

ROBOTICS

# Product specification

## IRB 6700



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## Product specification

IRB 6700-235/2.65  
IRB 6700-220/2.65 LID  
IRB 6700-205/2.80  
IRB 6700-200/2.80 LID  
IRB 6700-175/3.05  
IRB 6700-155/3.05 LID  
IRB 6700-150/3.20  
IRB 6700-145/3.20 LID  
IRB 6700-200/2.60  
IRB 6700-175/2.60 LID  
IRB 6700-155/2.85  
IRB 6700-140/2.85 LID  
IRB 6700-300/2.70  
IRB 6700-270/2.70 LID  
IRB 6700-245/3.00  
IRB 6700-220/3.00 LID  
IRB 6700I-300/2.60  
IRB 6700I-270/2.60 LID  
IRB 6700I-245/2.90  
IRB 6700I-210/2.90 LID

OmniCore

Document ID: 3HAC080365-001

Revision: F

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# Overview of this product specification

## About this product specification

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

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

The specification covers the manipulator using the OmniCore controller.

## Usage

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

The specification is intended for:

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

## References

Reference	Document ID
<i>Product specification - OmniCore V line</i>	3HAC074671-001
<i>Product manual - IRB 6700</i>	3HAC044266-001
<i>Product manual - IRB 6700Inv / IRB 6700I</i>	3HAC058254-001

## Revisions

Revision	Description
A	First edition.
B	Published in release 22A. The following updates are done in this revision: <ul style="list-style-type: none"> <li>• Updated the DressPack section, especially in connector kits chapter.</li> </ul>
C	Published in release 23B. The following updates are done in this revision: <ul style="list-style-type: none"> <li>• Added RAL code in manipulator color introduction.</li> <li>• Added DressPack options for spotwelding.</li> </ul>
D	Published in release 23C. The following updates are done in this revision: <ul style="list-style-type: none"> <li>• Added more data for DressPack options.</li> <li>• Corrections done in the DressPack connector kits, see <a href="#">Connector kits on page 130</a>.</li> <li>• Updated information regarding pose stabilization time.</li> </ul>
E	Published in release 23D. The following updates are made in this revision: <ul style="list-style-type: none"> <li>• Added support for OmniCore V400XT.</li> <li>• Corrections done in the DressPack connector kits, see <a href="#">Connector kits on page 130</a>.</li> </ul>

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## Overview of this product specification

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*Continued*

Revision	Description
F	Published in release 24A. The following updates are done in this revision: <ul style="list-style-type: none"><li data-bbox="655 338 1123 374">• Added DressPack options for CC-Link.</li></ul>



# 1 Description

## 1.1 Structure

### 1.1.1 Introduction

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#### General

The IRB 6700 series is ABB Robotics 7th generation of high payload, high performance industrial robots. Based on the famous IRB 6640 series, with large working range, the very high wrist torque, the service friendly modular built up and the availability, significant for ABB's robots, the IRB 6700 robot family goes even further. With focus on high production capacity, compact design and low weight, simple service and low maintenance cost. The IRB 6700 is ideal for process applications, regardless of industry.

Typical areas are for example Material Handling, Machine Tending, Spot Welding.

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#### 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.

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#### Options

There are a large number of options for material handling and spot welding integrated in the robot. For a complete description of Material handling see [DressPack on page 105](#).

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#### 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*.

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#### Safety

Safety standards valid for complete robot, manipulator and controller.

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#### 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*.

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#### 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.

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*Continues on next page*

# 1 Description

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## 1.1.1 Introduction

*Continued*

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 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.

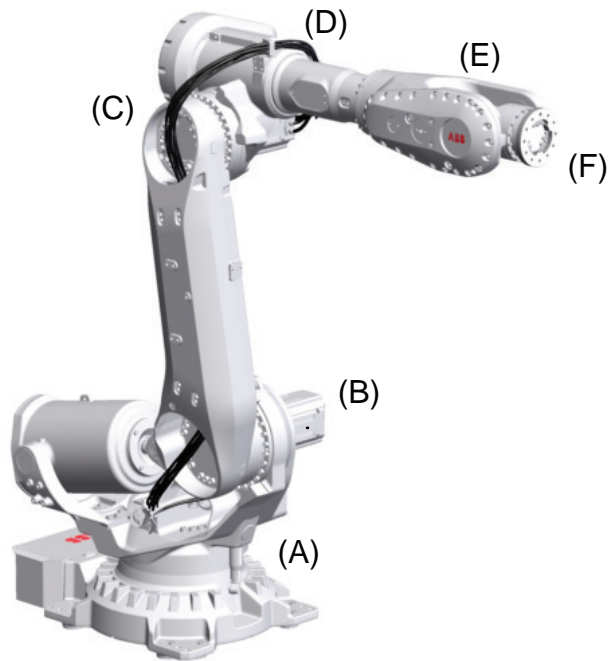
Available robot variants

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

See [Specification of variants and options on page 131](#) for robot versions and other options not selectable together with Foundry Plus 2.

*Continues on next page*

### Robot axes



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

# 1 Description

## 1.1.2 Different robot variants

### 1.1.2 Different robot variants

#### Robot variants

The following standard robot variants are available.

Robot variants	Handling capacity (kg)	Reach (m)
6700-300/2.70	300	2.70
6700-270/2.70 LID	270	2.70
6700-245/3.00	245	3.00
6700-220/3.00 LID	220	3.00
6700-235/2.65	235	2.65
6700-220/2.65 LID	220	2.65
6700-205/2.80	205	2.80
6700-200/2.80 LID	200	2.80
6700-200/2.60	200	2.60
6700-175/2.60 LID	175	2.60
6700-175/3.05	175	3.05
6700-155/3.05 LID	155	3.05
6700-155/2.85	155	2.85
6700-140/2.85 LID	140	2.85
6700-150/3.20	150	3.20
6700-145/3.20 LID	145	3.20
6700I-300/2.60	300	2.60
6700I-270/2.60 LID	270	2.60
6700I-245/2.90	245	2.90
6700I-210/2.90 LID	210	2.90



#### Note

If LeanID is selected, the payload will decrease as stated above, for detailed information see [Load diagrams on page 39](#)

## 1.1.3 Technical data

## Manipulator weight

Robot type	Weight [kg] <sup>i</sup>
IRB 6700 - 300/2.70	1,525
IRB 6700 - 270/2.70 LID	1,525
IRB 6700 - 245/3.00	1,540
IRB 6700 - 220/3.00 LID	1,540
IRB 6700 - 235/2.65	1,250
IRB 6700 - 220/2.65 LID	1,250
IRB 6700 - 205/2.80	1,260
IRB 6700 - 200/2.80 LID	1,260
IRB 6700 - 200/2.60	1,205
IRB 6700 - 175/2.60 LID	1,205
IRB 6700 - 175/3.05	1,270
IRB 6700 - 155/3.05 LID	1,270
IRB 6700 - 155/2.85	1,220
IRB 6700 - 140/2.85 LID	1,220
IRB 6700 - 150/3.20	1,280
IRB 6700 - 145/3.20 LID	1,280
IRB 6700I - 300/2.60	1,690
IRB 6700I - 270/2.60 LID	1,690
IRB 6700I - 245/2.90	1,705
IRB 6700I - 210/2.90 LID	1,705

<sup>i</sup> Weight without DressPack

## Other technical data

Data	Description	Note
Airborne noise level	The sound pressure level outside the working space.	< 71 dB (A) Leq (acc. to machinery directive 2006/42/EG)

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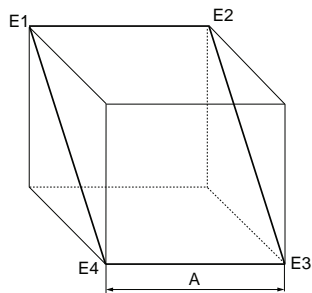
# 1 Description

## 1.1.3 Technical data

*Continued*

### Power consumption at max speed (vmax)

	235/2.65 205/2.80 200/2.60 175/3.05 155/2.85 150/3.20	300/2.70 245/3.00	I-300/2.60 I-300/2.60
ISO Cube Max. velocity (kW)	2.8	3.4	3.4
<b>Robot in calibration position</b>	235/2.65 205/2.80 200/2.60 175/3.05 155/2.85 150/3.20	300/2.70 245/3.00	I-300/2.60 I-300/2.60
Brakes engaged (kW)	0.24	0.24	0.24
Brakes disengaged (kW)	0.87	0.87	1.07



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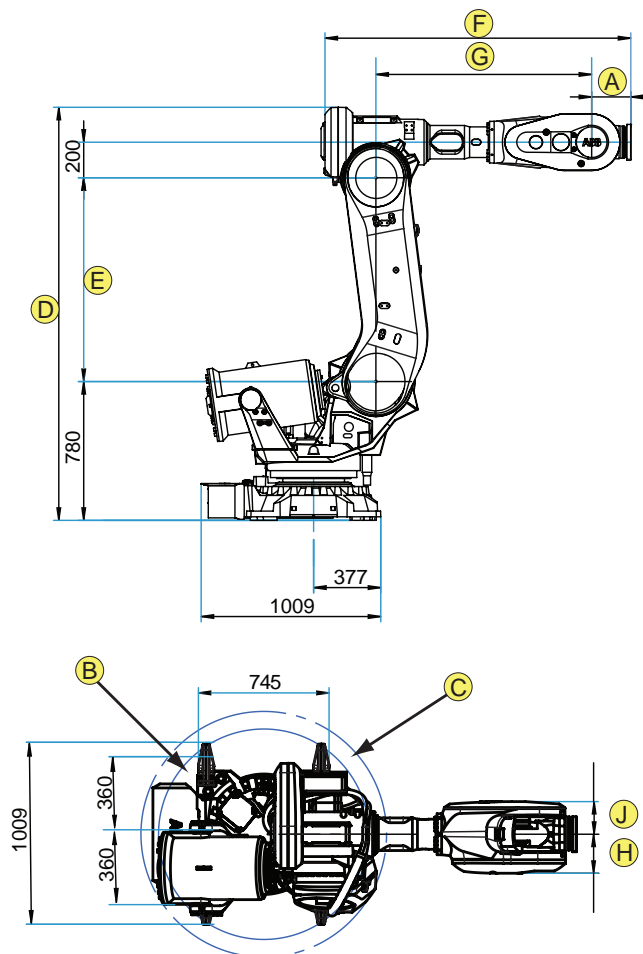
A	1,000 mm
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### Power factor (cos φ)

The power factor is above 0.95 at a steady state power consumption higher than 2.0 kW, when the IRB 6700 is connected to the OmniCore V line.

*Continues on next page*

### Main dimensions of IRB 6700



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Pos	Description
A	200 mm (all standard variants); except 300/2.70 and 245/3.00 = 220 mm 350 mm (all LeanID variants); except IRB 6700-270/2.70 LID and IRB 6700-220/3.00 LID = 380 mm
B	Radius ax1, front = 532 mm (IRB 6700-235/2.65, IRB 6700-220/2.65 LID, IRB 6700-205/2.80, IRB 6700-200/2.80 LID, IRB 6700-175/3.05, IRB 6700-155/3.05 LID, IRB 6700-150/3.20, IRB 6700-145/3.20 LID, IRB 6700-200/2.60, IRB 6700-200/2.60 LID, IRB 6700-155/2.85, IRB 6700-140/2.85 LID) Radius ax1, front = 600 mm (IRB 6700-300/2.70, IRB 6700-270/2.70 LID, IRB 6700-245/3.00, IRB 6700-220/3.00 LID)
C	Radius ax1, back = 633 mm (IRB 6700-235/2.65, IRB 6700-220/2.65 LID, IRB 6700-205/2.80, IRB 6700-200/2.80 LID, IRB 6700-175/3.05, IRB 6700-155/3.05 LID, IRB 6700-150/3.20, IRB 6700-145/3.20 LID, IRB 6700-200/2.60, IRB 6700-200/2.60 LID, IRB 6700-155/2.85, IRB 6700-140/2.85 LID) Radius ax1, back = 700 mm (IRB 6700-300/2.70, IRB 6700-270/2.70 LID, IRB 6700-245/3.00, IRB 6700-220/3.00 LID)

Robot variant	D	E	F	G	H	J
IRB 6700-235/2.65	2300	1135	1670	1,182.5	209	186
IRB 6700-205/2.80	2445	1280	1670	1,182.5	186	209

*Continues on next page*

# 1 Description

## 1.1.3 Technical data

*Continued*

Robot variant	D	E	F	G	H	J
IRB 6700-200/2.60	2276	1125	1623	1,142.5	197.5	193
IRB 6700-175/3.05	2300	1135	2080	1,592.5	209	186
IRB 6700-150/3.20	2445	1280	2080	1,592.5	209	186
IRB 6700-155/2.85	2276	1125	1873	1,392.5	197.5	193
IRB 6700-300/2.70	2321	1145	1,718.5	1,212.5	222.5	187
IRB 6700-245/3.00	2321	1145	1,968.5	1,462.5	222.5	186
IRB 6700-220/2.65 LID	2300	1135	-	1,182.5	209	186
IRB 6700-200/2.80 LID	2445	1280	-	1,182.5	186	209
IRB 6700-155/3.05 LID	2300	1135	-	1,592.5	209	186
IRB 6700-145/3.20 LID	2445	1280	-	1,592.5	209	186
IRB 6700-200/2.60 LID	2276	1125	-	1,142.5	197.5	193
IRB 6700-140/2.85 LID	2276	1125	-	1,392.5	197.5	193
IRB 6700-270/2.70 LID	2321	1145	-	1,212.5	222.5	187
IRB 6700-220/3.00 LID	2321	1145	-	1,462.5	222.5	186



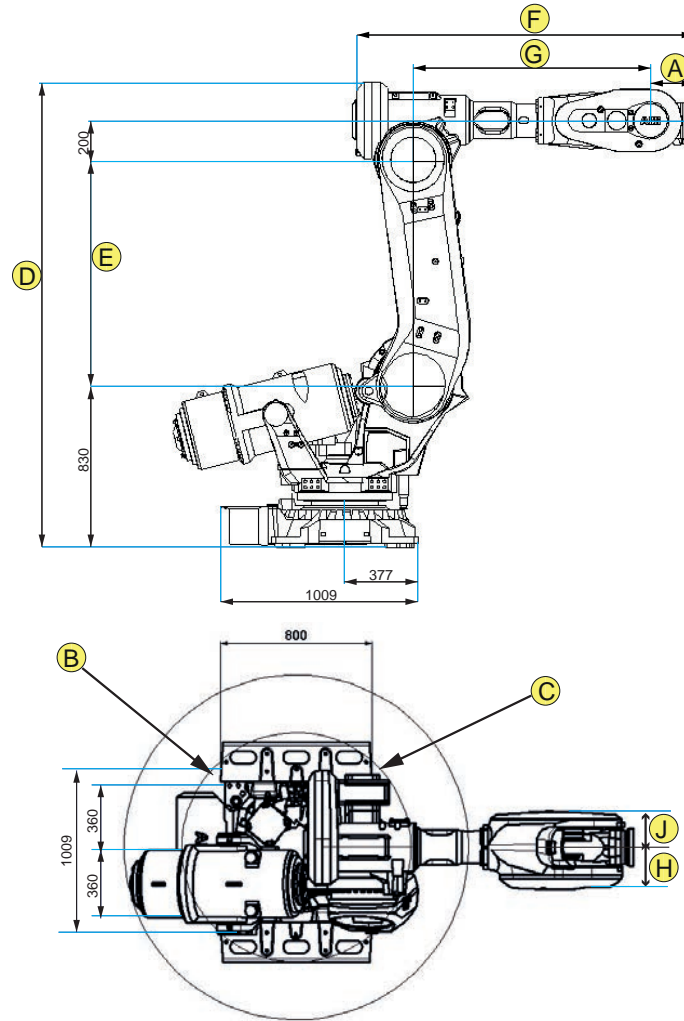
### Note

For DressPack dimensions, see [Dimensions for robot with DressPack on page 117](#)

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### Main dimensions of IRB 6700 inverted variants



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Pos	Description
A	220 mm (all IRB 6700Inv variants) 380 mm (all IRB 6700Inv LeanID variants)
B	Radius ax1, front = 626 mm
C	Radius ax1, back = 910 mm

Robot variant	D	E	F	G	H	J
IRB 6700I-300/2.60	2372	1145	1,718.5	1,212.5	222.5	187
IRB 6700I-245/2.90	2372	1145	1,968.5	1,468.5	222.5	186
IRB 6700I-210/2.90 LID	2372	1145	N/A	1,468.5	222.5	186
IRB 6700I-270/2.60 LID	2372	1145	N/A	1,212.5	222.5	187

# 1 Description

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## 1.2.1 Applicable standards

## 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.

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#### 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

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#### 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

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#### 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

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## 1.3 Installation

### 1.3.1 Introduction to installation

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#### General

IRB 6700 are designed for floor mounting (no tilting allowed around X-axis or Y-axis). The inverted variants are designed for inverted mounting (no tilting allowed around X-axis or Y-axis). Depending on the robot variant, an end effector with max. weight of 150 to 300 kg including payload, can be mounted on the tool flange (axis 6). See [Load diagrams on page 39](#).

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#### Extra loads

Extra load (valve packages, transformers, DressPack) of 50 kg, which is included in the load diagrams, can be mounted on the upper arm. An extra load of 250 kg can also be mounted on the frame of axis 1.

See [Fitting equipment to the robot on page 78](#).

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#### Working range limitation

The working range of axes 1 can be limited by mechanical stops as option. See [Limited working range on page 135](#).

# 1 Description

## 1.3.2 Operating requirements

### 1.3.2 Operating requirements

#### Protection standards

Robot variant/Protection standard	IEC 60529
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	Minimum: +5 °C <sup>i</sup> (41 °F) Maximum: +50 °C (122 °F)
For the controller	Standard/Option	See <i>Product specification - Omni-Core V line</i>
Complete robot during transportation and storage	Standard	Minimum: -25 °C (-13 °F) Maximum: +55 °C (+131 °F)
for short periods (not exceeding 24 hours)	Standard	+70 °C (+158 °F)

<sup>i</sup> At low environmental temperature (below 10 °C) a warm-up phase is recommended to be run with the robot. Otherwise there is a risk that the robot stops or runs with lower performance due to temperature dependent oil and grease viscosity.

#### Relative humidity

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

1.3.3 Assembling the manipulator

Maximum load

Maximum load in relation to the base coordinate system.

Floor mounted

Force	Endurance load (in operation)	Max. load (emergency stop)
Force xy	$\pm 7.4 \text{ kN}^i / \pm 8.7 \text{ kN}^{ii}$	$\pm 19.8 \text{ kN}^i / \pm 21.8 \text{ kN}^{ii}$
Force z	$14.6 \pm 4.5 \text{ kN}^i / 18.0 \pm 5.4 \text{ kN}^{ii}$	$14.6 \pm 15.7 \text{ kN}^i / 18.0 \pm 17.4 \text{ kN}^{ii}$
Torque xy	$\pm 21.0 \text{ kNm}^i / \pm 24.9 \text{ kNm}^{ii}$	$\pm 37.1 \text{ kNm}^i / \pm 45.3 \text{ kNm}^{ii}$
Torque z	$\pm 5.0 \text{ kNm}^i / \pm 6.5 \text{ kNm}^{ii}$	$\pm 11.4 \text{ kNm}^i / \pm 15.5 \text{ kNm}^{ii}$

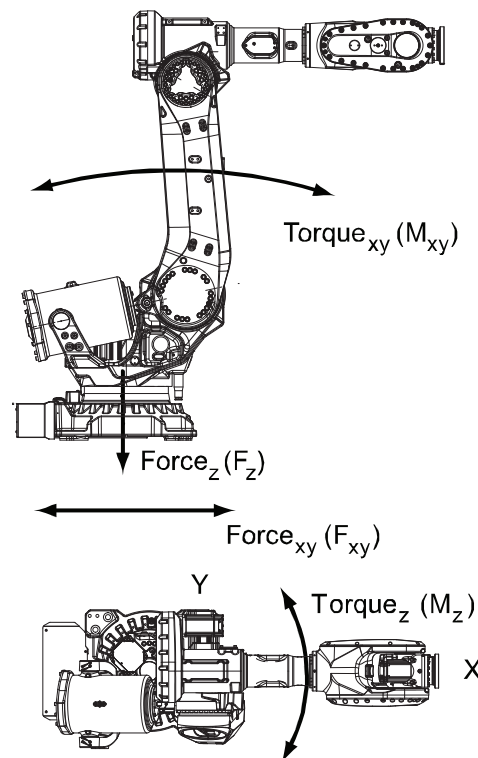
<sup>i</sup> Valid for IRB 6700-200/2.60, IRB 6700-200/2.60 LID, IRB 6700-155/2.85, IRB 6700-140/2.85 LID, IRB 6700-235/2.65, IRB 6700-220/2.65 LID, IRB 6700-205/2.80, IRB 6700-200/2.80 LID, IRB 6700-175/3.05, IRB 6700-155/3.05 LID, IRB 6700-150/3.20, IRB 6700-145/3.20 LID.

<sup>ii</sup> Valid for IRB 6700-300/2.70, IRB 6700-270/2.70 LID, IRB 6700-245/3.00, IRB 6700-220/3.00 LID.

Inverted Mounted

Force	Endurance load (in operation)	Max. load (emergency stop)
Force xy	$\pm 8.9 \text{ kN}^i$	$\pm 23.7 \text{ kN}^i$
Force z	$-22.1 \pm 6.6 \text{ kN}^i$	$-22.1 \pm 18.1 \text{ kN}^i$
Torque xy	$\pm 22.5 \text{ kNm}^i$	$\pm 45.4 \text{ kNm}^i$
Torque z	$\pm 6.5 \text{ kNm}^i$	$\pm 15.7 \text{ kNm}^i$

<sup>i</sup> Valid for IRB 6700I-300/2.60, I-270/2.60 LID, I-245/2.90, I-210/2.90 LID.



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# 1 Description

## 1.3.3 Assembling the manipulator

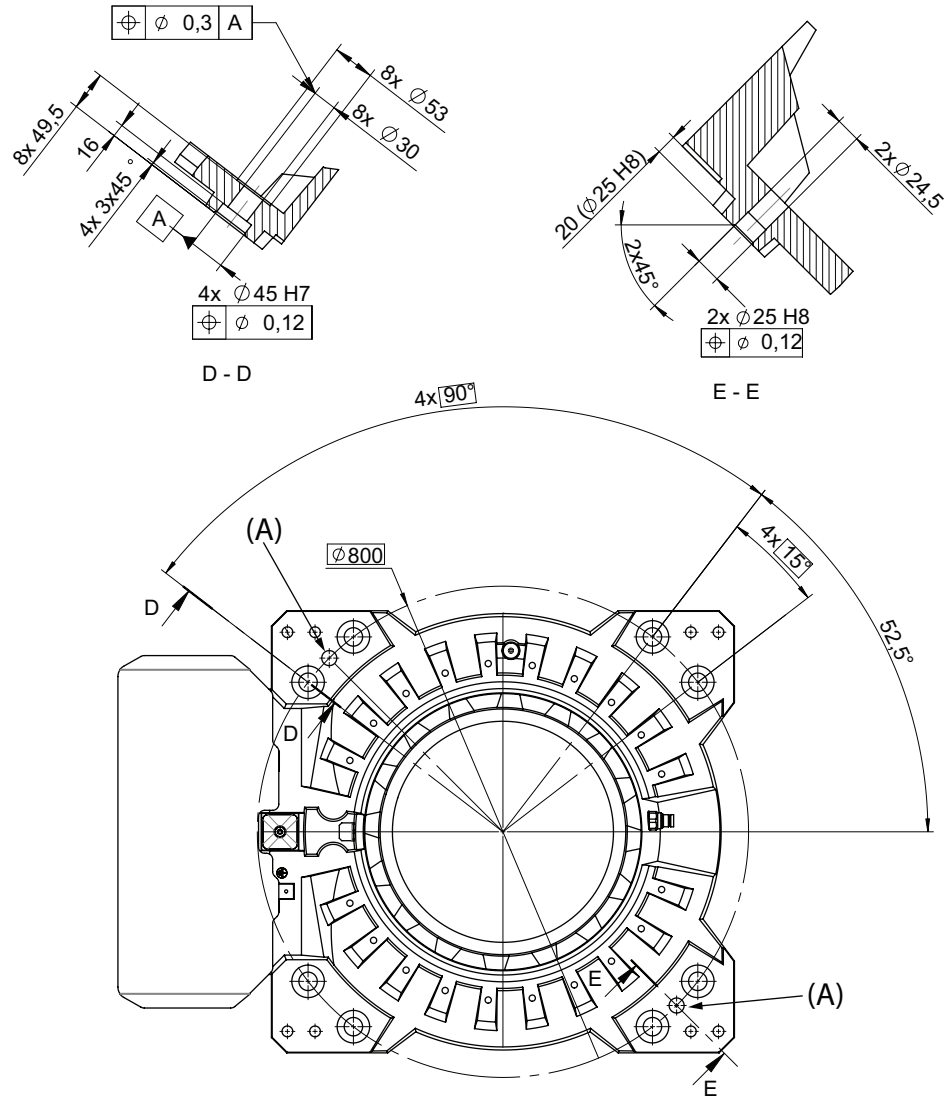
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### Note regarding $M_{xy}$ and $F_{xy}$

The bending torque ( $M_{xy}$ ) can occur in any direction in the XY-plane of the base coordinate system.

The same applies to the transverse force ( $F_{xy}$ ).

### Fastening holes robot base - for all variants



xx1300000243

Pos	Description
A	Holes for guide pins (x2)



#### Note

Holes for guide pins (x2) Rear hole straight slot.

Continues on next page

### Fastener quality

Suitable screws:	M24 x 100 (installation on base plate/foundation)
Quality:	8.8
Screw tightening yield point utilization factor (v) (according to VDI2230):	90% (v=0.9)
Suitable washer:	4 mm flat washer
Tightening torque:	550 Nm (screws lubricated with Molykote 1000) 600-725 Nm, typical 650 Nm (screws none or lightly lubricated)



#### Note

Only two guide pins shall be used.

### AbsAcc performance

Regarding AbsAcc performance, the use of guide pins are mandatory.

*Continues on next page*

# 1 Description

## 1.3.3 Assembling the manipulator

Continued

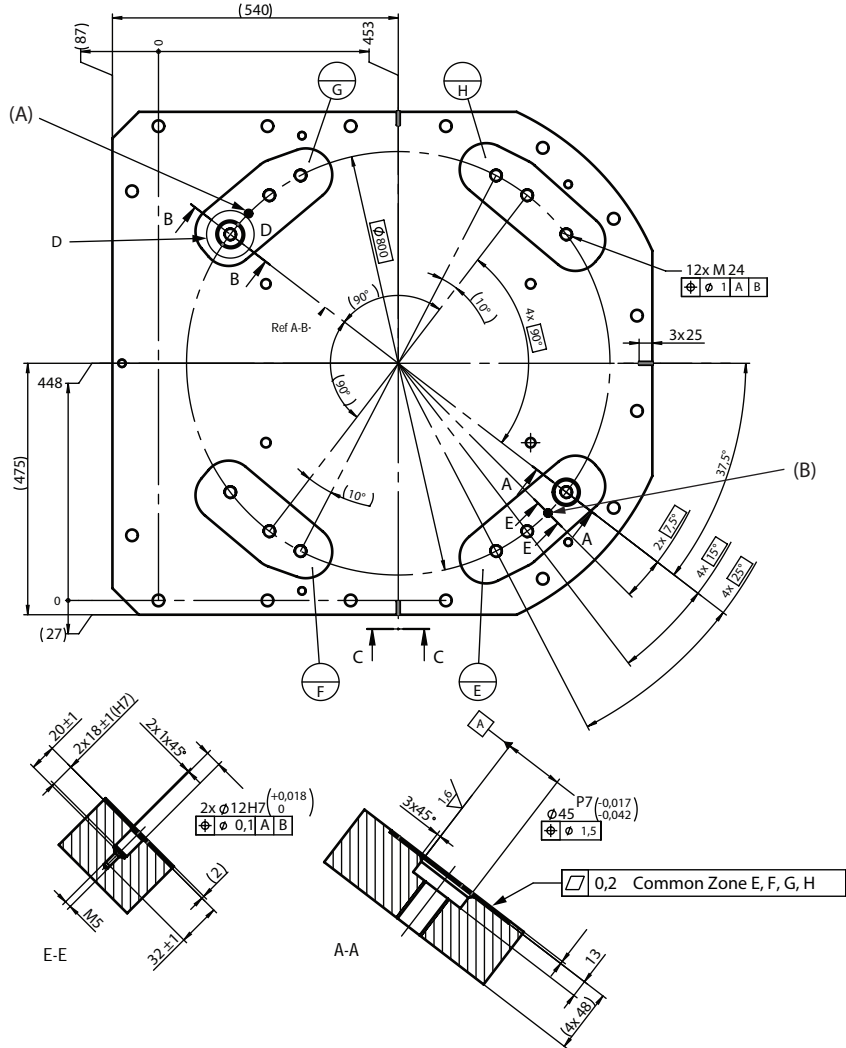
### Base plate drawing



#### Note

IRB 6700INV is not valid for base plate.

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

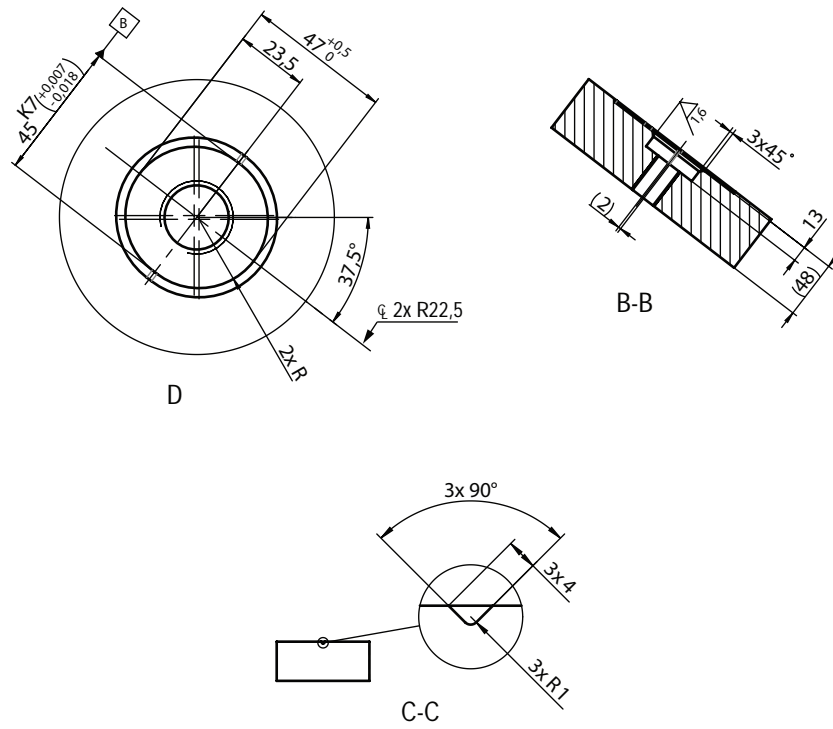


xx150000246

Pos	Description
A, B	Hole for guide pin, cylindrical, see <a href="#">Guide pins on page 27</a>
E, F, G, H	Common tolerance zone (accuracy all over the base plate from one contact surface to the other)

Continues on next page



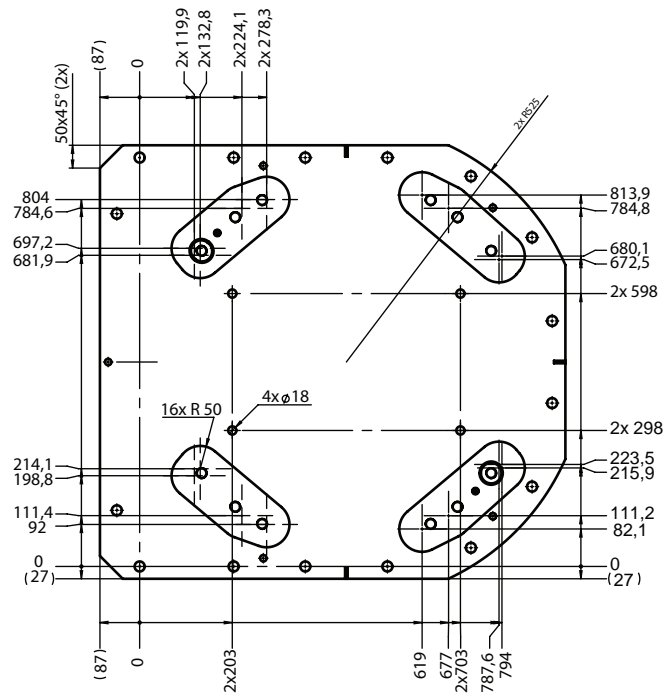
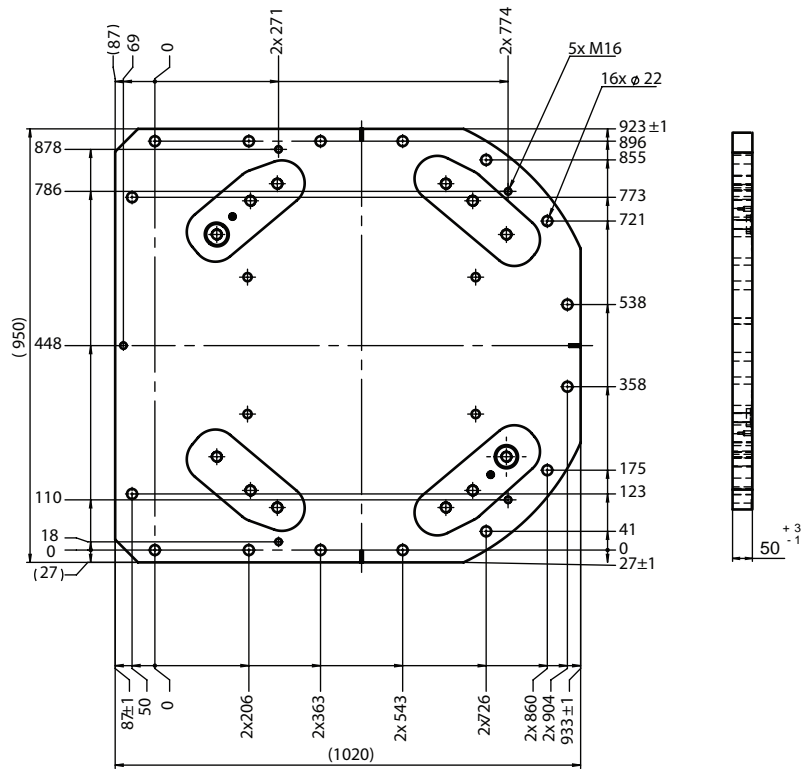


xx150000247

# 1 Description

## 1.3.3 Assembling the manipulator

Continued

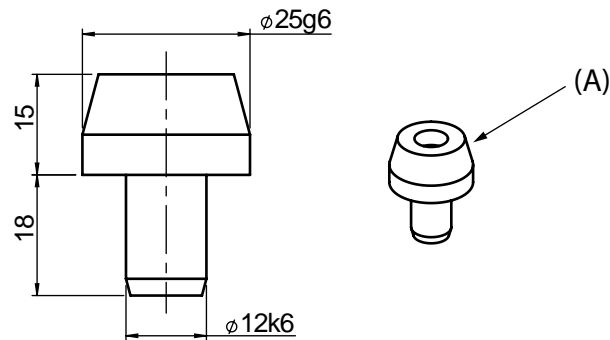


xx1500000249

<b>A</b>	<p>Color: RAL 9005</p> <p>Thickness: 80-100 µm</p> <p>Weight: 360 kg</p>
----------	--

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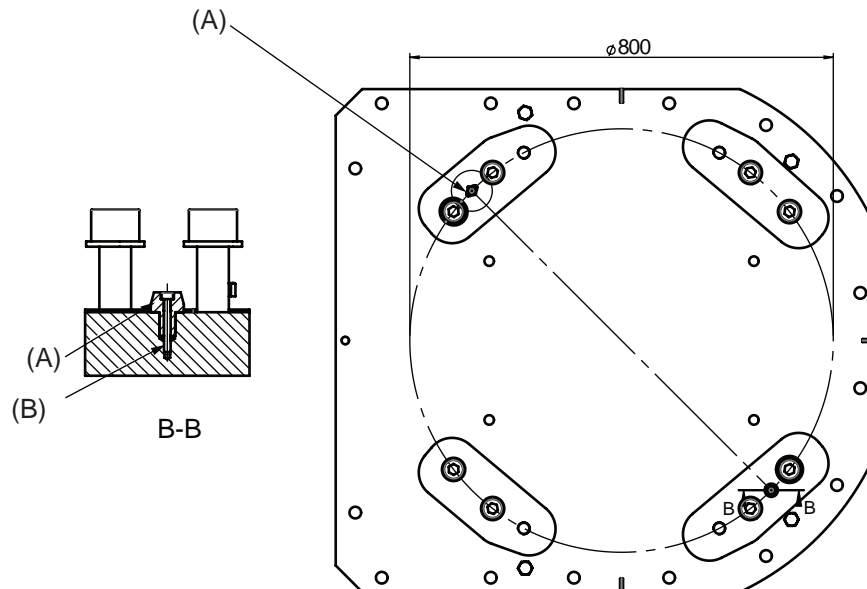
Guide pins



XX1500000248

Pos	Description
A	Cylindrical guide pin (x2)

Assembly of guide pins



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



Note

All screws and pins are delivered in a plastic bag together with the base plate.

