ROBOTICS

Product specification

IRB 6700

Trace back information:
Workspace R19B 6-09 version a1
Checked in 2019-05-29
Skribenta version 5.3.012

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: M

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Overview of this product specification

About this product specification

It describes the performance of the manipulator or a complete family of manipulators in terms of:

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

Usage

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

Users

It is intended for:

- Product managers and product personnel
- Sales and marketing personnel
- Order and customer service personnel
- Robot programmers
- Project leaders
- Design engineers

References

Reference	Document ID
Product specification - Controller IRC5 IRC5 with main computer DSQC1000.	*3HAC047400-001*
Product specification - Controller software IRC5 IRC5 with main computer DSQC1000 and RobotWare 5.6x.	*3HAC050945-001*
Product specification - Controller software IRC5 IRC5 with main computer DSQC1000 and RobotWare 6.	*3HAC050945-001*
Product manual - IRB 6700	*3HAC044266-001*
Product manual - IRB 6700Inv	*3HAC058254-001*
Product specification - Robot user documentation, IRC5 with RobotWare 6	*3HAC052355-001*

Revisions

Revision	Description
-	First release
A	• The variants IRB 6700-200/2.60 and IRB 6700-155/2.85 are added. • Minor corrections/updates

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Continued

Revision	Description
B	• DressPack & SpotPack updated
C	• Text for Foundry Plus updated. • Two variants added, IRB 6700-300/2.70 and IRB 6700-245/3.00. • Minor corrections/update
D	• 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	• Minor corrections/update • Updated standard tool flange drawing • Guide pins for base plate changed to two cylindrical
F	• Information regarding warranty for upper arm dress pack added. • Minor corrections/update • Section *SpotWelding cabinet* updated.
G	• Warranty information for DressPack updated. • Dimensions (measure D), for products -150/3.20 and -205/2.80 in table *Holes for fitting extra equipment* are changed from 400 mm to 500 mm. • Illustration in section *Fastening holes robot base* is updated regarding guide holes. • Illustration regarding centering diameters on tool flange updated.
H	Published in release R17.1. The following updates are done in this revision: • Illustration for *Tool flange, standard* is updated. • Major structural change is made on chapter *Specifications of variants and options*. • IRB 6700Inv is added. • Restriction of load diagram added. • Working range axis 2 and 3 added.
J	Published in release R17.2. The following updates are done in this revision: • 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	Published in release R18.1. The following updates are done in this revision: • Water and air unit updated.
L	Published in release R18.2. The following updates are done in this revision: • Customer signal wire information for Type H/HSe Ethernet updated.
M	Published in release 19B. The following updates are done in this revision: • Minor corrections/updates • Updated information about *Absolute Accuracy*.

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1 Description

1.1 Structure

1.1.1 Introduction

General

The IRB 6700 series is ABB Robotics 7:th 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 Spot Welding, Material Handling and Machine Tending.

Software product range

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

Process options

There are a large number of process options for Spot Welding and Material Handling integrated in the robot. For a complete description of process options for Spot Welding see *DressPack and SpotPack on page 103*.

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 with FlexPendant*.

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 software 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

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1.1.1 Introduction
Continued

Typical applications are spraying insertion and part extraction of die-casting machines, handling in sand casting and gravity casting, etc. (Please refer to Foundry Prime robots for washing applications or other similar applications). Special care must be taken in regard to operational and maintenance requirements for applications in foundry 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 167* for robot versions and other options not selectable together with Foundry Plus 2.

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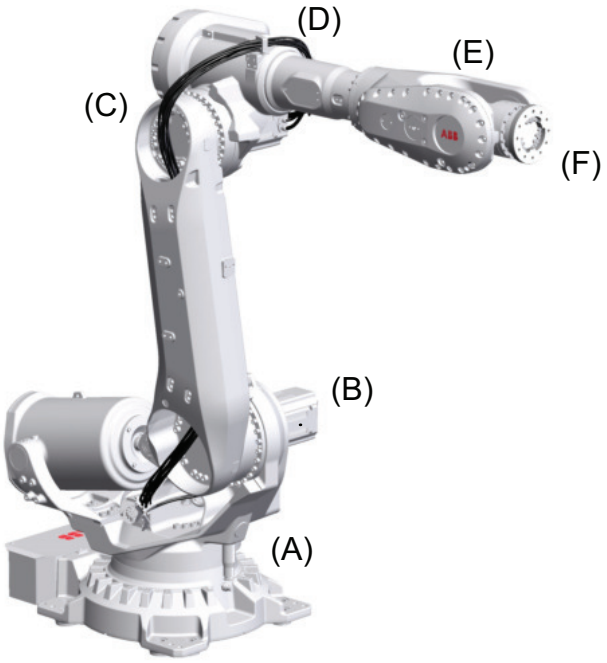
Robot axes



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

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1.1.2 Different robot versions

General

The IRB 6700 is available in ten versions.

Robot types

The following standard robot versions are available.

Robot type	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 35*

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1.1.3 Definition of version designations

IRB 6700 mounting

Handling capacity (kg)/Reach (m)

	Prefix	Description
Mounting	-	IRB 6700: Floor-mounted manipulator IRB 6700Inv: Inverted-mounted manipulator
Handling capacity (kg)	yyy	Indicates the maximum handling capacity (kg)
Reach (m)	x.x	Indicates the maximum reach at wrist center (m)

Manipulator weight

Robot type	Weight
IRB 6700-235/2.65	1250 kg [i]
IRB 6700-205/2.80	1260 kg [i]
IRB 6700-200/2.60	1205 kg [i]
IRB 6700-175/3.05	1270 kg [i]
IRB 6700-155/2.85	1220 kg [i]
IRB 6700-150/3.20	1280 kg [i]
IRB 6700-300/2.70	1525 kg [i]
IRB 6700-245/3.00	1540 kg [i]
IRB 6700Inv-300/2.60	1690 kg [i]
IRB 6700Inv-245/2.90	1705 kg [i]

[i] Weight without DressPack

Other technical data

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

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)	2.7	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

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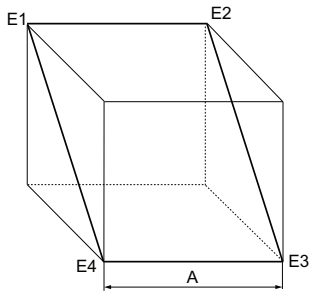
1.1.3 Definition of version designations
Continued



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Pos	Description
A	1,000 mm

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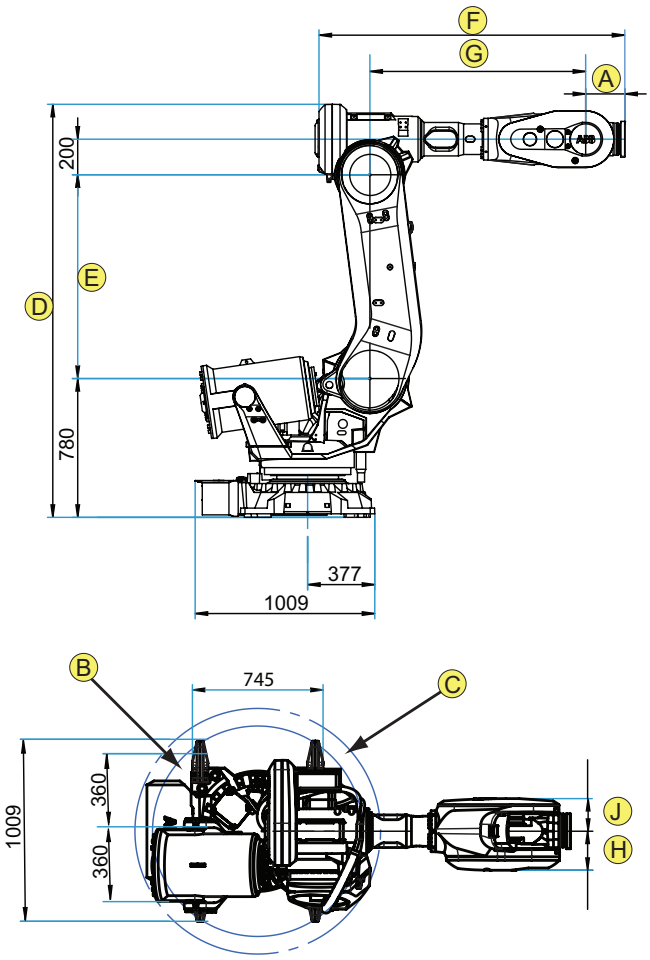
Main dimensions of IRB 6700



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Pos	Description
A	200 mm (all standard variants); except 300/2.70 and 245/3.00 =220 mm 350 mm (all LeanID variants, 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, -205/2.80, -175/3.05, -150/3.20, -200/2.60 and -155/2.85) Radius ax1, back = 700 mm (IRB 6700-300/2.70 and -245/3.00)

Robot variant	D	E	F	G	H	J
IRB 6700 - 235/2.65	2300	1135	1670	1,182.5	209	186
IRB 6700 - 205/2.80	2445	1280	1670	1,182.5	186	209
IRB 6700 - 200/2.60	2276	1125	1623	1,142.5	197.5	193
IRB 6700 - 175/3.05	2300	1135	2080	1,592.5	209	186
IRB 6700 - 150/3.20	2445	1280	2080	1,592.5	209	186
IRB 6700 - 155/2.85	2276	1125	1873	1,392.5	197.5	193

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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 116*

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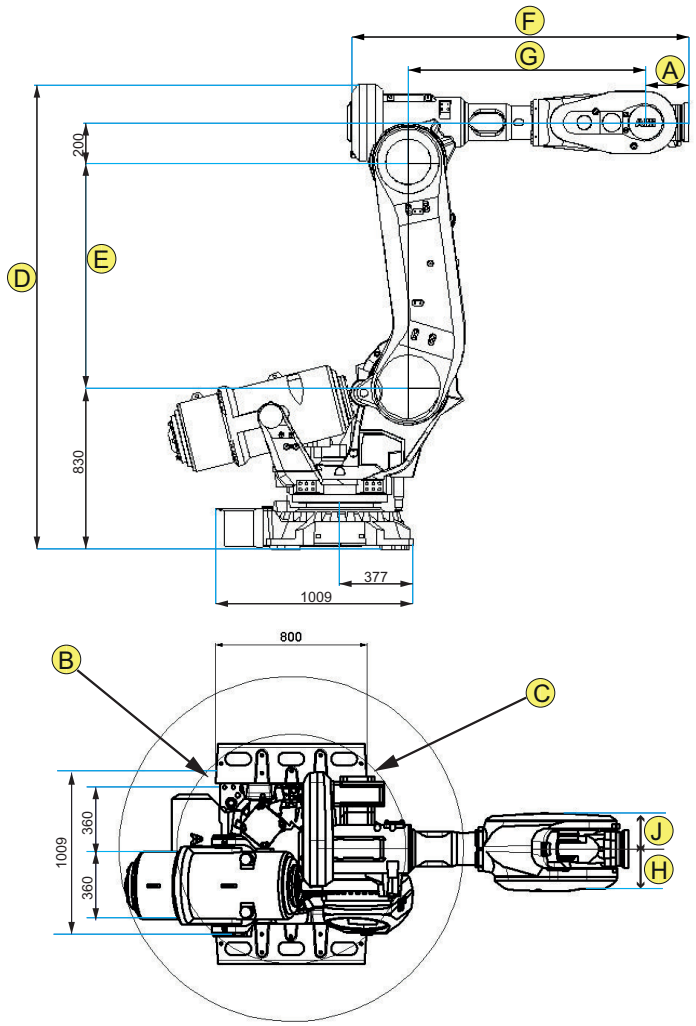
Main dimensions of IRB 6700Inv



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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

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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.

Standards, EN ISO

The product is designed in accordance with the requirements of:

Standard	Description
EN ISO 12100:2010	Safety of machinery - General principles for design - Risk assessment and risk reduction
EN ISO 13849-1:2015	Safety of machinery, safety related parts of control systems - Part 1: General principles for design
EN ISO 13850:2015	Safety of machinery - Emergency stop - Principles for design
EN ISO 10218-1:2011	Robots for industrial environments - Safety requirements -Part 1 Robot
ISO 9787:2013	Robots and robotic devices -- Coordinate systems and motion nomenclatures
ISO 9283:1998	Manipulating industrial robots, performance criteria, and related test methods
EN ISO 14644-1:2015[i]	Classification of air cleanliness
EN ISO 13732-1:2008	Ergonomics of the thermal environment - Part 1
EN 61000-6-4:2007 + A1:2011 IEC 61000-6-4:2006 + A1:2010 (option 129-1)	EMC, Generic emission
EN 61000-6-2:2005 IEC 61000-6-2:2005	EMC, Generic immunity
EN IEC 60974-1:2012[ii]	Arc welding equipment - Part 1: Welding power sources
EN IEC 60974-10:2014[ii]	Arc welding equipment - Part 10: EMC requirements
EN IEC 60204-1:2006	Safety of machinery - Electrical equipment of machines - Part 1 General requirements
IEC 60529:1989 + A2:2013	Degrees of protection provided by enclosures (IP code)

i Only robots with protection Clean Room.
ii Only valid for arc welding robots. Replaces EN IEC 61000-6-4 for arc welding robots.

European standards

Standard	Description
EN 614-1:2006 + A1:2009	Safety of machinery - Ergonomic design principles - Part 1: Terminology and general principles

Continues on next page

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Standard	Description
EN 574:1996 + A1:2008	Safety of machinery - Two-hand control devices - Functional aspects - Principles for design

Other standards

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 434-14	Industrial robots and robot Systems - General safety requirements

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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 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 35*.

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 70*.

Working range limitation

The working range of axes 1 can be limited by mechanical stops as option. See *Working range limitation on page 172*.

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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 *Product specification - Controller IRC5*
For the spot welding cabinet	Standard	+ 5°C (41°F) to + 45°C (113°F)
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.

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1.3.3 Assembling the manipulator

Maximum load

Maximum load in relation to the base coordinate system.

Floor mounted

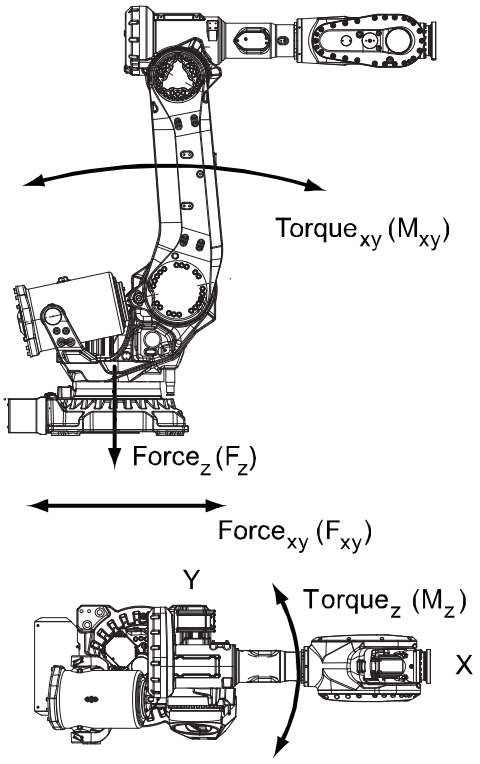
Force	Endurance load (in operation)	Max. load (emergency stop)
Force xy	±7.4 kN[i] / ±8.7 kN[ii]	±19.8 kN[i] / ±21.8 kN[ii]
Force z	14.6 ±4.5 kN[i] / 18.0 ±5.4 kN[ii]	14.6 ±15.7 kN[i] / 18.0 ±17.4 kN[ii]
Torque xy	±21.0 kNm[i] / ±24.9 kNm[ii]	±37.1 kNm[i] / ±45.3 kNm[ii]
Torque z	±5.0 kNm[i] / ±6.5 kNm[ii]	±11.4 kNm[i] / ±15.5 kNm[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	±8.9 kN[i]	±23.7 kN[i]
Force z	-22.1 ±6.6 kN[i]	-22.1 ± 18.1 kN[i]
Torque xy	±22.5 kNm[i]	±45.4 kNm[i]
Torque z	±6.5 kNm[i]	±15.7 kNm[i]

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



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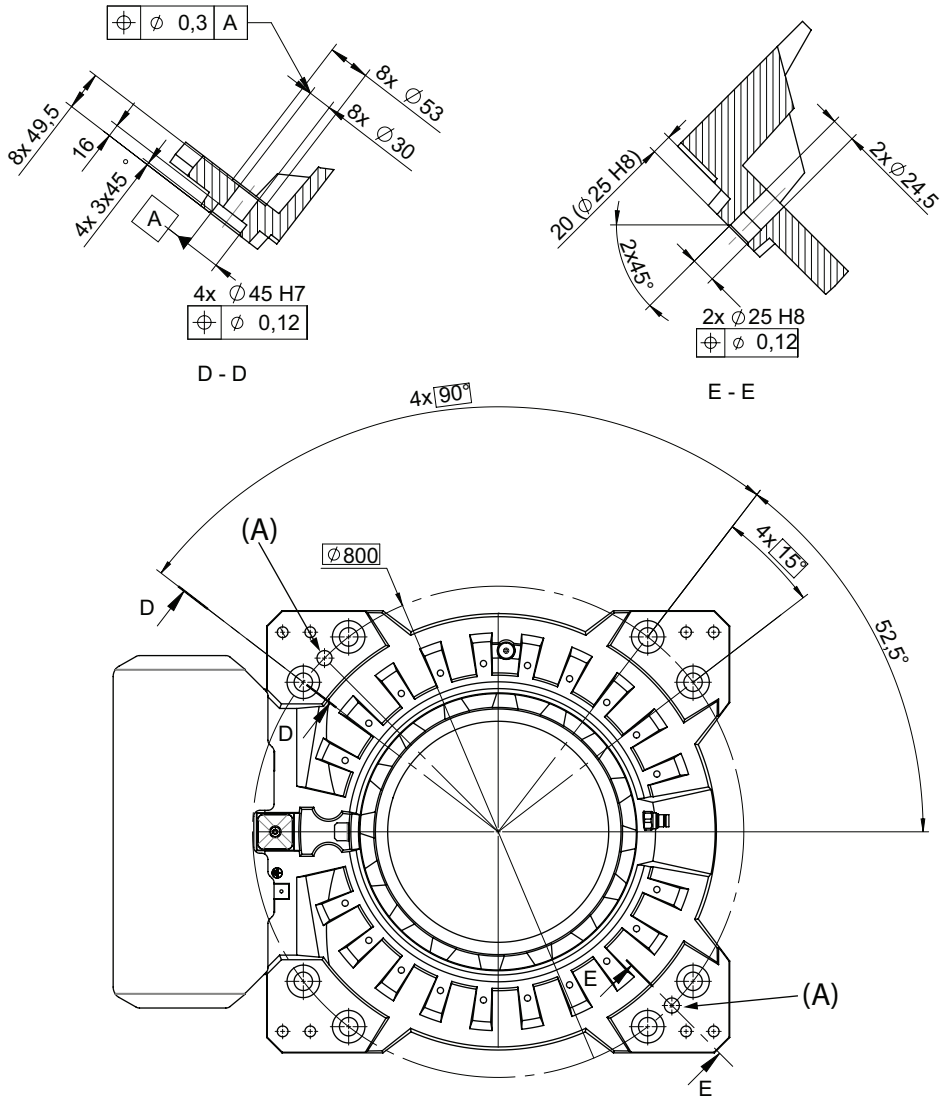
Note regarding M_{xy} and F_{xy}

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

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

Fastening holes robot base - for all variants



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Pos	Description
A	Holes for guide pins (x2)

Note

Holes for guide pins (x2) Rear hole straight slot, see *Guide pins on page 28*.

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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 25*.

AbsAcc performance

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

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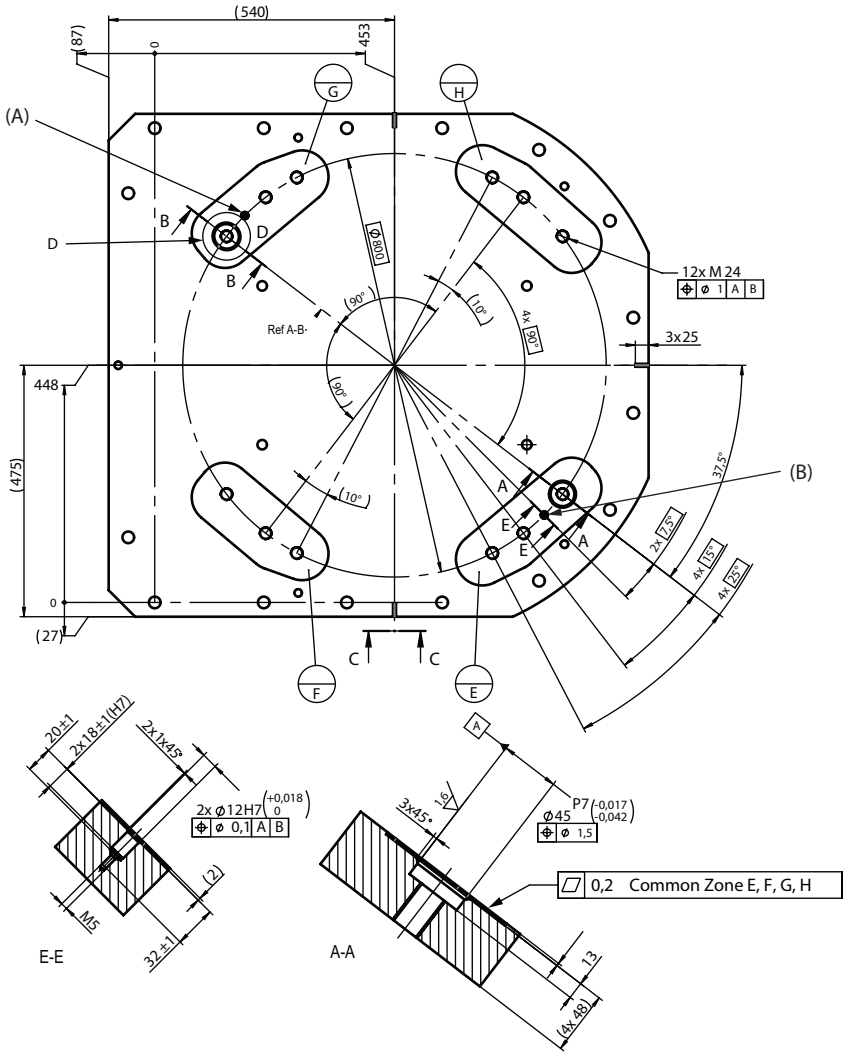
Base plate drawing

Note

IRB 6700Inv is not valid for base plate.

