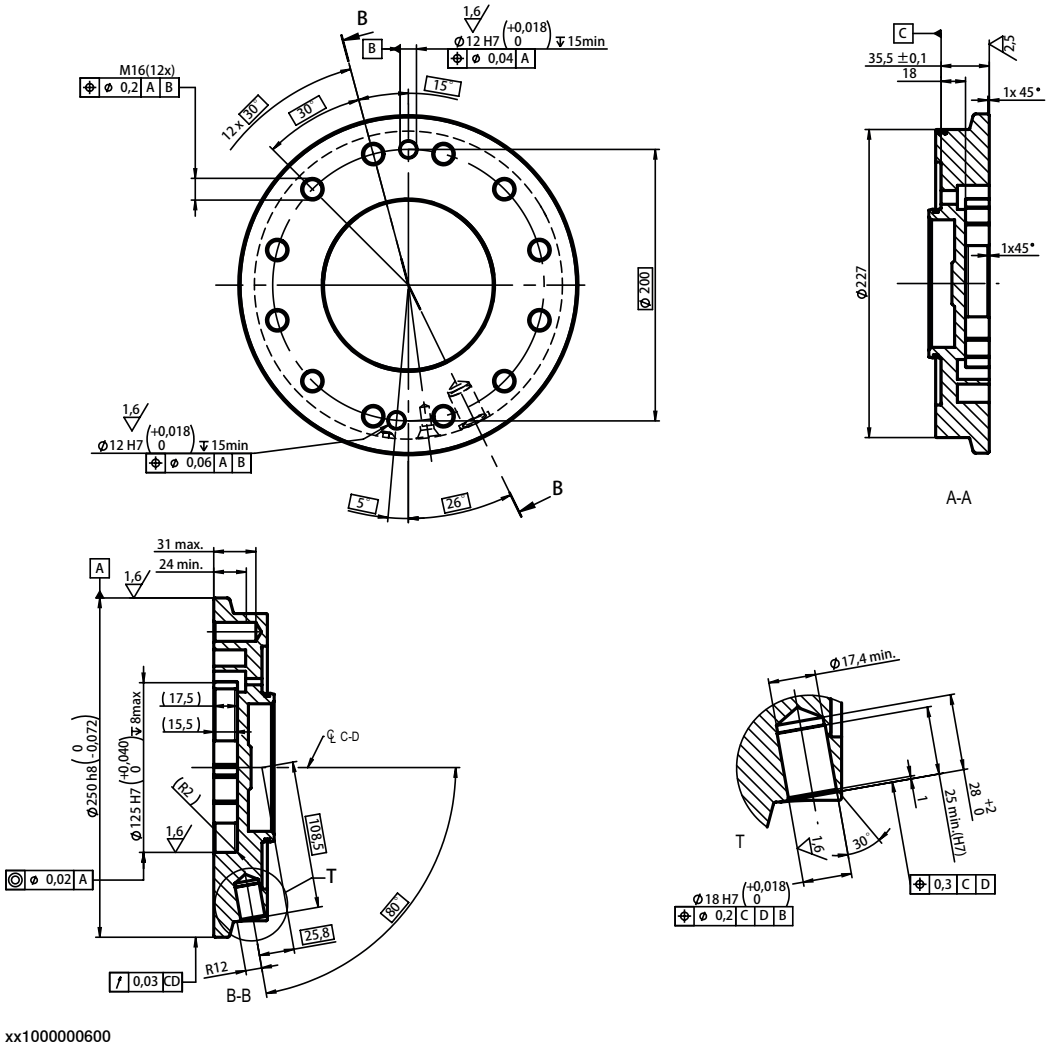
The tool flange is also valid for LeanID.



Fastener quality

Use suitable screws and tightening torque for your application.

1.5.7 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 type	E-stop Max acceleration at nominal load COG [m/s^2]	Controlled Motion Max acceleration at nominal load COG [m/s^2]
IRB 7600 - 500/2.55	34	15
IRB 7600 - 400/2.55	38	18
IRB 7600 - 340/2.8	41	18
IRB 7600 - 325/3.10	45	18
IRB 7600 - 150/3.50	55	24

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).

1.6 Maintenance and troubleshooting

1.6.1 Introduction

General

The robot requires only a minimum of maintenance during operation. It is designed to make it as easy to service as possible:

- Maintenance-free AC motors are used
- Liquid grease or oil is used for the gear boxes
- 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 depends on selected options. For detailed information on maintenance procedures, see Maintenance section in the Product Manual.

1.7 Robot motion

1.7.1 Introduction

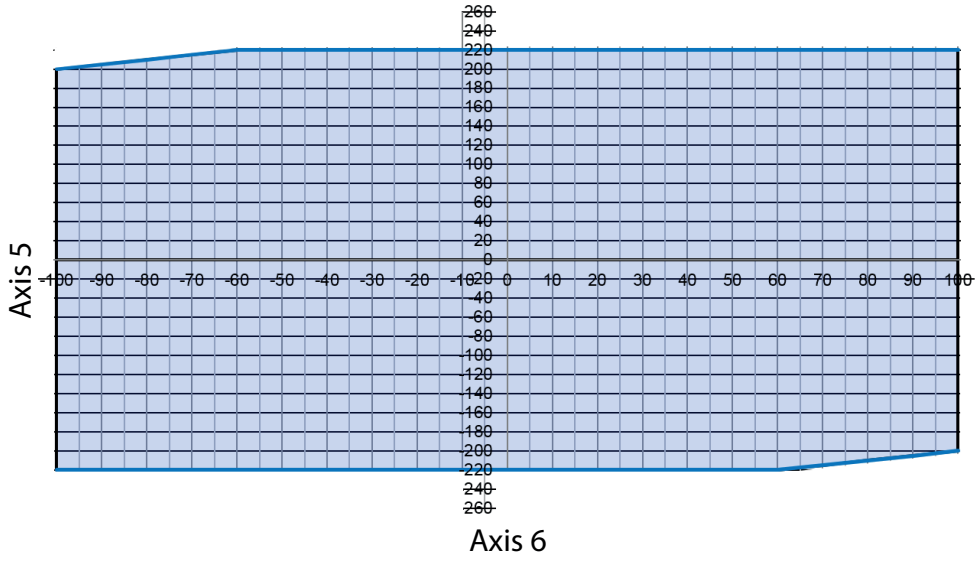
Type of motion

Axis	Type of motion	Range of movement	
		from	to
1	Rotation motion	+180°	-180°
2	Arm motion	+85°	-60°
3	Arm motion	+60°	-180°
4	Wrist motion	+300°	-300°
5	Bend motion	+100°	-100°
6	Turn motion	+360° Default [i] +67 Rev. max.	-360° Default -67 Rev.[ii] max.[iii]

i Working range +220° to -220° for robots with LeanID, option 780-4.
ii Rev. = Revolutions
iii The default working range for axis 6 can be extended by changing parameter values in the software. Option 610-1 “Independent axis” can be used for resetting the revolution counter after the axis has been rotated (no need for “rewinding” the axis).

