

ROBOTICS

Product specification

IRB 6700



Trace back information:

Workspace 21D version a10

Checked in 2021-12-06

Skribenta version 5.4.005

Product specification

**IRB 6700-235/2.65
IRB 6700-205/2.80
IRB 6700-175/3.05
IRB 6700-150/3.20
IRB 6700-200/2.60
IRB 6700-155/2.85
IRB 6700-300/2.70
IRB 6700-245/3.00
IRB 6700Inv-300/2.60
IRB 6700Inv-245/2.90**

IRC5

Document ID: 3HAC044265-001

Revision: U

The information in this manual is subject to change without notice and should not be construed as a commitment by ABB. ABB assumes no responsibility for any errors that may appear in this manual.

Except as may be expressly stated anywhere in this manual, nothing herein shall be construed as any kind of guarantee or warranty by ABB for losses, damage to persons or property, fitness for a specific purpose or the like.

In no event shall ABB be liable for incidental or consequential damages arising from use of this manual and products described herein.

This manual and parts thereof must not be reproduced or copied without ABB's written permission.

Keep for future reference.

Additional copies of this manual may be obtained from ABB.

Original instructions.

© Copyright 2021 ABB. All rights reserved.
Specifications subject to change without notice.

Table of contents

| | |
|--|------------|
| Overview of this product specification | 7 |
| 1 Description | 11 |
| 1.1 Structure | 11 |
| 1.1.1 Introduction | 11 |
| 1.1.2 Different robot versions | 14 |
| 1.1.3 Definition of version designations | 15 |
| 1.2 Standards | 20 |
| 1.2.1 Applicable standards | 20 |
| 1.3 Installation | 22 |
| 1.3.1 Introduction to installation | 22 |
| 1.3.2 Operating requirements | 23 |
| 1.3.3 Assembling the manipulator | 24 |
| 1.4 Calibration and references | 31 |
| 1.4.1 Calibration methods | 31 |
| 1.4.2 Fine calibration | 34 |
| 1.4.3 Absolute Accuracy calibration | 35 |
| 1.5 Load diagrams | 38 |
| 1.5.1 Introduction | 38 |
| 1.5.2 Diagrams | 39 |
| 1.5.3 Maximum load and moment of inertia for full and limited axis 5 (center line down) movement | 69 |
| 1.5.4 Wrist torque | 71 |
| 1.5.5 Maximum TCP acceleration | 72 |
| 1.6 Fitting equipment to the robot | 73 |
| 1.7 Maintenance and troubleshooting | 82 |
| 1.8 Robot motion | 83 |
| 1.8.1 Robot motion | 83 |
| 1.8.2 Performance according to ISO 9283 | 96 |
| 1.8.3 Velocity | 98 |
| 1.8.4 Robot stopping distances and times | 99 |
| 1.9 Cooling fan for axis 1 motor | 100 |
| 1.10 Servo gun | 101 |
| 1.10.1 Introduction | 101 |
| 1.10.2 Stationary gun | 102 |
| 1.10.3 Robot gun | 103 |
| 1.10.4 Robot gun and track motion | 104 |
| 1.10.5 Track motion | 105 |
| 2 DressPack | 107 |
| 2.1 Introduction | 107 |
| 2.1.1 Included options | 107 |
| 2.1.2 Product range | 110 |
| 2.1.3 Limitations of robot movements | 111 |
| 2.1.4 Impact on MH3 DressPack lifetime | 112 |
| 2.1.5 Information structure | 113 |
| 2.2 DressPack | 114 |
| 2.2.1 Introduction | 114 |
| 2.2.2 Built-in features for upper arm DressPack | 115 |
| 2.2.3 Interface descriptions for DressPack | 116 |
| 2.2.4 Dimensions | 122 |
| 2.3 Type H/HSe | 124 |
| 2.3.1 Introduction | 124 |
| 2.3.2 Configuration result for Type H HSe | 126 |
| 2.3.3 Summary common options Type H HSe | 131 |
| 2.3.4 Summary options required for Type HSe | 132 |

Table of contents

| | | |
|--------------|--|------------|
| 2.4 | Type Se | 133 |
| 2.4.1 | Introduction | 133 |
| 2.4.2 | Configuration result for Type Se | 135 |
| 2.4.3 | Summary common options for Type Se | 144 |
| 2.5 | Connection kits | 145 |
| 2.5.1 | Base - Connector kits | 146 |
| 2.5.2 | Axis 3 - Connector kits | 148 |
| 2.5.3 | Axis 6 - Connector kits | 149 |
| 3 | Specification of variants and options | 151 |
| 3.1 | Introduction to variants and options | 151 |
| 3.2 | Manipulator | 152 |
| 3.3 | Equipment | 157 |
| 3.4 | Floor cables | 159 |
| 3.5 | Process DressPack | 160 |
| 3.6 | DressPack floor cables | 161 |
| 3.7 | DressPack Lower and Upper arm | 162 |
| 3.8 | Connection kits | 163 |
| 3.9 | Servo Gun | 164 |
| 3.10 | User documentation | 165 |
| 4 | Accessories | 167 |
| 4.1 | Introduction to accessories | 167 |
| Index | | 169 |

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 IRC5 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 - Controller IRC5</i> IRC5 with main computer DSQC1000. | 3HAC047400-001 |
| <i>Product specification - Controller software IRC5</i> IRC5 with main computer DSQC1000 and RobotWare 6. | 3HAC050945-001 |
| <i>Product manual - IRB 6700</i> | 3HAC044266-001 |
| <i>Product manual - IRB 6700Inv</i> | 3HAC058254-001 |
| <i>Product specification - Robot user documentation, IRC5 with RobotWare 6</i> | 3HAC052355-001 |

Revisions

| Revision | Description |
|----------|--|
| - | First release |
| A | <ul style="list-style-type: none">• The variants IRB 6700-200/2.60 and IRB 6700-155/2.85 are added.• Minor corrections/updates |
| B | <ul style="list-style-type: none">• DressPack & SpotPack updated |
| C | <ul style="list-style-type: none">• Text for Foundry Plus updated.• Two variants added, IRB 6700-300/2.70 and IRB 6700-245/3.00.• Minor corrections/update |

Continues on next page

Overview of this product specification

Continued

| Revision | Description |
|----------|---|
| D | <ul style="list-style-type: none"> AbsAcc data added New loads for IRB 6700-300 and -245 added Values for power consumption, brakes engaged/disengaged added Tightening torque for robot adjusted The use of guide pins for robot base added Updated data (ISO, weight) for IRB 6700-200 and IRB 6700-155 |
| E | <ul style="list-style-type: none"> Minor corrections/update Updated standard tool flange drawing Guide pins for base plate changed to two cylindrical |
| F | <ul style="list-style-type: none"> Information regarding warranty for upper arm dress pack added. Minor corrections/update Section <i>SpotWelding cabinet</i> updated. |
| G | <ul style="list-style-type: none"> Warranty information for DressPack updated. Dimensions (measure D), for products -150/3.20 and -205/2.80 in table <i>Holes for fitting extra equipment</i> are changed from 400 mm to 500 mm. Illustration in section <i>Fastening holes robot base</i> is updated regarding guide holes. Illustration regarding centering diameters on tool flange updated. |
| H | <p>Published in release R17.1. The following updates are done in this revision:</p> <ul style="list-style-type: none"> Illustration for <i>Tool flange, standard</i> is updated. Major structural change is made on chapter <i>Specifications of variants and options</i>. IRB 6700Inv is added. Restriction of load diagram added. Working range axis 2 and 3 added. |
| J | <p>Published in release R17.2. The following updates are done in this revision:</p> <ul style="list-style-type: none"> Updated list of applicable standards. Delete option 828-1, 828-2, 768-3 and 782-1 as they were all phased out. 635-1,3,4,5 option phased out and replaced by 636-6. Type HS and S are phased out. 782-7, 796-1 phased out. |
| K | <p>Published in release R18.1. The following updates are done in this revision:</p> <ul style="list-style-type: none"> Water and air unit updated. |
| L | <p>Published in release R18.2. The following updates are done in this revision:</p> <ul style="list-style-type: none"> Customer signal wire information for Type H/HSe Ethernet updated. |
| M | <p>Published in release 19B. The following updates are done in this revision:</p> <ul style="list-style-type: none"> Minor corrections/updates Updated information about <i>Absolute Accuracy</i>. |
| N | <p>Published in release 19C. The following updates are done in this revision:</p> <ul style="list-style-type: none"> Updated option description of Extended working range. Note added about need to calibrate if the robot is other than floor mounted. See Calibration methods on page 31. Graphics for DressPack updated. See Base on page 117 |
| P | <p>Published in release 20A. The following updates are done in this revision:</p> <ul style="list-style-type: none"> M8 cable lug description added in DressPack section. |

Continues on next page

Overview of this product specification

Continued

| Revision | Description |
|----------|--|
| Q | Published in release 20C. The following updates are done in this revision: <ul style="list-style-type: none">Made minor changes in Dresspack section. |
| R | Published in release 20D. The following updates are done in this revision: <ul style="list-style-type: none">Warranty section updated |
| S | Published in release 21A. The following updates are done in this revision: <ul style="list-style-type: none">Minor changes |
| T | Published in release 21C The following updates are done in this revision: <ul style="list-style-type: none">Text regarding fastener quality is updated.Removed Axis resolution.Updated information about the option <i>Extended working range</i>.Removed options (SpotPack phase out)782-13 Bosch MFDC ProfiNet, 858-1 Bosch Adaptive control, 788-1 Forced air cooling, 789-1 Earth fault protection unit, 790-1 Contactor for weld power, 791-1 Weld power cable, 7 m, 791-2 Weld power cable, 15 m, 809-1 process cable to stationary gun, 7 m, 809-2 process cable to stationary gun, 15 m, 792-1 Type S, 792-2 Type HS, 793-1 Second water return, 797-1 7m, 797-2 15m, 797-3 22m, 797-4 30m. |
| U | Published in release 21D The following updates are done in this revision: <ul style="list-style-type: none">Updated the available type for DressPack Type H/HS/HSe and Type Se. |

This page is intentionally left blank

1 Description

1.1 Structure

1.1.1 Introduction

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.

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.

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 107](#).

Operating system

The robot is equipped with the IRC5 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 - Controller IRC5](#).

Safety

Safety standards valid for complete robot, manipulator and controller.

Additional functionality

For additional functionality, the robot can be equipped with optional software for application support - for example gluing and welding, communication features - network communication - and advanced functions such as multitasking, sensor control etc. For a complete description on optional software, see the [Product specification - Controller IRC5](#).

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.

Continues on next page

1 Description

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 are as well as in other applications areas. Please contact ABB Robotics Sales organization if in doubt regarding specific application feasibility for the Foundry Plus 2 protected robot.

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

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

Selected Foundry Plus 2 features:

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

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

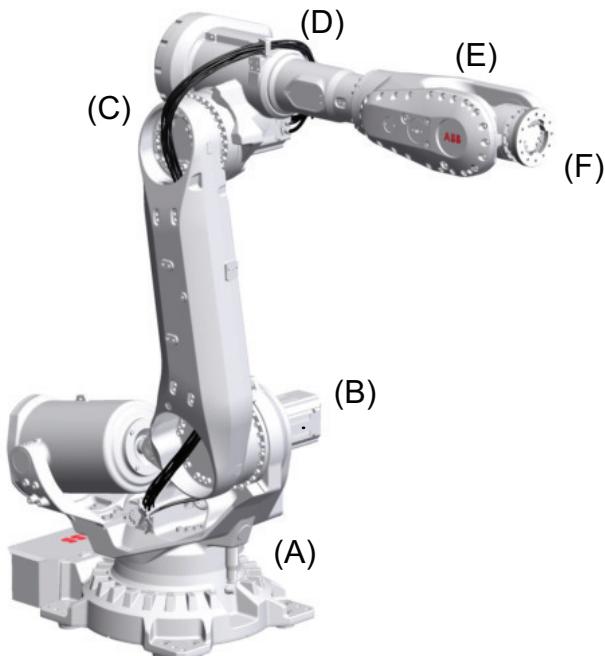
Available robot versions

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

See [Specification of variants and options on page 151](#) for robot versions and other options not selectable together with Foundry Plus 2.

Continues on next page

Robot axes



xx1300000244

| 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 versions

General

The IRB 6700 is available in ten versions.

Robot versions

The following standard robot versions are available.

| Robot version | Handling capacity (kg) | Handling capacity for LeanID (kg) | Reach (m) |
|---------------|------------------------|-----------------------------------|-----------|
| IRB 6700 | 235 kg | 220 kg | 2.65 m |
| IRB 6700 | 205 kg | 200 kg | 2.80 m |
| IRB 6700 | 200 kg | 175 kg | 2.60 m |
| IRB 6700 | 175 kg | 155 kg | 3.05 m |
| IRB 6700 | 155 kg | 140 kg | 2.85 m |
| IRB 6700 | 150 kg | 145 kg | 3.20 m |
| IRB 6700 | 300 kg | 270 kg | 2.70 m |
| IRB 6700 | 245 kg | 220 kg | 3.00 m |
| IRB 6700Inv | 300 kg | 270 kg | 2.60 m |
| IRB 6700Inv | 245 kg | 210 kg | 2.90 m |



Note

If option 780-4, LeanID is selected, the payload will decrease as stated above, for detailed information see [Load diagrams on page 38](#)

1.1.3 Definition of version designations**Manipulator weight**

| Robot type | Weight [kg] ⁱ |
|----------------------|--------------------------|
| IRB 6700-235/2.65 | 1,250 |
| IRB 6700-205/2.80 | 1,260 |
| IRB 6700-200/2.60 | 1,205 |
| IRB 6700-175/3.05 | 1,270 |
| IRB 6700-155/2.85 | 1,220 |
| IRB 6700-150/3.20 | 1,280 |
| IRB 6700-300/2.70 | 1,525 |
| IRB 6700-245/3.00 | 1,540 |
| IRB 6700INV-300/2.60 | 1,690 |
| IRB 6700INV-245/2.90 | 1,705 |

ⁱ Manipulator weight

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) |

Continues on next page

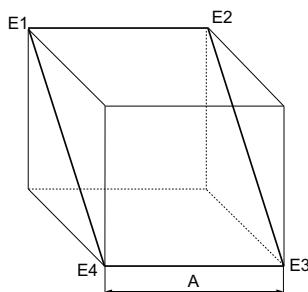
1 Description

1.1.3 Definition of version designations

Continued

Power consumption at max load

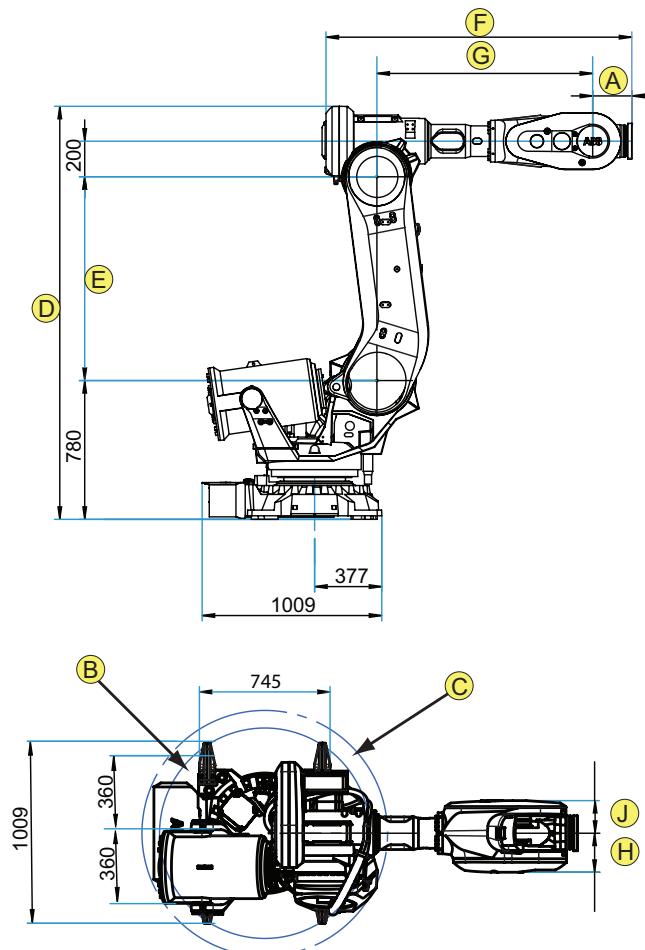
| Type of movement | 235/2.65 | 205/2.80 | 200/2.60 | 175/3.05 | 155/2.85 | 150/3.20 | 300/2.70 | 245/3.00 | INV 300/2.60 | INV 245/2.90 |
|-------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|--------------|--------------|
| ISO Cube Max. velocity (kW) | 2.9 | 2.6 | 2.6 | 2.8 | 2.7 | 2.7 | 3.4 | 3.2 | 3.4 | 3.3 |
| Robot in calibration position | 235/2.65 | 205/2.80 | 200/2.60 | 175/3.05 | 155/2.85 | 150/3.20 | 300/2.70 | 245/3.00 | INV 300/2.60 | INV 245/2.90 |
| Brakes engaged (kW) | 0.16 | 0.17 | 0.15 | 0.16 | 0.15 | 0.16 | 0.15 | 0.15 | 0.17 | 0.17 |
| Brakes disengaged (kW) | 0.71 | 0.84 | 0.62 | 0.82 | 0.69 | 0.77 | 0.79 | 0.75 | 1.06 | 0.99 |



xx1000000101

| | |
|---|----------|
| A | 1,000 mm |
|---|----------|

Continues on next page

Main dimensions of IRB 6700

xx1300000241

| Pos | Description |
|-----|--|
| A | 200 mm (all standard variants); except 300/2.70 and 245/3.00 =220 mm 350 mm (all LeanID variants, option 780-4); except IRB 300/2.70 and 245/3.00 = 380 mm |
| B | Radius ax1, front = 532 mm (IRB 6700-235/2.65, -205/2.80, -175/3.05, -150/3.20, -200/2.60 and -155/2.85) Radius ax1, front = 600 mm (IRB 6700-300/2.70 and -245/3.00) |
| C | Radius ax1, back = 633 mm (IRB 6700-235/2.65, -220/2.65 LID, -205/2.80, -200/2.80 LID, -175/3.05, -155/3.05 LID, -150/3.20, -145/3.20 LID, -200/2.60, -175/2.60 LID, -155/2.85 and 140/2.85 LID) |

| Robot variant | D | E | F | G | H | J |
|---------------------|------|------|------|---------|-------|-----|
| IRB 6700 - 235/2.65 | 2300 | 1135 | 1670 | 1182.5 | 209 | 186 |
| IRB 6700 - 205/2.80 | 2445 | 1280 | 1670 | 1182.5 | 186 | 209 |
| 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 | 1592.5 | 209 | 186 |
| IRB 6700 - 155/2.85 | 2276 | 1125 | 1873 | 1,392.5 | 197.5 | 193 |

Continues on next page

1 Description

1.1.3 Definition of version designations

Continued

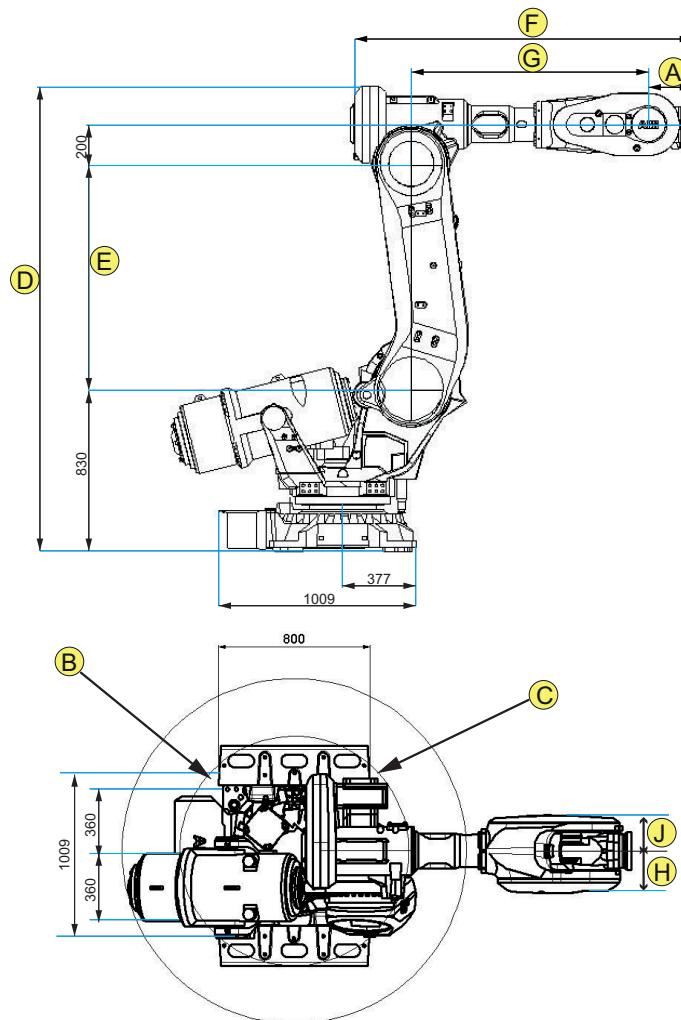
| Robot variant | D | E | F | G | H | J |
|---------------------|------|------|--------|--------|-------|-----|
| IRB 6700 - 300/2.70 | 2321 | 1145 | 1718.5 | 1212.5 | 222.5 | 187 |
| IRB 6700 - 245/3.00 | 2321 | 1145 | 1968.5 | 1462.5 | 222.5 | 186 |



Note

For DressPack dimensions, see [Dimensions for robot with DressPack on page 122](#)

Continues on next page

Main dimensions of IRB 6700 inverted variants

xx1700000559

| Pos | Description |
|-----|--|
| A | 220 mm (all IRB 6700Inv variants) 380 mm (all IRB 6700Inv LeanID variants) option 780-4 |
| B | Radius ax1, front = 626 mm |
| C | Radius ax1, back = 910 mm |

| Robot variant | D | E | F | G | H | J |
|------------------------|------|------|--------|--------|-------|-----|
| IRB 6700Inv - 300/2.60 | 2372 | 1145 | 1718.5 | 1212.5 | 222.5 | 187 |
| IRB 6700Inv - 245/2.90 | 2372 | 1145 | 1968.5 | 1468.5 | 222.5 | 186 |

1 Description

1.2.1 Applicable standards

1.2 Standards

1.2.1 Applicable standards



Note

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

General

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

Normative standards as referred to from ISO 10218-1

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

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 |

Other standards used in design

| Standard | Description |
|---------------|---|
| ISO 9787:2013 | Robots and robotic devices -- Coordinate systems and motion nomenclatures |
| IEC 61000-6-2 | Electromagnetic compatibility (EMC) – Part 6-2: Generic standards – Immunity standard for industrial environments |
| IEC 61000-6-4 | Electromagnetic compatibility (EMC) – Part 6-4: Generic standards – Emission standard for industrial environments |

Continues on next page

1 Description

1.2.1 Applicable standards

Continued

| Standard | Description |
|--------------------------------|--|
| ISO 13732-1:2006 | Ergonomics of the thermal environment - Part 1 |
| IEC 60974-1:2012 ⁱ | Arc welding equipment - Part 1: Welding power sources |
| IEC 60974-10:2014 ⁱ | Arc welding equipment - Part 10: EMC requirements |
| ISO 14644-1:2015 ⁱⁱ | Classification of air cleanliness |
| IEC 60529:1989 + A2:2013 | Degrees of protection provided by enclosures (IP code) |

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

ⁱⁱ Only robots with protection Clean Room.

1 Description

1.3.1 Introduction to installation

1.3 Installation

1.3.1 Introduction to installation

General

IRB 6700 are designed for floor mounting (no tilting allowed around X-axis or Y-axis). IRB 6700Inv variants are designed for inverted mounting (no tilting allowed around X-axis or Y-axis). Depending on the robot version, 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 38](#).

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 73](#).

Working range limitation

The working range of axes 1 can be limited by mechanical stops as option. See [Working range limitation on page 155](#).

1.3.2 Operating requirements

Protection standards

| | |
|--|------------------|
| Robot version/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 ⁱ (41°F) Maximum: +50°C (122°F) |
| For the controller | Standard/Option | See <i>Product specification - Controller IRC5</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) |

ⁱ 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 Description

1.3.3 Assembling the manipulator

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 | $\pm 7.4 \text{ kN}^{\text{i}} / \pm 8.7 \text{ kN}^{\text{ii}}$ | $\pm 19.8 \text{ kN}^{\text{i}} / \pm 21.8 \text{ kN}^{\text{ii}}$ |
| Force z | $14.6 \pm 4.5 \text{ kN}^{\text{i}} / 18.0 \pm 5.4 \text{ kN}^{\text{ii}}$ | $14.6 \pm 15.7 \text{ kN}^{\text{i}} / 18.0 \pm 17.4 \text{ kN}^{\text{ii}}$ |
| Torque xy | $\pm 21.0 \text{ kNm}^{\text{i}} / \pm 24.9 \text{ kNm}^{\text{ii}}$ | $\pm 37.1 \text{ kNm}^{\text{i}} / \pm 45.3 \text{ kNm}^{\text{ii}}$ |
| Torque z | $\pm 5.0 \text{ kNm}^{\text{i}} / \pm 6.5 \text{ kNm}^{\text{ii}}$ | $\pm 11.4 \text{ kNm}^{\text{i}} / \pm 15.5 \text{ kNm}^{\text{ii}}$ |

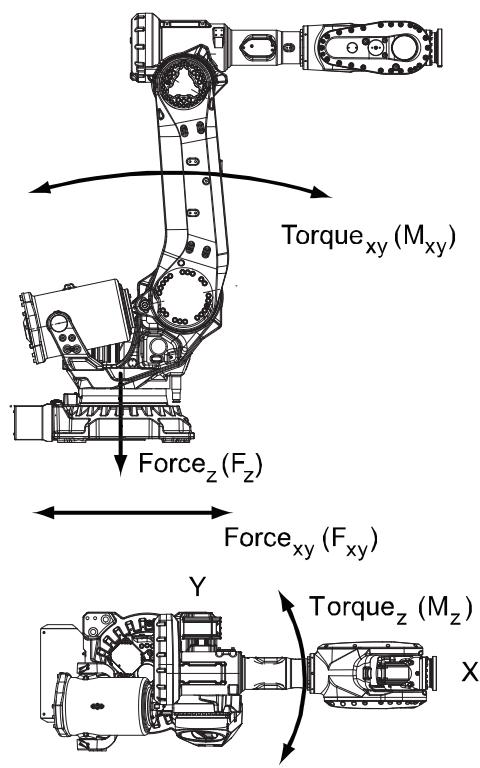
i Valid for IRB 6700-235, -205, -175, -150, -200, -155.

ii Valid for IRB 6700-300, -245.

Inverted Mounted

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

i Valid for IRB 6700Inv-300, -245.



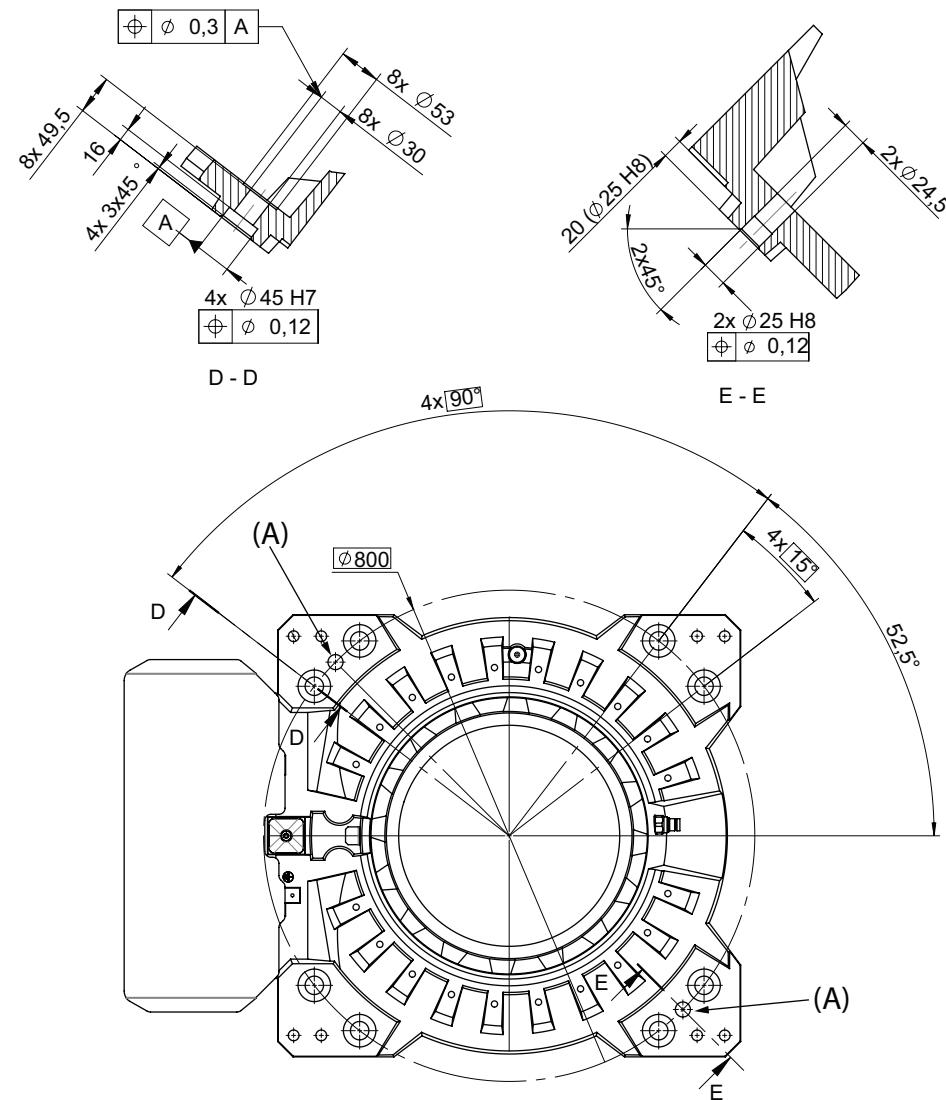
xx1300000242

Continues on next page

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. See [Guide pins on page 30](#).

Continues on next page

1 Description

1.3.3 Assembling the manipulator

Continued

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. The corresponding holes in the base plate shall be circular according to figure [Base plate drawing on page 27](#).

AbsAcc performance

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

Continues on next page

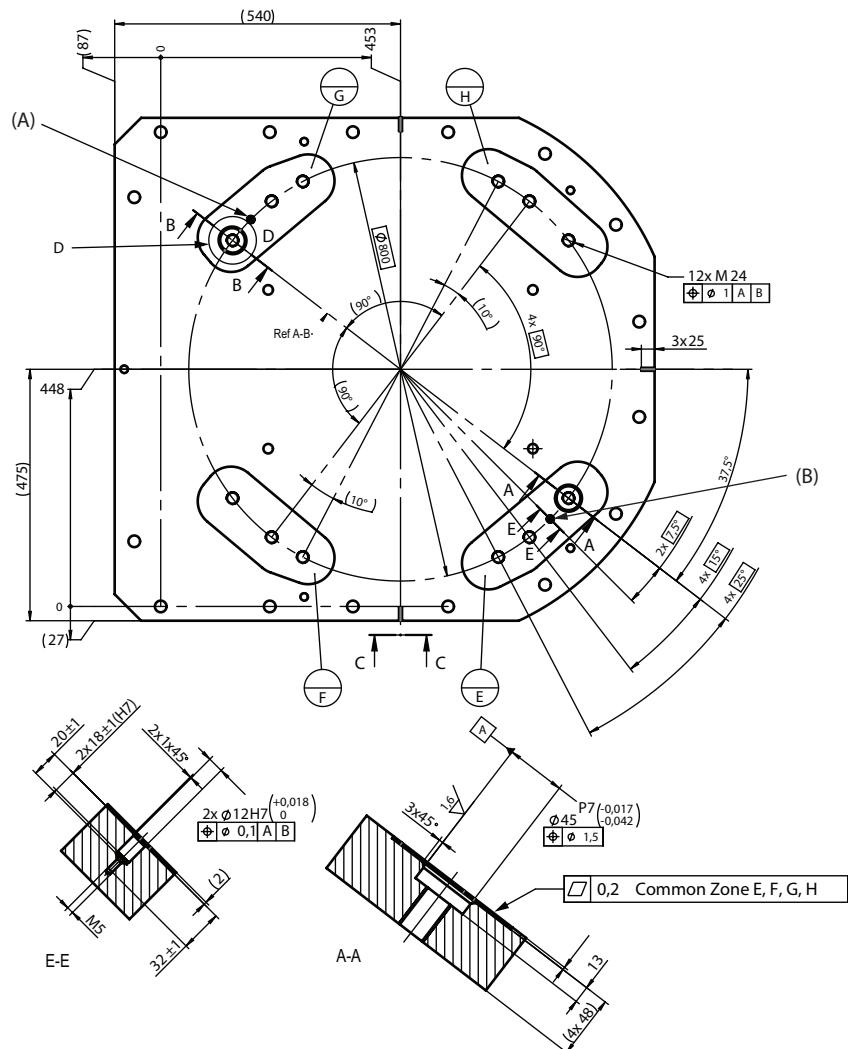
Base plate drawing



Note

IRB 6700INV is not valid for base plate.