# 1 Description

## 1.3.4 Mechanically restricting the working range of axis 1

### 1.3.4 Mechanically restricting the working range of axis 1

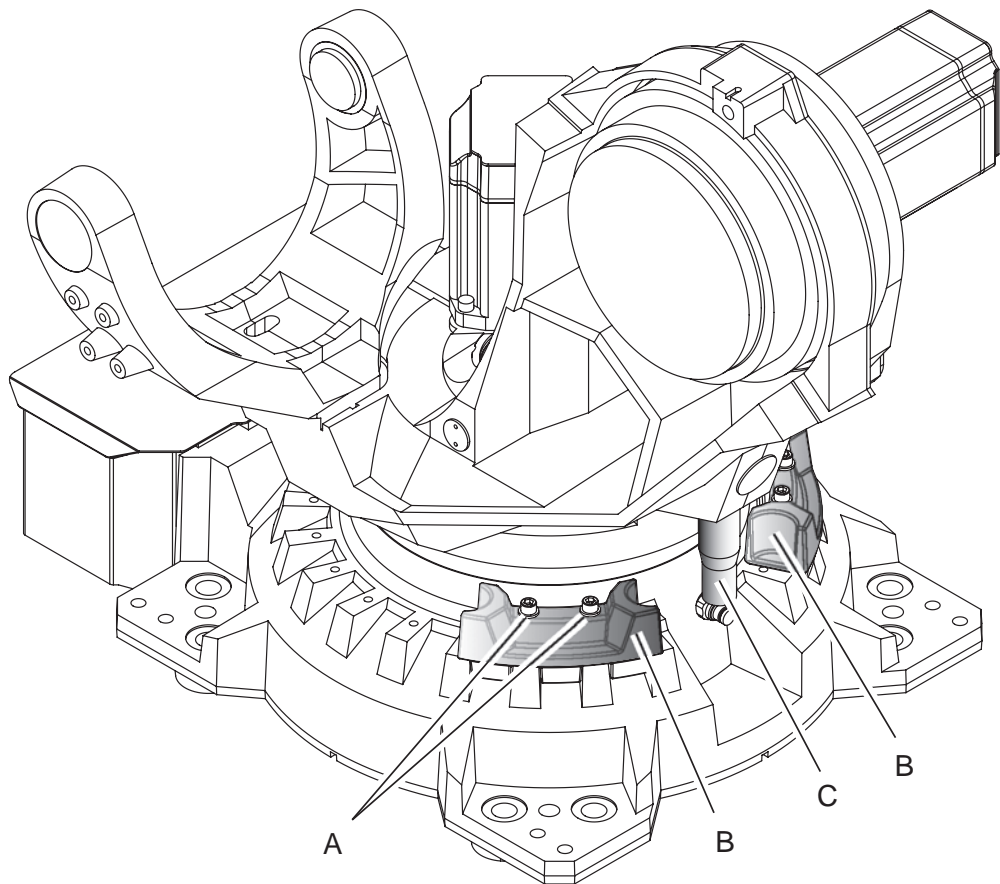
#### General

The working range of axis 1 is limited by fixed mechanical stops and adjustment of the system parameter configuration. The working range can be reduced by adding additional mechanical stops giving 15° graduation, between ±5° and ±125° in both directions.

#### Mechanical stops, axis 1

The illustration shows the mounting position of the stop pin and one of the additional mechanical stops available for axis 1.

IRB 6700



xx1300001971

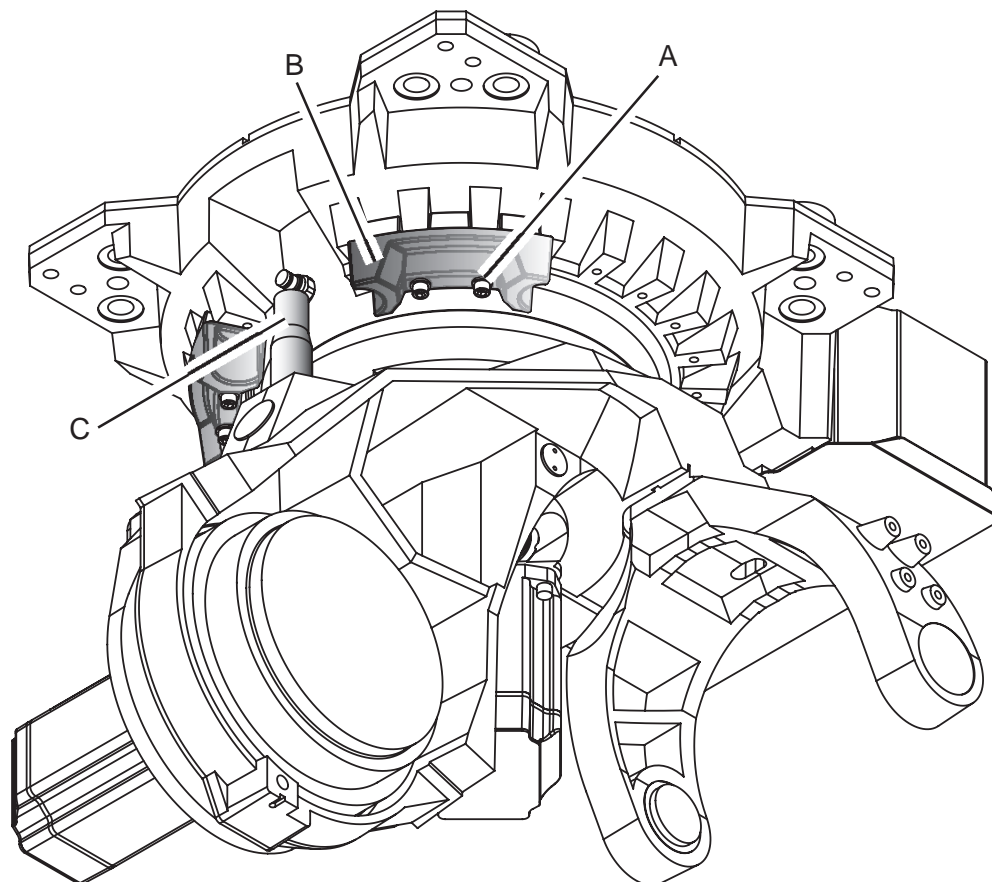
A	Attachment screws M12x70 quality 12.9 Gleitmo 603 (2 pcs per additional mechanical stop) When the robot is used in a corrosive environment, the securing screws and washers must be of stainless steel.
B	Movable mechanical stop
C	Mechanical stop pin axis-1

*Continues on next page*

## 1.3.4 Mechanically restricting the working range of axis 1

*Continued*

IRB 6700Inv



xx1600002066

A	Attachment screws M12x70 quality 12.9 Gleitmo 603 (2 pcs per additional mechanical stop)
B	Movable mechanical stop
C	Mechanical stop pin axis-1

# 1 Description

## 1.4.1 Calibration methods

## 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.

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

More information is available in the product manual.

#### Types of calibration

Type of calibration	Description	Calibration method
Standard calibration	The calibrated robot is positioned at calibration position. Standard calibration data is found on the SMB (serial measurement board) or EIB in the robot.	Axis Calibration
Absolute accuracy calibration (optional)	Based on standard calibration, and besides positioning the robot at synchronization position, the Absolute accuracy calibration also compensates for: <ul style="list-style-type: none"><li>Mechanical tolerances in the robot structure</li><li>Deflection due to load</li></ul> 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.  <b>Note</b> For advanced users, it is also possible to use the 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 6700. 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 Description

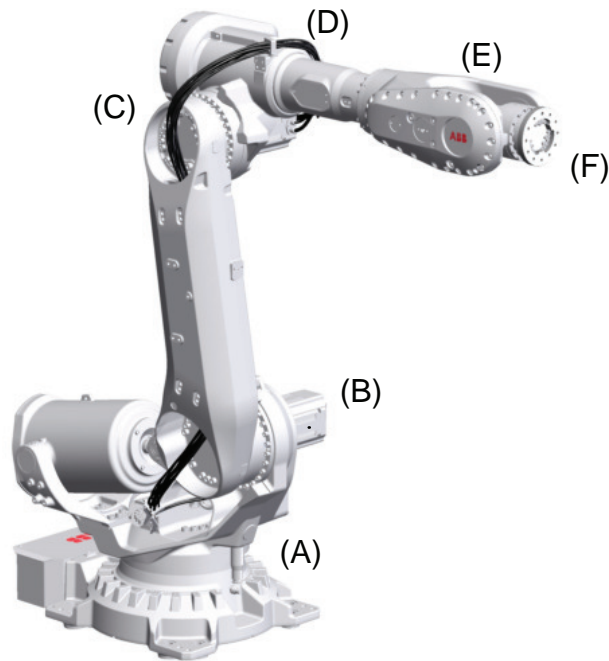
## 1.4.2 Fine calibration

### 1.4.2 Fine calibration

#### General

Fine calibration is made using the Axis calibration method, see *Product manual - IRB 6700* and *Product manual - IRB 6700Inv / IRB 6700I*.

#### Axes



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

#### Calibration

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



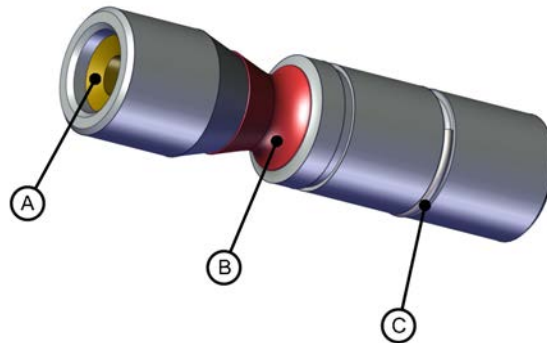
1.4.3 Calibration tools for Axis Calibration

Calibration tools



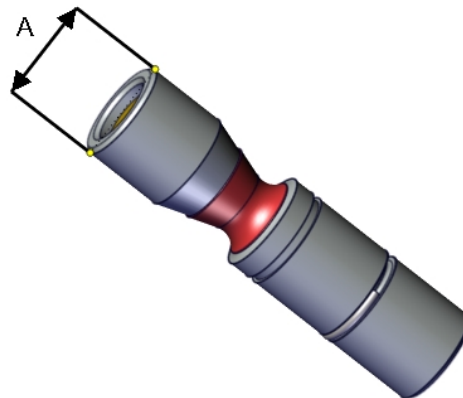
**WARNING**

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.

# 1 Description

---

## 1.4.4 Absolute Accuracy calibration

### 1.4.4 Absolute Accuracy calibration



#### Note

IRB 6700Inv is valid for field AbsAcc but does not have an AbsAcc option.

---

#### 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.

*Continues on next page*

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
- 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 6700 (all variants except LID)	0.35	0.75	100
IRB 6700 LID (all variants)	0.40	0.85	100

# 1 Description

## 1.4.5.1 Synchronization marks and synchronization position for axes

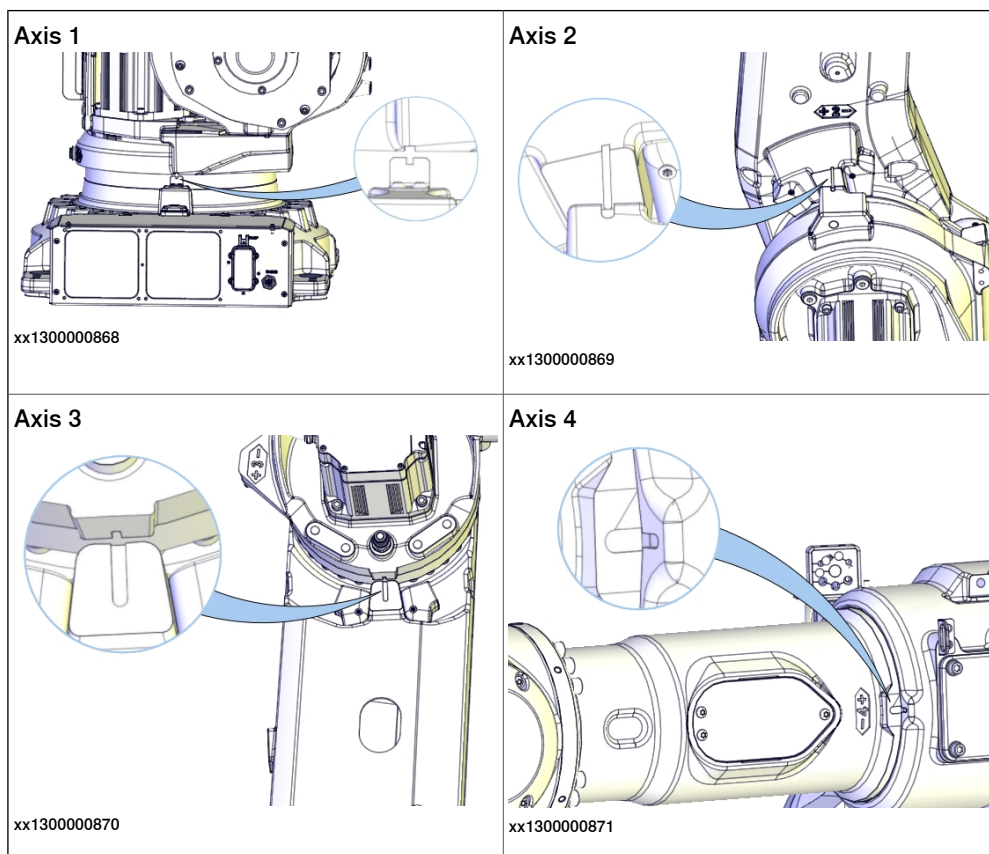
### 1.4.5 Synchronization marks and axis movement directions

#### 1.4.5.1 Synchronization marks and synchronization position for axes

##### Introduction

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

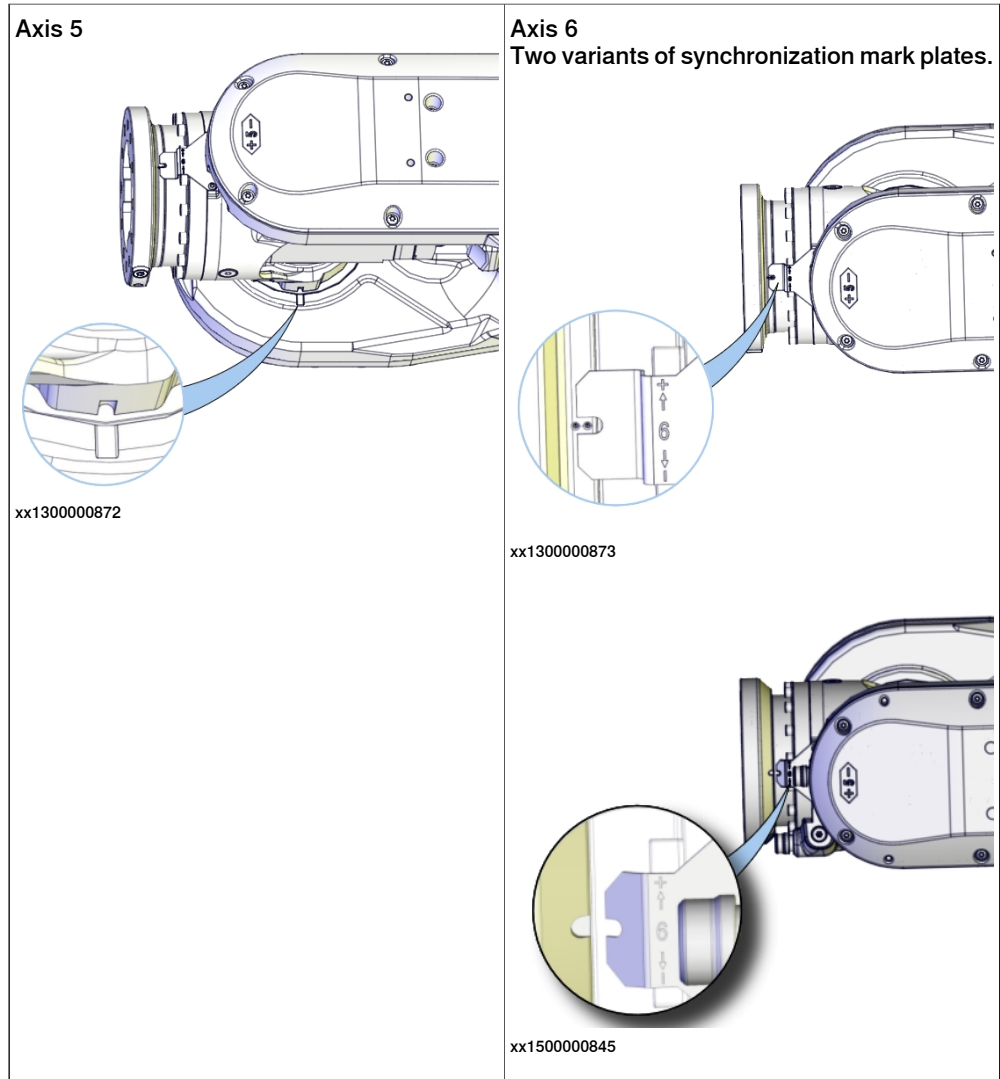
##### Synchronization marks, IRB 6700, IRB 6700Inv



*Continues on next page*

1.4.5.1 Synchronization marks and synchronization position for axes

Continued



# 1 Description

## 1.4.5.2 Calibration movement directions for all axes

### 1.4.5.2 Calibration movement directions for all axes

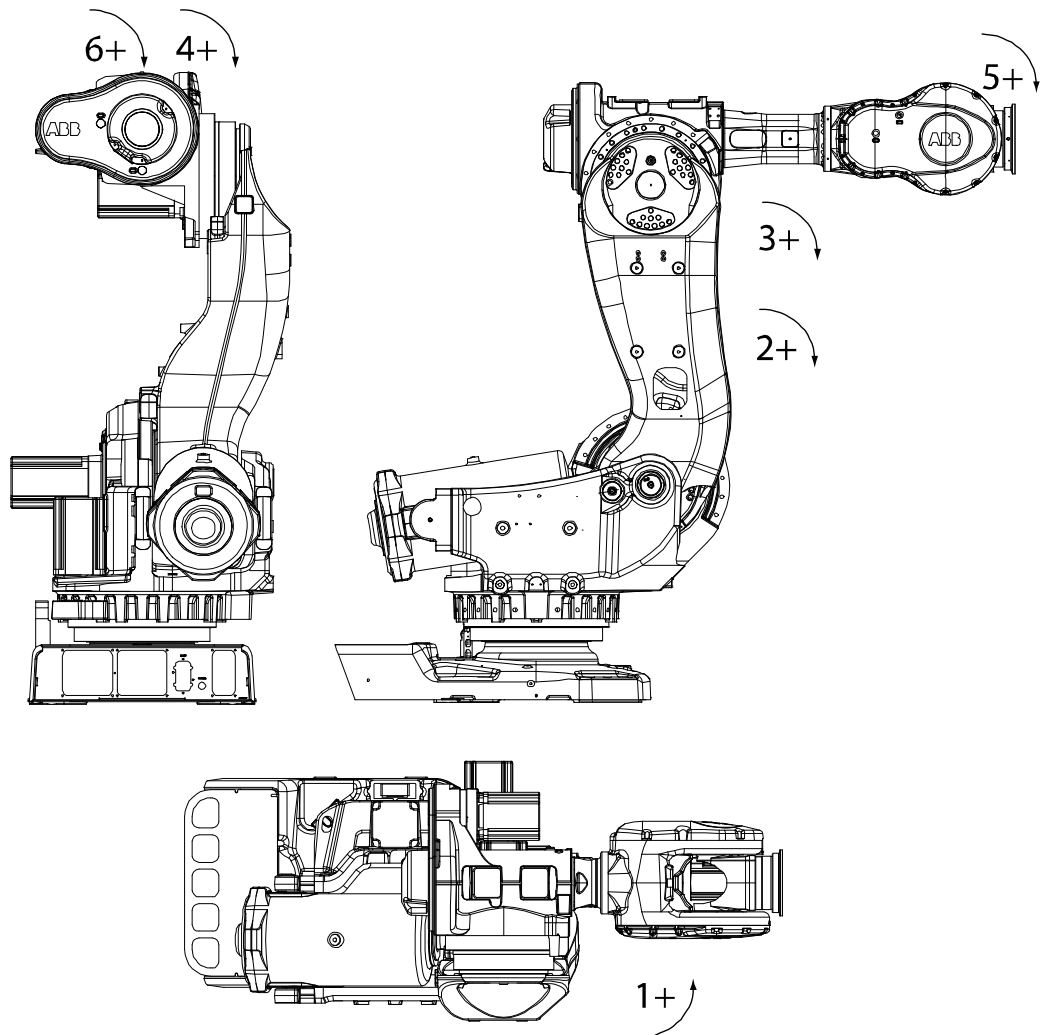
#### Overview

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

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

#### Manual movement directions, 6 axes

**Note!** The graphic shows an IRB 7600. The positive direction is the same for all 6-axis robots, except the positive direction of axis 3 for IRB 6400R, which is in the opposite direction!



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## 1.5 Load diagrams

### 1.5.1 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 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<sup>2</sup>, 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.

---

**Control of load case by "RobotLoad"**

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

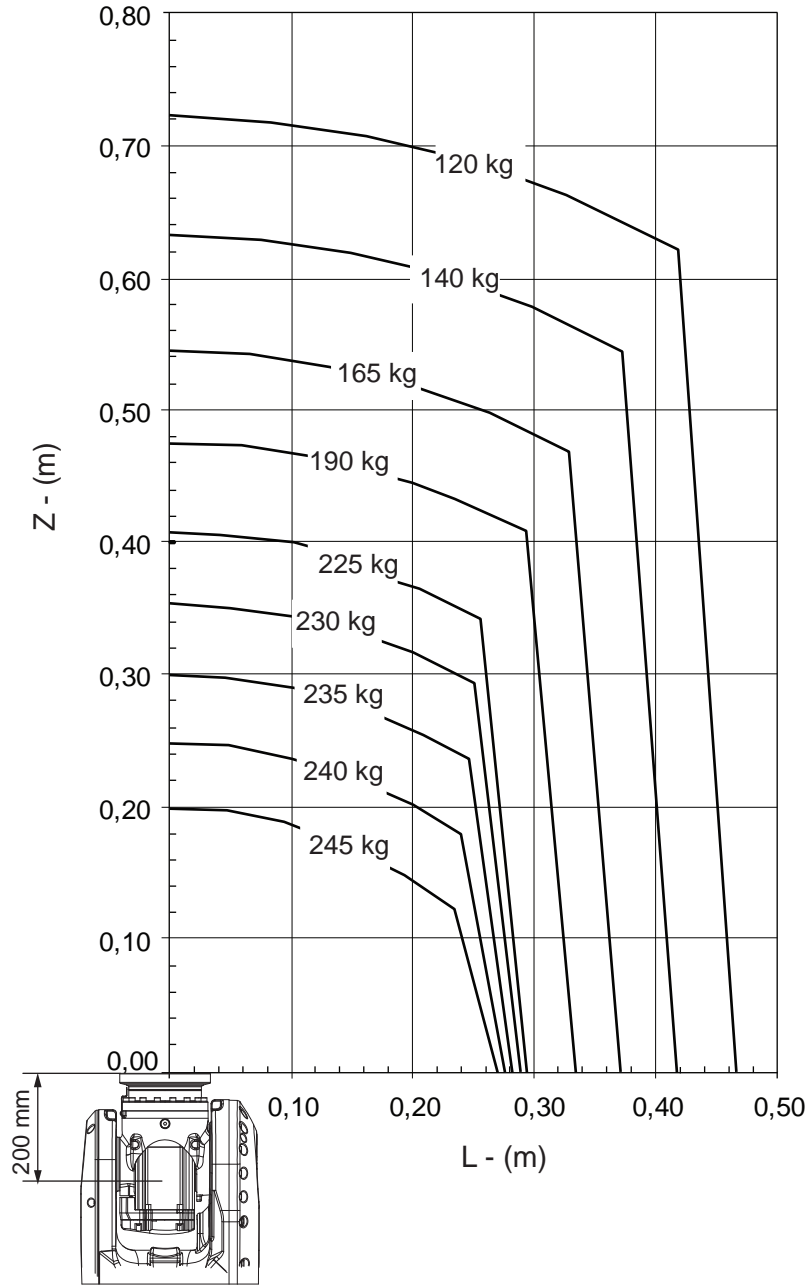
The result from RobotLoad is only valid within the maximum loads and tilt angles. There is no warning if the maximum permitted arm load is exceeded. For over-load cases and special applications, contact ABB for further analysis.

# 1 Description

## 1.5.2 Diagrams

### 1.5.2 Diagrams

IRB 6700-235/2.65

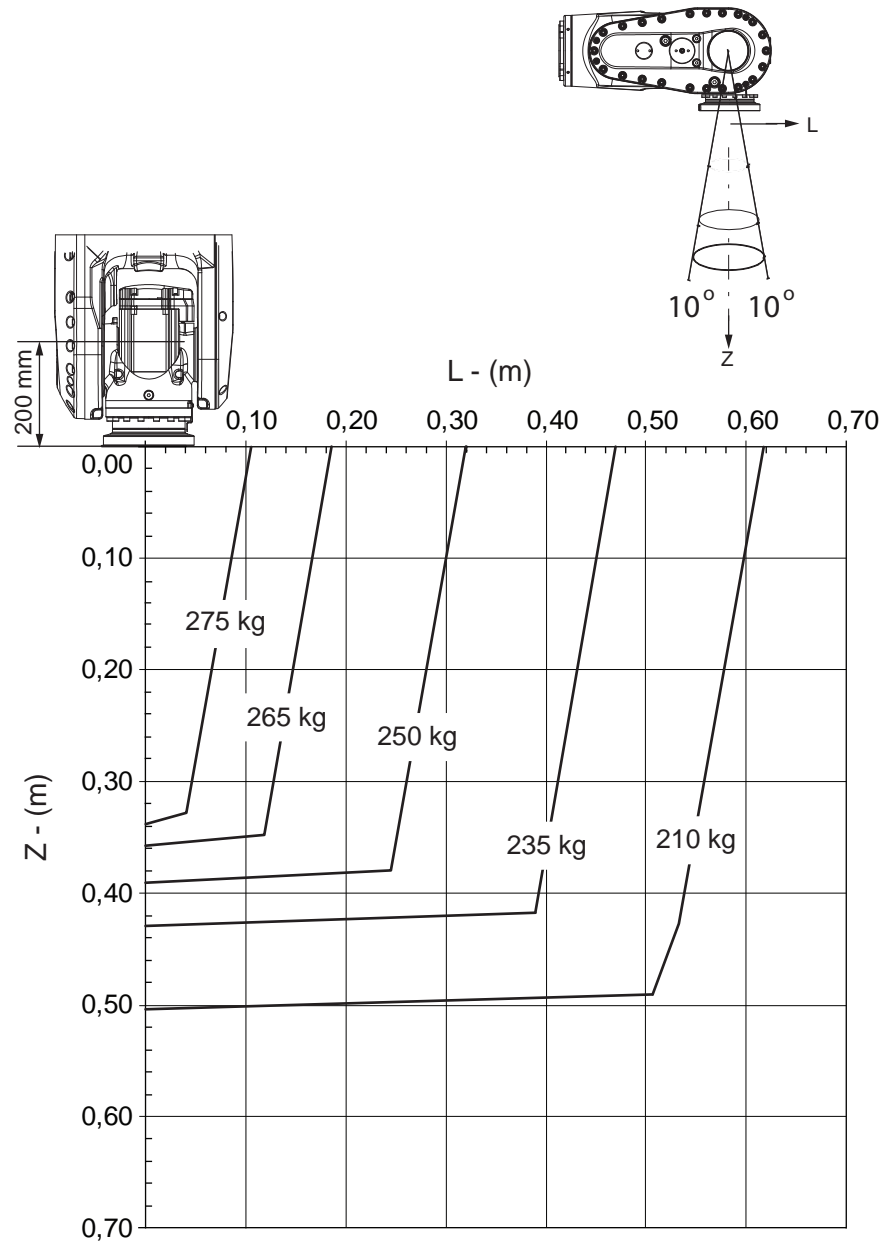


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IRB 6700-235/2.65 "Vertical Wrist" ( $\pm 10^\circ$ )



xx1300000246

For wrist down ( $0^\circ$  deviation from the vertical line).

	Description
Max load	280 kg
Z <sub>max</sub>	0.327 m
L <sub>max</sub>	0.100 m

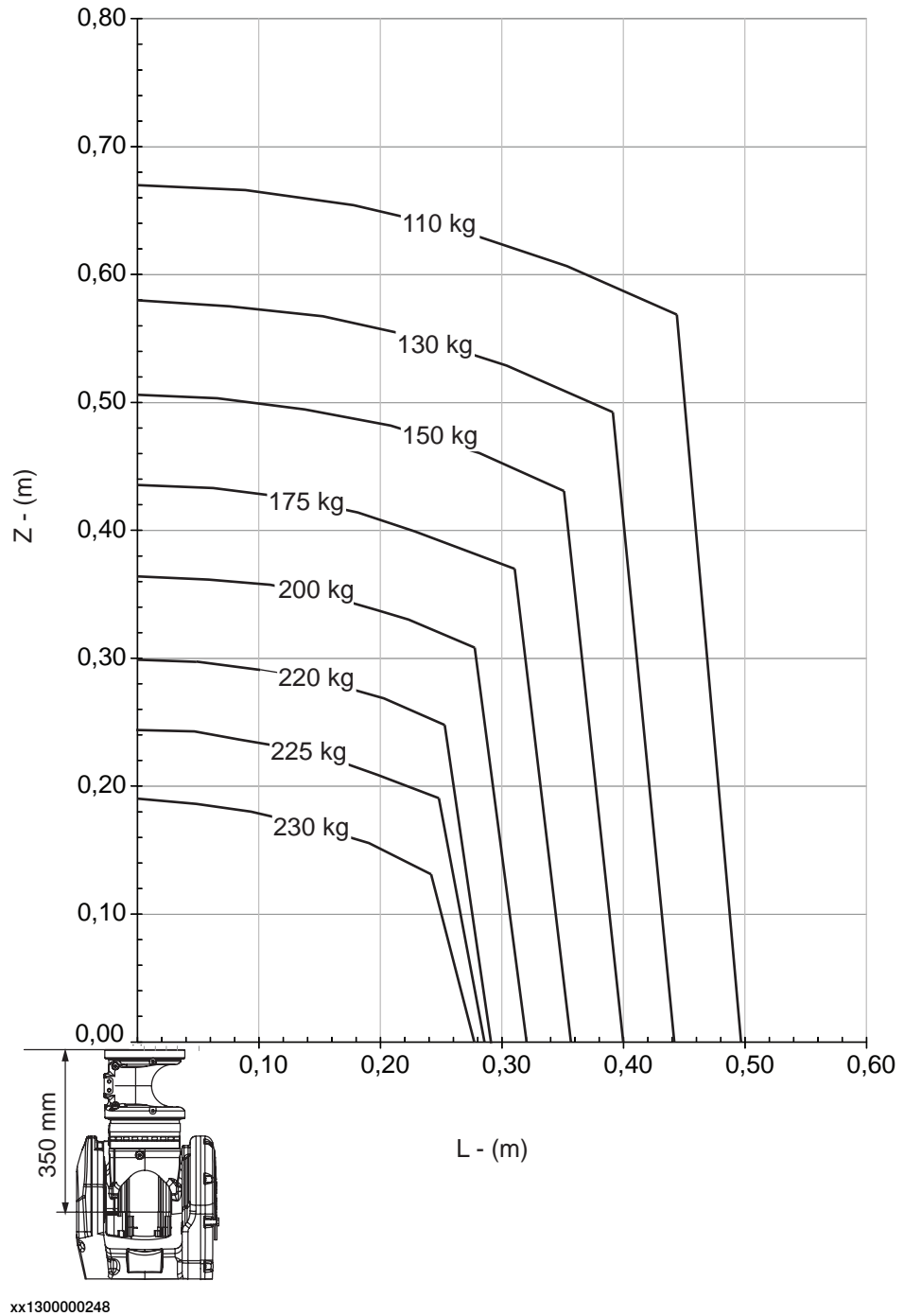
Continues on next page

# 1 Description

## 1.5.2 Diagrams

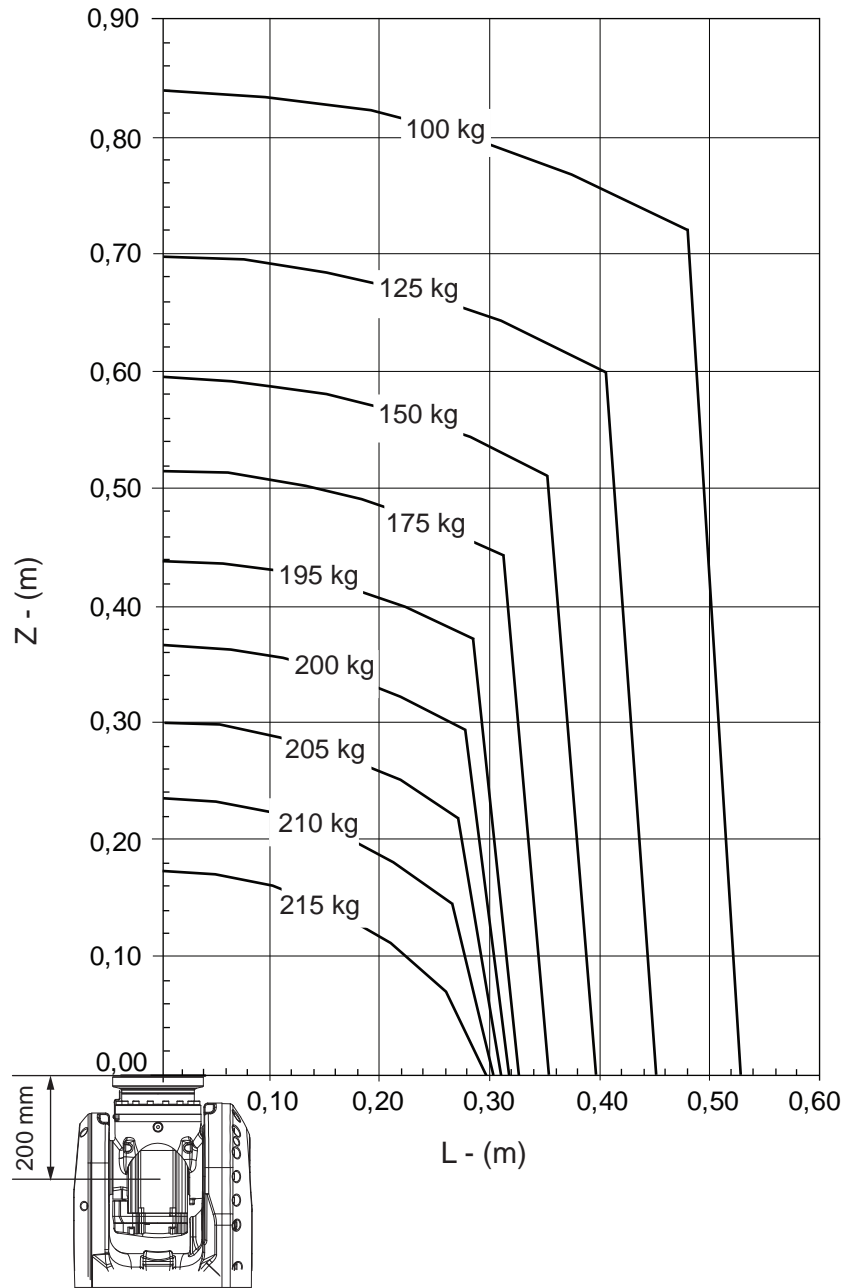
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### IRB 6700-220/2.65 LID