Working range axis 5 and axis 6 for LeanID, option 780-4

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



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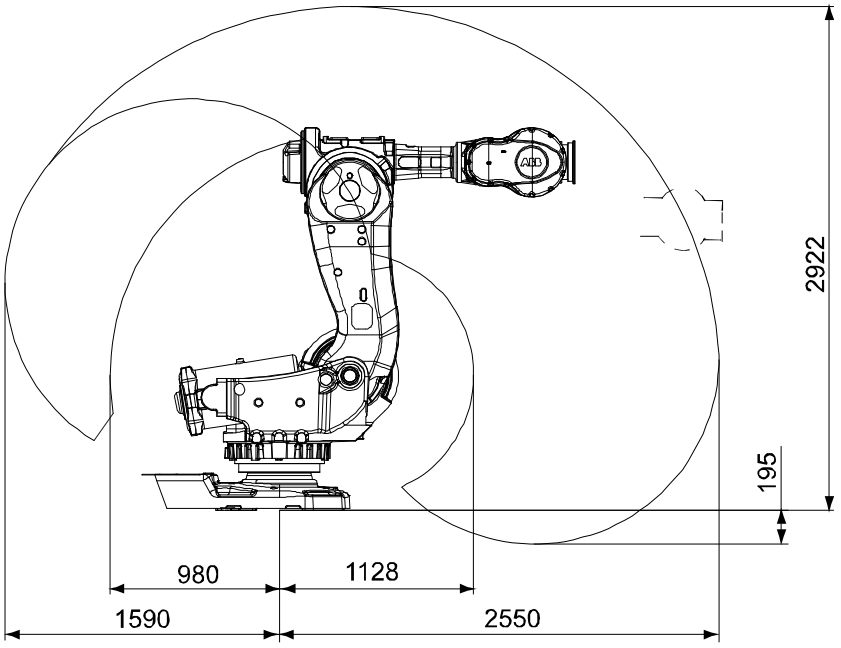
IRB 7600 - 400/2.55 and IRB 7600 - 500/2.55



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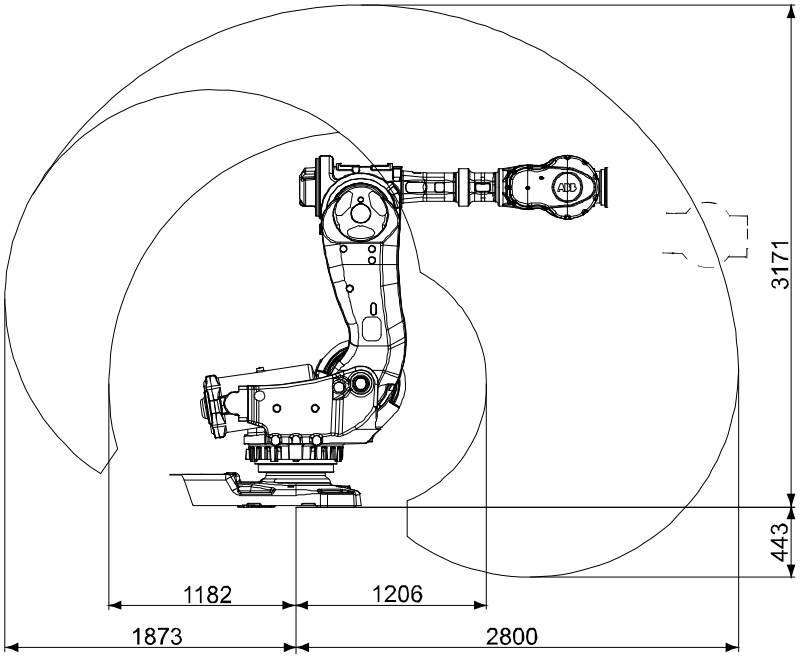
IRB 7600 - 340/2.8



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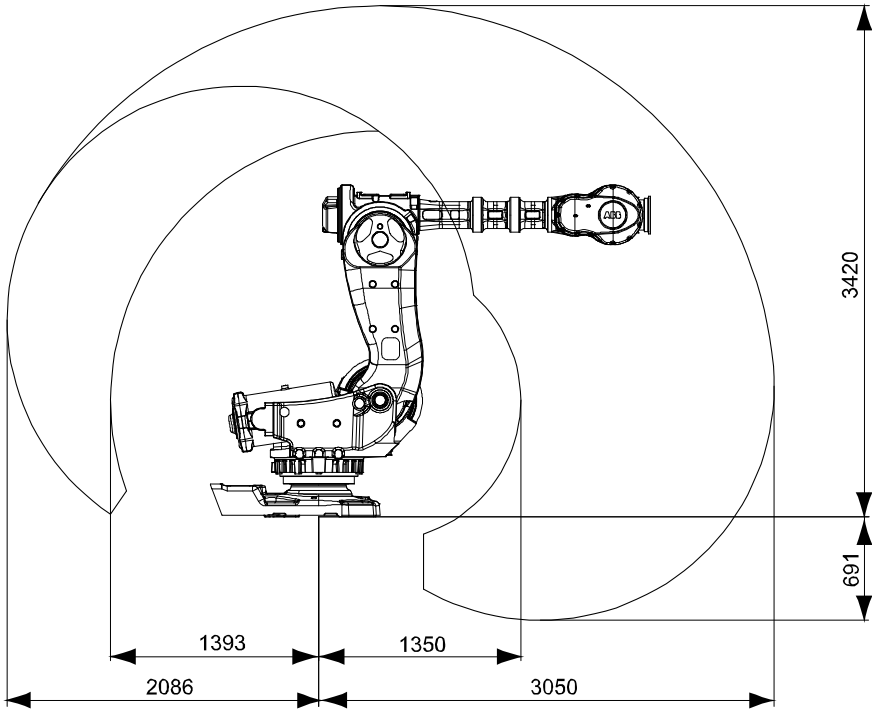
1.7.1 Introduction
Continued

IRB 7600 - 325/3.1



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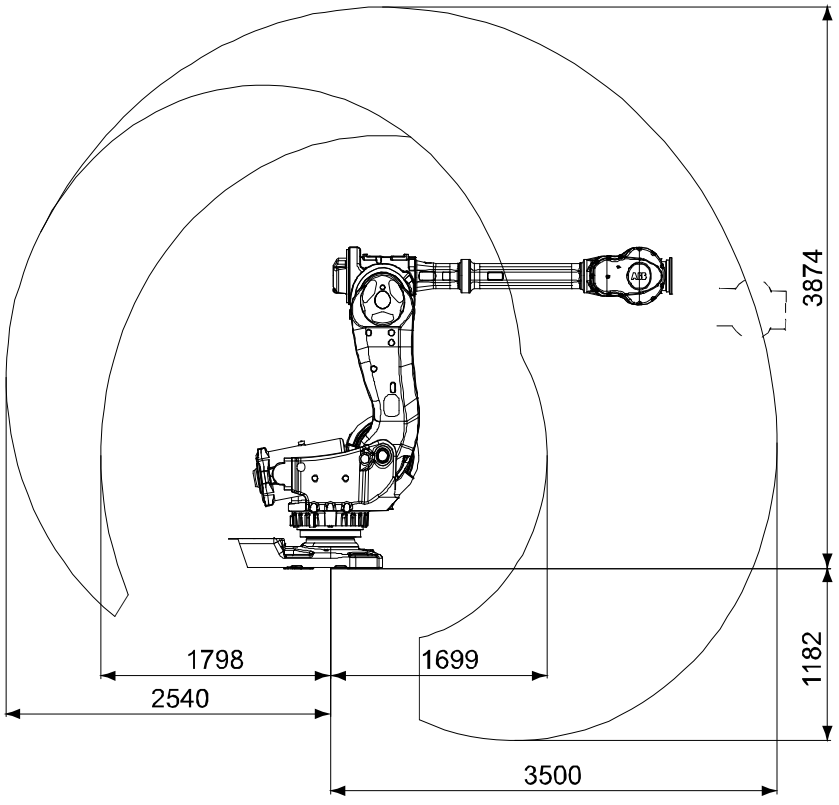
IRB 7600 - 150/3.5