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



xx1500000246

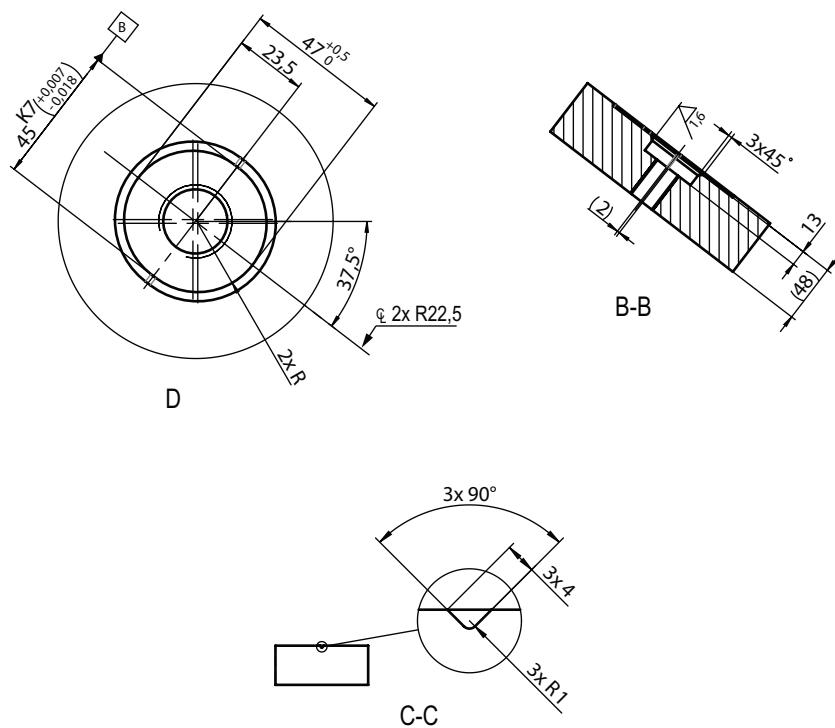
| Pos | Description |
|------------|--|
| A, B | Hole for guide pin, cylindrical, see Guide pins on page 30 |
| E, F, G, H | Common tolerance zone (accuracy all over the base plate from one contact surface to the other) |

Continues on next page

1 Description

1.3.3 Assembling the manipulator

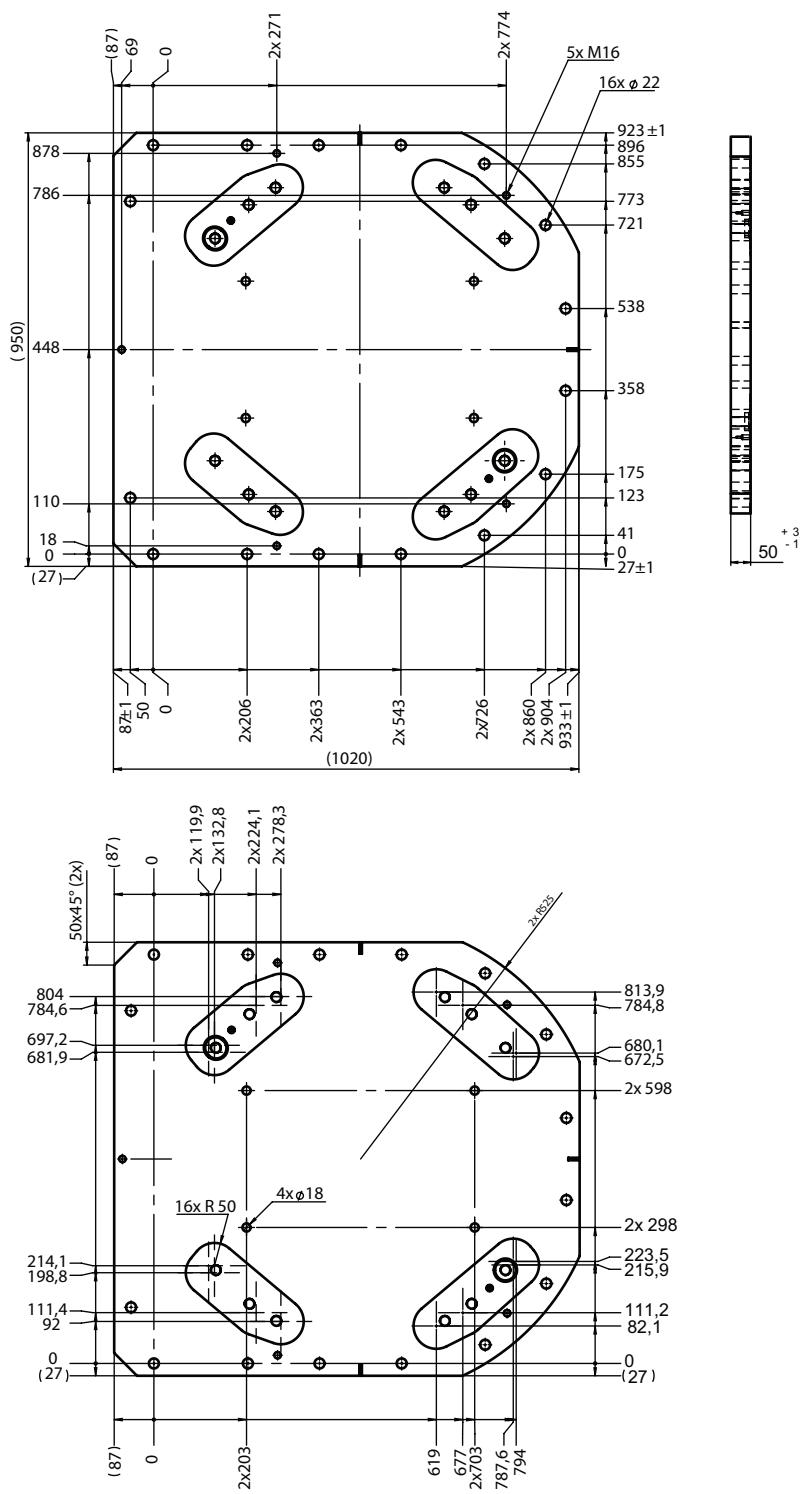
Continued



xx1500000247

Continues on next page

1.3.3 Assembling the manipulator

Continued

xx1500000249

A

Color: RAL 9005
 Thickness: 80-100 µm
 Weight: 360 kg

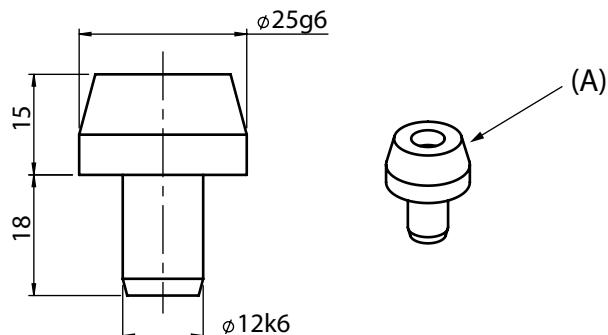
Continues on next page

1 Description

1.3.3 Assembling the manipulator

Continued

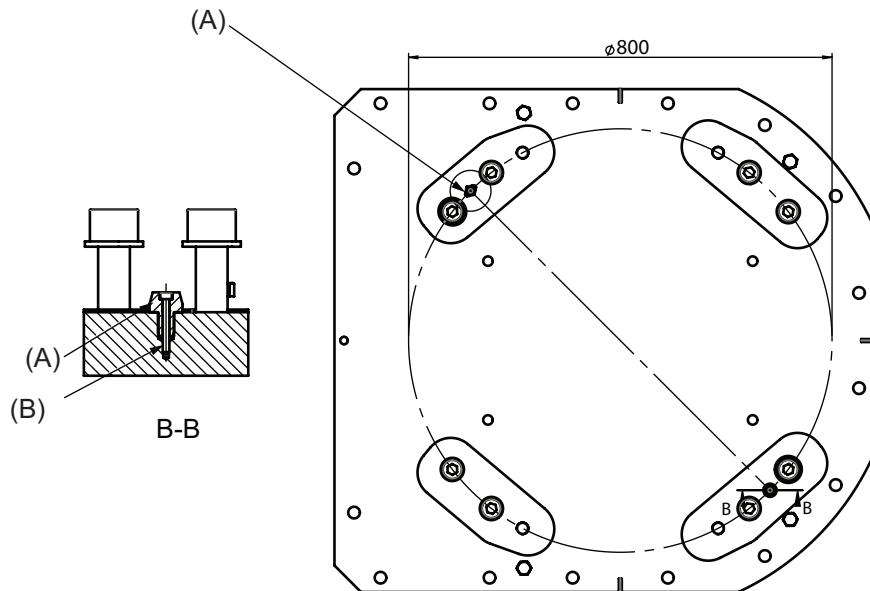
Guide pins



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.

1.4 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 | <p>The calibrated robot is positioned at calibration position.</p> <p>Standard calibration data is found on the SMB (serial measurement board) or EIB in the robot.</p> <p>For robots with RobotWare 5.04 or older, the calibration data is delivered in a file, calib.cfg, supplied with the robot at delivery. The file identifies the correct resolver/motor position corresponding to the robot home position.</p> | Axis Calibration or Calibration Pendulum |
| Absolute accuracy calibration (optional) | <p>Based on standard calibration, and besides positioning the robot at synchronization position, the Absolute accuracy calibration also compensates for:</p> <ul style="list-style-type: none"> • Mechanical tolerances in the robot structure • Deflection due to load <p>Absolute accuracy calibration focuses on positioning accuracy in the Cartesian coordinate system for the robot.</p> <p>Absolute accuracy calibration data is found on the SMB (serial measurement board) in the robot.</p> <p>For robots with RobotWare 5.05 or older, the absolute accuracy calibration data is delivered in a file, absacc.cfg, supplied with the robot at delivery. The file replaces the calib.cfg file and identifies motor positions as well as absolute accuracy compensation parameters.</p> <p>A robot calibrated with Absolute accuracy has a sticker next to the identification plate of the robot.</p> <p>To regain 100% Absolute accuracy performance, the robot must be recalibrated for absolute accuracy after repair or maintenance that affects the mechanical structure.</p>  <p>ABSOLUTE ACCURACY</p> <p>xx0400001197</p> <p>3HAC 14257-1</p> | CalibWare |

Continues on next page

1 Description

1.4.1 Calibration methods

Continued

| Type of calibration | Description | Calibration method |
|---------------------|---|--------------------|
| 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. | Wrist Optimization |

- i The robot is calibrated by either Calibration Pendulum or Axis Calibration at factory. Always use the same calibration method as used at the factory.
Information about valid calibration method is found on the calibration label or in the calibration menu on the FlexPendant.
If no data is found related to standard calibration, contact the local ABB Service.

Brief description of calibration methods

Calibration Pendulum method

Calibration Pendulum is a standard calibration method for calibration of many of ABB robots (except IRB 6400R, IRB 640, IRB 1400H, and IRB 4400S).

Two different routines are available for the Calibration Pendulum method:

- Calibration Pendulum II
- Reference calibration

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

Axis Calibration method

Axis Calibration is a standard calibration method for calibration of IRB 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 following routines are available for the Wrist Optimization method:

- Wrist Optimization

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.

Continues on next page

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.

1 Description

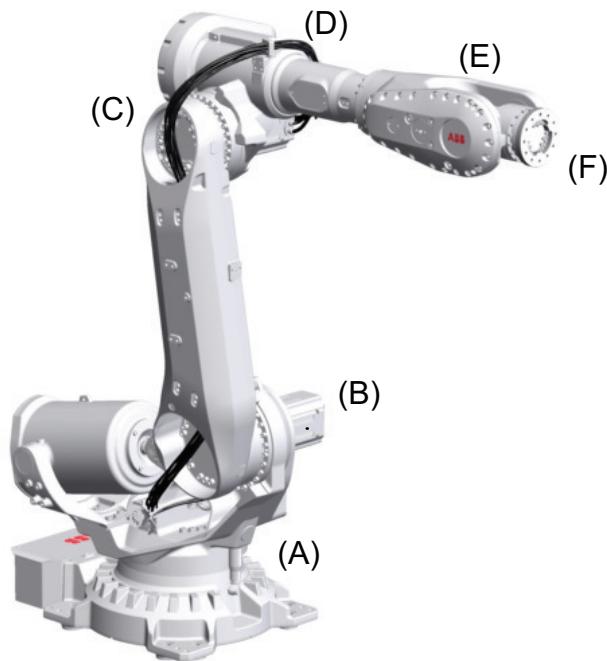
1.4.2 Fine calibration

1.4.2 Fine calibration

General

Fine calibration is made using the Calibration Pendulum, see *Operating manual - Calibration Pendulum* or Axis calibration, see *Product manual - IRB 6700* and *Product manual - IRB 6700Inv*.

Axes



xx1300000244

| 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 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:

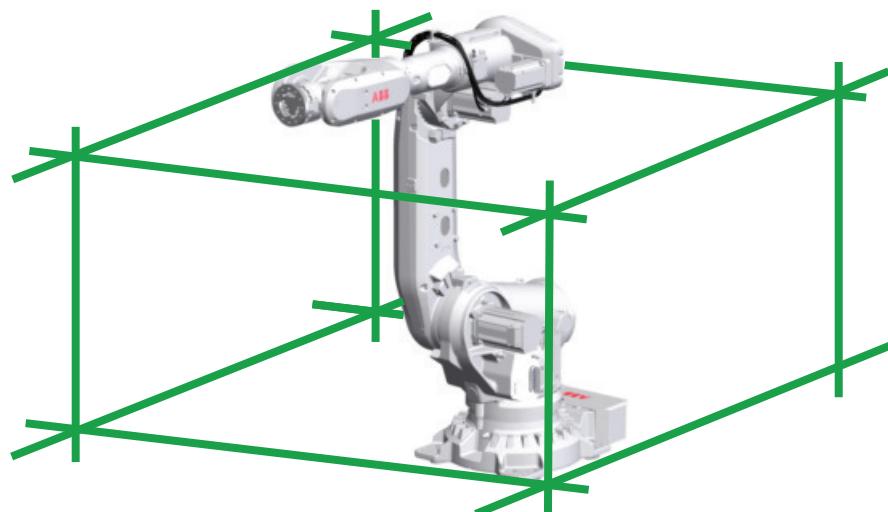
- Exchangeability of robots
- Offline programming with no or minimum touch-up
- Online programming with accurate movement and reorientation of tool
- Programming with accurate offset movement in relation to eg. vision system or offset programming
- Re-use of programs between applications

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.



xx1300002177

What is included

Every *Absolute Accuracy* robot is delivered with:

- compensation parameters saved on the robot's serial measurement board

Continues on next page

1 Description

1.4.3 Absolute Accuracy calibration

Continued

- 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. Compensation parameters saved in the robot's serial measurement board differ depending on which *Absolute Accuracy* option is selected.

When is *Absolute Accuracy* being used

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

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

Absolute Accuracy active

Absolute Accuracy will be active in the following cases:

- Any motion function based on robttargets (e.g. `MoveL`) and `ModPos` on robttargets
- 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.

Continues on next page

Production data

Typical production data regarding calibration are:

| Robot | Positioning accuracy (mm) | | |
|---------------------------------------|---------------------------|------|---------------|
| | Average | Max | % Within 1 mm |
| IRB 6700 (all variants except LeanID) | 0.35 | 0.75 | 100 |
| IRB 6700 LeanID (all variants) | 0.40 | 0.85 | 100 |

1 Description

1.5.1 Introduction

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 - IRC5 with FlexPendant*, for detailed information.



WARNING

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

General

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

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

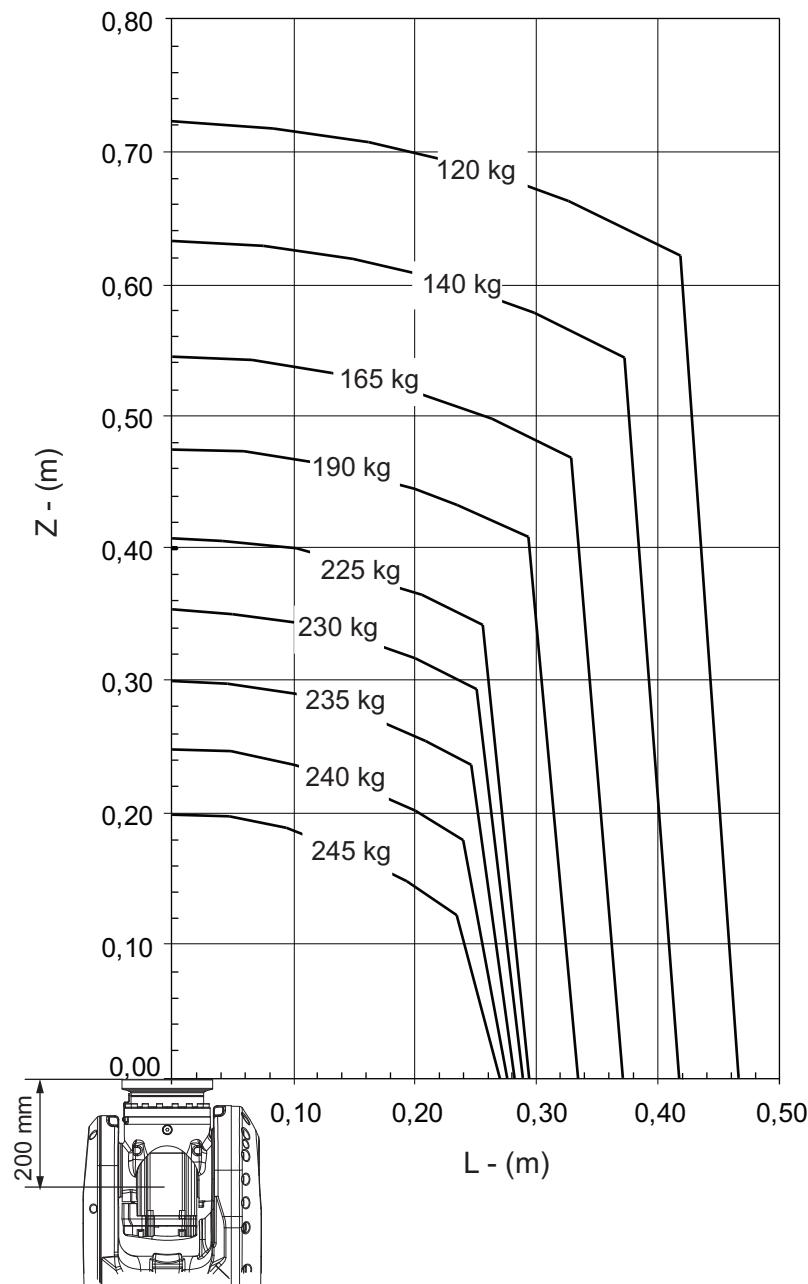
Control of load case by "RobotLoad"

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.

1.5.2 Diagrams

IRB 6700-235/2.65



xx1300000245

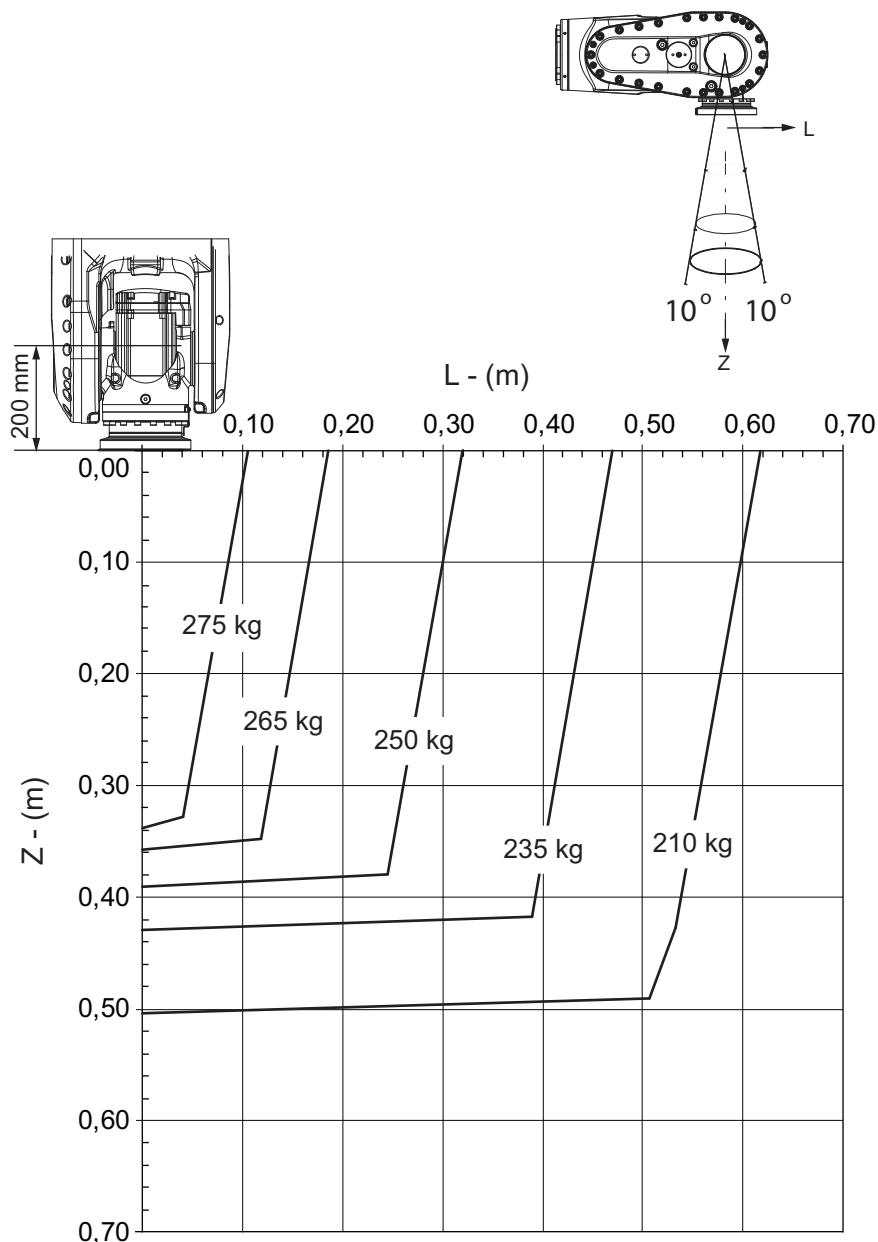
Continues on next page

1 Description

1.5.2 Diagrams

Continued

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



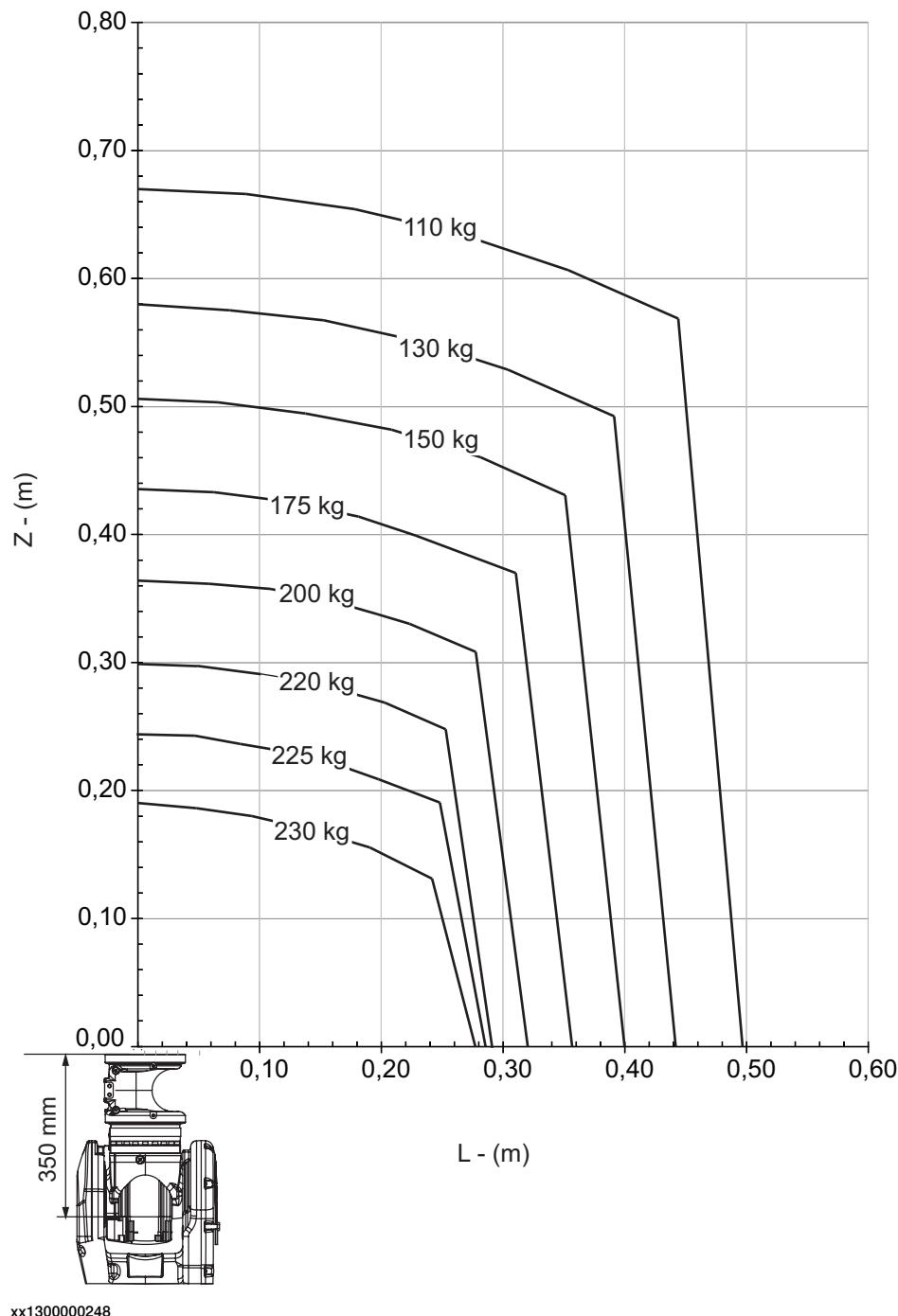
xx1300000246

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

| | Description |
|------------|-------------|
| Max load | 280 kg |
| Z_{\max} | 0.327 m |
| L_{\max} | 0.100 m |

Continues on next page

IRB 6700-235/2.65 "LeanID", option 780-4



xx1300000248

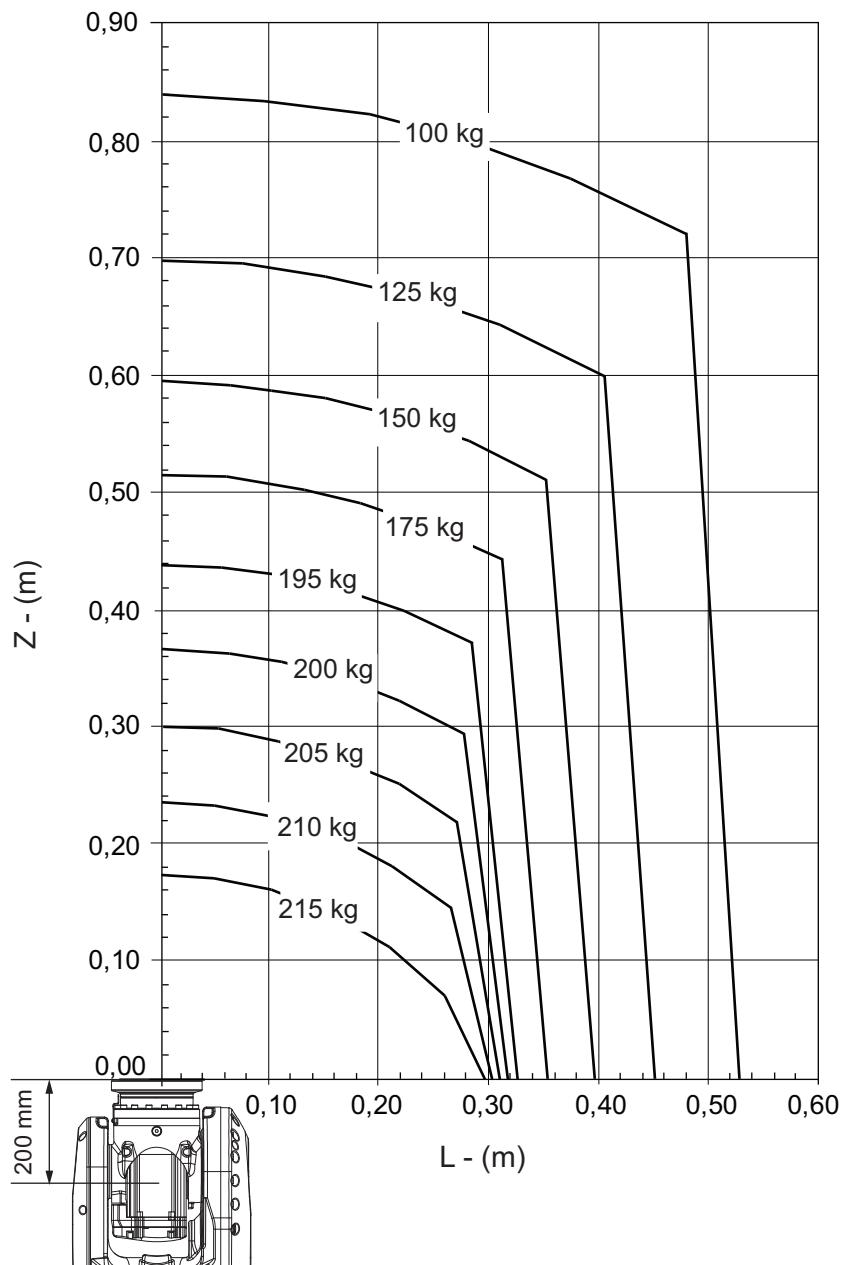
Continues on next page

1 Description

1.5.2 Diagrams

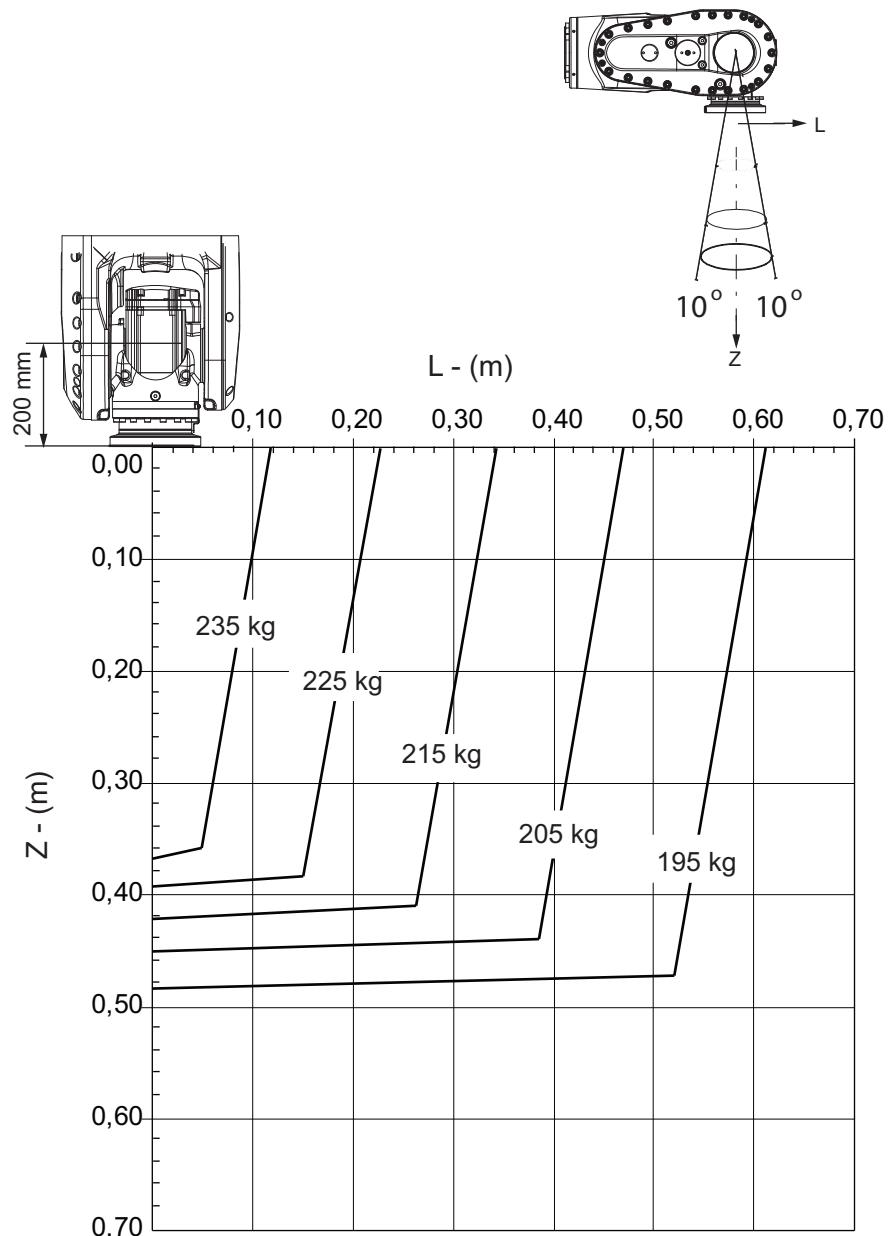
Continued

IRB 6700-205/2.80



xx1300000249

Continues on next page

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

xx1300000250

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

| | Description |
|------------------|-------------|
| Max load | 240 kg |
| Z _{max} | 0.355 m |
| L _{max} | 0.103 m |