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



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Pos	Description
A, B	Hole for guide pin, cylindrical, see *Guide pins on page 28*
E, F, G, H	Common tolerance zone (accuracy all over the base plate from one contact surface to the other)

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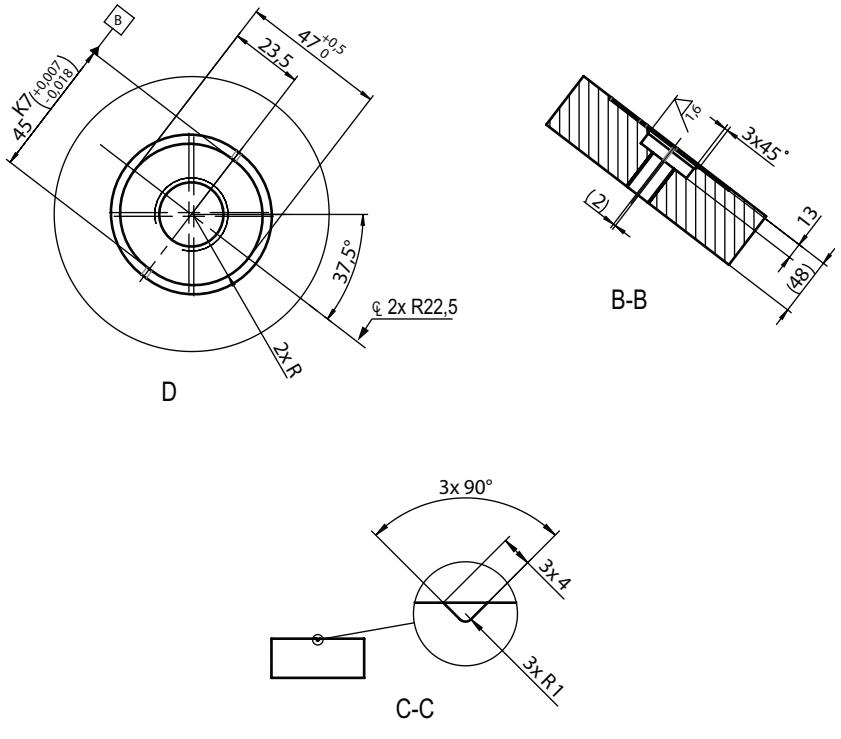
1.3.3 Assembling the manipulator

Continued



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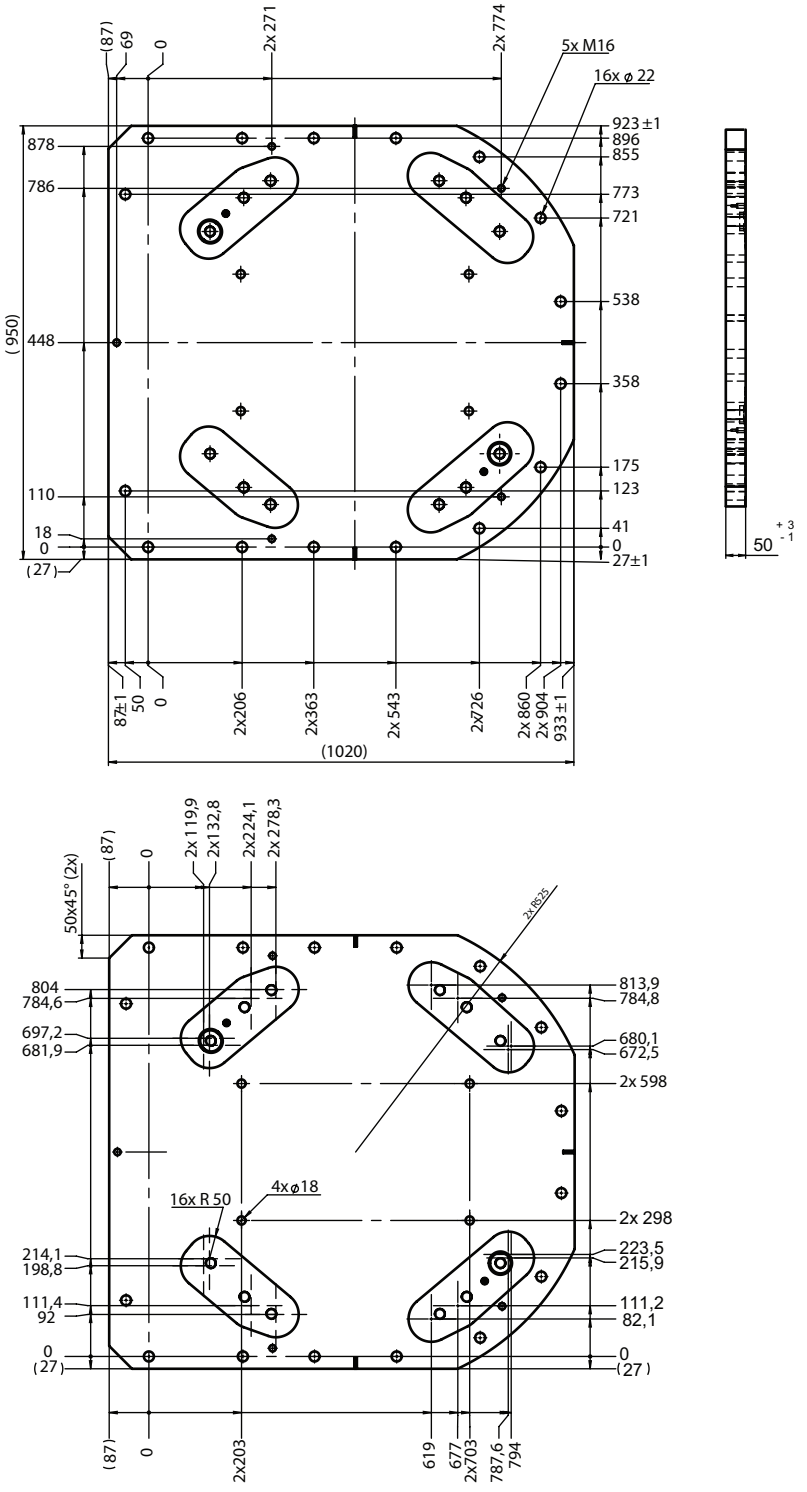

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A	Color: RAL 9005 Thickness: 80-100 µm Weight: 360 kg

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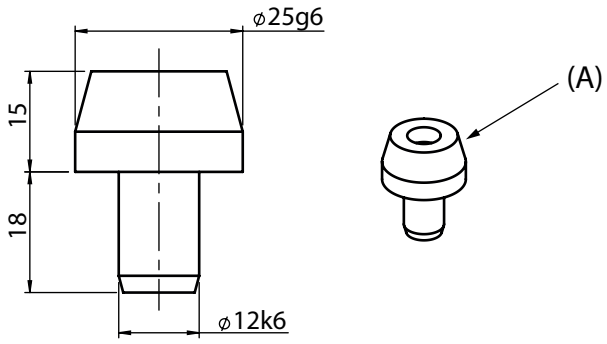
1.3.3 Assembling the manipulator
Continued

Guide pins



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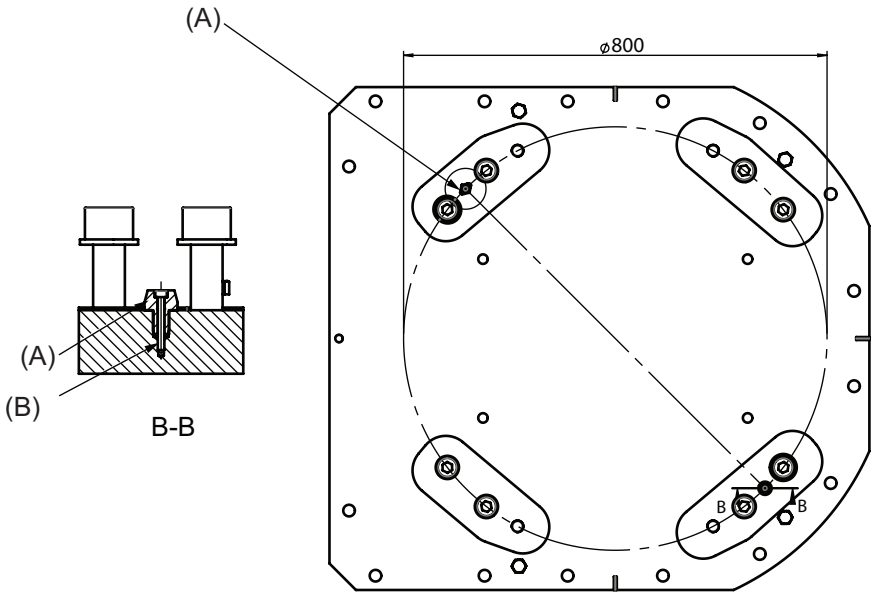
Pos	Description
A	Cylindrical guide pin (x2)

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.

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1.4 Calibration and references

1.4.1 Calibration methods

Overview

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

More information is available in the product manual.

Types of calibration

Type of calibration	Description	Calibration method
Standard calibration	The calibrated robot is positioned at calibration position. Standard calibration data is found on the SMB (serial measurement board) or EIB in the robot. 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.	Axis Calibration or Calibration Pendulum [i]
Absolute accuracy calibration (optional)	Based on standard calibration, and besides positioning the robot at synchronization position, the Absolute accuracy calibration also compensates for: • Mechanical tolerances in the robot structure • Deflection due to load Absolute accuracy calibration focuses on positioning accuracy in the Cartesian coordinate system for the robot. Absolute accuracy calibration data is found on the SMB (serial measurement board) in the robot. 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. A robot calibrated with Absolute accuracy has a sticker next to the identification plate of the robot. To regain 100% Absolute accuracy performance, the robot must be recalibrated for absolute accuracy after repair or maintenance that affects the mechanical structure. xx0400001197	CalibWare

[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.

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1.4.1 Calibration methods
Continued

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, Calibration Pendulum is used as default.

Brief description of calibration methods

Calibration Pendulum method

Calibration Pendulum is a standard calibration method for calibration of all 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 and is the most accurate method for the standard calibration. 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.

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.

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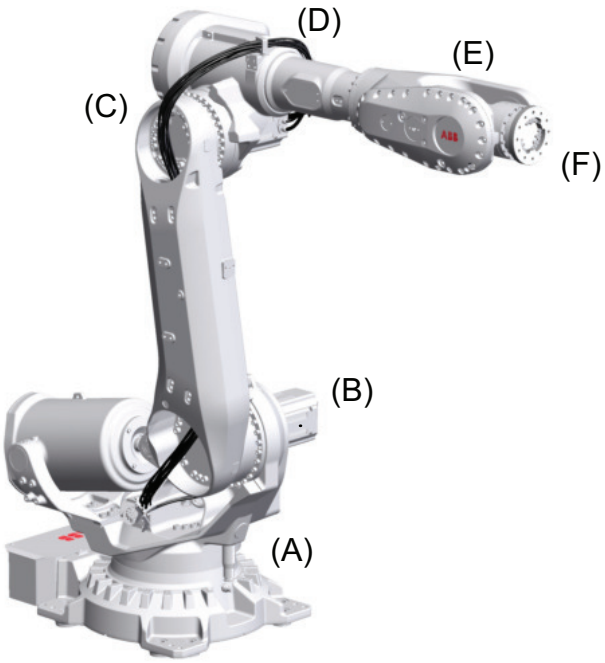
1.4.2 Fine calibration

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*.



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Axes

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

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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.

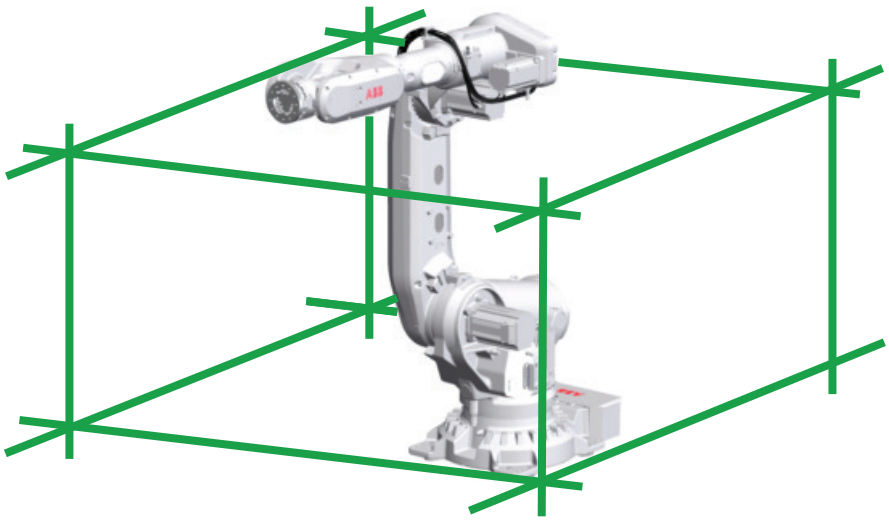
Here are some examples of when this accuracy is important:

- Exchangeability of robots
- Offline programming with non or minimum touch-up
- Online programming with accurate movement and reorientation of tool
- Accurate cell alignment for MultiMove coordinated motion
- Programming with accurate offset movement in relation to eg. vision system or offset programming
- Re-use of programs between applications

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

Note

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



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What is included

Every Absolute Accuracy robot is delivered with:

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

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- a birth certificate representing the Absolute Accuracy measurement protocol for the calibration and verification sequence.

A robot with Absolute Accuracy calibration is marked on the manipulator.

Absolute Accuracy supports both floor mounted and inverted installations. The compensation parameters differ depending on if the robot is floor mounted or inverted.

When is Absolute Accuracy being used

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

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

Absolute Accuracy active

Absolute Accuracy will be active in the following cases:

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

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1.4.3 Absolute Accuracy calibration
Continued

MultiMove

If the main robot in a MultiMove system has the Absolute Accuracy option, it opens up Absolute Accuracy capability for all the robots in the system. However, each robot needs to be calibrated individually.

Note

Note that this is the only RobotWare option that is relevant for an additional robot.

Note

It is possible to mix robots with and without the option Absolute Accuracy arbitrarily in a MultiMove system.

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

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1.5 Load diagrams

1.5.1 Introduction

WARNING

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

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

- motors
- gearboxes
- mechanical structure

WARNING

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

See *Operating manual - IRC5 with FlexPendant*, for detailed information.

WARNING

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

General

The load diagrams include a nominal payload inertia, J_0 of 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 easily control a specific load case, use the calculation program ABB RobotLoad. Contact your local ABB organization for more information.

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

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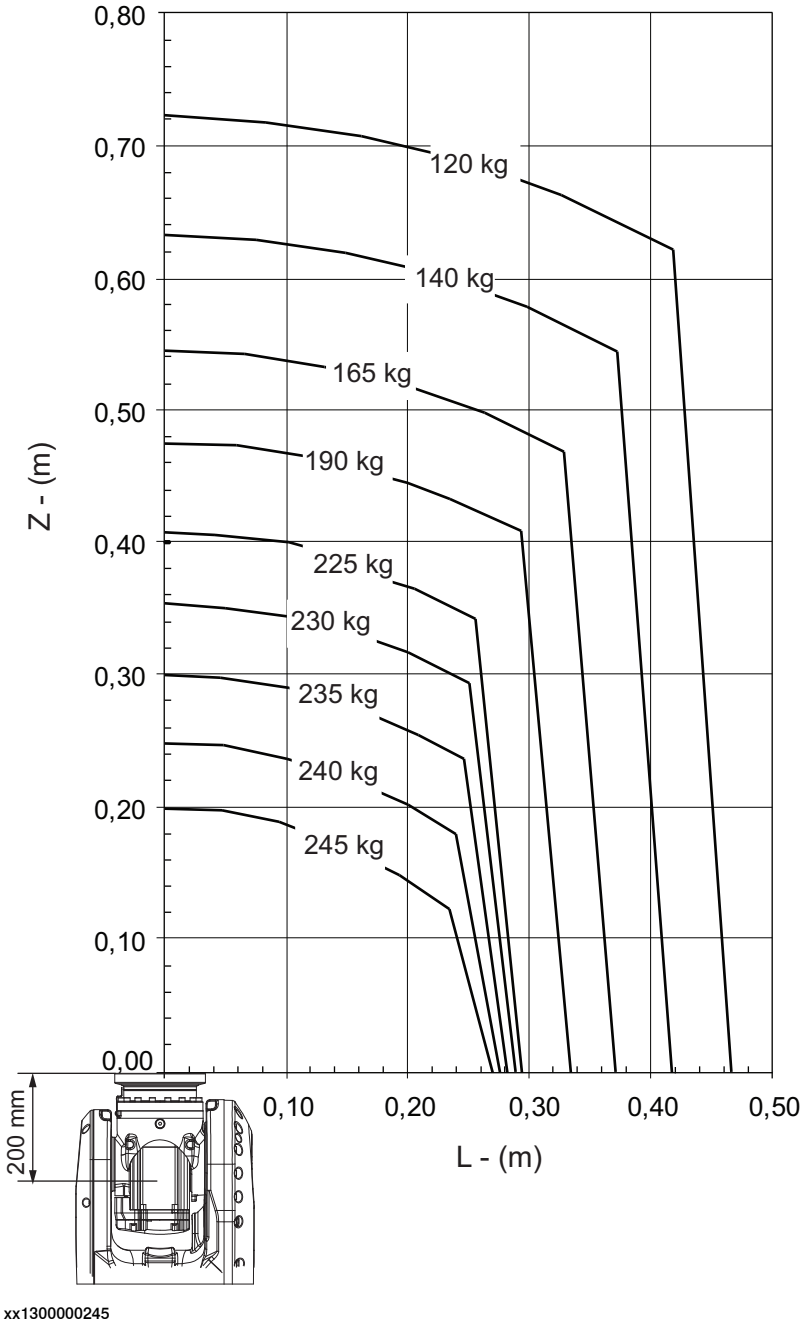
1.5.2 Diagrams

IRB 6700-235/2.65



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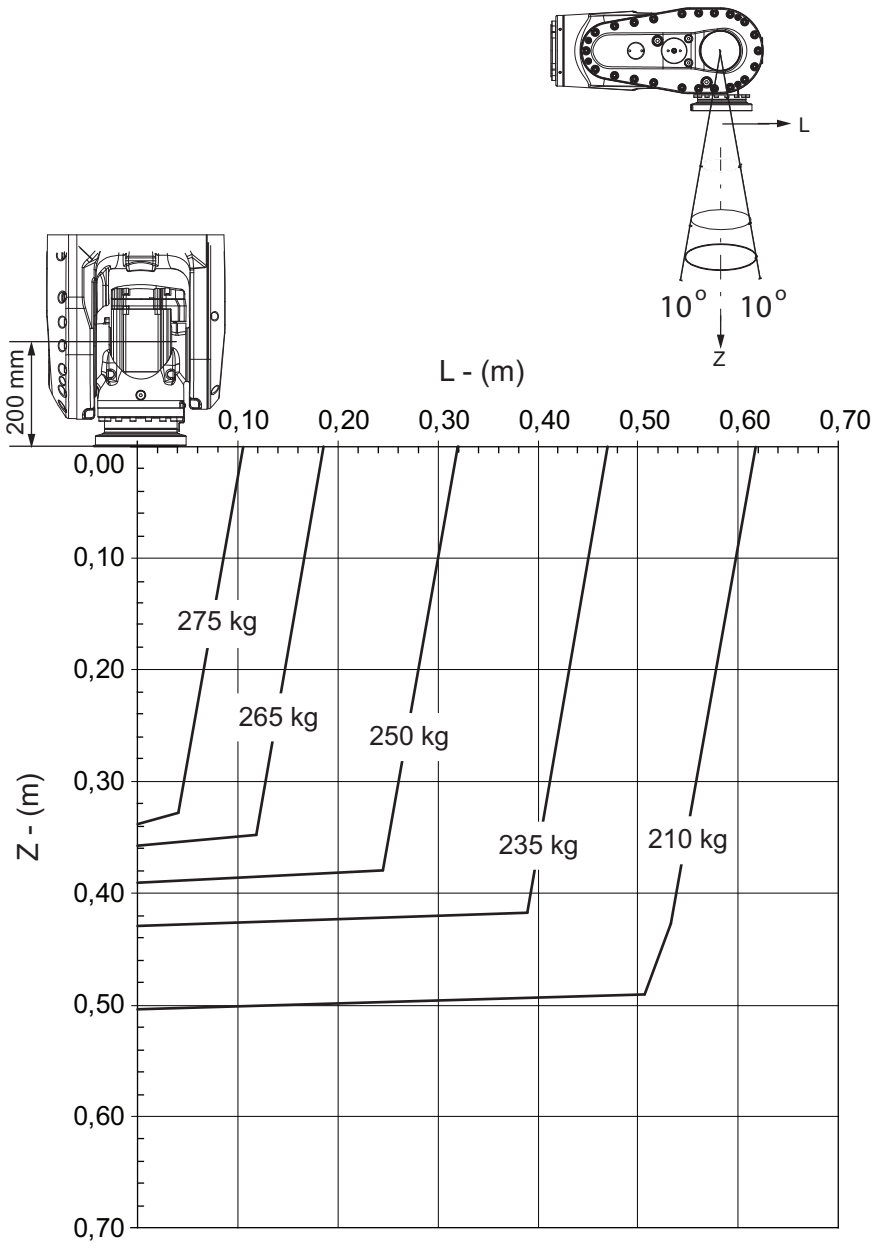
IRB 6700-235/2.65 "Vertical Wrist" (±10°)



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

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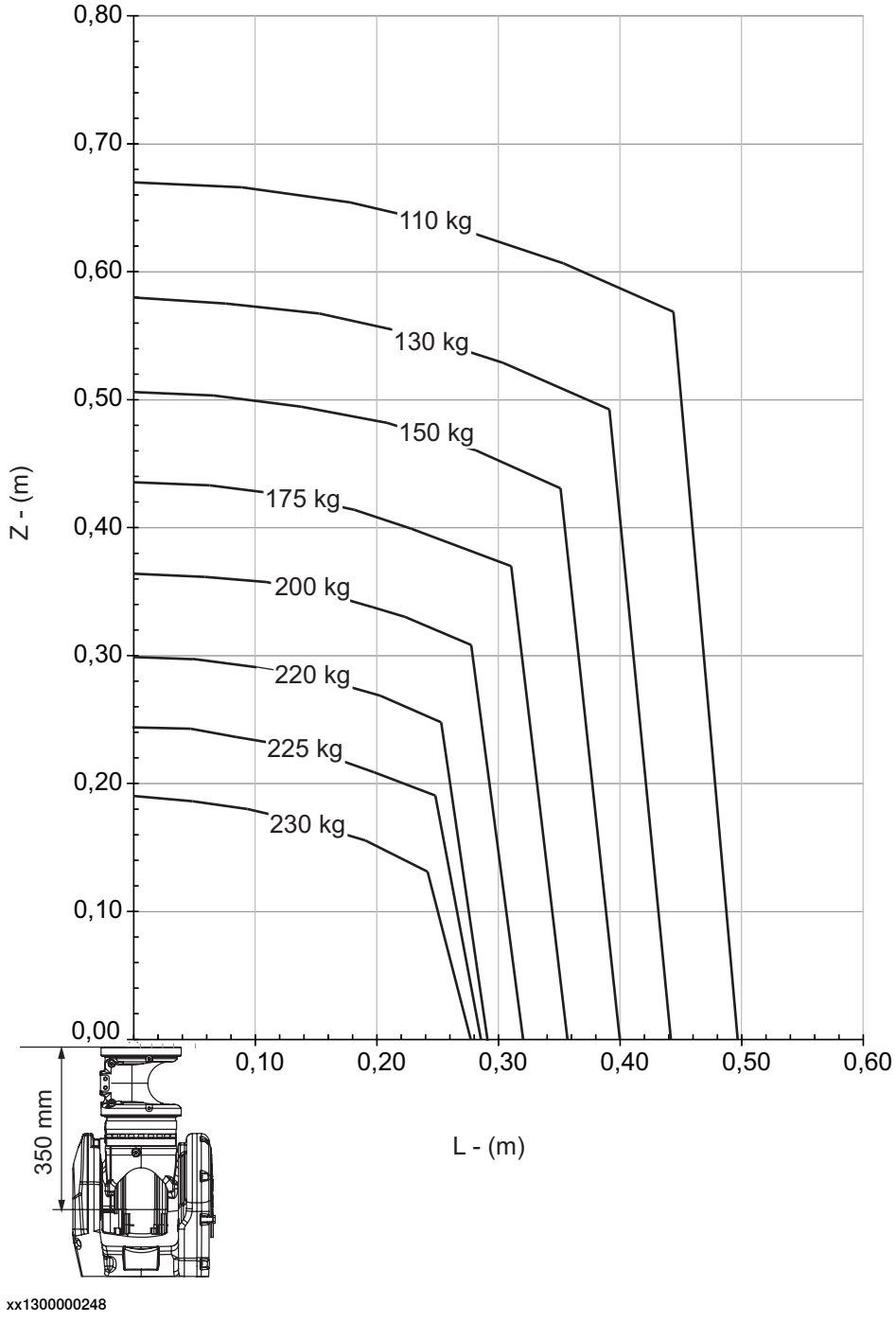
1.5.2 Diagrams
Continued