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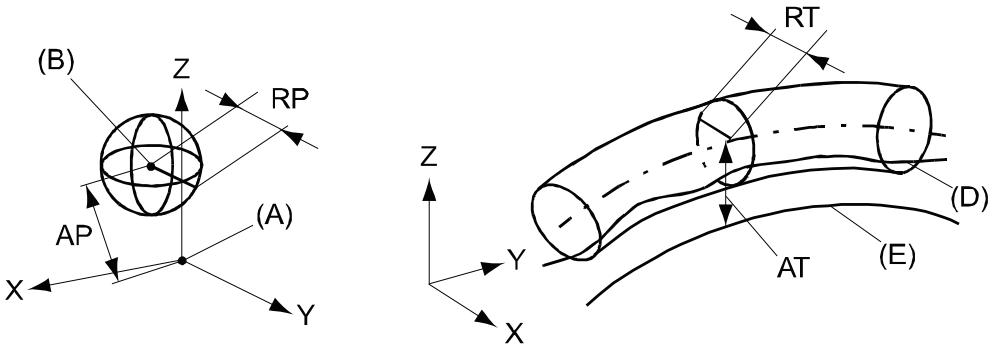
1.7.2 Performance according to ISO 9283

General

At rated maximum load, maximum offset and 1.6 m/s velocity on the inclined ISO test plane, with all six axes in motion. Values in the table below are the average result of measurements on a small number of robots. The result may differ depending on where in the working range the robot is positioning, velocity, arm configuration, from which direction the position is approached, the load direction of the arm system. Backlashes in gearboxes also affect the result.

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



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

IRB 7600	-500/2.55	-400/2.55	-340/2.8	-150/3.5	-325/3.1
Pose accuracy, AP (mm)	0.09	0.10	0.18	0.10	0.11
Pose repeatability, RP (mm)	0.08	0.19	0.27	0.19	0.10
Pose stabilization time, Pst (s) within 0.4 [i] (0.6 [ii]) mm of the position	0.30	0.38	0.18	0.55	0.24
Path accuracy, AT (mm)	3.43	2.95	2.05	1.21	1.36
Path repeatability,RT (mm)	0.30	1.27	0.23	0.40	0.59

[i] Valid for variant 400/2.55 and 500/2.55
[ii] Valid for variant 340/2.8, 150/3.5 and 325/3.1

The above values are the range of average test results from a number of robots.

1.7.3 Velocity

General

Maximum axis speeds.

IRB 7600 Axis No.	- 500/2.55 (°/s)	- 400/2.55 (°/s)	- 340/2.8 (°/s)	- 150/3.5 (°/s)	- 325/3.1 (°/s)
1	75	75	75	100	75
2	50	60	60	60	50
3	55	60	60	60	55
4	100	100	100	100	100
5	100	100	100	100	100
6	160	160	160	190	160

There is a supervision function to prevent overheating in applications with intensive and frequent movements.

1.7.4 Robot stopping distances and times

Introduction

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

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2 DressPack

2.1 General

2.1.1 Introduction

DressPack

Includes options for Upper arm, Lower arm and Floor pos C, D and E, see Figure below. These are described separately below but are designed as a complete package for various applications.

The DressPack for the floor contains customer signals.

The DressPack for upper and lower arm contains process cable packages including signals, process media (water and/or air) and power feeding (for Spot Welding power) for customer use.

Necessary supports and brackets are also included.

The routing of the process cable package on the robot is available in different configurations.

For the upper arm there are also internal routing alternative for some of the manipulator variants and Material Handling option.

Spot welding

The package supplies the transformer gun/gripper with necessary media, such as compressed air, electrical power and software.

Note

Note that some figures within Chapter 2 show the IRB 6600 instead of the IRB 7600. This is valid where principles and dimensions are equal between IRB 6600 and IRB 7600.

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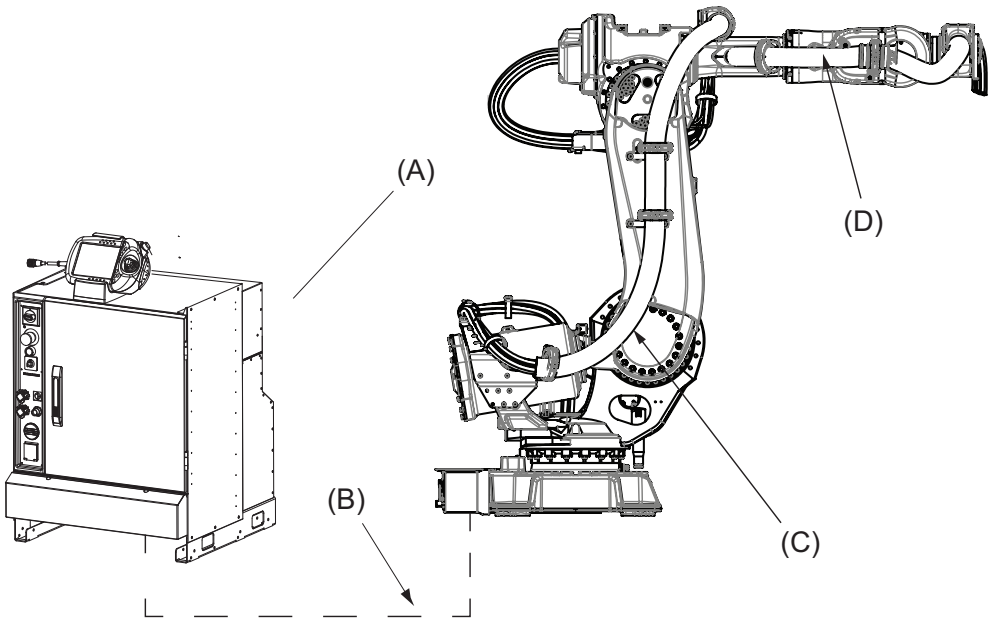
2.1.1 Introduction
Continued