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IRB 6700-205/2.80



xx130000249

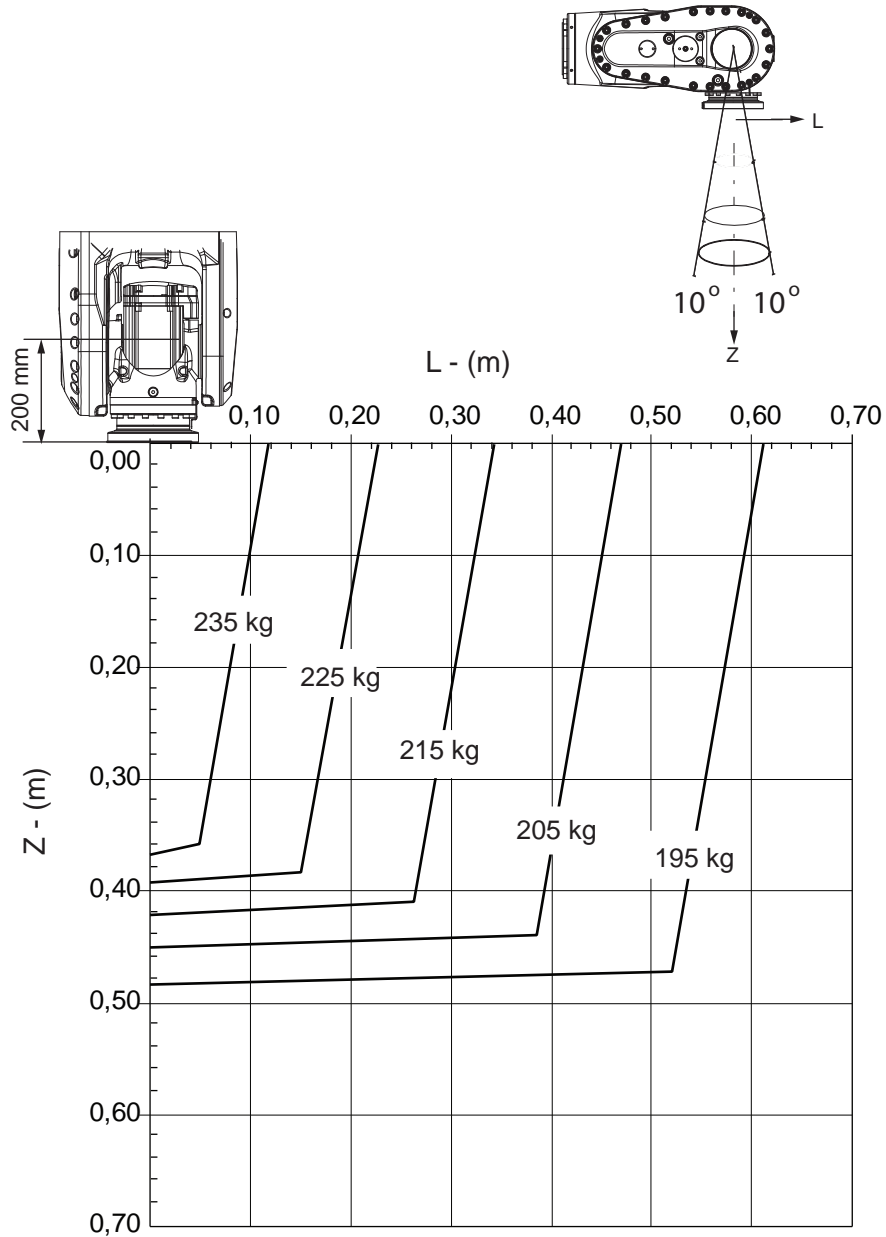
Continues on next page

# 1 Description

## 1.5.2 Diagrams

Continued

### IRB 6700-205/2.80 "Vertical Wrist" ( $\pm 10^\circ$ )



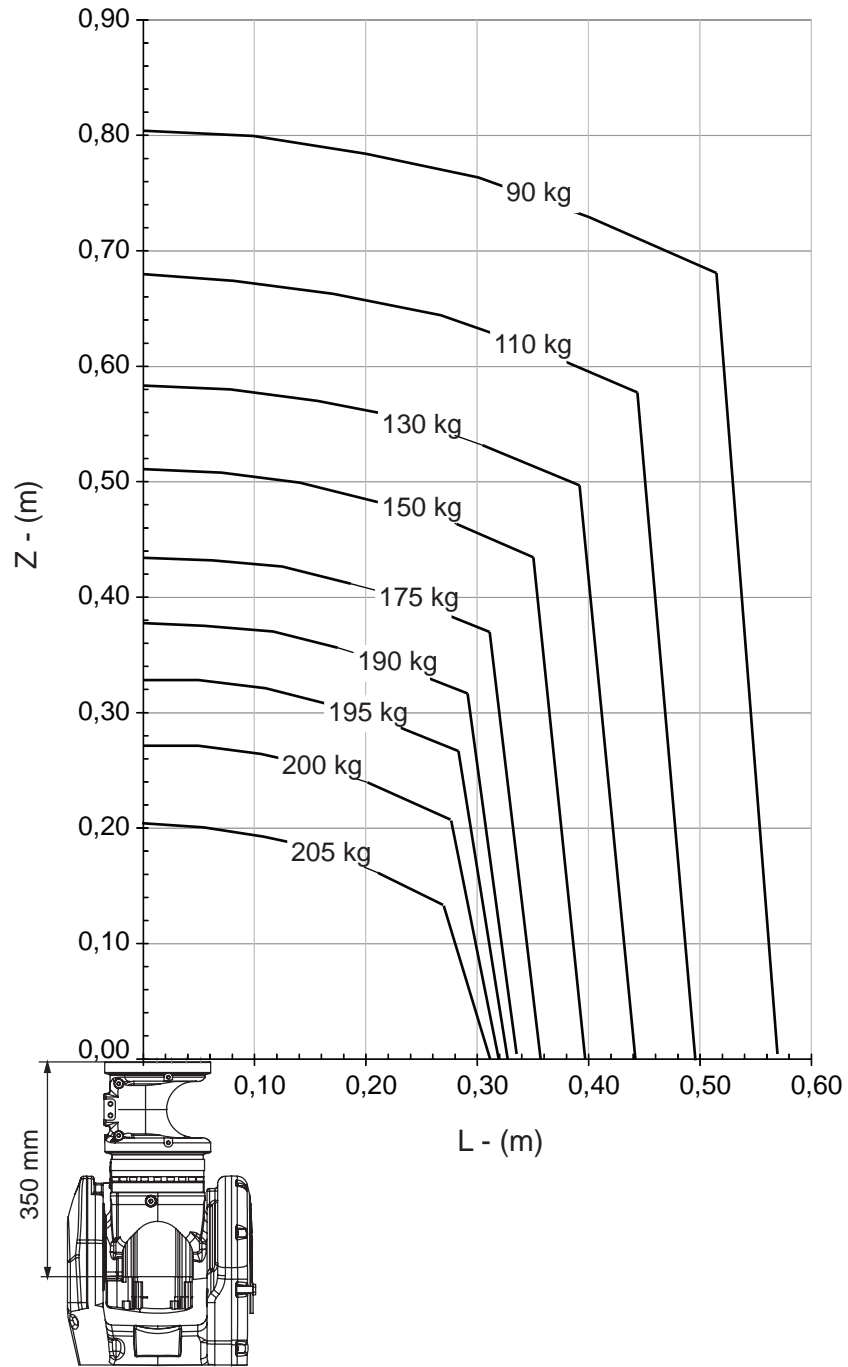
xx1300000250

For wrist down ( $0^\circ$  deviation from the vertical line).

	Description
Max load	240 kg
Z <sub>max</sub>	0.355 m
L <sub>max</sub>	0.103 m

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IRB 6700-200/2.80 LID



xx1300000251

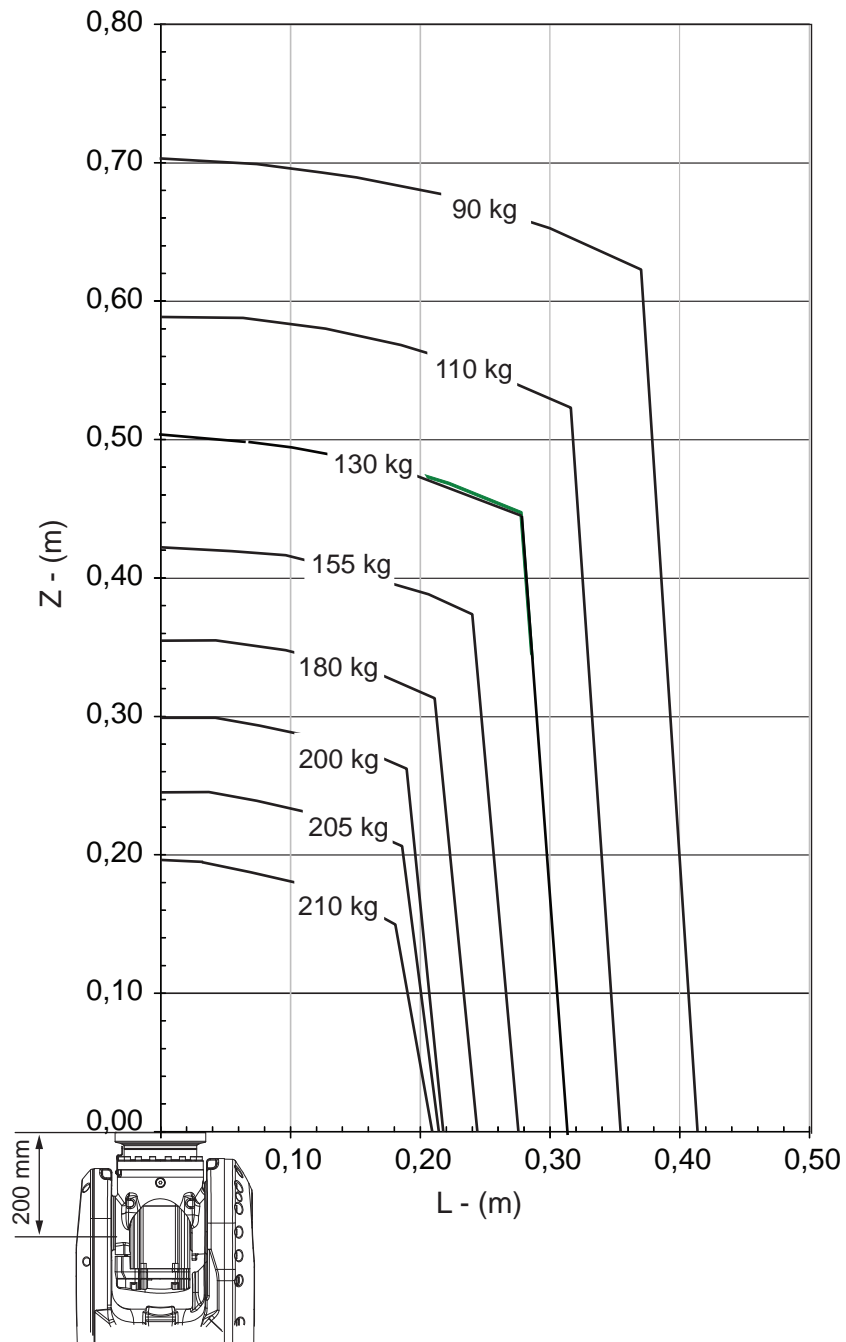
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# 1 Description

## 1.5.2 Diagrams

Continued

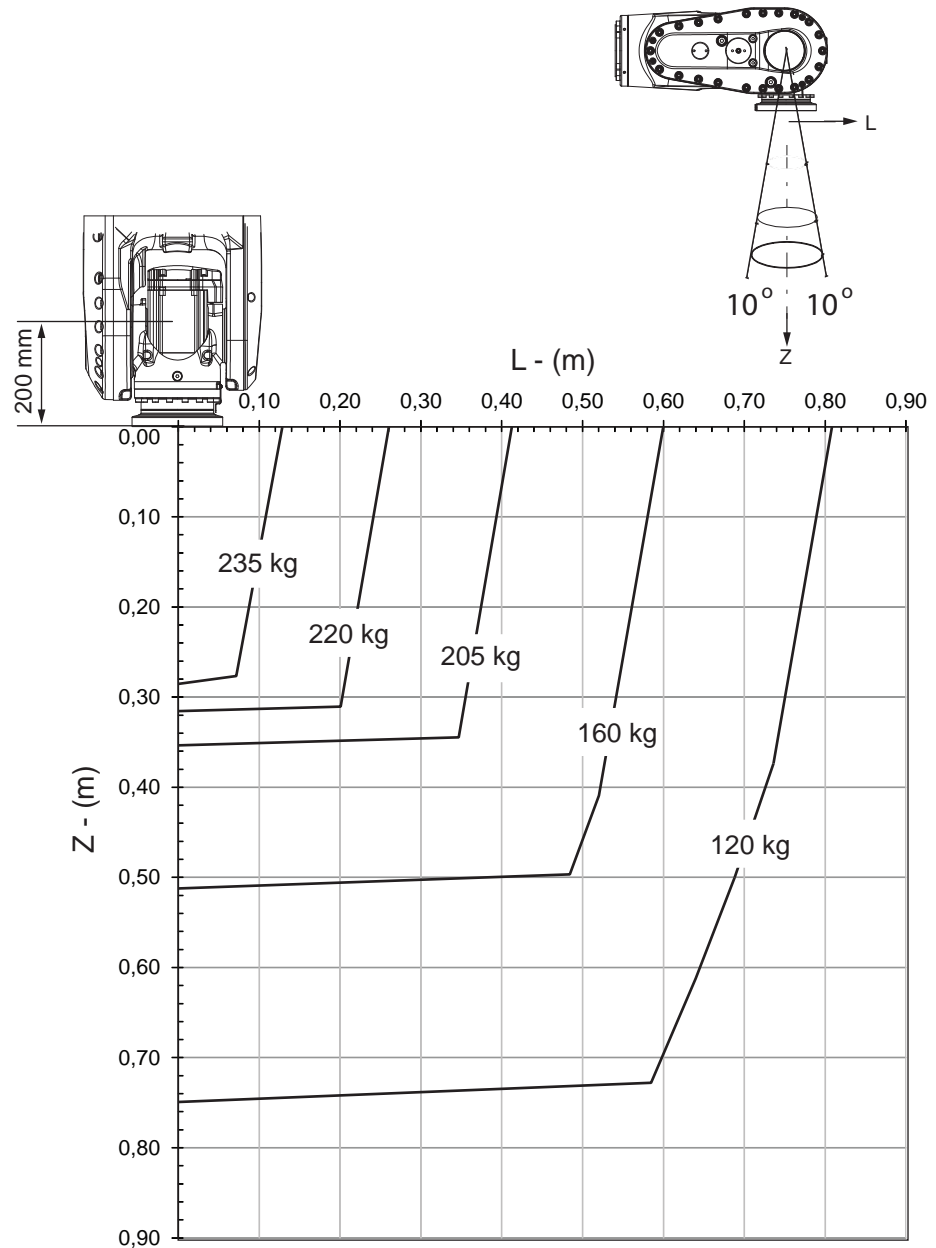
IRB 6700-200/2.60



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IRB 6700-200/2.60 "Vertical Wrist" ( $\pm 10^\circ$ )



xx130000334

For wrist down ( $0^\circ$  deviation from the vertical line).

	Description
Max load	242 kg
Z <sub>max</sub>	0.27 m
L <sub>max</sub>	0.104 m

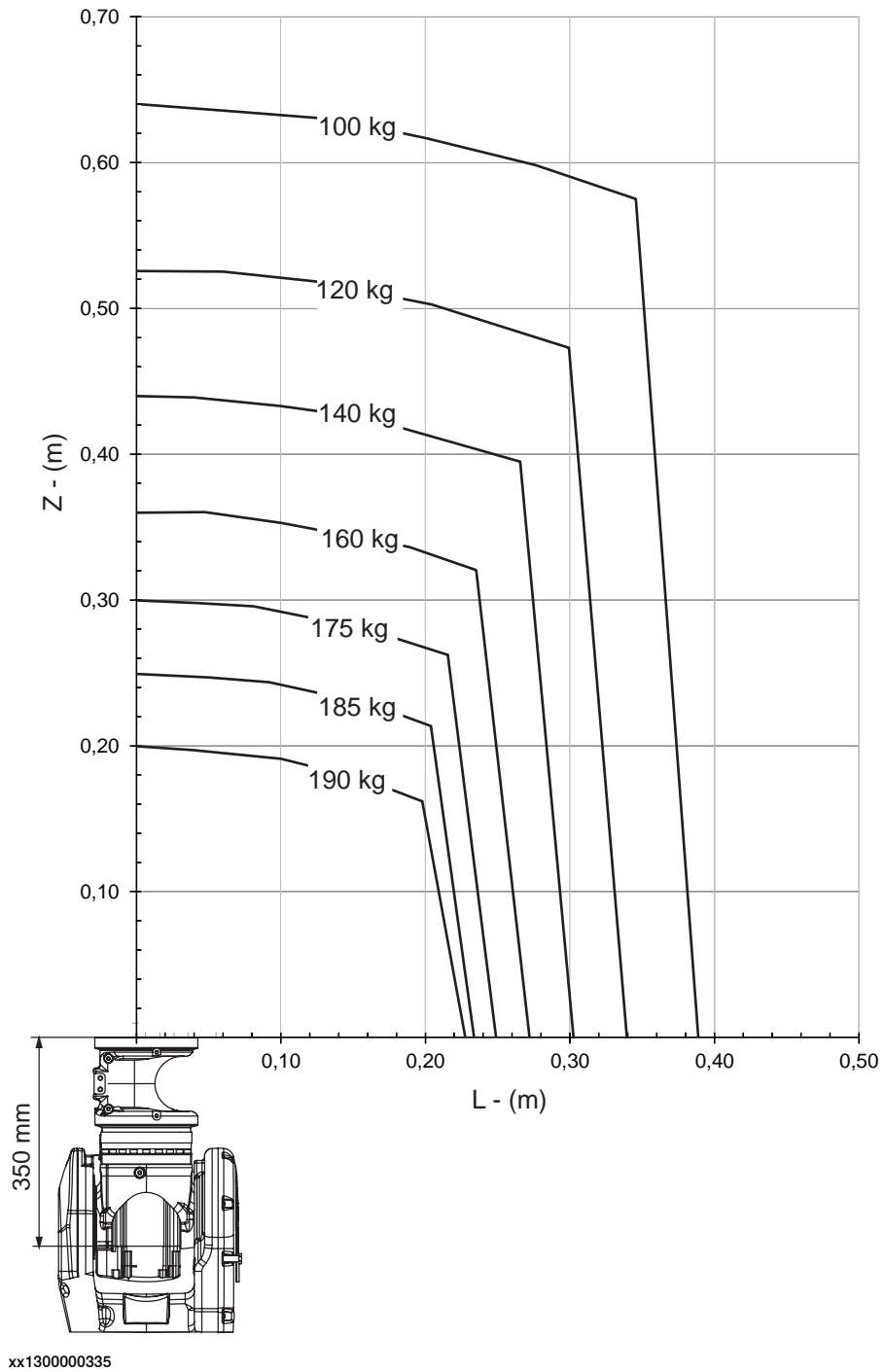
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# 1 Description

## 1.5.2 Diagrams

Continued

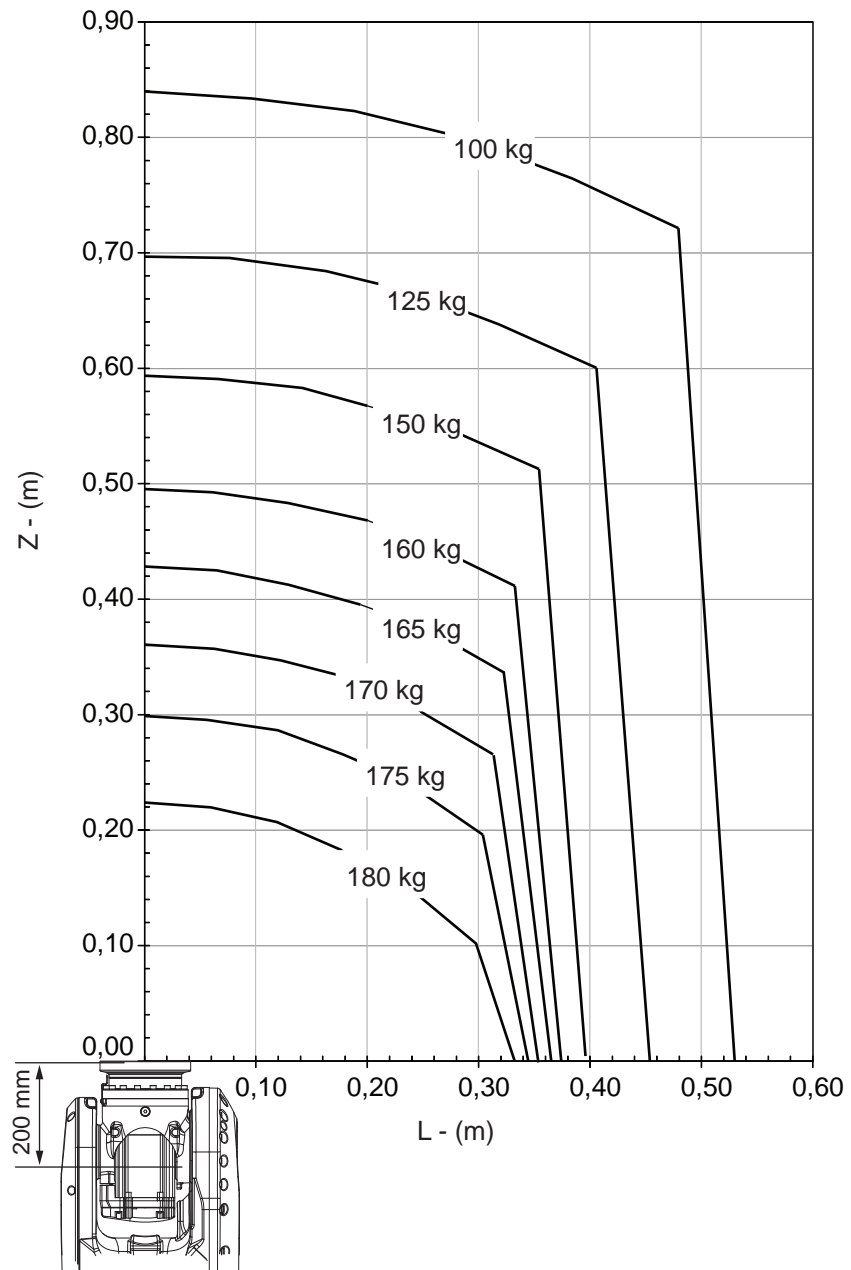
### IRB 6700-175/2.60 LID



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IRB 6700-175/3.05



xx130000252

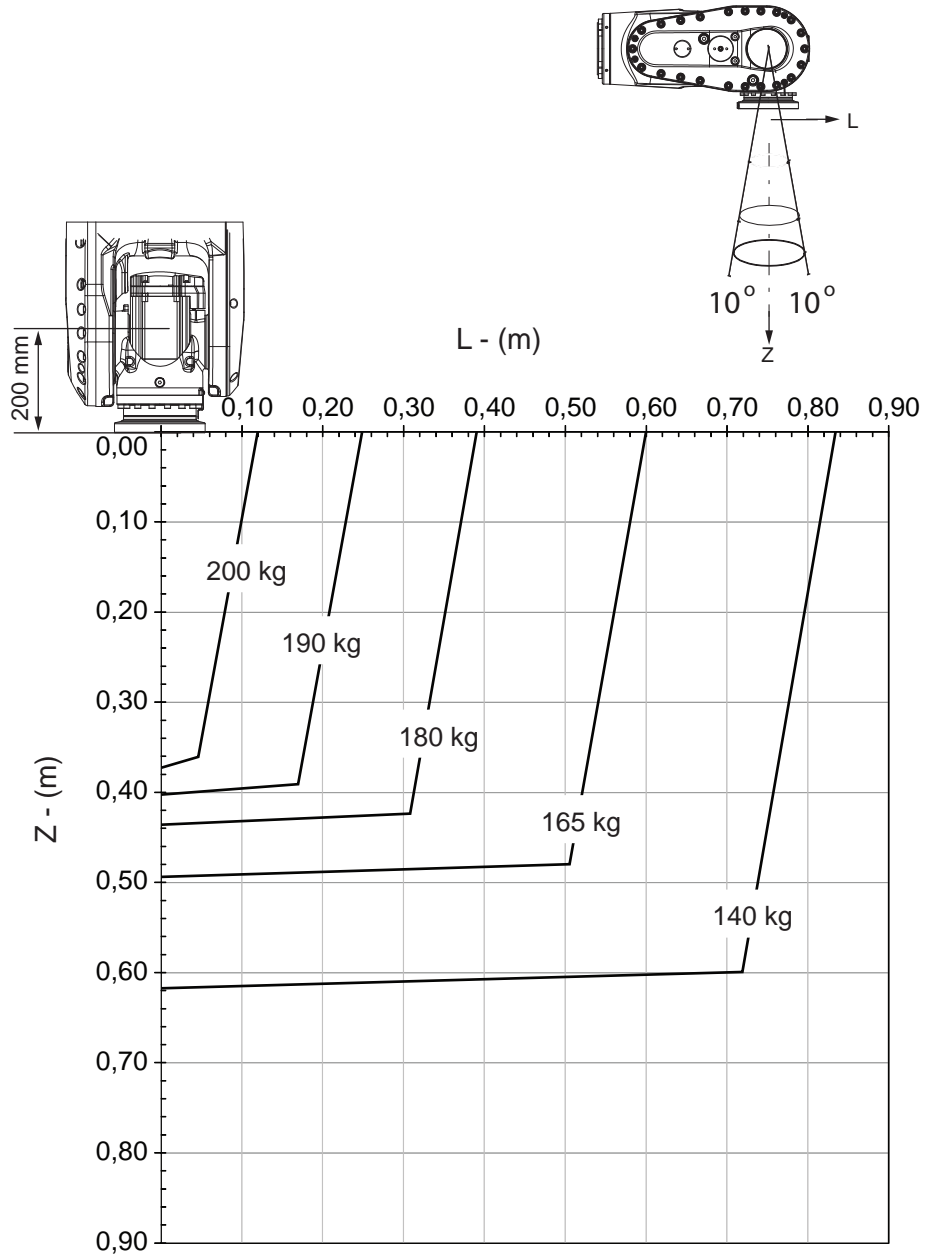
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# 1 Description

## 1.5.2 Diagrams

Continued

### IRB 6700-175/3.05 "Vertical Wrist" ( $\pm 10^\circ$ )

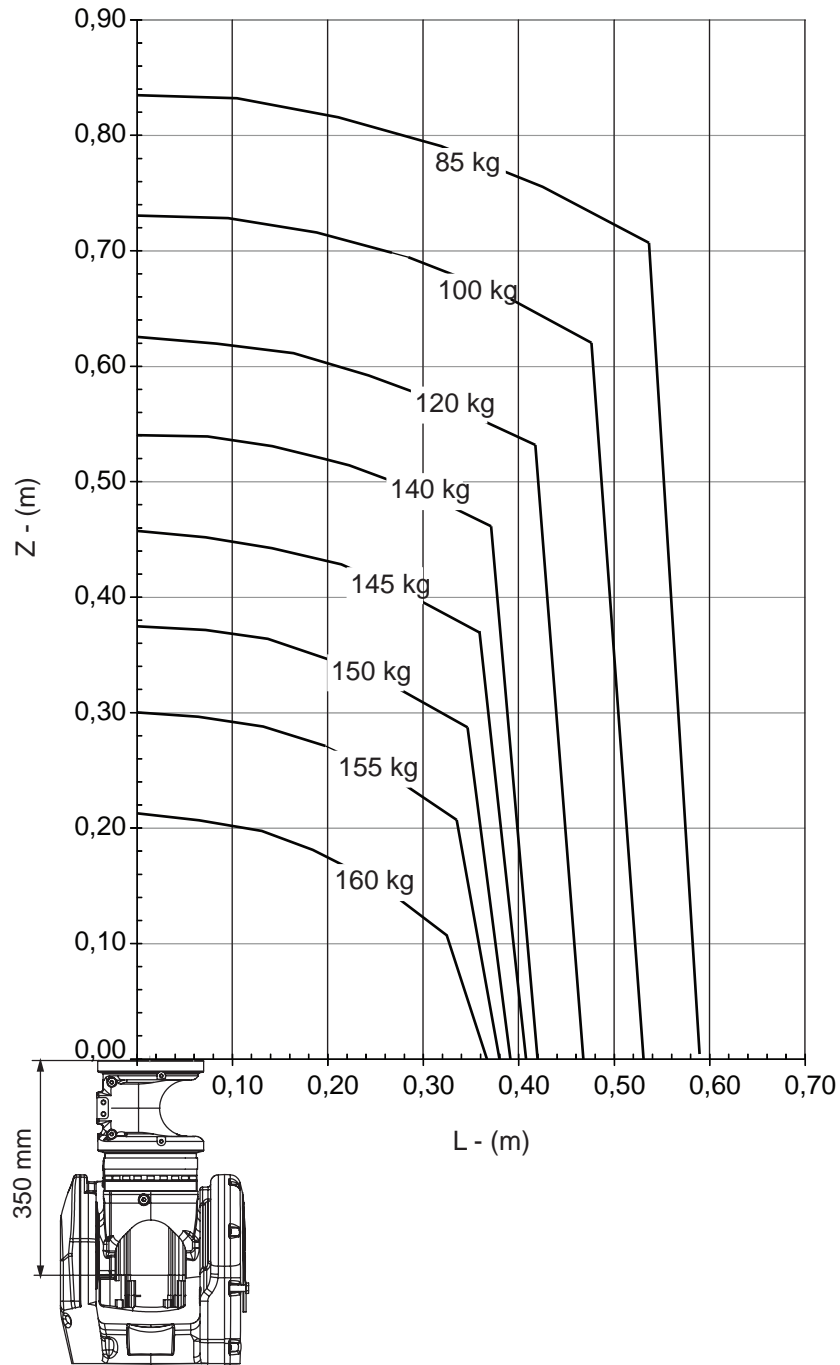


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	Description
Max load	204 kg
Z <sub>max</sub>	0.360 m
L <sub>max</sub>	0.101 m

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IRB 6700-155/3.05 LID



xx130000254

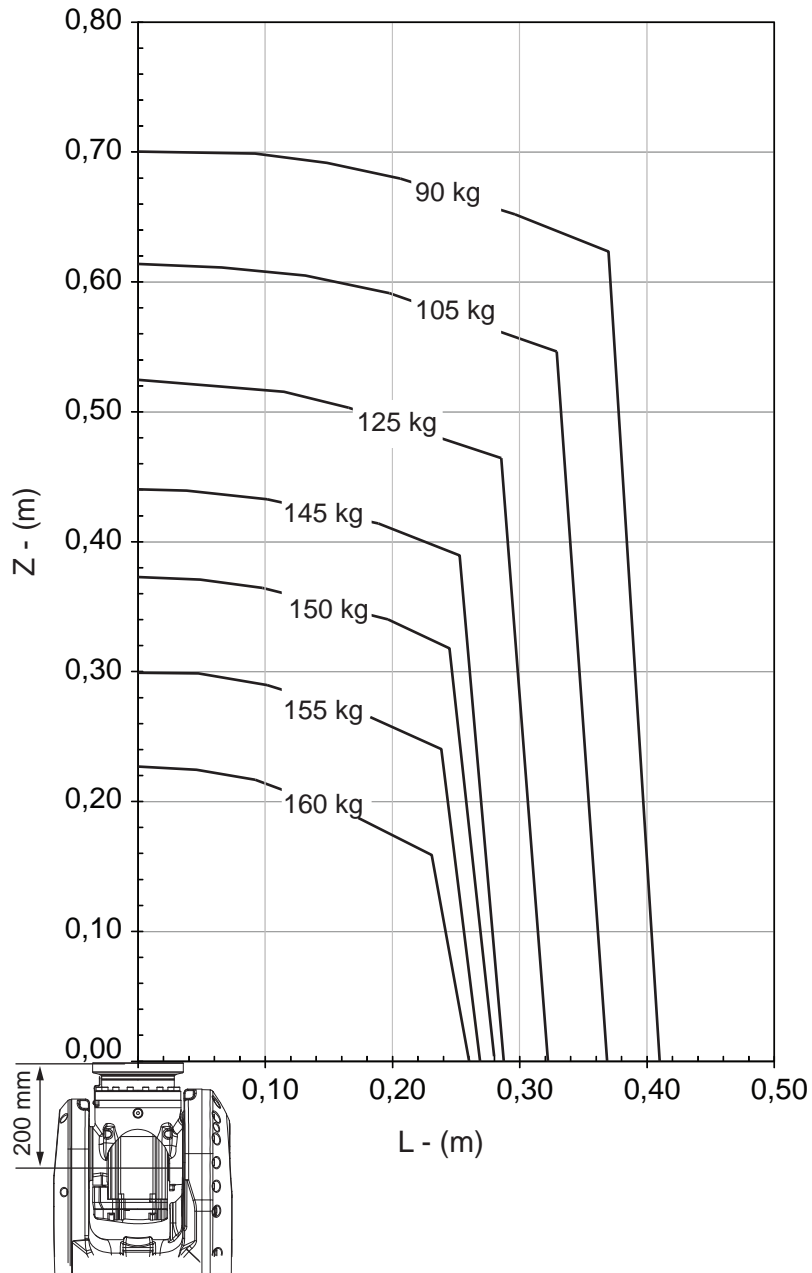
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# 1 Description