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



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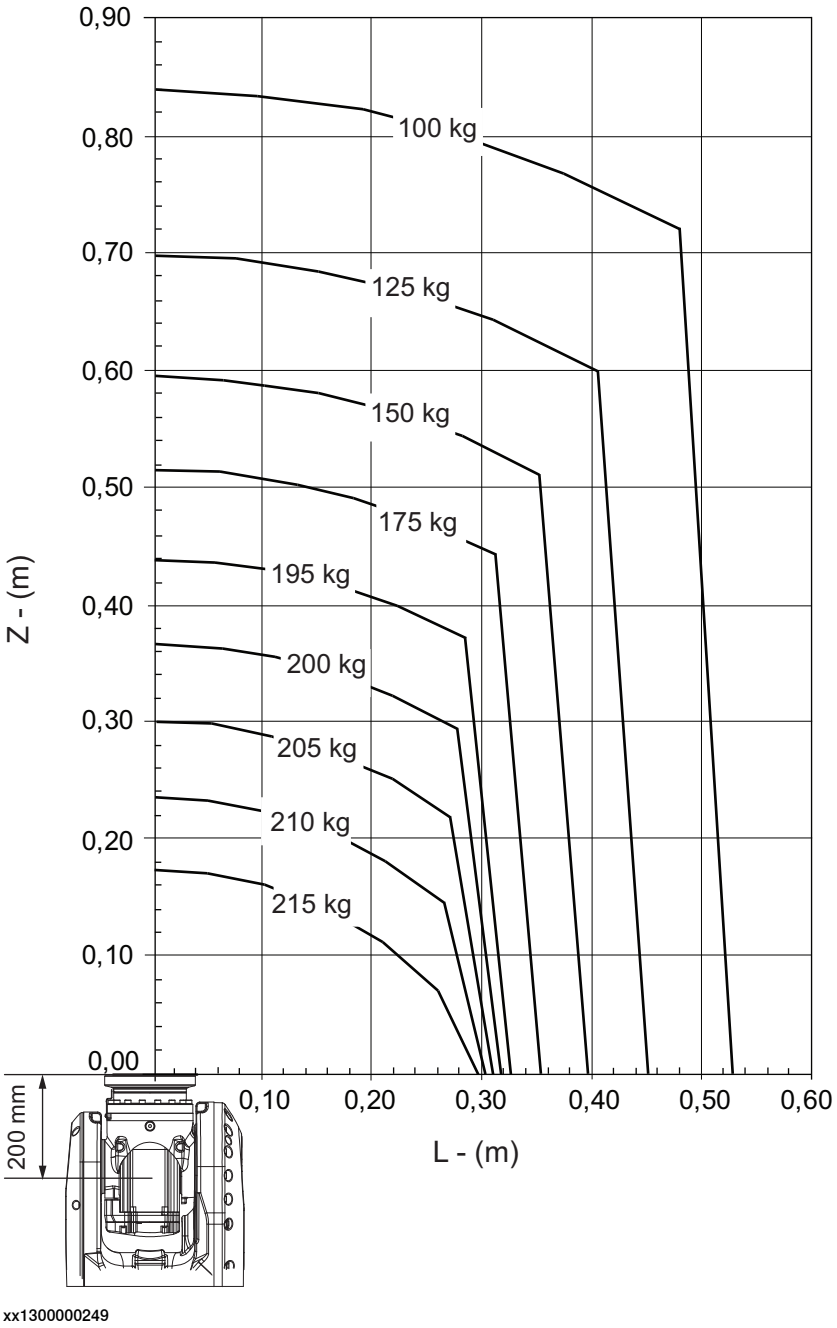
IRB 6700-205/2.80



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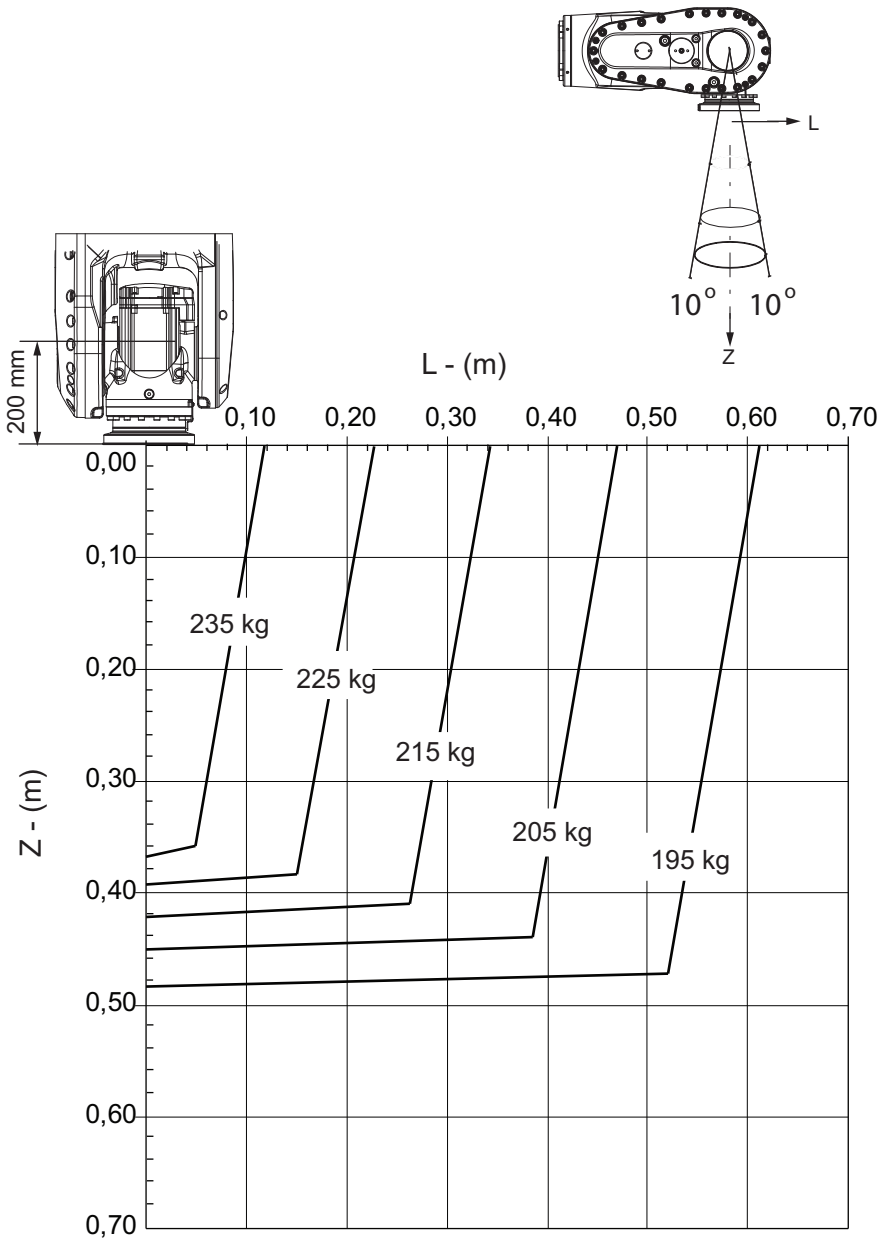
1.5.2 Diagrams
Continued

IRB 6700-205/2.80 "Vertical Wrist" (±10°)



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

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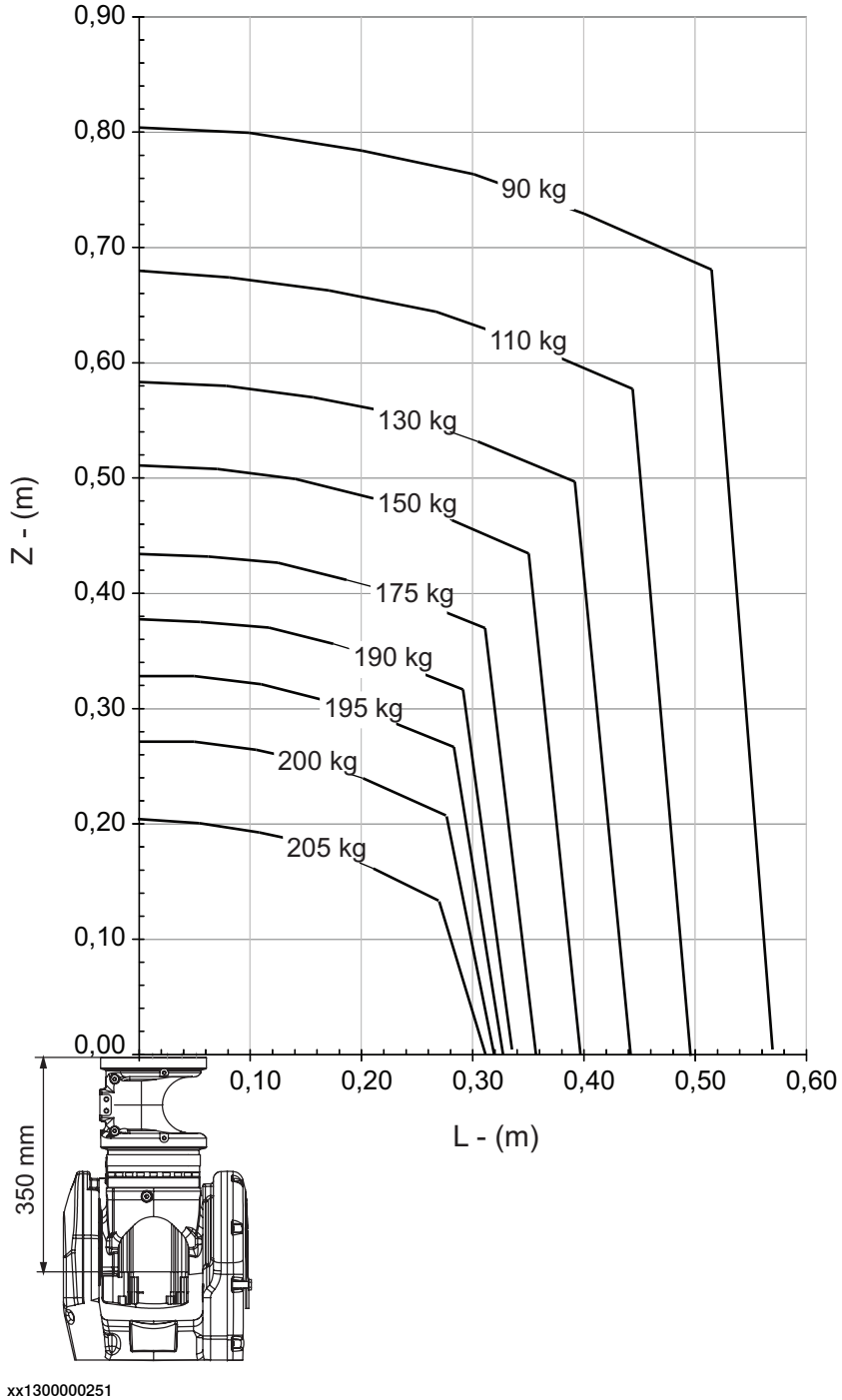
IRB 6700-205/2.80 "LeanID", option 780-4



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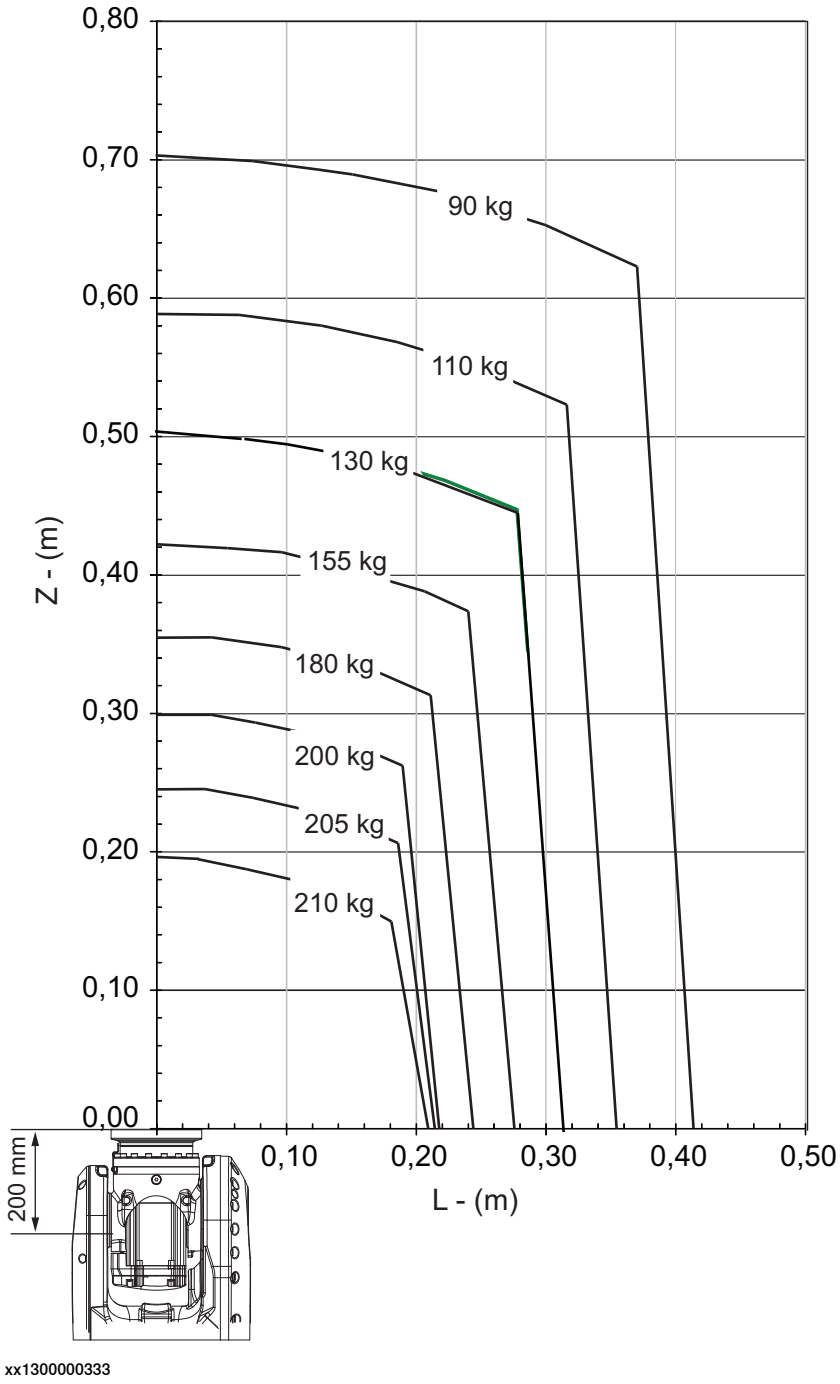
1.5.2 Diagrams
Continued

IRB 6700-200/2.60



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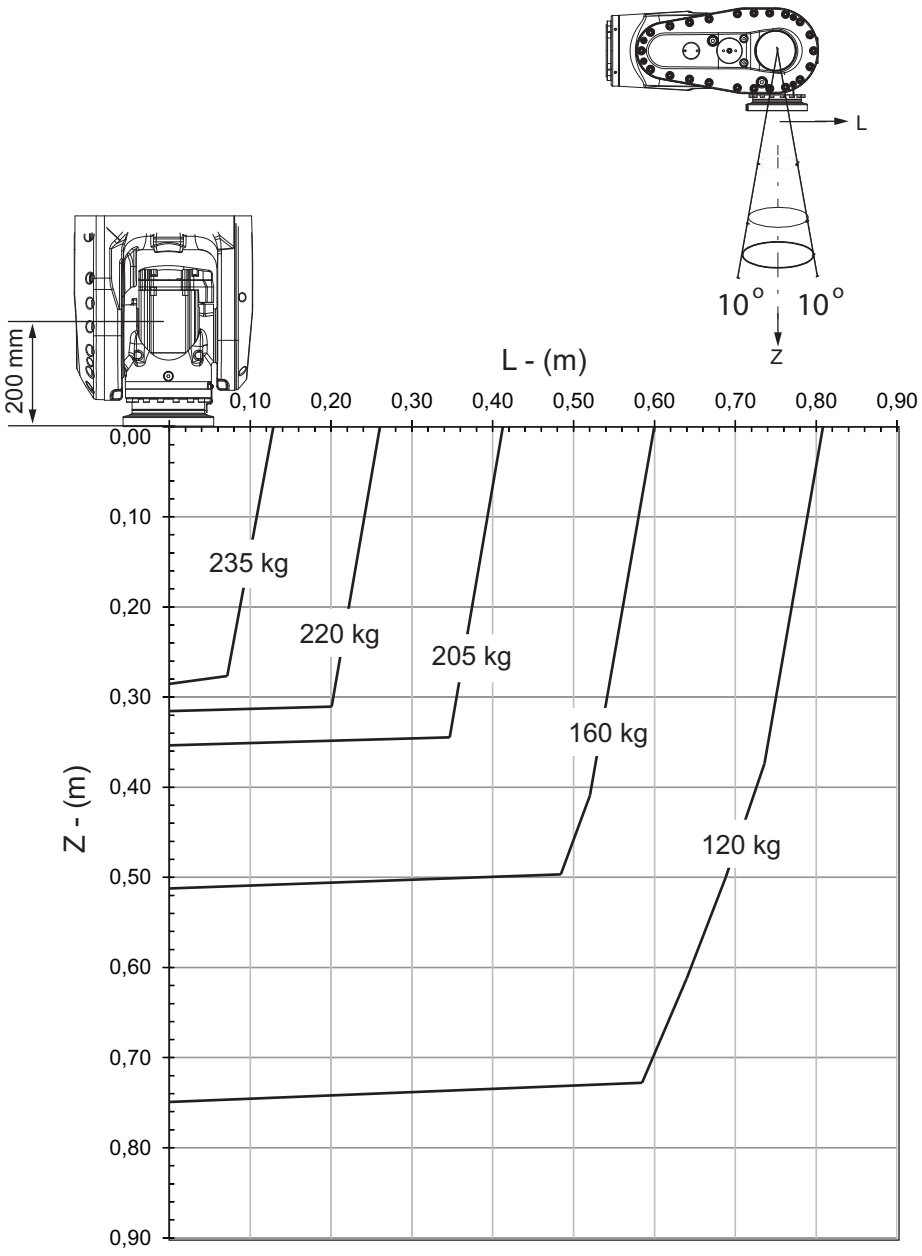
IRB 6700-200/2.60 "Vertical Wrist" (±10°)



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

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

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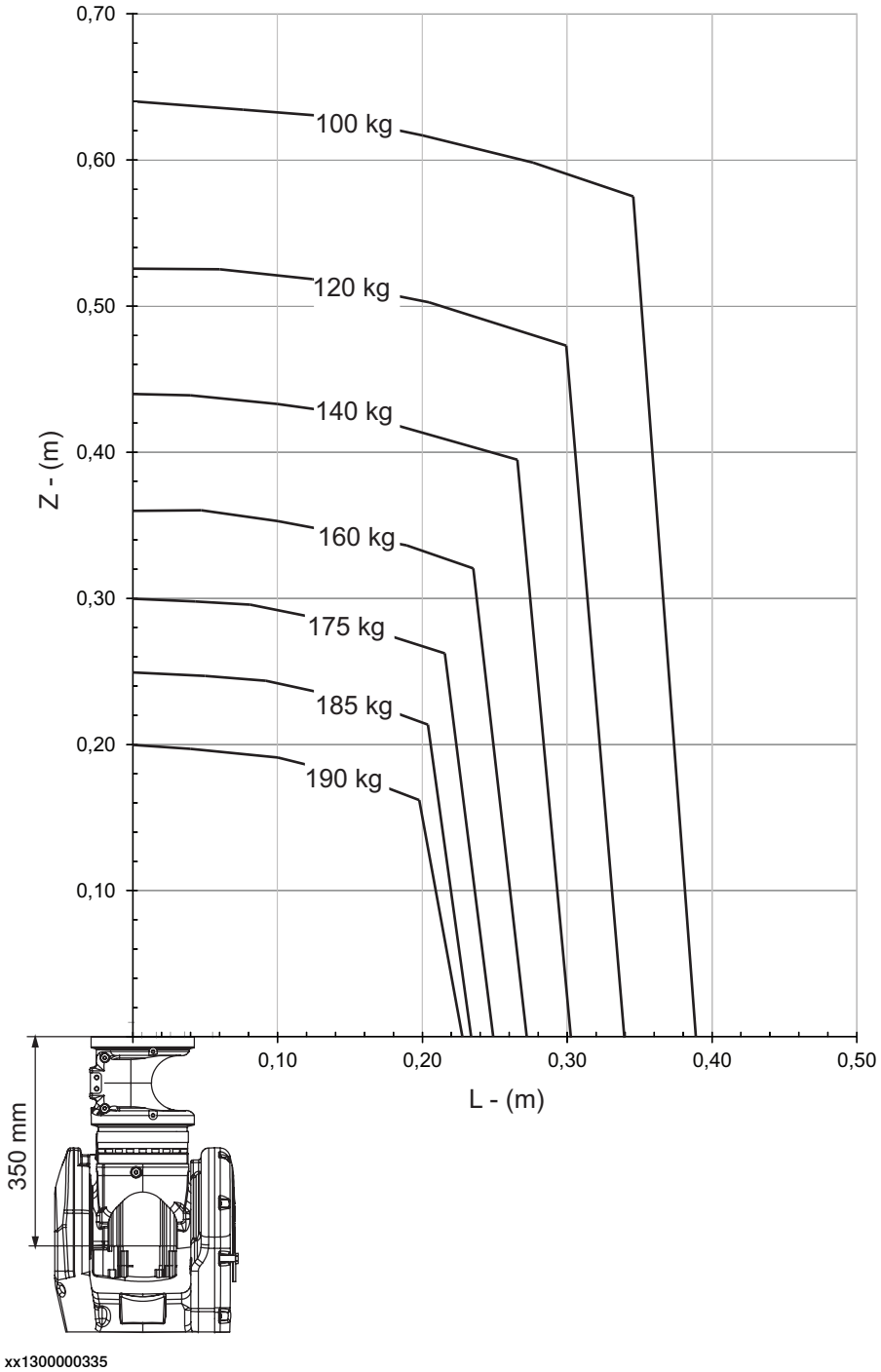
1.5.2 Diagrams
Continued