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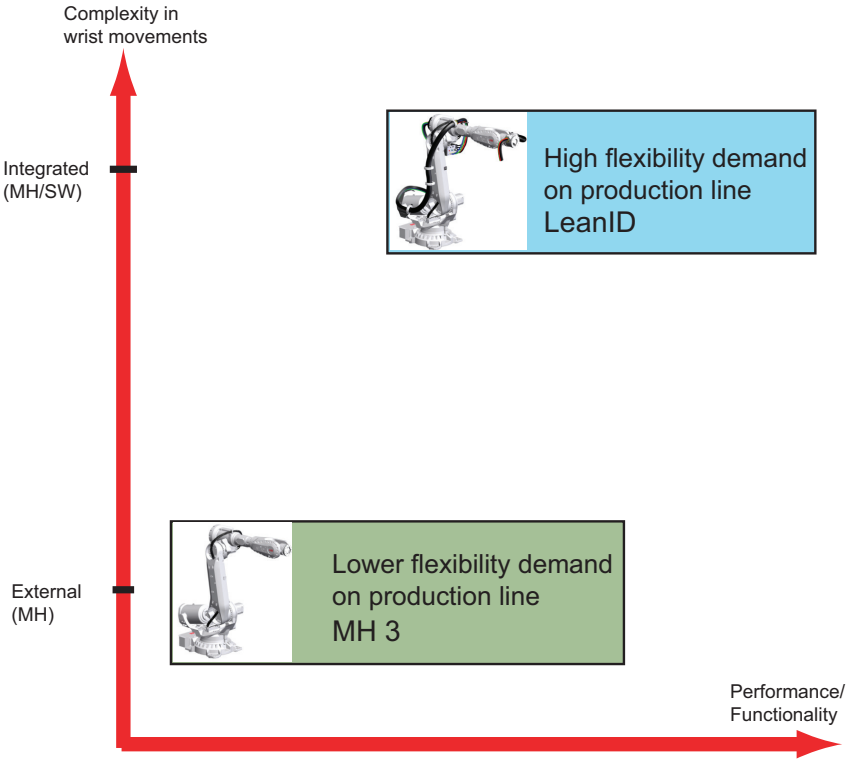
Pos	Description
A	Robot controller, (including 7th axis drive for servo gun)
B	DressPack, Floor
C	DressPack, Lower arm
D	DressPack, Upper arm

2.1.2 Product range

DressPack solutions for different user's needs

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

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



Integrated

This type of dress pack is intended for a production where there are many complex wrist movements and the need for flexibility in changing products is high.

Available options are 3325-x and 3326-x for material handling/spot welding, the LeanID concept.

External

This type of dress pack is recommended where there are less complexity in wrist movements. This normally occurs when there are not many different products running in the production cell. This package requires more individual adjustment to optimize towards robot program at set up.

Available options are 3325-11/12/13/14 and 3326-11/12/13/14 for material handling.

2.1.3 Limitations of robot movements

General

When using DressPack options on the upper arm the robot movements will be limited. The position of bracket installed on axis 6 must be taken in consideration when optimizing the possible robot movements.

- The axis 5 working range is limited to +/- 110 degrees due to the axis 6 bracket attachment (when applicable).
- In bending backwards positions there are limitations due to inteference with manipulator or Water and Air unit (if such is mounted).

Restrictions for LeanID

Limitation for axis 6 depends on how the dress pack is assembled at the tool and how adjustment has been done.

Axis	Working range
Axis 6	220° to -220°

2.1.4 Impact on DressPack lifetime

General

There are some robot movements/positions that shall be avoided in the robot production program. This to improve the lifetime significantly of external upper arm DressPack and wear parts, for example, protection hose, hose reinforcement, and protective sleeves.

- The axis 5 movement is not allowed to press the DressPack against the robot upper arm.
- Combined rotation of the wrist axes must be limited so that the DressPack is not wrapped hard against the upper arm.

See the product manual for more detailed information and recommended adjustments.

2.2 DressPack

2.2.1 Introduction

Available DressPack configurations for Material Handling

The table below shows the different DressPack configurations available for Material Handling.

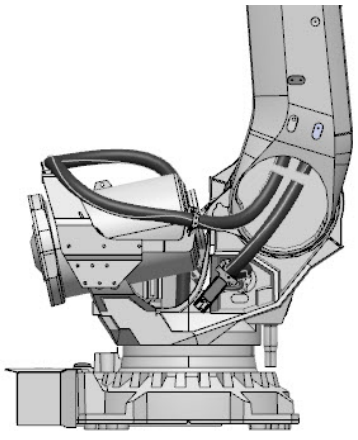
	Lower arm	Upper arm
Material Handling	Option 3325-51/52/53/54, Base to axis 3 Internal routing in lower arm	Option 3326-11/12/13/14, Axis 3 to axis 6 External routing
		Option 3326-31/32/33/34, Axis 3 to axis 6 (LID) Internal routing

Available DressPack configurations for Spot Welding

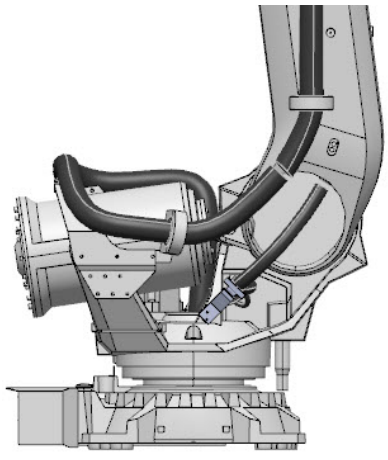
The table below shows the different DressPack configurations available for Spot Welding.

	Lower arm	Upper arm
Spot Welding	Option 3325-51/52/53/54/61/62/63/64 Base to axis 3	Option 3326-51/52/53/54/61/62/63/64 Int. Axis 3 to 6 (LeanID) Internal routing

Lower arm



Internal routing in lower arm
Option 3325-11/12/13, Base to axis 3



External routing
Option 3325-11/12/13, Base to axis 3

2.2.2 Built-in features for upper arm DressPack

External

Material handling (option 3326/11/12/13/14, Axis 3 to axis 6)

- Internal routing through the rear part of the upper arm.
- Protection hose can easily be replaced if damaged.
- One version for all IRB 7600 variants.
- Adjustment for optimal hose/cable lengths.
- Easy exchange of DressPack

Internal

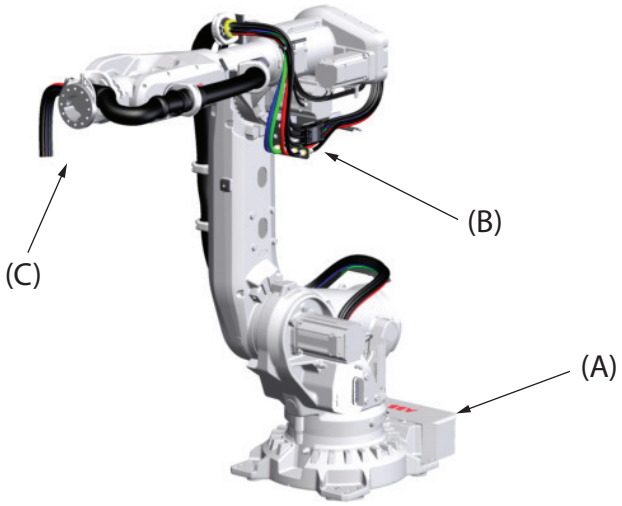
Material handling (option 3326-31/32/33/34, Axis 3 to axis 6 (LID)), or spot welding (option 3326-51/52/53/54/61/62/63/64, Axis 3 to axis 6 (LID))

- Partly internal routing through the upper arm.
- Suitable for complex movements.
- High demands for flexibility and accessibility.
- Longer life time
- Predictable movements
- Easy exchange of DressPack

2.2.3 Interface descriptions for DressPack

General

Below is an overview showing the different DressPack options connection points, and their locations. For detailed information see the circuit diagram, and product manual for the manipulator.