## 1.5.2 Diagrams

Continued

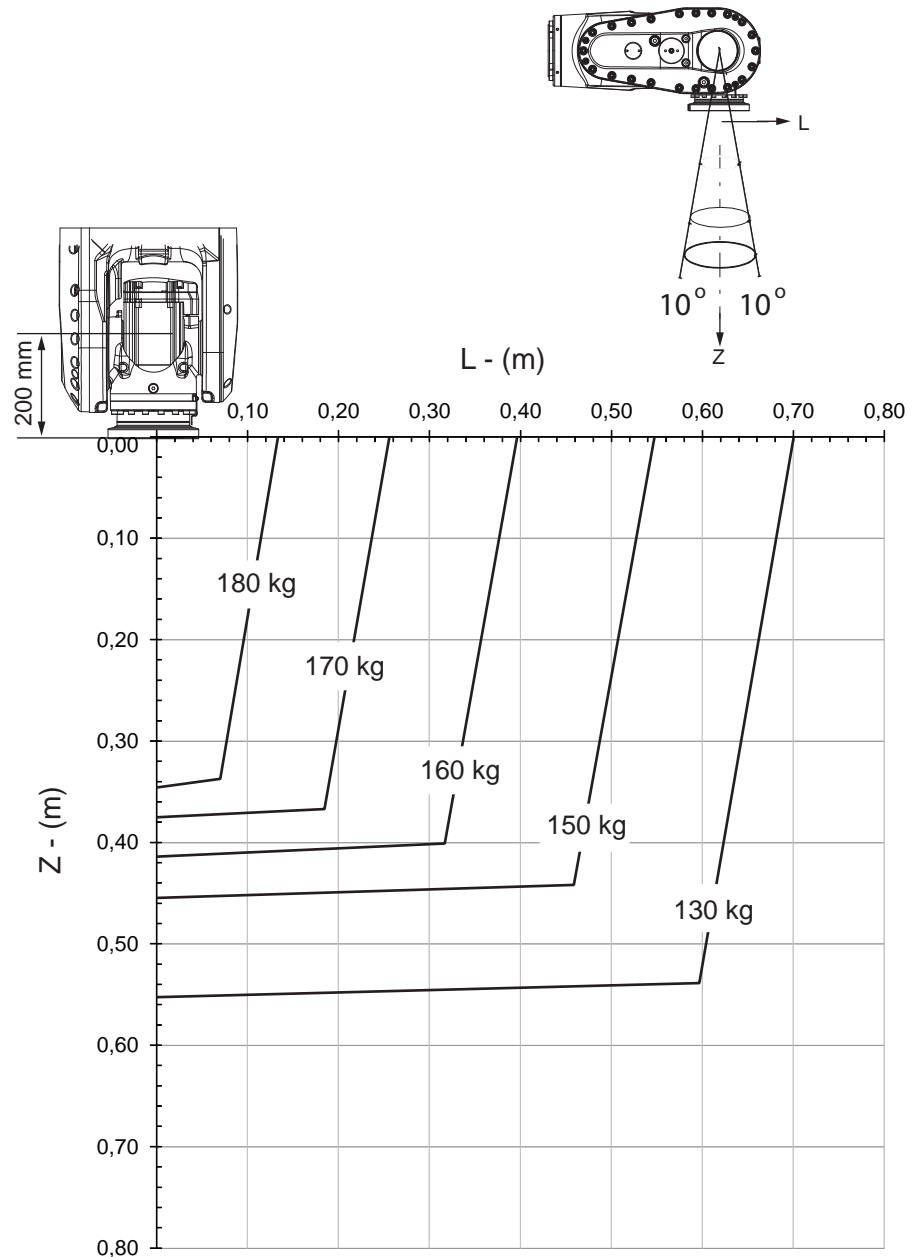
IRB 6700-155/2.85



xx1300000336

Continues on next page

IRB 6700-155/2.85 "Vertical Wrist" ( $\pm 10^\circ$ )



xx1300000337

	Description
Max load	186 kg
Z <sub>max</sub>	0.327 m
L <sub>max</sub>	0.101 m

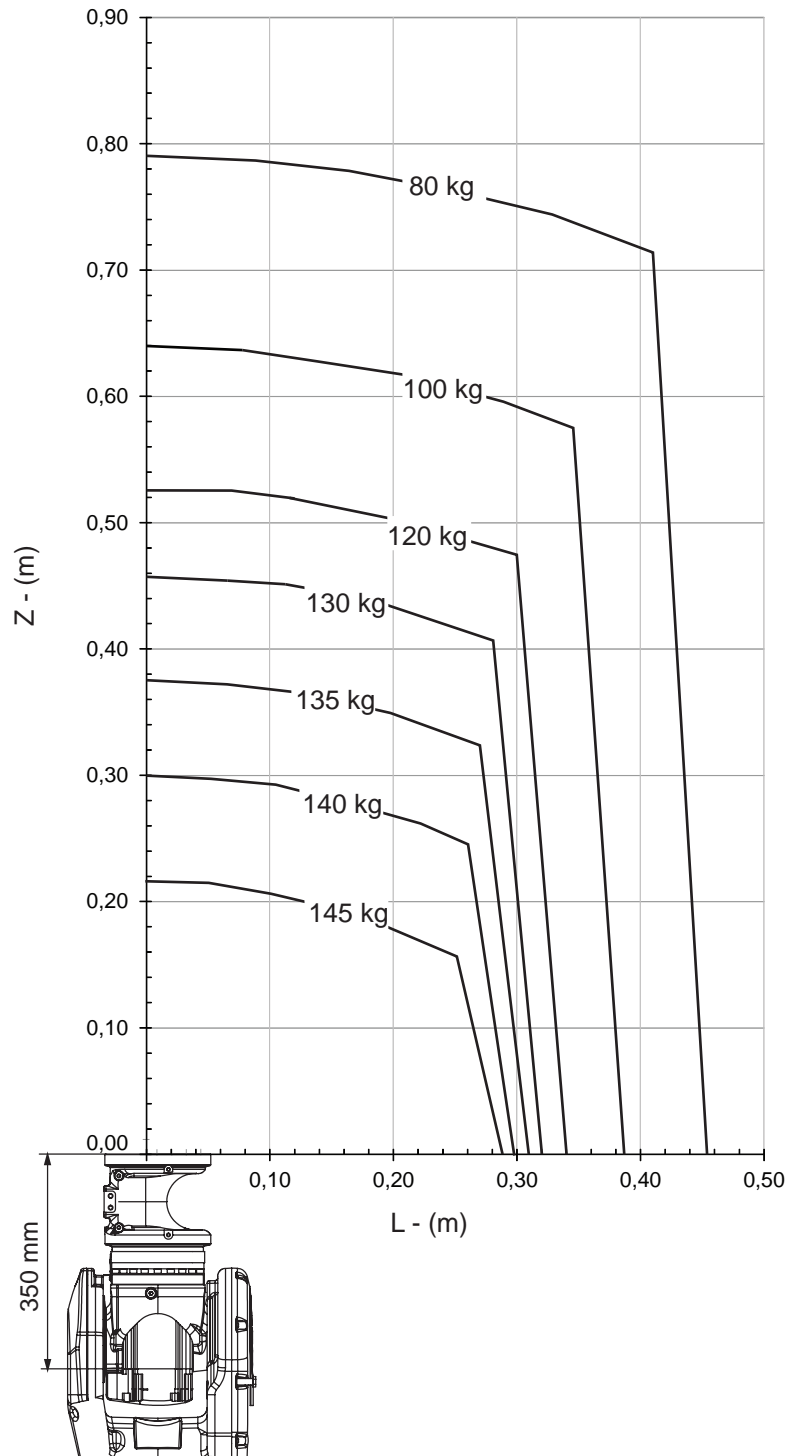
Continues on next page

# 1 Description

## 1.5.2 Diagrams

Continued

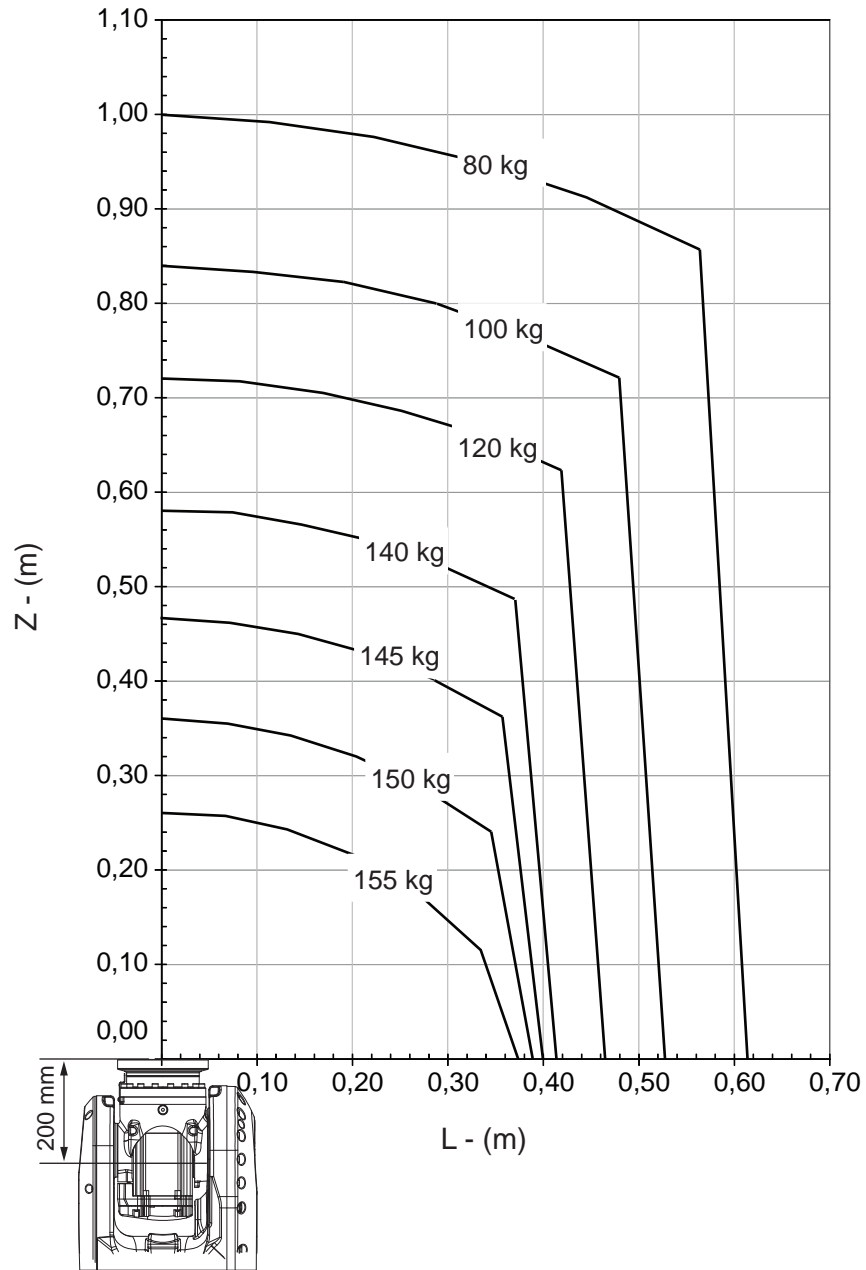
### IRB 6700-140/2.85 LID



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IRB 6700-150/3.20



xx130000255

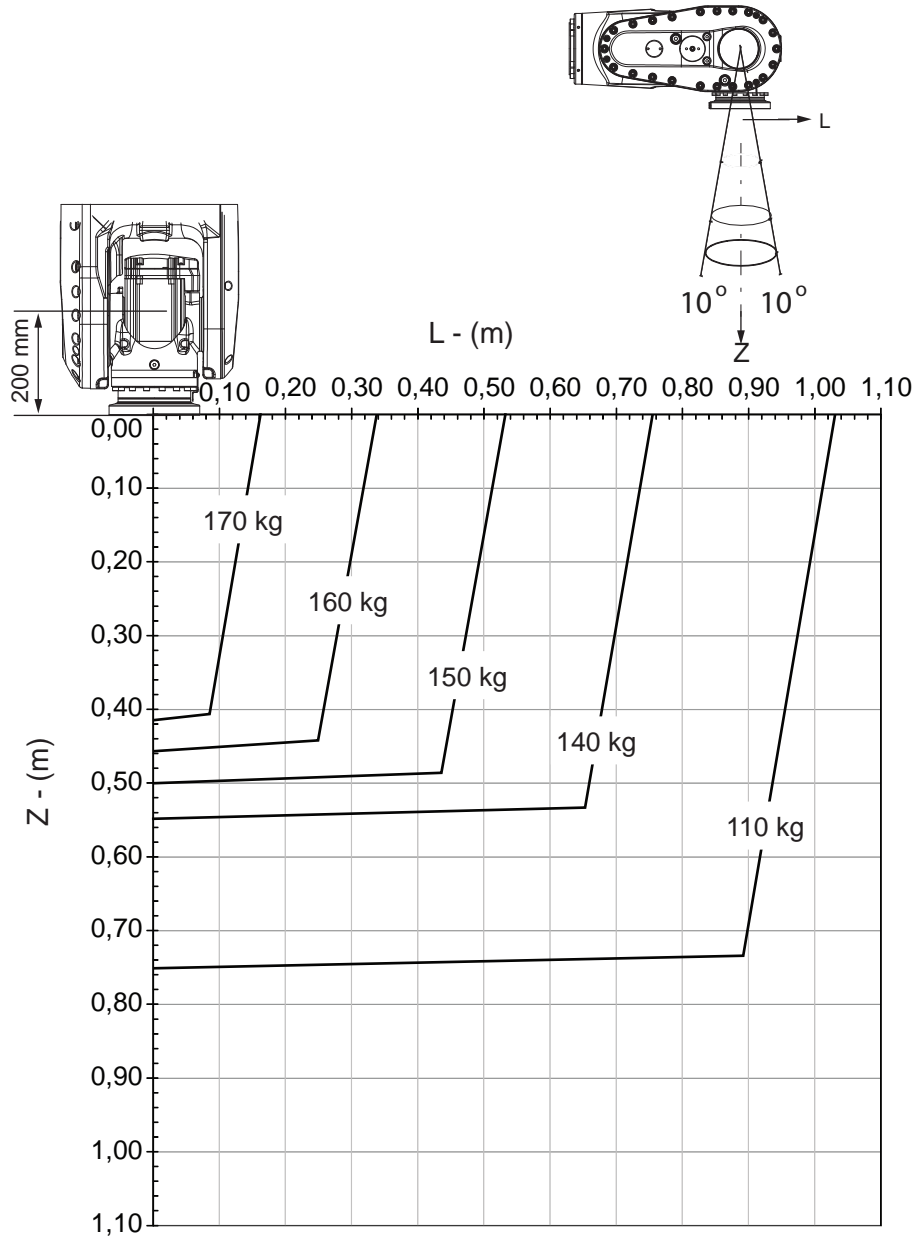
Continues on next page

# 1 Description

## 1.5.2 Diagrams

Continued

### IRB 6700-150/3.20 "Vertical Wrist" ( $\pm 10^\circ$ )



xx1300000256

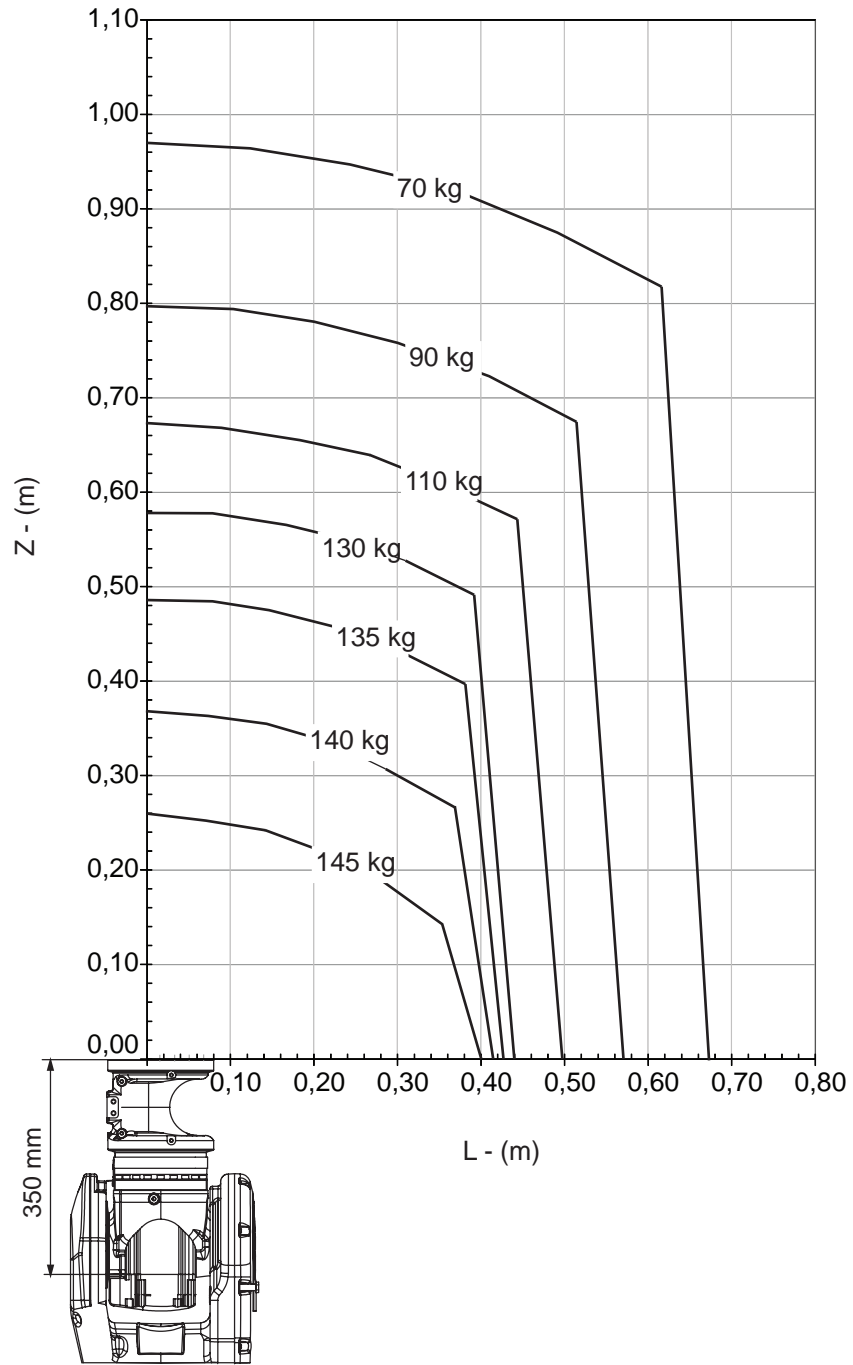
For wrist down ( $0^\circ$  deviation from the vertical line).

	Description
Max load	177 kg
Z <sub>max</sub>	0.394 m
L <sub>max</sub>	0.106 m

Continues on next page



IRB 6700-145/3.20 LID



xx1300000257

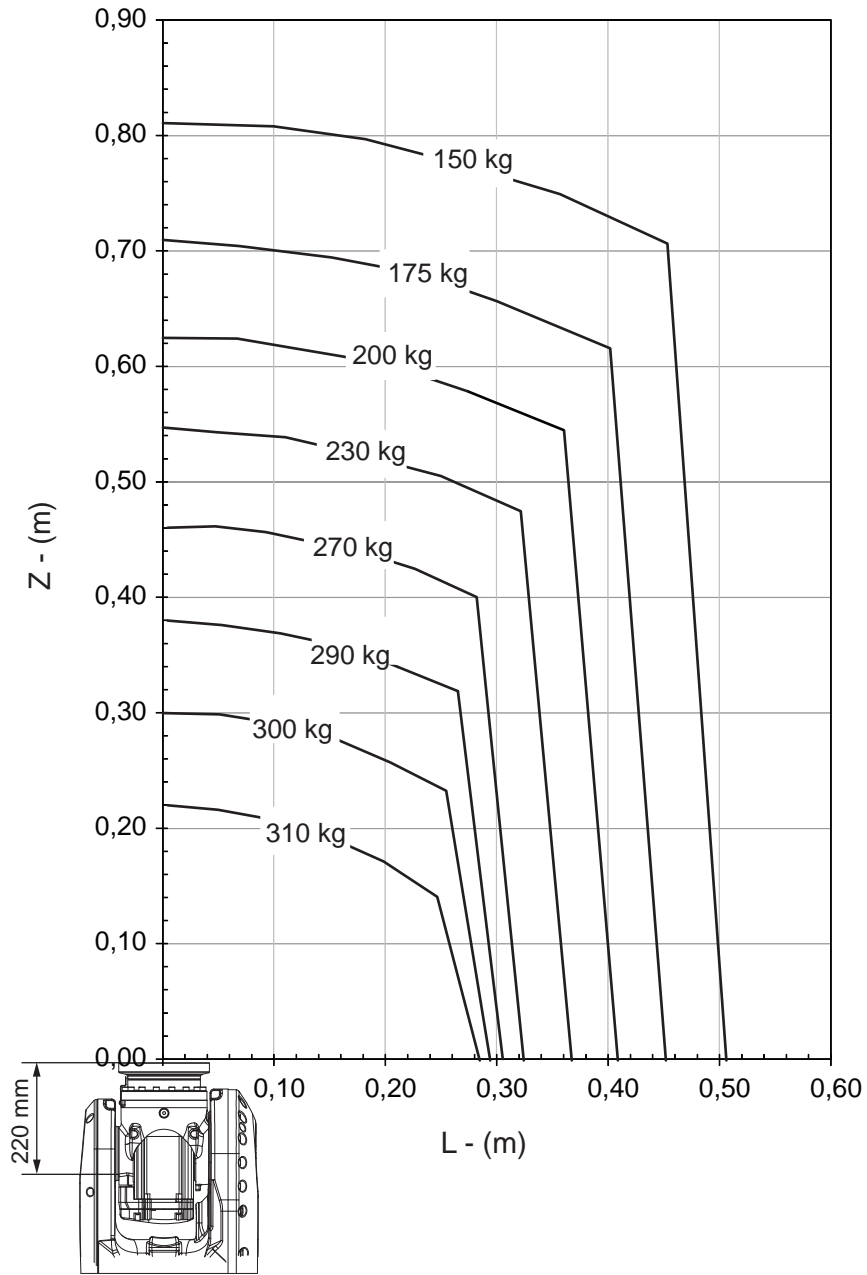
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# 1 Description

## 1.5.2 Diagrams

Continued

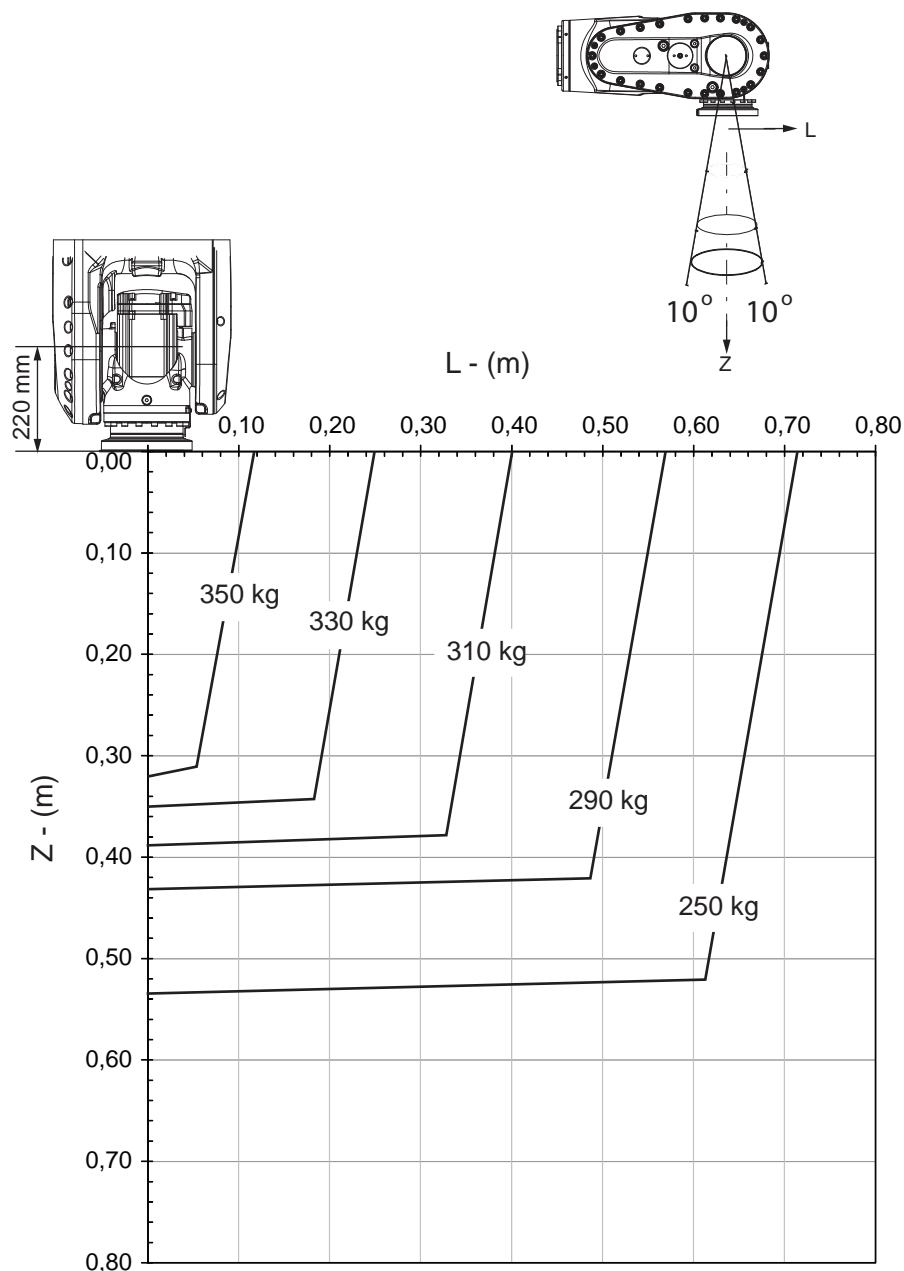
### IRB 6700-300/2.70



xx1400002044

Continues on next page

IRB 6700-300/2.70 "Vertical Wrist" ( $\pm 10^\circ$ )



xx1400002045

For wrist down ( $0^\circ$  deviation from the vertical line).

	Description
Max load	357 kg
$Z_{max}$	0.308 m
$L_{max}$	0.102 m

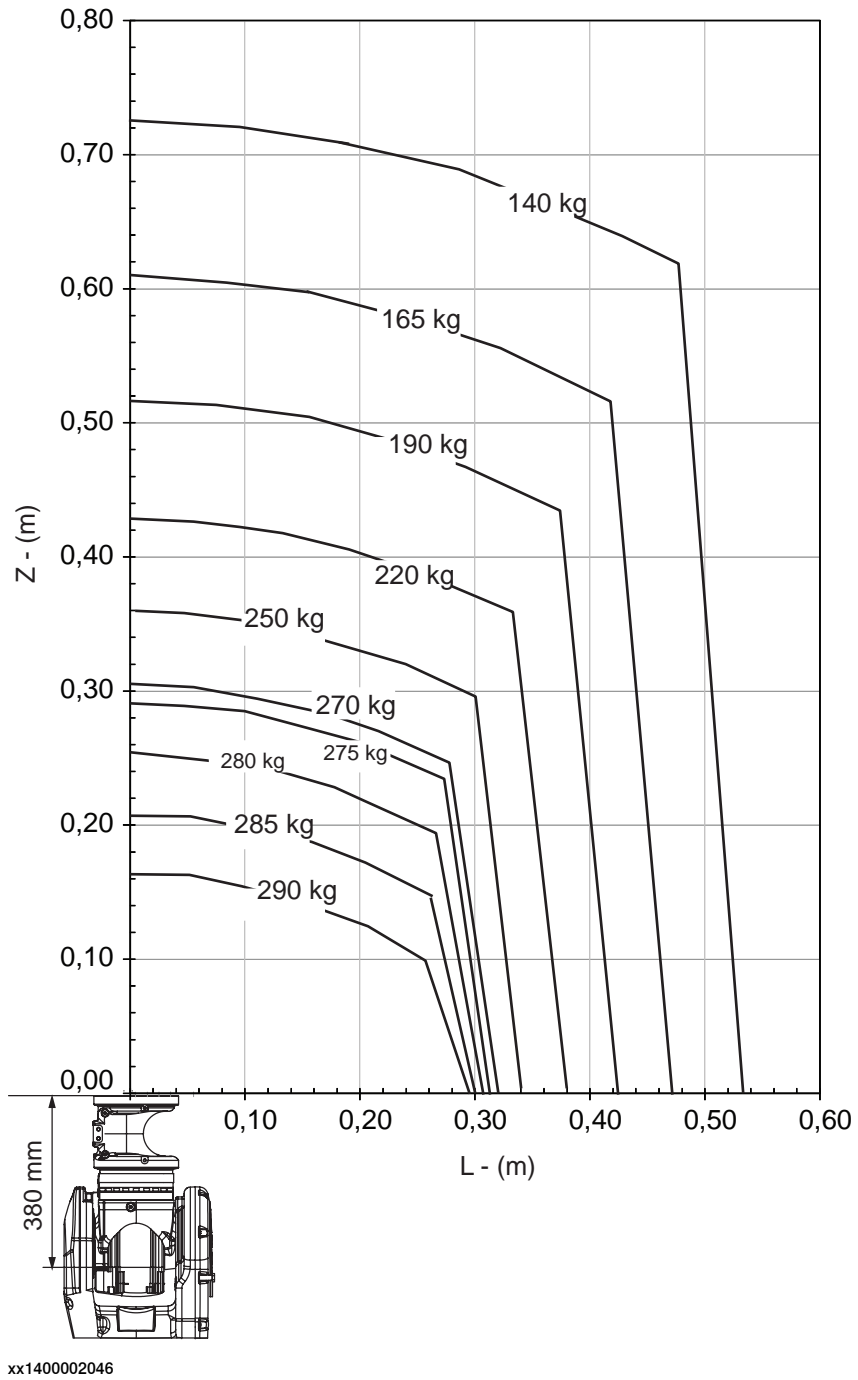
Continues on next page

# 1 Description

## 1.5.2 Diagrams

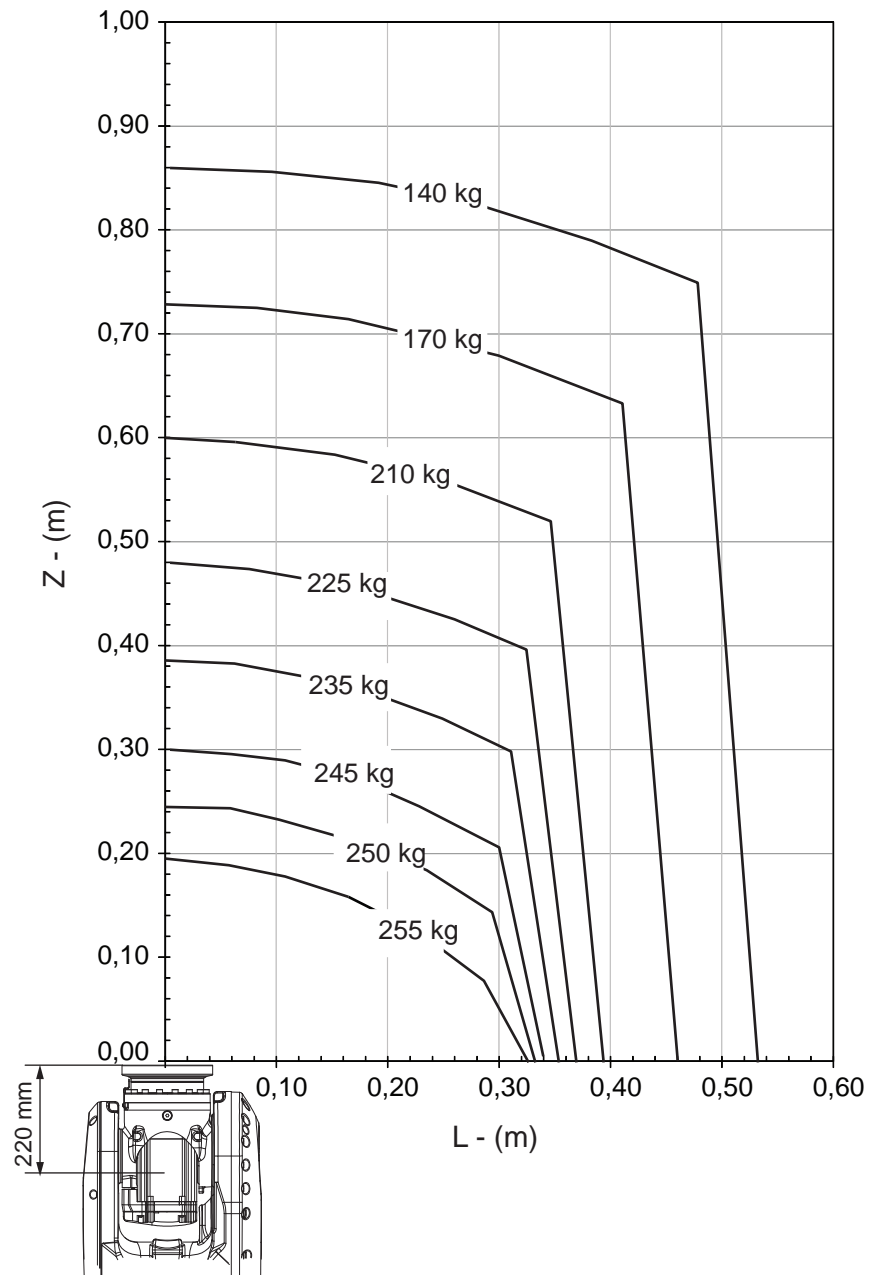
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### IRB 6700-270/2.70 LID



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IRB 6700-245/3.00



xx1400002041

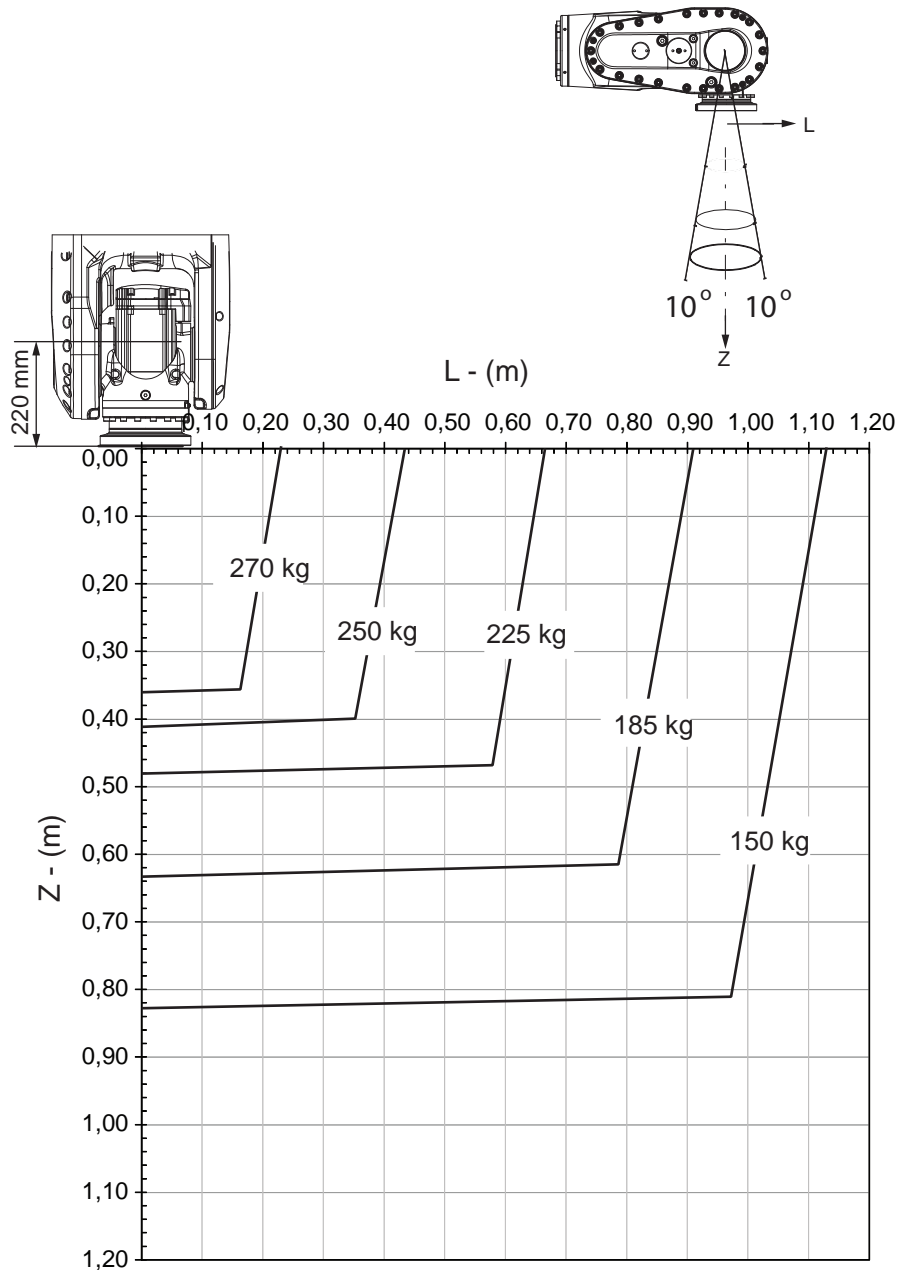
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# 1 Description

## 1.5.2 Diagrams

Continued

### IRB 6700-245/3.00 "Vertical Wrist" ( $\pm 10^\circ$ )



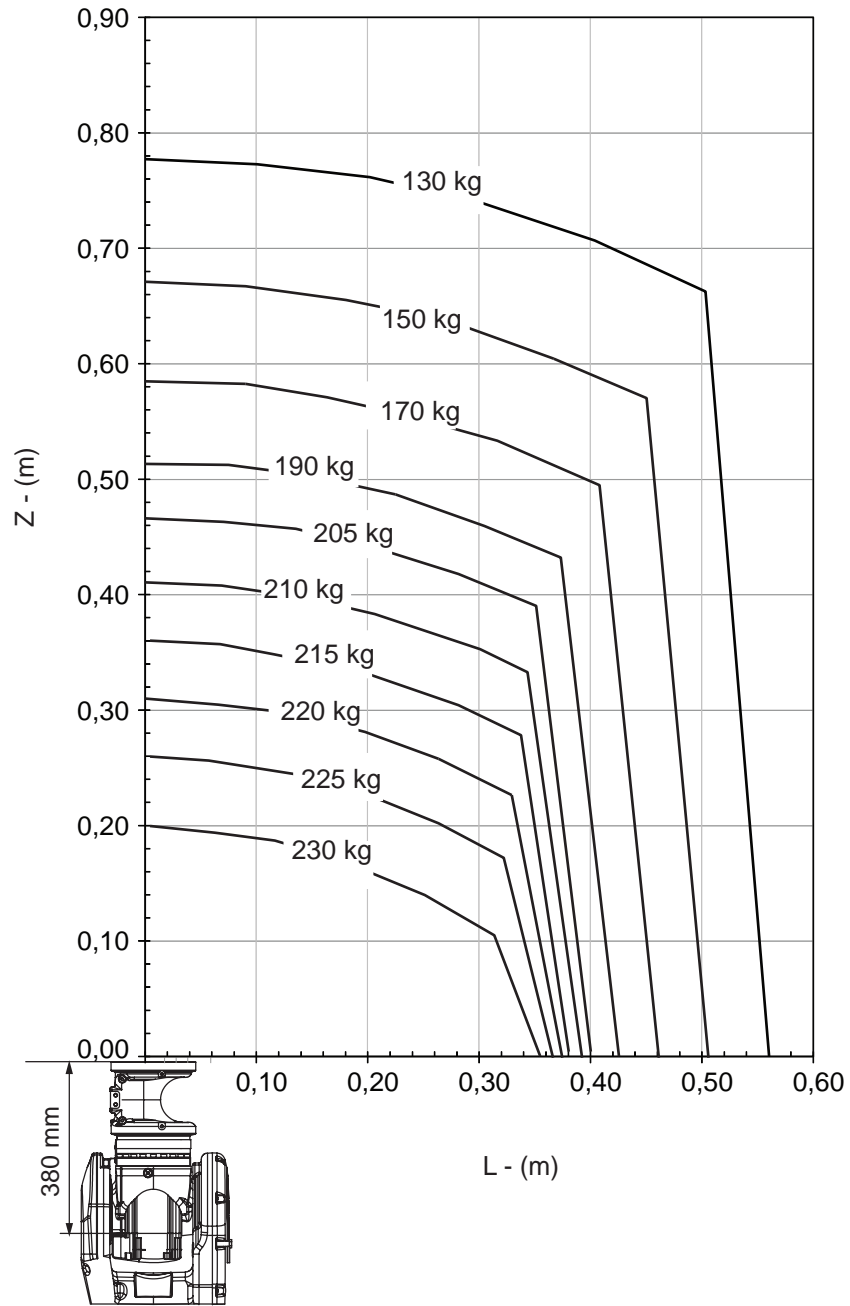
xx1400002042

For wrist down ( $0^\circ$  deviation from the vertical line).