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



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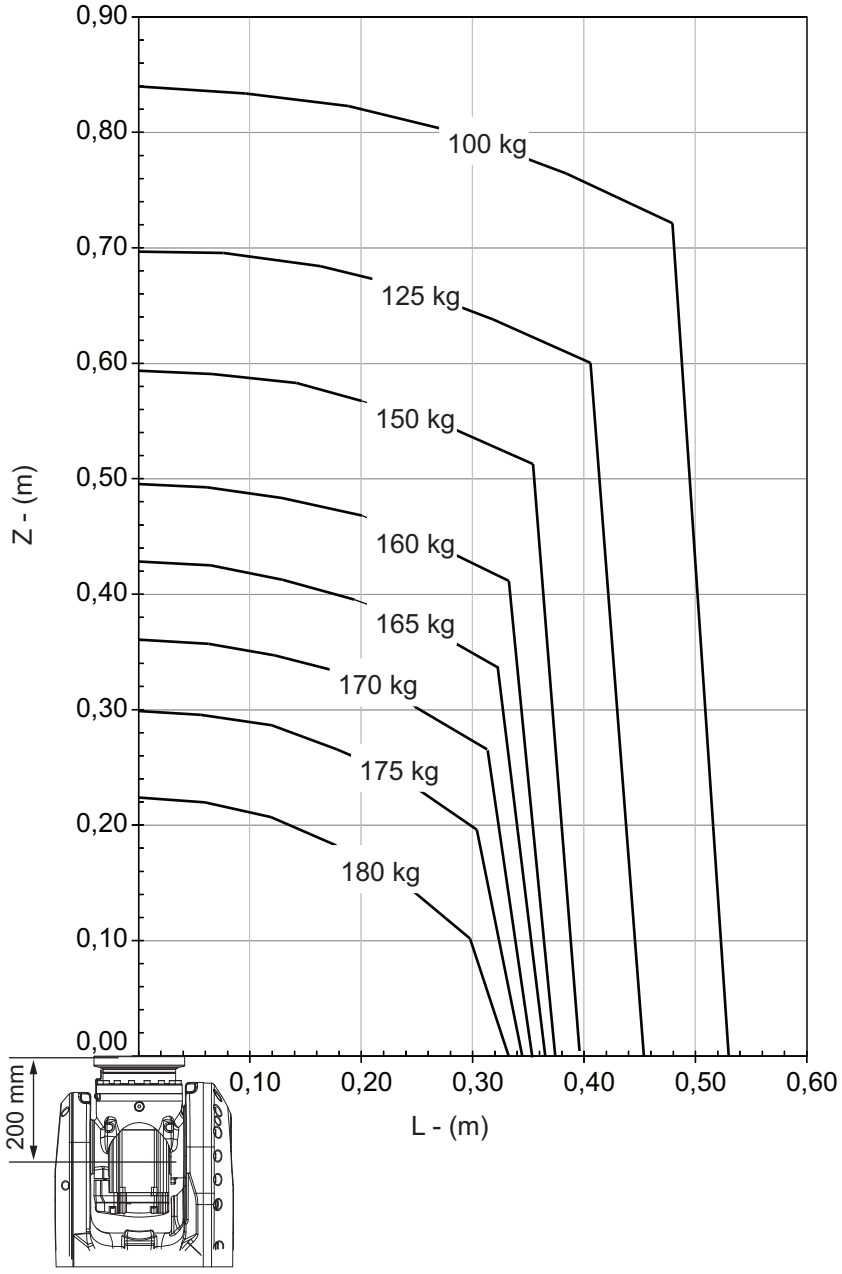
IRB 6700-175/3.05



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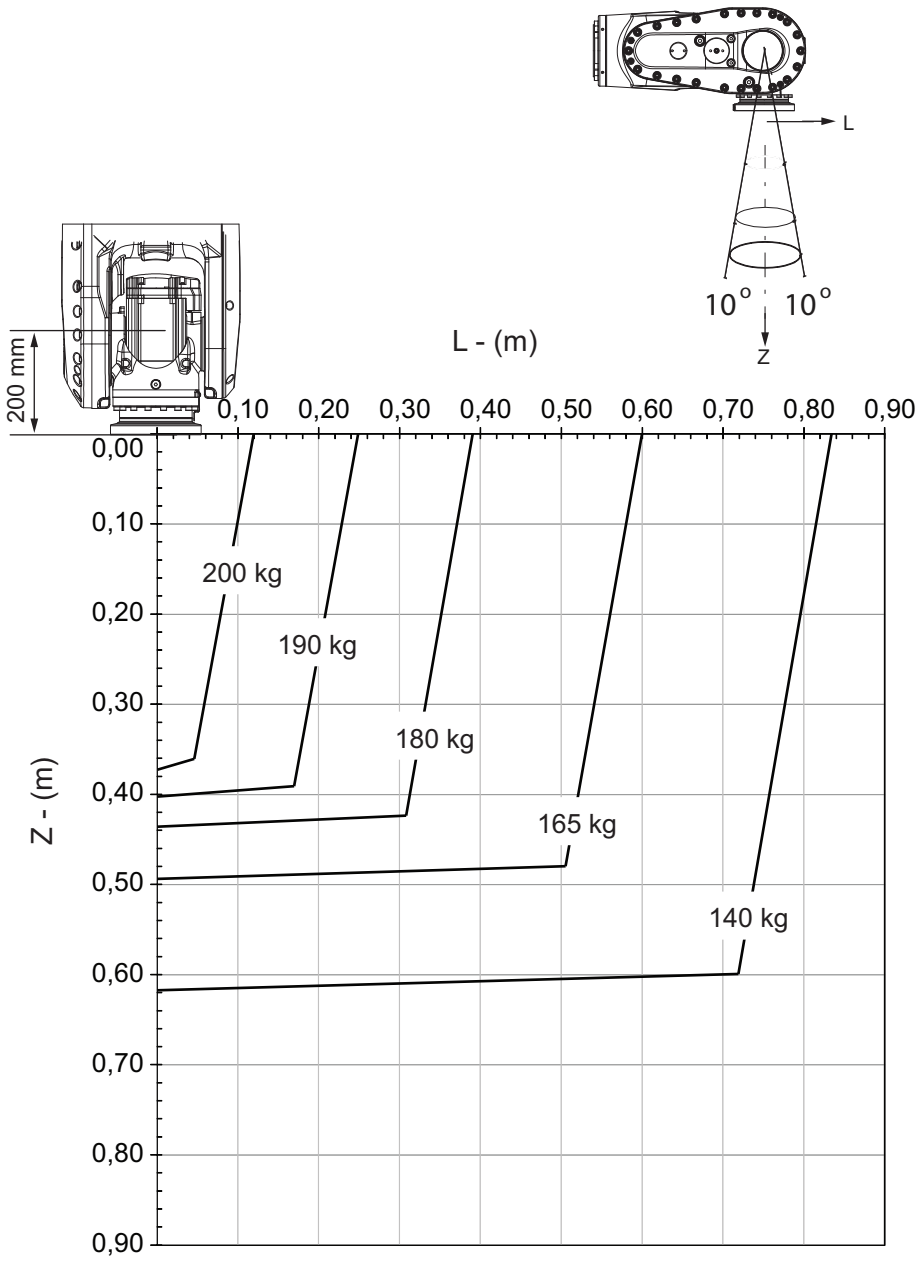
1.5.2 Diagrams
Continued

IRB 6700-175/3.05 "Vertical Wrist" (±10°)



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	Description
Max load	204 kg
Z_{max}	0.360 m
L_{max}	0.101 m

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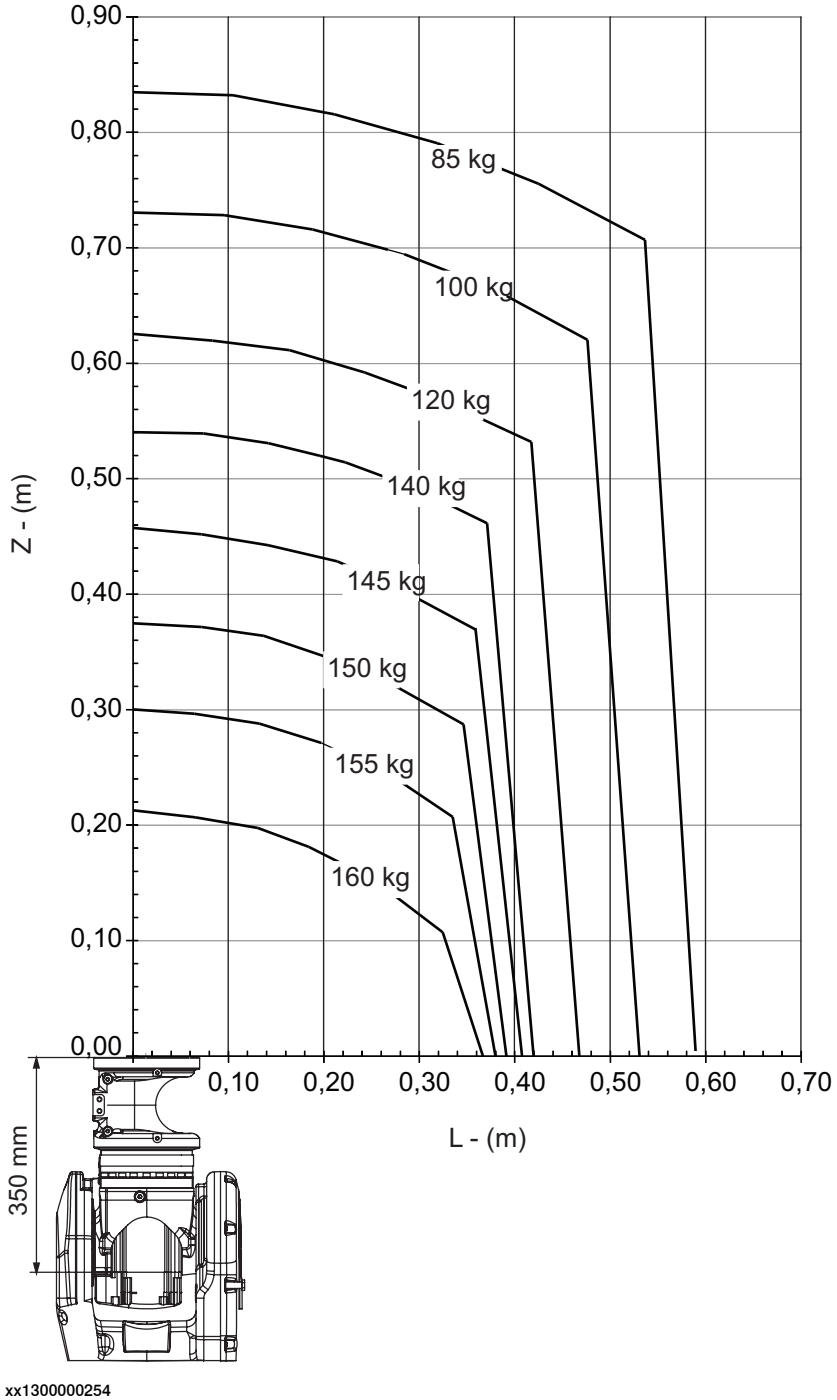
IRB 6700-175/3.05 "LeanID", option 780-4



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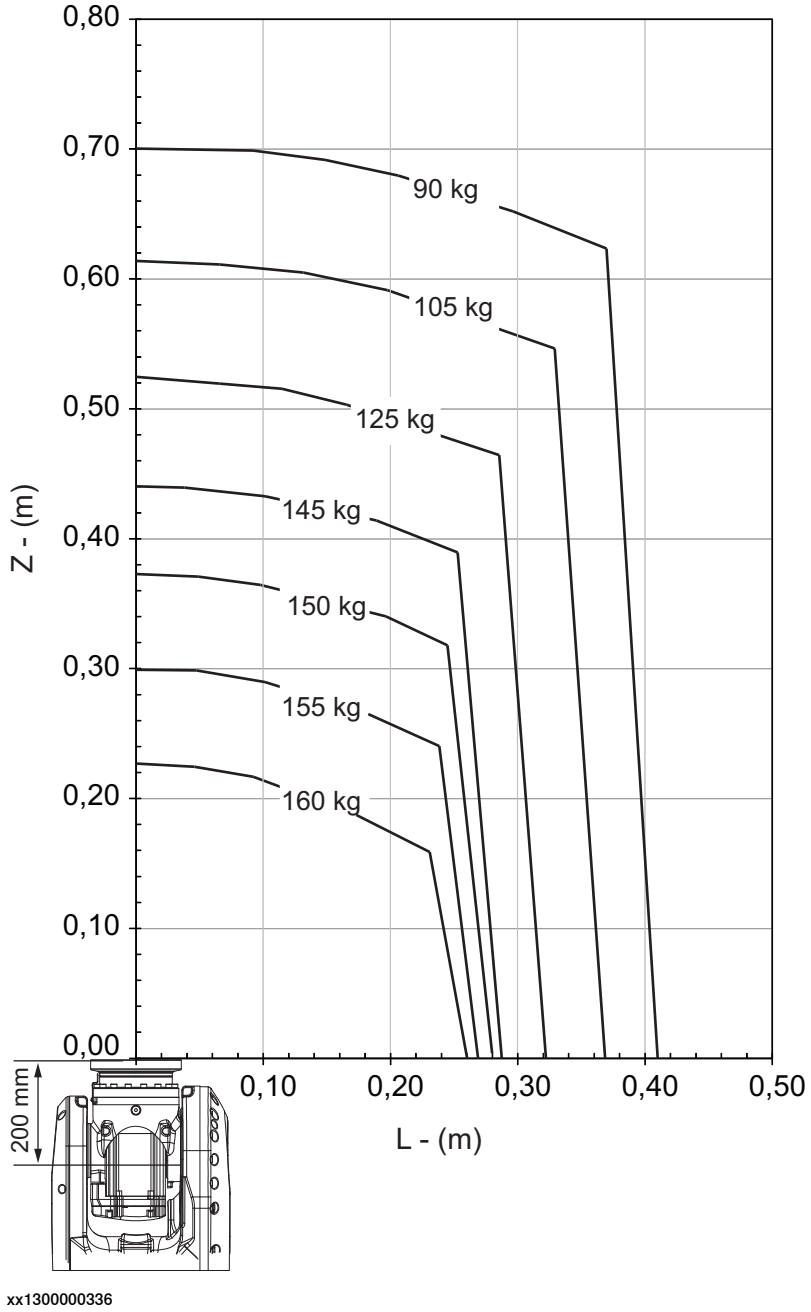
1.5.2 Diagrams
Continued

IRB 6700-155/2.85



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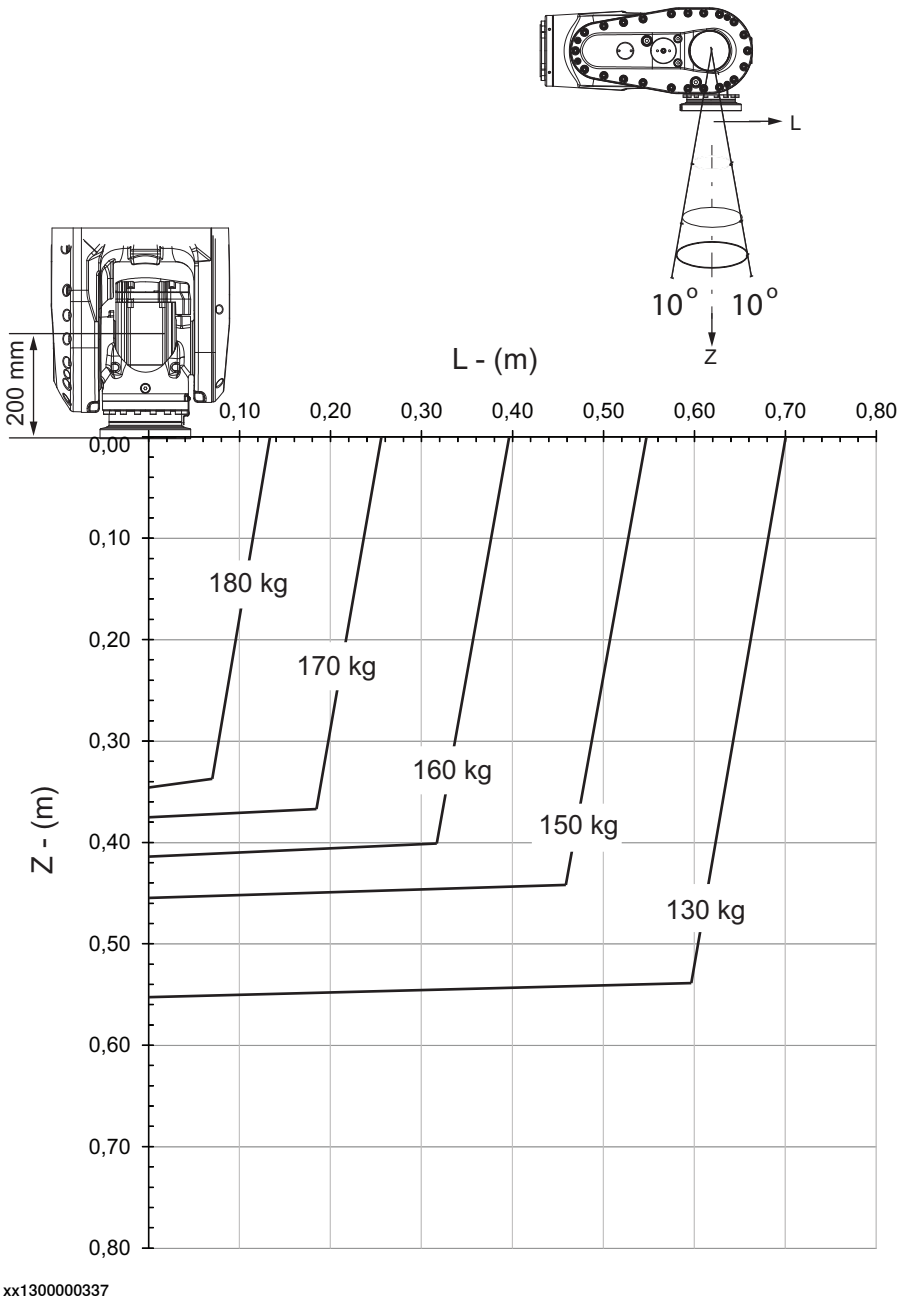
IRB 6700-155/2.85 "Vertical Wrist" (±10°)



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

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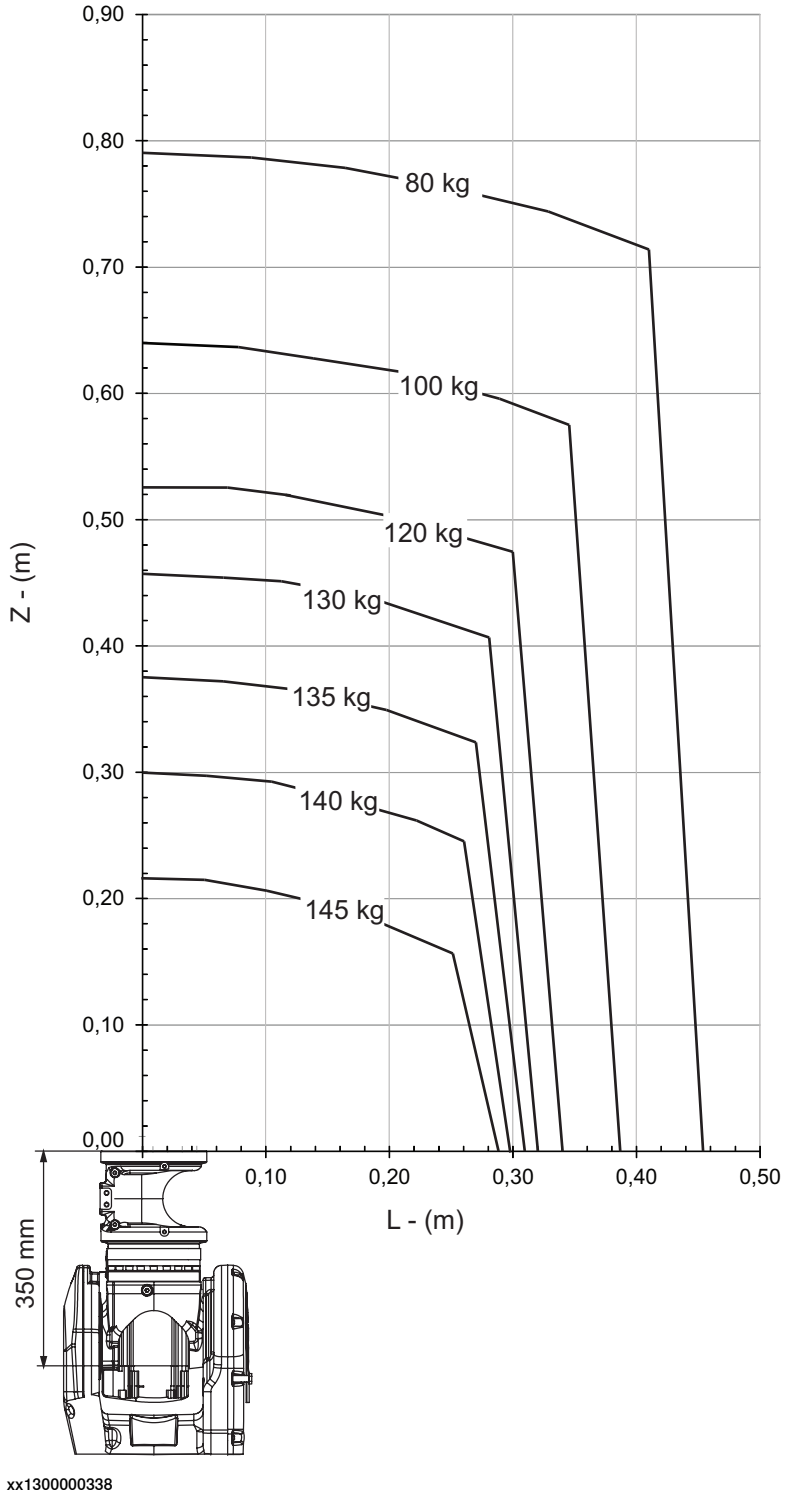
1.5.2 Diagrams
Continued