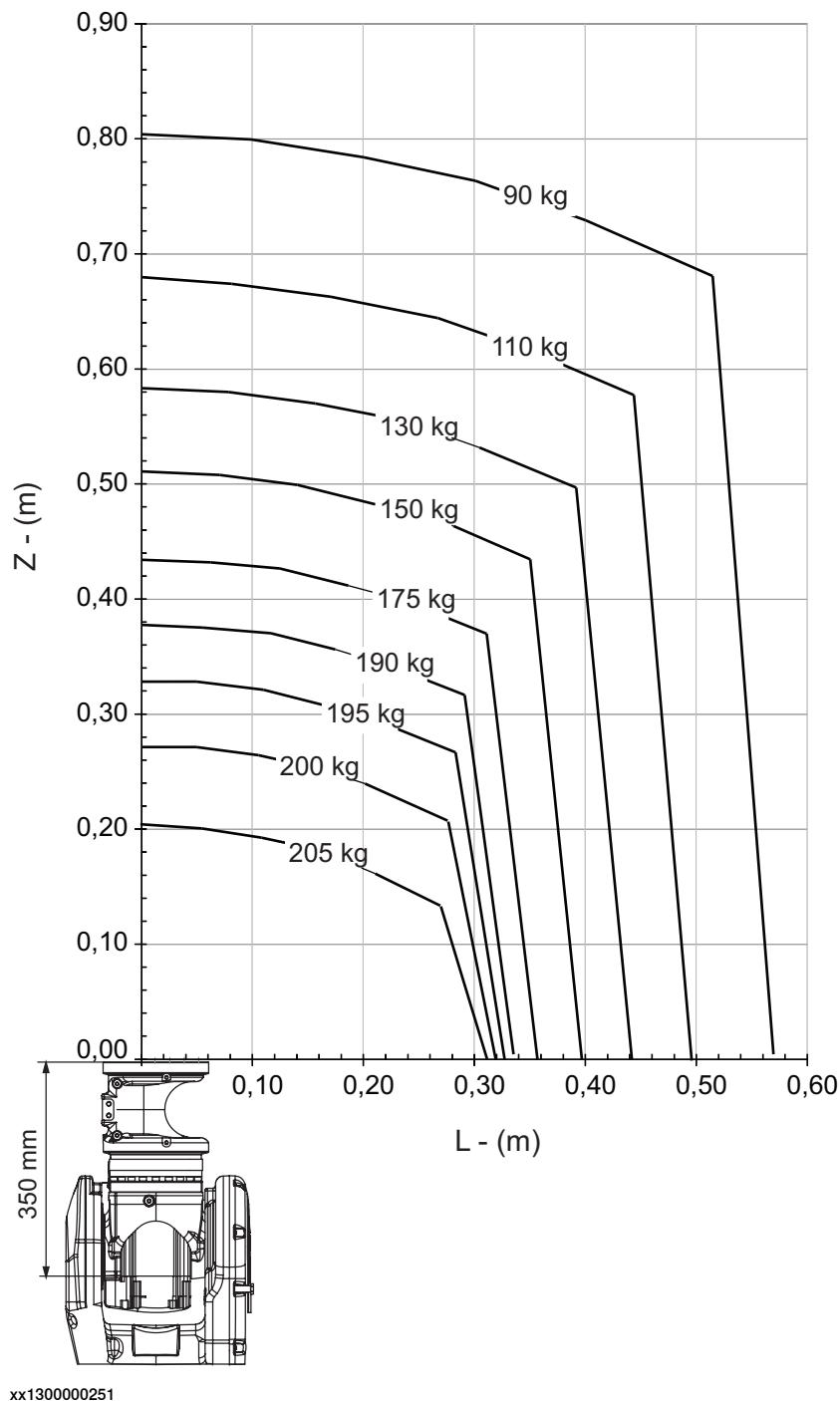
Continues on next page

1 Description

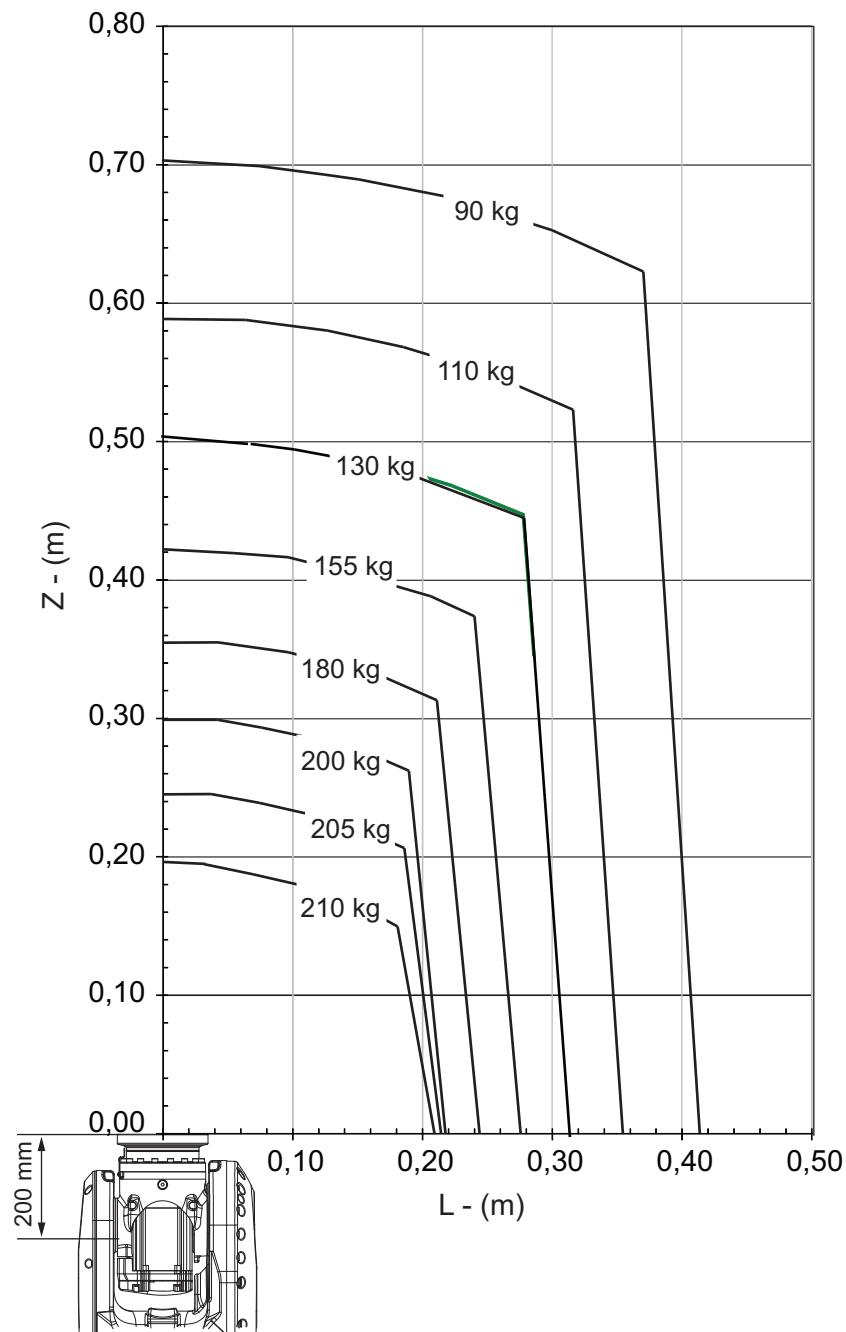
1.5.2 Diagrams

Continued

IRB 6700-205/2.80 "LeanID", option 780-4



Continues on next page

IRB 6700-200/2.60

xx1300000333

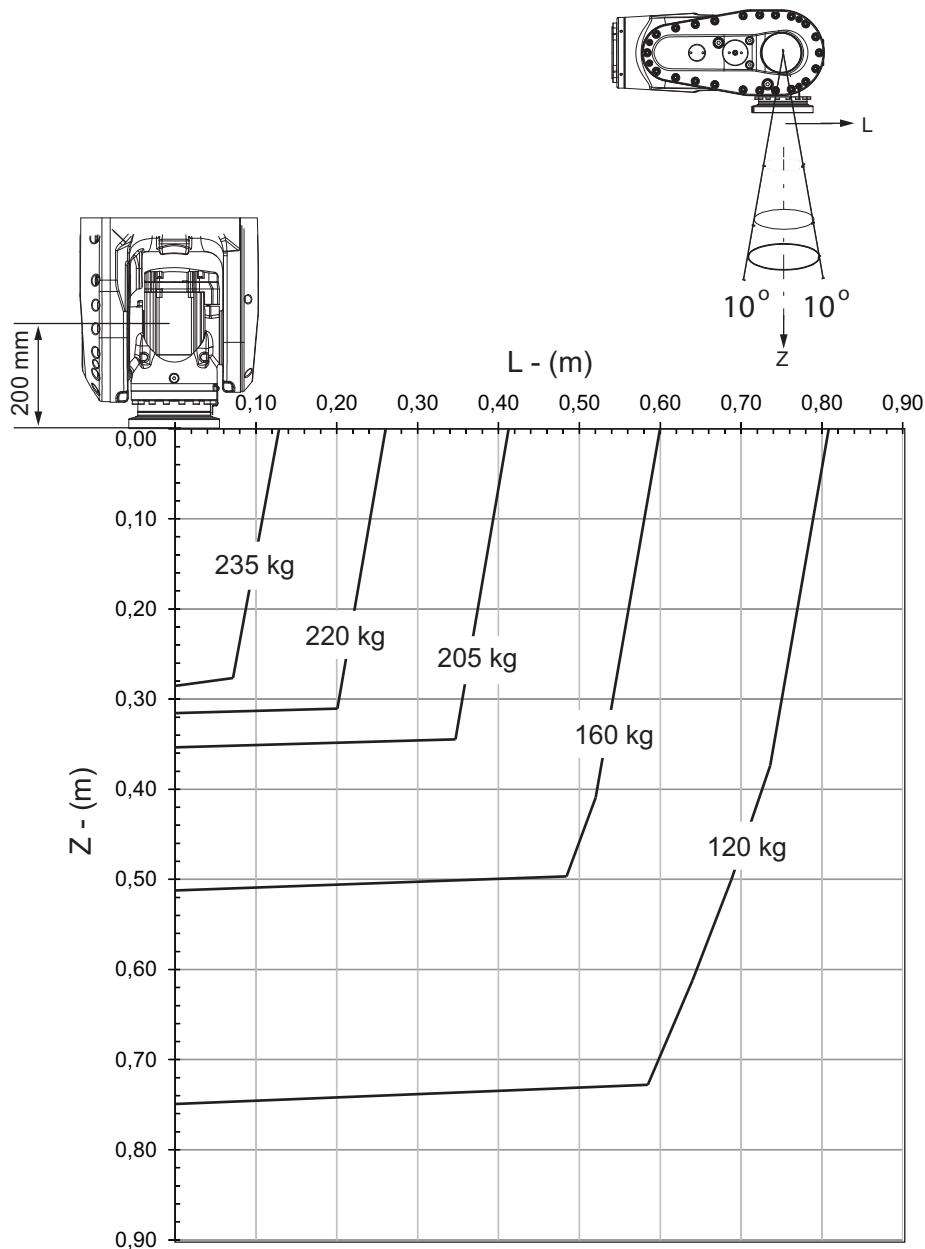
Continues on next page

1 Description

1.5.2 Diagrams

Continued

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



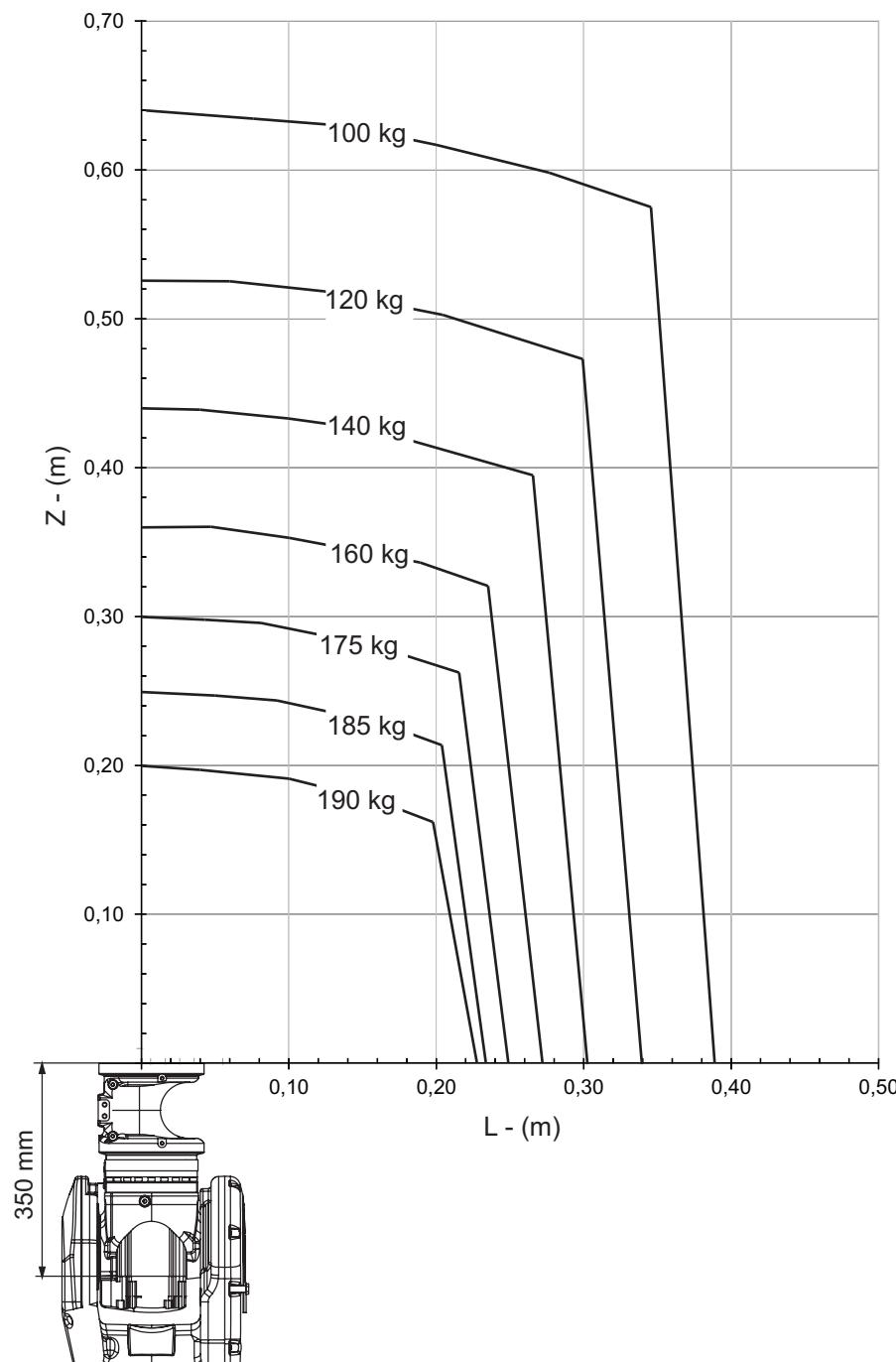
xx1300000334

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

| | Description |
|------------|-------------|
| Max load | 242 kg |
| Z_{\max} | 0.27 m |
| L_{\max} | 0.104 m |

Continues on next page

IRB 6700-200/2.60 "LeanID", option 780-4



xx1300000335

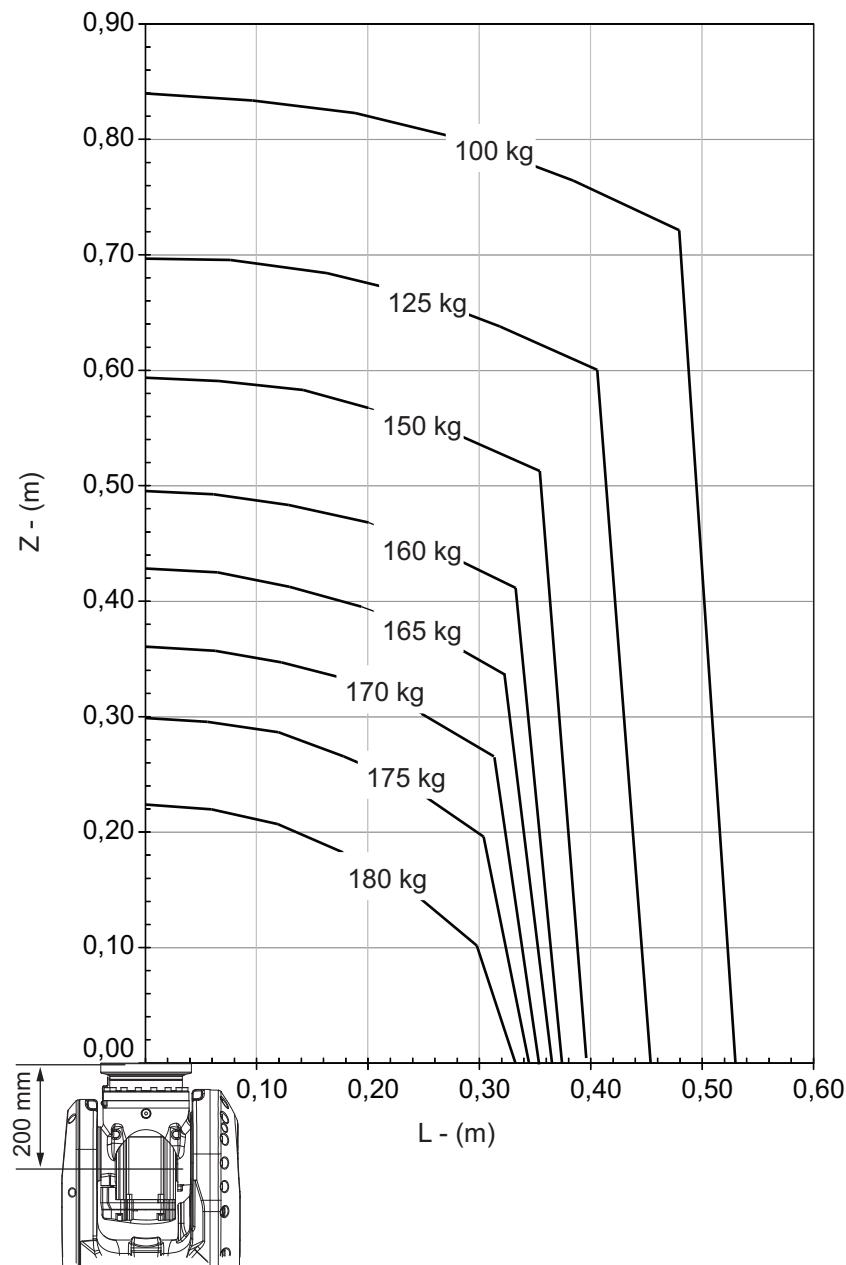
Continues on next page

1 Description

1.5.2 Diagrams

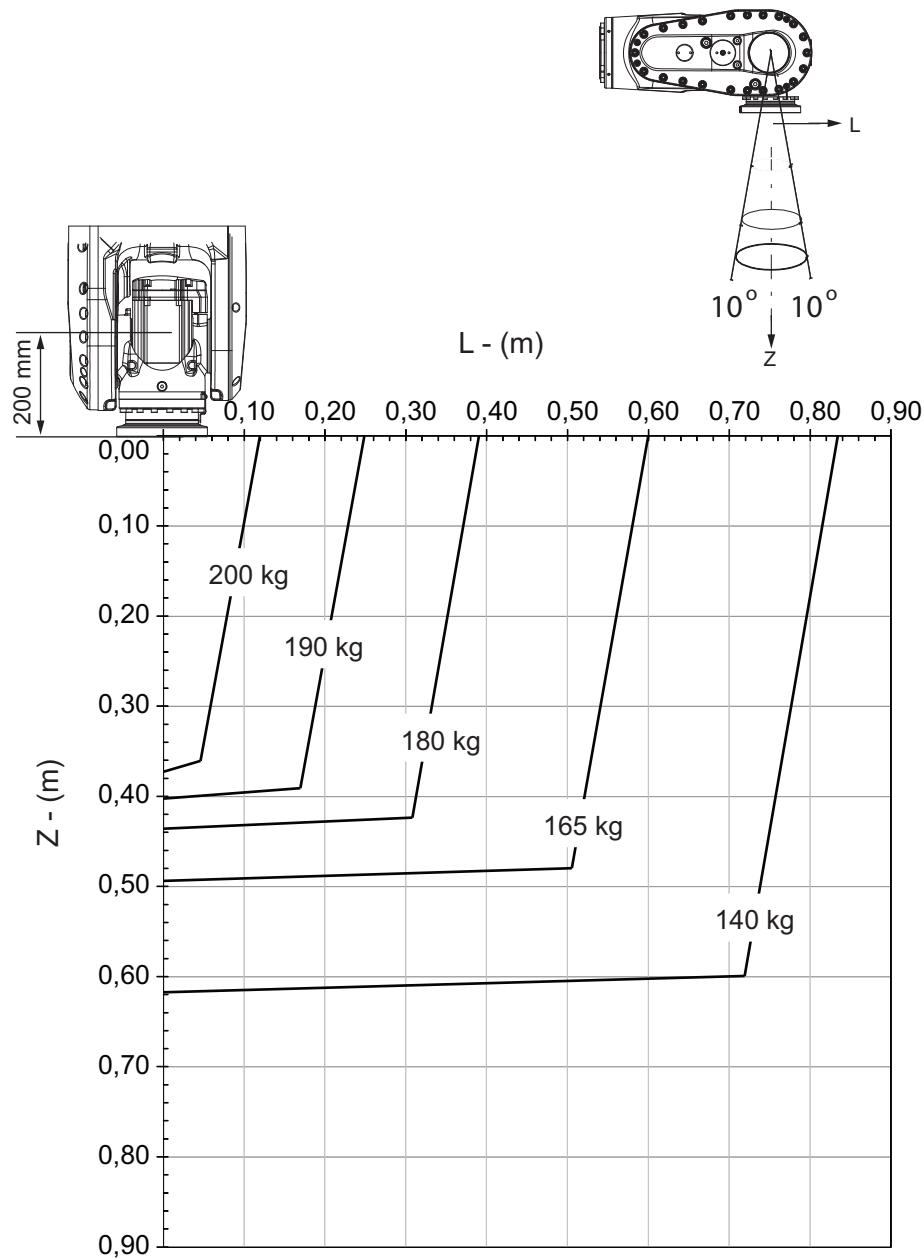
Continued

IRB 6700-175/3.05



xx1300000252

Continues on next page

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

xx1300000253

| Description | |
|------------------|---------|
| Max load | 204 kg |
| Z _{max} | 0.360 m |
| L _{max} | 0.101 m |

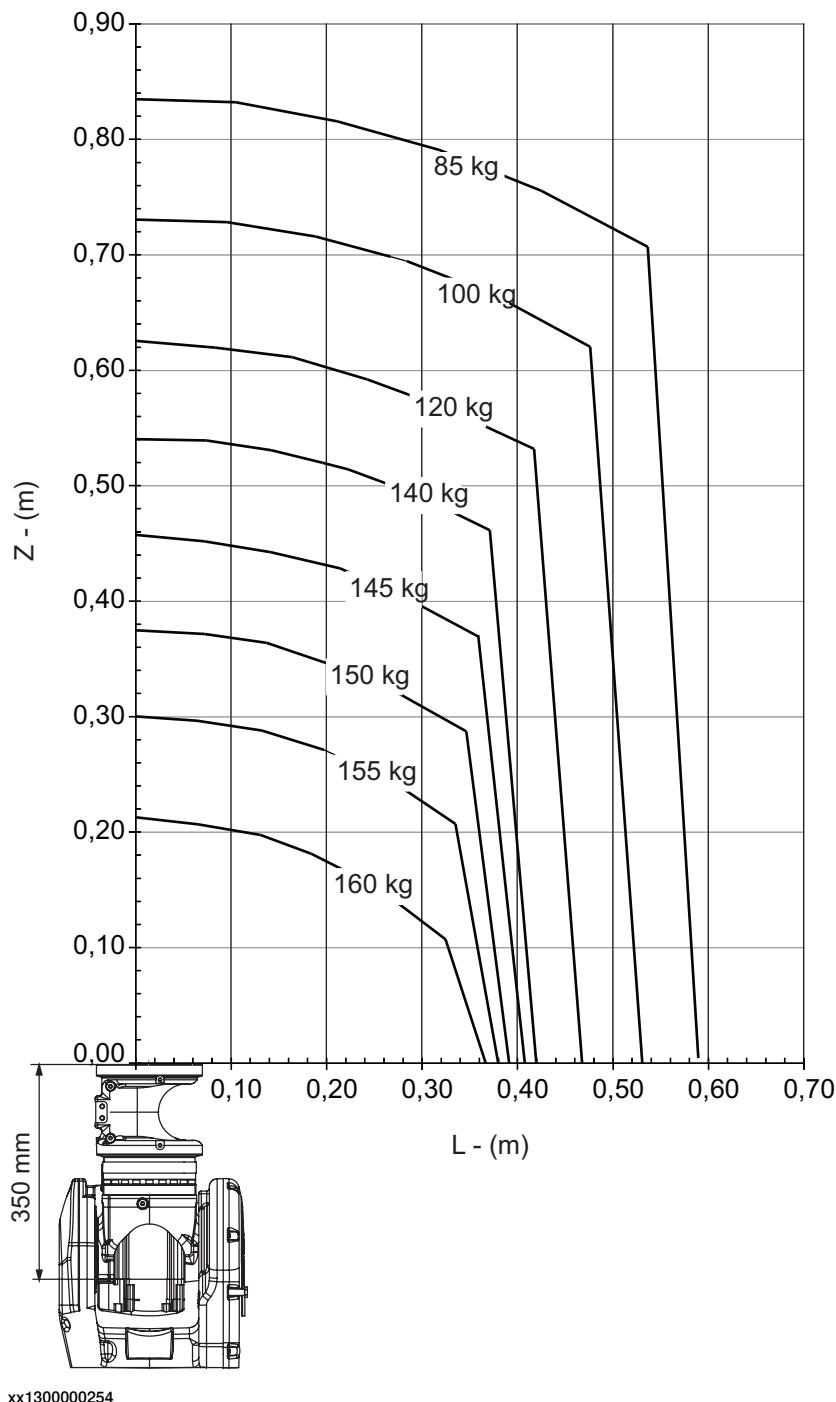
Continues on next page

1 Description

1.5.2 Diagrams

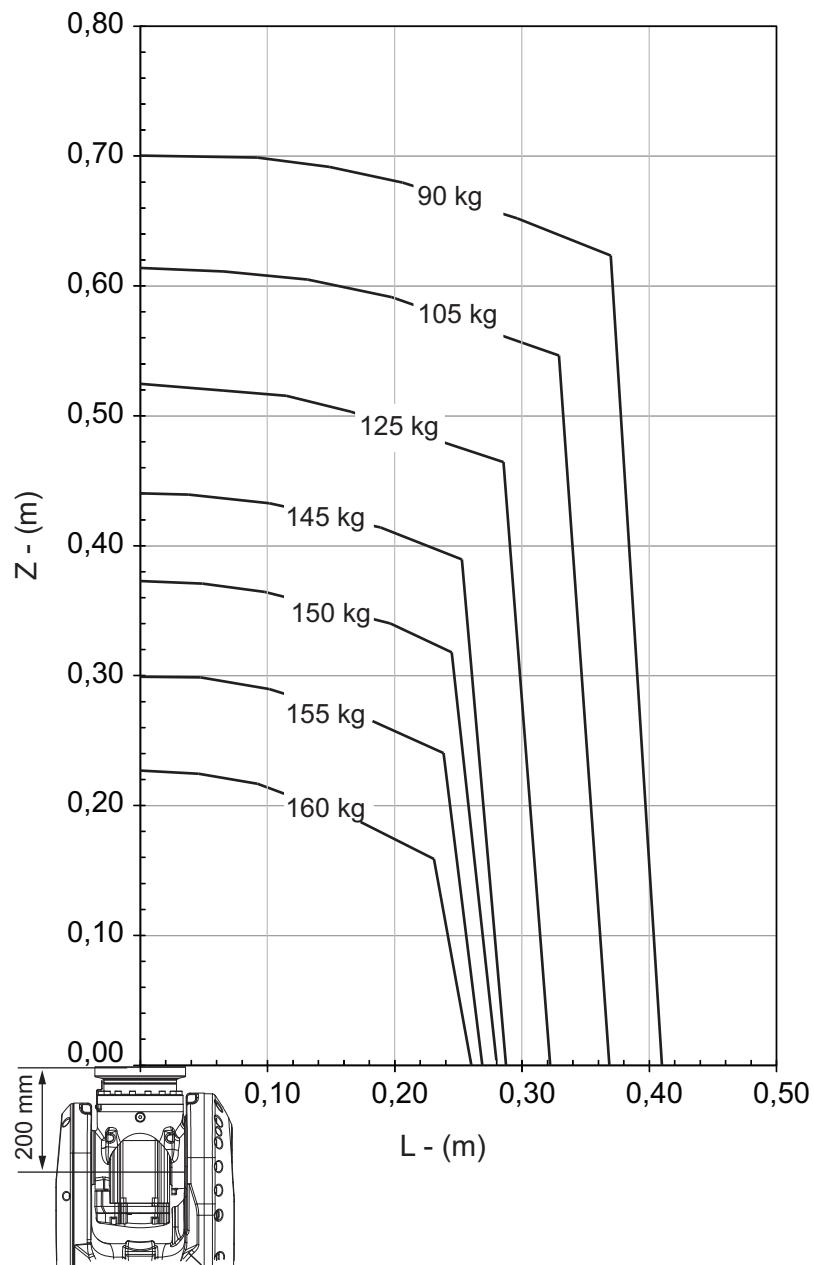
Continued

IRB 6700-175/3.05 "LeanID", option 780-4



xx1300000254

Continues on next page

IRB 6700-155/2.85

xx1300000336

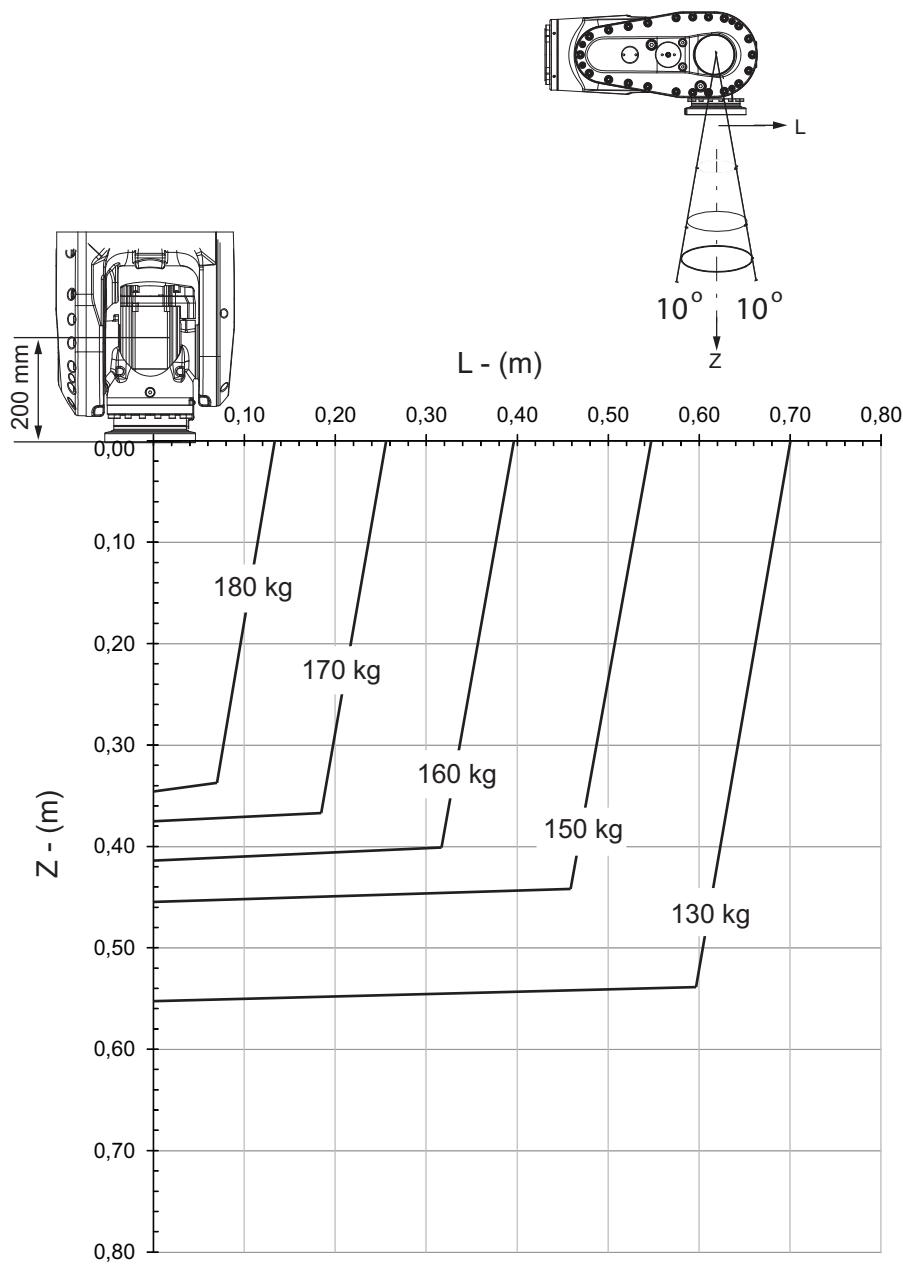
Continues on next page

1 Description

1.5.2 Diagrams

Continued

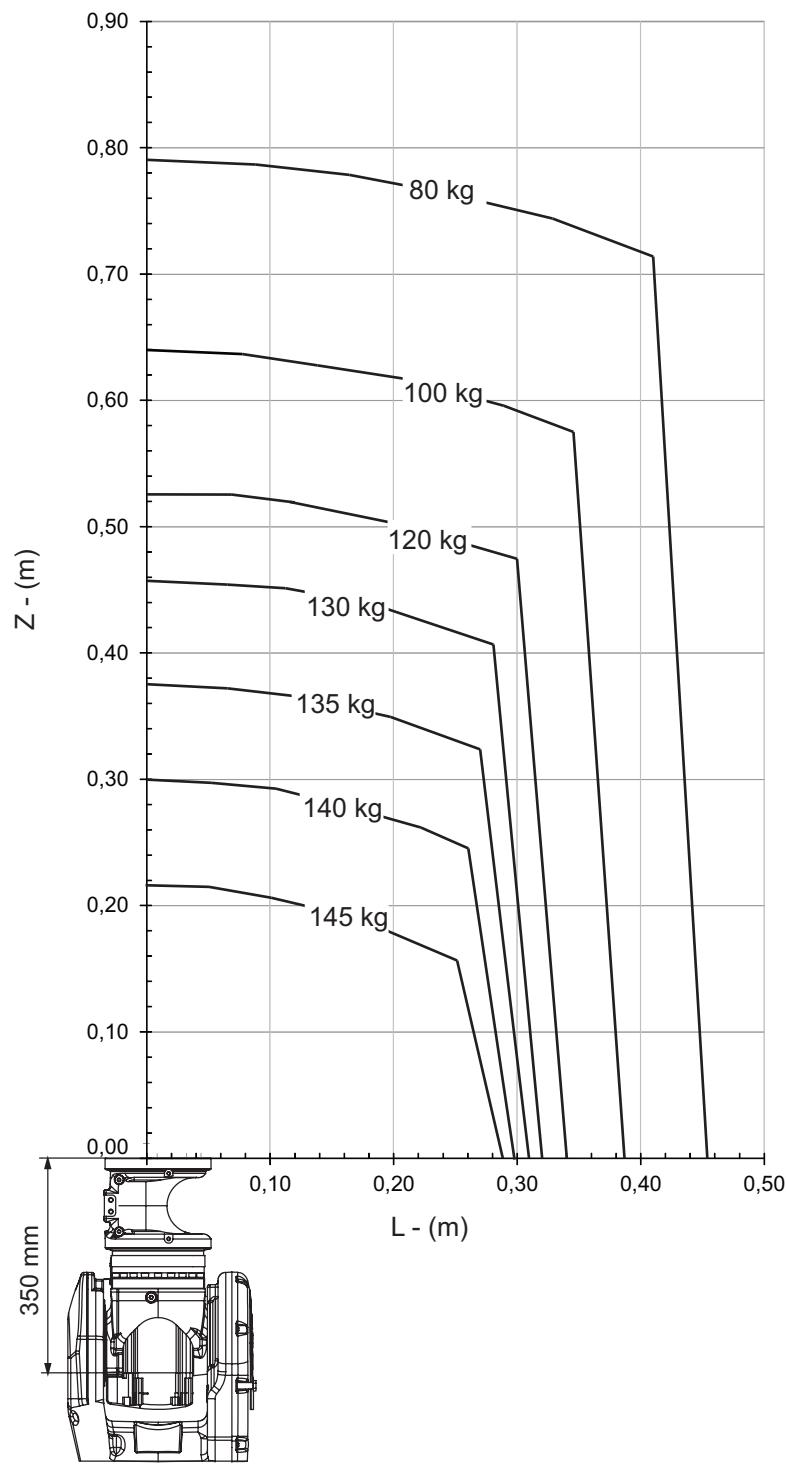
IRB 6700-155/2.85 "Vertical Wrist" ($\pm 10^\circ$)



xx1300000337

| Description | |
|-------------|---------|
| Max load | 186 kg |
| Z_{\max} | 0.327 m |
| L_{\max} | 0.101 m |

Continues on next page

IRB 6700-155/2.85 "LeanID", option 780-4

xx1300000338

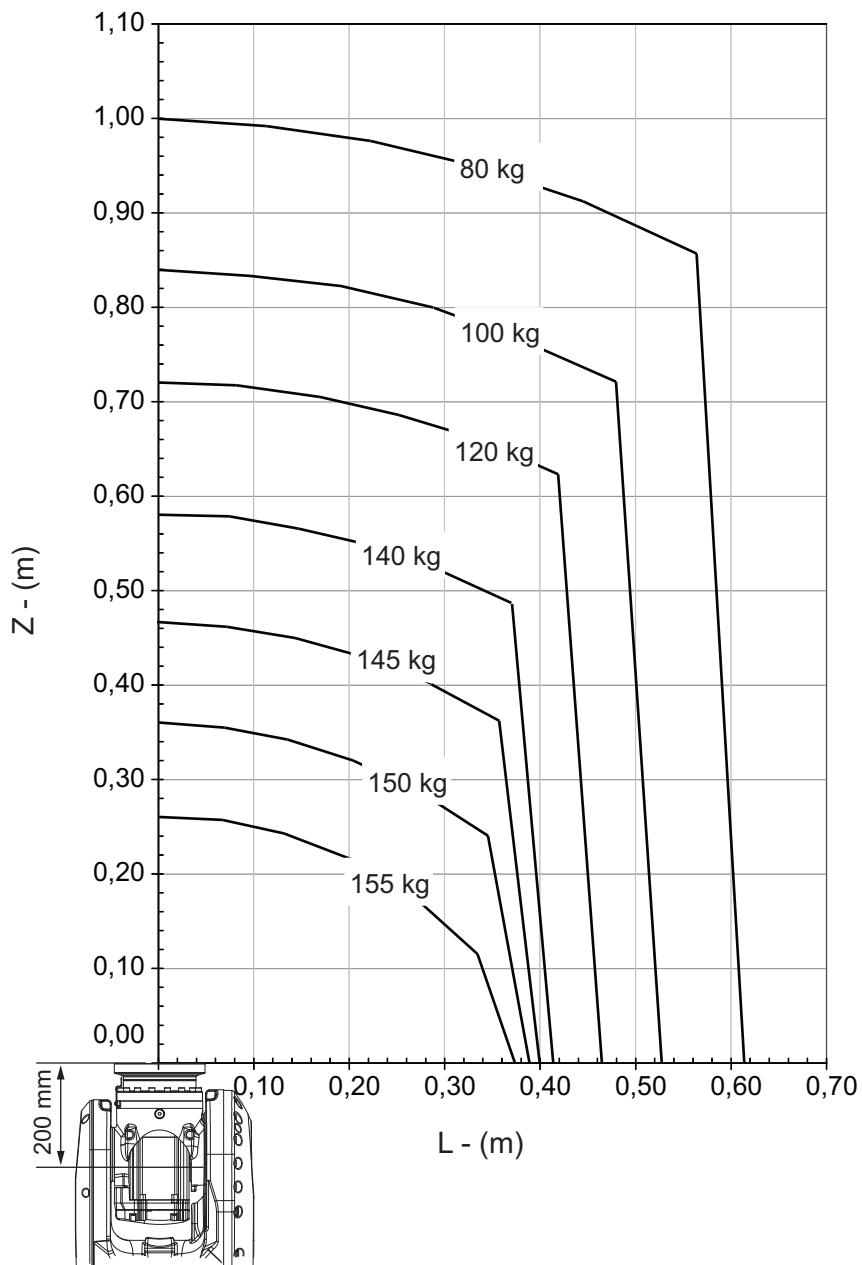
Continues on next page

1 Description

1.5.2 Diagrams

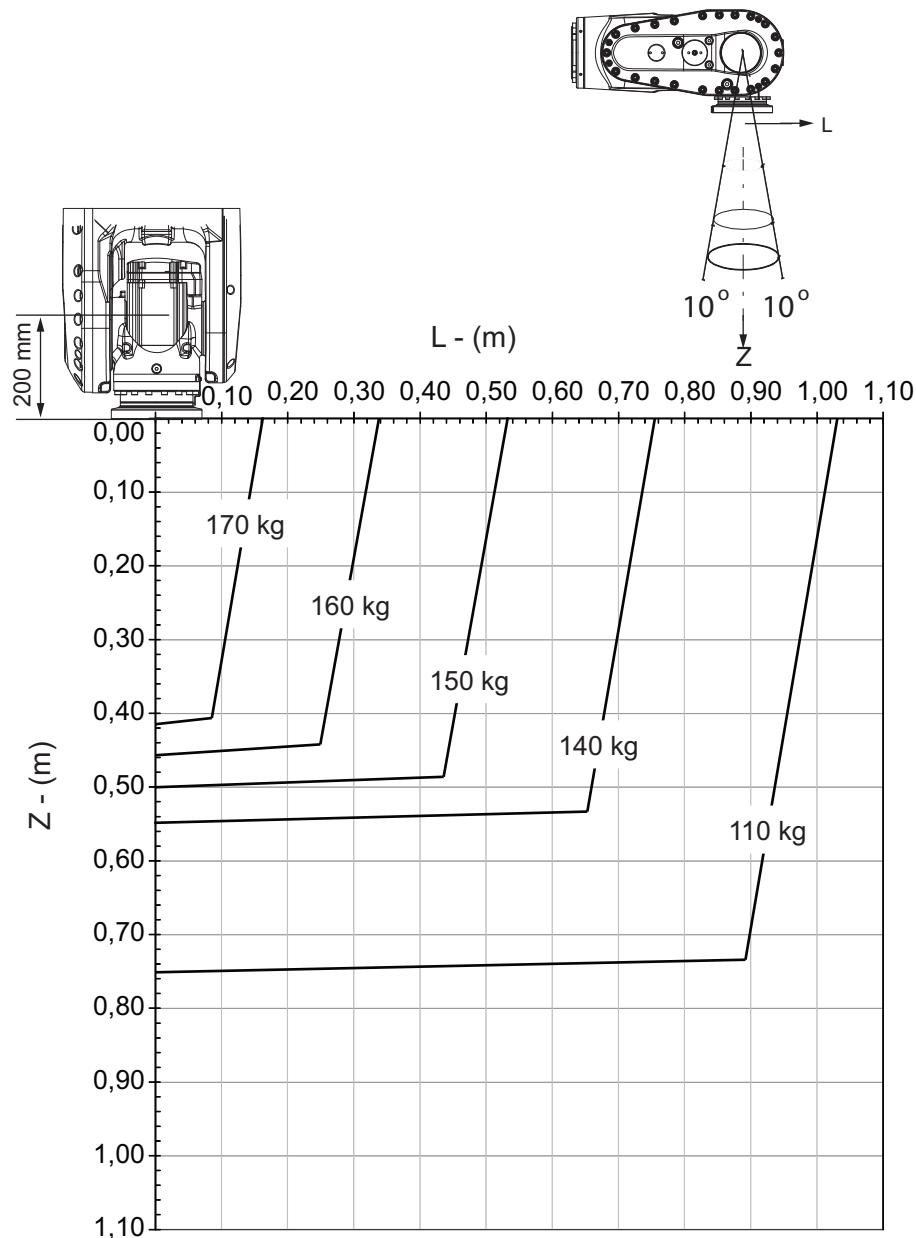
Continued

IRB 6700-150/3.20



xx1300000255

Continues on next page

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

xx1300000256

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

| | Description |
|------------------|-------------|
| Max load | 177 kg |
| Z _{max} | 0.394 m |
| L _{max} | 0.106 m |