	Description
Max load	315 kg
Z <sub>max</sub>	0.280 m
L <sub>max</sub>	0.102 m

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IRB 6700-220/3.00 LID



xx1400002043

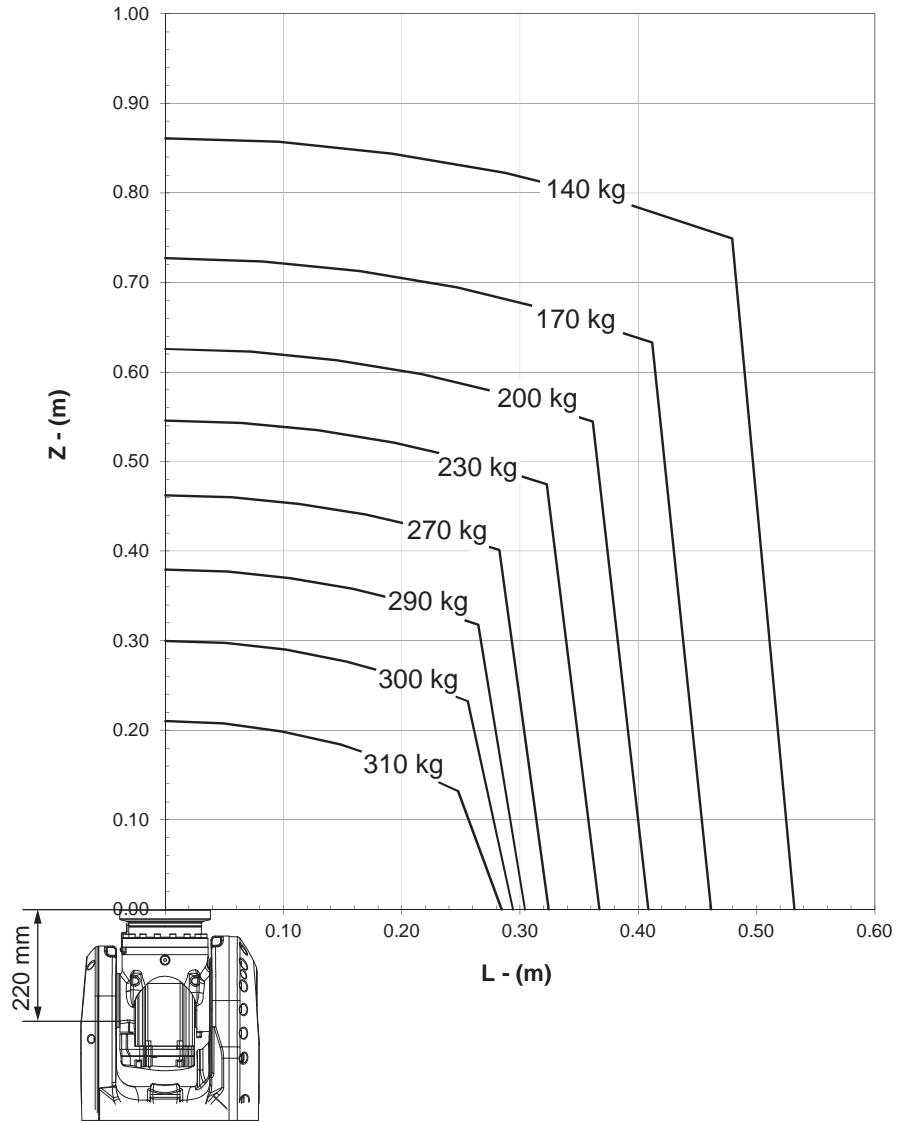
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# 1 Description

## 1.5.2 Diagrams

Continued

IRB 6700I-300/2.60

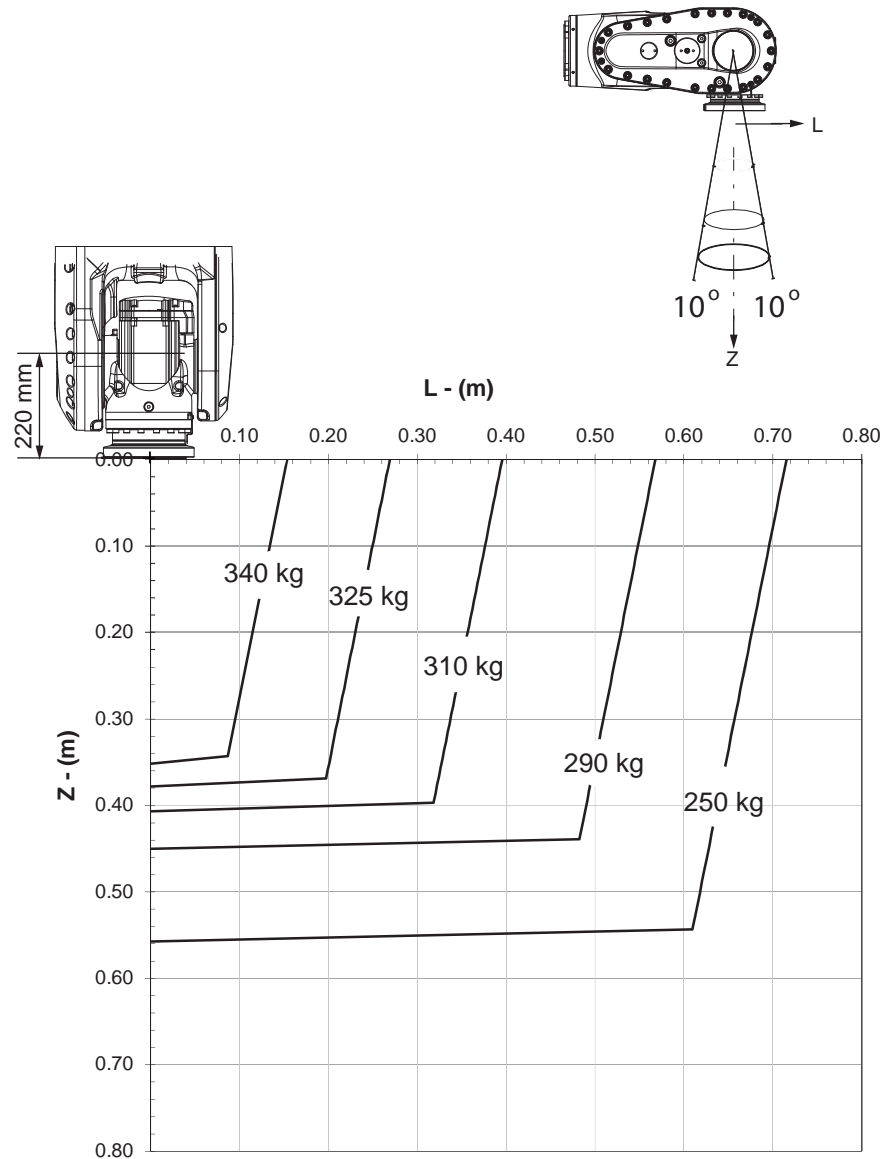


xx1600002017

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"Vertical Wrist" ( $\pm 10^\circ$ ) IRB 6700I-300/2.60



xx1600002018

For wrist down ( $0^\circ$  deviation from the vertical line).

	Description
Max load	352 kg
Z <sub>max</sub>	0.332 m
L <sub>max</sub>	0.105 m

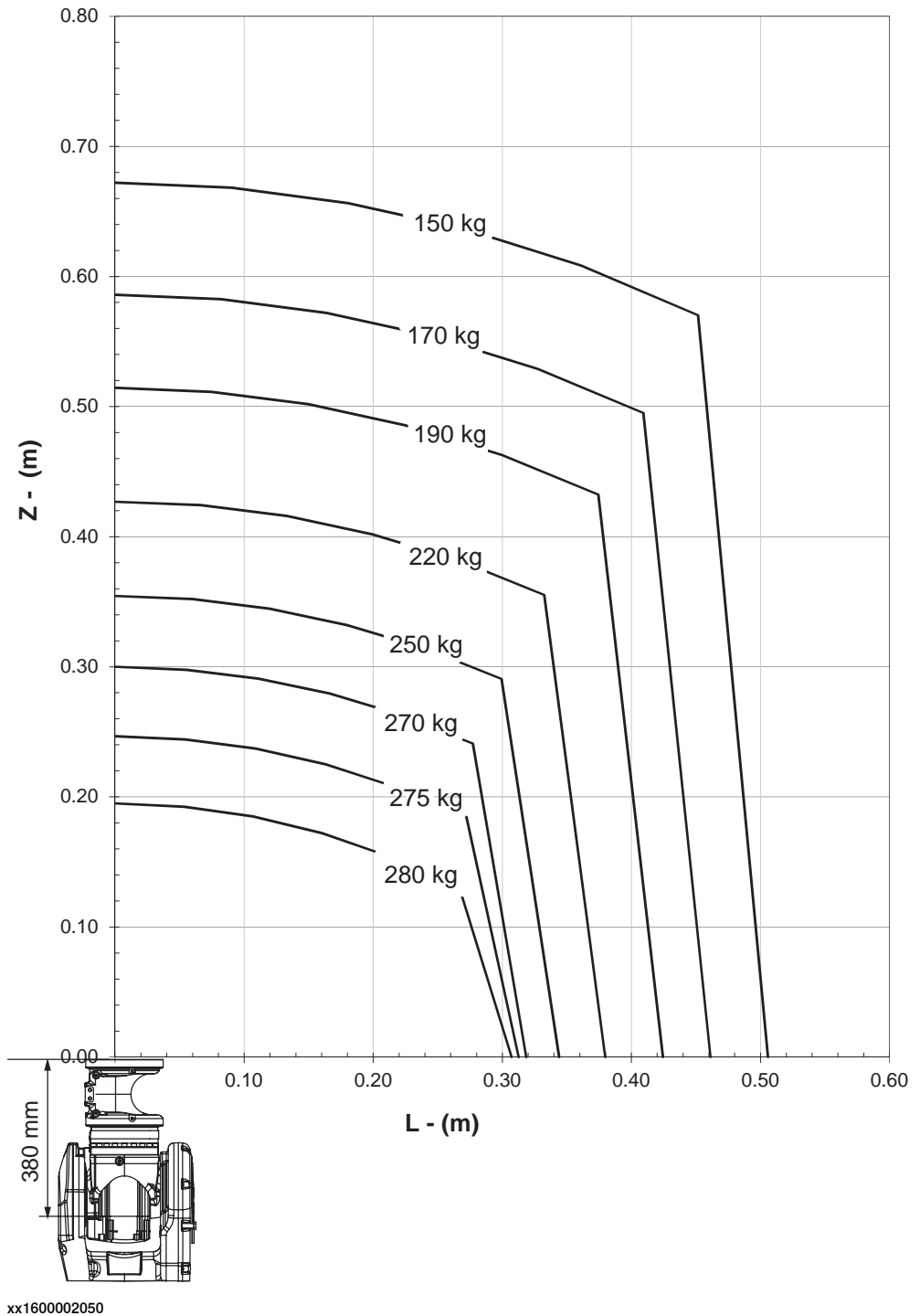
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# 1 Description

## 1.5.2 Diagrams

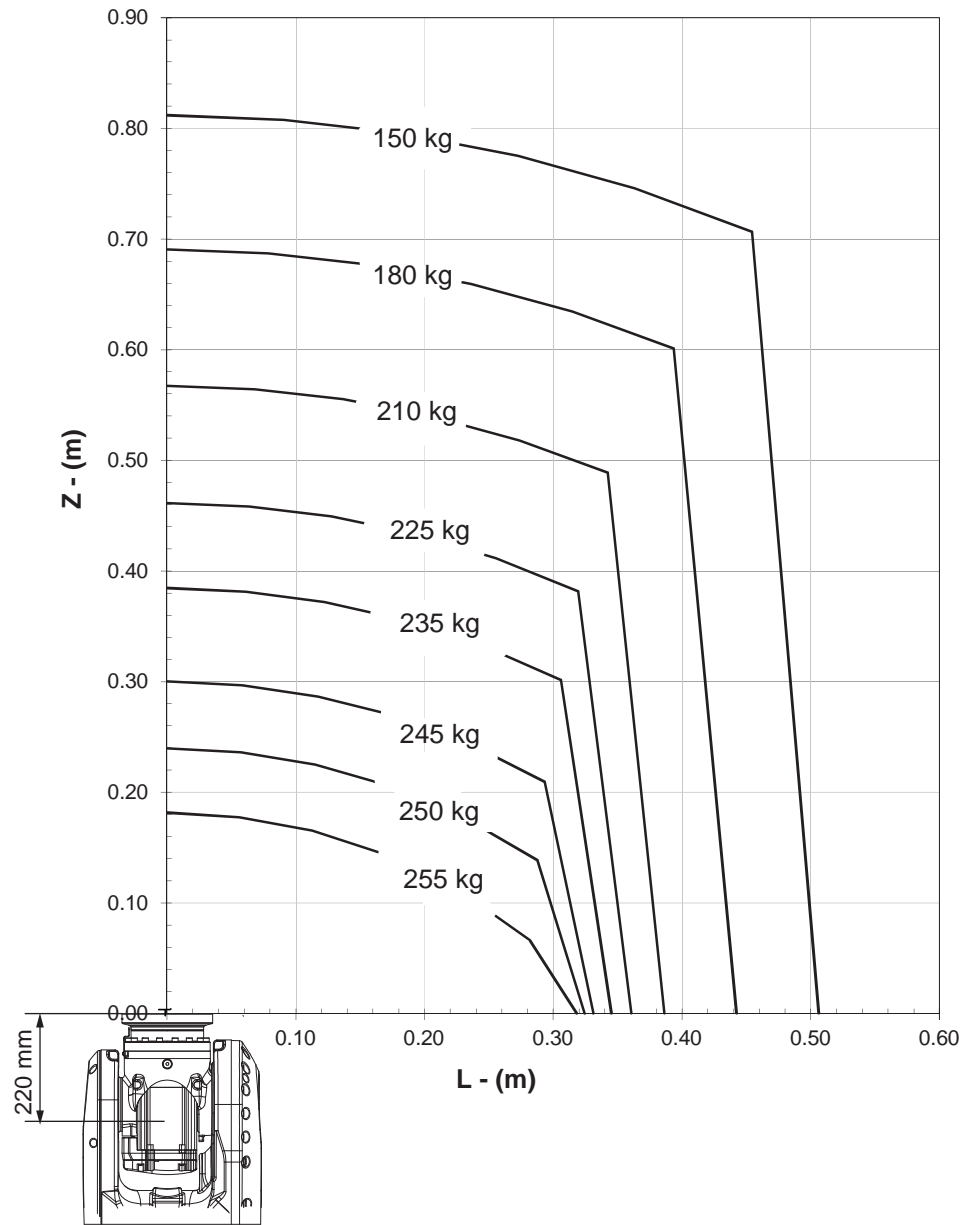
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### IRB 6700I-270/2.60 LID



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IRB 6700I-245/2.90



xx1600002019

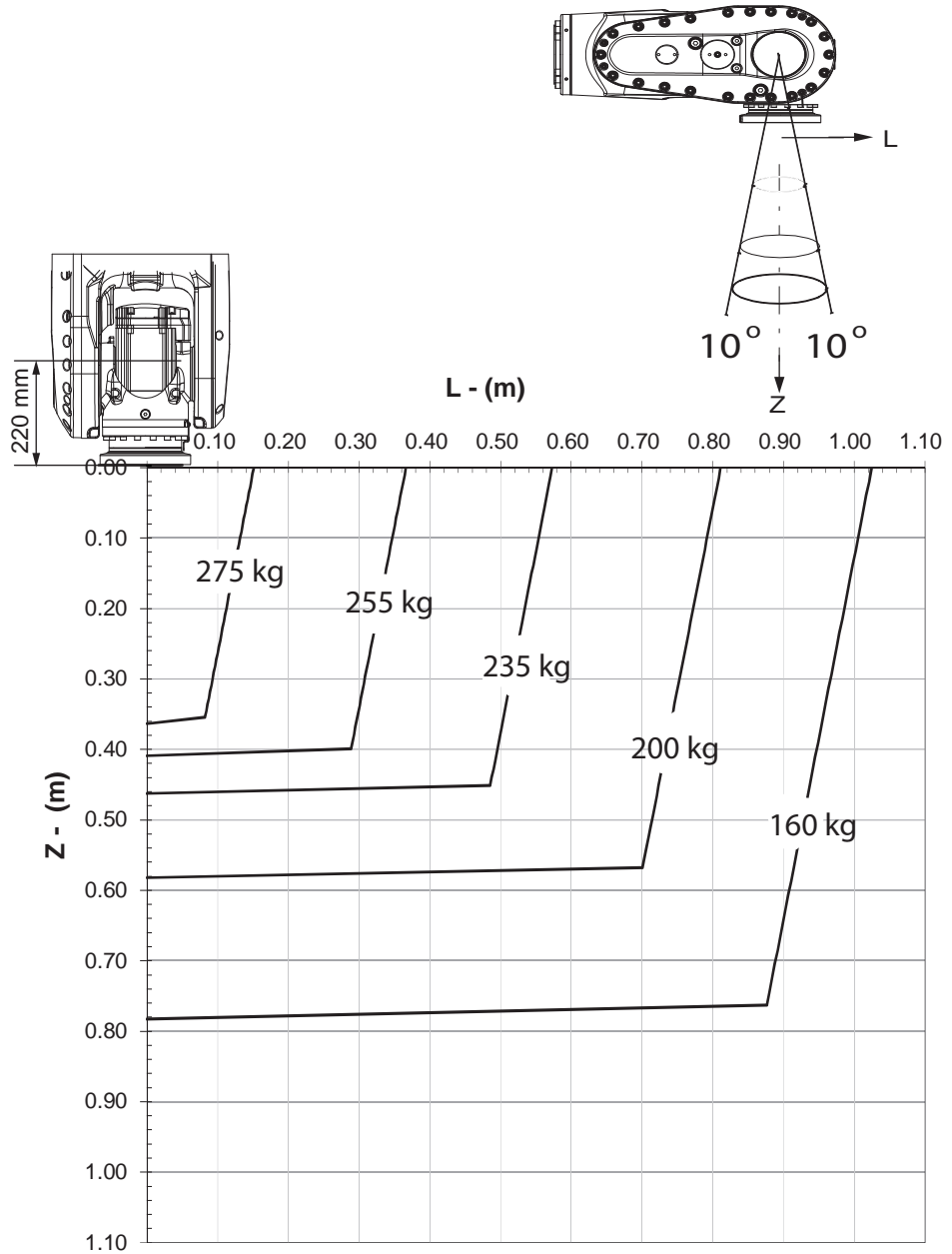
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# 1 Description

## 1.5.2 Diagrams

Continued

### "Vertical Wrist" ( $\pm 10^\circ$ ) IRB 6700I-245/2.90



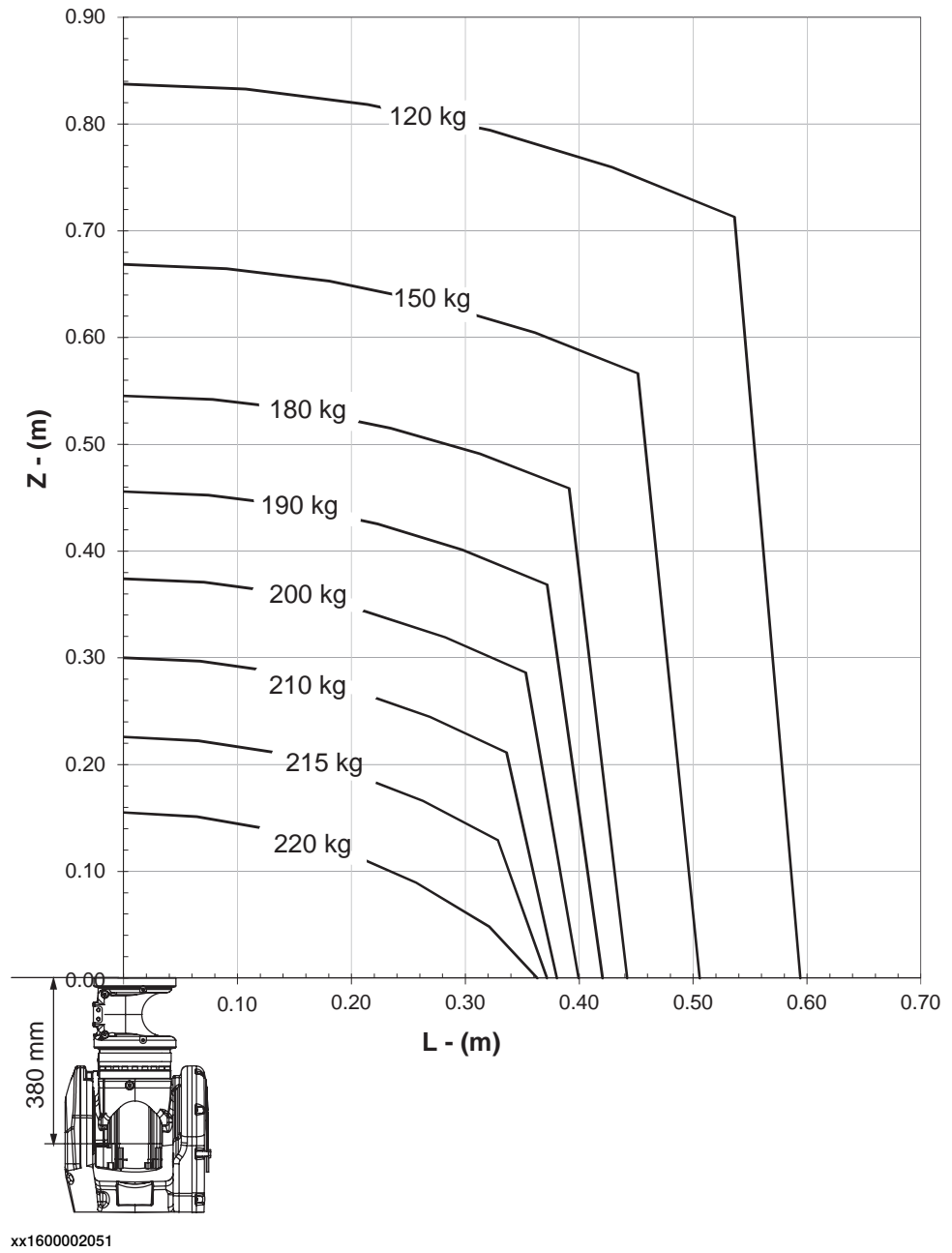
xx1600002020

For wrist down ( $0^\circ$  deviation from the vertical line).

	Description
Max load	284 kg
Z <sub>max</sub>	0.345 m
L <sub>max</sub>	0.101 m

Continues on next page

IRB 6700I-210/2.90 LID



# 1 Description

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

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



#### Note

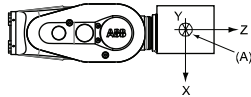
Total load given as: mass in kg, center of gravity (Z and L) in meters and moment of inertia ( $J_{ox}$ ,  $J_{oy}$ ,  $J_{oz}$ ) in  $\text{kgm}^2$ .  $L = \sqrt{X^2 + Y^2}$ , see the following figure.

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

Axis	Robot type	Maximum moment of inertia	
5	IRB 6700-235/2.65 IRB 6700-205/2.80 IRB 6700-175/3.05 IRB 6700-150/3.20	$Ja_5 = \text{Load} \times ((Z + 0.200^i)^2 + L^2) + \max(J_{0x}, J_{0y}) \leq 250 \text{ kgm}^2$	
	IRB 6700-200/2.60 IRB 6700-155/2.85	$Ja_5 = \text{Load} \times ((Z + 0.200^i)^2 + L^2) + \max(J_{0x}, J_{0y}) \leq 195 \text{ kgm}^2$	
	IRB 6700-300/2.70 IRB 6700-245/3.00 IRB 6700Inv-300/2.60 IRB 6700Inv-245/2.90	$Ja_5 = \text{Load} \times ((Z + 0.220^{ii})^2 + L^2) + \max(J_{0x}, J_{0y}) \leq 325 \text{ kgm}^2$	
	6	IRB 6700-235/2.65 IRB 6700-205/2.80 IRB 6700-175/3.05 IRB 6700-150/3.20	$Ja_6 = \text{Load} \times L^2 + J_{0z} \leq 185 \text{ kgm}^2$
		IRB 6700-200/2.60 IRB 6700-155/2.85	$Ja_6 = \text{Load} \times L^2 + J_{0z} \leq 145 \text{ kgm}^2$
		IRB 6700-300/2.70 IRB 6700-245/3.00 IRB 6700Inv-300/2.60 IRB 6700Inv-245/2.90	$Ja_6 = \text{Load} \times L^2 + J_{0z} \leq 225 \text{ kgm}^2$

i For option 780-4, LeanID = 0.350 m

ii For option 780-4, LeanID = 0.380 m



xx1400002028

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

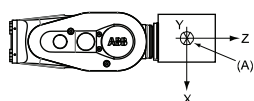
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## 1.5.3 Maximum load and moment of inertia for full and limited axis 5 (center line down) movement

*Continued*

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

Axis	Robot type	Maximum moment of inertia
5	IRB 6700-235/2.65 IRB 6700-205/2.80 IRB 6700-175/3.05 IRB 6700-150/3.20	$Ja_5 = \text{Load} \times ((Z + 0.200)^2 + L^2) + \max(J_{0x}, J_{0y}) \leq 250 \text{ kgm}^2$
	IRB 6700-220/2.65 LID IRB 6700-200/2.80 LID IRB 6700-155/3.05 LID IRB 6700-145/3.20 LID	$Ja_5 = \text{Load} \times ((Z + 0.350)^2 + L^2) + \max(J_{0x}, J_{0y}) \leq 250 \text{ kgm}^2$
	IRB 6700-200/2.60 IRB 6700-155/2.85	$Ja_5 = \text{Load} \times ((Z + 0.200)^2 + L^2) + \max(J_{0x}, J_{0y}) \leq 195 \text{ kgm}^2$
	IRB 6700-175/2.60 LID IRB 6700-140/2.85 LID	$Ja_5 = \text{Load} \times ((Z + 0.350)^2 + L^2) + \max(J_{0x}, J_{0y}) \leq 195 \text{ kgm}^2$
	IRB 6700-300/2.70 IRB 6700-245/3.00 IRB 6700I-300/2.60 IRB 6700I-245/2.90	$Ja_5 = \text{Load} \times ((Z + 0.220)^2 + L^2) + \max(J_{0x}, J_{0y}) \leq 325 \text{ kgm}^2$
	IRB 6700-270/2.70 LID IRB 6700-220/3.00 LID IRB 6700I-270/2.60 LID IRB 6700I-210/2.90 LID	$Ja_5 = \text{Load} \times ((Z + 0.380)^2 + L^2) + \max(J_{0x}, J_{0y}) \leq 325 \text{ kgm}^2$
	6	IRB 6700-235/2.65 IRB 6700-220/2.65 LID IRB 6700-205/2.80 IRB 6700-200/2.80 LID IRB 6700-175/3.05 IRB 6700-155/3.05 LID IRB 6700-150/3.20 IRB 6700-145/3.20 LID
IRB 6700-200/2.60 IRB 6700-175/2.60 LID IRB 6700-155/2.85 IRB 6700-140/2.85 LID		$Ja_6 = \text{Load} \times L^2 + J_{0z} \leq 145 \text{ kgm}^2$
IRB 6700-300/2.70 IRB 6700-270/2.70 LID IRB 6700-245/3.00 IRB 6700-220/3.00 LID IRB 6700I-300/2.60 IRB 6700I-270/2.60 LID IRB 6700I-245/2.90 IRB 6700I-210/2.90 LID		$Ja_6 = \text{Load} \times L^2 + J_{0z} \leq 225 \text{ kgm}^2$



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*Continues on next page*

## 1 Description

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

*Continued*

Pos	Description
A	Center of gravity

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

*Continues on next page*



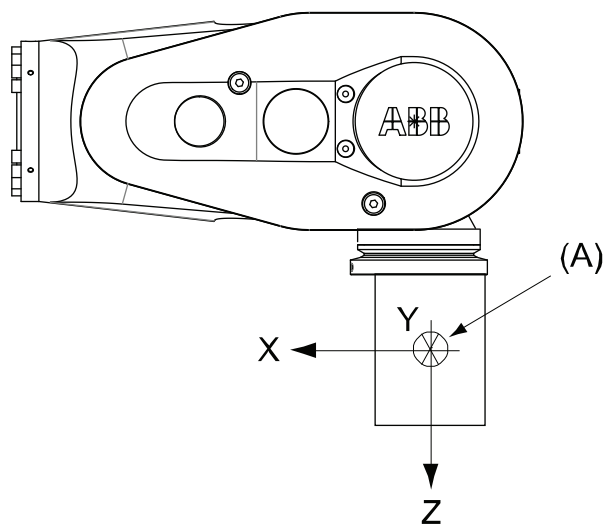
## 1.5.3 Maximum load and moment of inertia for full and limited axis 5 (center line down) movement Continued

### Limited axis 5, center line down

Axis	Robot type	Maximum moment of inertia
5	IRB 6700-235/2.65 IRB 6700-205/2.80 IRB 6700-175/3.05 IRB 6700-150/3.20	$Ja_5 = \text{Load} \times ((Z + 0.200^i)^2 + L^2) + \max(J_{0x}, J_{0y}) \leq 275 \text{ kgm}^2$
	IRB 6700-200/2.60 IRB 6700-155/2.85	$Ja_5 = \text{Load} \times ((Z + 0.200^i)^2 + L^2) + \max(J_{0x}, J_{0y}) \leq 215 \text{ kgm}^2$
	IRB 6700-300/2.70 IRB 6700-245/3.00 IRB 6700Inv-300/2.60 IRB 6700Inv-245/2.90	$Ja_5 = \text{Load} \times ((Z + 0.220^{ii})^2 + L^2) + \max(J_{0x}, J_{0y}) \leq 360 \text{ kgm}^2$
6	IRB 6700-235/2.65 IRB 6700-205/2.80 IRB 6700-175/3.05 IRB 6700-150/3.20	$Ja_6 = \text{Load} \times L^2 + J_{0z} \leq 250 \text{ kgm}^2$
	IRB 6700-200/2.60 IRB 6700-155/2.85	$Ja_6 = \text{Load} \times L^2 + J_{0z} \leq 195 \text{ kgm}^2$
	IRB 6700-300/2.70 IRB 6700-245/3.00 IRB 6700Inv-300/2.60 IRB 6700Inv-245/2.90	$Ja_6 = \text{Load} \times L^2 + J_{0z} \leq 320 \text{ kgm}^2$

i For option 780-4, LeanID = 0,350 m

ii For option 780-4, LeanID = 0,380 m



xx1400002029

Pos	Description
A	Center of gravity
	<b>Description</b>
$J_{0x}, J_{0y}, J_{0z}$	Max. moment of inertia around the X, Y and Z axes at center of gravity.

Continues on next page

# 1 Description

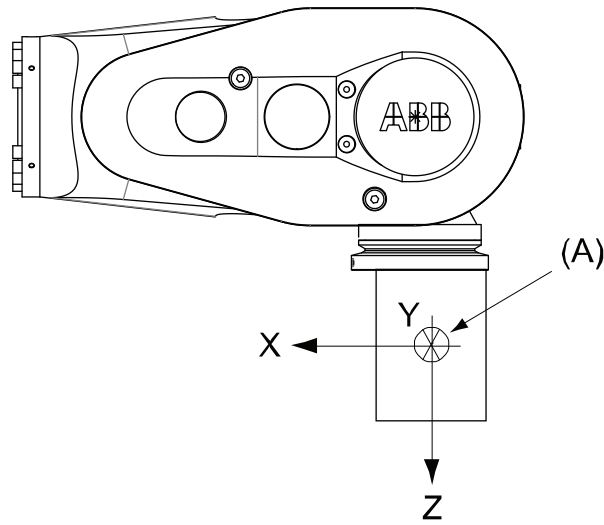
## 1.5.3 Maximum load and moment of inertia for full and limited axis 5 (center line down) movement Continued

### Limited axis 5, center line down

Axis	Robot type	Maximum moment of inertia
5	IRB 6700-235/2.65 IRB 6700-205/2.80 IRB 6700-175/3.05 IRB 6700-150/3.20	$Ja_5 = \text{Load} \times ((Z + 0.200)^2 + L^2) + \max(J_{0x}, J_{0y}) \leq 275 \text{ kgm}^2$
	IRB 6700-220/2.65 LID IRB 6700-200/2.80 LID IRB 6700-155/3.05 LID IRB 6700-145/3.20 LID	$Ja_5 = \text{Load} \times ((Z + 0.350)^2 + L^2) + \max(J_{0x}, J_{0y}) \leq 275 \text{ kgm}^2$
	IRB 6700-200/2.60 IRB 6700-155/2.85	$Ja_5 = \text{Load} \times ((Z + 0.200)^2 + L^2) + \max(J_{0x}, J_{0y}) \leq 215 \text{ kgm}^2$
	IRB 6700-175/2.60 LID IRB 6700-140/2.85 LID	$Ja_5 = \text{Load} \times ((Z + 0.350)^2 + L^2) + \max(J_{0x}, J_{0y}) \leq 215 \text{ kgm}^2$
	IRB 6700-300/2.70 IRB 6700-245/3.00 IRB 6700I-300/2.60 IRB 6700I-245/2.90	$Ja_5 = \text{Load} \times ((Z + 0.220)^2 + L^2) + \max(J_{0x}, J_{0y}) \leq 360 \text{ kgm}^2$
	IRB 6700-270/2.70 LID IRB 6700-220/3.00 LID IRB 6700I-270/2.60 LID IRB 6700I-210/2.90 LID	$Ja_5 = \text{Load} \times ((Z + 0.380)^2 + L^2) + \max(J_{0x}, J_{0y}) \leq 360 \text{ kgm}^2$
	6	IRB 6700-235/2.65 IRB 6700-220/2.65 LID IRB 6700-205/2.80 IRB 6700-200/2.80 LID IRB 6700-175/3.05 IRB 6700-155/3.05 LID IRB 6700-150/3.20 IRB 6700-145/3.20 LID
IRB 6700-200/2.60 IRB 6700-175/2.60 LID IRB 6700-155/2.85 IRB 6700-140/2.85 LID		$Ja_6 = \text{Load} \times L^2 + J_{0z} \leq 195 \text{ kgm}^2$
IRB 6700-300/2.70 IRB 6700-270/2.70 LID IRB 6700-245/3.00 IRB 6700-220/3.00 LID IRB 6700I-300/2.60 IRB 6700I-270/2.60 LID IRB 6700I-245/2.90 IRB 6700I-210/2.90 LID		$Ja_6 = \text{Load} \times L^2 + J_{0z} \leq 320 \text{ kgm}$

Continues on next page

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



xx140002029

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

# 1 Description

## 1.5.4 Wrist torque

### 1.5.4 Wrist torque



#### Note

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

#### Torque

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

Robot type	Max wrist torque axis 4 and 5	Max wrist torque axis 6	Max torque valid at load
IRB 6700 - 235/2.65	1,324 Nm	650 Nm	225 kg
IRB 6700 - 205/2.80	1,263 Nm	625 Nm	192 kg
IRB 6700 - 200/2.60	981 Nm	429 Nm	175 kg
IRB 6700 - 175/3.05	1,179 Nm	589 Nm	154 kg
IRB 6700 - 155/2.85	927 Nm	410 Nm	144 kg
IRB 6700 - 150/3.20	1,135 Nm	570 Nm	137 kg
IRB 6700 - 300/2.70	1,825 Nm	865 Nm	280 kg
IRB 6700 - 245/3.00	1,693 Nm	815 Nm	214 kg
IRB 6700I - 300/2.60	1,825 Nm	865 Nm	280 kg
IRB 6700I - 245/2.90	1,645 Nm	796 Nm	194 kg

#### Torque for LeanID variants

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

Robot type	Max wrist torque axis 4 and 5	Max wrist torque axis 6	Max torque valid at load
IRB 6700 - 270/2.70 LID	1,825 Nm	865 Nm	280 kg
IRB 6700 - 220/3.00 LID	1,693 Nm	815 Nm	214 kg
IRB 6700 - 220/2.65 LID	1,324 Nm	650 Nm	225 kg
IRB 6700 - 200/2.80 LID	1,263 Nm	625 Nm	192 kg
IRB 6700 - 175/2.60 LID	981 Nm	429 Nm	175 kg
IRB 6700 - 155/3.05 LID	1,179 Nm	589 Nm	154 kg
IRB 6700 - 140/2.85 LID	927 Nm	410 Nm	144 kg
IRB 6700 - 145/3.20 LID	1,135 Nm	570 Nm	137 kg
IRB 6700I - 270/2.60 LID	1,825 Nm	865 Nm	280 kg
IRB 6700I - 210/2.90 LID	1,645 Nm	796 Nm	194 kg

## 1.5.5 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 type	E-stop Max acceleration at nominal load COG [m/s <sup>2</sup> ]	Controlled Motion Max acceleration at nominal load COG [m/s <sup>2</sup> ]
IRB 6700 - 235/2.65	41	22
IRB 6700 - 205/2.8	45	24
IRB 6700 - 175/3.05	42	25
IRB 6700 - 150/3.2	47	24
IRB 6700 - 200/2.6	51	23
IRB 6700 - 155/2.85	47	29
IRB 6700 - 300/2.7	39	21
IRB 6700 - 245/3.0	44	27



#### 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 Description

## 1.6 Fitting equipment to the robot

### 1.6 Fitting equipment to the robot

#### General

Extra loads can be fitted on the upper arm housing, the lower arm, and on the frame. Definitions of distances and masses are shown in the following figures. The robot is supplied with holes for fitting extra equipment (see figure in [Holes for fitting extra equipment on page 81](#)). Maximum allowed arm load depends on center of gravity of arm load and robot payload.