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Pos	Location	Description	Options
A	Base	FB7, CP/CS/CBUS/Ethernet	3325-11/12/13/14
B	Axis 3	CP/CS/CBUS/Ethernet	3325-11/12/13/14
C	Axis 6	CP/CS/CBUS/Ethernet, WELD	3326-11/12/13/14, 3326-31/32/33/34

Base

Material handling (option 3325-11/12), see figure below:

- Included are: A, one D (Proc 1).

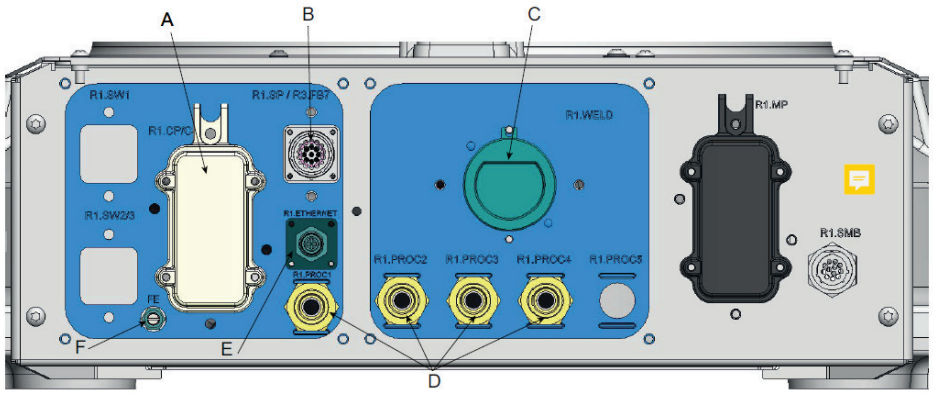
Material handling (option 3325-13/14), see figure below:

- Included are: A, E, F and one D.

Spot welding (option 3325-51/52/53/54/61/62/63/64), see figure below:

- Included are: A, B (if applicable), C, D (Proc 1-4) and E, F (if applicable).

Continues on next page



xx1900001501

For corresponding parts of the tool, see *Connector kits on page 77*.

Pos	Description
A	R1.CP/CS
B	R1.SP (spot welding servo gun) or FB7 (resolver connection)
C	R1.WELD 3x35mm^2 (spot welding)
D	R1.PROC 1 (material handling/spot welding 1/2", M22x1.5, 24 degree seal) R1.PROC 2 - 4 (spot welding 1/2", M22x1.5, 24 degree seal)
E	R1.ETHERNET (M12 connector, when EtherNet communication is selected)
F	FE (functional earth, when EtherNet communication is selected)

Axis 3

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

- Included are: A and one C (Proc 1).

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

- Included are: A, G and one C (Proc 1).

Material handling (option 3325-13/14), see figure below:

- Included are: A, G, B, H and one C (Proc 1).

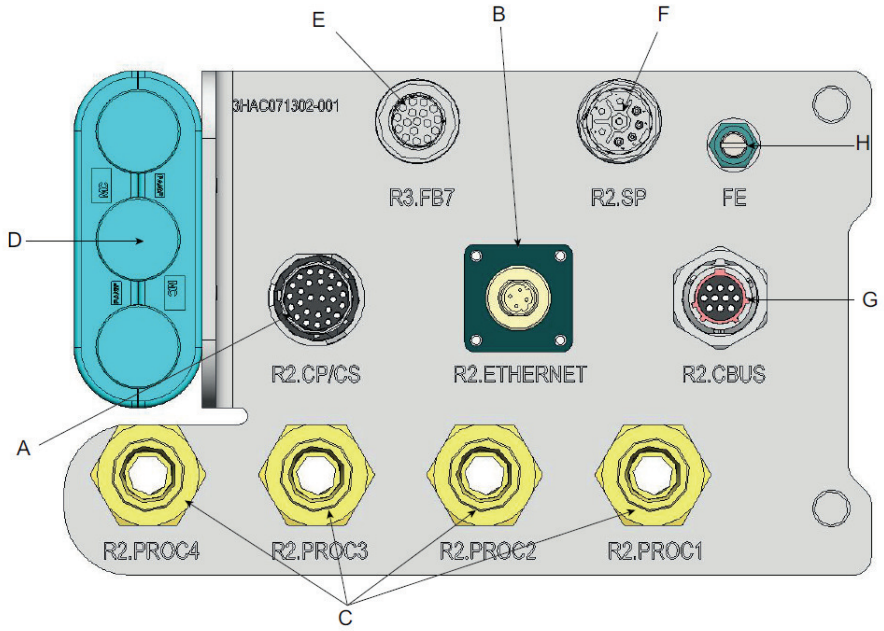
Spot welding (option 3325-51/52/53/54/61/62/63/64), see figure below:

- Included are: A, D, B/E/F/G/H (if applicable) and C (Proc 1-4).

Continues on next page

2.2.3 Interface descriptions for DressPack

Continued



xx1900001511

For corresponding parts of the tool, see *Connector kits on page 77*.

Pos	Description
A	R2.CP/CS
B	R2.ETHERNET (M12 connector, when EtherNet communication is selected)
C	R2.PROC 1 (material handling 1/2", M22x1.5, 24 degree seal) R2.PROC 2-4 (spot welding 1/2", M22x1.5, 24 degree seal)
D	R2.WELD 3x35mm^2 (spot welding)
E	R2.FB7
F	R2.SP (spot welding servo gun)
G	R2.CBUS (UTOW connector when DeviceNet communication is selected)
H	FE (functional earth, when EtherNet communication is selected)

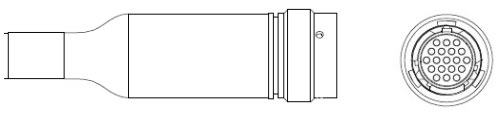
Axis 6

External

Material handling (option 3326-11/12/13/14), see figure below:

- Hose and cable free length, min. 1,000 mm
- Air hose ends with free end.

The cable ends with a connector, the main parts are described in the list below (for corresponding parts of the tool, see *Connector kits on page 77*):



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Material handling connector

Material handling (option 3326-11/12/13/14), see figure below:

- Cable free length, min. 1,000 mm
- Signals are connected with an M12 connector.

The connectors are the same as for option 3326-31/32/33/34/54. The difference is the free length of the cables.

Name	Harting article
PIN connector, R3.ETHERNET	21 03 881 1405
PIN	61 03 000 0094

xx1100000956

Material handling connector (LeanID)

Material handling option 3326-31/32/33/34/54 (LeanID), see figure below:

- Hose and cable free length, min. 1,160 mm
- Hoses with free end.