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



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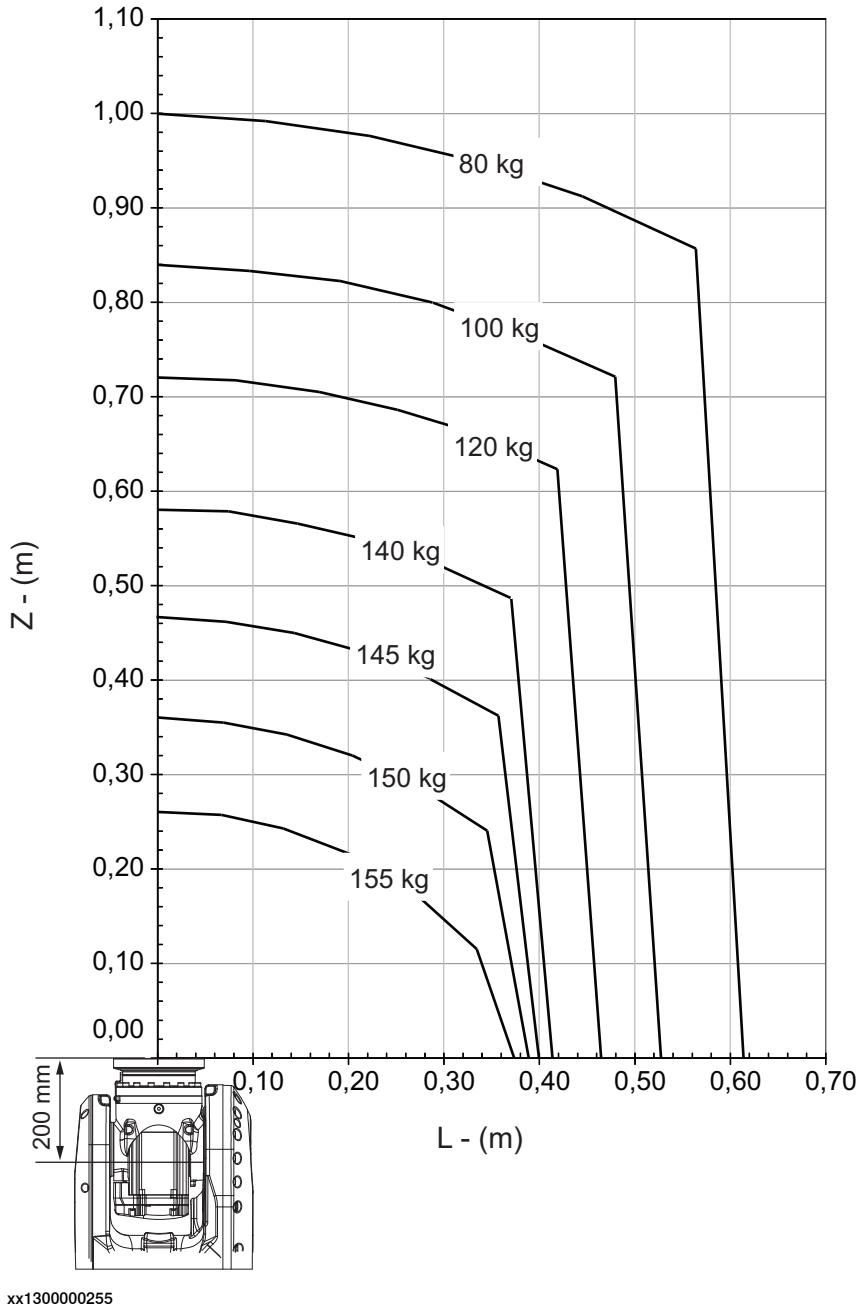
IRB 6700-150/3.20



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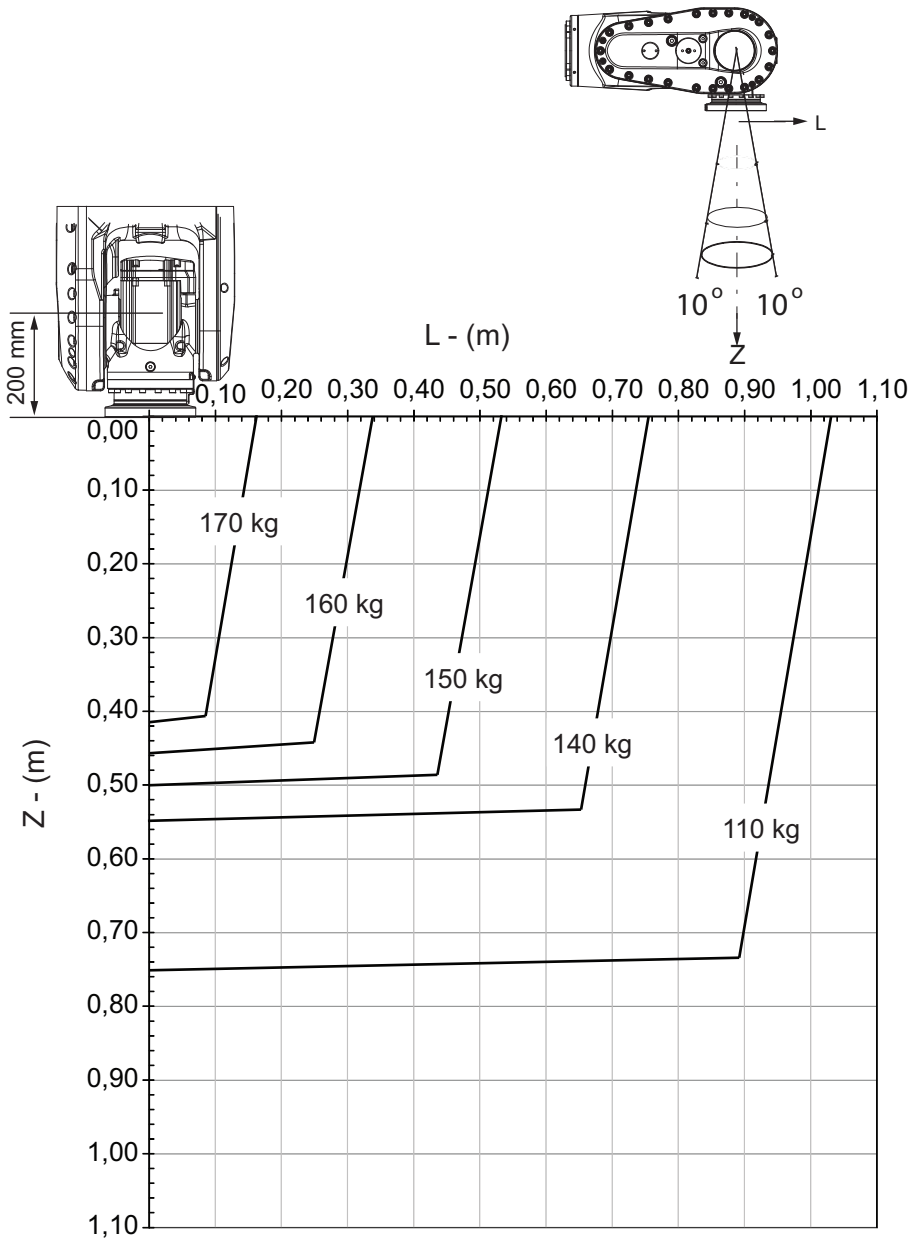
1.5.2 Diagrams
Continued

IRB 6700-150/3.20 "Vertical Wrist" (±10°)



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

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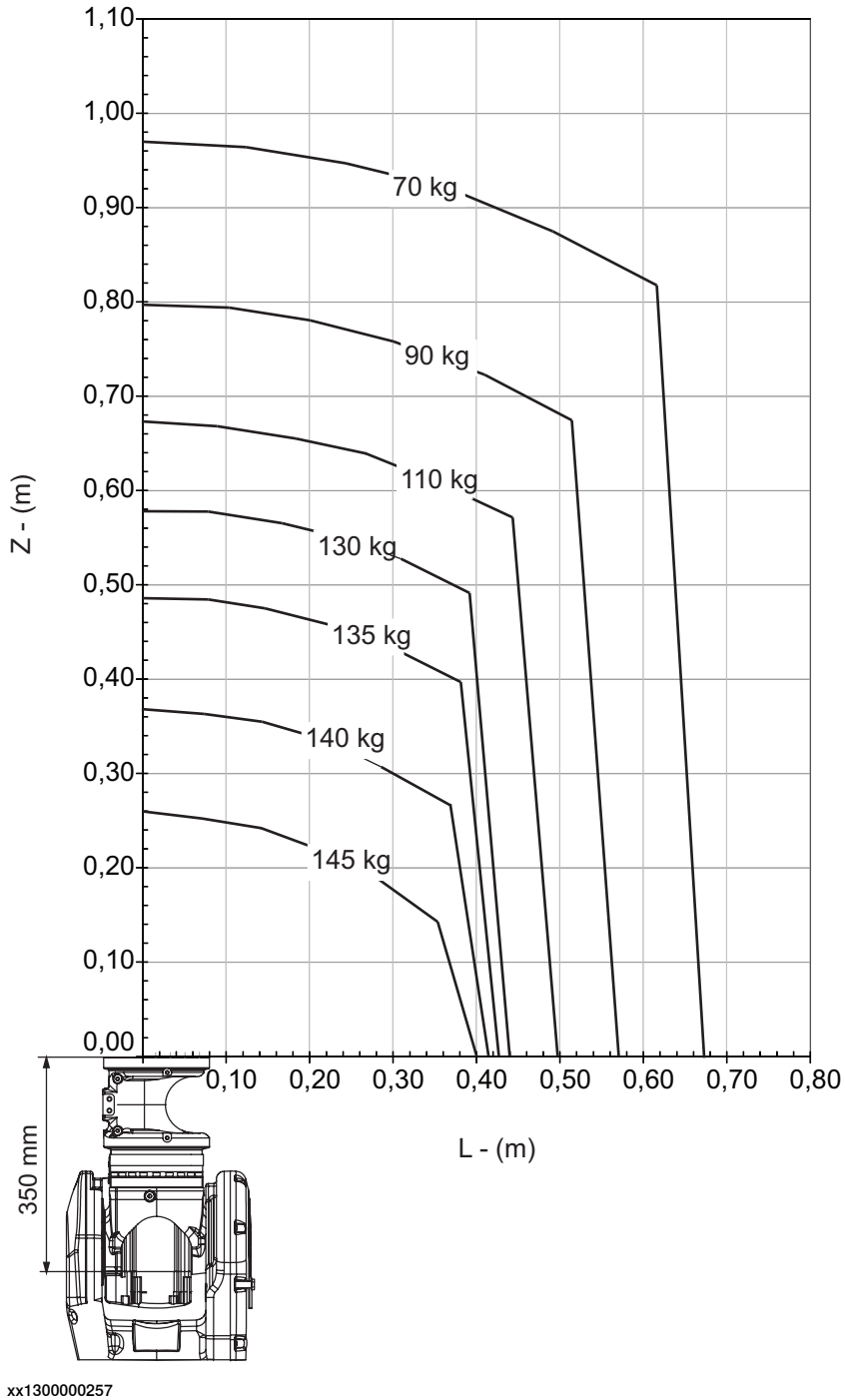
IRB 6700-150/3.20 "LeanID", option 780-4



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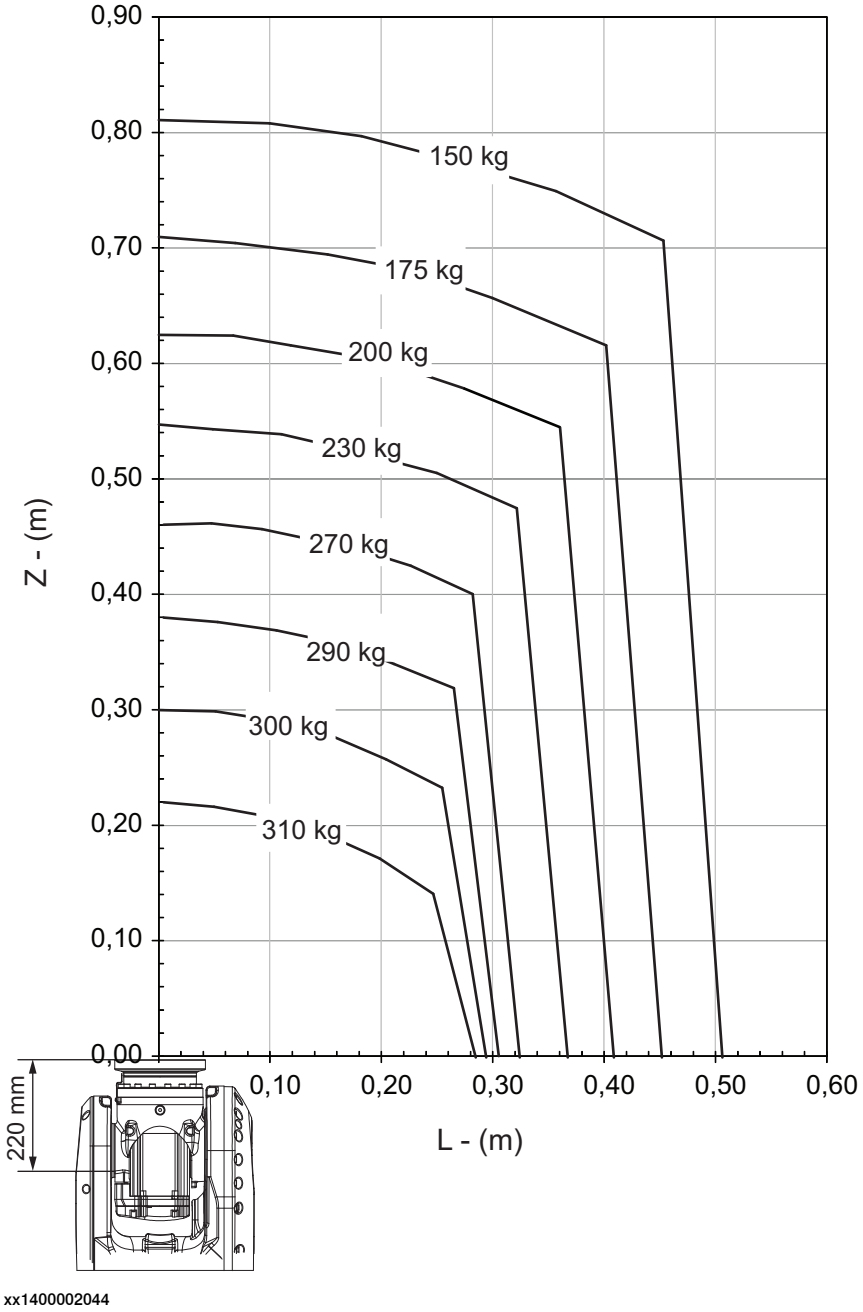
1.5.2 Diagrams
Continued

IRB 6700-300/2.70



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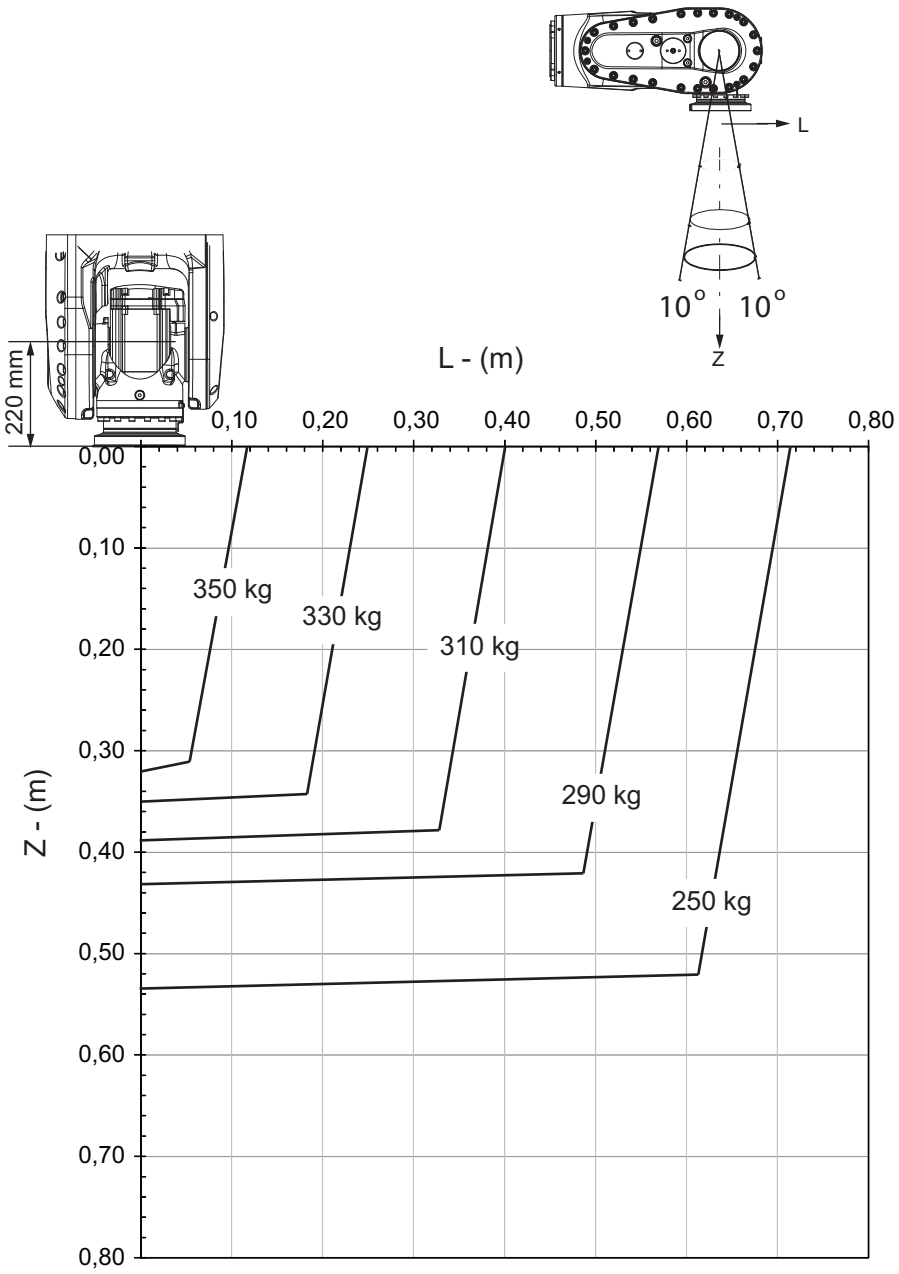
IRB 6700-300/2.70 "Vertical Wrist" (±10°)



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

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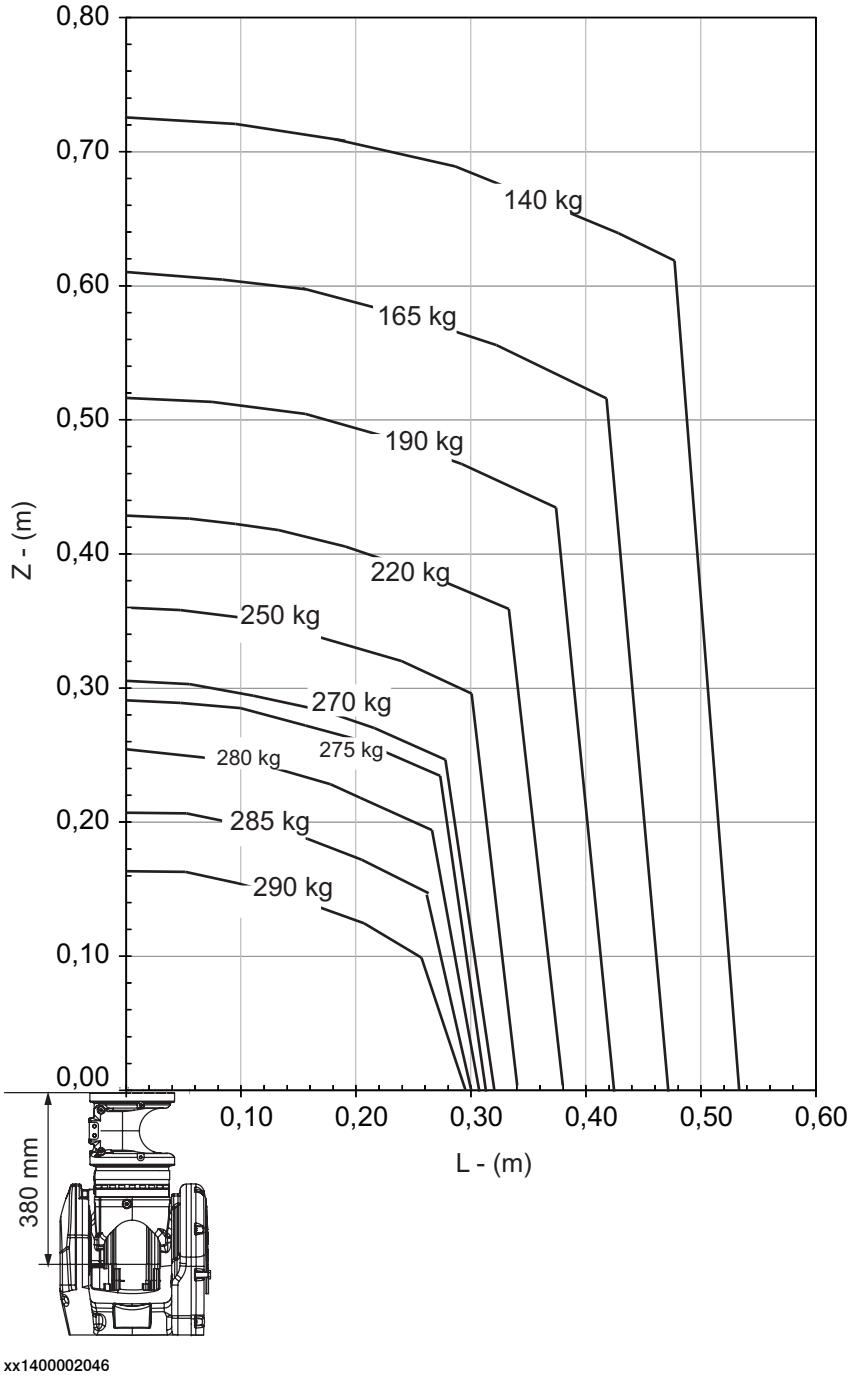
1.5.2 Diagrams
Continued