#### Note

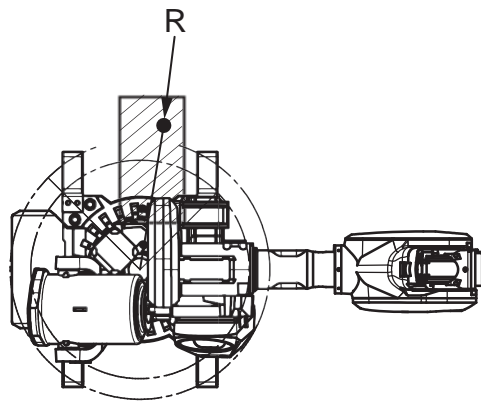
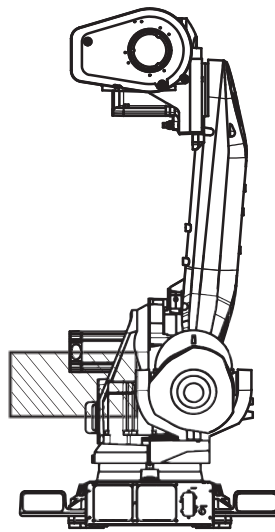
All equipment and cables used on the robot, must be designed and fitted not to damage the robot and/or its parts.

#### Frame (hip load)

Extra load can be fitted 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: <ul style="list-style-type: none"><li>• <math>J_{H0}</math> is the moment of inertia of the equipment</li><li>• <math>R</math> is the radius (m) from the center of axis 1</li><li>• <math>M4</math> is the total mass (kg) of the equipment including bracket and harness (<math>\leq 250 \text{ kg}</math>)</li></ul>

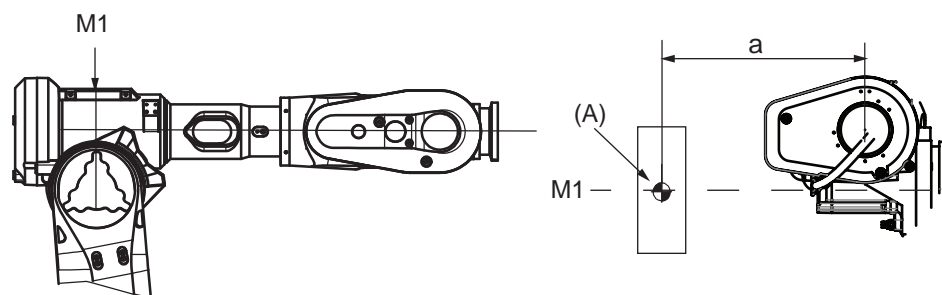
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Upper arm

Allowed extra load on the upper arm housing, in addition to the maximum handling weight, is  $M1 \leq 50$  kg with a distance ( $a$ )  $\leq 500$  mm from the center of gravity in the axis-3 extension.



xx1400002019

A	Mass center
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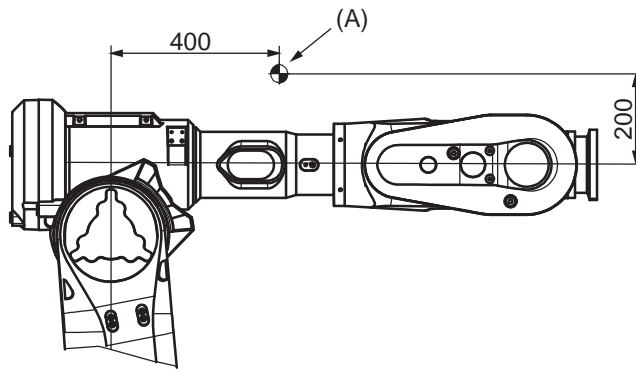
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# 1 Description

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## 1.6 Fitting equipment to the robot

*Continued*



xx130000866

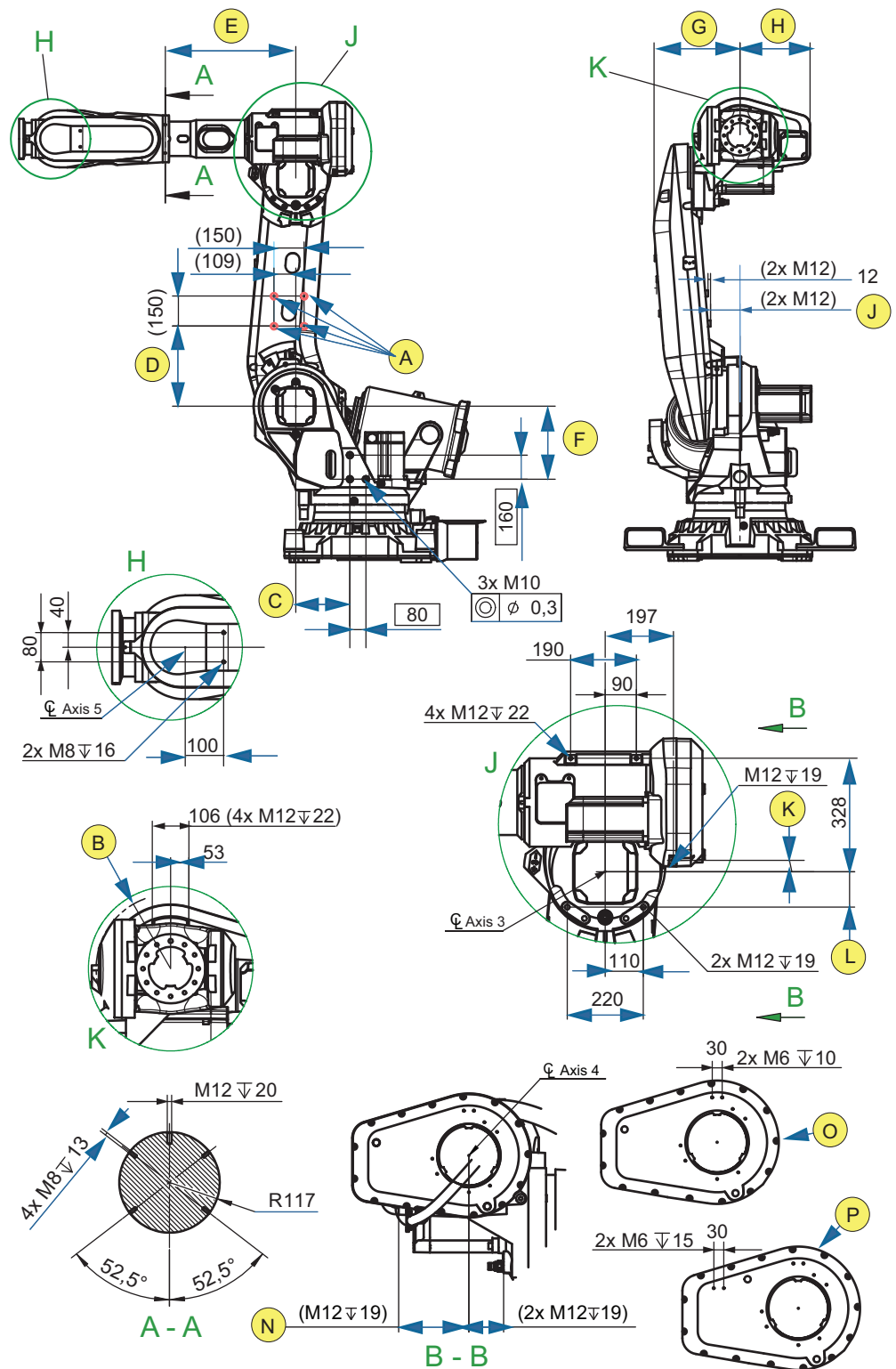
A	Center of gravity 50 kg
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Holes for fitting extra equipment

Position of attachment holes - drawing 1



xx130000263

A	Allowed position for attachment holes, M12 through. Be careful not to touch the cables when drilling.
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# 1 Description

## 1.6 Fitting equipment to the robot

*Continued*

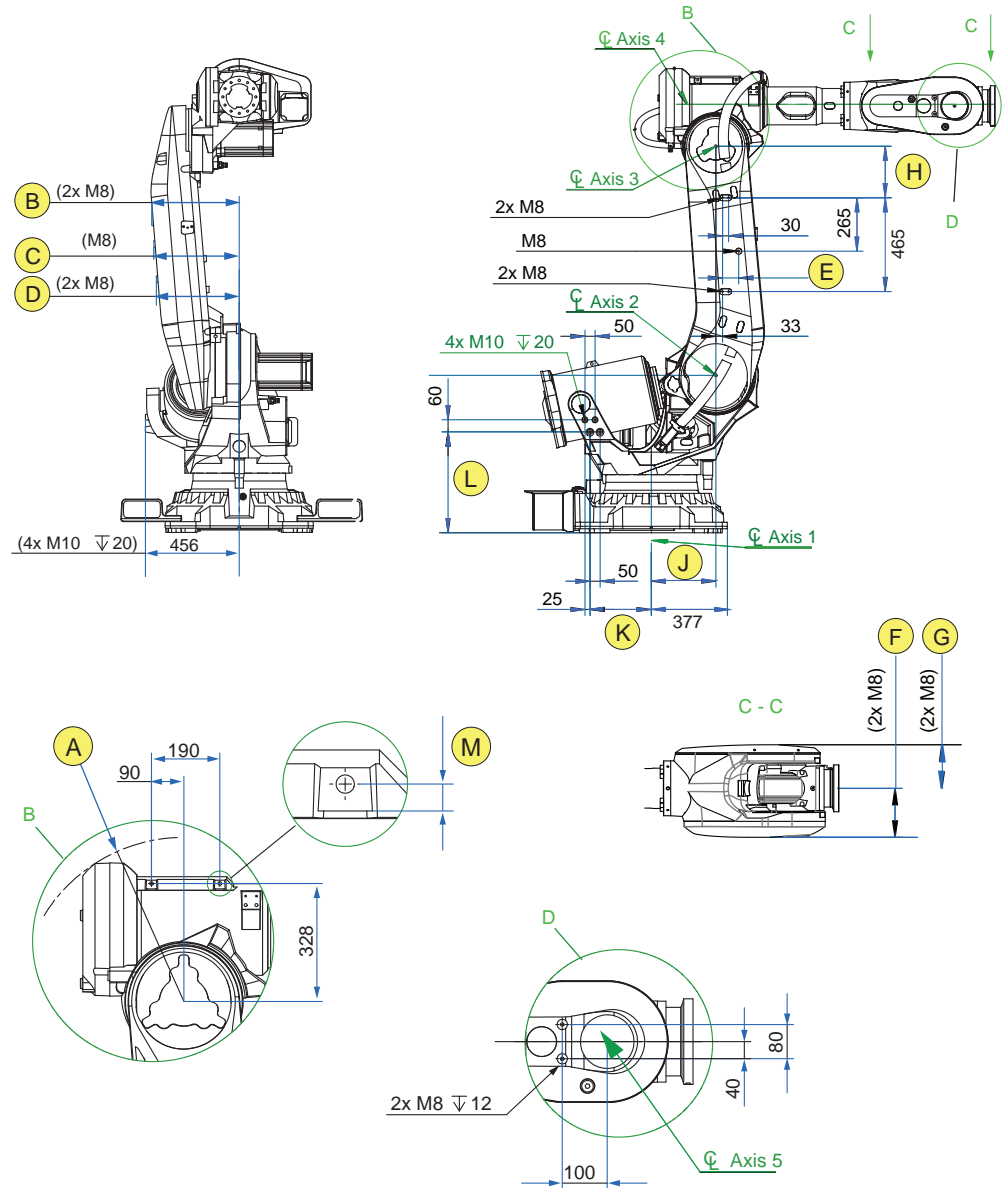
O	Attachment holes on arm house cover for extra equipment IRB 6700-235/2.65, IRB 6700-220/2.65 LID, IRB 6700-205/2.80, IRB 6700-200/2.80 LID, IRB 6700-175/3.05, IRB 6700-155/3.05 LID, IRB 6700-150/3.20, IRB 6700-145/3.20 LID IRB 6700-200/2.60, IRB 6700-200/2.60 LID, IRB 6700-155/2.85, IRB 6700-140/2.85 LID
P	Attachment holes on arm house cover for extra equipment IRB 6700-300/2.70, IRB 6700-270/2.70 LID, IRB 6700-245/3.00, IRB 6700-220/3.00 LID

Variant	B <sup>i</sup>	C	D	E	F	G	H	J	K	L	M	N
IRB 6700-235/2.65 IRB 6700-220/2.65 LID	R=216	270	400	652.5	365	437	349	147	33	102	104	210
IRB 6700-205/2.80 IRB 6700-200/2.80 LID	R=216	270	500	652.5	365	437	349	147	33	102	104	210
IRB 6700-175/3.05 IRB 6700-155/3.05 LID	R=216	270	400	652.5	365	437	349	147	33	102	104	210
IRB 6700-150/3.20 IRB 6700-145/3.20 LID	R=216	270	500	652.5	365	437	349	147	33	102	104	210
IRB 6700-200/2.60 IRB 6700-200/2.60 LID	R=204.5	270	400	650.5	365	437	315	143	43	102	95	210
IRB 6700-155/2.85 IRB 6700-140/2.85 LID	R=204.5	270	400	650.5	365	437	315	143	43	102	95	210
IRB 6700-300/2.70 IRB 6700-270/2.70 LID	R=230	310	450	652.5	376	467	405	152	12	117	98.5	215.5
IRB 6700-245/3.00 IRB 6700-220/3.00 LID	R=230	310	450	652.5	376	467	405	152	12	117	98.5	215.5
IRB 6700I-300/2.60 IRB 6700I-270/2.60 LID	R=230	310	450	652.5	425.6	467	405	152	12	117	98.5	215.5
IRB 6700I-245/2.90 IRB 6700I-210/2.90 LID	R=230	310	450	652.5	425.6	467	405	152	12	117	98.5	215.5

<sup>i</sup> Smallest circumscribed radius axis-4.

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Position of attachment holes - drawing 2



xx130000264

Variant	A <sup>i</sup>	B	C	D	E	F	G	H	J	K	L	M
IRB 6700-235/2.65	R=456	433	418	403	80	208.5	186	255	320	303.5	500	13.8
IRB 6700-220/2.65 LID	R=477											
IRB 6700-205/2.80	R=456	438	423	408	80	208.5	186	255	320	303.5	500	13.8
IRB 6700-200/2.80 LID	R=477											
IRB 6700-175/3.05	R=465	433	418	403	80	208.5	186	255	320	303.5	500	13.8
IRB 6700-155/3.05 LID	R=477											
IRB 6700-150/3.20	R=456	438	423	408	80	208.5	186	255	320	303.5	500	13.8
IRB 6700-145/3.20 LID	R=477											
IRB 6700-200/2.60	R=440	425	410	395	113	197	193	255	320	303.5	500	13.8
IRB 6700-200/2.60 LID	R=472											

*Continues on next page*

# 1 Description

## 1.6 Fitting equipment to the robot

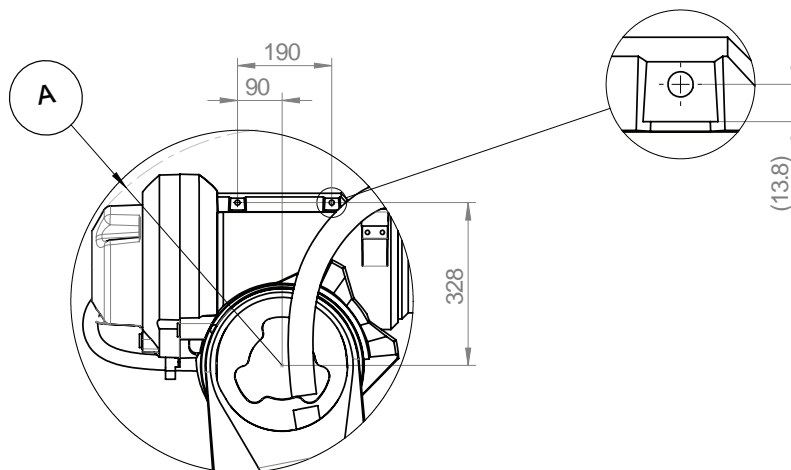
*Continued*

Variant	A <sup>i</sup>	B	C	D	E	F	G	H	J	K	L	M
IRB 6700-155/2.85 IRB 6700-140/2.85 LID	R=440 R=472	425	410	395	113	197	193	255	320	303.5	500	13.8
IRB 6700-300/2.70 IRB 6700-270/2.70 LID	R=468 R=481	453	438	423	80	222.5	187	265	350	273.5	523.5	15
IRB 6700-245/3.00 IRB 6700-220/3.00 LID	R=468 R=481	453	438	423	80	222.5	187	265	350	273.5	523.5	15
IRB 6700I-300/2.60 IRB 6700I-270/2.60 LID	R=468 R=481	453	438	423	80	222.5	187	265	350	273.5	523.5	15
IRB 6700I-245/2.90 IRB 6700I-210/2.90 LID	R=468 R=481	453	438	423	80	222.5	187	265	350	273.5	523.5	15

<sup>i</sup> Smallest circumscribed radius axis-3.

### Extra cover

There is an extra upper arm cover for LID (LeanID) variants, which causes the value A to be different for the LID variants.

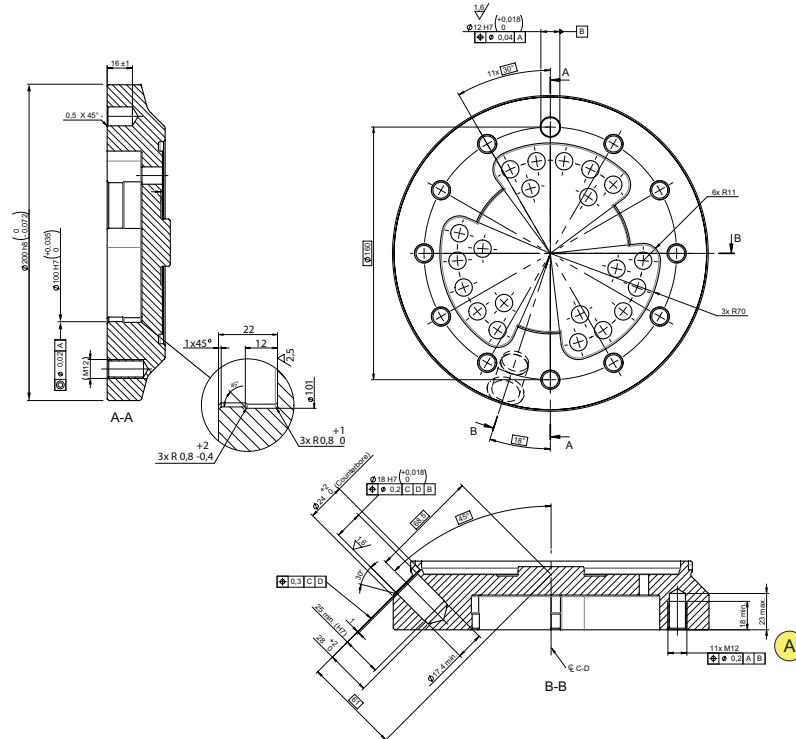


xx2100002054

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### Tool flange, standard

Below is the standard tool flange. The guide pin hole is, in calibration position, pointing upwards in Z-direction.



xx130000280

A	Thread length: 18 mm.
---	-----------------------

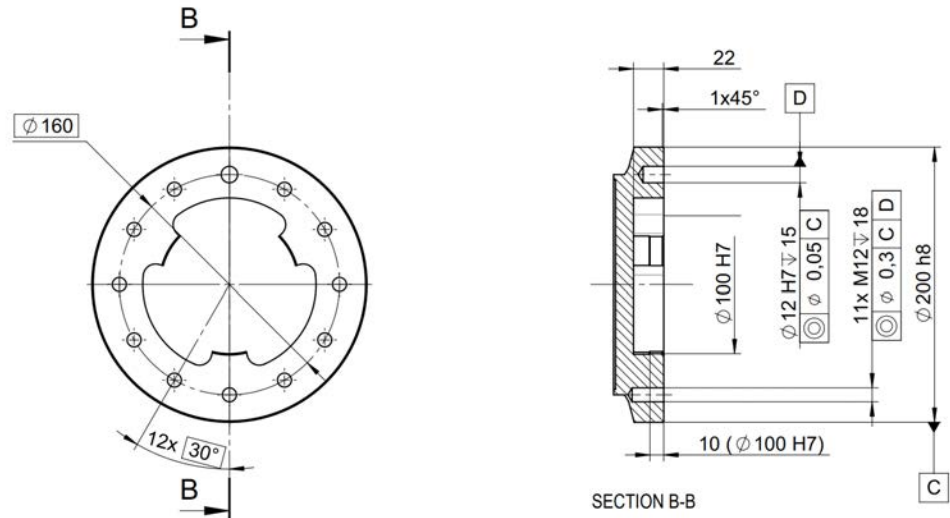
The turning disc for robot variants IRB 6700-200/2.60 and IRB 6700-155/2.85 was redesigned when Axis Calibration was introduced for IRB 6700. Prior to Axis Calibration the holes on the disc were through. On the current turning disc the holes are not through.

*Continues on next page*

# 1 Description

## 1.6 Fitting equipment to the robot

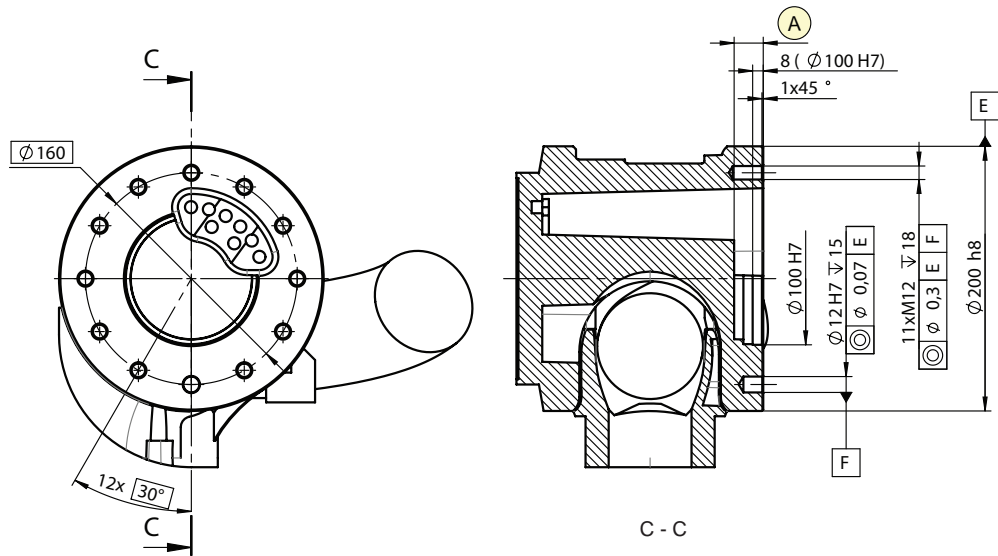
Continued



xx1700001590

### Tool flange, LID variants

Below is the tool flange for LID variants. The guide pin hole is, in calibration position, pointing upwards in Z-direction.



xx1300000290

A	Thread length: 18 mm.
---	-----------------------

### 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.

### 1.7 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 the product manuals.

# 1 Description

## 1.8.1 Robot motion

## 1.8 Robot motion

### 1.8.1 Robot motion

#### Type of motion

Axis	Type of motion	Range of movement - IRB 6700	Range of movement - IRB 6700Inv	Note
Axis 1	Rotation motion	$\pm 170^\circ$ or $\pm 220^\circ$ (option)	$\pm 170^\circ$	
Axis 2	Arm motion	$-65^\circ/+85^\circ$ <sup>i</sup>	$\pm 65^\circ$ <sup>ii</sup>	
Axis 3	Arm motion	$-180^\circ/+70^\circ$	$-180^\circ$ <sup>ii</sup> / $+70^\circ$ <sup>ii</sup>	
Axis 4	Wrist motion	$\pm 300^\circ$	$\pm 300^\circ$	
Axis 5	Bend motion	$\pm 130^\circ$ <sup>iii</sup>	$\pm 130^\circ$ <sup>iii</sup>	
Axis 6	Turn motion	$\pm 360^\circ$ <sup>iv</sup>	$\pm 360^\circ$ <sup>iv</sup>	
		$\pm 93.7$ revolutions	$\pm 93.7$ revolutions	Maximum value. The default working range for axis 6 can be extended by changing parameter values in the software. Option 3111-1 <i>Independent axis</i> can be used for resetting the revolution counter after the axis has been rotated (no need for "rewinding" the axis).

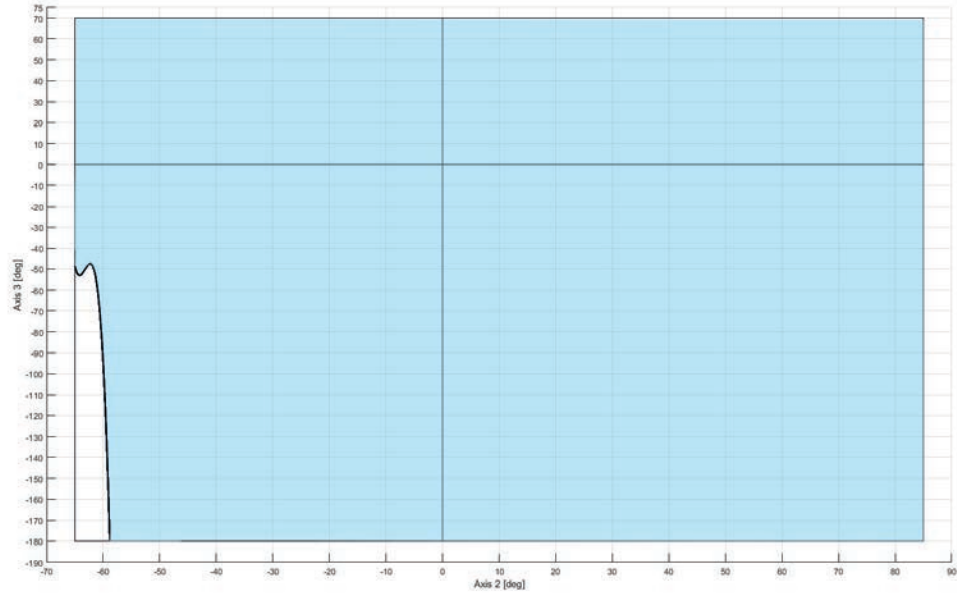
- <sup>i</sup> Working range for variants IRB 6700-300/2.70, IRB 6700-270/2.70 LID, IRB 6700-245/3.00, IRB 6700-220/3.00 LID:  
+85° to -65° when axis 3 is within +70° to -45°  
+85° to -58° when axis 3 is within +70° to -180°
- <sup>ii</sup> Working ranges of axis 2 and axis 3 are limited in some areas to avoid collision with balancing.
- <sup>iii</sup> Working range +120° to -120° for robots with LID variants.
- <sup>iv</sup> Working range +220° to -220° for robots with LID variants.

Continues on next page



**Working range axis 2 and axis 3 for IRB 6700-300/2.70, IRB 6700-270/2.70 LID, IRB 6700-245/3.00 and IRB 6700-220/3.00 LID**

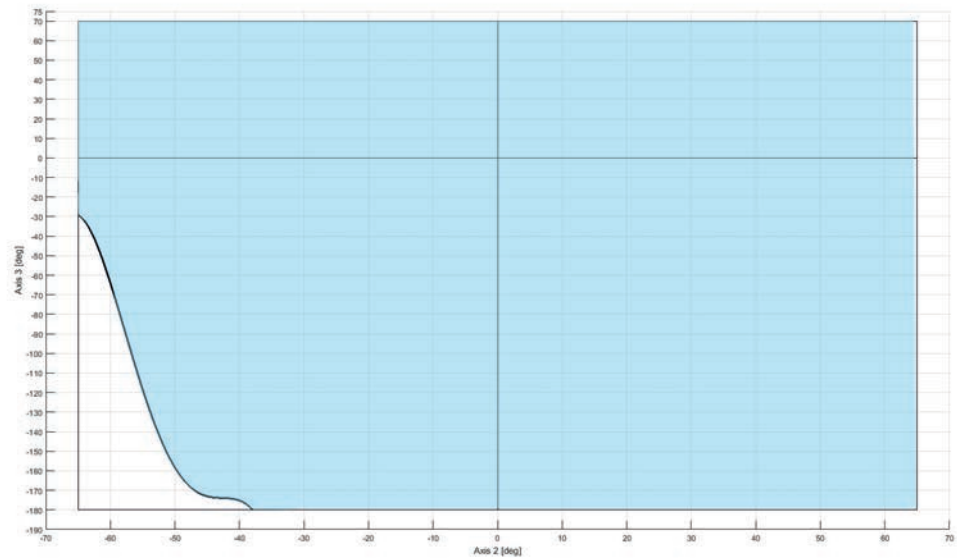
Limited in some areas to avoid collision with balancing.



xx170000509

**Working range axis 2 and axis 3 for IRB 6700I-300/2.60, IRB 6700I-270/2.60 LID, IRB 6700I-245/2.90 and IRB 6700I-210/2.90 LID**

Limited in some areas to avoid collision with balancing.



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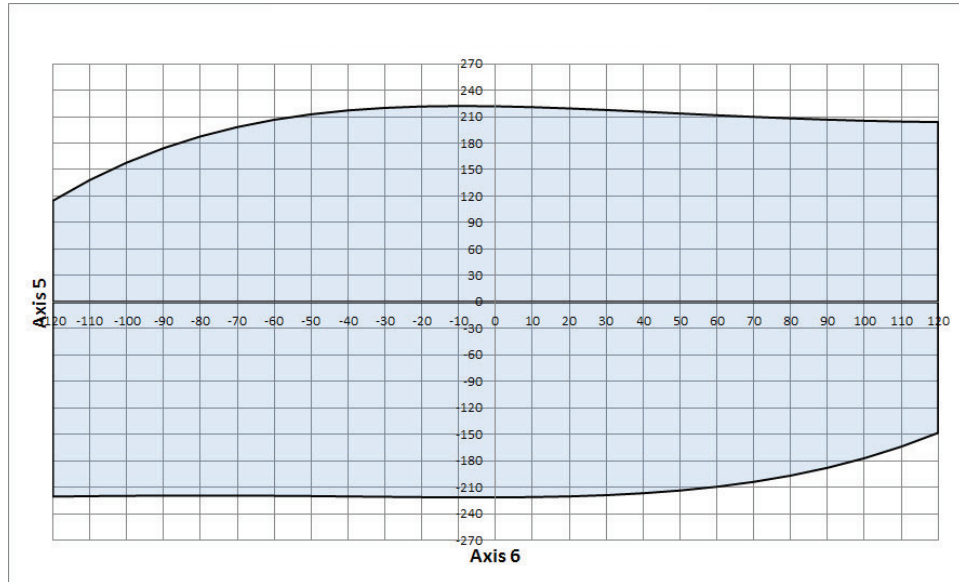
# 1 Description

## 1.8.1 Robot motion

*Continued*

### Working range axis 5 and axis 6 for LID variants

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



xx1300001587

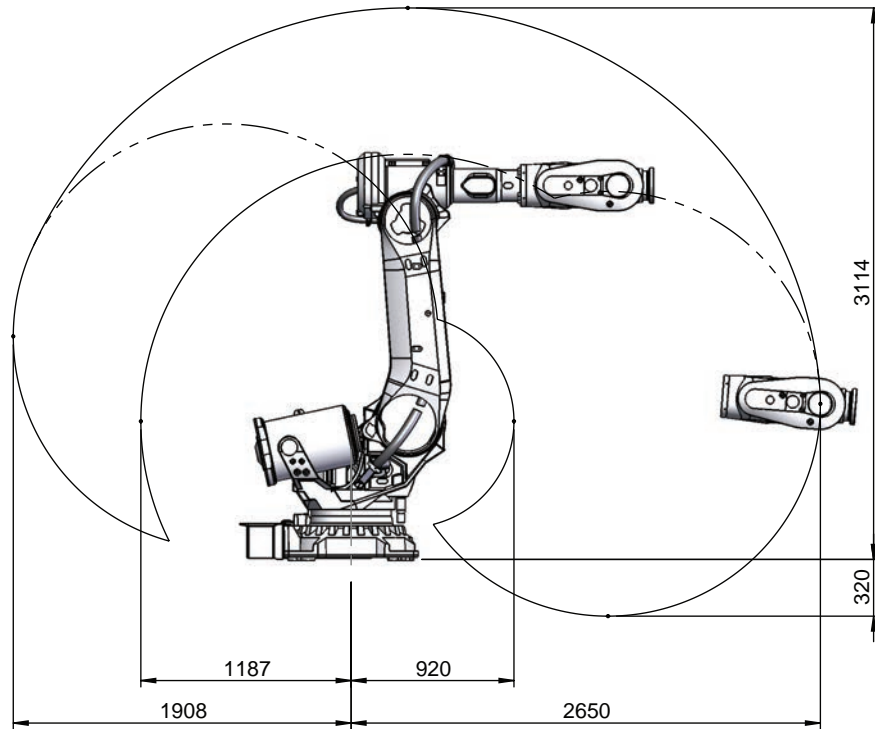
*Continues on next page*

# 1 Description

## 1.8.1 Robot motion *Continued*

### Working range

Robot	Handling capacity (kg)	Reach (m)
IRB 6700	235	2.65
IRB 6700 (LID variant)	220	2.65



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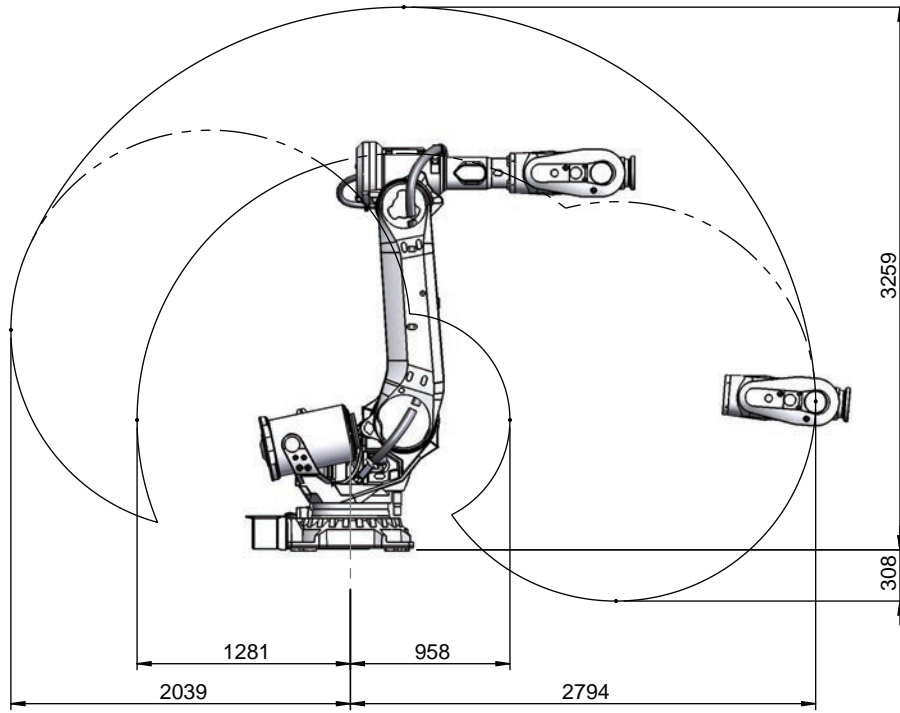
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# 1 Description