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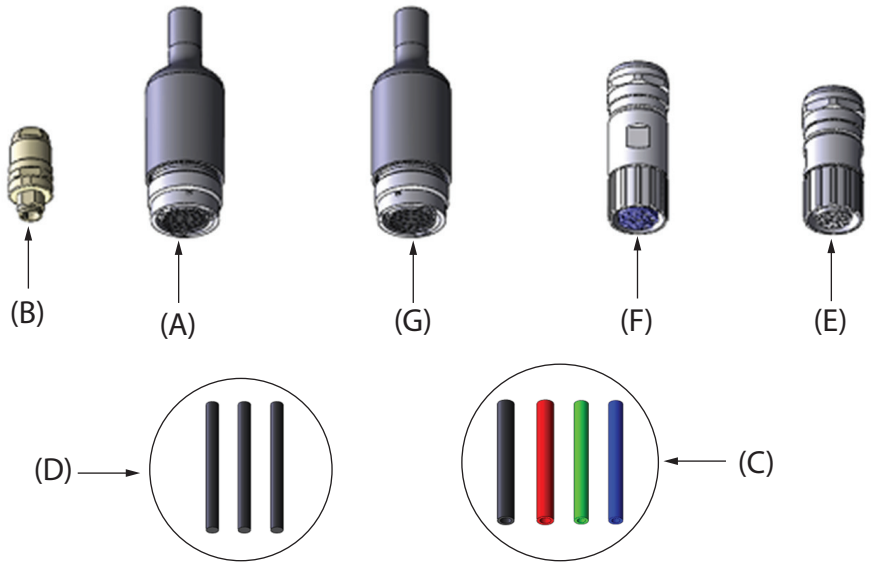
2.2.3 Interface descriptions for DressPack
Continued

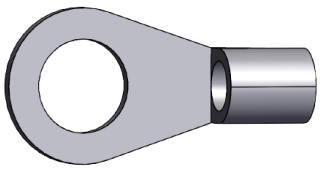
The cable ends with connectors, for corresponding parts of the tool, see *Connector kits on page 77* and within the UTOW product offer.



xx1200000117

Pos	Description
A	R3.CP/CS (UTOW connector 26p) Customer signals and power
B	R3.ETHERNET (M12 connector) EtherNet signals (when EtherNet communication is selected)
C	R3.PROC 1-2 (1/2", free end) R3.PROC 2-4 (3/8", free end) Media hoses
D	R3.WELD 3x25mm^2 (free end) Spot Welding power
E	R3.FB7 (M23 connector 17p) Servo motor feedback (when Spot Welding Servo gun is selected)
F	R3.SP (M23 connector 8p) Servo motor power (when Spot Welding Servo gun is selected)
G	R3.CBUS (UTOW connector 10p) BUS signals (when DeviceNet communication is selected)

- FE (M8 cable lug), when Ethernet option 3326-13/33/34/54 is selected



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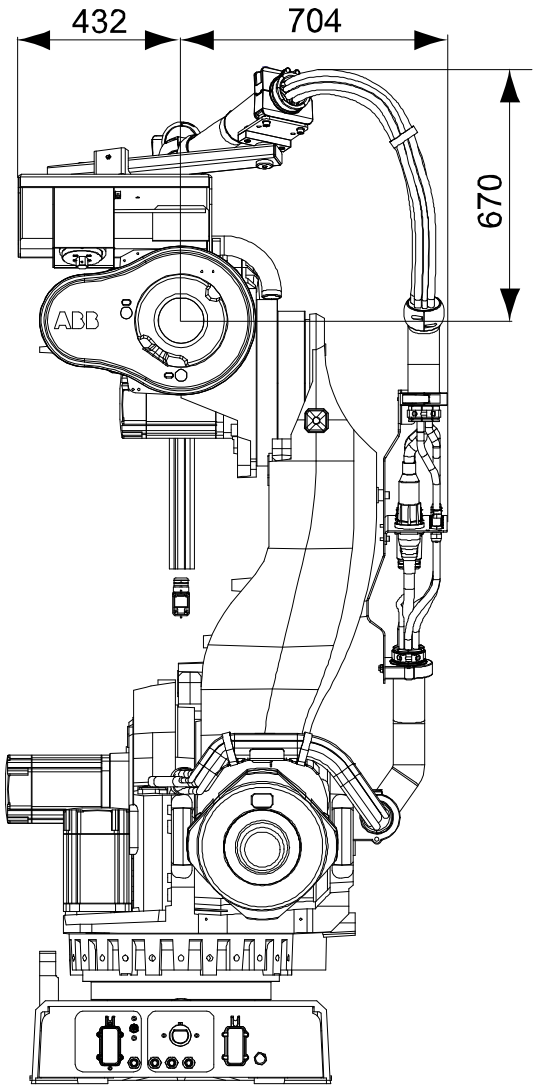
2.2.4 Dimensions

General

Dimensions are shown in Figures below.

All routing alternatives are shown in the Spot Welding version.



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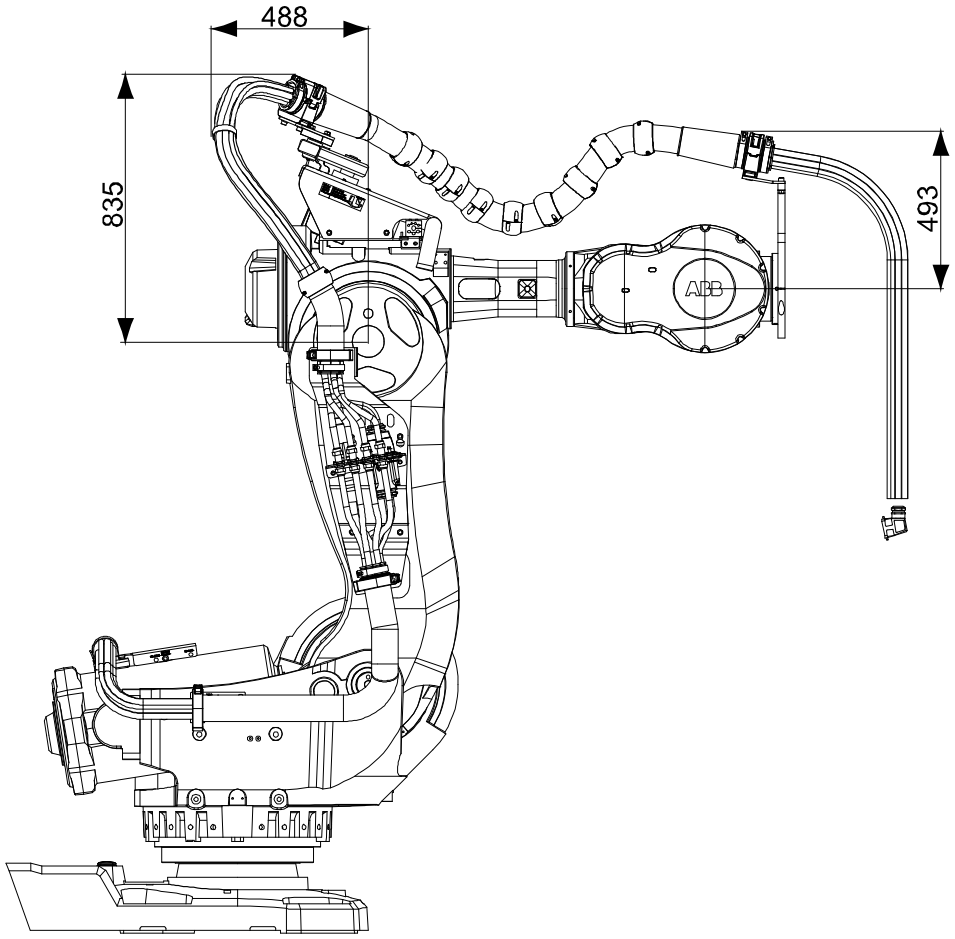
2.2.4 Dimensions
Continued