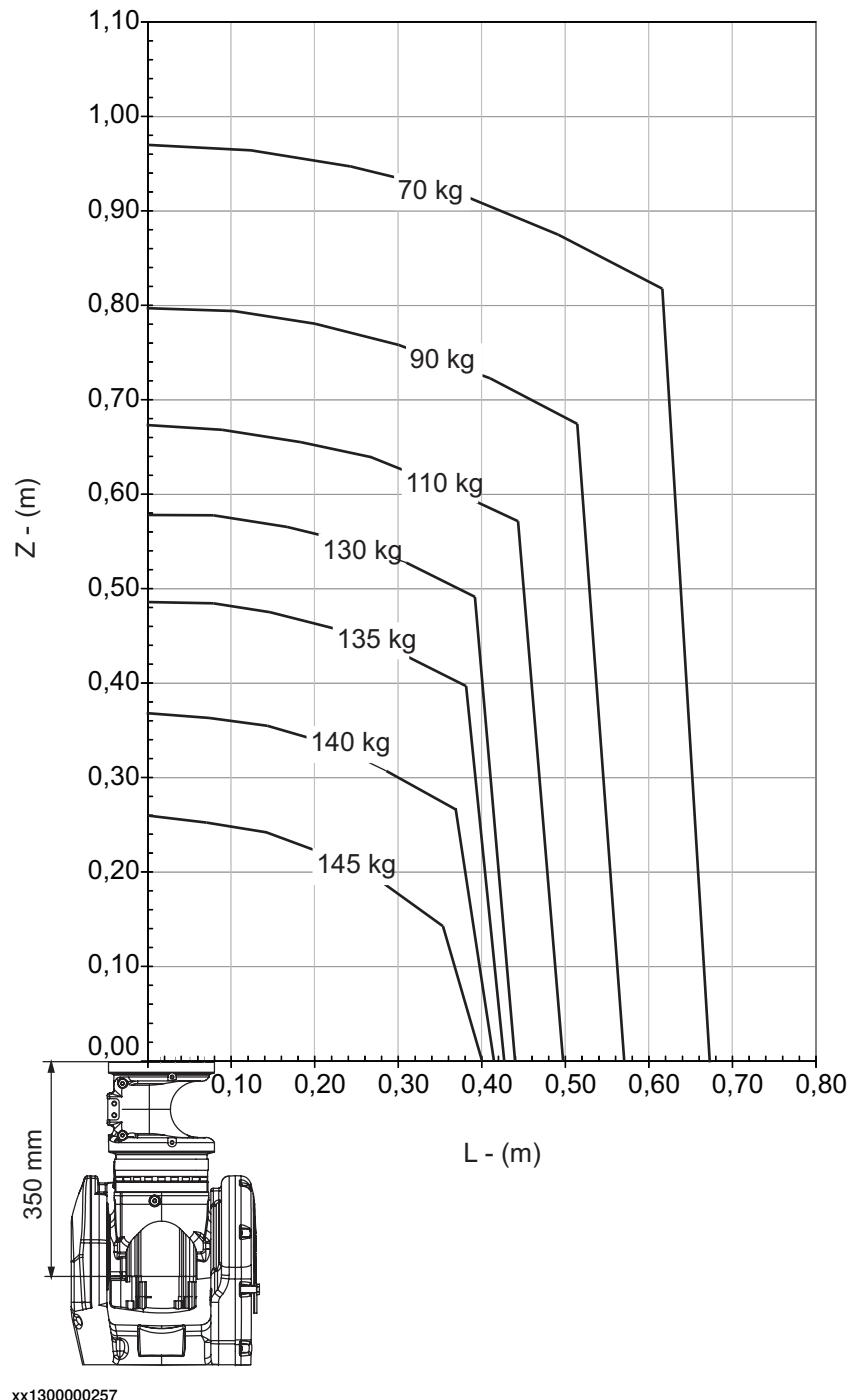
Continues on next page

1 Description

1.5.2 Diagrams

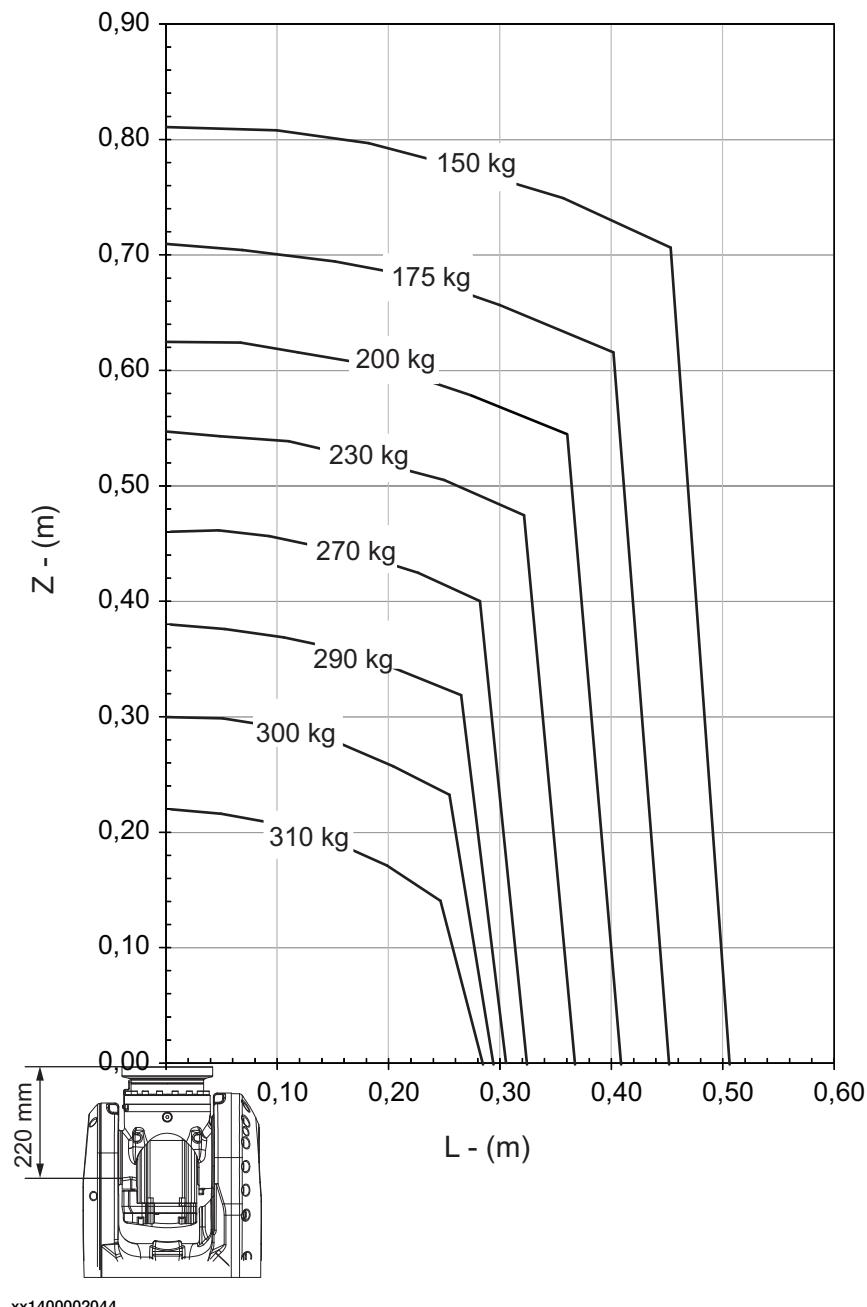
Continued

IRB 6700-150/3.20 "LeanID", option 780-4



xx1300000257

Continues on next page

IRB 6700-300/2.70

xx1400002044

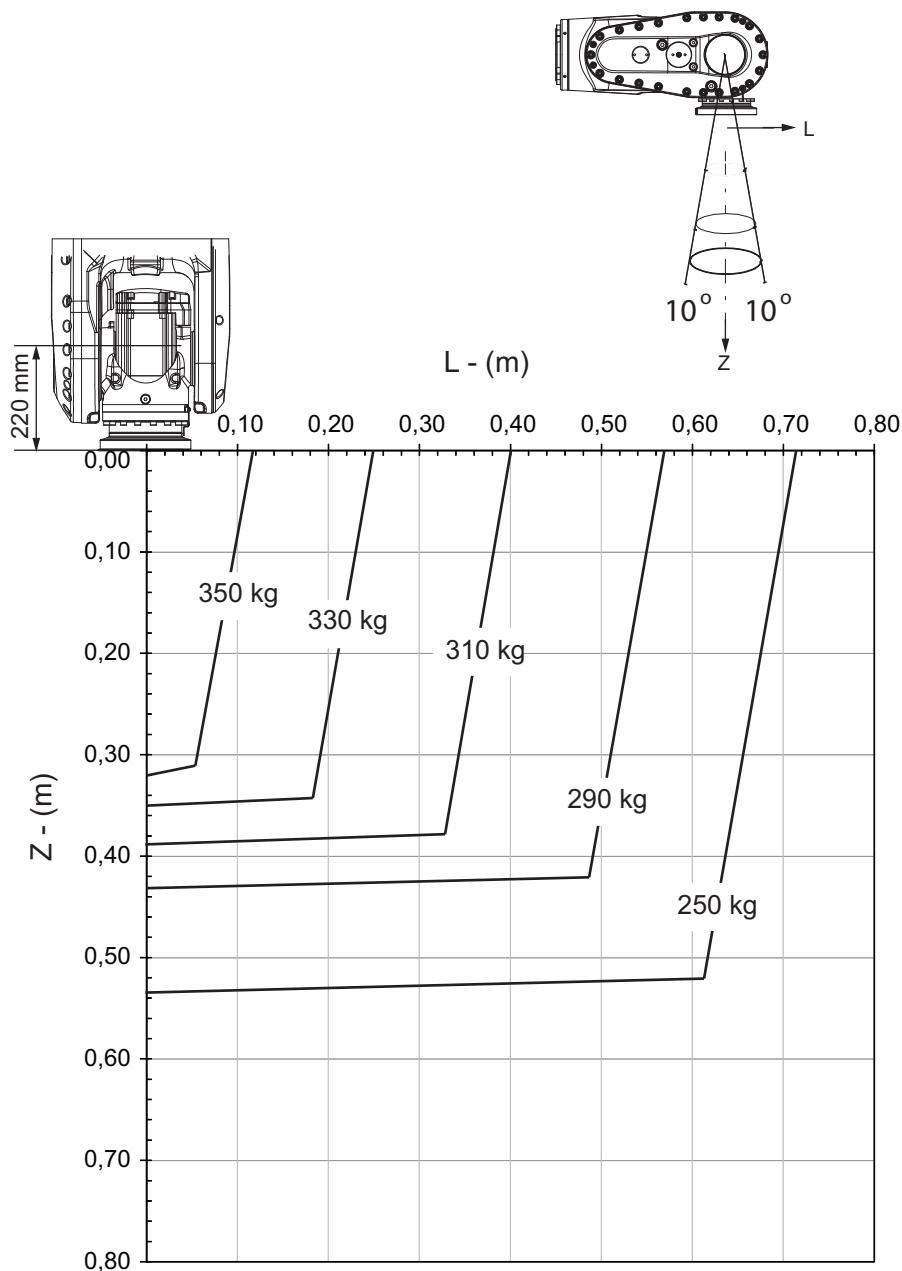
Continues on next page

1 Description

1.5.2 Diagrams

Continued

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

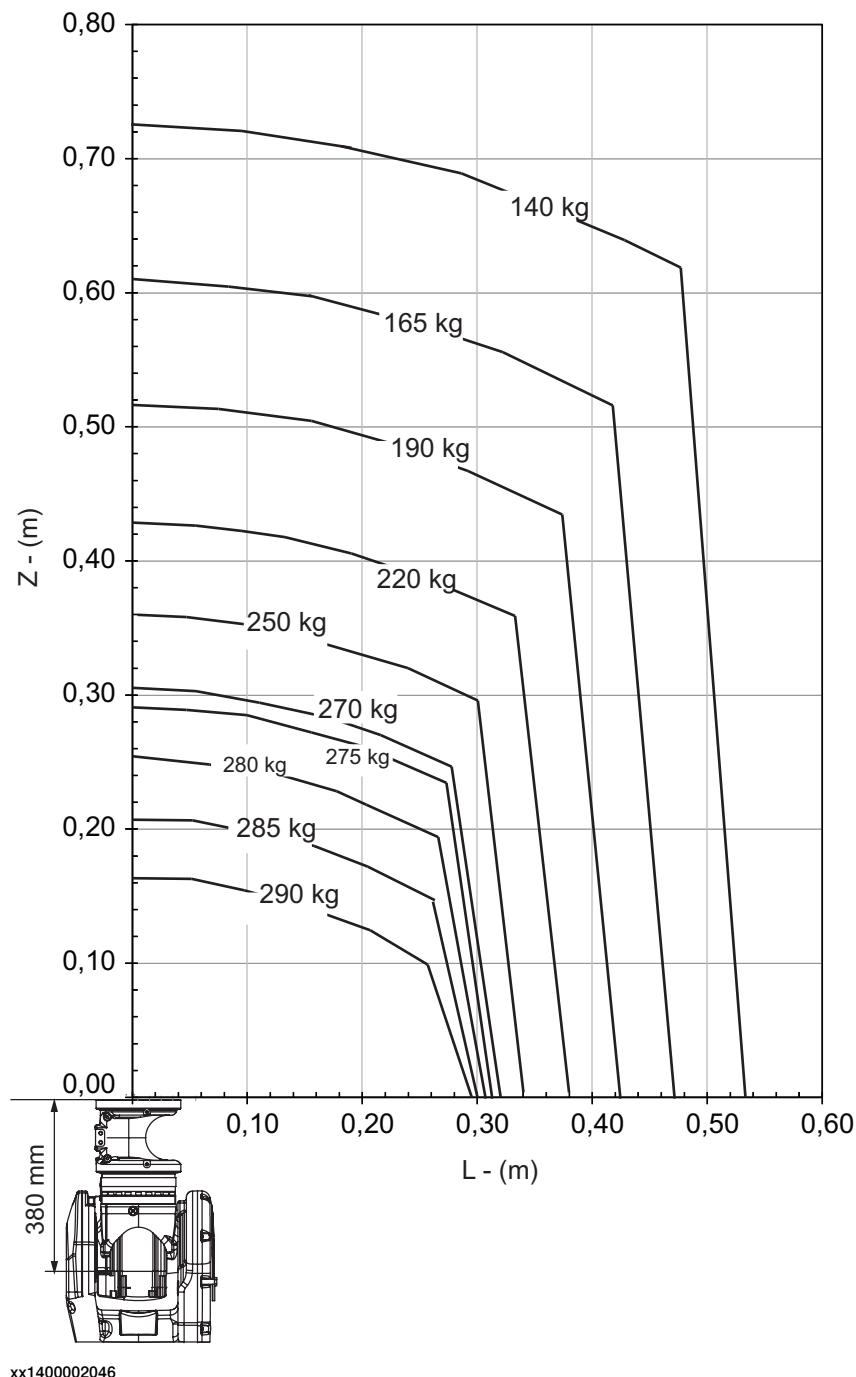


xx1400002045

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

| | Description |
|------------|-------------|
| Max load | 357 kg |
| Z_{\max} | 0,308 m |
| L_{\max} | 0,102 m |

Continues on next page

IRB 6700-300/2.70 "LeanID", option 780-4

xx1400002046

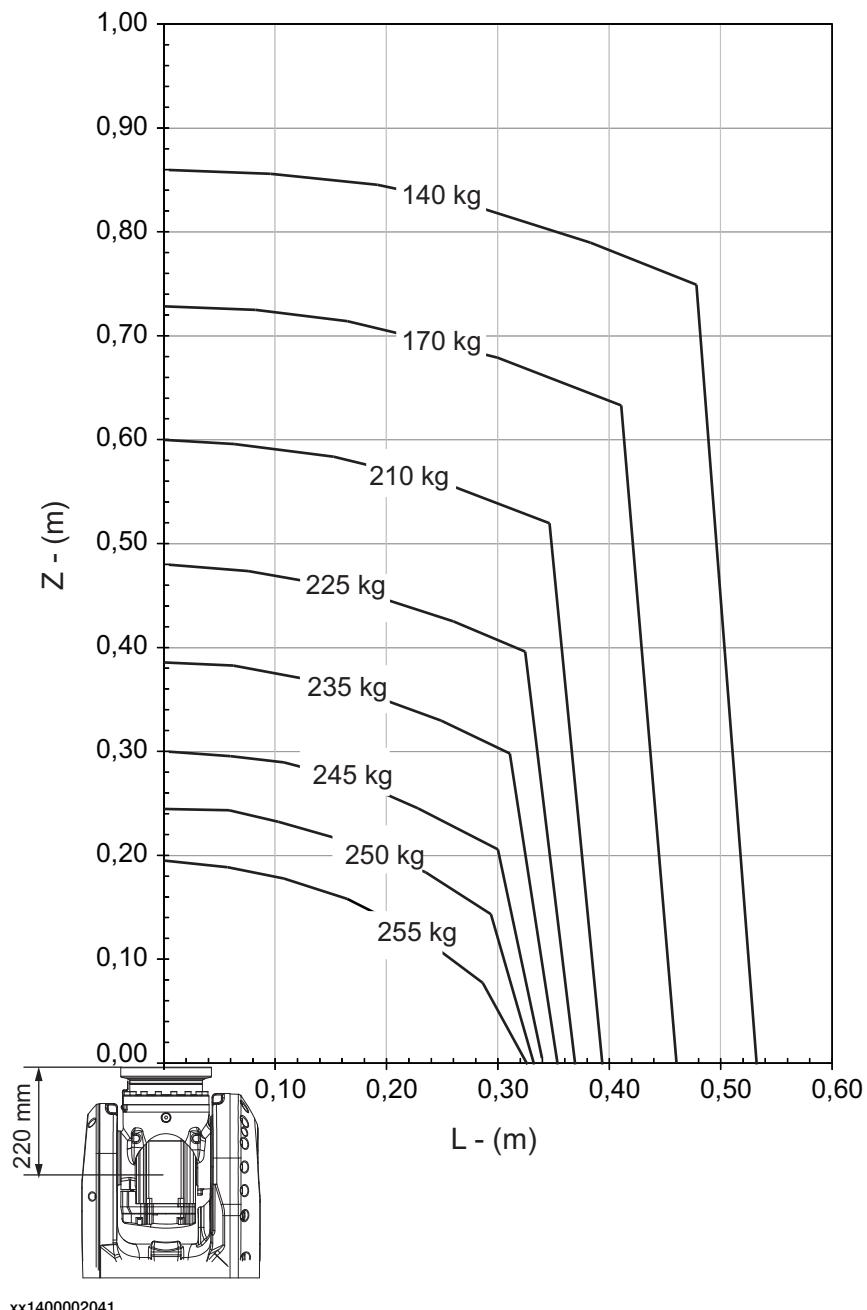
Continues on next page

1 Description

1.5.2 Diagrams

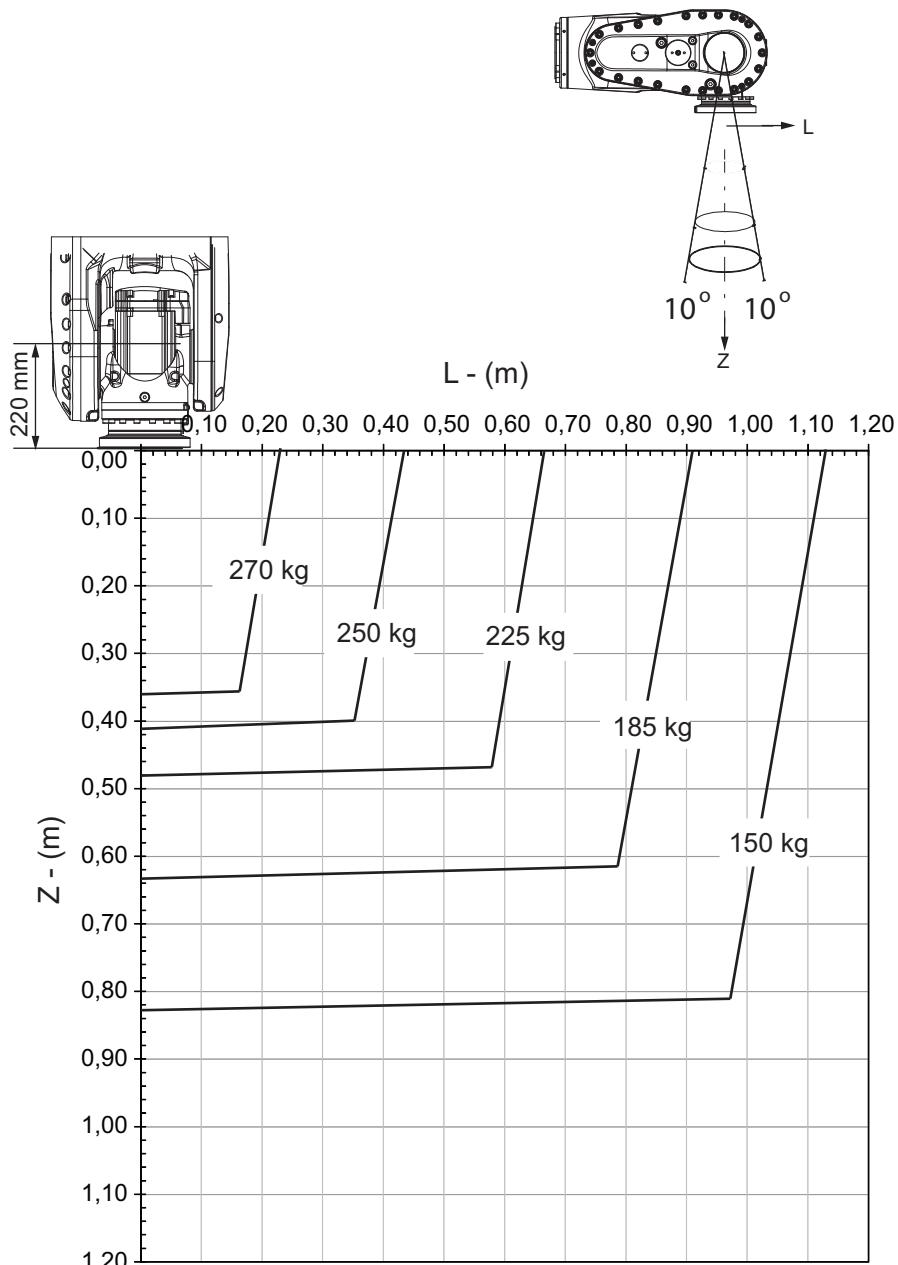
Continued

IRB 6700-245/3.00



xx1400002041

Continues on next page

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

xx1400002042

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

| | Description |
|-----------|-------------|
| Max load | 315 kg |
| Z_{max} | 0.280 m |
| L_{max} | 0.102 m |

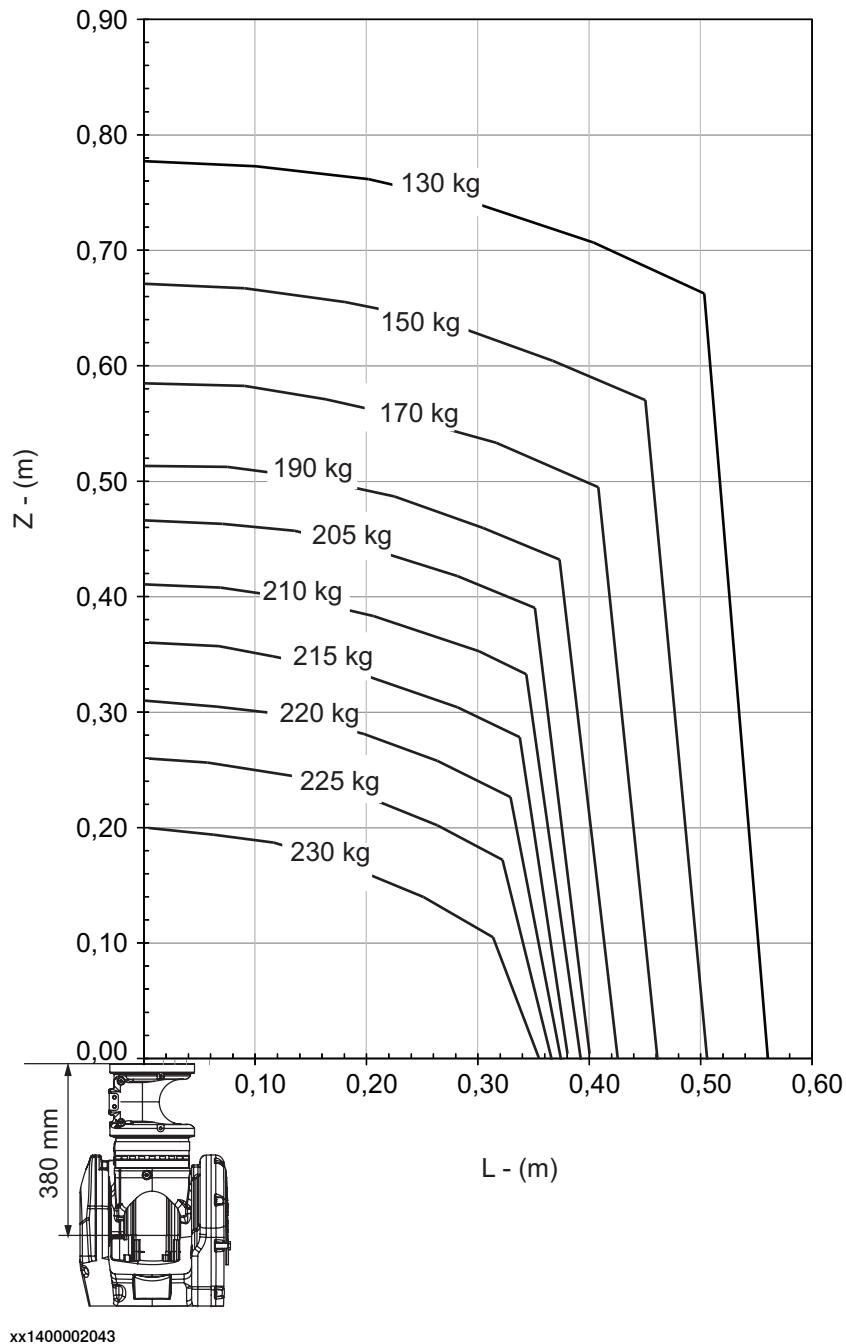
Continues on next page

1 Description

1.5.2 Diagrams

Continued

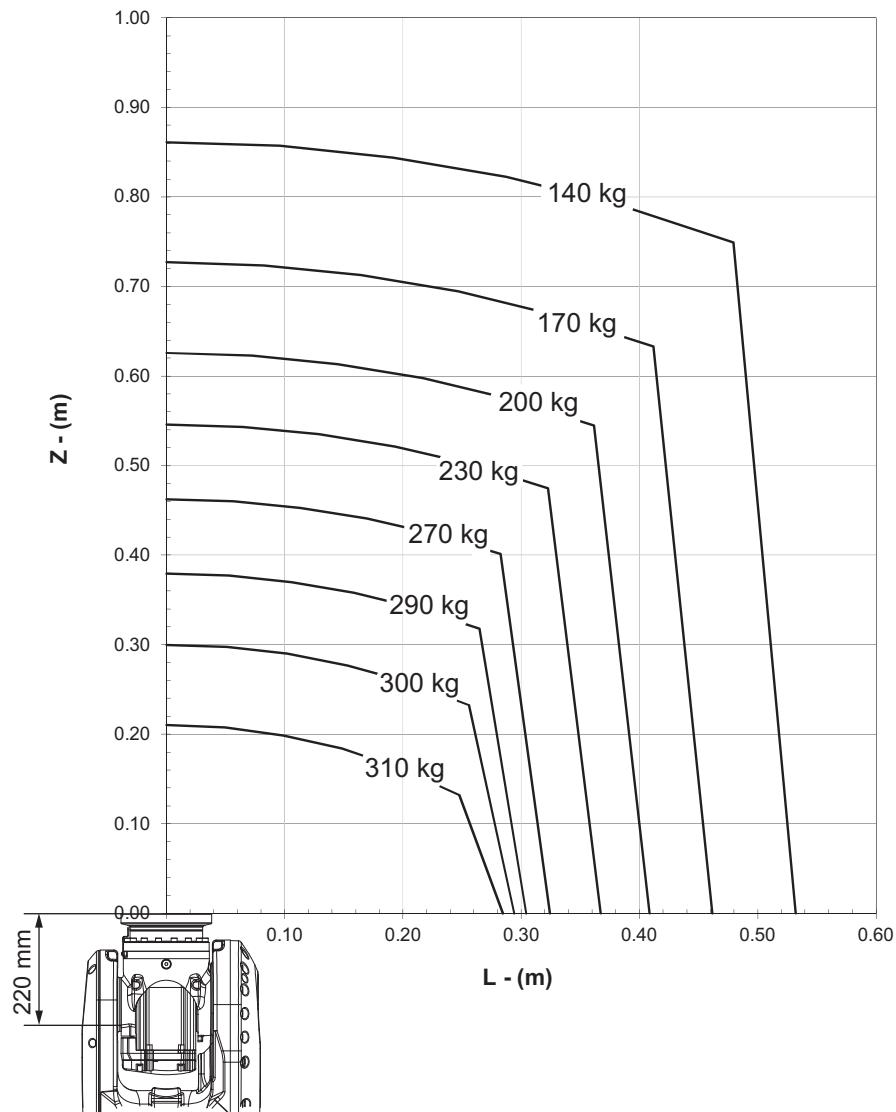
IRB 6700-245/3.00 "LeanID", option 780-4



xx1400002043

Continues on next page

IRB 6700Inv-300/2.60



xx1600002017

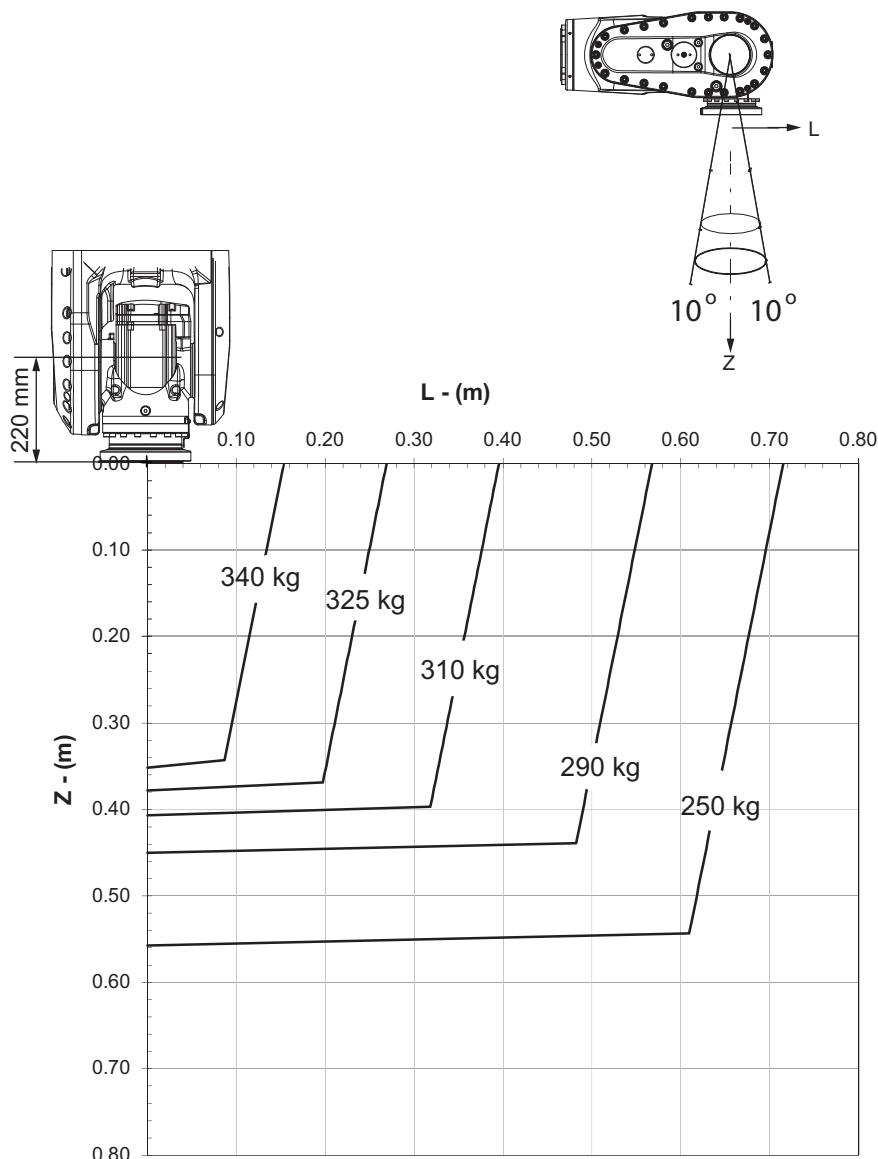
Continues on next page

1 Description

1.5.2 Diagrams

Continued

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



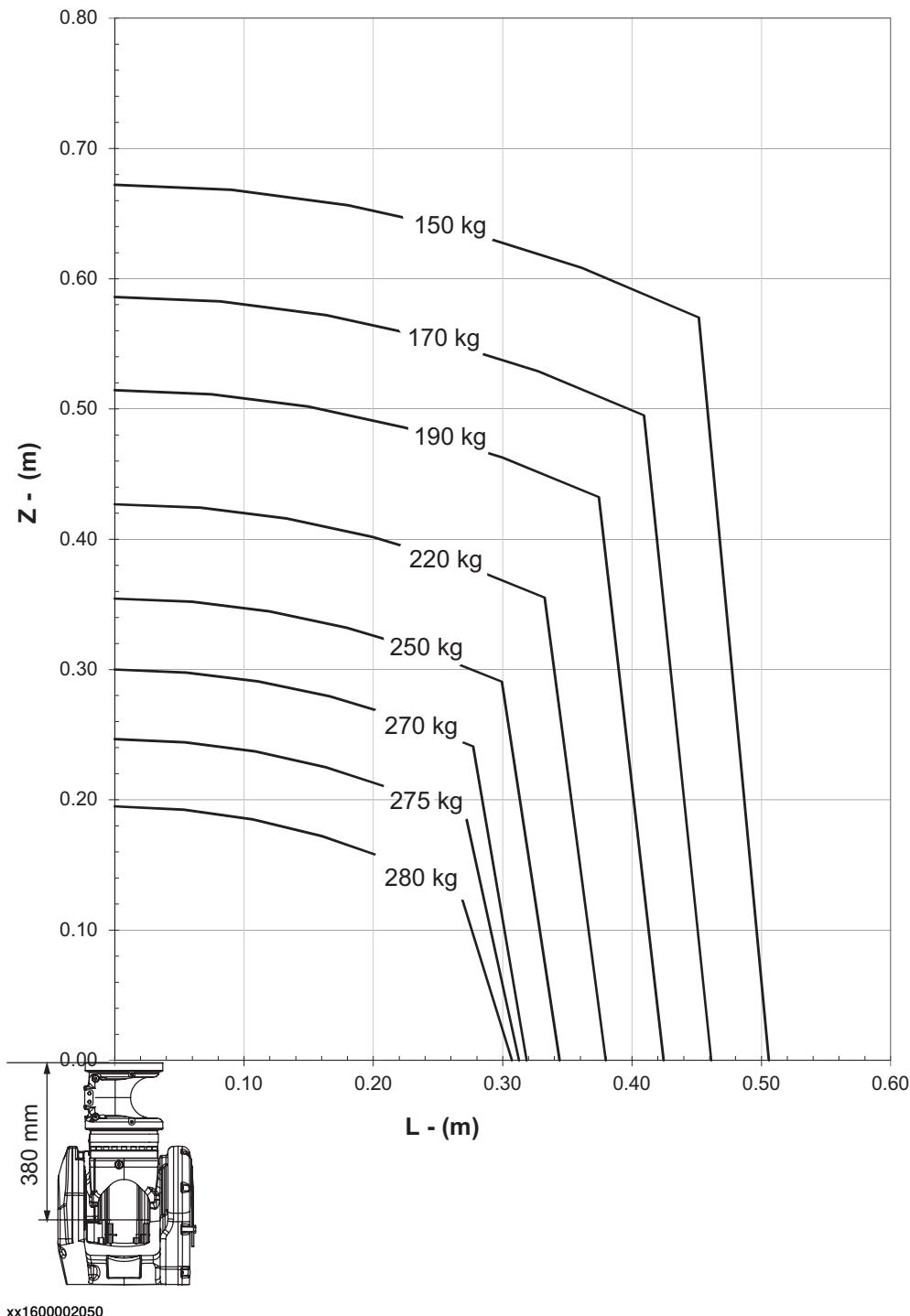
xx1600002018

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

| | Description |
|------------|-------------|
| Max load | 352 kg |
| Z_{\max} | 0.332 m |
| L_{\max} | 0.105 m |