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



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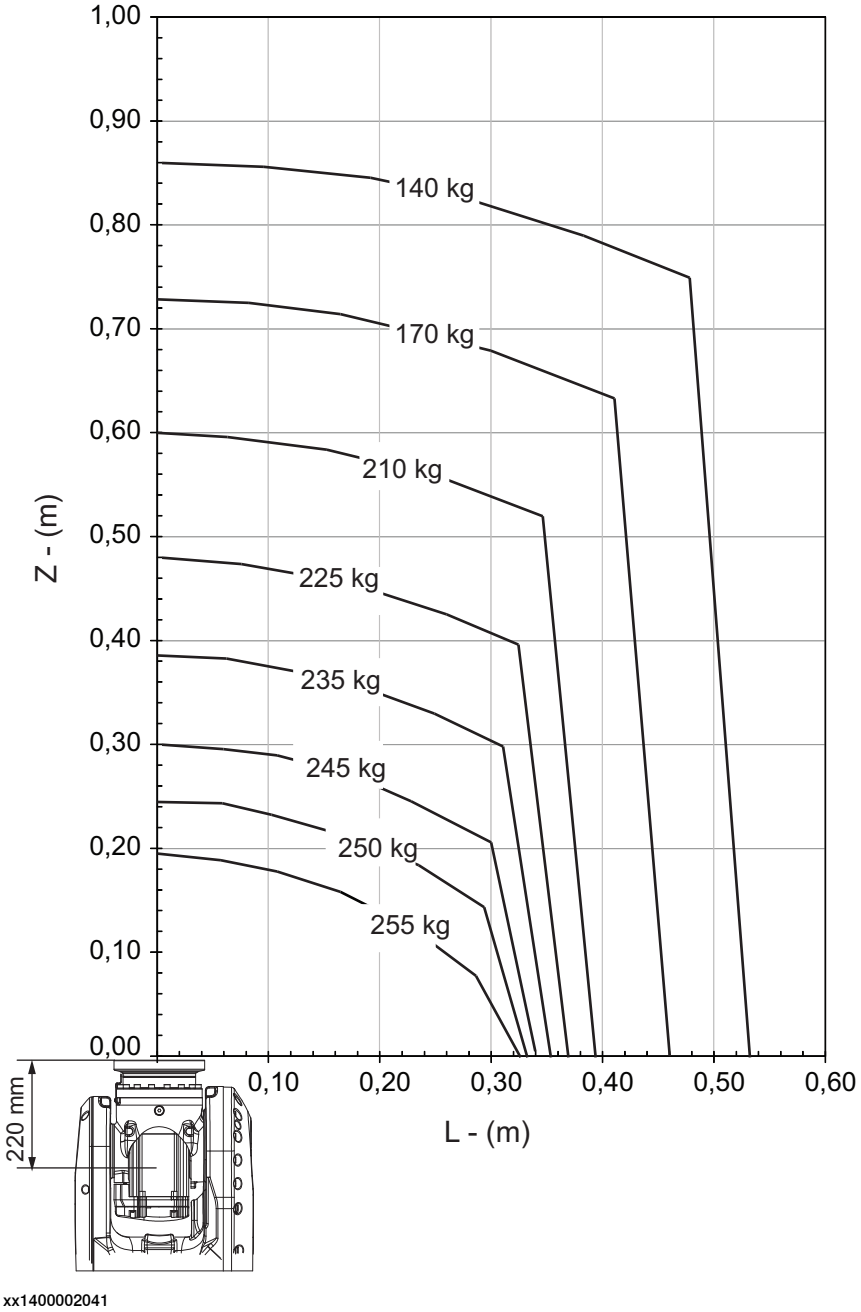
IRB 6700-245/3.00



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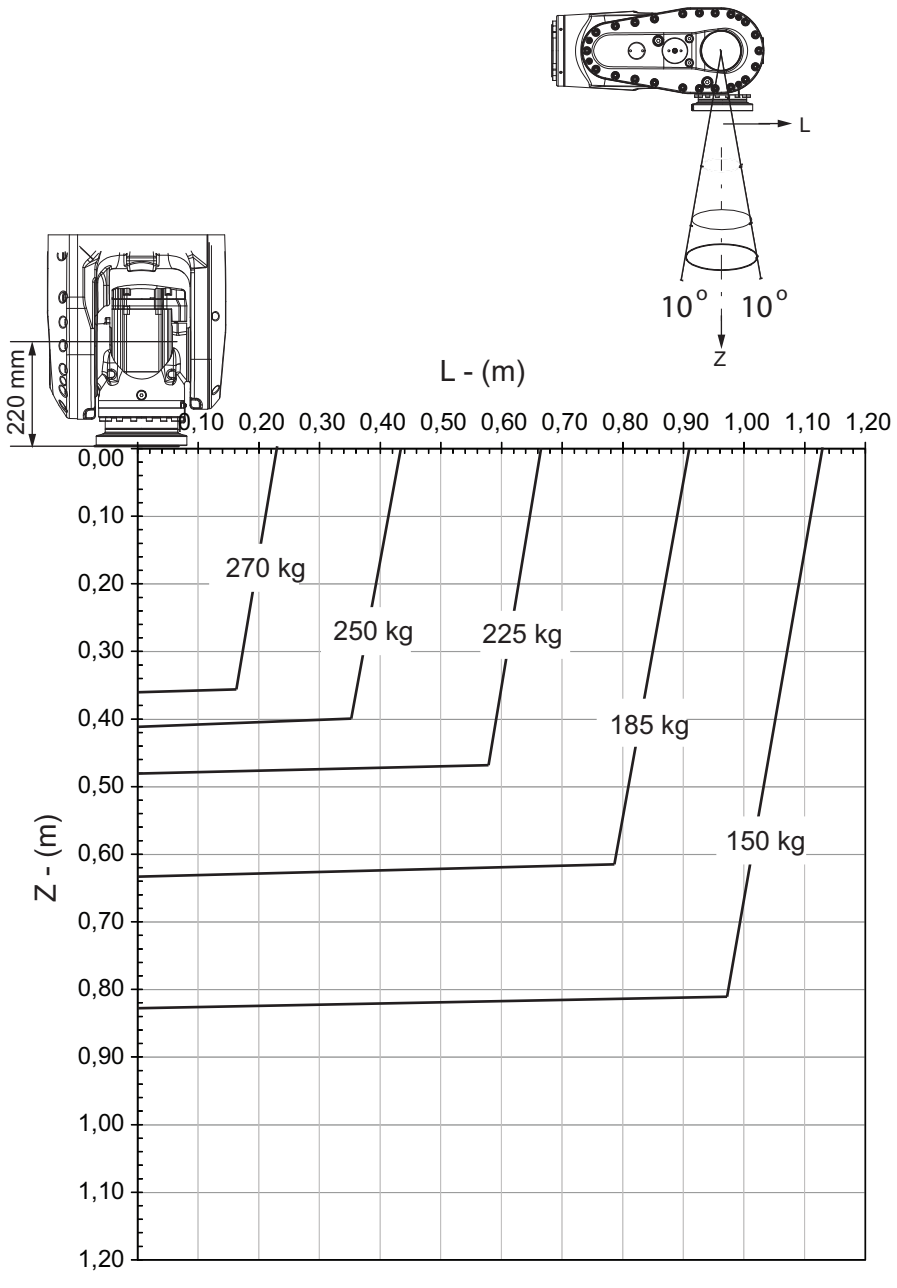
1.5.2 Diagrams
Continued

IRB 6700-245/3.00 "Vertical Wrist" (±10°)



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

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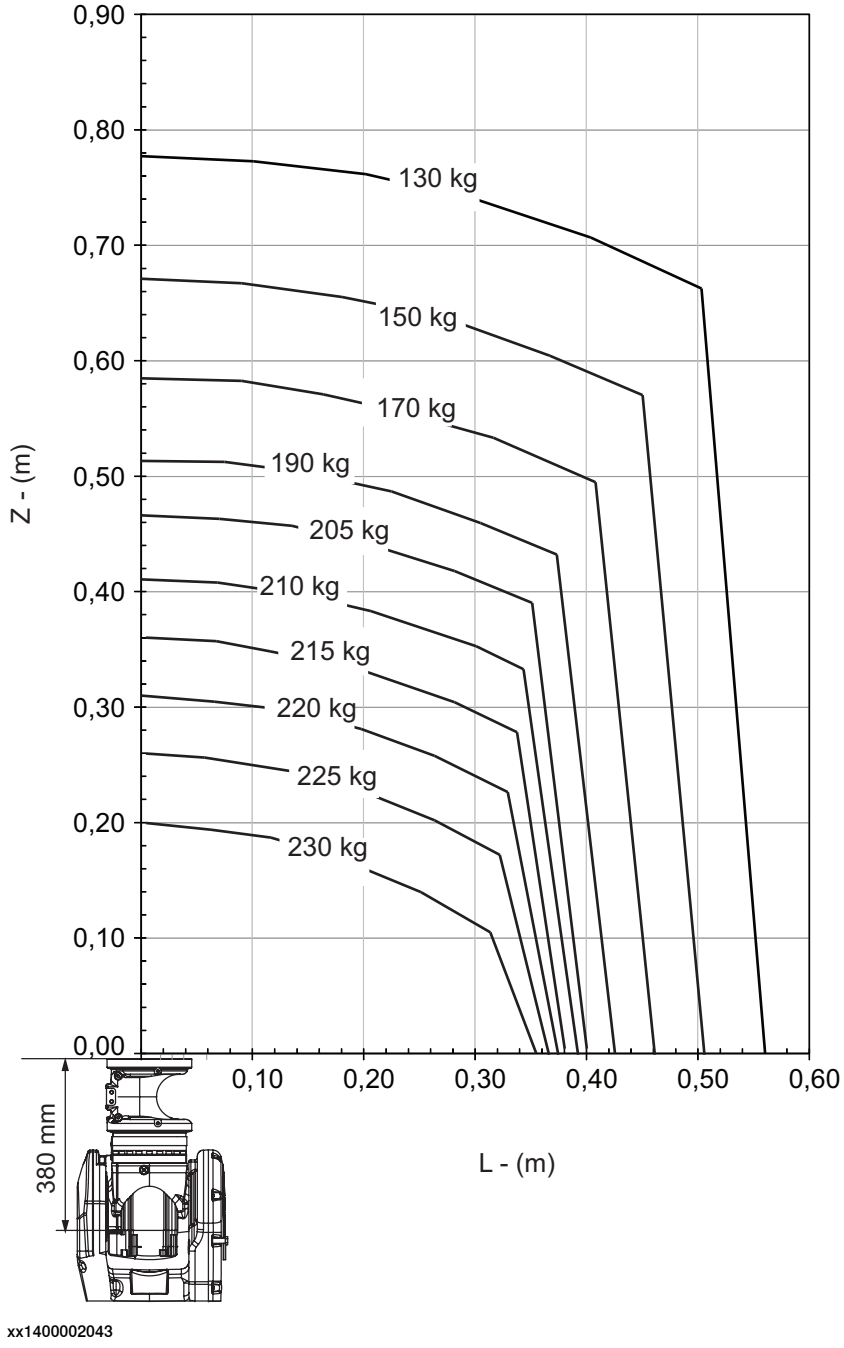
IRB 6700-245/3.00 "LeanID", option 780-4



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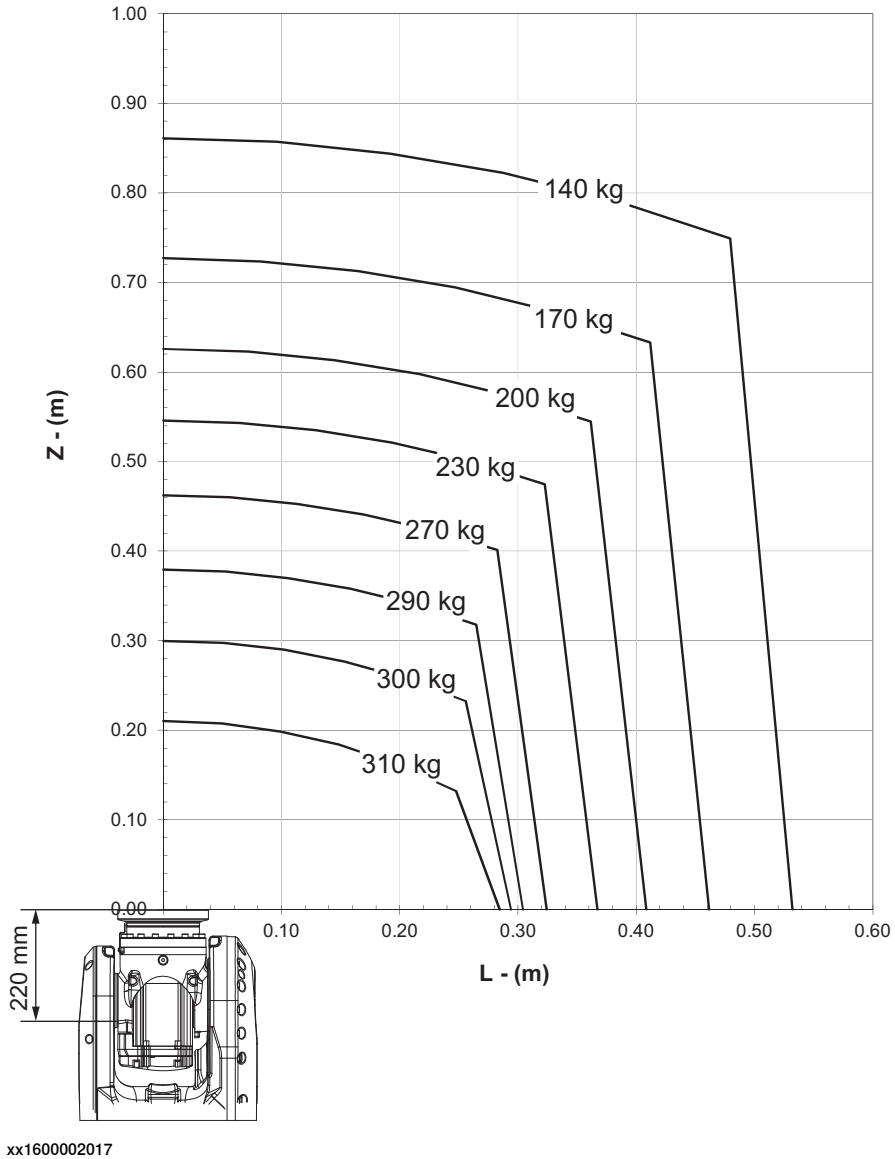
1.5.2 Diagrams
Continued

IRB 6700Inv-300/2.60



xx1600002017

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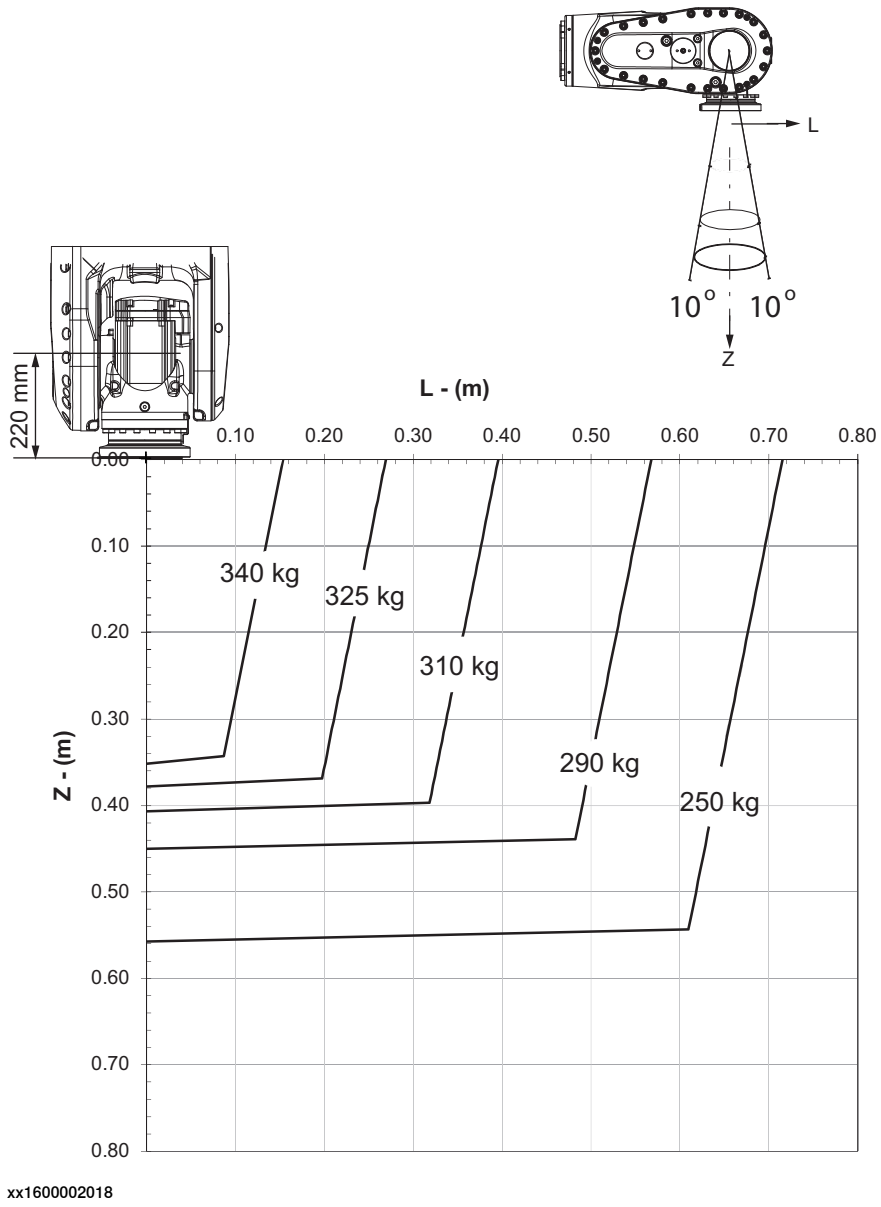
IRB 6700Inv-300/2.60 "Vertical Wrist" (±10°)



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

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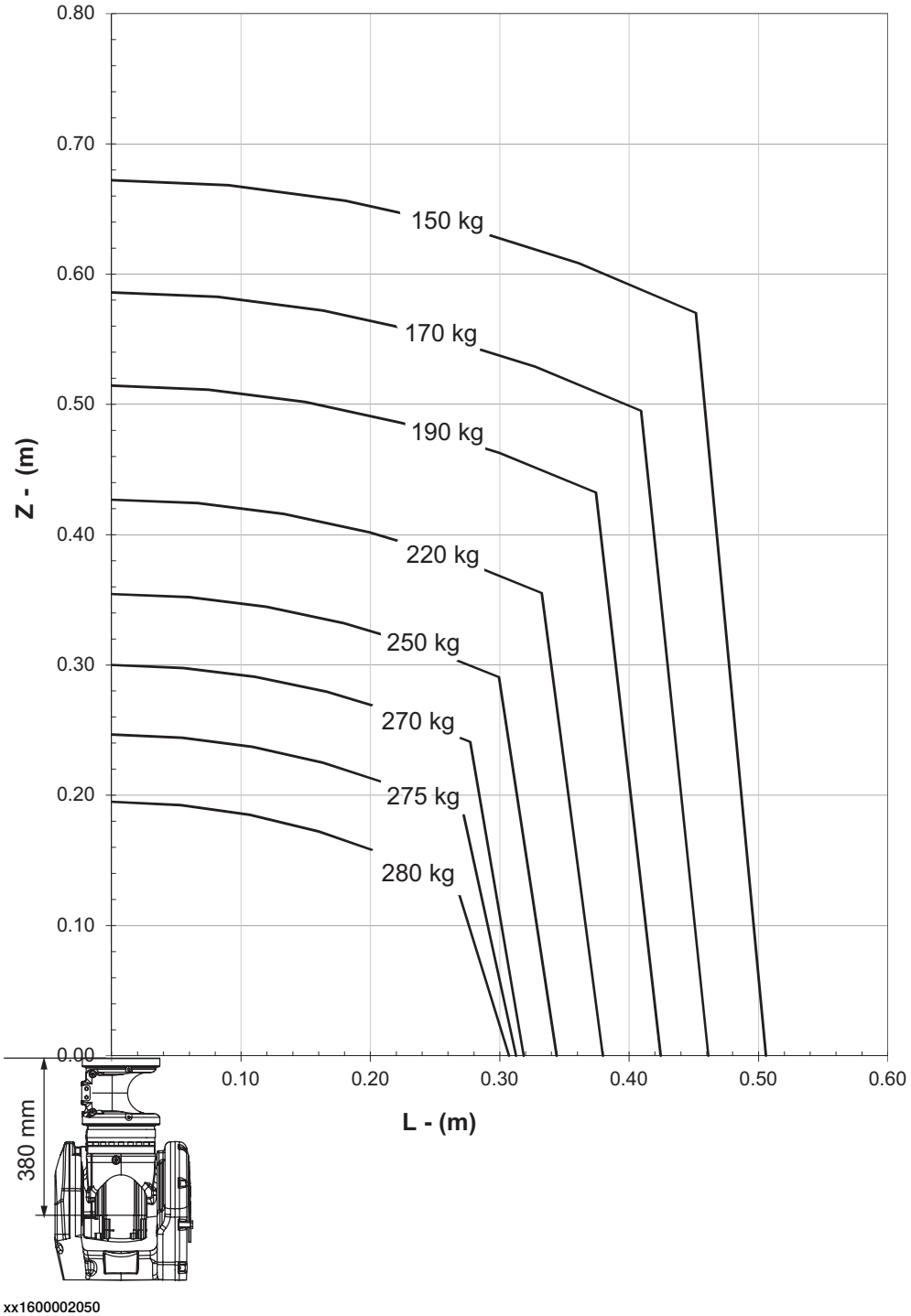
1.5.2 Diagrams
Continued

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



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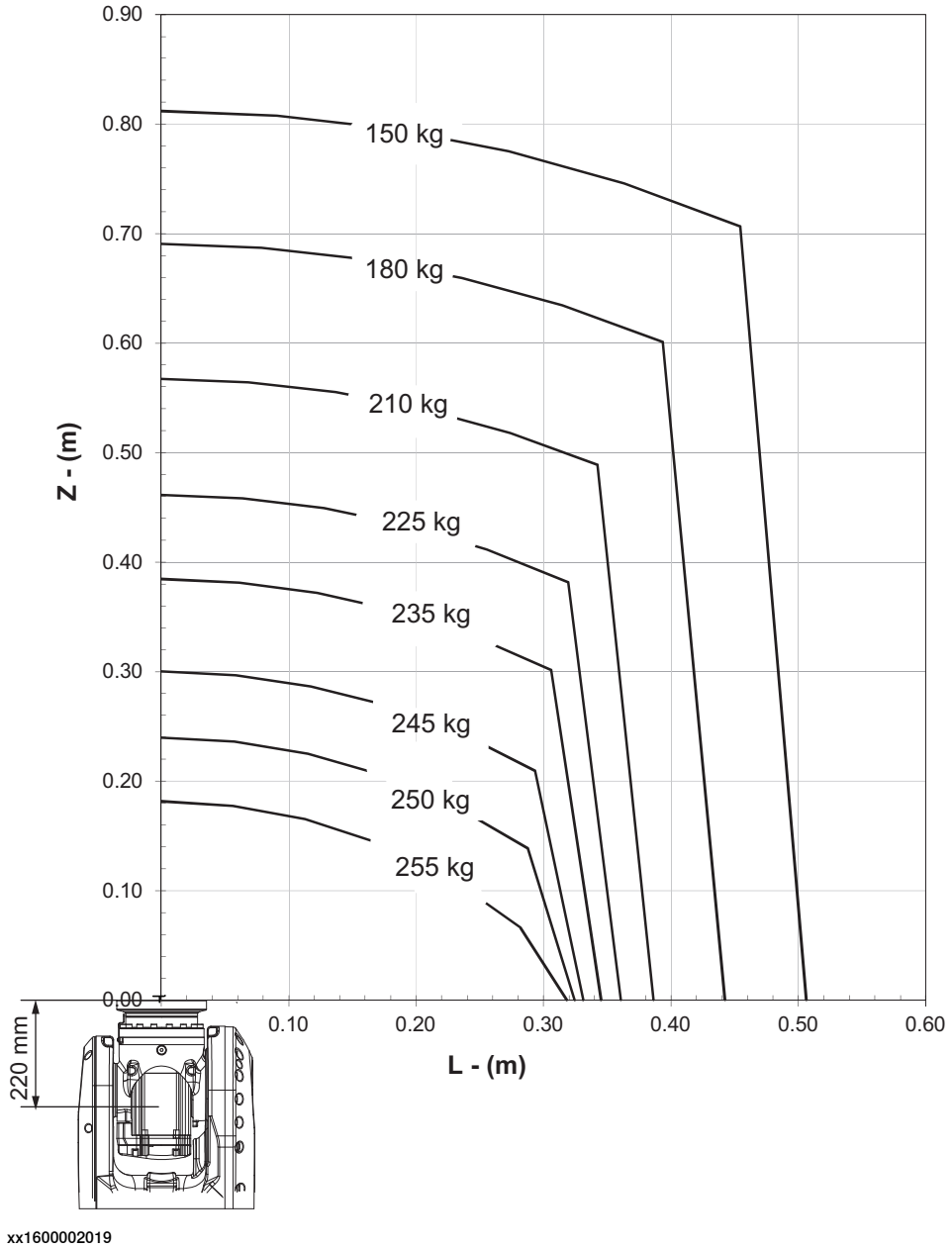
IRB 6700Inv-245/2.90