## 1.8.1 Robot motion

*Continued*

Robot	Handling capacity (kg)	Reach (m)
IRB 6700	205	2.80
IRB 6700 (LID variant)	200	2.80



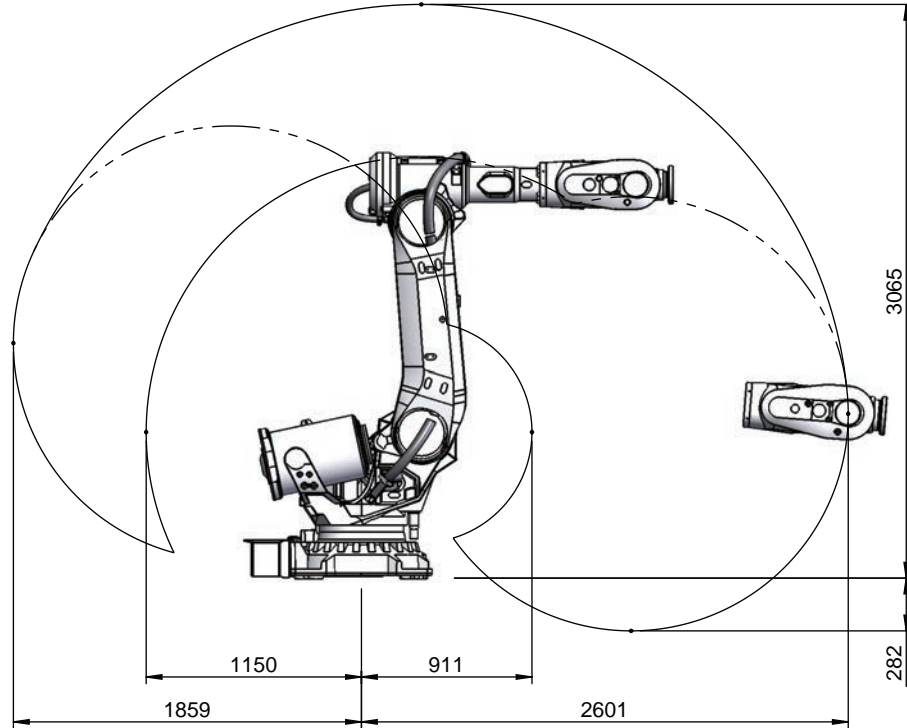
xx1300000282

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# 1 Description

## 1.8.1 Robot motion *Continued*

Robot	Handling capacity (kg)	Reach (m)
IRB 6700	200	2.60
IRB 6700 (LID variant)	175	2.60



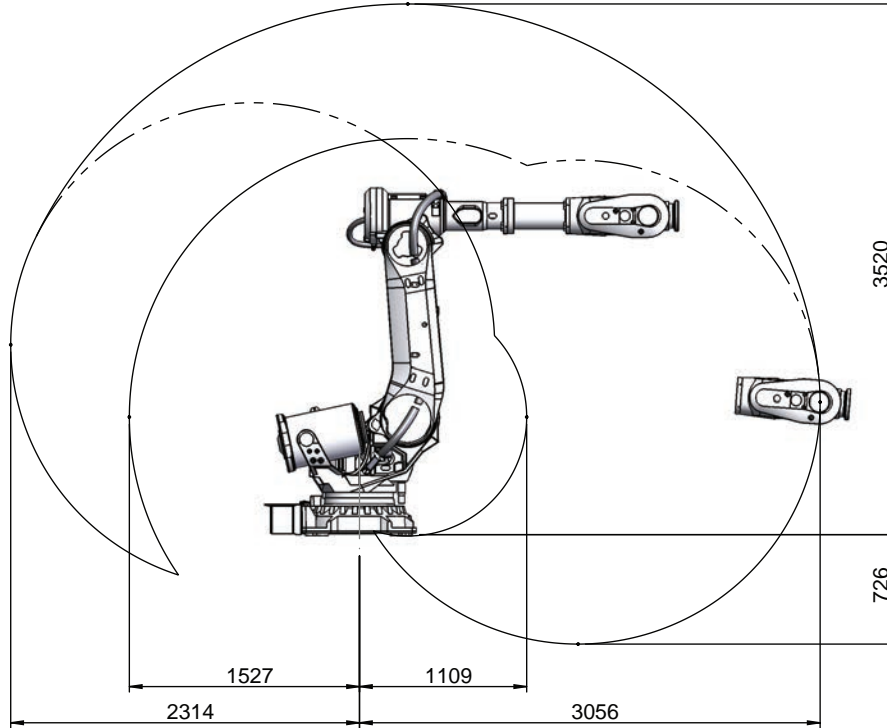
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# 1 Description

## 1.8.1 Robot motion

*Continued*

Robot	Handling capacity (kg)	Reach (m)
IRB 6700	175	3.05
IRB 6700 (LID variant)	155	3.05

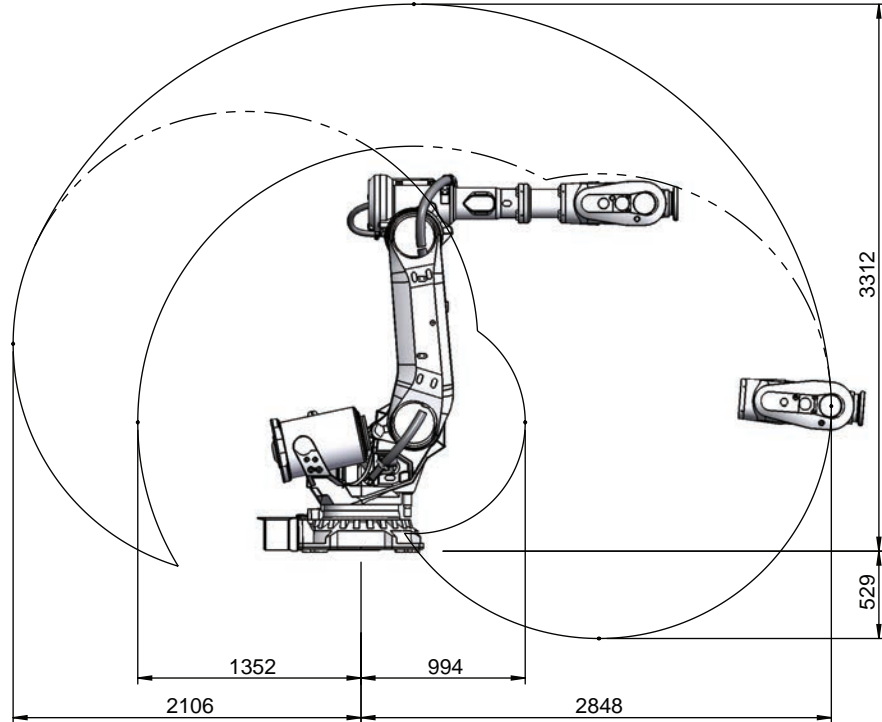


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# 1 Description

## 1.8.1 Robot motion *Continued*

Robot	Handling capacity (kg)	Reach (m)
IRB 6700	155	2.85
IRB 6700 (LID variant)	140	2.85



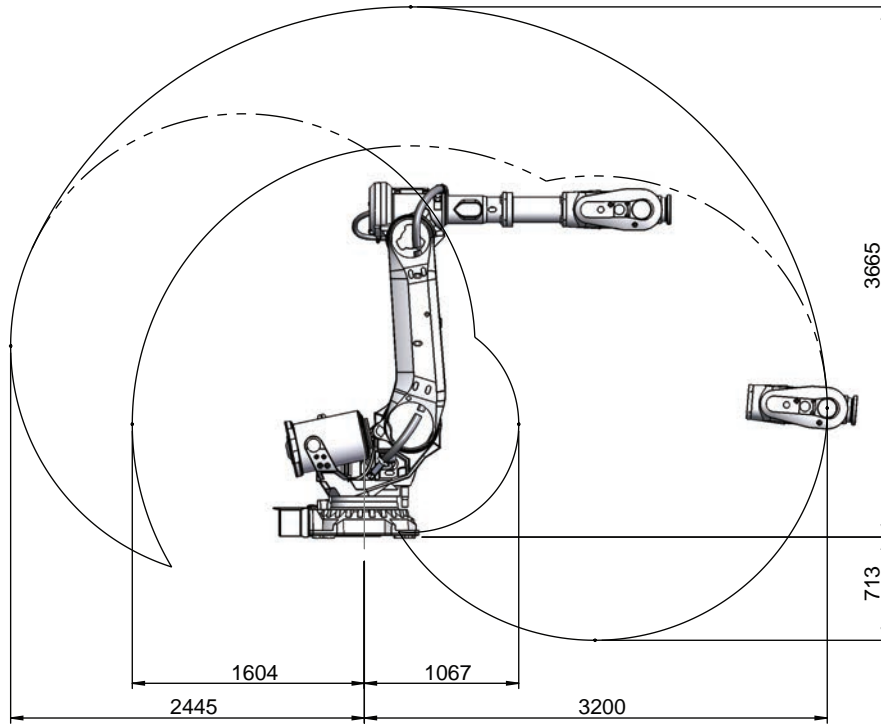
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# 1 Description

## 1.8.1 Robot motion

*Continued*

Robot	Handling capacity (kg)	Reach (m)
IRB 6700	150	3.20
IRB 6700 (LID variant)	145	3.20



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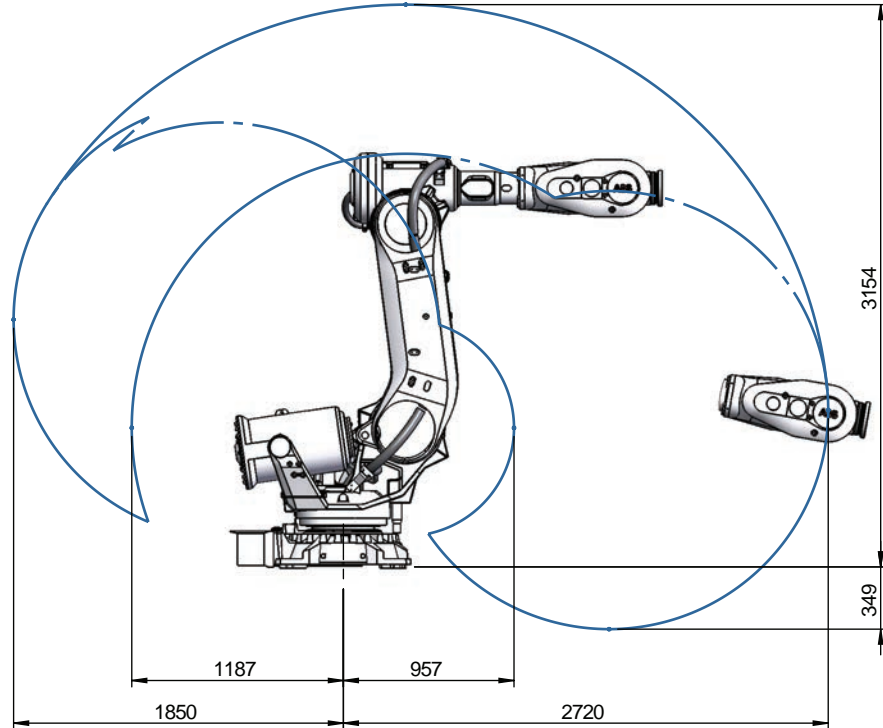
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# 1 Description

## 1.8.1 Robot motion *Continued*

Robot	Handling capacity (kg)	Reach (m)
IRB 6700	300	2.70
IRB 6700 (LID variant)	270	2.70



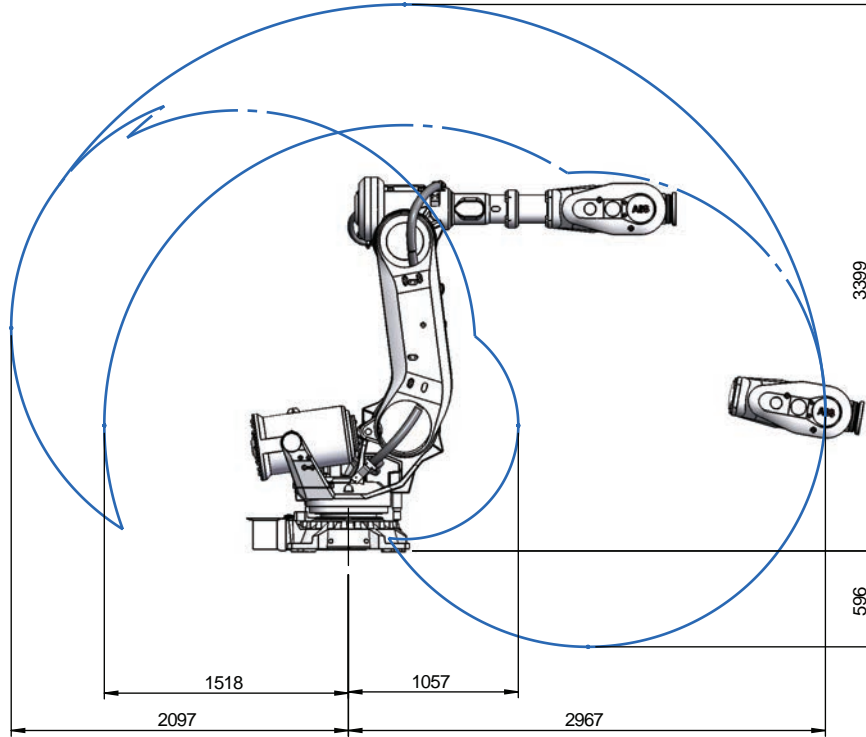
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# 1 Description

## 1.8.1 Robot motion

*Continued*

Robot	Handling capacity (kg)	Reach (m)
IRB 6700	245	3.00
IRB 6700 (LID variant)	220	3.00



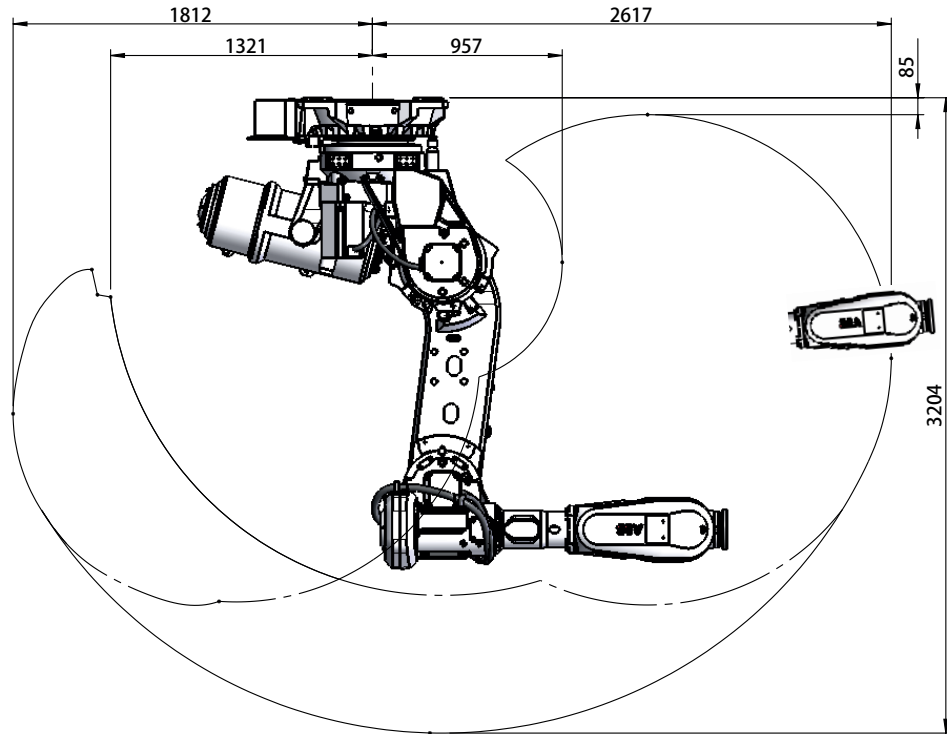
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# 1 Description

## 1.8.1 Robot motion *Continued*

Robot	Handling capacity (kg)	Reach (m)
IRB 6700I	300	2.60
IRB 6700I (LID variant)	270	2.60



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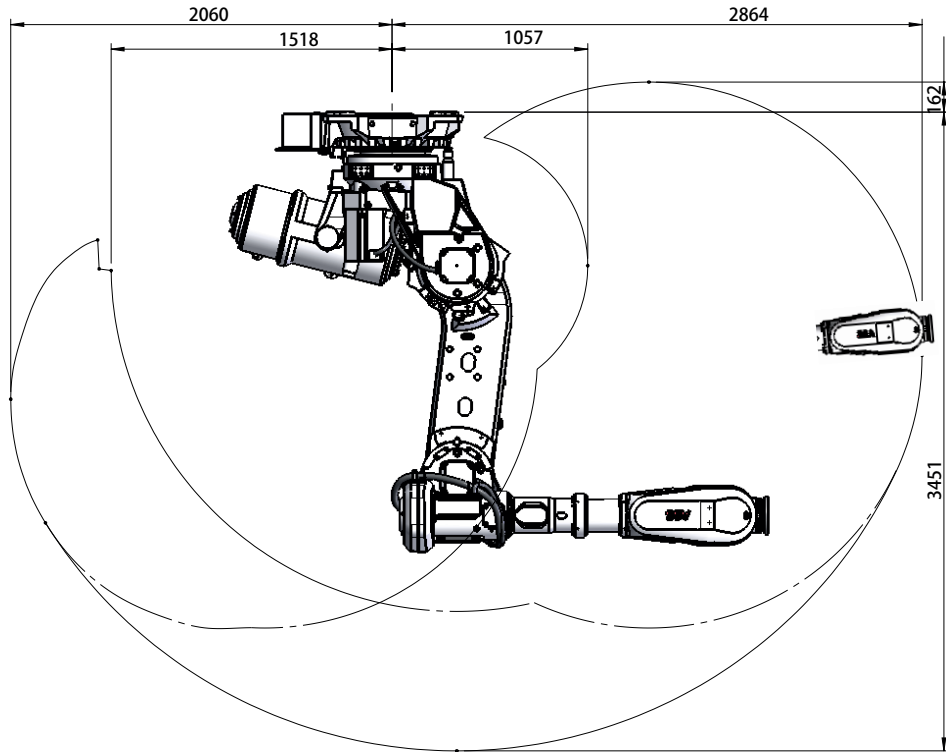
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# 1 Description

## 1.8.1 Robot motion

*Continued*

Robot	Handling capacity (kg)	Reach (m)
IRB 6700I	245	2.90
IRB 6700I (LID variant)	210	2.90



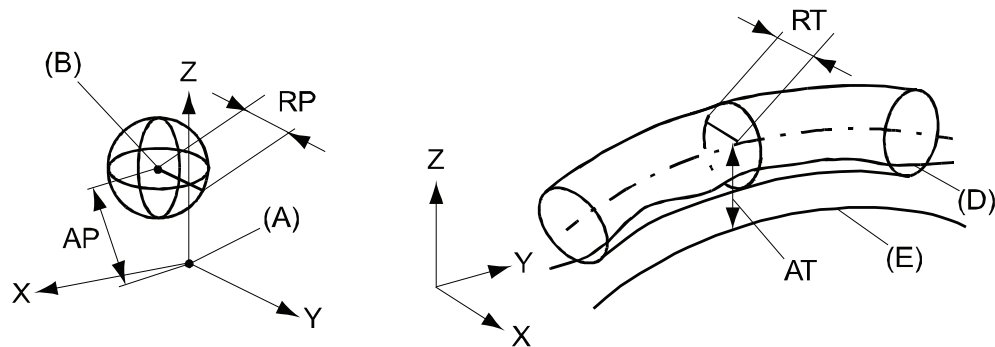
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1.8.2 Performance according to ISO 9283

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.



xx080000424

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 6700	235/2.65 and 220/2.65 LID	205/2.80 and 200/2.80 LID	175/3.05 and 155/3.05 LID	150/3.20 and 145/3.20 LID
Pose accuracy, AP <sup>i</sup> (mm)	0.03	0.06	0.04	0.05
Pose repeatability, RP (mm)	0.05	0.05	0.05	0.06
Pose stabilization time, PSt (s) within 0.5 mm of the position	0.16	0.17	0.28	0.34
Path accuracy, AT (mm)	1.7	1.5	1.9	1.6
Path repeatability, RT (mm)	0.08	0.08	0.12	0.14

<sup>i</sup> 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.

Continues on next page

# 1 Description

## 1.8.2 Performance according to ISO 9283

Continued

IRB 6700	200/2.60 and 175/2.60 LID	155/2.85 and 140/2.85 LID	300/2.70 and 270/2.70 LID	245/3.00 and 220/3.00 LID
Pose accuracy, AP <sup>i</sup> (mm)	0.03	0.03	0.07	0.03
Pose repeatability, RP (mm)	0.05	0.08	0.06	0.05
Pose stabilization time, PSt (s) within 0.5 mm of the position	0.21	0.19	0.11	0.14
Path accuracy, AT (mm)	1.7	1.5	1.4	1.6
Path repeatability, RT (mm)	0.11	0.09	0.07	0.12

<sup>i</sup> 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.

IRB 6700I	300/2.60 and 270/2.60 LID	245/2.90 and 210/2.90 LID
Pose accuracy, AP <sup>i</sup> (mm)	0.06	0.06
Pose repeatability, RP (mm)	0.05	0.06
Pose stabilization time, PSt (s) within 0.5 mm of the position	0.26	0.28
Path accuracy, AT (mm)	1.6	1.6
Path repeatability, RT (mm)	0.1	0.22

<sup>i</sup> 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.

## 1.8.3 Velocity

## Maximum axis speed

Robot type	Axis 1	Axis 2	Axis 3	Axis 4	Axis 5	Axis 6
IRB 6700-235/2.65	100 °/s	90 °/s	90 °/s	170 °/s	120 °/s	190 °/s
IRB 6700-220/2.65 LID	100 °/s	90 °/s	90 °/s	170 °/s	120 °/s	190 °/s
IRB 6700-205/2.80	100 °/s	90 °/s	90 °/s	170 °/s	120 °/s	190 °/s
IRB 6700-200/2.80 LID	100 °/s	90 °/s	90 °/s	170 °/s	120 °/s	190 °/s
IRB 6700-200/2.60	110 °/s	110 °/s	110 °/s	190 °/s	150 °/s	210 °/s
IRB 6700-175/2.60 LID	110 °/s	110 °/s	110 °/s	190 °/s	150 °/s	210 °/s
IRB 6700-175/3.05	100 °/s	90 °/s	90 °/s	170 °/s	120 °/s	190 °/s
IRB 6700-155/3.05 LID	100 °/s	90 °/s	90 °/s	170 °/s	120 °/s	190 °/s
IRB 6700-155/2.85	110 °/s	110 °/s	110 °/s	190 °/s	150 °/s	210 °/s
IRB 6700-140/2.85 LID	110 °/s	110 °/s	110 °/s	190 °/s	150 °/s	210 °/s
IRB 6700-150/3.20	100 °/s	90 °/s	90 °/s	170 °/s	120 °/s	190 °/s
IRB 6700-145/3.20 LID	100 °/s	90 °/s	90 °/s	170 °/s	120 °/s	190 °/s
IRB 6700-300/2.70	100 °/s	88 °/s	90 °/s	140 °/s	110 °/s	180 °/s
IRB 6700-270/2.70 LID	100 °/s	88 °/s	90 °/s	140 °/s	110 °/s	180 °/s
IRB 6700-245/3.00	100 °/s	88 °/s	90 °/s	140 °/s	110 °/s	180 °/s
IRB 6700-220/3.00 LID	100 °/s	88 °/s	90 °/s	140 °/s	110 °/s	180 °/s
IRB 6700I-300/2.60	100 °/s	88 °/s	90 °/s	140 °/s	110 °/s	180 °/s
IRB 6700I-270/2.60 LID	100 °/s	88 °/s	90 °/s	140 °/s	110 °/s	180 °/s
IRB 6700I-245/2.90	100 °/s	88 °/s	90 °/s	140 °/s	110 °/s	180 °/s
IRB 6700-210/2.90 LID	100 °/s	88 °/s	90 °/s	140 °/s	110 °/s	180 °/s

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

# 1 Description

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## 1.8.4 Robot stopping distances and times

### 1.8.4 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)*.



## 2 DressPack

### 2.1 Introduction

#### 2.1.1 Included options

##### DressPack

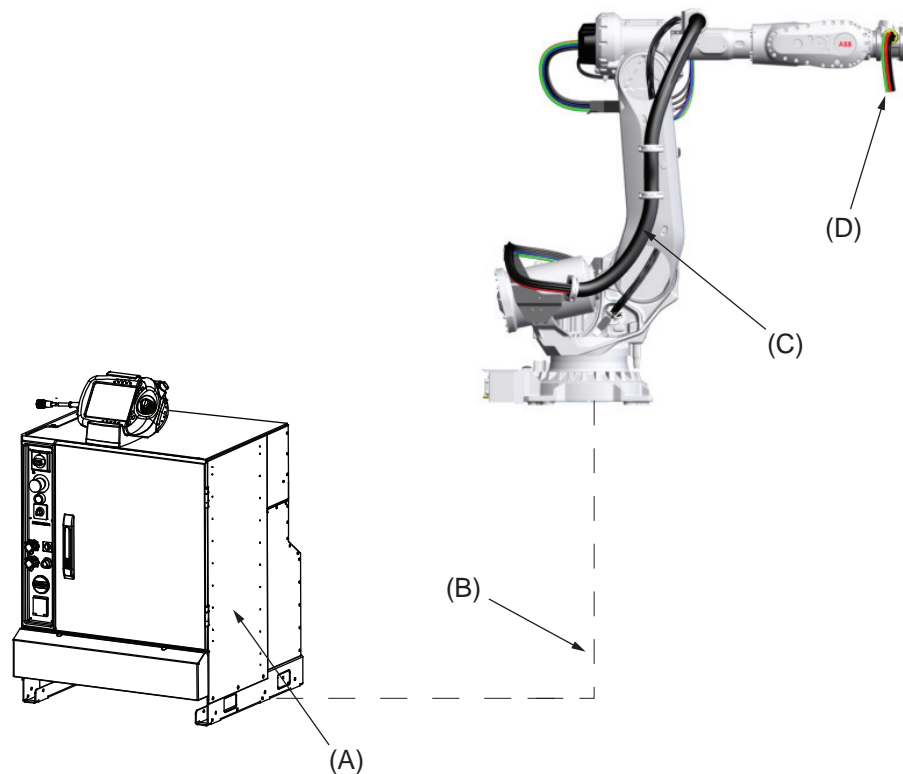
Includes options for upper arm, lower arm and floor pos B, C and D, see the following figure. These are described separately below but are designed as a complete package for various applications.

The DressPack for the floor contains customer signals.

The DressPack for upper and lower arm contains process cable packages including signals, 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.



xx1300001588

Pos	Description
A	Robot controller, (including 7th axis drive for servo gun)
B	DressPack, floor
C	DressPack, lower arm
D	DressPack, upper arm

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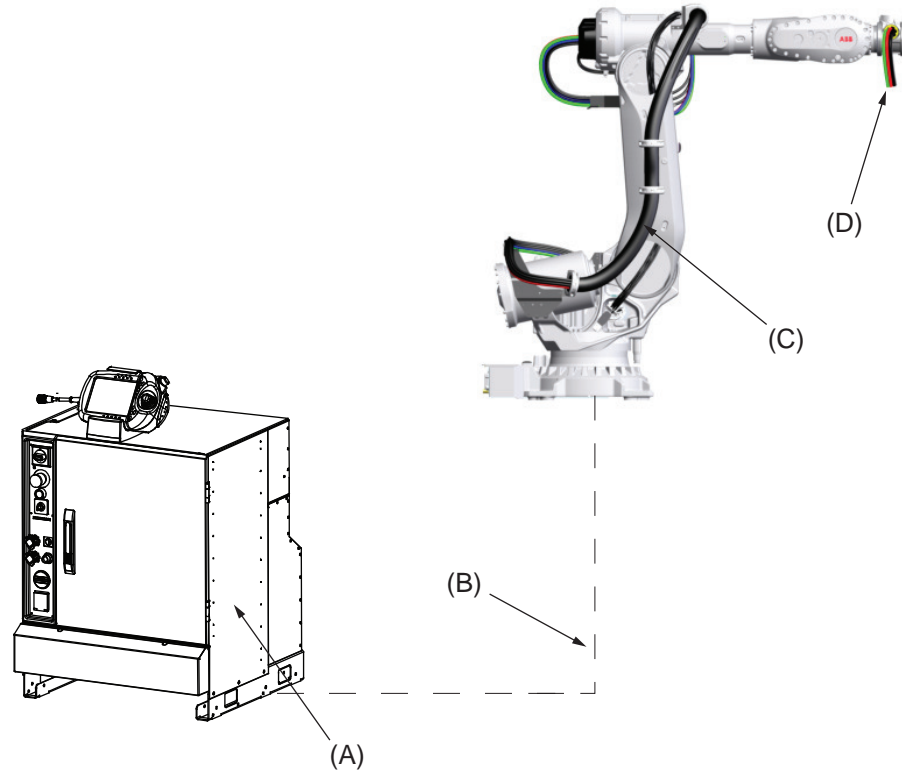
## 2 DressPack

### 2.1.1 Included options

Continued

#### Spotwelding

The package supplies above described DressPack, transformer gun/gripper with necessary media and software, see the following figure.



xx1300001588

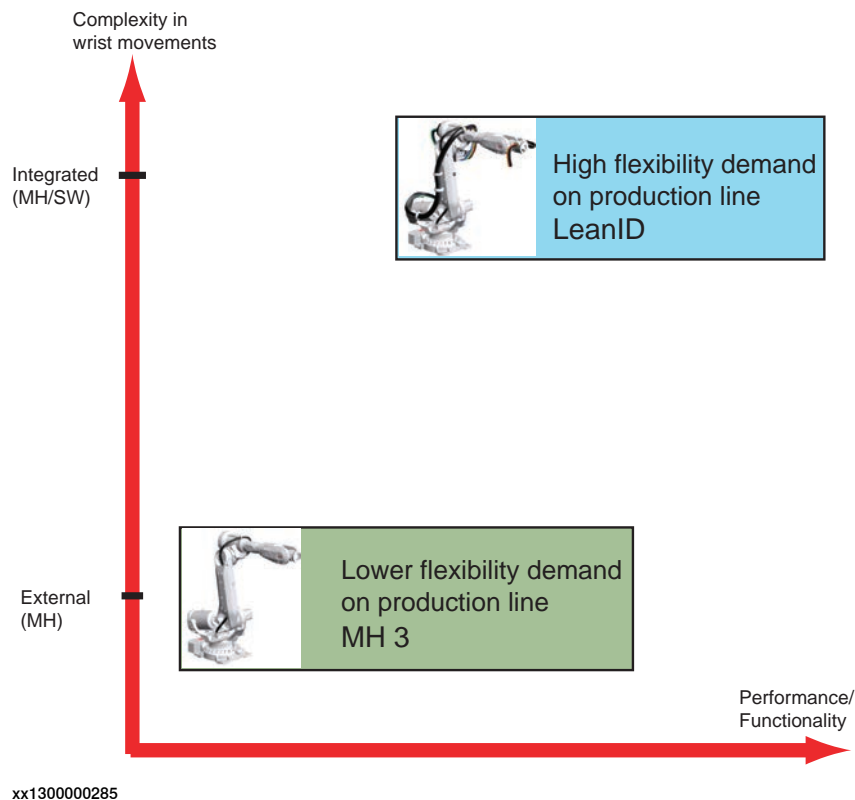
Pos	Description
A	Robot controller, (including 7th axis drive for servo gun)
B	DressPack, floor
C	DressPack, lower arm
D	DressPack, upper arm

## 2.1.2 Product range

### DressPack solutions for different users needs

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

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



### 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 3325-11/12/13/14 and 3326-31/32/33/34 for material handling, 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 DressPack

---

### 2.1.3 Limitations of robot movements

### 2.1.3 Limitations of robot movements

---

#### General

When using DressPack options on the upper arm the robot movements will be limited.

- In bending backwards positions there are limitations due to interference with manipulator.
- Might restrict working range, see [Working range axis 5 and axis 6 for LID variants on page 90](#).



#### Note

For more details, contact your local ABB office.

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#### Restrictions for all LID variants

Limitation for axis 5 and 6 depends on how the dress pack is assembled at the tool and how adjustment has been done.

Axis	Working range
Axis 5	120° to -120°
Axis 6	220° to -220°

#### 2.1.4 Impact on MH3 DressPack lifetime

---

##### General

There are some robot movements/positions that shall be avoided in the robot production program. This will improve the lifetime significantly of external upper arm MH3 DressPack and wear parts e.g. 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 set-up adjustments.

## 2 DressPack

### 2.2.1 Introduction

## 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.

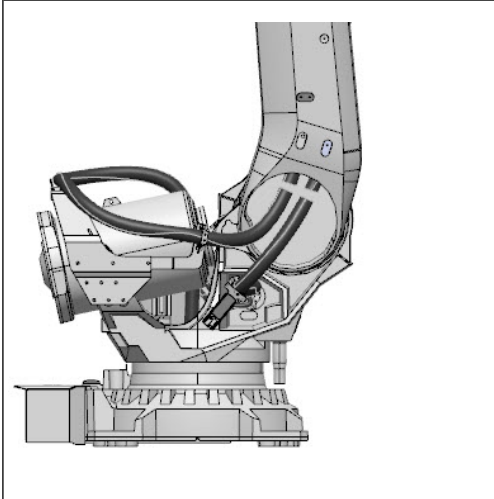
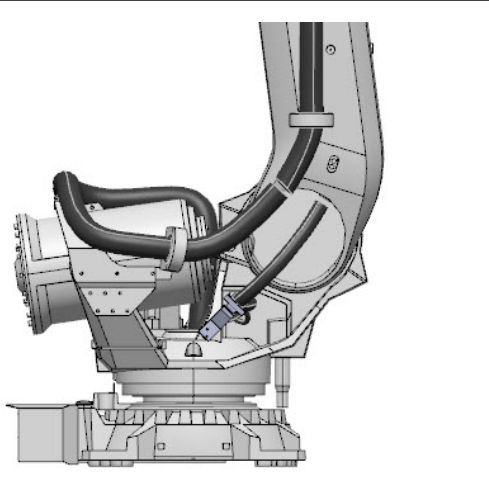
	Lower arm	Upper arm
Material Handling	Option 3325-51/52/53/54, Base to axis 3 Internal routing in lower arm	Option 3326-11/12/13/14, Axis 3 to axis 6 External routing Option 3326-31/32/33/34, Axis 3 to axis 6 (LID) Internal routing

#### 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 6700 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

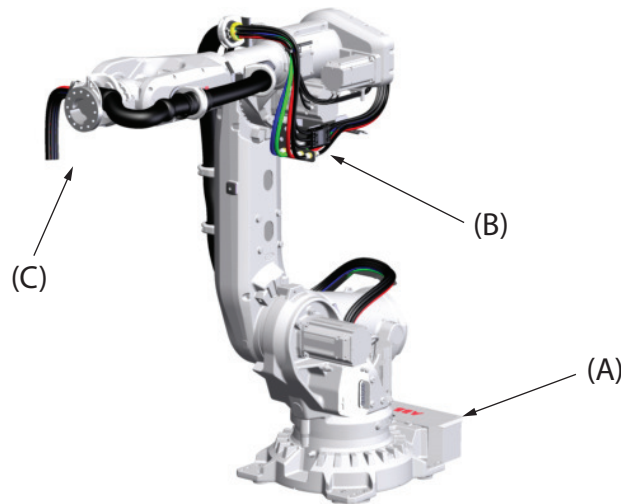
## 2 DressPack

### 2.2.3 Interface descriptions for 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:**

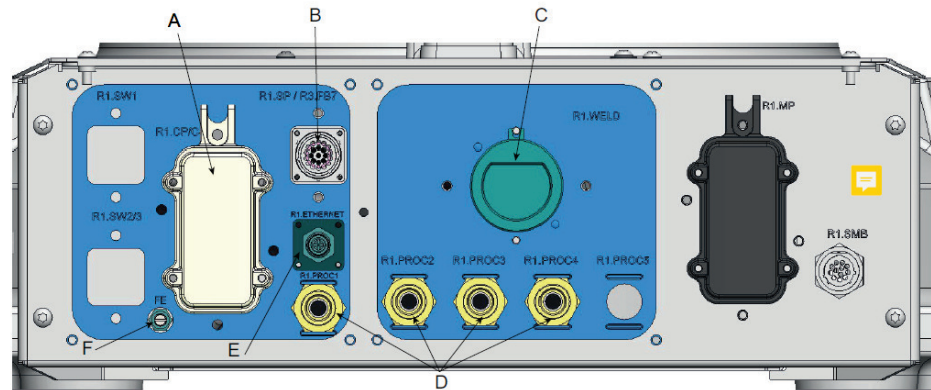
- Included are: A, E, F and one D.