Continues on next page

IRB 6700Inv-270/2.60 "LeanID", option 780-4



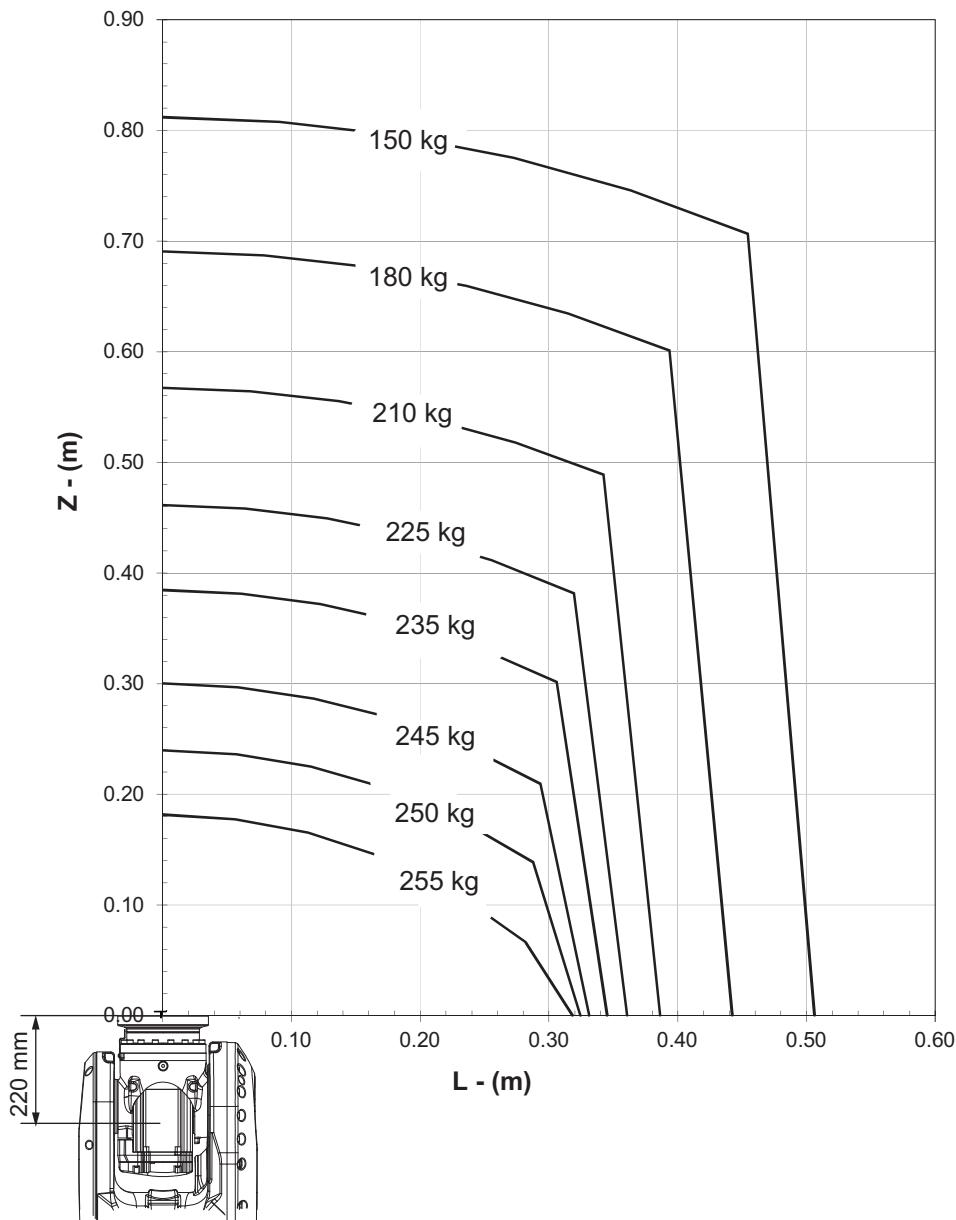
Continues on next page

1 Description

1.5.2 Diagrams

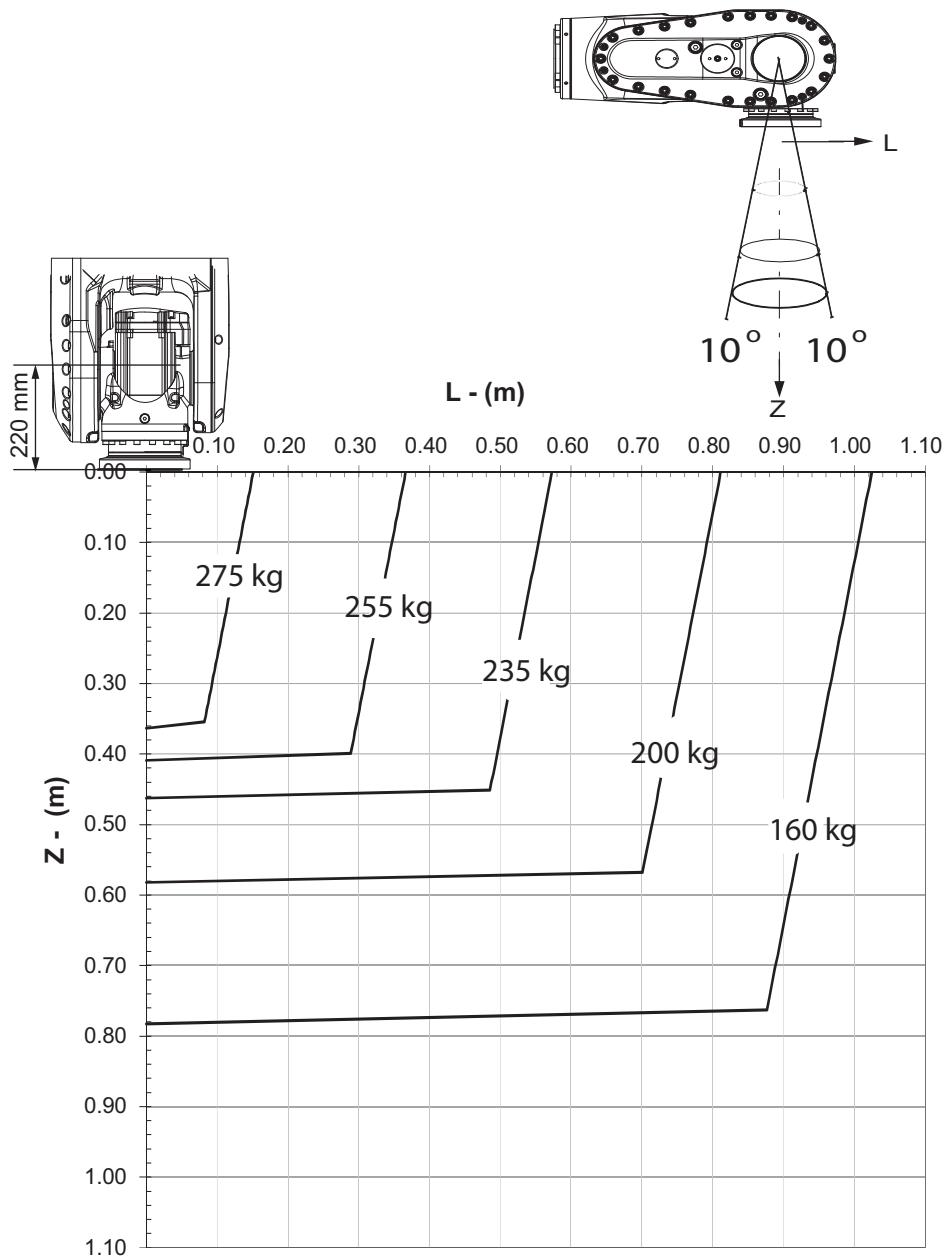
Continued

IRB 6700Inv-245/2.90



xx1600002019

Continues on next page

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

xx1600002020

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

| | Description |
|------------------|-------------|
| Max load | 284 kg |
| Z _{max} | 0.345 m |
| L _{max} | 0.101 m |

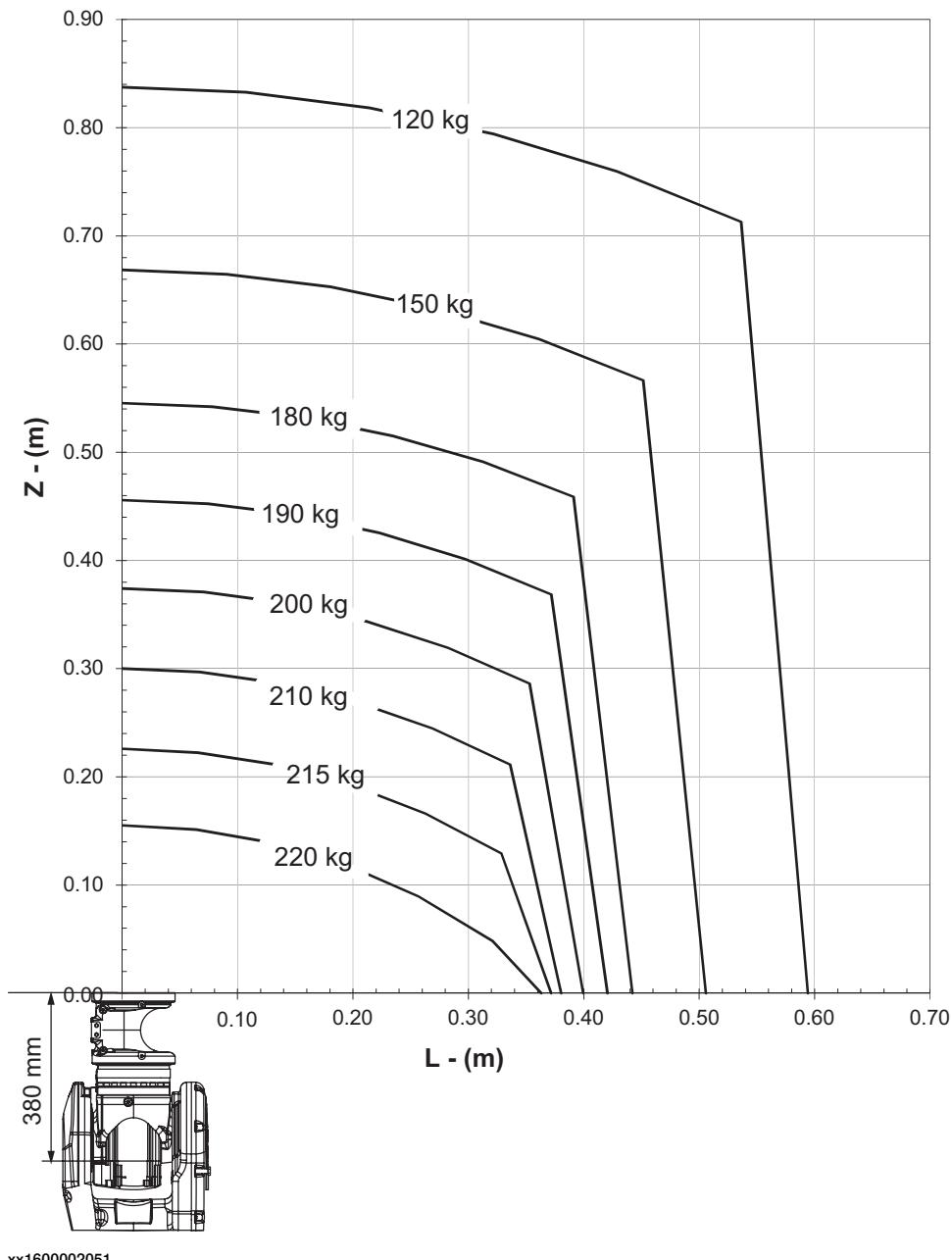
Continues on next page

1 Description

1.5.2 Diagrams

Continued

IRB 6700Inv-210/2.90 "LeanID", option 780-4



xx1600002051

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**

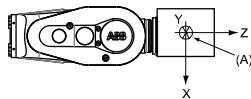
Total load given as: mass in kg, center of gravity (Z and L) in meters and moment of inertia (J_{ox} , J_{oy} , J_{oz}) in kgm^2 . $L = \text{sqr}(X^2 + Y^2)$, see the following figure.

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

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

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. |

Continues on next page

1 Description

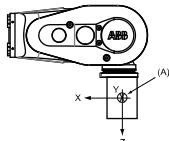
1.5.3 Maximum load and moment of inertia for full and limited axis 5 (center line down) movement
Continued

Limited axis 5, center line down

| Axis | Robot type | Maximum moment of inertia |
|------|----------------------|--|
| 5 | IRB 6700-235/2.65 | $J_{a5} = \text{Load} \times ((Z + 0.200^i)^2 + L^2) + \max(J_{0x}, J_{0y}) \leq 275 \text{ kgm}^2$ |
| | IRB 6700-205/2.80 | |
| | IRB 6700-175/3.05 | |
| | IRB 6700-150/3.20 | |
| 5 | IRB 6700-200/2.60 | $J_{a5} = \text{Load} \times ((Z + 0.200^i)^2 + L^2) + \max(J_{0x}, J_{0y}) \leq 215 \text{ kgm}^2$ |
| | IRB 6700-155/2.85 | |
| | IRB 6700-300/2.70 | $J_{a5} = \text{Load} \times ((Z + 0.220^{ii})^2 + L^2) + \max(J_{0x}, J_{0y}) \leq 360 \text{ kgm}^2$ |
| | IRB 6700-245/3.00 | |
| 6 | IRB 6700Inv-300/2.60 | |
| | IRB 6700Inv-245/2.90 | |
| | IRB 6700-235/2.65 | $J_{a6} = \text{Load} \times L^2 + J_{0z} \leq 250 \text{ kgm}^2$ |
| | IRB 6700-205/2.80 | |
| 6 | IRB 6700-175/3.05 | |
| | IRB 6700-150/3.20 | |
| | IRB 6700-200/2.60 | $J_{a6} = \text{Load} \times L^2 + J_{0z} \leq 195 \text{ kgm}^2$ |
| | IRB 6700-155/2.85 | |
| 6 | IRB 6700-300/2.70 | $J_{a6} = \text{Load} \times L^2 + J_{0z} \leq 320 \text{ kgm}^2$ |
| | IRB 6700-245/3.00 | |
| | IRB 6700Inv-300/2.60 | |
| | IRB 6700Inv-245/2.90 | |

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 |

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

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 6700INV - 300/2.60 | 1,825 Nm | 865 Nm | 280 kg |
| IRB 6700INV - 245/2.90 | 1,645 Nm | 796 Nm | 194 kg |

1 Description

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 then to use RobotStudio.

Maximum Cartesian design acceleration for nominal loads

| Robot type | E-stop Max acceleration at nominal load COG [m/s ²] | Controlled Motion Max acceleration at nominal load COG [m/s ²] |
|---------------------|--|---|
| IRB 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).

1.6 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 76](#)). 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.

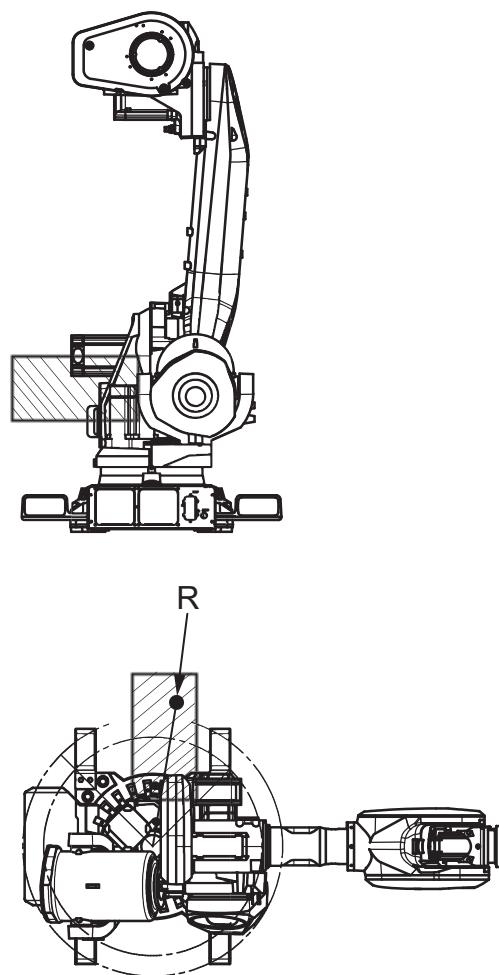
| | Description |
|---|--|
| Permitted extra load on frame | $J_H = 100 \text{ kgm}^2$ |
| Recommended position (see the following figure) | $J_H = J_{H0} + M_4 \times R^2$ where: <ul style="list-style-type: none">• J_{H0} is the moment of inertia of the equipment• R is the radius (m) from the center of axis 1• M_4 is the total mass (kg) of the equipment including bracket and harness ($\leq 250 \text{ kg}$) |

Continues on next page

1 Description

1.6 Fitting equipment to the robot

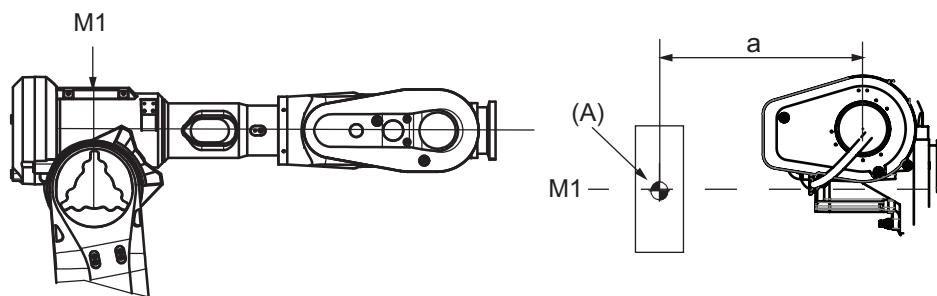
Continued



xx1300000262

Upper arm

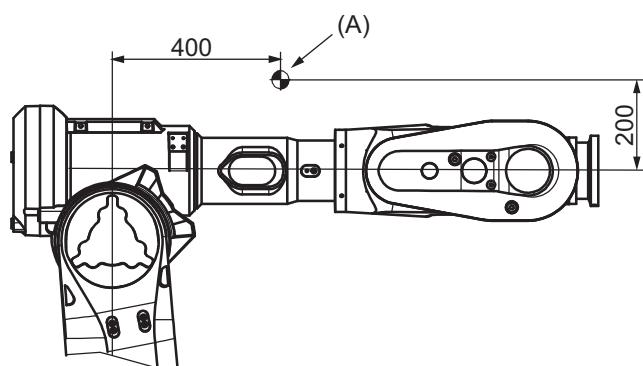
Allowed extra load on the upper arm housing, in addition to the maximum handling weight, is $M_1 \leq 50$ kg with a distance $(a) \leq 500$ mm from the center of gravity in the axis-3 extension.



xx1400002019

| | |
|---|-------------|
| A | Mass center |
|---|-------------|

Continues on next page



xx1300000866

| | |
|---|-------------------------|
| A | Center of gravity 50 kg |
|---|-------------------------|

Continues on next page

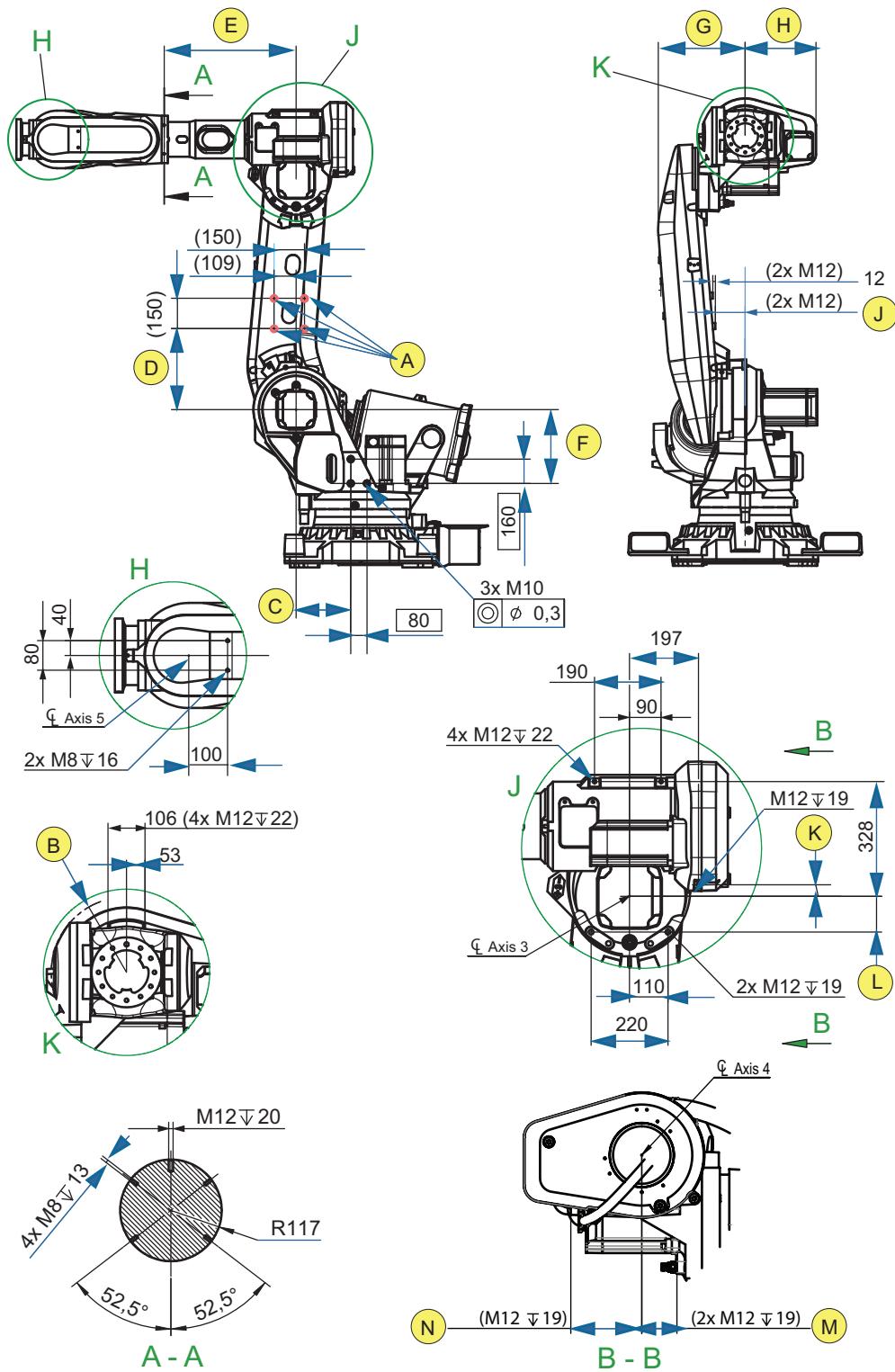
1 Description

1.6 Fitting equipment to the robot

Continued

Holes for fitting extra equipment

Position of attachment holes - drawing 1



xx1300000263

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

Continues on next page

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

ⁱ Smallest circumscribed radius axis-4.

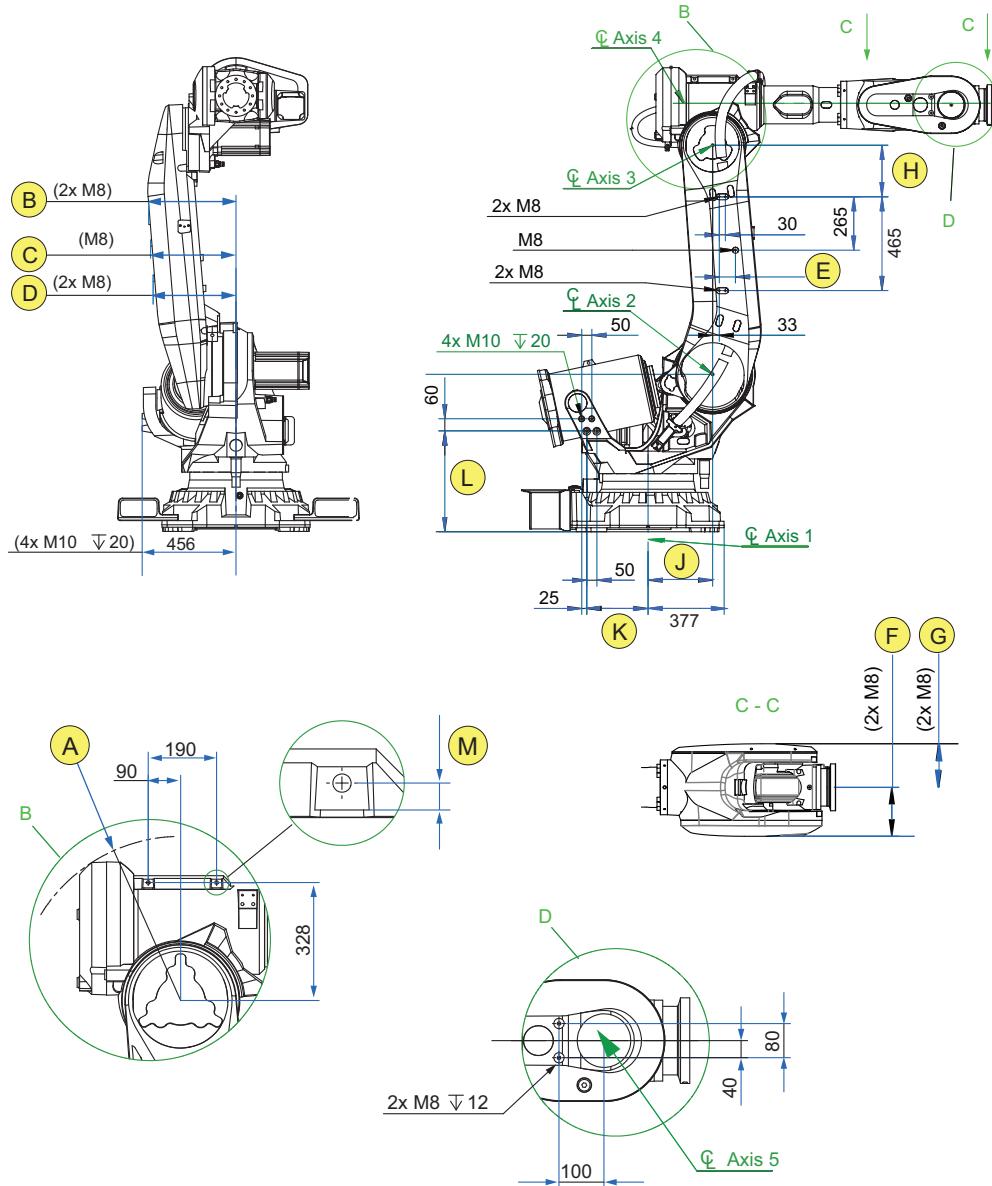
Continues on next page

1 Description

1.6 Fitting equipment to the robot

Continued

Position of attachment holes - drawing 2



xx1300000264

| Variant | A ⁱ | 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 - 205/2.80 | R=456 | 438 | 423 | 408 | 80 | 208.5 | 186 | 255 | 320 | 303.5 | 500 | 13.8 |
| IRB 6700 - 175/3.05 | R=456 | 433 | 418 | 403 | 80 | 208.5 | 186 | 255 | 320 | 303.5 | 500 | 13.8 |
| IRB 6700 - 150/3.20 | R=456 | 438 | 423 | 408 | 80 | 208.5 | 186 | 255 | 320 | 303.5 | 500 | 13.8 |
| IRB 6700 - 200/2.60 | R=440 | 425 | 410 | 395 | 113 | 197 | 193 | 255 | 320 | 303.5 | 500 | 13.8 |
| IRB 6700 - 155/2.85 | R=440 | 425 | 410 | 395 | 113 | 197 | 193 | 255 | 320 | 303.5 | 500 | 13.8 |
| IRB 6700 - 245/3.00 | R=468 | 453 | 438 | 423 | 80 | 222.5 | 187 | 265 | 350 | 273.5 | 523.5 | 15 |
| IRB 6700 - 300/2.70 | R=468 | 453 | 438 | 423 | 80 | 222.5 | 187 | 265 | 350 | 273.5 | 523.5 | 15 |
| IRB 6700Inv - 300/2.60 | R=468 | 453 | 438 | 423 | 80 | 222.5 | 187 | 265 | 350 | 273.5 | 523.5 | 15 |

Continues on next page

1 Description

1.6 Fitting equipment to the robot

Continued

| Variant | A ⁱ | B | C | D | E | F | G | H | J | K | L | M |
|------------------------|----------------|-----|-----|-----|----|-------|-----|-----|-----|-------|-------|----|
| IRB 6700Inv - 245/2.90 | R=468 | 453 | 438 | 423 | 80 | 222.5 | 187 | 265 | 350 | 273.5 | 523.5 | 15 |

ⁱ Smallest circumscribed radius axis-3.

Continues on next page

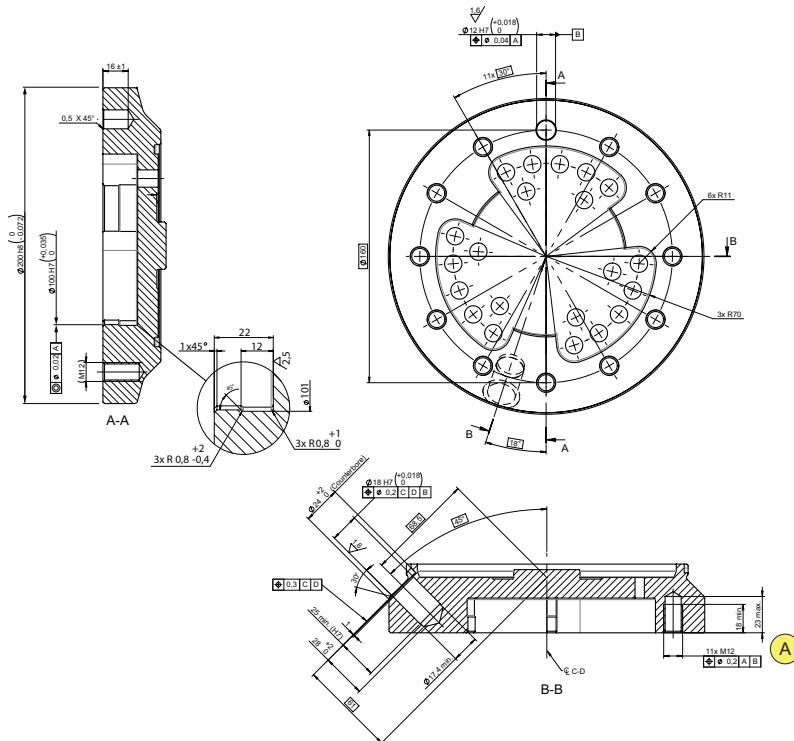
1 Description

1.6 Fitting equipment to the robot

Continued

Tool flange, standard

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



xx1300000280

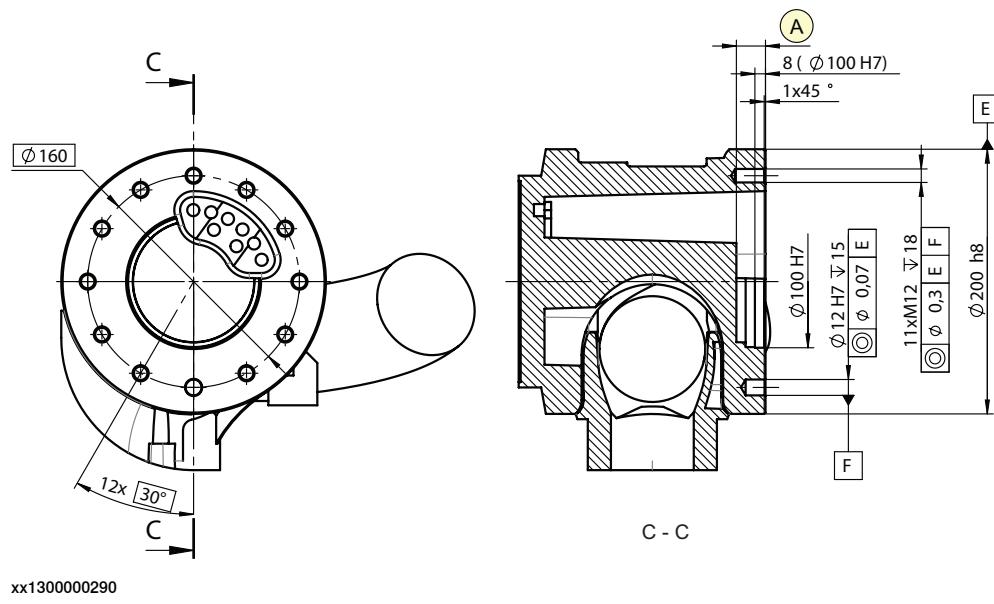
| | |
|---|-----------------------|
| A | Thread length: 18 mm. |
|---|-----------------------|

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

Tool flange, LeanID

Below is the tool flange for option 780-4, LeanID



| | |
|---|-----------------------|
| 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 Description

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 product manuals.

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 | $-65^\circ/+85^\circ$ ⁱ | $\pm 65^\circ$ ⁱⁱ | |
| Axis 3 | Arm motion | $-180^\circ/+70^\circ$ | -180° ⁱⁱ / $+70^\circ$ ⁱⁱ | |
| Axis 4 | Wrist motion | $\pm 300^\circ$ | $\pm 300^\circ$ | |
| Axis 5 | Bend motion | $\pm 130^\circ$ ⁱⁱⁱ | $\pm 130^\circ$ ⁱⁱⁱ | |
| Axis 6 | Turn motion | $\pm 360^\circ$ ^{iv} ± 93.7 revolutions | $\pm 360^\circ$ ^{iv} ± 93.7 revolutions | Maximum value. The default working range for axis 6 can be extended by changing parameter values in the software. Option 610-1 <i>Independent axis</i> |

ⁱ Working range for variants IRB 6700 - 300/2.70 and - 245/3.00:

$+85^\circ$ to -65° when axis 3 is within $+70^\circ$ to -45°

$+85^\circ$ to -58° when axis 3 is within $+70^\circ$ to -180°

ⁱⁱ Working ranges of axis 2 and axis 3 are limited in some areas to avoid collision with balancing.