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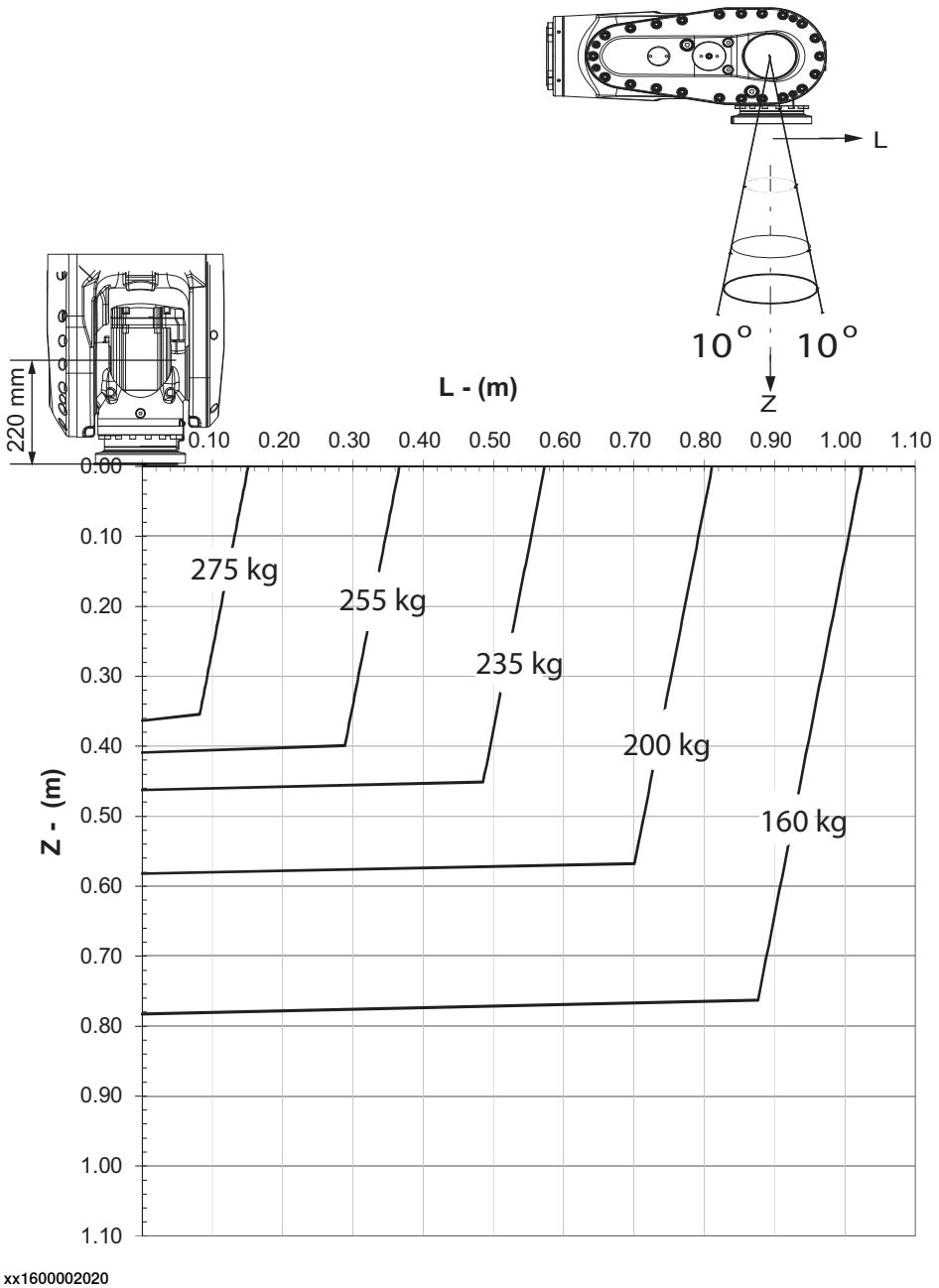
1.5.2 Diagrams
Continued

IRB 6700Inv-245/2.90 "Vertical Wrist" (±10°)



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

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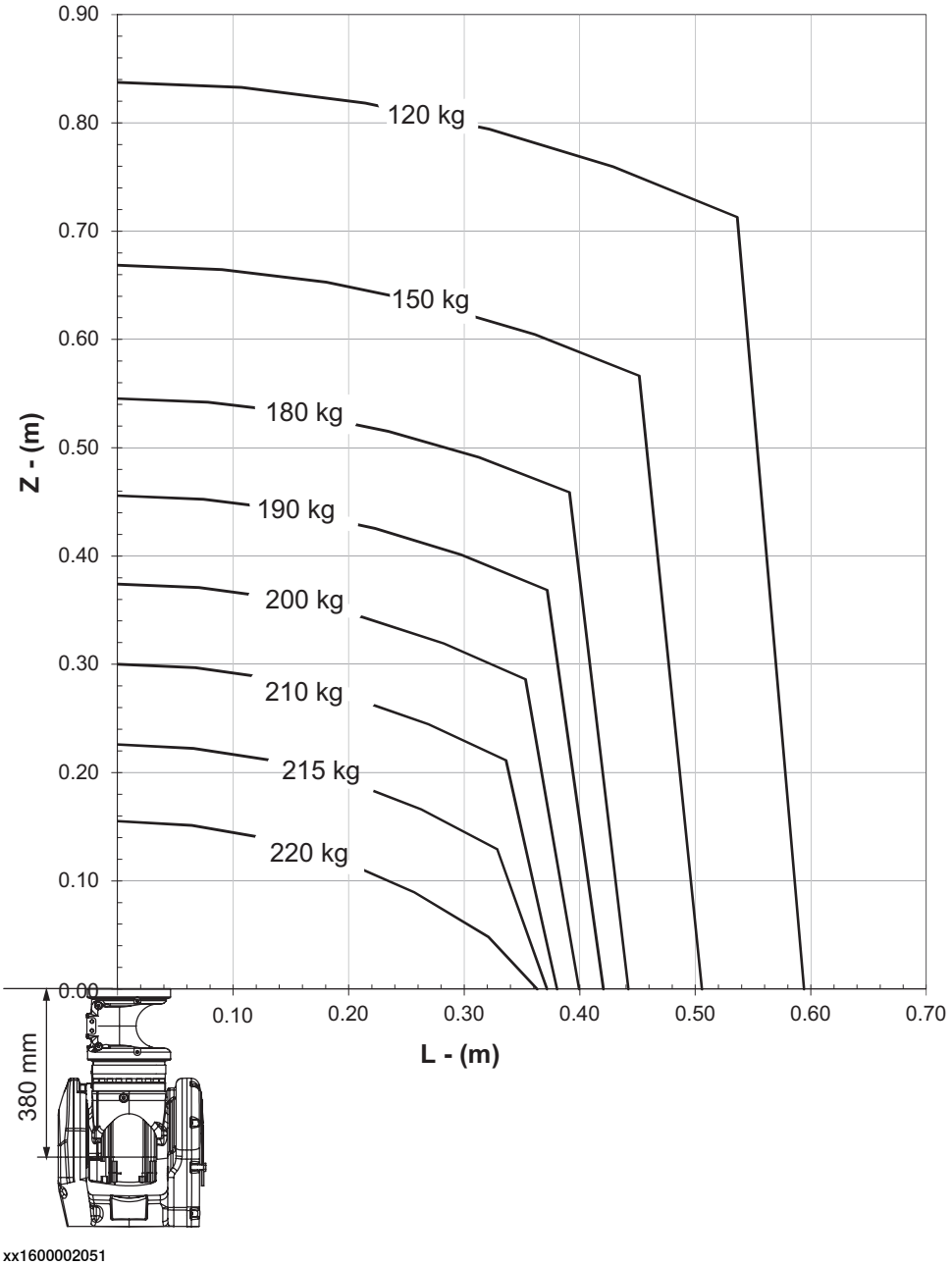
IRB 6700Inv-210/2.90 "LeanID", option 780-4



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

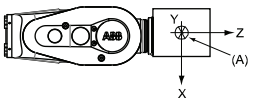
Note

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= sqr (X^2 + Y^2), see the following figure.

Full movement of axis 5 (±130°)

Axis	Robot type	Maximum moment of inertia
5	IRB 6700-235/2.65 IRB 6700-205/2.80 IRB 6700-175/3.05 IRB 6700-150/3.20	Ja_5 = Load x $((Z + 0{,}200^{i})^2 + L^2)$ + max (J_{0x}, J_{0y}) ≤ 250 kgm^2
	IRB 6700-200/2.60 IRB 6700-155/2.85	Ja_5 = Load x $((Z + 0{,}200^{i})^2 + L^2)$ + max (J_{0x}, J_{0y}) ≤ 195 kgm^2
	IRB 6700-300/2.70 IRB 6700-245/3.00 IRB 6700Inv-300/2.60 IRB 6700Inv-245/2.90	Ja_5 = Load x $((Z + 0{,}220^{ii})^2 + L^2)$ + max (J_{0x}, J_{0y}) ≤ 325 kgm^2
6	IRB 6700-235/2.65 IRB 6700-205/2.80 IRB 6700-175/3.05 IRB 6700-150/3.20	Ja_6 = Load x L^2 + J_{0Z} ≤ 185 kgm^2
	IRB 6700-200/2.60 IRB 6700-155/2.85	Ja_6 = Load x L^2 + J_{0Z} ≤ 145 kgm^2
	IRB 6700-300/2.70 IRB 6700-245/3.00 IRB 6700Inv-300/2.60 IRB 6700Inv-245/2.90	Ja_6 = Load x L^2 + J_{0Z} ≤ 225 kgm^2

i For option 780-4, LeanID = 0,350 m
ii For option 780-4, LeanID = 0,380 m



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Pos	Description
A	Center of gravity

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

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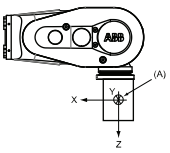
1.5.3 Maximum load and moment of inertia for full and limited axis 5 (center line down) movement
Continued

Limited axis 5, center line down

Axis	Robot type	Maximum moment of inertia
5	IRB 6700-235/2.65 IRB 6700-205/2.80 IRB 6700-175/3.05 IRB 6700-150/3.20	$Ja_5 = Load \times ((Z + 0{,}200^{i})^2 + L^2) + \max(J_{0x}, J_{0y}) \leq 275\ kgm^2$
	IRB 6700-200/2.60 IRB 6700-155/2.85	$Ja_5 = Load \times ((Z + 0{,}200^{i})^2 + L^2) + \max(J_{0x}, J_{0y}) \leq 215\ kgm^2$
	IRB 6700-300/2.70 IRB 6700-245/3.00 IRB 6700Inv-300/2.60 IRB 6700Inv-245/2.90	$Ja_5 = Load \times ((Z + 0{,}220^{ii})^2 + L^2) + \max(J_{0x}, J_{0y}) \leq 360\ kgm^2$
6	IRB 6700-235/2.65 IRB 6700-205/2.80 IRB 6700-175/3.05 IRB 6700-150/3.20	$Ja_6 = Load \times L^2 + J_{0Z} \leq 250\ kgm^2$
	IRB 6700-200/2.60 IRB 6700-155/2.85	$Ja_6 = Load \times L^2 + J_{0Z} \leq 195\ kgm^2$
	IRB 6700-300/2.70 IRB 6700-245/3.00 IRB 6700Inv-300/2.60 IRB 6700Inv-245/2.90	$Ja_6 = Load \times L^2 + J_{0Z} \leq 320\ kgm$

i For option 780-4, LeanID = 0,350 m
ii For option 780-4, LeanID = 0,380 m



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Pos	Description
A	Center of gravity

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

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1.5.4 Wrist torque

Note

The 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. Also arm loads will influence the permitted load diagram. For finding the absolute limits of the load diagram, use the ABB RobotLoad. Contact your local ABB organization.

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	1324 Nm	650 Nm	225 kg
IRB 6700-205/2.80	1263 Nm	625 Nm	192 kg
IRB 6700-200/2.60	981 Nm	429 Nm	175 kg
IRB 6700-175/3.05	1179 Nm	589 Nm	154 kg
IRB 6700-155/2.85	927 Nm	410 Nm	144 kg
IRB 6700-150/3.20	1135 Nm	570 Nm	137 kg
IRB 6700-300/2.70	1825 Nm	865 Nm	280 kg
IRB 6700-245/3.00	1693 Nm	815 Nm	214 kg
IRB 6700Inv-300/2.60	1,825 Nm	865 Nm	280 kg
IRB6700Inv-245/2.90	1,645 Nm	796 Nm	194 kg

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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 E-stop and controlled motion includes acceleration due to gravitational forces. Nominal load is define with nominal mass and cog with max offset in Z and L (see load diagram).

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

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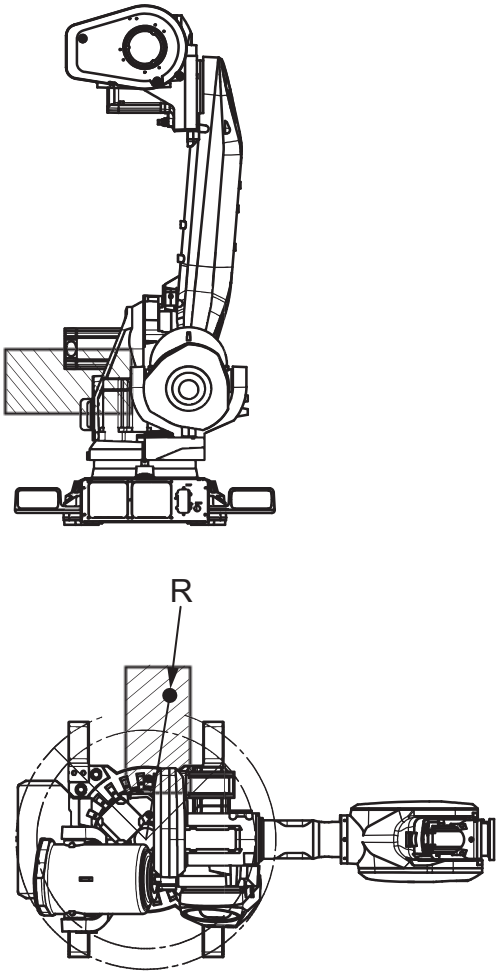

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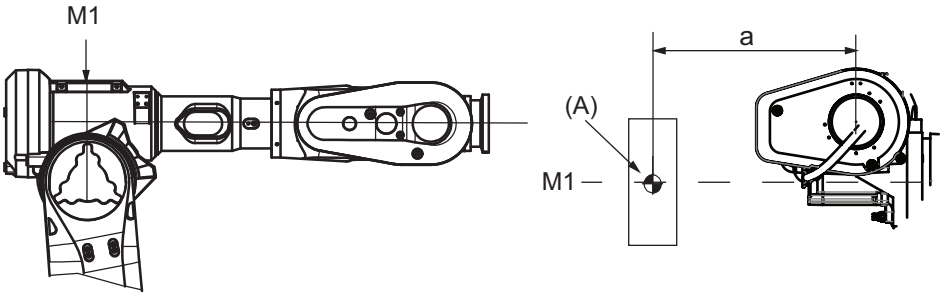
Upper arm

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



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A	Mass center

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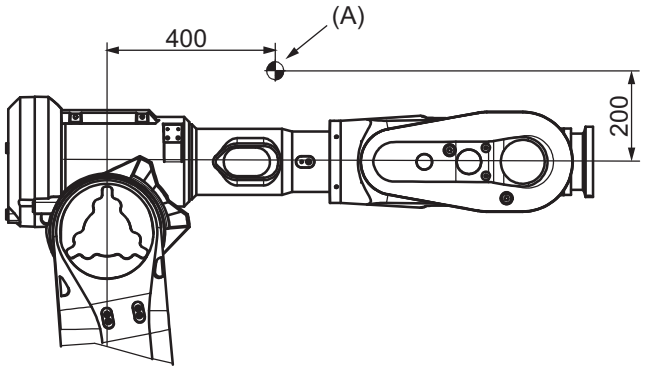
1.6 Fitting equipment to the robot
Continued



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A	Center of gravity 50 kg

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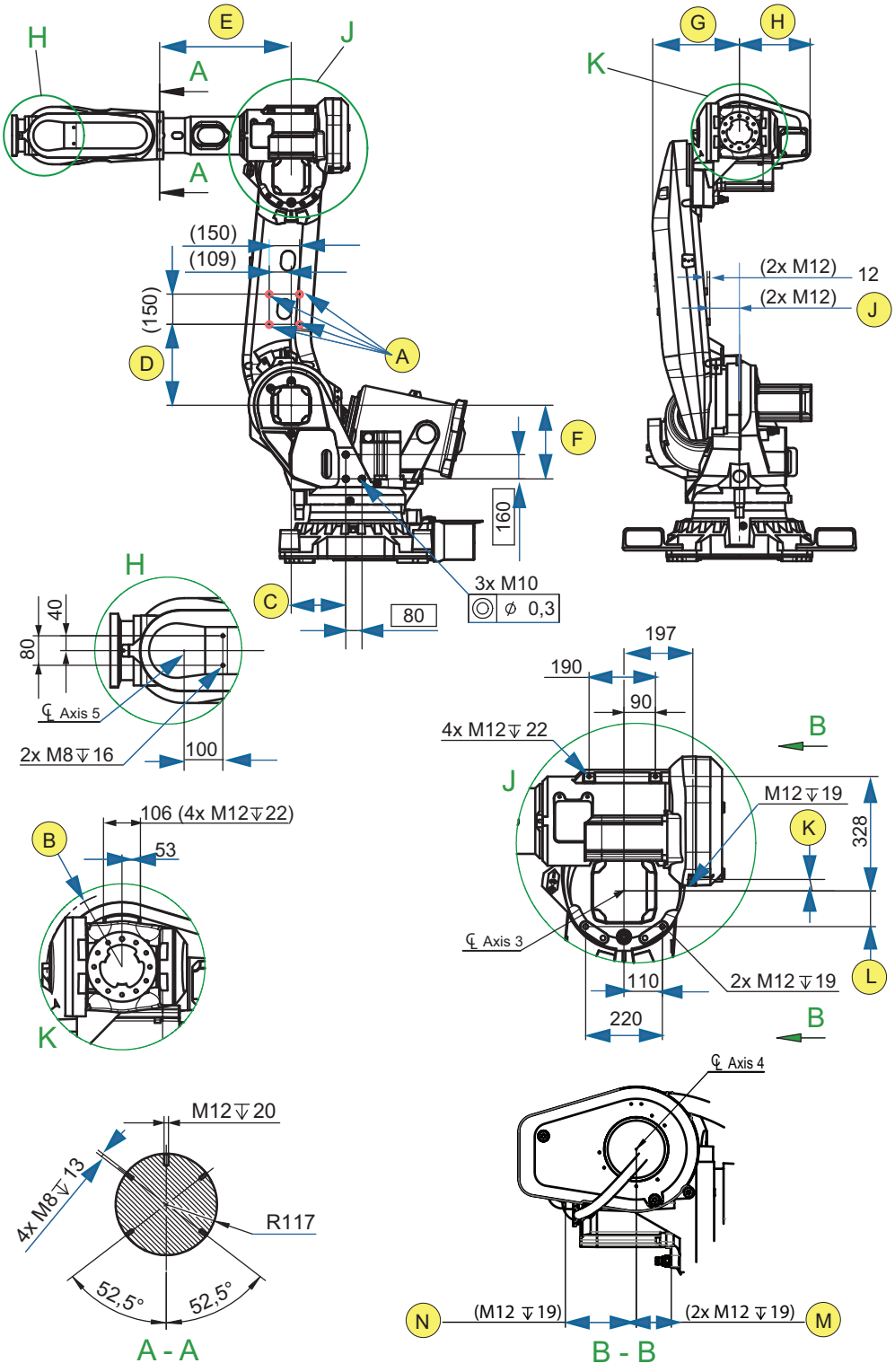
Holes for fitting extra equipment

Position of attachment holes - drawing 1



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

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1.6 Fitting equipment to the robot
Continued

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.

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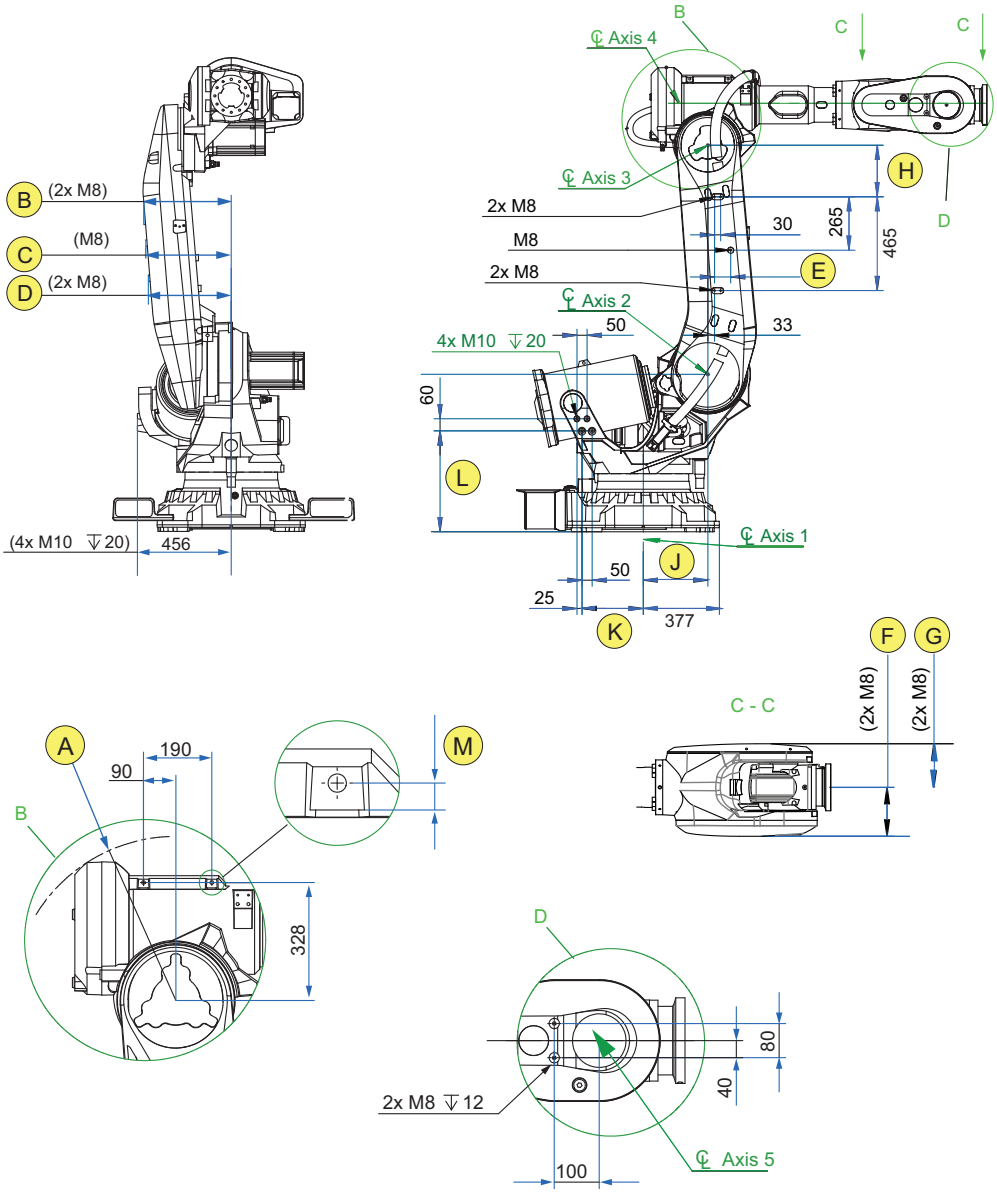
Position of attachment holes - drawing 2



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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

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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.