**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*





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For corresponding parts of the tool, see [Connector kits on page 130](#).

Pos	Description
A	R1.CP/CS
B	R1.SP (spot welding servo gun) or FB7 (resolver connection)
C	R1.WELD 3x35mm <sup>2</sup> (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:**

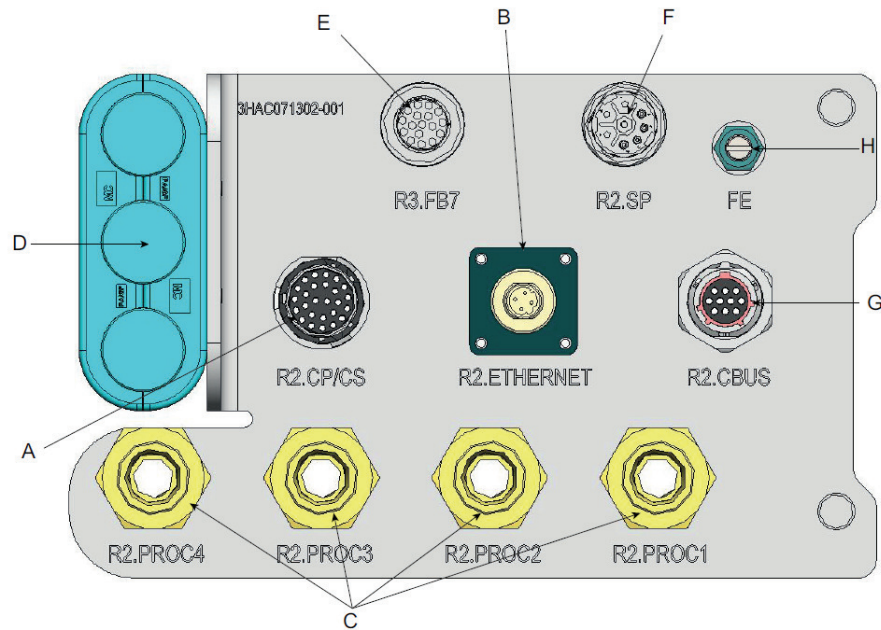
- Included are: A, D, B/E/F/G/H (if applicable) and C (Proc 1-4).

*Continues on next page*

## 2 DressPack

### 2.2.3 Interface descriptions for DressPack

Continued



xx1900001511

For corresponding parts of the tool, see [Connector kits on page 130](#).

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 <sup>2</sup> (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)

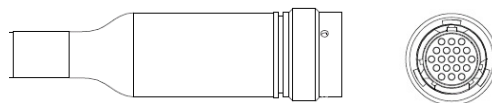
## Axis 6

### 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 130](#)):



xx0900000728

Continues on next page

## 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.

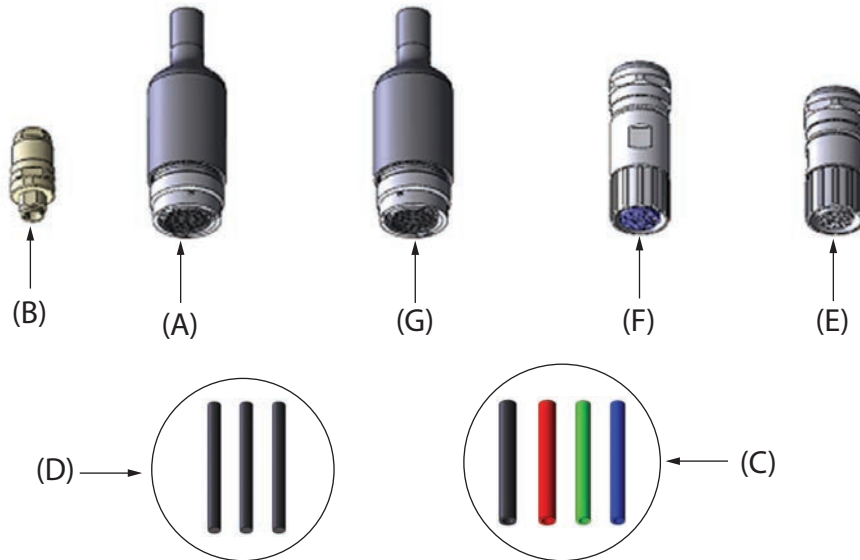
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## 2 DressPack

### 2.2.3 Interface descriptions for DressPack

Continued

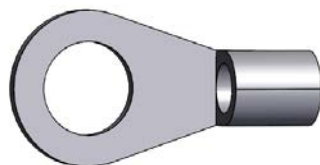
The cable ends with connectors, for corresponding parts of the tool, see [Connector kits on page 130](#) and within the UTOW product offer.



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 <sup>2</sup> (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



xx2000000109

2.2.4 Dimensions

Dimensions for robot with DressPack

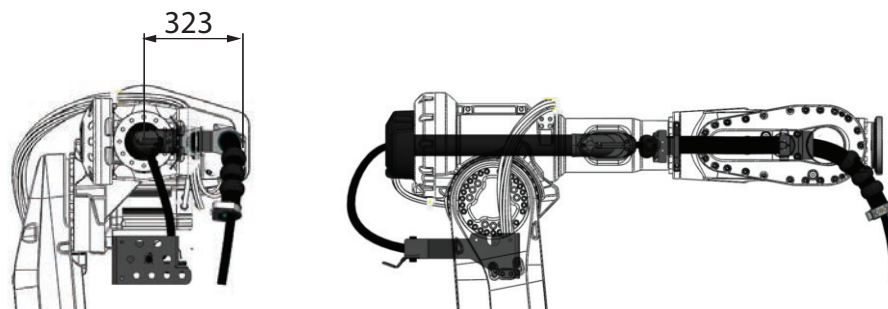


Note

Dimensions for specific variant can be measured in 3D-Cad models.

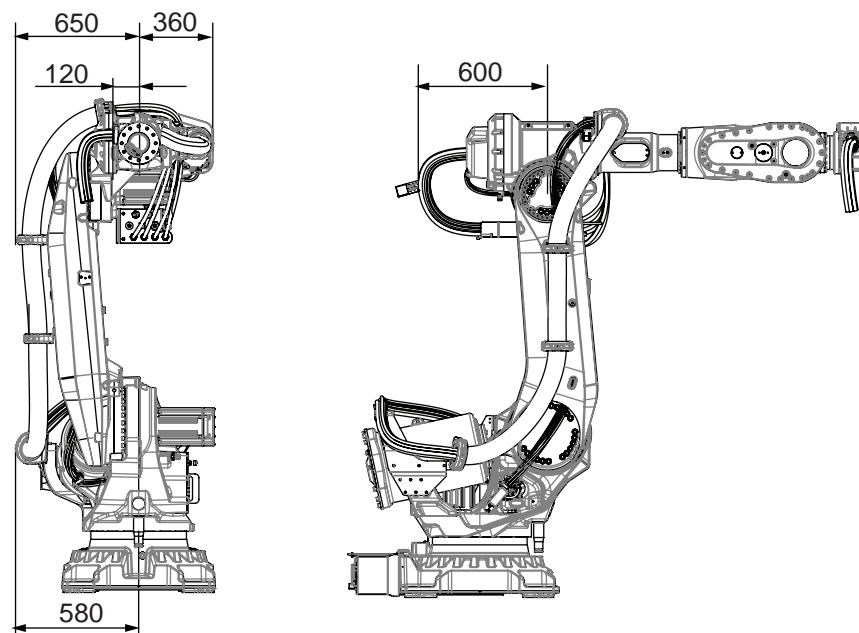
Dimensions are shown in figures below.

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



xx2200000418

Spotwelding option 3325-51/52/52/61/62/63 (Base to axis 3) + Option 3326-50/51/52/52/61/62/63 (Axis 3 to axis 6)



xx1300000287

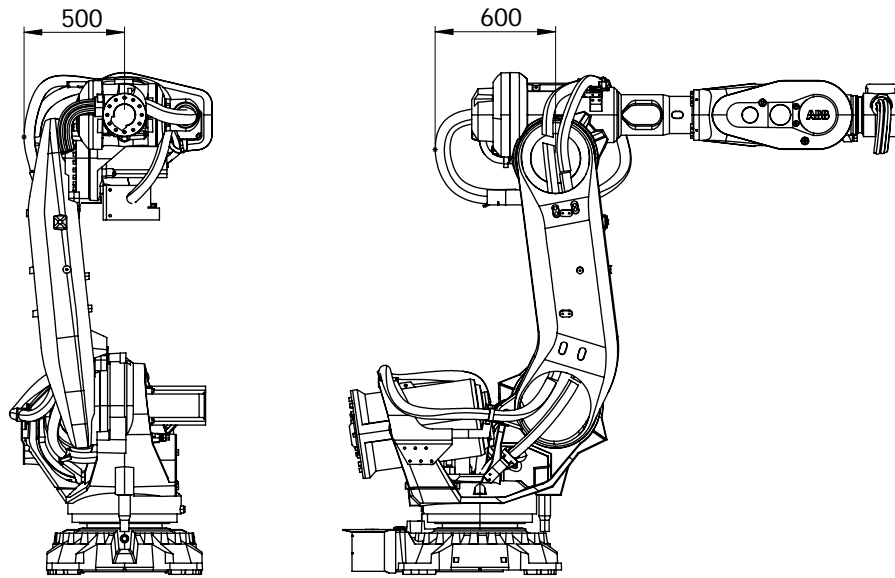
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## 2 DressPack

### 2.2.4 Dimensions

Continued

Material handling option 3325-11/12/13 (Base to axis 3) + Option 3326-31/32/33 (Axis 3 to axis 6)



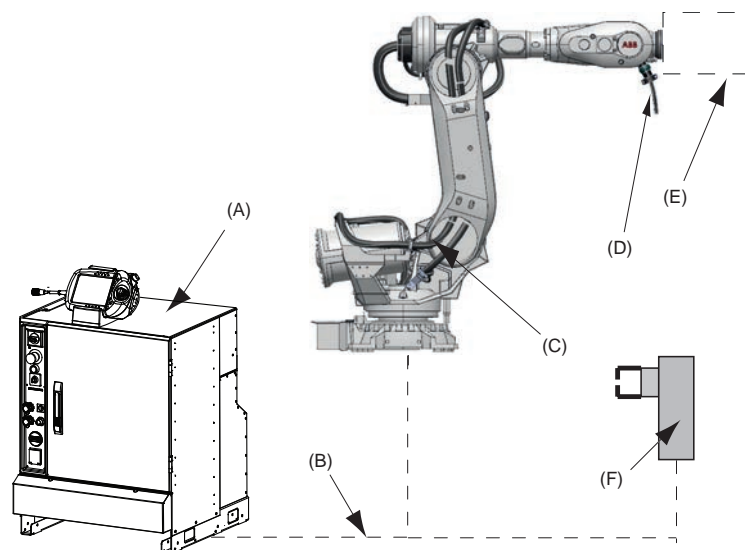
xx2000001776

## 2.3 Type H/HSe

### 2.3.1 Introduction

#### General

Variant Type H is designed for Material Handling (MH) application and Hse to handling parts against a stationary Spot Welding gun (pneumatic or servo controlled). Included modules are shown in Figure below.



xx2000001777

Pos	Name	
A	Robot controller	Incl. 7:th axis drive for servo gun, HSe
B	DressPack, Floor	
C	DressPack, Lower arm	
D	DressPack, Upper arm	For type H and HSe
E	Robot Gripper	
F	Stationary gun	Pneumatic or servo controlled and HSe

## 2 DressPack

### 2.3.2 Configuration result for Type H HSe

### 2.3.2 Configuration result for Type H HSe

#### General

Depending on the choice of options above the DressPack will have different content. The choice of routing will not affect the content. See tables for signal content below.

#### DressPack Type H/HSe. Parallel communication

The table below shows the available type of wires/media.

Type	At terminals in cabinet	At connection point. Base, Axis 3 or axis 6	Cable/part area	Allowed capacity
<b>Customer Power (CP)</b>				
Utility Power	2+2	2+2	0.75 mm <sup>2</sup>	250 VAC, 5 A rms
Protective earth		1	0.75 mm <sup>2</sup>	250 VAC
<b>Customer Signals (CS)</b>				
Signals	13	13	0.2 mm <sup>2</sup>	50 V DC, 1 A rms
Signals separate shielded	8	8 (4x2)	0.2 mm <sup>2</sup>	50 V DC, 1 A rms
<b>Media</b>				
Air (PROC 1)		1	12.5 mm inner diameter	Max. air pressure 16 bar/230 PSI

*Continues on next page*



**DressPack Type H/HSe. Parallel and field bus communication, Can/DeviceNet**

The table below shows the available type of wires/media.

Type	At terminals in cabinet	At Connection point. Base, Axis 3 or axis 6	Cable/part area	Allowed capacity
<b>Customer Power (CP)</b>				
Utility Power	2+2	2+2	0.75 mm <sup>2</sup>	250 VAC, 5 A rms
Protective earth		1	0.75 mm <sup>2</sup>	250 VAC
<b>Customer Signals (CS)</b>				
Signals	13	13	0.2 mm <sup>2</sup>	50 V DC, 1 A rms
Signals separate shielded	8	8 (4x2)	0.2 mm <sup>2</sup>	50 V DC, 1 A rms
<b>Customer bus (CBus)</b>				
Bus signals	At bus board	2	0.14 mm <sup>2</sup>	Can/DeviceNet spec
Bus signals	At bus board	2	0.2 mm <sup>2</sup>	50 V DC, 1 A rms
<b>Media</b>				
Air (PROC 1)		1	12.5 mm inner diameter	Max. air pressure 16 bar/230 PSI

*Continues on next page*

## 2 DressPack

### 2.3.2 Configuration result for Type H HSe

*Continued*

#### DressPack Type H/HSe. Parallel and field bus communication, Ethernet

The table below shows the available type of wires/media.

Type	At terminals in cabinet	At connection point. Base, Axis 3 or axis 6	Cable/part area	Allowed capacity
<b>Customer Power (CP)</b>				
Utility Power	2+2	2+2	0.75 mm <sup>2</sup>	250 VAC, 5 A rms
Protective earth		1	0.75 mm <sup>2</sup>	250 VAC
<b>Customer Signals (CS)</b>				
Signals	13	13	0.2 mm <sup>2</sup>	50 V DC, 1 A rms
Signals separate shielded	8	8 (4x2)	0.2 mm <sup>2</sup>	50 V DC, 1 A rms
<b>Customer bus (Ethernet)</b>				
Bus signals	4	4	0.4 mm <sup>2</sup>	Ethernet CAT 5e, 100 Mbit <sup>i</sup>
<b>Media</b>				
Air (PROC 1)		1	12.5 mm inner diameter	Max. air pressure 16 bar/230 PSI

<sup>i</sup> Ethernet with wire colors according to PROFINET standard, M12-connectors.

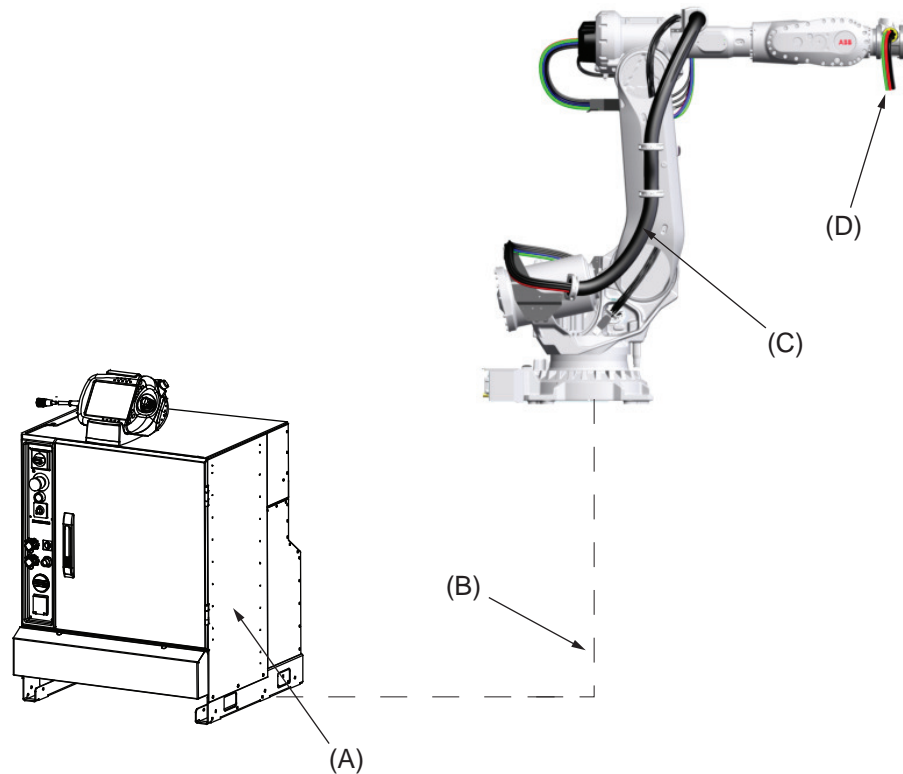
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## 2.4 Type Se

### 2.4.1 Introduction

#### General

Variant Type Se is designed for robot handled servo-controlled tool (electrical gun). Included modules are shown in Figure below. Available configurations with linked option numbers are described below.



xx1300002179

Position	Name
A	Robot controller (including 7th axis drive), Se
B	DressPack, Floor
C	DressPack, Lower arm
D	DressPack, Upper arm

## 2 DressPack

### 2.4.2 Configuration result for Type Se

### 2.4.2 Configuration result for Type Se

#### DressPack Type Se. Parallel communication

The table below shows the available type of wires/media for type S.

Type S	At terminals in cabinet	At connection point. Base, axis 3 or axis 6	Cable/part area	Allowed capacity
<b>Customer Power (CP)</b>				
Utility Power	2+2	2+2	0.75 mm <sup>2</sup>	250 VAC, 5 A rms
Protective earth		1	0.75 mm <sup>2</sup>	250 VAC
<b>Customer Signals (CS)</b>				
Signals	13	13	0.2 mm <sup>2</sup>	50 V DC, 1 A rms
Signals separate shielded	8	8 (4x2)	0.2 mm <sup>2</sup>	50 V DC, 1 A rms
<b>Media</b>				
Water/Air (PROC 1-4)		4	12.5 mm inner diameter <sup>i</sup>	Max. air pressure 16 bar/ 230 PSI Max. water pressure 10 bar/ 145 PSI
<b>Welding power (WELD)</b>				
Lower and Upper arm		2	35 mm <sup>2</sup> <sup>ii</sup>	600 VAC, 150 A rms at 20°C (68°F)
Protective earth (Lower and Upper arm)		1		

<sup>i</sup> For LeanID 2x1/2" + 2x3/8", only upper arm

<sup>ii</sup> For LeanID upper arm 25 mm<sup>2</sup>, only upper arm, 135 A rms

*Continues on next page*

The table below shows the available type of wires/media for type Se.

Type Se	At terminals in cabinet	At connection point. Base, axis 2/3 or axis 6	Cable/part area	Allowed capacity
<b>Customer Power (CP)</b>				
Utility Power	2+2	2+2	0.75 mm <sup>2</sup>	250 VAC, 5 A rms
Protective earth		1	0.75 mm <sup>2</sup>	250 VAC
<b>Customer Signals (CS)</b>				
Signals	13	13	0.2 mm <sup>2</sup>	50 V DC, 1 A rms
Signals separate shielded	8	8 (4x2)	0.2 mm <sup>2</sup>	50 V DC, 1 A rms
<b>Servo motor signals</b>				
Servo motor power	At drive	3	1.5 mm <sup>2</sup>	600 VAC, 12 A rms
Protective earth	At drive	1	1.5 mm <sup>2</sup>	600 VAC
Signals twisted pair for resolver	-	6	0.23 mm <sup>2</sup>	50 V DC, 1 A rms
Brake	-	2	0.23 mm <sup>2</sup>	50 V DC, 1 A rms
Temperature control/PTC	-	2	0.23 mm <sup>2</sup>	50 V DC, 1 A rms
<b>Media</b>				
Water/Air (PROC 1-4)		4	12.5 mm inner diameter <sup>i</sup>	Max. air pressure 16 bar/ 230 PSI. Max. water pressure 10 bar/ 145 PSI
<b>Welding power (WELD)</b>				
Lower and Upper arm		2	35 mm <sup>2</sup> ii	600 VAC, 150 A rms at 20°C (68°F)
Protective earth (Lower and Upper arm)		1		

<sup>i</sup> For LeanID 2x1/2" + 2x3/8", only upper arm

<sup>ii</sup> For LeanID upper arm 25 mm<sup>2</sup>, only upper arm, 135 A rms

Continues on next page

## 2 DressPack

### 2.4.2 Configuration result for Type Se

Continued

#### DressPack Type Se. Parallel and field bus communication, Can/DeviceNet

The table below shows the available type of wires/media for type S.

Type S	At terminals in cabinet	At connection point. Base, axis 3 or axis 6	Cable/part area	Allowed capacity
<b>Customer Power (CP)</b>				
Utility Power	2+2	2+2	0.75 mm <sup>2</sup>	250 VAC, 5 A rms
Protective earth		1	0.75 mm <sup>2</sup>	250 VAC
<b>Customer signals (CS)</b>				
Signals	13	13	0.2 mm <sup>2</sup>	50 V DC, 1 A rms
Signals separate shielded	8	8 (4x2)	0.2 mm <sup>2</sup>	50 V DC, 1 A rms
<b>Customer bus (CBus)</b>				
Bus signals	At bus board	2	0.14 mm <sup>2</sup>	Can/DeviceNet spec
Bus signals	At bus board	2	0.23 mm <sup>2</sup>	50 V DC, 1 A rms
<b>Media</b>				
Water/Air (PROC 1-4)		4	12.5 mm inner diameter <sup>i</sup>	Max. air pressure 16 bar/230 PSI Max. water pressure 10 bar/145 PSI.
<b>Welding power (WELD)</b>				
Lower and Upper arm		2	35 mm <sup>2</sup> ii	600 VAC, 150 A rms at 20°C (68°F)
Protective earth (Lower and Upper arm)		1		

<sup>i</sup> For LeanID 2x1/2" + 2x3/8", only upper arm

<sup>ii</sup> For LeanID upper arm 25 mm<sup>2</sup>, only upper arm, 135 A rms

Continues on next page

The table below shows the available type of wires/media for type Se.

Type Se	At terminals in cabinet	At connection point. Base, axis 3 or axis 6	Cable/part area	Allowed capacity
<b>Customer Power (CP)</b>				
Utility Power	2+2	2+2	0.75 mm <sup>2</sup>	250 VAC, 5 A rms
Protective earth		1	0.75 mm <sup>2</sup>	250 VAC
<b>Customer signals (CS)</b>				
Signals	13	13	0.2 mm <sup>2</sup>	50 V DC, 1 A rms
Signals separate shielded	8	8 (4x2)	0.2 mm <sup>2</sup>	50 V DC, 1 A rms
<b>Customer bus (CBus)</b>				
Bus signals	At bus board	2	0.14 mm <sup>2</sup>	Can/DeviceNet spec
Bus signals	At bus board	2	0.23 mm <sup>2</sup>	50 V DC, 1 A rms
<b>Servo motor signals</b>				
Servo motor power	At drive	3	1.5 mm <sup>2</sup>	600 VAC, 12 A rms
Protective earth	At drive	1	1.5 mm <sup>2</sup>	600 VAC
Signals twisted pair for resolver	-	6	0.23 mm <sup>2</sup>	50 V DC, 1 A rms
Brake	-	2	0.23 mm <sup>2</sup>	50 V DC, 1 A rms
Temperature control/PTC	-	2	0.23 mm <sup>2</sup>	50 V DC, 1 A rms
<b>Media</b>				
Water/Air (PROC 1-4)		4	12.5 mm inner diameter <sup>i</sup>	Max. air pressure 16 bar/230 PSI. Max. water pressure 10 bar/145 PSI.
<b>Welding power (WELD)</b>				
Lower and Upper arm		2	35 mm <sup>2</sup> ii	600 VAC, 150 A rms at 20°C (68°F)
Protective earth (Lower and Upper arm)		1		

<sup>i</sup> For LeanID 2x1/2" + 2x3/8", only upper arm

<sup>ii</sup> For LeanID upper arm 25 mm<sup>2</sup>, only upper arm, 135 A rms

Continues on next page

## 2 DressPack

### 2.4.2 Configuration result for Type Se

Continued

#### DressPack Type Se. Parallel and field bus communication, Ethernet

The table below shows the available type of wires/media for type S.

Type S	At terminals in cabinet	At connection point. Base, axis 3 or axis 6	Cable/part area	Allowed capacity
<b>Customer Power (CP)</b>				
Utility Power	2+2	2+2	0.75 mm <sup>2</sup>	250 VAC, 5 A rms
Protective earth		1	0.75 mm <sup>2</sup>	250 VAC
<b>Customer signals (CS)</b>				
Signals	13	13	0.2 mm <sup>2</sup>	50 V DC, 1 A rms
Signals separate shielded	8	8 (4x2)	0.2 mm <sup>2</sup>	50 V DC, 1 A rms
<b>Customer bus (Ethernet)</b>				
Bus signals	4	4	0.4 mm <sup>2</sup>	Ethernet CAT 5e, 100 Mbit <sup>i</sup>
<b>Media</b>				
Water/Air (PROC 1-4)		4	12.5 mm inner diameter <sup>ii</sup>	Max. air pressure 16 bar/230 PSI Max. water pressure 10 bar/145 PSI.
<b>Welding power (WELD)</b>				
Lower and Upper arm		2	35 mm <sup>2</sup> <sup>iii</sup>	600 VAC,
Protective earth (Lower and Upper arm)		1		150 A rms at 20°C (68°F)

<sup>i</sup> Ethernet with wire colors according to PROFINET standard, M12-connectors.

<sup>ii</sup> For LeanID 2x1/2" + 2x3/8"

<sup>iii</sup> For LeanID upper arm 25 mm<sup>2</sup>, 135 A rms

Continues on next page



The table below shows the available type of wires/media for type Se.

Type Se	At terminals in cabinet	At connection point. Base, axis 2/3 or axis 6	Cable/part area	Allowed capacity
<b>Customer Power (CP)</b>				
Utility Power	2+2	2+2	0.75 mm <sup>2</sup>	250 VAC, 5 A rms
Protective earth		1	0.75 mm <sup>2</sup>	250 VAC
<b>Customer signals (CS)</b>				
Signals	13	13	0.2 mm <sup>2</sup>	50 V DC, 1 A rms
Signals separate shielded	8	8 (4x2)	0.2 mm <sup>2</sup>	50 V DC, 1 A rms
<b>Customer bus (Ethernet)</b>				
Bus signals	4	4	0.4 mm <sup>2</sup>	Ethernet CAT 5e, 100 Mbit <sup>i</sup>
<b>Servo motor signals</b>				
Servo motor power	At drive	3	1.5 mm <sup>2</sup>	600 VAC, 12 A rms
Protective earth	At drive	1	1.5 mm <sup>2</sup>	600 VAC
Signals twisted pair for resolver	-	6	0.23 mm <sup>2</sup>	50 V DC, 1 A rms
Brake	-	2	0.23 mm <sup>2</sup>	50 V DC, 1 A rms
Temperature control/PTC	-	2	0.23 mm <sup>2</sup>	50 V DC, 1 A rms
<b>Media</b>				
Water/Air (PROC 1-4)		4	12.5 mm inner diameter <sup>ii</sup>	Max. air pressure 16 bar/230 PSI. Max. water pressure 10 bar/145 PSI.
<b>Welding power (WELD)</b>				
Lower and Upper arm		2	35 mm <sup>2</sup> <sup>iii</sup>	600 VAC,
Protective earth (Lower and Upper arm)		1		150 A rms at 20°C (68°F)

<sup>i</sup> Ethernet with wire colors according to PROFINET standard, M12-connectors.

<sup>ii</sup> For LeanID 2x1/2" + 2x3/8"

<sup>iii</sup> For LeanID upper arm 25 mm<sup>2</sup>, 135 A rms

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## 2 DressPack

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### 2.5 Connector kits

*Continued*

### 2.5 Connector kits

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#### General

The connector kits are described in section [Connector kits manipulator on page 139](#).

## 3 Specification of variants and options

### 3.1 Introduction to variants and options

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#### General

The different variants and options for the IRB 6700 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	IRB Variants	Handling capacity (kg)	Reach (m)
3300-34	6700 - 300/2.70	300	2.70
3300-35	6700 - 270/2.70 LID	270	2.70
3300-36	6700 - 245/3.00	245	3.00
3300-37	6700 - 220/3.00 LID	220	3.00
3300-38	6700 - 235/2.65	235	2.65
3300-39	6700 - 220/2.65 LID	220	2.65
3300-40	6700 - 205/2.80	205	2.80
3300-41	6700 - 200/2.80 LID	200	2.80
3300-42	6700 - 200/2.60	200	2.60
3300-43	6700 - 175/2.60 LID	175	2.60
3300-44	6700 - 175/3.05	175	3.05
3300-45	6700 - 155/3.05 LID	155	3.05
3300-46	6700 - 155/2.85	155	2.85
3300-47	6700 - 140/2.85 LID	140	2.85
3300-48	6700 - 150/3.20	150	3.20
3300-49	6700 - 145/3.20 LID	145	3.20
3300-50	6700I - 300/2.60	300	2.60
3300-51	6700I-270/2.60 LID	270	2.60
3300-52	6700I - 245/2.90	245	2.90
3300-53	6700I - 210/2.90 LID	210	2.90

##### Manipulator color

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

<sup>i</sup> 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.

Continues on next page

#### 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

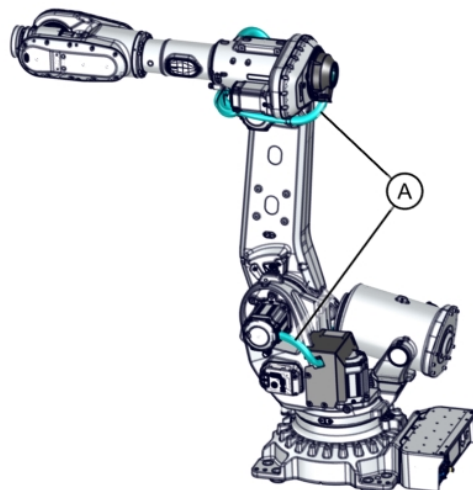
Base 67 includes IP67, according to standard IEC 60529.

#### Foundry cable guard

Option	Description
3315-1	Foundry cable guard

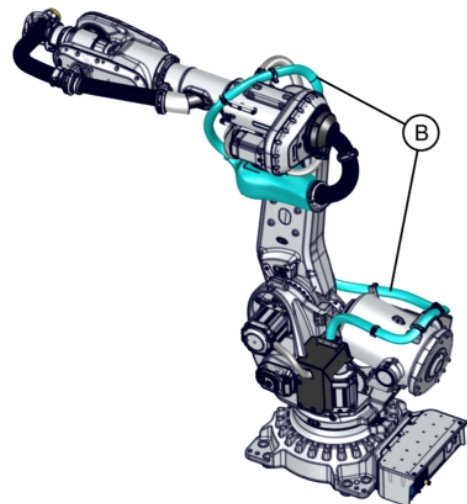
The manipulator can be equipped with additional cable guards for extra tough environmental conditions, for example, metals spits or frequent weld spatter. These additional covers will prolong cable lifetime and simplify service/maintenance as the robot is kept more clean under the covers.

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



xx2300001724

Schematic illustration



xx2300001725

Schematic illustration

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

### 3 Specification of variants and options

#### 3.2 Manipulator

*Continued*

B	Foundry cable guard for DressPack
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#### 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 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].

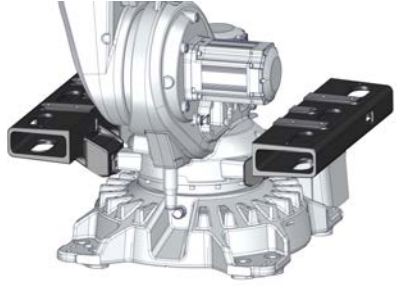
This option is mandatory to order with the option *DressPack axis 3-6* [3326-x].

#### Forklift device

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

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

*Continues on next page*

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.	 <p>xx2300001243</p>

#### Limitations

The option *Fork lift on base* [3318-1] cannot be combined with the option *Inverted* [3317-1].

#### Resolver connection 7th axis

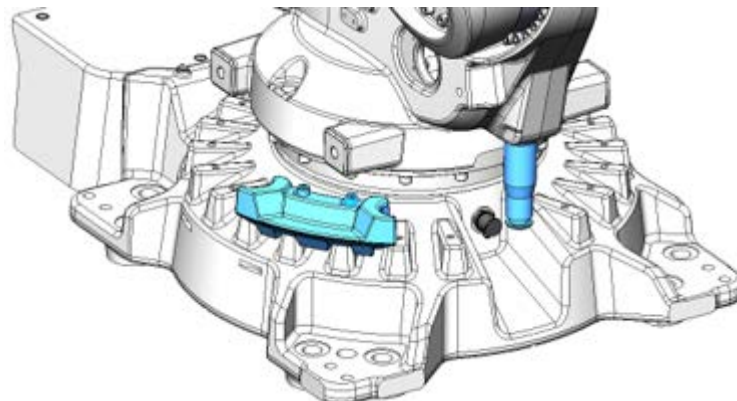
Option	Description
3322-1	On base
3322-2	In servo DressPack Requires options for DressPack base-axis 3.

#### 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.

For detailed information see [Mechanically restricting the working range of axis 1 on page 28](#).



xx2100002595

Continues on next page

### 3 Specification of variants and options

#### 3.2 Manipulator

*Continued*

#### 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 $\pm 220^\circ$ .



#### CAUTION

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

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

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

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

#### Limitations

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

#### 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 Specification of variants and options

#### 3.4 Application manipulator

#### 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.



xx130000223

*Continues on next page*

### 3 Specification of variants and options

#### 3.5.1 Base - Connector kits

#### 3.5.1 Base - Connector kits

##### Available options

Option	Name	DressPack options		
		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, (1/2", 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 <sup>2</sup>
10 pcs Female crimp contacts	For 0.5 mm <sup>2</sup>
10 pcs Female crimp contacts	For 1.0 mm <sup>2</sup>
10 pcs Female crimp contacts	For 2.5 mm <sup>2</sup>
12 pcs Female crimp contacts	For 0.14 - 0.37 mm <sup>2</sup>
45 sockets	For 0.2 - 0.56 mm <sup>2</sup>
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 <sup>2</sup>	

Continues on next page

### 3 Specification of variants and options

#### 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 <sup>2</sup>
Assembly Accessories to complete connector	
Assembly instruction	

### 3 Specification of variants and options

#### 3.5.2 Axis 3 - Connector kits

#### 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 <sup>2</sup>
CBUS	
1 pcs UTOW Pin connector 10p, bayonet	UTOW61210PH, Shell size 12
10 pcs Pin	RM18W3K, 0.5-0.82 mm <sup>2</sup>
Ethernet	
1 pcs Pin connector M12	Harting 21 03 881 1405
4 pcs Pin	Harting 09670005576, 0.13-0.33 mm <sup>2</sup>

##### 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:

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

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

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

*Continues on next page*

### 3 Specification of variants and options

---

#### 3.5.3 Axis 6 - Connector kits

*Continued*

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#### 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 1/2", M22x1.5) and (2x 3/8", M16x1.5))
- 1 Multi contact connector (Female) type including:

• 1 pc Welding connector	3x25 mm <sup>2</sup>
1 pc Cable gland	Diameter 24-28 mm
1 pc End housing	0.21-0.93 mm <sup>2</sup>
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 Specification of variants and options

#### 3.7 Warranty

#### 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 <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	<p>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.</p> <div data-bbox="798 1800 860 1861" data-label="Image"> </div> <div data-bbox="880 1814 946 1845" data-label="Section-Header"> <h5>Note</h5> </div> <div data-bbox="790 1868 1418 1926" data-label="Text"> <p>Special conditions are applicable, see <i>Robotics Warranty Directives</i>.</p> </div>

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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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