ⁱⁱⁱ Working range $+120^\circ$ to -120° for robots with LeanID, option 780-4

^{iv} Working range $+220^\circ$ to -220° for robots with LeanID, option 780-4

Continues on next page

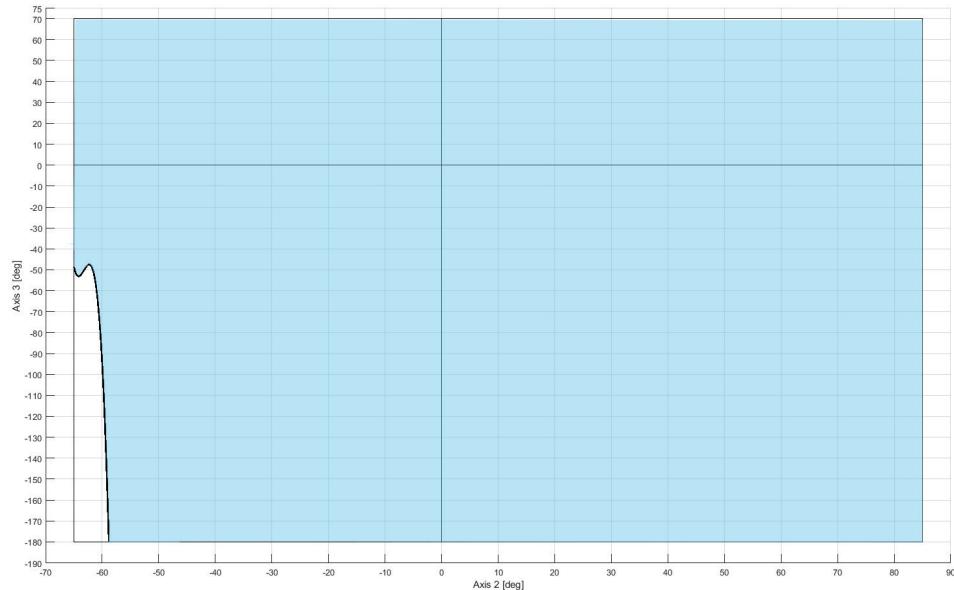
1 Description

1.8.1 Robot motion

Continued

Working range axis 2 and axis 3 for IRB 6700-300/2.70 and -245/3.00

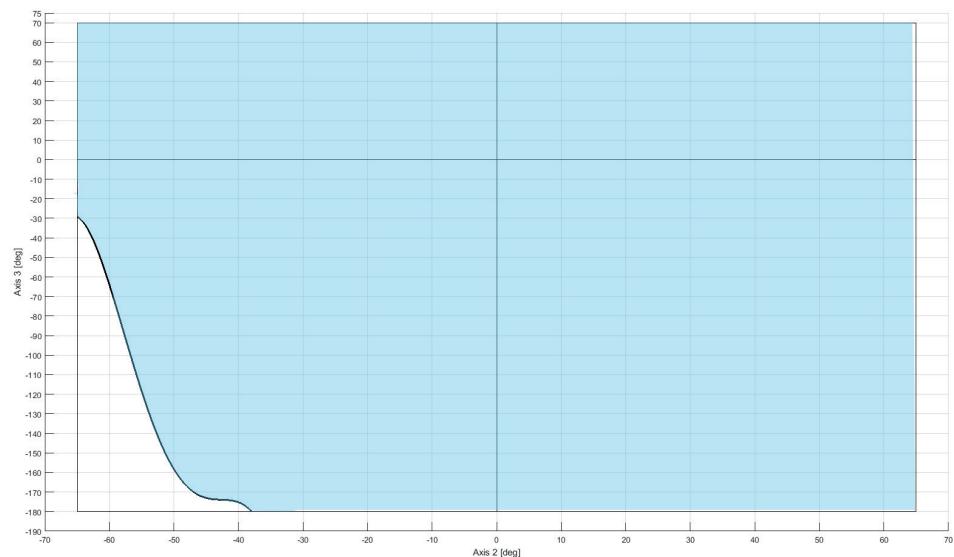
Limited in some areas to avoid collision with balancing.



xx1700000509

Working range axis 2 and axis 3 for IRB 6700Inv-300/2.60 and -245/2.90

Limited in some areas to avoid collision with balancing.

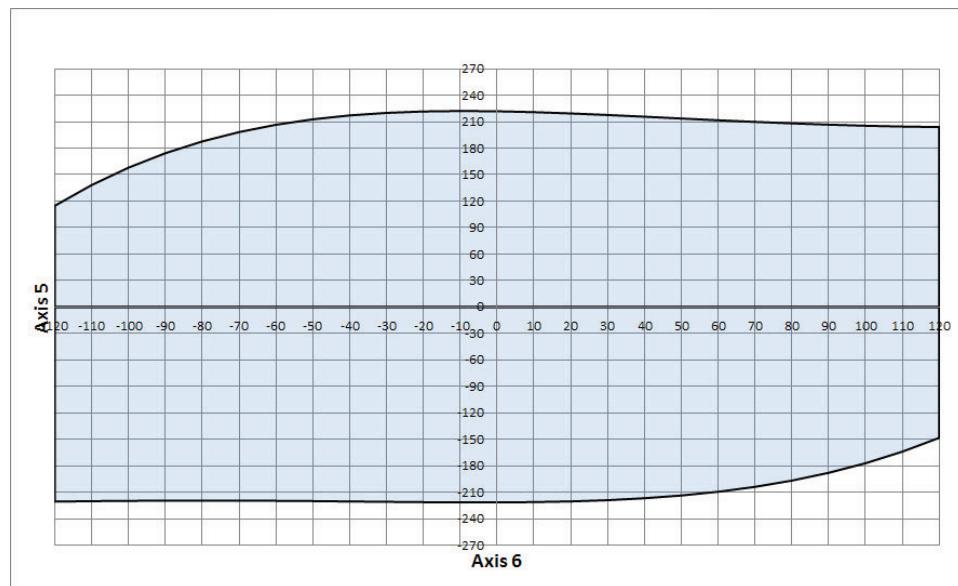


xx1700000510

Continues on next page

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

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



xx1300001587

Continues on next page

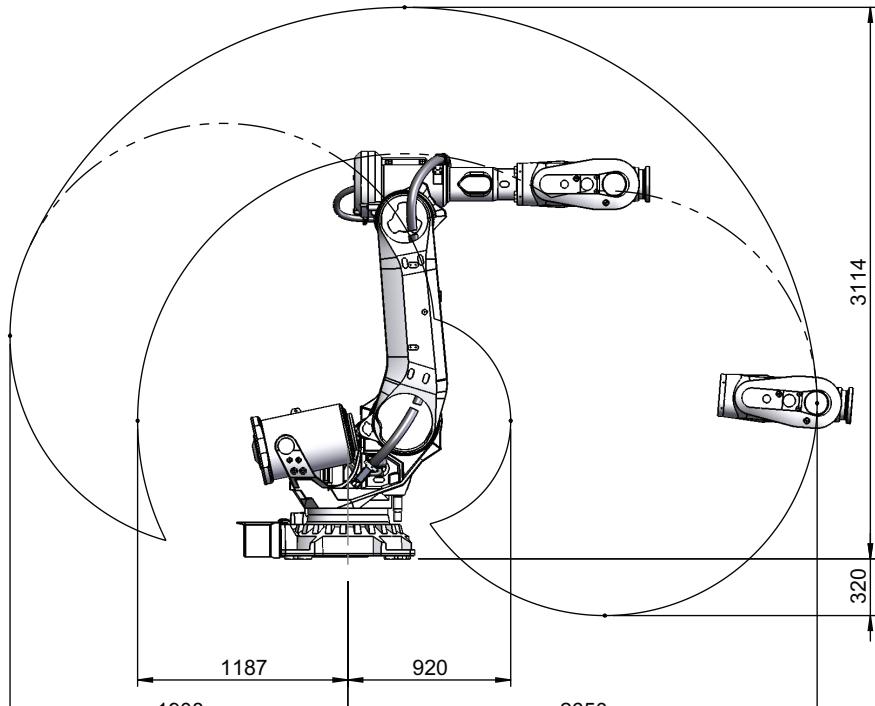
1 Description

1.8.1 Robot motion

Continued

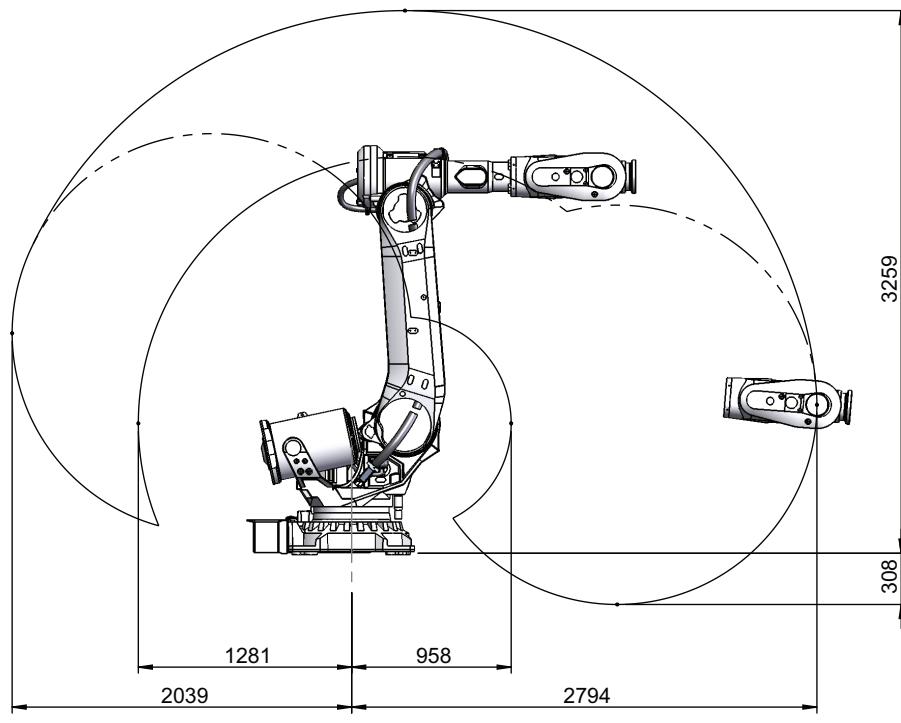
Working range

| Robot type | Handling capacity (kg) | Reach (m) |
|------------|------------------------|-----------|
| IRB 6700 | 235 | 2.65 |



Continues on next page

| Robot type | Handling capacity (kg) | Reach (m) |
|------------|------------------------|-----------|
| IRB 6700 | 205 | 2.80 |



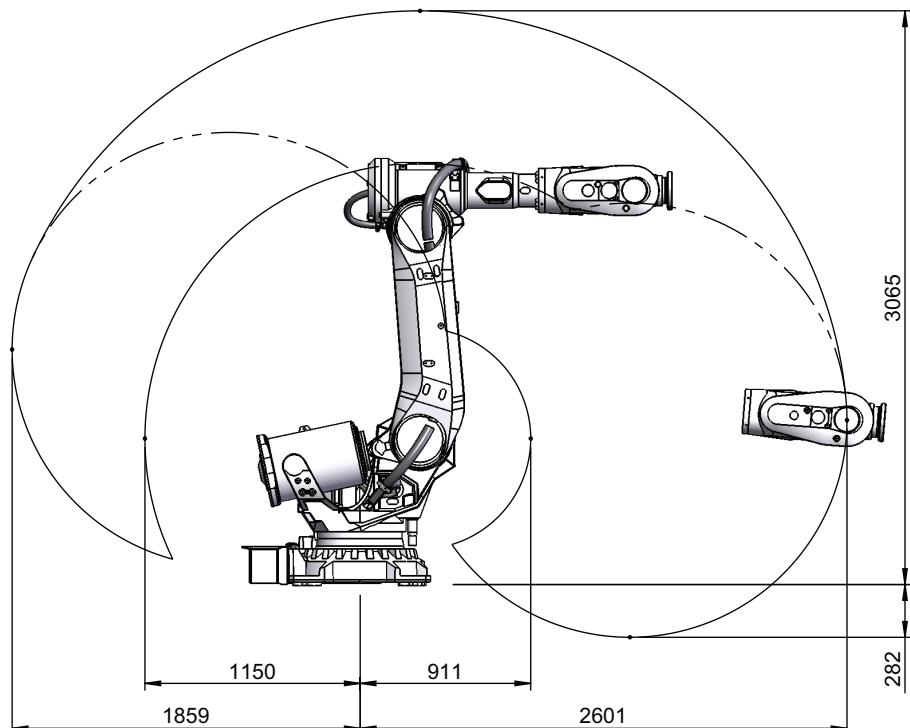
Continues on next page

1 Description

1.8.1 Robot motion

Continued

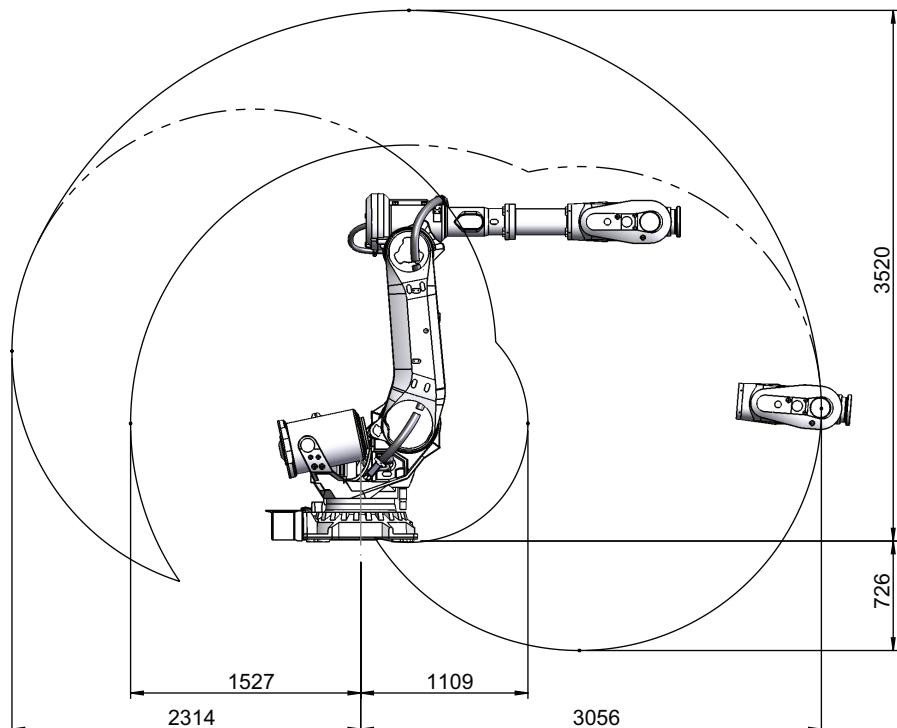
| Robot type | Handling capacity (kg) | Reach (m) |
|------------|------------------------|-----------|
| IRB 6700 | 200 | 2.60 |



xx1300000341

Continues on next page

| Robot type | Handling capacity (kg) | Reach (m) |
|------------|------------------------|-----------|
| IRB 6700 | 175 | 3.05 |



xx1300000283

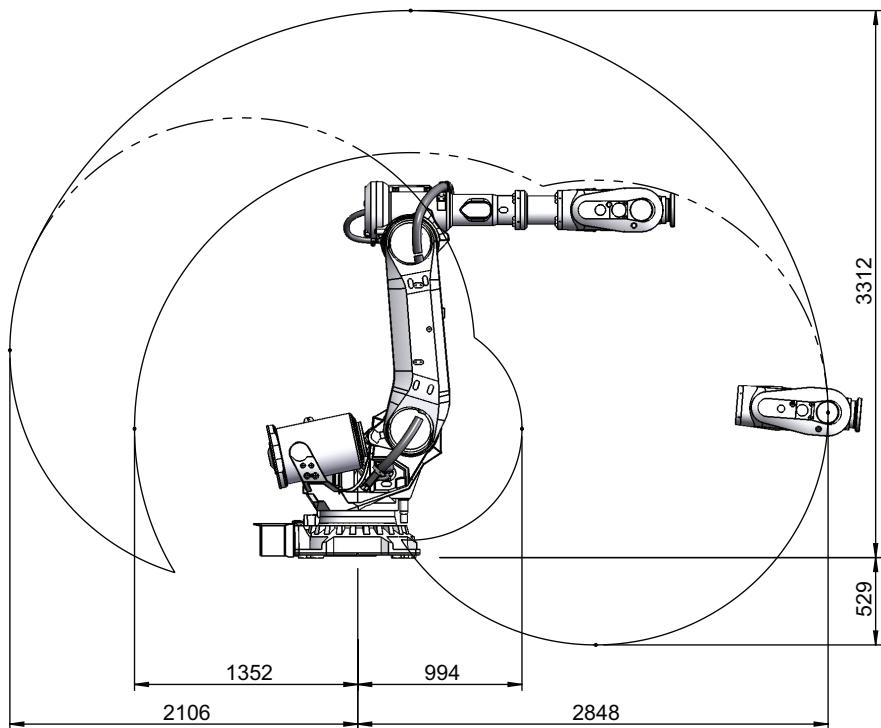
Continues on next page

1 Description

1.8.1 Robot motion

Continued

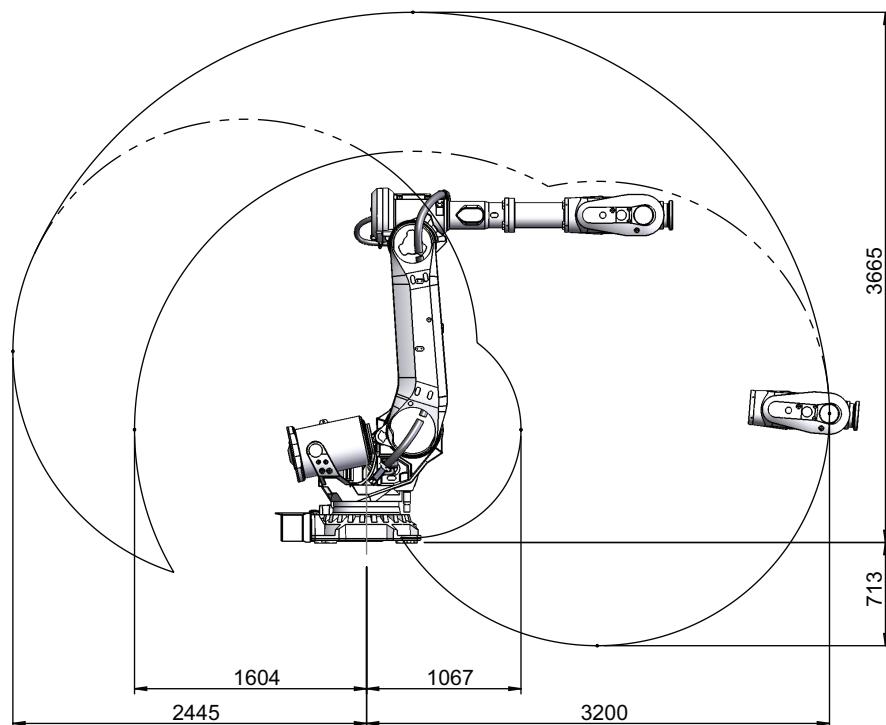
| Robot type | Handling capacity (kg) | Reach (m) |
|------------|------------------------|-----------|
| IRB 6700 | 155 | 2.85 |



xx1300000340

Continues on next page

| Robot type | Handling capacity (kg) | Reach (m) |
|------------|------------------------|-----------|
| IRB 6700 | 150 | 3.20 |



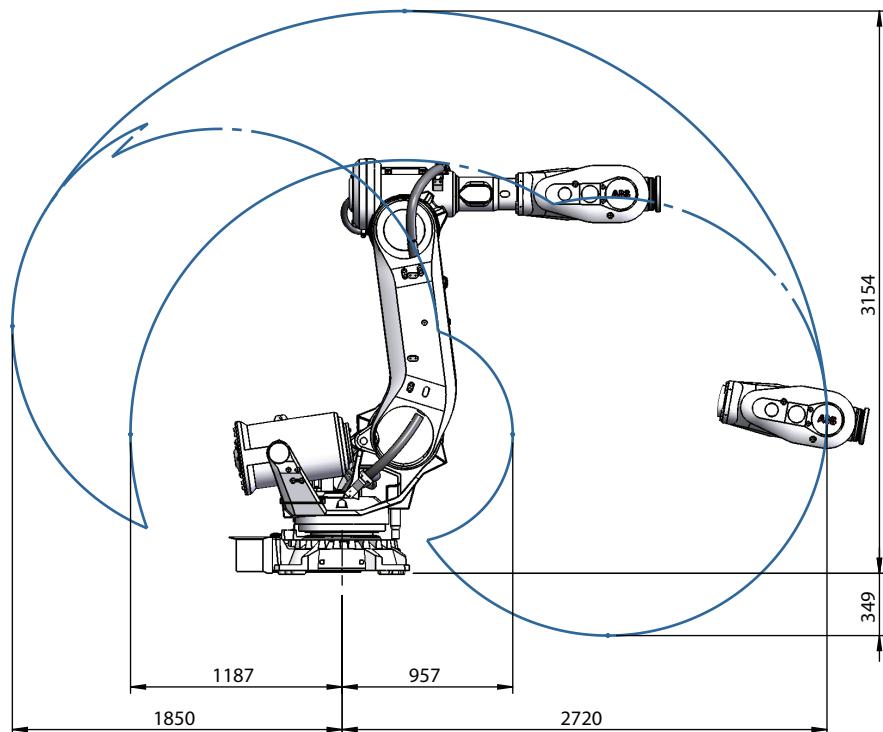
Continues on next page

1 Description

1.8.1 Robot motion

Continued

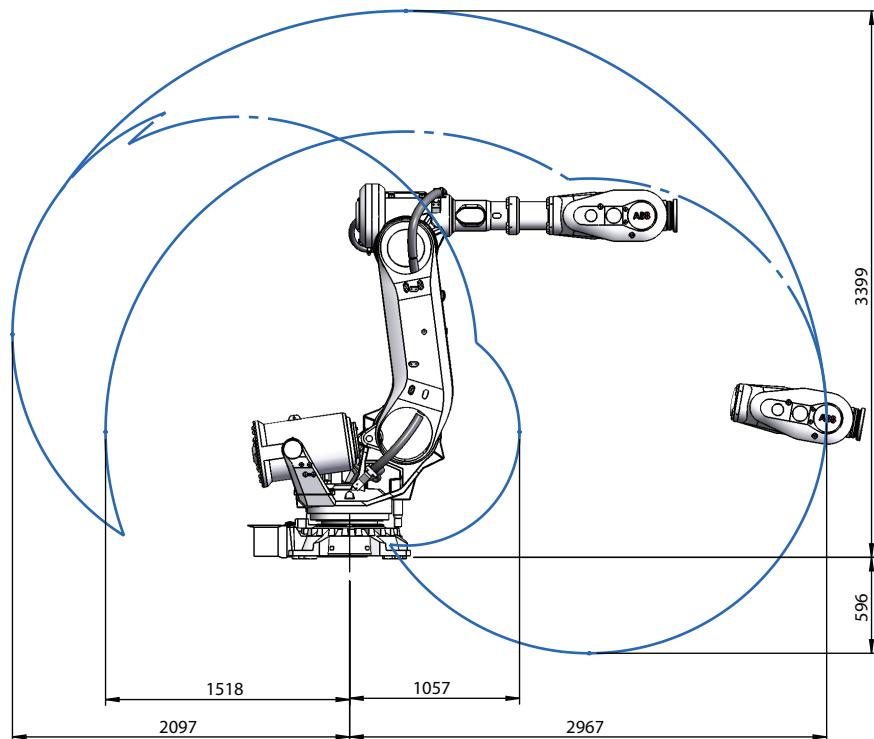
| Robot type | Handling capacity (kg) | Reach (m) |
|------------|------------------------|-----------|
| IRB 6700 | 300 | 2.70 |



xx1400001137

Continues on next page

| Robot type | Handling capacity (kg) | Reach (m) |
|------------|------------------------|-----------|
| IRB 6700 | 245 | 3.00 |



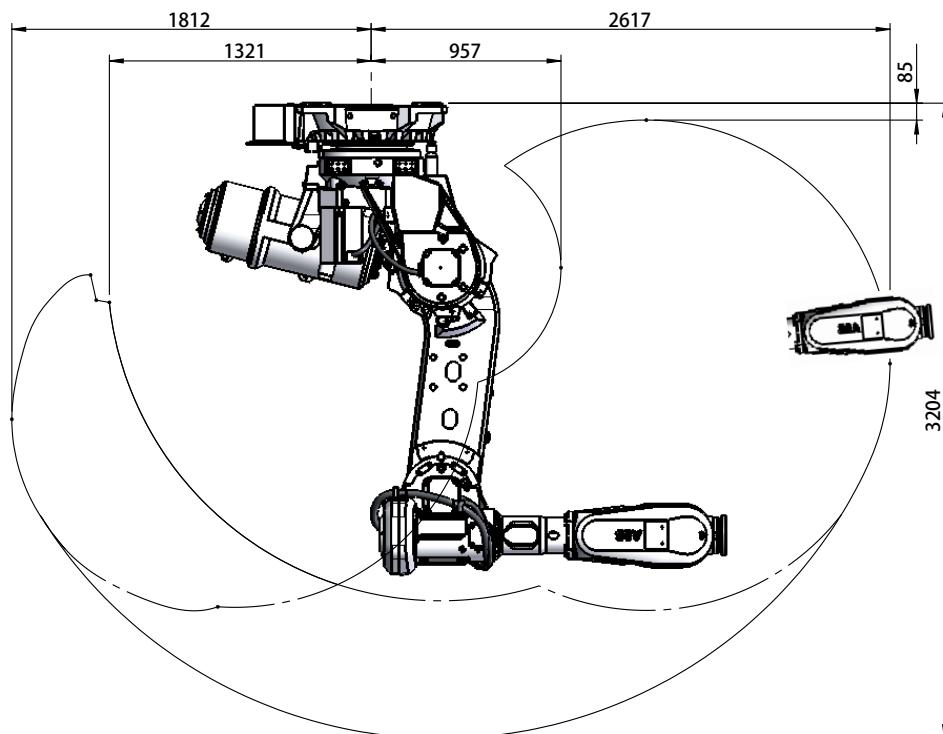
Continues on next page

1 Description

1.8.1 Robot motion

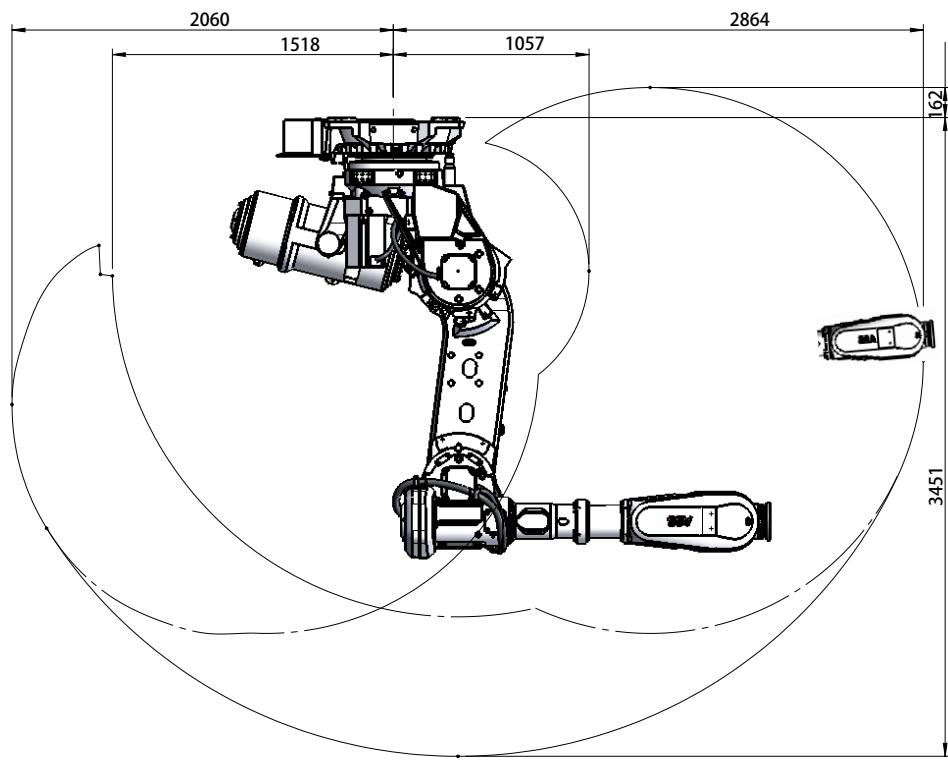
Continued

| Robot type | Handling capacity (kg) | Reach (m) |
|-------------|------------------------|-----------|
| IRB 6700Inv | 300 | 2.60 |



Continues on next page

| Robot type | Handling capacity (kg) | Reach (m) |
|-------------|------------------------|-----------|
| IRB 6700Inv | 245 | 2.90 |



xx1700000558

1 Description

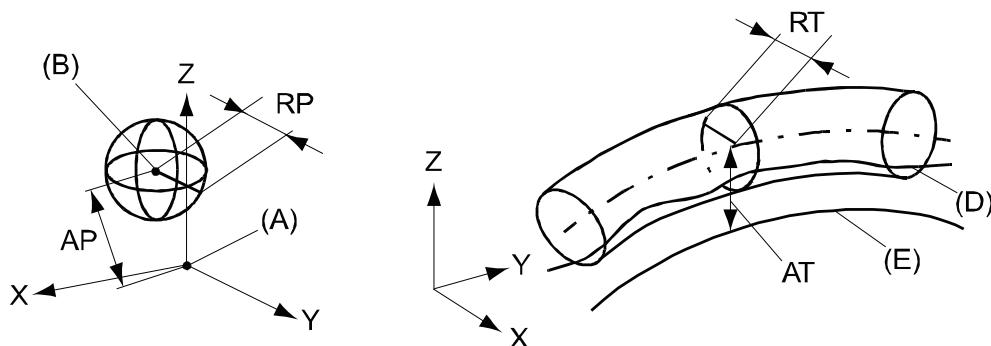
1.8.2 Performance according to ISO 9283

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.



xx0800000424

| 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 | 205/2.80 | 175/3.05 | 150/3.20 |
|--|----------|----------|----------|----------|
| Pose accuracy, AP ⁱ (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 0.4 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 |

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

Continues on next page

1.8.2 Performance according to ISO 9283*Continued*

| IRB 6700 | 200/2.60 | 155/2.85 | 300/2.70 | 245/3.00 |
|--|----------|----------|----------|----------|
| Pose accuracy, AP ⁱ (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 0.4 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 |

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

| IRB 6700Inv | 300/2.60 | 245/2.90 |
|--|----------|----------|
| Pose accuracy, AP ⁱ (mm) | 0.06 | 0.06 |
| Pose repeatability, RP (mm) | 0.05 | 0.06 |
| Pose stabilization time, PSt (s) within 0.4 mm of the position | 0.26 | 0.28 |
| Path accuracy, AT (mm) | 1.6 | 1.6 |
| Path repeatability, RT (mm) | 0.1 | 0.22 |

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

1 Description

1.8.3 Velocity

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 6700-205/2.80 | 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 6700-175/3.05 | 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 6700-150/3.20 | 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 6700-245/3.00 | 100 °/s | 88 °/s | 90 °/s | 140 °/s | 110 °/s | 180 °/s |
| IRB 6700Inv-300/2.60 | 100 °/s | 88 °/s | 90 °/s | 140 °/s | 110 °/s | 180 °/s |
| IRB 6700Inv-245/2.90 | 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).

1.8.4 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)*.

1 Description

1.9 Cooling fan for axis 1 motor

Option 87-1

To be used to avoid overheating of motors and gears in applications with intensive motion (high average speed and /or high average torque and/or short wait time) of axis 1.

Valid protection for cooling fan is IP54. Fan failure stops the robot. The option is not allowed to select when the robot is placed on a track motion, IRBT.

To determine the use of cooling fan for axis 1 motor use the function **Gearbox Heat Prediction Tool** in RobotStudio. Reliable facts for the decision of need for fan or not will be achieved by entering the ambient temperature for a specific cycle. Contact your local ABB organization.

1.10 Servo gun

1.10.1 Introduction

General

The robot can be supplied with hardware and software for control of the following configurations:

- Stationary Gun
- Robot Gun
- Robot Gun and Track Motion
- Track Motion

The specific parts related to the servo motor control for electrical welding guns and for track motion configurations are shown in the conceptual pictures below. The major parts and required options are also stated in the configurations lists below each picture.

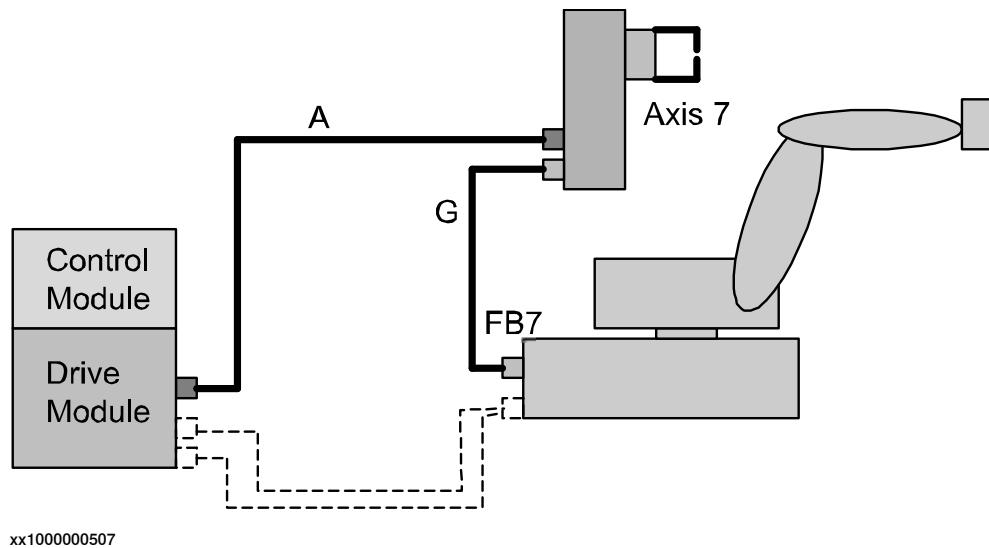
The cables for control of the basic robot are shown in the pictures with dotted lines.

1 Description

1.10.2 Stationary gun

1.10.2 Stationary gun

General



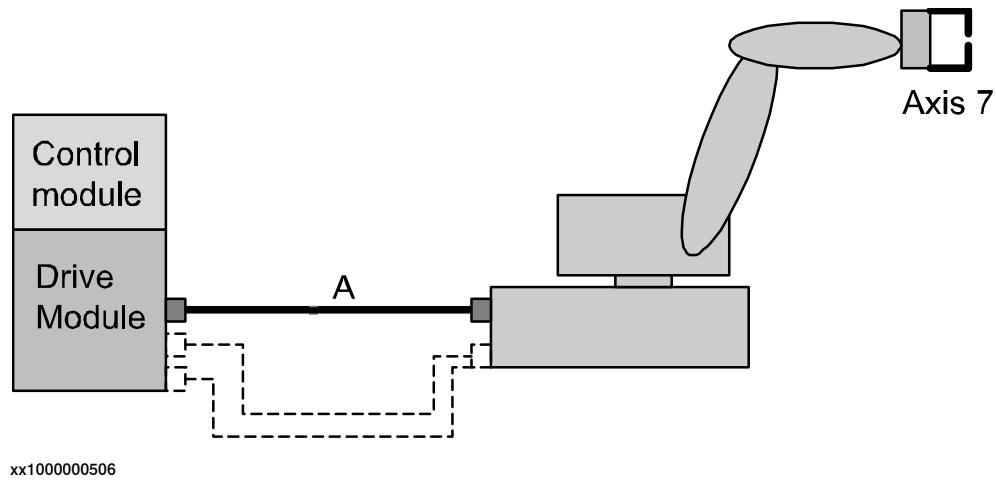
Options

Options according to the table below are required to complete the delivery. For further details on each option see corresponding product specification.

| Option | Description | Product specification |
|-------------------|--|--|
| 785-5 | Stationary gun. This option includes cable G (7 m length) for resolver signals from robot base (FB7) to stationary gun/axis 7. | |
| 864-1 | Resolver connection, axis 7, on base. | |
| 907-1 | First additional drive. Drive unit for 7th axis with corresponding cables assembled inside drive module. | <i>Product specification - Controller IRC5</i> |
| 786-1, -2, -3, -4 | Connection to first drive. Cable A (7-30 m) between drive module and stationary gun/axis 7 for servo drive power. | |
| 635-6 | Spot 6. This option includes Spot Servo and Spot Servo Equalizing. | <i>Product specification - Controller IRC5</i> |

1.10.3 Robot gun

General



Option

Options according to table below are required to complete the delivery. For further details on each option see corresponding product specification.