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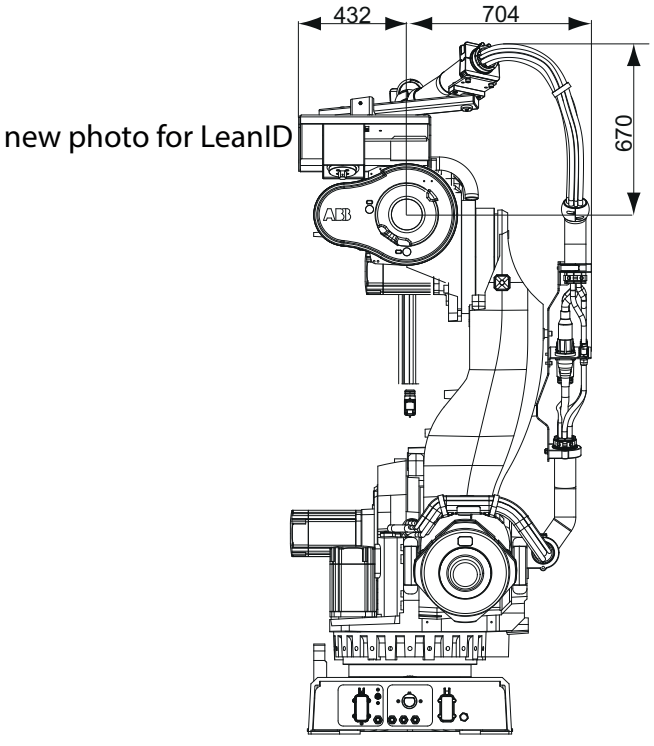

new photo for LeanID

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2.3 Connector kits

General

The connector kits are described in section *Connector kits manipulator on page 86*.

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3 Specification of variants and options

3.1 Introduction to variants and options

General

The different variants and options for the IRB 7600 are described in the following sections. The same option numbers are used here as in the specification form.

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

3.2 Manipulator

Manipulator variant

Option	Robot variant	Handling capacity (kg)	Reach (m)
3300-89	7600-400/2.55	400	2.55
3300-90	7600-390/2.55 LID	390	2.55
3300-91	7600-340/2.8	340	2.8
3300-92	7600-320/2.8 LID	320	2.8
3300-93	7600-150/3.5	150	3.5
3300-94	7600-500/2.55	500	2.55
3300-95	7600-325/3.1	325	3.1
3300-96	7600-290/3.1 LID	290	3.1

Manipulator color

Option	Color	RAL code[i]
209-1	ABB orange standard	NCS 2070-Y60R
209-202	ABB Graphite White std Standard color	RAL 7035
209	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.

Note

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

Manipulator protection

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

Requirements

The option *Foundry Plus2 67* [3352-10] requires option *Upper arm cover* [3316-1].

Note

It is strongly recommended, if Foundry Plus robots in another color than ABB orange is required, that only colors in a yellow nuance are selected, if not the robot can look discolored after a while in the foundry environment. The protection is still preserved in any color.

Note

Base 67 includes IP67, according to standard IEC 60529.

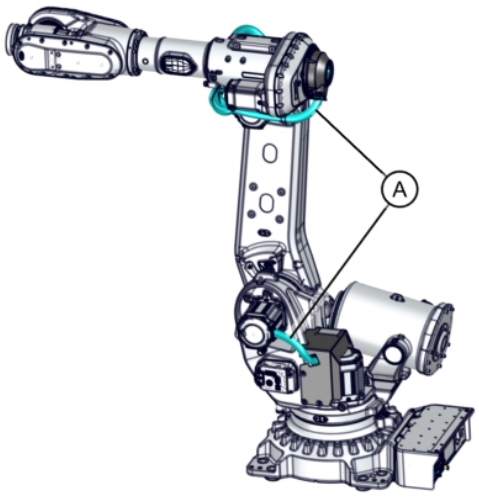
Continues on next page

Foundry cable guard

Option	Description
3315-1	Foundry cable guard

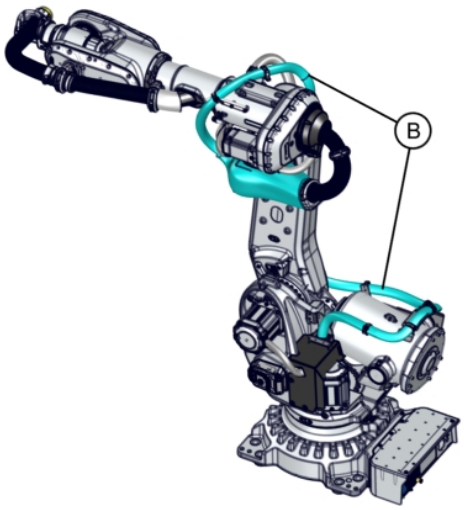
The manipulator can be equipped with additional cable guards for extra tough environmental conditions, for example, metals spits or frequent weld spatter. These additional covers will prolong cable lifetime and simplify service/maintenance as the robot is kept more clean under the covers.

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



xx2300001724

Schematic illustration



xx2300001725

Schematic illustration

A	Foundry cable guard for manipulator cable harness
B	Foundry cable guard for DressPack

Requirements

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

Upper arm cover

Option	Description
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

Continues on next page

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.

xx2100002592

Requirements

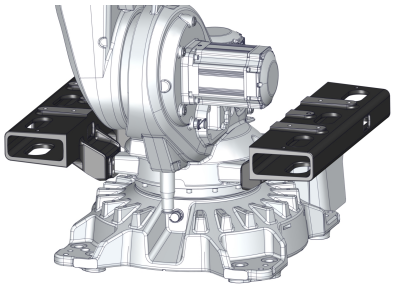
This option is mandatory to order with the option *Foundry Plus2 [3352-10]*.

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	
3318-2	Forklift device on frame Fork lift pockets placed on the frame gives a more balanced lifting point. This can be used together with special tool to invert a robot.	 xx2300001243

Resolver connection 7th axis

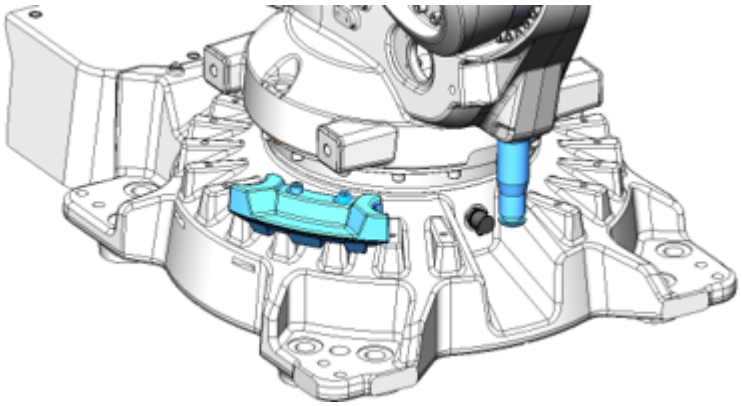
Option	Description
3322-1	On base
3322-2	In servo DressPack Requires options for DressPack base-axis 3.

Continues on next page

Limited working range

Option	Description
3323-1	Axis 1 adjustable 15°
3323-3	Axis 1 adjustable 7.5°

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.