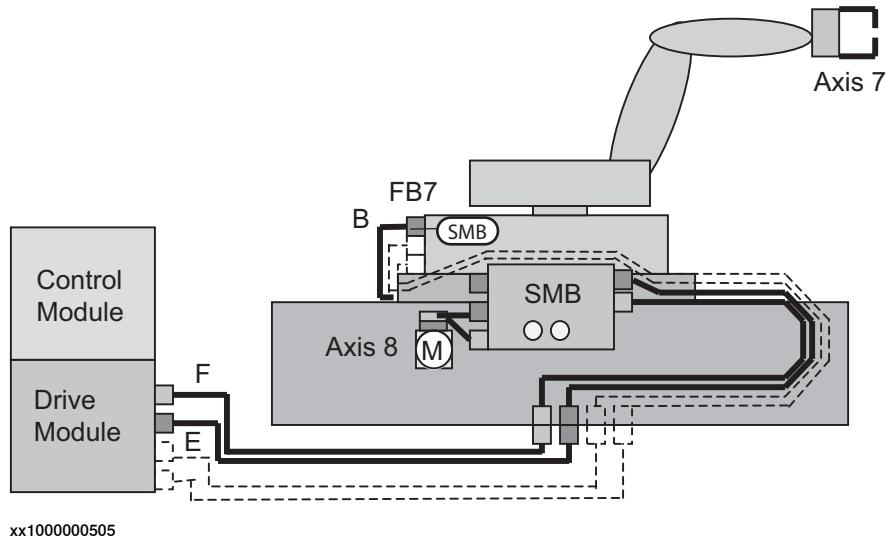
| Option | Description | Product specification |
|-------------------|--|--|
| 785-1 | Robot gun. This option includes cables within manipulator for servo power signals (servo gun/axis 7). | |
| 907-1 | First additional drive. Drive unit for 7th axis with corresponding cables assembled inside drive module. | <i>Product specification - Controller IRC5</i> |
| 786-1, -2, -3, -4 | Connection to first drive. Cable A (7-30 m) between drive module and robot base for servo drive power. | |
| 635-6 | Spot 6, Spot Servo, or Spot Servo Equalizing. | <i>Product specification - Controller IRC5</i> |

1 Description

1.10.4 Robot gun and track motion

1.10.4 Robot gun and track motion

General



Options

Options according to table below are required to complete the delivery. For further details on each option see corresponding product specification.

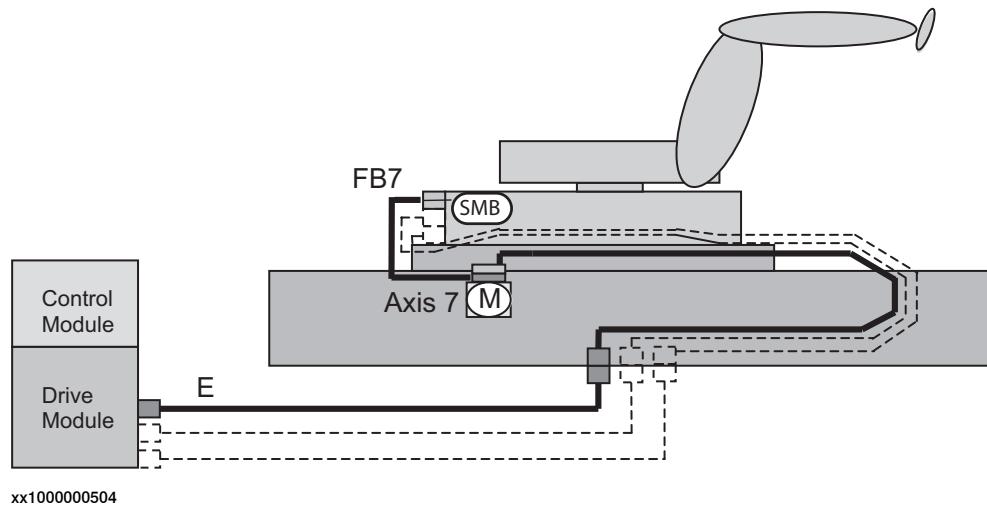
| Option | Description | Product specification |
|--------------------------------|--|--|
| 785-1 +1002-2 ⁱ | Robot Gun - Track Motion. This option includes cables within manipulator for servo power signals (servo gun/axis 7). | Product specification - IRBT 4004/6004/7004 |
| Track motion delivery includes | Serial measurement box (SMB2, Split box) for distribution of servo power to axis 8. The box is placed on the track motion. Cables from serial measurement box to track motion. Cable B for servo power (1.5 m length). Connection to first and second drive. Cable E and F (7-22 m) between drive module and serial measurement box for dual servo drive power/resolver signals. | Product specification - IRBT 4004/6004/7004 |
| 907-1 | First additional drive. Drive unit for 7th axis with corresponding cables assembled inside drive module. | Product specification - Controller IRC5 |
| 907-1 | Second additional drive. Drive unit for 8th axis with corresponding cables assembled inside drive module. | Product specification - Controller IRC5 |
| 635-6 | Spot 6, Spot Servo, or Spot Servo Equalizing. | Product specification - Controller software IRC5 |
| 864-1 | Resolver connection, axis 7, on base (FB7). | |

ⁱ To specify robot on track equipped with servo gun. Option 1002-2 from specification form for track motion.

1.10.5 Track motion

General

The robot can be supplied with a track motion, see *Product specification - IRBT 4004/6004/7004*. For configuration and specification of hardware see the following figure.



Options

Options according to table below are required to complete the delivery. For further details on each option see corresponding product specification.

| Option | Description | Product specification |
|--------------------------------|--|--|
| Track motion delivery includes | Serial measurement (SMB) in manipulator is used, together with option 864-1, FB7 for signals to axis 7/Track motion. Cable E for between Drive Module and track motion servo for drive power. | <i>Product specification - IRBT 4004/6004/7004</i> |
| 907-1 | First additional drive. Drive unit for 7th axis with corresponding cables assembled inside drive module. | |
| 864-1 | Resolver connection, axis 7, on base (FB7). | |

This page is intentionally left blank

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.

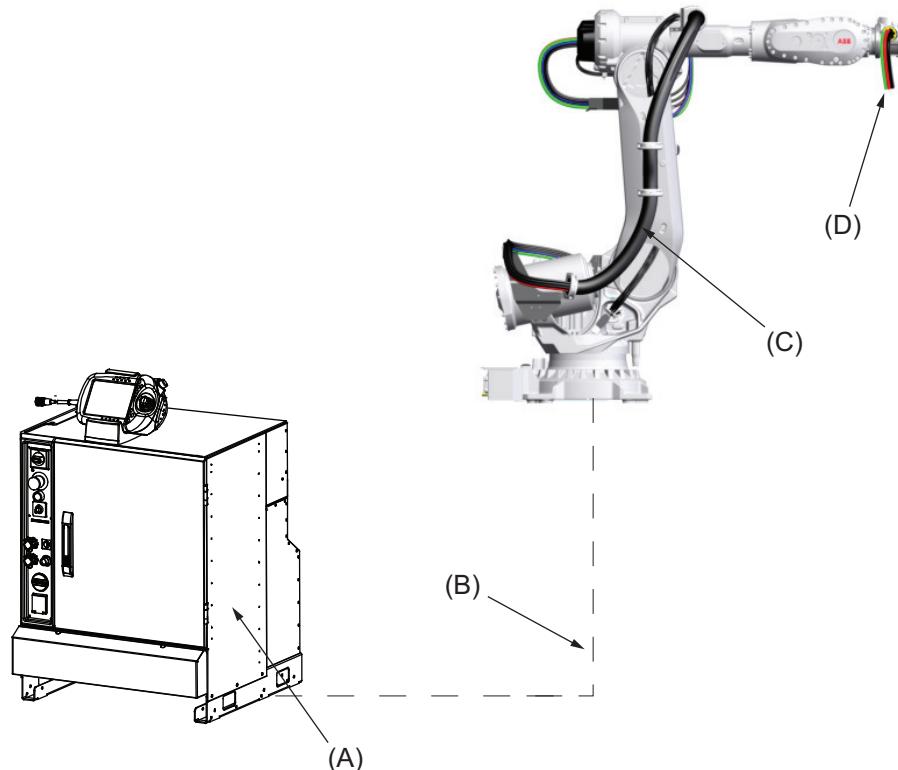
Necessary supports and brackets are also included.

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



Note

Include everywhere that this is also for IRB 6700Inv (e.g. "This is available for all IRB 6700 and IRB 6700Inv versions").



xx1300001588

Continues on next page

2 DressPack

2.1.1 Included options

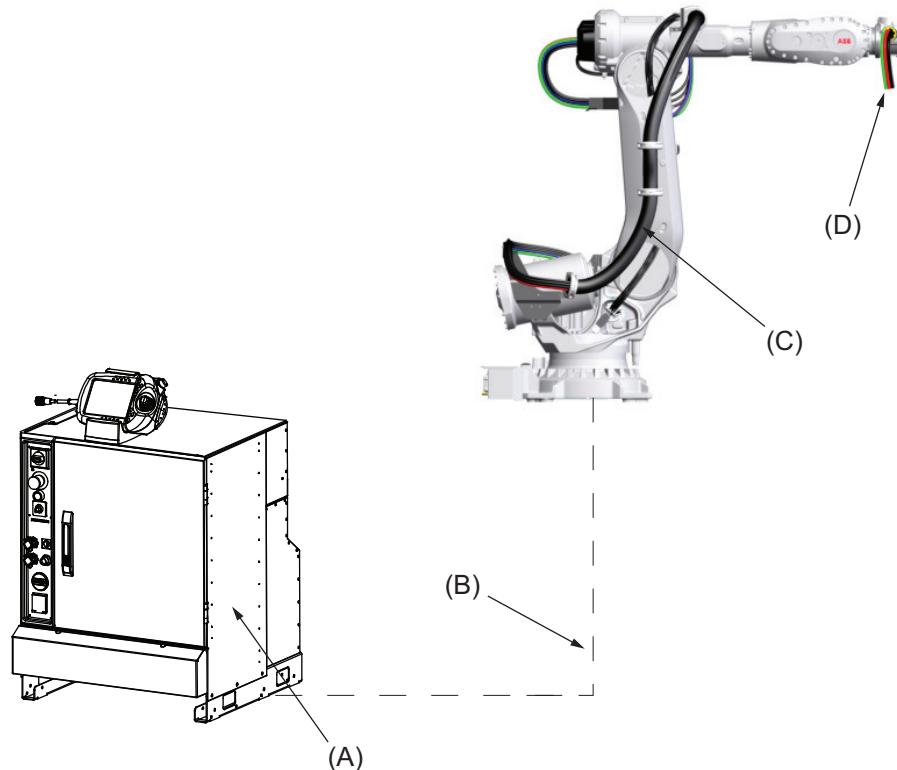
Continued

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

Continues on next page

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 DressPack

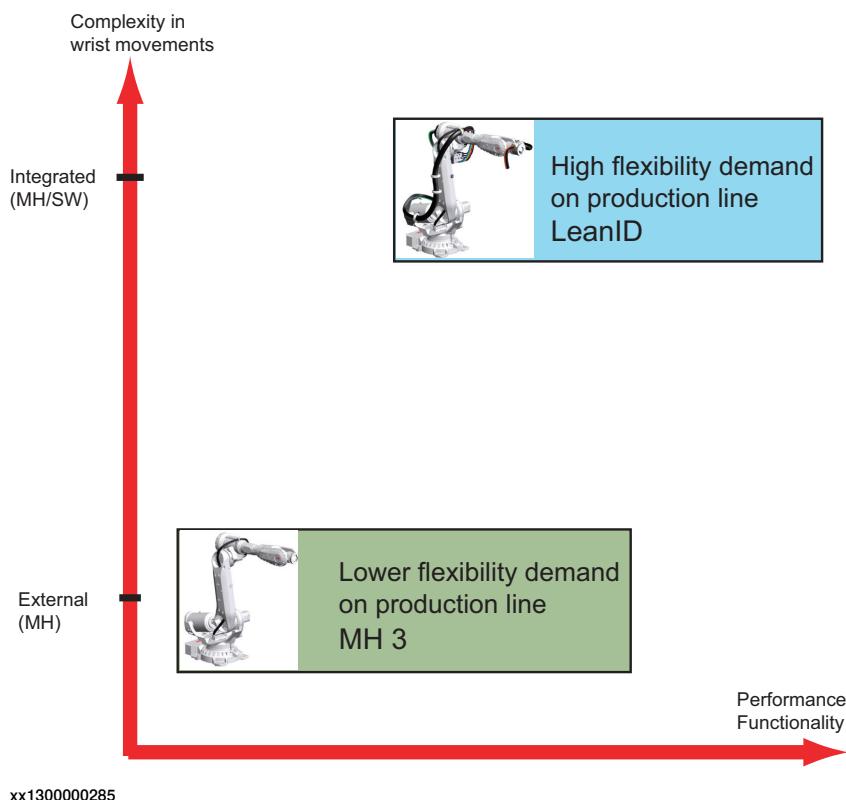
2.1.2 Product range

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 798-3 and 780-4 for material handling/spot welding, the LeanID concept.

External

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

Available options are 798-3 and 780-3 for material handling.

2.1.3 Limitations of robot movements

General

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

- 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 LeanID, option 780-4 on page 85](#).



Note

For more detail information please contact Serop Product support/SEROP/ABB.
E-mail address: serop.product_support@se.abb.com

Restrictions for LeanID, option 780-4

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 DressPack

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.

2.1.5 Information structure

General

The information for DressPack is structured in the following way.

The DressPack can be delivered in two versions developed for two different applications. Each type is described in a separate section.

| Section | Option | Description |
|---------|-----------|---|
| 2.2 | DressPack | DressPack includes general description DressPack with common information. |

Material handling application DressPack

| Section | Option | Description |
|---------|----------|--|
| 2.3 | Type H | DressPack for Material Handling. |
| | Type Hse | DressPack for handling the part against electrical servo driven transformer guns stationary mounted. |

Spot welding application DressPack

| Section | Option | Description |
|---------|---------|--|
| 2.4 | Type Se | DressPack for electrical servo driven transformer guns carried by the robot manipulator. |

Connector kits

| Section | Option | Description |
|---------|----------------|---|
| 2.3 | Connector Kits | Includes general description of connector kits for DressPack. |

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.

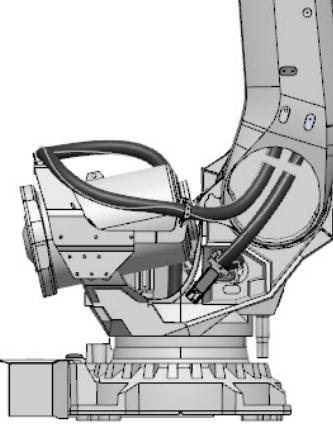
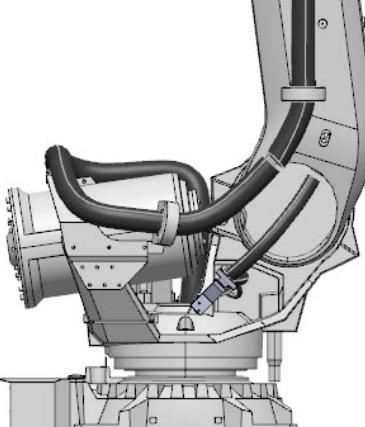
| | Lower arm | Upper arm |
|------------------------------------|---|--|
| Option 778-1, Material Handling | Option 798-3, Base to axis 3 Internal routing in lower arm | Option 780-3, Axis 3 to 6 External routing |
| | | Option 780-4, Axis 3 to axis 6 (LeanID) Internal routing |

Available DressPack configurations for Spot Welding

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

| | Lower arm | Upper arm |
|-------------------------------|--|--|
| Option 778-2, Spot Welding | Option 798-3, Base to axis 3 External routing | Option 780-4, Axis 3 to axis 6 (LeanID) Internal routing |

Lower arm

| | |
|---|--|
|  |  |
| Internal routing in lower arm Option 778-1 (Material handling) Option 798-3, Base to axis 3 Option 3325-11/12/13, Base to axis 3 | External routing Option 798-3, Base to axis 3 Option 3325-11/12/13, Base to axis 3 |

2.2.2 Built-in features for upper arm DressPack

External

Material handling (option 780-3):

- Internal routing through the rear part of the upper arm.
 - Protection hose can easily be replaced if damaged.
 - One version for all IRB 6700 versions and all IRB 6700Inv versions.
 - Adjustment for optimal hose/cable lengths.
-

Internal

Spot Welding and Material handling (option 780-4):

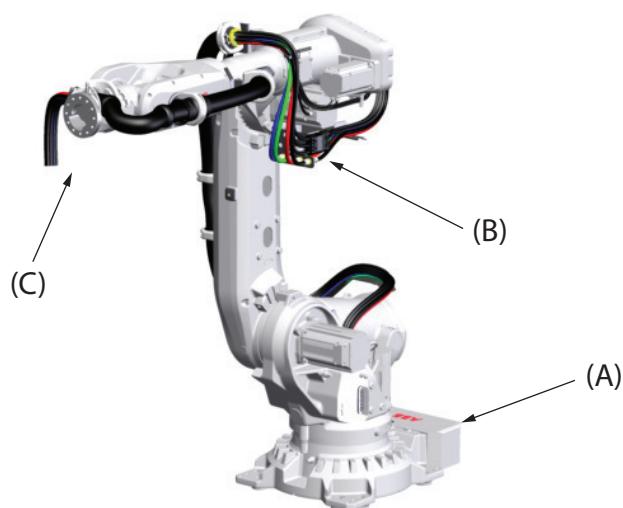
- Partly internal routing through the upper arm.
- Suitable for complex movements.
- High demands for flexibility and accessibility.
- Longer lifetime.
- Predictable movements.
- Easy exchange of DressPack.

2 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 - DressPack/SpotPack IRB 6700*.



xx1300000224

| Pos | Location | Description | Options |
|-----|----------|--------------------|--------------|
| A | Base | FB7, CP/CS/CBUS | 864-1, 798-3 |
| B | Axis 3 | CP/CS/CBUS | 798-3 |
| C | Axis 6 | CP/CS/CBUS, WELD | 780-3, 780-4 |

Continues on next page

Base

Material handling (option 798-3), see figure below:

, see figure below:

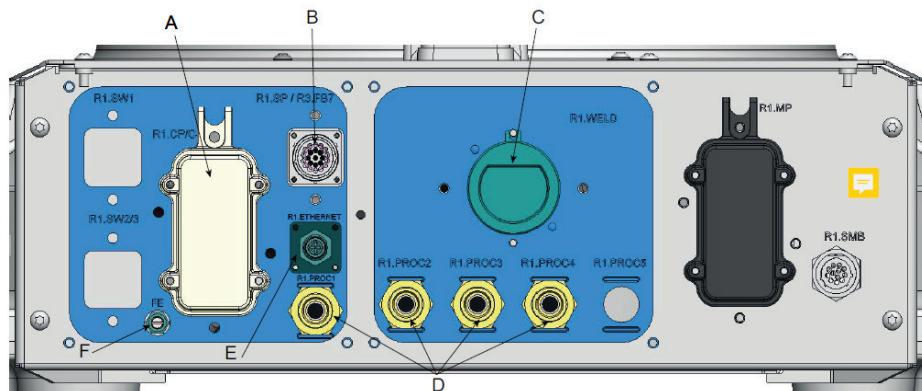
- Included are: A, one D (Proc 1).

, see figure below:

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

Spot welding (option 798-3), see figure below:

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



xx1900001501

For corresponding parts of the tool, see [Connection kits on page 145](#).

| Pos | Description |
|-----|--|
| A | R1.CP/CS |
| B | R1.SP (Spot Welding Servo gun) or FB7 (Resolver connection) |
| C | R1.WELD 3x35mm2. (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) |

Continues on next page

2 DressPack

2.2.3 Interface descriptions for DressPack

Continued

Axis 3

Material Handling (option 798-3), see figure below:

, see figure below:

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

, see figure below:

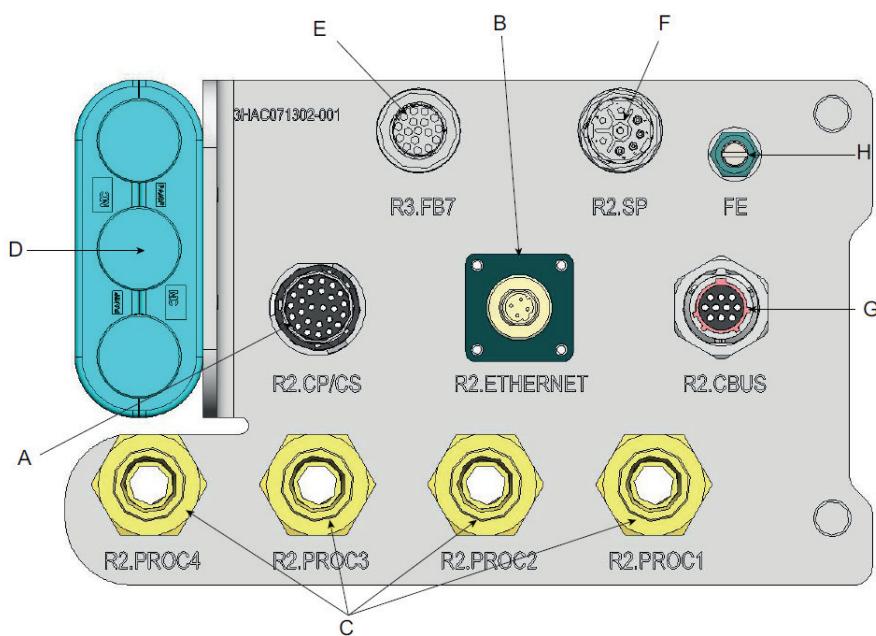
- Included are: A, G and one C (Proc 1).

, see figure below:

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

Spot welding (option 798-3), see figure below:

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



xx1900001511

For corresponding parts of the tool, see [Connection kits on page 145](#).

| 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 3x35mm2 (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) |

Continues on next page

Axis 6

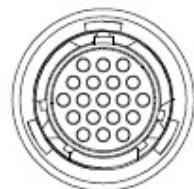
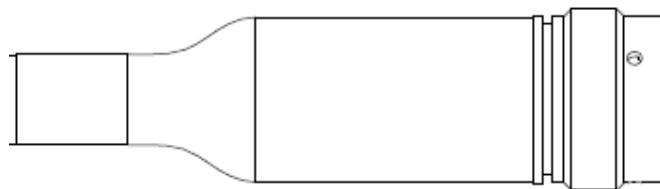
External

Material handling (option 780-3), see figure below:

, see figure below:

- Hose and cable free length, min. 1000 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 [Connection kits on page 145](#)):



xx0900000728

Material handling connector

Material handling (option 780-3), see figure below:

, see figure below:

- Cable free length, min. 1000 mm.
- Signals are connected with a M12 connector.

The different main parts within the connector are described in the list below, both with name and Harting article number (for corresponding parts of the tool, see within the Harting product offer).

Continues on next page

2 DressPack

2.2.3 Interface descriptions for DressPack

Continued

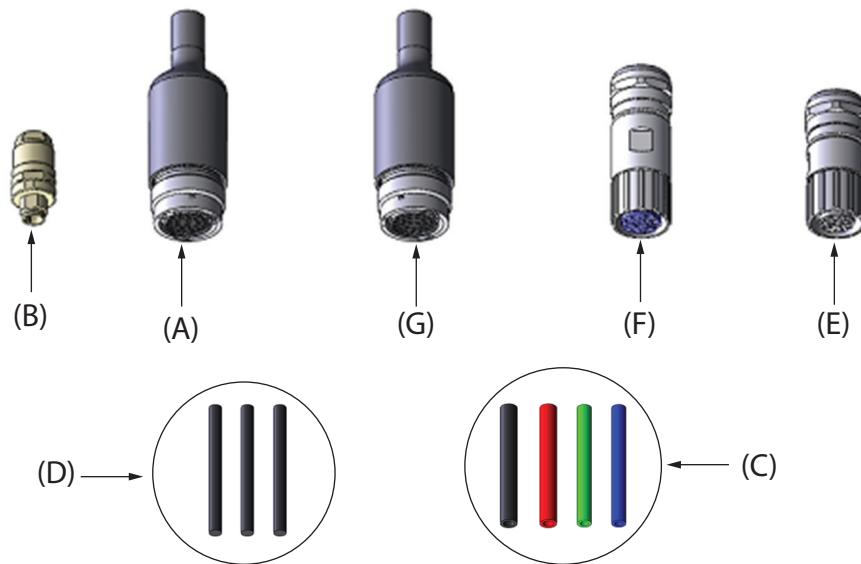
Material Handling connector (LeanID)

Material Handling/Spot Welding option 780-4 (LeanID), see figure below:

, see figure below:

- Hose and cable free length, min. 1160 mm.
- Hoses and weld power cable (only for spot welding) end with free end.

The cable ends with connectors, for corresponding parts of the tool, see [Connection kits on page 145](#) and within the UTOW product offer.

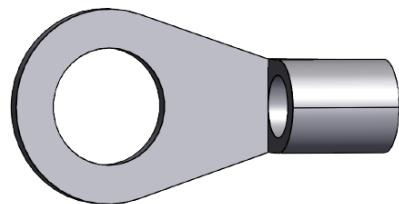


xx1200000117

| 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", freeend) R3.PROC 2-4 (3/8", free end) Media hoses |
| D | R3.WELD 3x25mm ² (Free end) Spot Welding power |
| E | R3.FB7 (M23 connector 17p) Servo motor feedback (when Spot Welding Servo gun is selected) |
| F | R3.SP (M23 connector 8p) Servo motor power (when Spot Welding Servo gun is selected) |
| G | R3.CBUS (UTOW connector 10p) BUS signals (when Profibus or DeviceNet communication is selected) |

- FE (M8 cable lug) Functional Earth 10mm² (When Parallel and Ethernet communication is selected)

Continues on next page



xx2000000109

2 DressPack

2.2.4 Dimensions

2.2.4 Dimensions

Dimensions for robot with DressPack

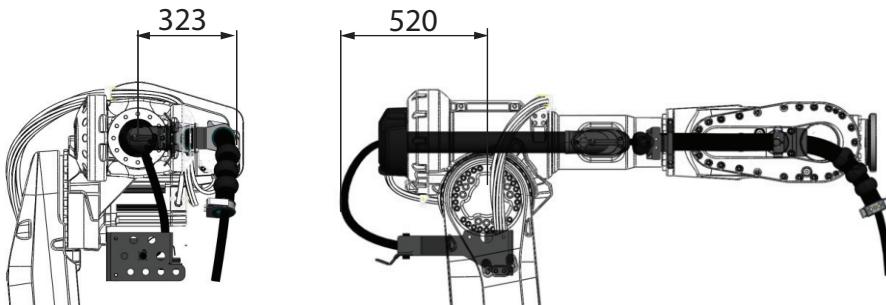


Note

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

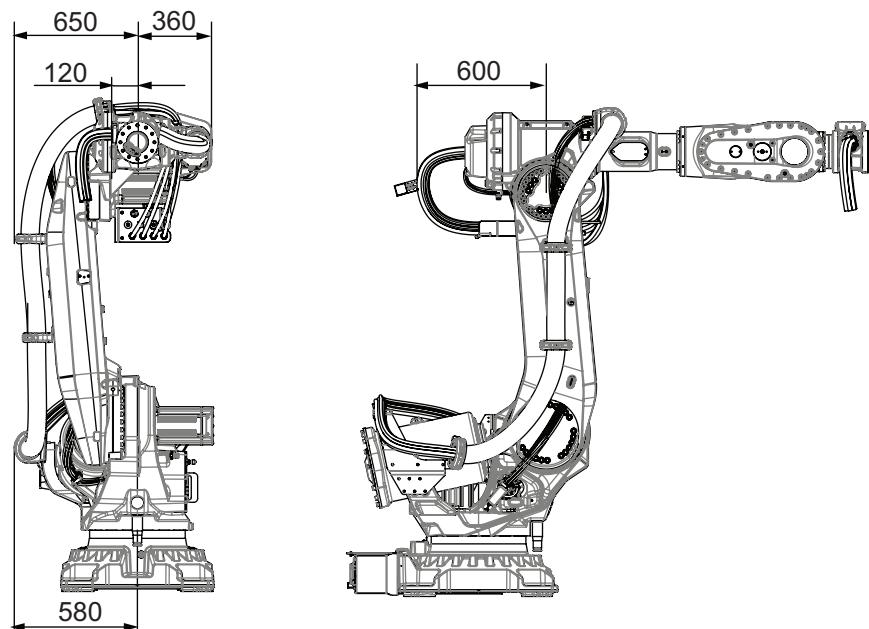
Dimensions are shown in figures below.

Axis 3 to axis 6 (option 780-3)



xx1300000286

Option 778-2 (Spot Welding) + Option 798-3 (Base to axis 3) + Option 780-4 (Axis 3 to axis 6)

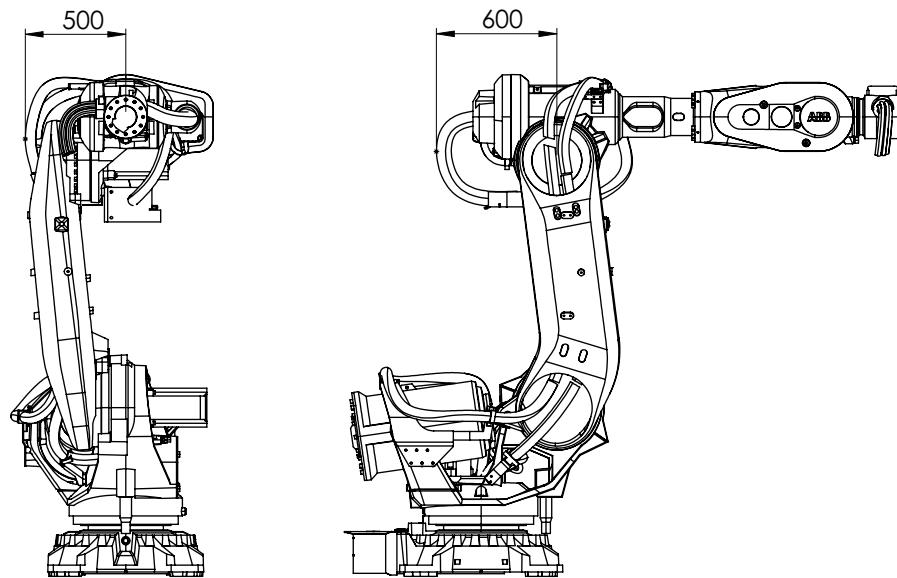


xx1300000287

Base to axis 3 + Axis 3 to axis 6 (option 798-3 + 780-4)

Continues on next page

Option 778-1 (Material handling) + Option 798-3 (Base to axis 3) + Option 780-4 (Axis 3 to axis 6)



xx2000001776

2 DressPack

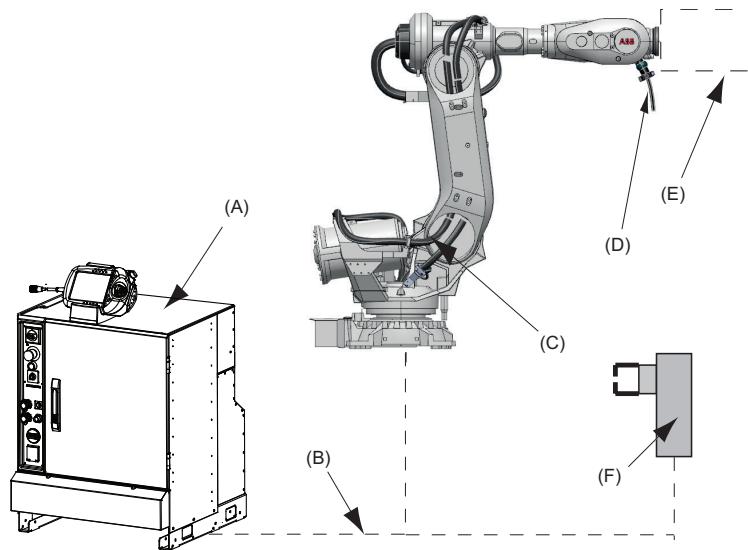
2.3.1 Introduction

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 Cabinet IRC5 | 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 |

Available configurations with linked option numbers are described below.

Option description

| Option | Type | Description |
|--------|-----------------------|---|
| 16-1 | Connection to cabinet | Floor cables and connections inside the I/O section for the DressPack are chosen. The length and configuration of the floor harness is specified under the options below. Option 94-X for parallel communication. Option 90-X for parallel communication and field bus communication with Can/DeviceNet. Option 92-X for parallel communication and field bus communication with Profibus. |

Continues on next page

| Option | Type | Description |
|--------|-------------------------------------|--|
| 455-1 | Parallel communication | Offers the signal cables needed for parallel communication in lower and upper arm DressPack. To be combined with option 94-X. |
| 455-4 | Parallel and Bus communication | Offers the signal cables needed for the combination of parallel and bus communication in lower and upper arm DressPack. To be combined with option 90-X or 92-X. |
| 455-8 | Parallel and Ethernet communication | Offers the signal cables needed for the bus communication in lower and upper arm DressPack. To be combined with option 859-X. Requires selection of option 94-X. |

The available alternatives and allowed combinations are shown in the schematic Figures below.

| | | | |
|---|---|---|-----------------------------------|
| Application Interface connected to Option 16-1, Cabinet | Option 455-1 Parallel communication | Option 94-X Cable length, Parallel communication | Option 778-1 Material Handling |
| | Option 455-4 Parallel and bus communication | Option 90-X Option 92-X Cable length, Parallel and bus communication | |
| | Option 455-8 Parallel and Ethernet communication | Option 859-X Cable length, Ethernet communication | |

DressPack

| | Lower arm | Upper arm |
|------------------------------------|---|---|
| Option 778-1. Material Handling | Option 798-3, Base to axis 3 Internal routing in lower arm | Option 780-3, Axis 3 to 6 External routing |
| | | Option 780-4, Axis 3 to 6 Internal routing |

2 DressPack

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

- Option 16-1 with Connection to cabinet
- (Option 94-X to specify cable length)
- Option 455-1. Parallel communication
- Option 778-1. Material Handling
- Option 798-3. Internal routing, DressPack Lower arm

One of the options:

- Option 780-3 (and Option 798-3). External routing
- Option 780-4 (and option 798-3) Internal routing

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

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

Continues on next page

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

- Option 16-1 with Connection to cabinet
- (Option 90-X to specify cable length)
- Option 455-4. Parallel and bus communication
- Option 778-1 Material Handling
- Option 798-3. Internal routing, DressPack Lower arm

One of the options:

- Option 780-3 (and Option 798-3). External routing
- Option 780-4 (and option 798-3). Internal routing

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 |
|------------------------------|-------------------------|---|------------------------|----------------------------------|
| Customer Power (CP) | | | | |
| Utility Power | 2+2 | 2+2 | 0.75 mm ² | 250 VAC, 5 A rms |
| Protective earth | | 1 | 0.75 mm ² | 250 VAC |
| Customer Signals (CS) | | | | |
| Signals | 13 | 13 | 0.2 mm ² | 50 V DC, 1 A rms |
| Signals separate shielded | 8 | 8 (4x2) | 0.2 mm ² | 50 V DC, 1 A rms |
| Customer bus (CBus) | | | | |
| Bus signals | At bus board | 2 | 0.14 mm ² | Can/DeviceNet spec |
| Bus signals | At bus board | 2 | 0.2 mm ² | 50 V DC, 1 A rms |
| Media | | | | |
| 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, Profibus

- Option 16-1 with Connection to cabinet
- (Option 92-X to specify cable length)
- Option 455-4. Parallel and bus communication
- Option 778-1. Material Handling
- Option 798-3. Internal routing, DressPack Lower arm

One of the options:

- Option 780-3 (and Option 798-3). External routing
- Option 780-4 (and option 798-3) Internal routing

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

| Type | At terminals in cabinet | At connection point. Base, Ax- is 3 or axis 6 | Cable/part area | Allowed capacity |
|------------------------------|----------------------------|---|--------------------------------|-------------------------------------|
| Customer Power (CP) | | | | |
| Utility Power | 2+2 | 2+2 | 0,75 mm ² | 250 VAC, 5 A rms |
| Protective earth | | 1 | 0,75 mm ² | 250 VAC |
| Customer Signals (CS) | | | | |
| Signals | 13 | 13 | 0,2 mm ² | 50 V DC, 1 A rms |
| Signals separate shielded | 8 | 8 (4x2) | 0,2 mm ² | 50 V DC, 1 A rms |
| Customer bus (CBus) | | | | |
| Bus signals | At bus board | 4 | 0,14 mm ² | Profibus 12 Mbit/s spec |
| Media | | | | |
| Air (PROC 1) | | 1 | 12,5 mm inner dia- meter | Max. air pressure 16 bar/230 PSI |

Continues on next page

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

- Option 16-1 with Connection to cabinet
- (Option 859-X to specify cable length)
- (Option 94-X to specify cable length)
- Option 455-8. Parallel and Ethernet communication
- Option 778-1. Material Handling
- Option 798-3. Internal routing, DressPack Lower arm

One of the options:

- Option 780-3 (and Option 798-3). External routing
- Option 780-4 (and option 798-3). Internal routing

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 |
|--------------------------------|-------------------------|---|------------------------|--|
| Customer Power (CP) | | | | |
| Utility Power | 2+2 | 2+2 | 0.75 mm ² | 250 VAC, 5 A rms |
| Protective earth | | 1 | 0.75 mm ² | 250 VAC |
| Customer Signals (CS) | | | | |
| Signals | 13 | 13 | 0.2 mm ² | 50 V DC, 1 A rms |
| Signals separate shielded | 8 | 8 (4x2) | 0.2 mm ² | 50 V DC, 1 A rms |
| Customer bus (Ethernet) | | | | |
| Bus signals | 4 | 4 | 0.4 mm ² | Ethernet CAT 5e, 100 Mbit ⁱ |
| Media | | | | |
| Air (PROC 1) | | 1 | 12.5 mm inner diameter | Max. air pressure 16 bar/230 PSI |

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

Continues on next page

2 DressPack

2.3.2 Configuration result for Type H HSe

Continued

Required general options for Type HSe

To enable the spot welding function on the IRB 6700 a number of general standard robot options are required. These standard options are further described under other chapters and are also mentioned in this chapter.

- Option 727-1. 24V 8 Amps power supply
- Option 635-6. Spot. Software option for pneumatic guns

Required additional options for servo gun Type HSe

To enable the spot welding function to run with a servo controlled gun, some additional (additional to those described in [Summary options required for Type HSe on page 132](#)) servo drive options are required. These standard options are described under other chapters and are also mentioned below in this chapter.

- Option 907-1. First additional drive
- Option 864-1. Resolver connection, axis 7
- Option 785-5. Stationary gun
- Option 786-1,-2,-3,-4. Connection to first drive (Cable length to be stated)
- Option 635-6. Spot 6

Also option 630-1, Servo tool change, should be used if servo gun tool change is required.

2.3.3 Summary common options Type H HSe

General

The following options are the minimum required to form a complete spotwelding function DressPack Type H/HSe:

- Option 16-1. Connection to cabinet (Cable length and communication type to be stated)
- Option 455-1, 455-4 or 455-8. Parallel, Parallel and Bus communication or EtherNet (Communication type to be stated)
- Option 778-1. Material Handling
- Option 798-3. DressPack Lower arm (Internal routing in lower arm)
- Option 780-3, -4. DressPack Upper arm (External or internal routing)

2.3.4 Summary options required for Type HSe

Servo gun

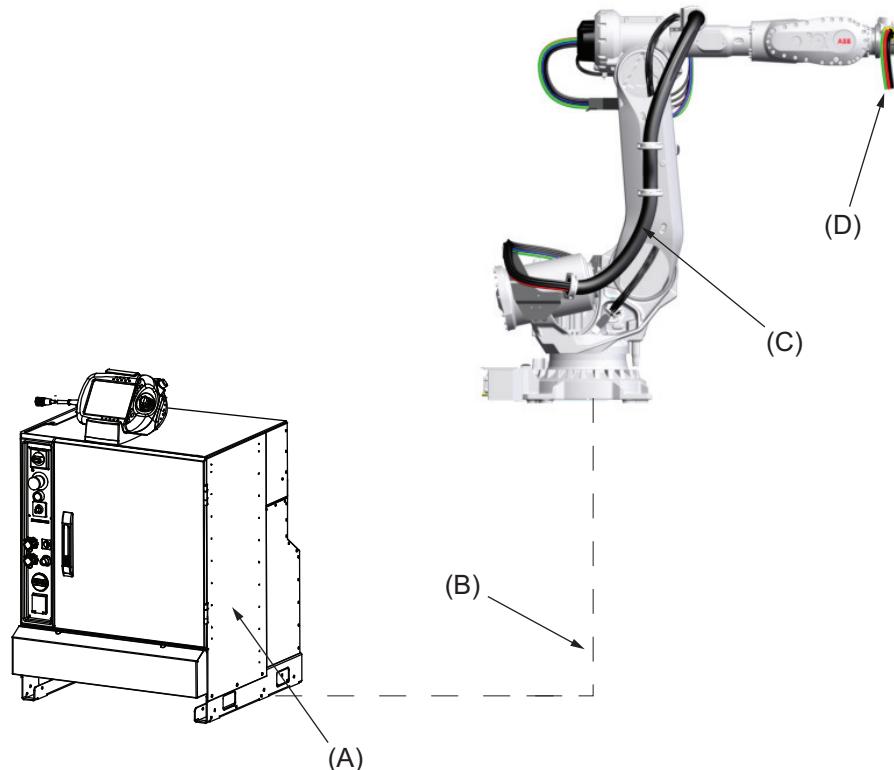
- Option 907-1. First additional drive
- Option 785-5. Stationary gun
- Option 786-1. Connection to first drive (other lengths available)
- Option 635-6. Spot 6

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 Cabinet IRC5 (including 7th axis drive), Se |
| B | DressPack, Floor |
| C | DressPack, Lower arm |
| D | DressPack, Upper arm |

Available configurations with linked option numbers are described below. To achieve the specific servo motor connections within the DressPack for Type Se option 785-1 Robot gun must also be chosen. See [Robot gun on page 103](#) for details.

Continues on next page

2 DressPack

2.4.1 Introduction

Continued

Option description

| Option | Type | Description |
|--------|--------------------------------|--|
| 16-1 | Connection to cabinet | Floor cables and connections inside the I/O section for the DressPack are chosen. The length and configuration of the floor harness is specified under the options below. Option 94-X for parallel communication Option 90-X for parallel communication and field bus communication with Can/DeviceNet Option 92-X for parallel communication and field bus communication with Profibus |
| 455-1 | Parallel communication | Offers the signal cables needed for parallel communication in lower and upper arm DressPack. To be combined with option 94-X. |
| 455-4 | Parallel and Bus communication | Offers the signal cables needed for the combination of parallel and bus communication in combination in lower and upper arm DressPack. To be combined with option 90-X or 92-X. |
| 455-8 | Parallel and Ethernet | Offers the signal cables needed for the Ethernet communication in combination in lower and upper arm DressPack. To be combined with option 859-X. Requires selection of option 94-X. |

| | | | |
|---|---|--|-------------------------------|
| Application Interface connected to Option 16-1, Cabinet | Option 455-1, Parallel communication | Option 94-X Cable length, Parallel communication | Option 778-2, Spot Welding |
| | Option 455-4, Parallel and Bus communication | Option 90-X Option 92-X Cable length, Parallel and Bus communication | |
| | Option 455-8, Parallel and Ethernet communication | Option 859-X Cable length, Ethernet communication | |

DressPack

| | Lower arm | Upper arm |
|------------------------------|--|---|
| Option 778-2 Spot Welding | Option 798-3, Base to axis 3 External routing | Option 780-4, Axis 3 to 6 Internal routing |

2.4.2 Configuration result for Type Se

General

Depending on the choice of options above (combined with option 785-1 Robot gun) the DressPack will have different content. The choice of routing will not affect the content. See tables for signal content below.

DressPack Type Se. Parallel communication

- Option 16-1 with Connection to cabinet
- (Option 94-X to specify cable length)
- Option 455-1. Parallel communication
- Option 778-2. Spot Welding
- Option 798-3. External routing, DressPack Lower arm

and:

- Option 780-4 (and Option 798-3). Internal routing, DressPack Upper arm

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

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

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

ⁱⁱ For LeanID upper arm 25 mm², only upper arm, 135 A rms

Continues on next page

2 DressPack

2.4.2 Configuration result for Type Se

Continued

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

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

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

ⁱⁱ For LeanID upper arm 25 mm², only upper arm, 135 A rms

Continues on next page

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

- Option 16-1 with Connection to cabinet
- (Option 90-X to specify cable length)
- Option 455-4. Parallel and bus communication
- Option 778-2. Spot Welding
- Option 798-3. External routing, DressPack Lower arm

and:

- Option 780-4 (and option 798-3). Internal routing, DressPack Upper arm

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 |
|--|-------------------------|---|-------------------------------------|---|
| Customer Power (CP) | | | | |
| Utility Power | 2+2 | 2+2 | 0.75 mm ² | 250 VAC, 5 A rms |
| Protective earth | | 1 | 0.75 mm ² | 250 VAC |
| Customer signals (CS) | | | | |
| Signals | 13 | 13 | 0.2 mm ² | 50 V DC, 1 A rms |
| Signals separate shielded | 8 | 8 (4x2) | 0.2 mm ² | 50 V DC, 1 A rms |
| Customer bus (CBus) | | | | |
| Bus signals | At bus board | 2 | 0.14 mm ² | Can/DeviceNet spec |
| Bus signals | At bus board | 2 | 0.23 mm ² | 50 V DC, 1 A rms |
| Media | | | | |
| Water/Air (PROC 1-4) | | 4 | 12.5 mm inner diameter ⁱ | Max. air pressure 16 bar/230 PSI Max. water pressure 10 bar/145 PSI. |
| Welding power (WELD) | | | | |
| Lower and Upper arm | | 2 | 35 mm ² ⁱⁱ | 600 VAC, 150 A rms at 20°C (68°F) |
| Protective earth (Lower and Upper arm) | | 1 | | |

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

ⁱⁱ For LeanID upper arm 25 mm², only upper arm, 135 A rms

Continues on next page

2 DressPack

2.4.2 Configuration result for Type Se

Continued

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

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

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

ⁱⁱ For LeanID upper arm 25 mm², only upper arm, 135 A rms

Continues on next page

DressPack Type Se. Parallel and field bus communication, Profibus

- Option 16-1 with Connection to cabinet
- (Option 92-X to specify cable length)
- Option 455-4. Parallel and bus communication
- Option 778-2. Spot Welding
- Option 798-3. External routing, DressPack Lower arm

and:

- Option 780-4 (and option 798-3). Internal routing, DressPack Upper arm

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 |
|--|-------------------------|---|-------------------------------------|---|
| Customer Power (CP) | | | | |
| Utility Power | 2+2 | 2+2 | 0,75 mm ² | 250 VAC, 5 A rms |
| Protective earth | | 1 | 0,75 mm ² | 250 VAC |
| Customer signals (CS) | | | | |
| Signals | 13 | 13 | 0,2 mm ² | 50 V DC, 1 A rms |
| Signals separate shielded | 8 | 8 (4x2) | 0,2 mm ² | 50 V DC, 1 A rms |
| Customer bus (CBus) | | | | |
| Bus signals | At bus board | 4 | 0,14 mm ² | Profibus 12 Mbit/s spec |
| Media | | | | |
| Water/Air (PROC 1-4) | | 4 | 12,5 mm inner diameter ⁱ | Max. air pressure 16 bar/230 PSI Max. water pressure 10 bar/145 PSI. |
| Welding power (WELD) | | | | |
| Lower and Upper arm | | 2 | 35 mm ² ⁱⁱ | 600 VAC, 150 A rms at 20°C (68°F) |
| Protective earth (Lower and Upper arm) | | 1 | | |

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

ⁱⁱ For LeanID upper arm 25 mm², only upper ar, 135 A rms

Continues on next page

2 DressPack

2.4.2 Configuration result for Type Se

Continued

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

| Type Se | At terminals in cabinet | At connection point. Base, ax- is 3 or axis 6 | Cable/part area | Allowed capacity |
|---|----------------------------|---|---|---|
| Customer Power (CP) | | | | |
| Utility Power | 2+2 | 2+2 | 0,75 mm ² | 250 VAC, 5 A rms |
| Protective earth | | 1 | 0,75 mm ² | 250 VAC |
| Customer signals (CS) | | | | |
| Signals | 13 | 13 | 0,2 mm ² | 50 V DC, 1 A rms |
| Signals separate shielded | 8 | 8 (4x2) | 0,2 mm ² | 50 V DC, 1 A rms |
| Customer bus (CBus) | | | | |
| Bus signals | At bus board 6 | 6 (3x2) | 0,14 mm ² | Profibus 12 Mbit/s spec |
| Servo motor signals | | | | |
| Servo motor power | At drive | 3 | 1,5 mm ² | 600 VAC, 12 A rms |
| Protective earth | At drive | 1 | 1,5 mm ² | 600 VAC |
| Signals twisted pair for re- solver | - | 6 | 0,23 mm ² | 50 V DC, 1 A rms |
| Brake | - | 2 | 0,23 mm ² | 50 V DC, 1 A rms |
| Temperature control/PTC | - | 2 | 0,23 mm ² | 50 V DC, 1 A rms |
| Media | | | | |
| Water/Air (PROC 1-4) | | 4 | 12,5 mm inner dia- meter ⁱ | Max. air pressure 16 bar/230 PSI. Max. water pres- sure 10 bar/145 PSI. |
| Welding power (WELD) | | | | |
| Lower and Upper arm | | 2 | 35 mm ² ⁱⁱ | 600 VAC, 150 A rms at 20°C (68°F) |
| Protective earth (Lower and Upper arm) | | 1 | | |

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

ⁱⁱ For LeanID upper arm 25 mm², only upper arm, 135 A rms

Continues on next page

DressPack Type Se. Parallel and field bus communication, Ethernet

- Option 16-1 with Connection to cabinet
- (Option 859-X to specify cable length)
- (Option 94-X to specify cable length)
- Option 455-8. Parallel and Ethernet communication
- Option 778-2. Spot Welding
- Option 798-3. External routing, DressPack Lower arm

and:

- Option 780-4 (and Option 798-3). Internal routing, DressPack Upper arm

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 |
|--|-------------------------|---|--------------------------------------|---|
| Customer Power (CP) | | | | |
| Utility Power | 2+2 | 2+2 | 0.75 mm ² | 250 VAC, 5 A rms |
| Protective earth | | 1 | 0.75 mm ² | 250 VAC |
| Customer signals (CS) | | | | |
| Signals | 13 | 13 | 0.2 mm ² | 50 V DC, 1 A rms |
| Signals separate shielded | 8 | 8 (4x2) | 0.2 mm ² | 50 V DC, 1 A rms |
| Customer bus (Ethernet) | | | | |
| Bus signals | 4 | 4 | 0.4 mm ² | Ethernet CAT 5e, 100 Mbit ⁱ |
| Media | | | | |
| Water/Air (PROC 1-4) | | 4 | 12.5 mm inner diameter ⁱⁱ | Max. air pressure 16 bar/230 PSI Max. water pressure 10 bar/145 PSI. |
| Welding power (WELD) | | | | |
| Lower and Upper arm | | 2 | 35 mm ² ⁱⁱⁱ | 600 VAC, |
| Protective earth (Lower and Upper arm) | | 1 | | 150 A rms at 20°C (68°F) |

ⁱ Ethernet with wire colors according to PROFINET standard, M12-connectors.ⁱⁱ For LeanID 2x1/2" + 2x3/8"ⁱⁱⁱ For LeanID upper arm 25 mm², 135 A rms

Continues on next page

2 DressPack

2.4.2 Configuration result for Type Se

Continued

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

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

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

ⁱⁱ For LeanID 2x1/2" + 2x3/8"

ⁱⁱⁱ For LeanID upper arm 25 mm², 135 A rms

Continues on next page

Required options for servo gun, type Se

To enable the spot welding function to run with a servo controlled gun, some additional servo drive options are required. These standard options are described under other chapters and are also mentioned below in this chapter.

- Option 907-1. First additional drive
- Option 864-1. Resolver connection, axis 7
- Option 785-1. Robot Gun
- Option 786-1,-2,-3,-4. Connection to first drive (Cable length to be stated)
- Option 635-6. Spot 6.

Also option 630-1, Servo tool change, should be added if servo gun tool change is required.

Continues on next page

2 DressPack

2.4.3 Summary common options for Type Se

Continued

2.4.3 Summary common options for Type Se

General

The following options are the minimum required to form a complete SpotPack Type S/Se:

- Option 16-1. Connection to cabinet, (Cable length and communication type to be stated)
- Option 455-1, 455-4 or 455-8. Parallel, Parallel and Bus communication or EtherNet (Communication type to be stated)
- Option 778-2. Spot Welding
- Option 798-3. External routing, DressPack Lower arm
- Option 780-4 Internal routing, DressPack Upper arm

Servo gun type Se

- Option 907-1. First additional drive
- Option 785-1. Robot Gun
- Option 786-1,-2,-3,-4. Connection to first drive (cable length to be stated)
- Option 635-6. Spot 6

2.5 Connection kits

General

For detailed information on connection location see [Interface descriptions for DressPack on page 116](#)

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



xx1300000223

Continues on next page

2 DressPack

2.5.1 Base - Connector kits

2.5.1 Base - Connector kits

Available options

| | | DressPack options | Resolver conn., axis 7 | Description |
|--------|-----------------------|-------------------|------------------------|-------------|
| Option | Name | 798-3 | 864-1 | |
| 459-1 | CP/CS, Proc 1 on base | X | | |
| 453-1 | FB 7 | | X | |



Note

Ethernet and Servo power connection kits not available.

Option 459-1, CP/CS, Proc 1 on base

R1. CP/CS and Proc 1 on base for option 798-3.

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 ² |
| 10 pcs Female crimp contacts | For 0,5 mm ² |
| 10 pcs Female crimp contacts | For 1,0 mm ² |
| 10 pcs Female crimp contacts | For 2,5 mm ² |
| 12 pcs Female crimp contacts | For 0,14– 0,37 mm ² |
| 45 sockets | For 0,2– 0,56 mm ² |
| Assembly Accessories to complete connector | |
| Assembly instruction | |

Continues on next page

Option 453-1, FB 7**R3. FB 7 on base for option 864-1**

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 Adaptor | 8 pin |
| 8 pcs Pin | for 0,13-0,25 mm ² |
| Assembly Accessories to complete connector | |
| Assembly instruction | |

2 DressPack

2.5.2 Axis 3 - Connector kits

2.5.2 Axis 3 - Connector kits

Available options

| | | DressPack options | Description |
|--------|---|-------------------|-------------|
| Option | Name | 798-3 | |
| 458-1 | CP/CS,CBUS/SP/SS Proc 1 axis 3 CP/CS bus, Proc 1 axis 3 | X | UTOW |

Option 458-1, CP/CS/CBus/SP/SS, Proc 1 axis 3

CP/CS/CBus/SP/SS, Proc 1 axis 3 on tool side for option 780-3 and 780-4.

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, bulkhead | UTOW71626PH05, Shell size 16 |
| 26 pcs Pin | RM18W3K, 0.21-0.93 mm ² |
| CBUS | |
| 1 pcs UTOW Pin connector 10p, bulkhead | UTOW71210PH05 Shell size 12 |
| 10 pcs Pin | RM18W3K, 0.21-0.93 mm ² |
| Ethernet | |
| 1 pcs Socket connector M12 | Harting 2103 88 |
| 4 pcs Socket | Harting 61 03 0, 0.13-0.33 mm ² |
| SP (Servo Power) | |
| 1 pcs Bulkhead contact M23 | |
| 4 pcs Crimp pin 1 mm | AWG 24-17 |
| 4 pcs Crimp pin 2 mm | AWG 18-14 |
| SS (Servo Signal) | |
| 1 pcs Bulkhead contact M23 | |
| 17 pcs Pin | AWG 28-20 |
| Assembly Accessories to complete connector | |
| Assembly instruction | |

2.5.3 Axis 6 - Connector kits

Available options

| | | | | Description |
|--------|--------------------------------|-----------|---------------|-------------------------|
| Option | Name | 780-3(MH) | 780-4(LeanID) | |
| 543-1 | CP/CS/CBus/SP/SS Proc 1 axis 6 | X | X | UTOW |
| 452-1 | Weld Proc 1-4 axis 6 | | X | MC, Separate conductors |

Option 543-1, CP/CS/CBus/SP/SS, Proc 1 axis 6

CP/CS/CBus/SP/SS, Proc 1 axis 6 on tool side for option 780-3 and 780-4.

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

This must be assembled by the customer.

The kit contains:

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

| CP/CS | |
|--|--|
| 1 pcs UTOW Pin connector 26p, bulkhead | UTOW71626PH05, Shell size 16 |
| 26 pcs Pin | RM81W3K, 0.21-0.93 mm ² |
| CBUS | |
| 1 pcs UTOW Pin connector 10p, bulkhead | UTOW71210PH05 Shell size 12 |
| 10 pcs Pin | RM18W3K, 0.21-0.93 mm ² |
| Ethernet | |
| 1 pcs Socket connector M12 | Harting 2103 88 |
| 4 pcs Socket | Harting 61 03 0, 0.13-0.33 mm ² |
| SP (Servo Power) | |
| 1 pcs Bulkhead contact M23 | |
| 4 pcs Crimp pin 1 mm | AWG 24-17 |
| 4 pcs Crimp pin 2 mm | AWG 18-14 |
| SS (Servo Signal) | |
| 1 pcs Bulkhead contact M23 | |
| 17 pcs Pin | AWG 28-20 |
| Assembly Accessories to complete connector | |
| Assembly instruction | |

Continues on next page

2 DressPack

2.5.3 Axis 6 - Connector kits

Continued

Option 452-1, Weld, Proc 1-4 axis 6

Weld and Proc 1-4 axis 6 on manipulator side for option 780-4

The process cable package from axis 6 ends with free end for media and for weld power cable. The option 452-1 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 ² |
| 1 pc Cable gland | Diameter 24-28 mm |
| 1 pc End housing | 0,21-0,93 mm ² |
| 1 pcs Reducing coupling | PG36/PG29 |
| Assembly Accessories to complete connector | |
| Assembly instruction | |

3 Specification of variants and options

3.1 Introduction to variants and options

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 Type | Handling capacity (kg) | Reach (m) |
|---------|----------|------------------------|-----------|
| 435-111 | 6700 | 235 | 2.65 |
| 435-112 | 6700 | 205 | 2.80 |
| 435-113 | 6700 | 175 | 3.05 |
| 435-114 | 6700 | 150 | 3.20 |
| 435-115 | 6700 | 200 | 2.60 |
| 435-116 | 6700 | 155 | 2.85 |
| 435-126 | 6700 | 300 | 2.70 |
| 435-127 | 6700 | 245 | 3.00 |
| 435-138 | 6700Inv | 300 | 2.60 |
| 435-139 | 6700Inv | 245 | 2.90 |

Manipulator color

| Option | Description | Note |
|-------------|-------------------------------|----------------|
| 209-1 | ABB Orange standard | |
| 209-2 | ABB White standard | |
| 209-202 | ABB Graphite White standard | Standard color |
| 209-4 --192 | Colors according to RAL-codes | |



Note

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

Protection types

| Option | Protection type | Note |
|--------|-----------------|---|
| 287-4 | Standard | IP67 |
| 287-3 | Foundry Plus 2 | See Protection type Foundry Plus 2 on page 11 for a complete description of protection type Foundry Plus 2. |

Continues on next page

Warranty

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

**Note**

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

| Option | Type | Description |
|--------|-------------------------------|---|
| 438-1 | Standard warranty | Standard warranty is 12 months from <i>Customer Delivery Date</i> or latest 18 months after <i>Factory Shipment Date</i> , whichever occurs first. Warranty terms and conditions apply. |
| 438-2 | Standard warranty + 12 months | Standard warranty extended with 12 months from end date of the standard warranty. Warranty terms and conditions apply. Contact Customer Service in case of other requirements. |
| 438-4 | Standard warranty + 18 months | Standard warranty extended with 18 months from end date of the standard warranty. Warranty terms and conditions apply. Contact Customer Service in case of other requirements. |
| 438-5 | Standard warranty + 24 months | Standard warranty extended with 24 months from end date of the standard warranty. Warranty terms and conditions apply. Contact Customer Service in case of other requirements. |
| 438-6 | Standard warranty + 6 months | Standard warranty extended with 6 months from end date of the standard warranty. Warranty terms and conditions apply. |
| 438-7 | Standard warranty + 30 months | Standard warranty extended with 30 months from end date of the standard warranty. Warranty terms and conditions apply. |
| 438-8 | Stock warranty | Maximum 6 months postponed start of standard warranty, starting from factory shipment date. Note that no claims will be accepted for warranties that occurred before the end of stock warranty. Standard warranty commences automatically after 6 months from <i>Factory Shipment Date</i> or from activation date of standard warranty in WebConfig. |
| | | <div data-bbox="822 1754 882 1817" data-label="Image"> </div> <div data-bbox="906 1774 971 1805" data-label="Section-Header">Note</div> <p>Special conditions are applicable, see <i>Robotics Warranty Directives</i>.</p> |

Continues on next page

3 Specification of variants and options

3.2 Manipulator

Continued

Warranty for DressPack



Note

Option 780-3 upper arm DressPack HM3 is not covered by warranty.



Note

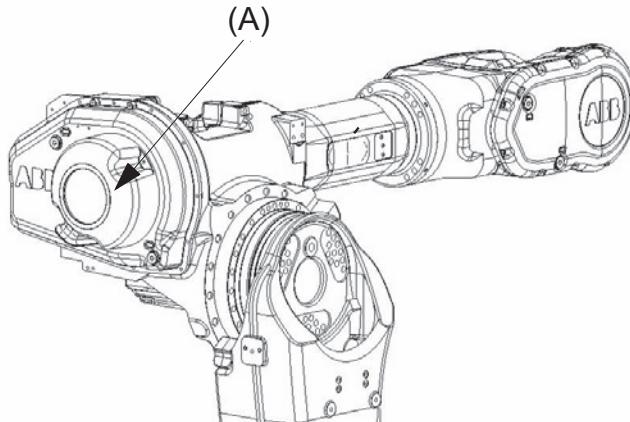
Option 780-4 DressPack LeanID is covered by the warranty.

Foundry Plus Cable Guard

The manipulator cables are equipped with an additional protection of aluminized leather against e.g. aluminium spits and flashes and chips from machining. Process cable for material handling from base to axis 3, option 798-3 has the same protection.

| Option | Type | Description |
|--------|---------------------|--|
| 908-1 | Foundry Cable Guard | For extra protection of cables. Requires option 287-3 Foundry Plus. |

Upper arm cover



xx1400002039

| Pos | Description |
|-----|--------------|
| A | Option 430-1 |

Fork lift device

| Option | Type | Description |
|--------|---|--|
| 159-1 | Fork lift device IRB 6700 ⁱ | Lifting device on the IRB 6700 floor standing manipulator for fork-lift handling. Note! When Cooling Fan for axis 1 motor unit is used, this must be disassembled in order to use fork lift device. |
| 159-2 | Fork lift device IRB 6700Inv ⁱ | For IRB 6700Inv hoses and adapter are not supplied. These have to be arranged by the customer. |

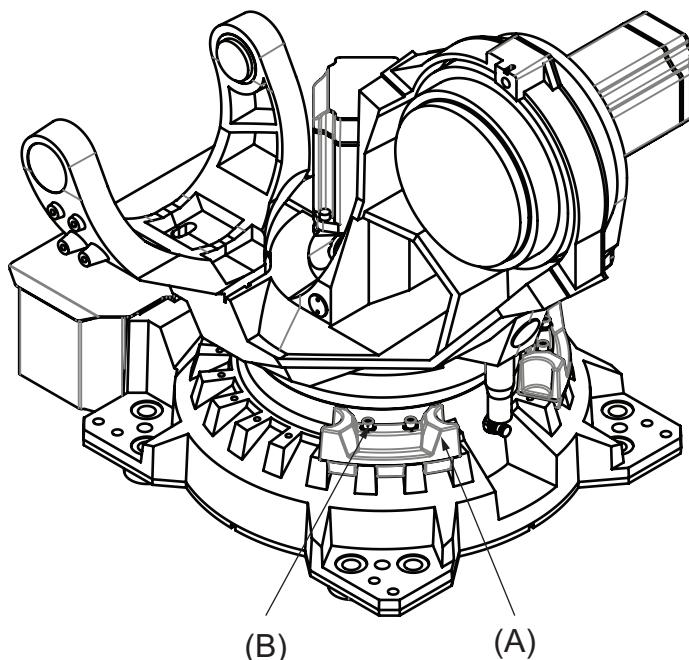
ⁱ Its recommended to remove the fork lift devices after use

Continues on next page

Working range limitation

To increase the safety of the robot, the working range of axis 1 can be restricted by extra mechanical stops.

| Option | Description |
|--------|--|
| 29-1 | Two stops which allow the working range to be restricted in increments of 15°. |



xx1400002035

| Pos | Description |
|-----|-------------------------------|
| A | Two mechanical stops |
| B | Bolt tightening torque: 60 Nm |

Extended working range

| Option | Type | Description |
|--------|-----------------|--|
| 561-1 | Axis 1 to ±220° | <p>The option extends the working range on axis 1 from ±170° to ±220°.</p> <p>When the option is used, the mechanical stop can after a risk-assessment be removed.</p> <p>Requires options SafeMove or EPS (Electronic Position Switches).</p> |

This option is not available for IRB 6700Inv.

Continues on next page

3 Specification of variants and options

3.2 Manipulator

Continued



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.

3.3 Equipment

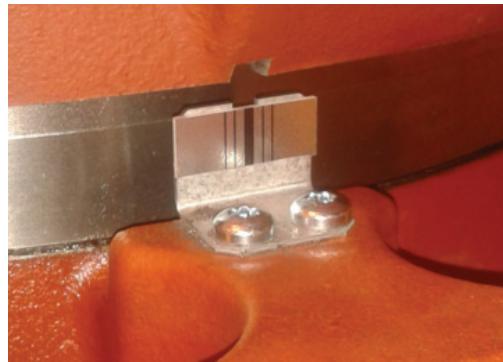
General

| Option | Type | Description |
|--------|-------------------------------------|--|
| 213-1 | Safety lamp | A safety lamp with an orange fixed light can be mounted on the manipulator. The lamp is active in MOTORS ON mode. The safety lamp is required on a UL/UR approved robot. |
| 37-1 | Base plate | Can also be used for IRB 7600. See Installation on page 22 , for dimension drawing. ⁱ |
| 87-1 | Cooling fan for axis 1 motor (IP54) | For in use recommendations see Cooling fan for axis 1 motor on page 100 . Not for protection Foundry Plus. Not together with track motion. |
| 430-1 | Upper arm covers | See Figure in Upper arm cover on page 154 . Included in protection Foundry. |
| 804-1 | Labels for synchronization markings | For a more accurate marking of the synchronization position of the robot. Assembly instructions are included. See Figure for Synchronize labels, Axis 1 - 6. |

ⁱ Can not be used for IRB 6700Inv.

Synchronization labels

The option contains labels for each axis. Below is an example of the synchronization labels.



xx1300001127

Electronic Position Switches (EPS)

The mechanical position switches indicating the position of the three main axes are replaced with electronic position switches for up to 7 axes, for increased flexibility and robustness. For more detailed information, see *Product specification - Controller IRC5 and Application manual - Electronic Position Switches*.

Resolver connection, axis 7

| Option | Description | Note |
|--------|-------------|--|
| 864-1 | On base | Used together with first additional drive, option 907-1. |

Continues on next page

3 Specification of variants and options

3.3 Equipment

Continued

Standard calibration method

| Option | Type | Description |
|--------|----------------------|--|
| 1999-1 | Axis calibration | Preferred standard calibration method. Robust, high performance axis calibration using only mechanical calibration stops and software. |
| 1999-2 | Calibration Pendulum | Previous standard calibration method only to be used in special cases if customers would like to harmonize calibration with already installed base. ⁱ |

ⁱ This option is not available for IRB 6700Inv



Note

The calibration methods are not interchangeable.

3.4 Floor cables

Manipulator cable length

| Option | Lengths |
|---------------|----------------|
| 210-2 | 7 m |
| 210-3 | 15 m |
| 210-4 | 22 m |
| 210-5 | 30 m |

3 Specification of variants and options

3.5 Process DressPack

3.5 Process DressPack

Connection to

| Option | Connection to | Description |
|---------------|----------------------|--|
| 16-1 | Cabinet | The signals CP/CS are connected to 12-pole screw terminals, Phoenix MSTB 2.5/12-ST-5.08, in the controller. The cable between R1.CP/CS and the controller is supplied. |

Communication

| Option | Type | Description |
|---------------|-------------------------------------|--|
| 455-1 | Parallel communication | Includes customer power CP, customer signals CS. |
| 455-4 | Parallel and bus communication | Includes CP, customer signals and CAN/DeviceNet or Profibus for process cable package. |
| 455-8 | Parallel and Ethernet communication | Includes CP, customer signals and PROFINET or Ethernet/IP for process cable package |

3.6 DressPack floor cables

Connection to Parallel/CAN DeviceNet/Profibus/Ethernet

Following information specifies the cable length for Parallel, CANDeviceNet/Profibus/Ethernet for connection to cabinet.

| Option | Lengths | Description |
|---------------|----------------|--------------------|
| 90-2/92-2 | 7 m | |
| 90-3/92-3 | 15 m | |
| 90-4/92-4 | 22 m | |
| 90-5/92-5 | 30 m | |

3 Specification of variants and options

3.7 DressPack Lower and Upper arm

3.7 DressPack Lower and Upper arm

DressPack process configuration



Note

For more information about the process cable packages, see [DressPack on page 114](#)

| Option | Description | Note |
|--------|-------------------|---|
| 778-1 | Material Handling | Includes signals and one air hose. |
| 778-2 | Spot Welding | Includes signals, weld power cable, one air hose and three media hoses. |

DressPack lower arm

| Option | Description | Note |
|--------|-----------------------------|--------------------------------|
| 798-3 | Routing from base to axis 3 | Material Handling/Spot Welding |

DressPack upper arm

| Option | Description | Note |
|--------|--|---|
| 780-3 | External routing from axis 3 to axis 6 | Requires option 778-1 and option 798-3 ⁱ . |
| 780-4 | Internal routing from axis 3 to axis 6 | Requires option 798-3. ⁱ |

ⁱ Upper arm cabling is not available for IRB 6700Inv together with option Foundry plus 2.



Note

If option 780-4, LeanID, is selected the payload will decrease, for detailed information see [Load diagrams on page 38](#)

3.8 Connection kits

General

The connectors fit to the connectors at the manipulator base, axis 3 and 6 respectively.

Content

The kit consists of connectors, pins and sockets. For technical description, see [Connection kits on page 145](#).

| Option | Type | Description |
|--------|-------------------------|---|
| 459-1 | R1.CP/CS, PROC1 | For the Customer Power/Customer Signal connector and one Process connector on the manipulator base. Sockets for bus communication are included. |
| 453-1 | R3.FB7 | For the 7-axis connector on the manipulator base. |
| 458-1 | R2.CP/CS, PROC1 | For the Customer Power/Customer Signal connector and one Process connector at axis 3. Pins for bus communication are included. |
| 452-1 | Weld, PROC1-4 axis 6 | Weld connector and four Process connectors at axis 6, the manipulator side. |
| 543-1 | CP/CS/BUS, PROC1 axis 6 | Connector for customer power/customer signal/customer bus at axis 6 tool side. |

3 Specification of variants and options

3.9 Servo Gun

3.9 Servo Gun

Content

For technical description see [Servo gun on page 101](#).

| Option | Lengths |
|--------|------------------------------|
| 785-1 | For robot handled Servo Gun. |
| 785-2 | For Stationary Servo Gun. |

Connection to first drive

Following information specifies the cable length for Connection to first drive. For further information see [Servo gun on page 101](#).

| Option | Lengths |
|--------|---------|
| 786-1 | 7 m |
| 786-2 | 15 m |
| 786-3 | 22 m |
| 786-4 | 30 m |

3.10 User documentation

User documentation

The user documentation describes the robot in detail, including service and safety instructions.



Tip

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

This page is intentionally left blank

4 Accessories

4.1 Introduction to accessories

General

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

Basic software and software options for robot and PC

For more information, see *Product specification - Controller IRC5* and *Product specification - Controller software IRC5*.

Robot peripherals

- Track Motion
- Motor Units

This page is intentionally left blank

Index

A

Absolute Accuracy, 35
Absolute Accuracy, calibration, 33
accessories, 167

C

calibration
 Absolute Accuracy type, 31
 standard type, 31
calibration, Absolute Accuracy, 33
Calibration Pendulum, 34
CalibWare, 31
category 0 stop, 99
category 1 stop, 99
compensation parameters, 35

D

documentation, 165
DressPack warranty, 154

E

Electronic Position Switches, 157
EPS, 157
equipment, on robot, 73
extended working range, 156

F

fine calibration, 34
fitting equipment to robot, 73

H

holes for equipment, 73

I

instructions, 165

M

manuals, 165

O

option
 Extended working range, 156
options, 151

P

product standards, 20

S

safety standards, 20
service instructions, 165
standards, 20
 ANSI, 20
 CAN, 20
 EN IEC, 20
 EN ISO, 20

standard warranty, 153

stock warranty, 153

stopping distances, 99

stopping times, 99

U

user documentation, 165

V

variants, 151

W

warranty, 153
warranty for DressPack, 154



ABB AB
Robotics & Discrete Automation
S-721 68 VÄSTERÅS, Sweden
Telephone +46 (0) 21 344 400

ABB AS
Robotics & Discrete Automation
Nordlysvegen 7, N-4340 BRYNE, Norway
Box 265, N-4349 BRYNE, Norway
Telephone: +47 22 87 2000

ABB Engineering (Shanghai) Ltd.
Robotics & Discrete Automation
No. 4528 Kangxin Highway
PuDong District
SHANGHAI 201319, China
Telephone: +86 21 6105 6666

ABB Inc.
Robotics & Discrete Automation
1250 Brown Road
Auburn Hills, MI 48326
USA
Telephone: +1 248 391 9000

abb.com/robotics