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Extended working range

Option	Description	
3324-1	Axis 1 to ±220°	The option extends the working range on axis 1 from ±170° to ±220°.

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.

Requirements

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

3.3 Floor cables

Manipulator cable length

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

3.4 Application manipulator

DressPack base-axis 3

Option	Description	Additional information
3325-11	MH Parallel	
3325-12	MH DeviceNet	Includes parallel signals
3325-13	MH EtherNet	Includes parallel signals. Supports ProfiNet, EtherNetIP
3325-14	MH CC-Link	Includes parallel signals
3325-51	SW Parallel	
3325-52	SW DeviceNet	Includes parallel signals
3325-53	SW EtherNet	Includes parallel signals. Supports ProfiNet, EtherNetIP
3325-54	SW CC-Link	Includes parallel signals
3325-61	SW Parallel-Servo	
3325-62	SW DeviceNet-Servo	Includes parallel signals
3325-63	SW EtherNet-Servo	Includes parallel signals. Supports ProfiNet, EtherNetIP
3325-64	SW CC-Link-Servo	Includes parallel signals

DressPack axis 3-6

Option	Description	Additional information
3326-11	MH3 Parallel	
3326-12	MH3 DeviceNet	Includes parallel signals
3326-13	MH3 EtherNet	Includes parallel signals. Supports ProfiNet, EtherNetIP
3326-14	MH3 CC-Link	Includes parallel signals
3326-31	MH LID Parallel	
3326-32	MH LID DeviceNet	Includes parallel signals
3326-33	MH LID EtherNet	Includes parallel signals. Supports ProfiNet, EtherNetIP
3326-34	MH LID CC-Link	Includes parallel signals
3326-51	SW LID Parallel	
3326-52	SW LID DeviceNet	Includes parallel signals
3326-53	SW LID EtherNet	Includes parallel signals. Supports ProfiNet, EtherNetIP
3326-54	SW LID CC-Link	Includes parallel signals
3326-61	SW LID Parallel-Servo	
3326-62	SW LID DeviceNet-Servo	Includes parallel signals
3326-63	SW LID EtherNet-Servo	Includes parallel signals. Supports ProfiNet, EtherNetIP
3326-64	SW LID CC-Link-Servo	Includes parallel signals

3.5 Connector kits manipulator

General

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

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Continues on next page

3.5.1 Base - Connector kits

Available options

		DressPack options		
Option	Name	3325-11/12/13	3325-51/-52/-3	3325-61/-62/-63
3330-2	CP/CS, Proc 1 base	X	X	
3331-1	Weld Proc 2-4 base		X	X
3332-1	FB7 on base			

Note

Servo power connection kits are not available.

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

R1. CP/CS and Proc 1 on base

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

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

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

Option Weld Proc 2-4 base - 3331-1

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

WELD

Amount	Description	Size, material, etc.	Brand
1	Welding connector socket	TSB150/L-UR	Stäubli
3	Socket	For 35 mm^2	

Continues on next page

3.5.1 Base - Connector kits
Continued

Amount	Description	Size, material, etc.	Brand
1	Form shroud welding conn.	202K174-3/42-0, for cable diameter 15.7-35 mm	Raychem

Media

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

Option FB7 on base - 3332-1

R3. FB 7 on base

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

- Connector with:

1 pcs Multiple connector (pin)	UTOW
1 pcs Adapter	8 pin
8 pcs Pin	For 0.13 - 0.25 mm^2
Assembly Accessories to complete connector	
Assembly instruction	

3.5.2 Axis 3 - Connector kits

Available options

		DressPack options	Description
Option	Name	3325-11/12/13	
3333-2	CP/CS bus, Proc 1 axis 3	X	UTOW
3334-3	CP/CS Proc1, Servo & FB		

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

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

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

This must be assembled by the customer.

The kit contains:

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

CP/CS	
1 pcs UTOW Pin connector 26p, bayonet	UTOW61626PH, Shell size 16
26 pcs Pin	RM18W3K, 0.5-0.82 mm^2
CBUS	
1 pcs UTOW Pin connector 10p, bayonet	UTOW61210PH, Shell size 12
10 pcs Pin	RM18W3K, 0.5-0.82 mm^2
Ethernet	
1 pcs Pin connector M12	Harting 21 03 881 1405
4 pcs Pin	Harting 09670005576, 0.13-0.33 mm^2

Option CP/CS Proc1, Servo & FB - 3334-3

SP (Servo Power)	
1 pc Straight connector M23 8p	
4 pcs Crimp pin 1 mm	AWG 24-17
4 pcs Crimp pin 2 mm	AWG 18-14
SS (Servo Signal)	
1 pcs Straight connector M23 17p	
17 pcs Pin	AWG 28-20
Assembly Accessories to complete connector	
Assembly instruction	

3.5.3 Axis 6 - Connector kits

Available options

		DressPack options	DressPack options	Description
Option	Name	3326-11/12/13	3326-30/31/32/33	
3334-2	CP/CS bus axis 6	X	X	UTOW
3334-3	CP/CS Proc1, Servo & FB			
3335-1	Weld Proc 2-4 axis 6			

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

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

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

This must be assembled by the customer.

The kit contains:

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

CP/CS	
1 pcs UTOW Pin connector 26p, bulkhead	UTOW71626PH05, Shell size 16
26 pcs Pin	RM18W3K, 0.5-0.82 mm^2
CBUS	
1 pcs UTOW Pin connector 10p, bulkhead	UTOW71210PH05, Shell size 12
10 pcs Pin	RM18W3K, 0.5-0.82 mm^2
Ethernet	
1 pcs Socket connector M12	Harting 21 03 881 2425
4 pcs Socket	Harting 09670005476, 0.13-0.33 mm^2

Option CP/CS Proc1, Servo & FB - 3334-3

SP (Servo Power)	
1 pcs Bulkhead contact M23	
4 pcs Crimp pin 1 mm	AWG 24-17
4 pcs Crimp pin 2 mm	AWG 18-14
SS (Servo Signal)	
1 pcs Bulkhead contact M23	
17 pcs Pin	AWG 28-20
Assembly Accessories to complete connector	
Assembly instruction	

Continues on next page

Option Weld Proc 2-4 axis 6 - 3335-1

Weld and Proc 2-4 axis 6 on manipulator side for option 3335-1

The process cable package from axis 6 ends with free end for media and for weld power cable. The option offers a kit for connectors. This must be assembled by the customer when hoses and power cable has been cut to required length.

The kit contains:

- 4 Hose fittings (Swivel Nut adapter, (2 x ½", M22x1.5) and (2x 3/8", M16x1.5))
- 1 Multi contact connector (Female) type including:
-

1 pc Welding connector	3x25 mm^2
1 pc Cable gland	Diameter 24-28 mm
1 pc End housing	0.21-0.93 mm^2
1 pcs Reducing coupling	PG36/PG29
Assembly Accessories to complete connector	
Assembly instruction	

3.6 Application floor cables

Parallel cable - Length

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

DeviceNet cable - Length

Option	Description	Note
3204-2	7 m	Includes Parallel cable
3204-3	15 m	Includes Parallel cable
3204-5	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
3205-5	30 m	Includes Parallel cable

Servo cable 1 axis - Length

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

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

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Warranty for DressPack

Note

Option 3326-11/13 upper arm DressPack MH3 is not covered by the warranty.

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