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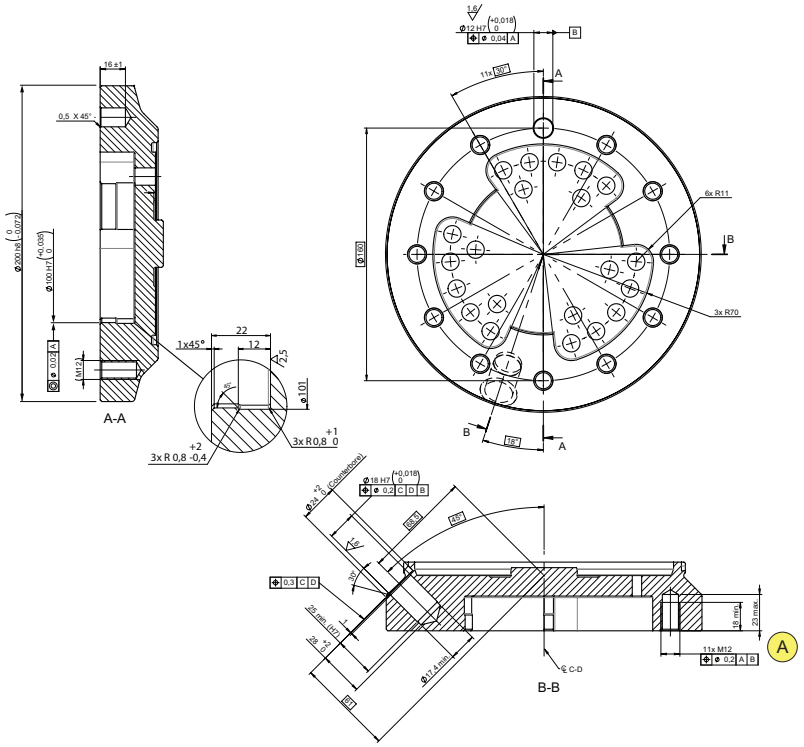
Tool flange, standard

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



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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.

Fastener quality

Use suitable screws and tightening torque for your application.

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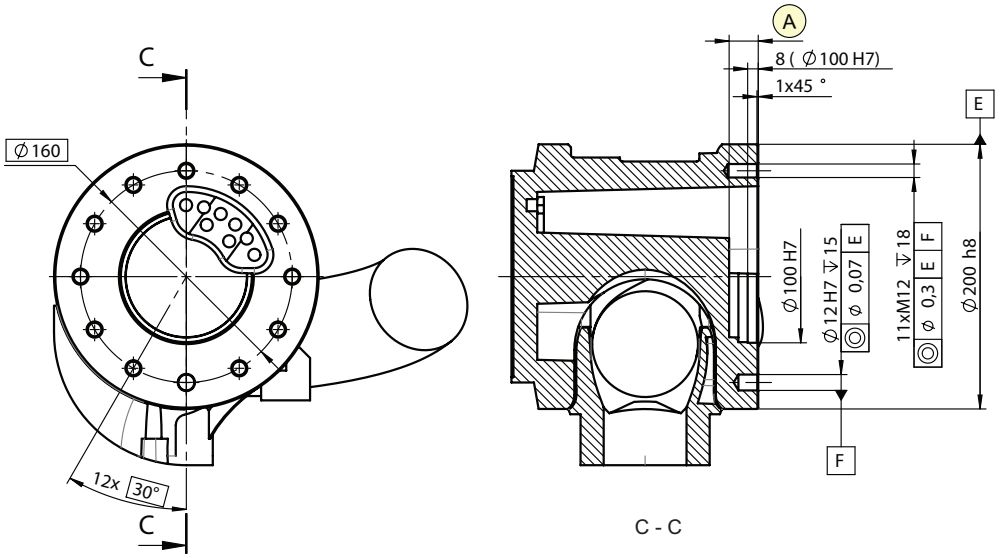
1.6 Fitting equipment to the robot
Continued

Tool flange, LeanID

Below is the tool flange for option 780-4, LeanID. The guide pin hole is, in calibration position, pointing upwards in Z-direction.



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A	Thread length: 18 mm.

Fastener quality

Use suitable screws and tightening torque for your application.

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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 manual - IRB 6700* and *Product manual - IRB 6700Inv*.

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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	±170° or ±220° (option)	±170°	
Axis 2	Arm motion	-65°/+85° [i]	±65° [ii]	
Axis 3	Arm motion	-180°/+70°	-180° [ii]/+70° [ii]	
Axis 4	Wrist motion	±300°	±300°	
Axis 5	Bend motion	±130° [iii]	±130° [iii]	
Axis 6	Turn motion	±360° [iv]	±360° [iv]	
		±93.7 revolutions	±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 *Independent axis* can be used for resetting the revolution counter after the axis has been rotated (no need for "rewinding" the axis).

i Working range for variants IRB 6700 - 300/2.70 and - 245/3.00:
+85° to -65° when axis 3 is within +70° to -45°
+85° to -58° when axis 3 is within +70° 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° to -120° for robots with LeanID, option 780-4.

iv Working range +220° to -220° for robots with LeanID, option 780-4.

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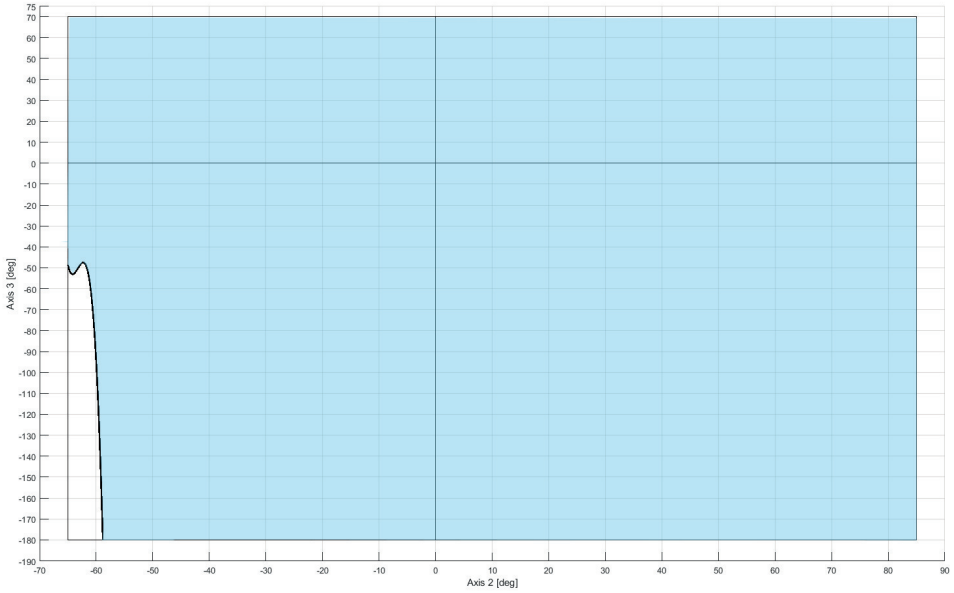
Working range axis 2 and axis 3 for IRB 6700-300/2.70 and -245/3.00

Limited in some areas to avoid collision with balancing.



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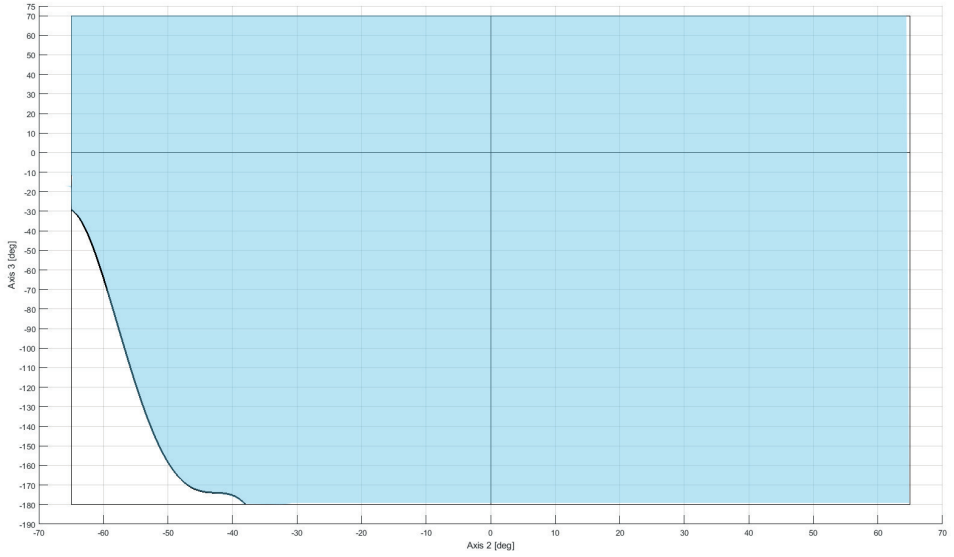
Working range axis 2 and axis 3 for IRB 6700Inv-300/2.60 and -245/2.90

Limited in some areas to avoid collision with balancing.



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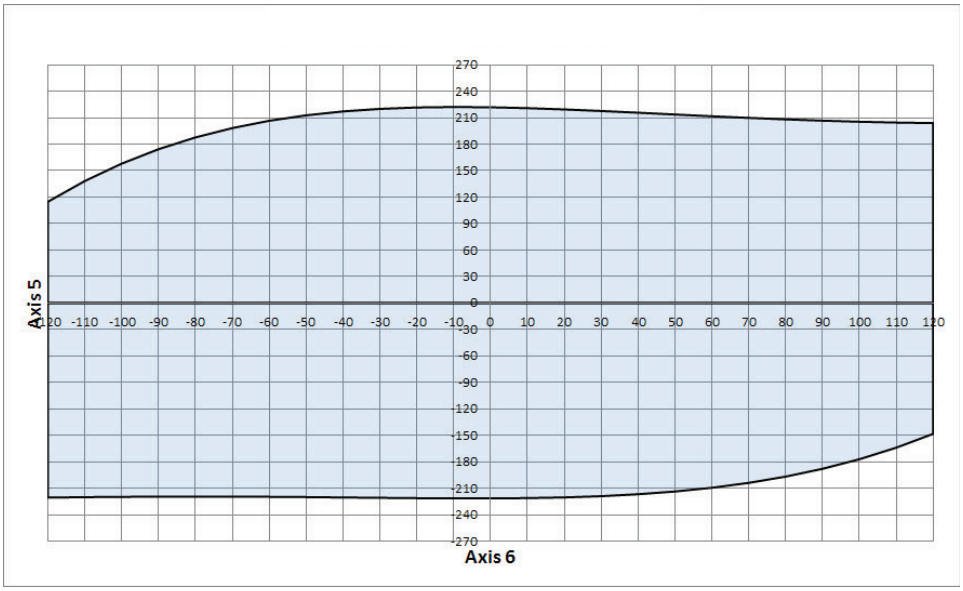
1.8.1 Robot motion
Continued

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

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



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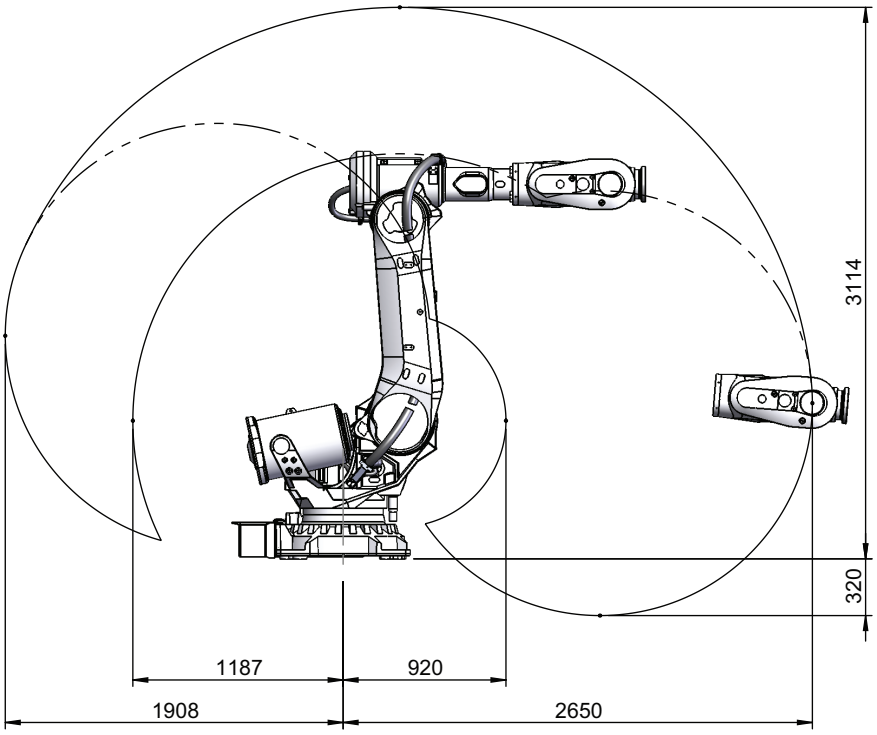
Working range

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



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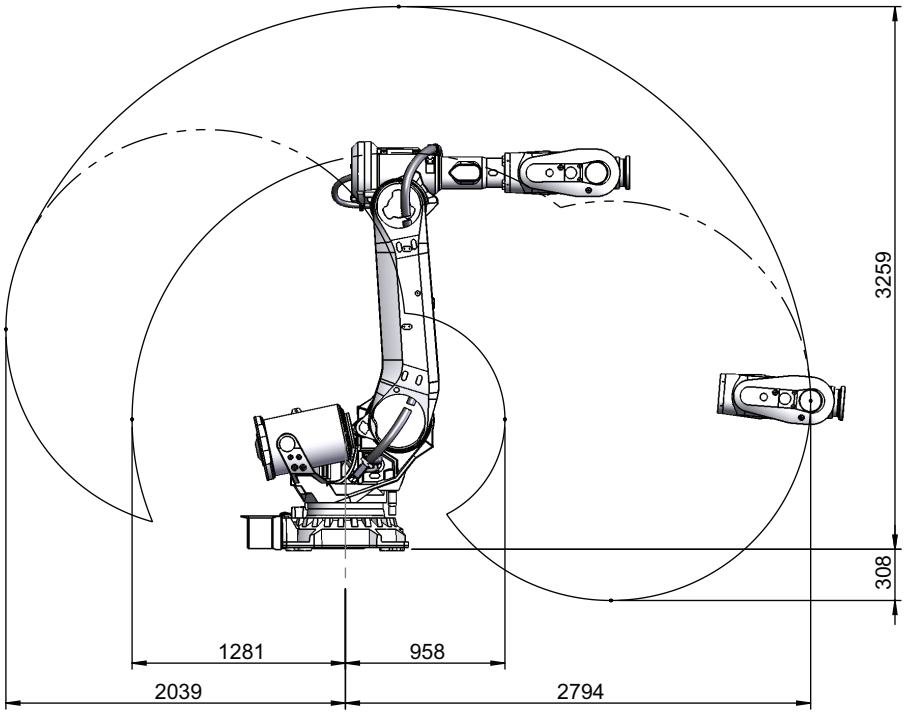
1.8.1 Robot motion

Continued

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



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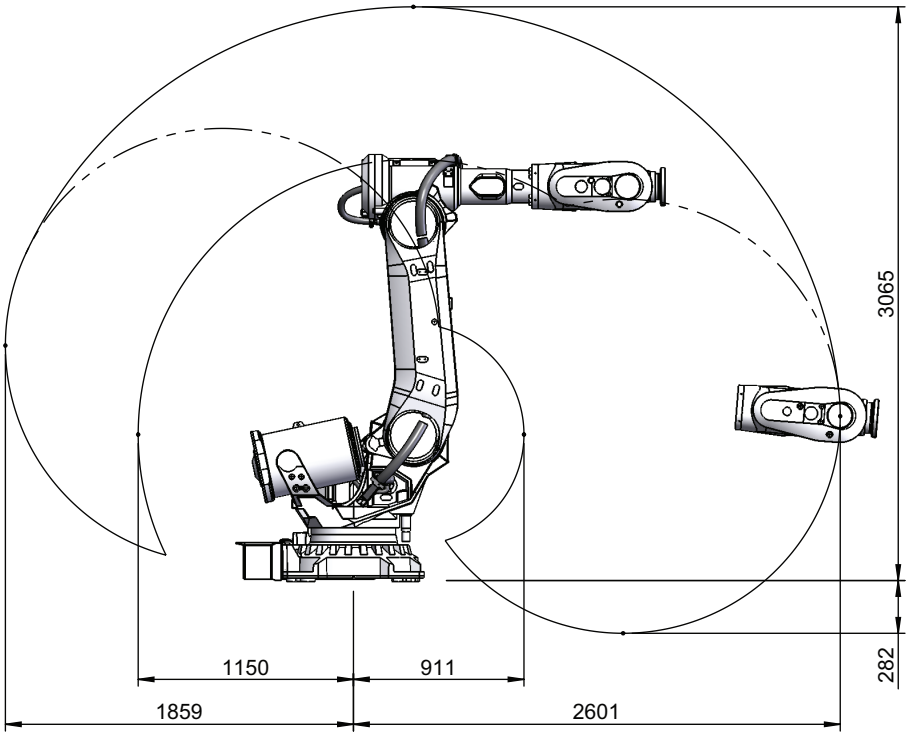
Robot type	Handling capacity (kg)	Reach (m)
IRB 6700	200	2.60



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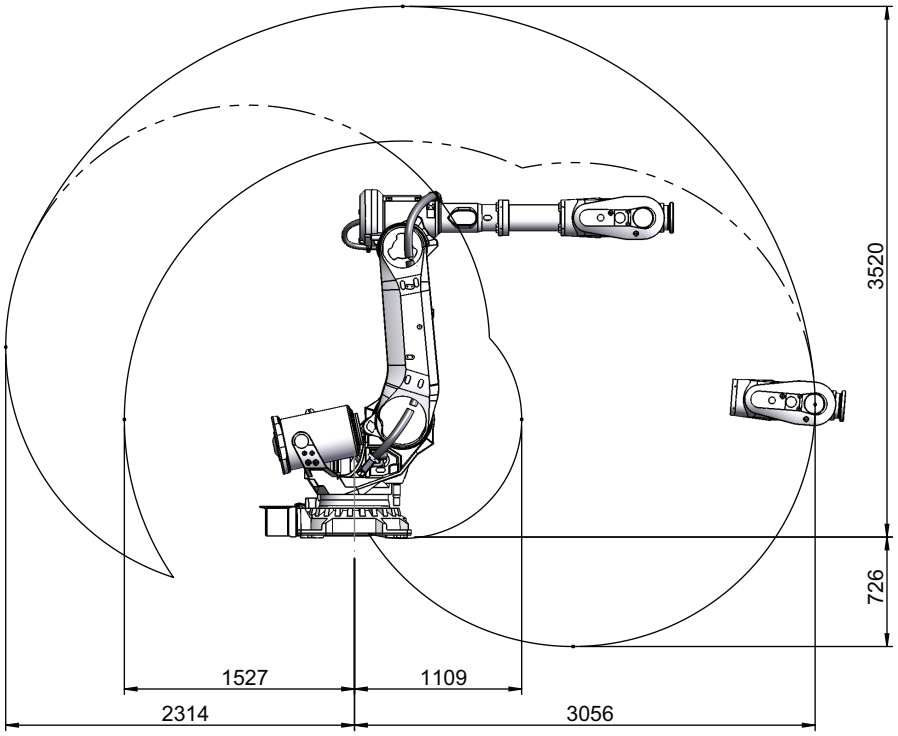
1.8.1 Robot motion

Continued

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



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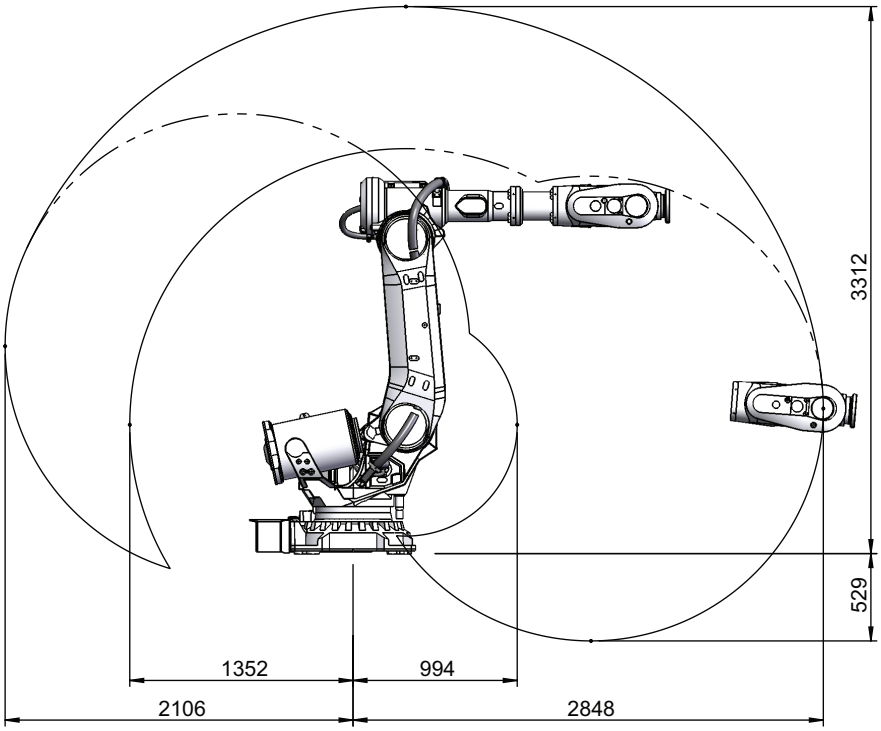
Robot type	Handling capacity (kg)	Reach (m)
IRB 6700	155	2.85



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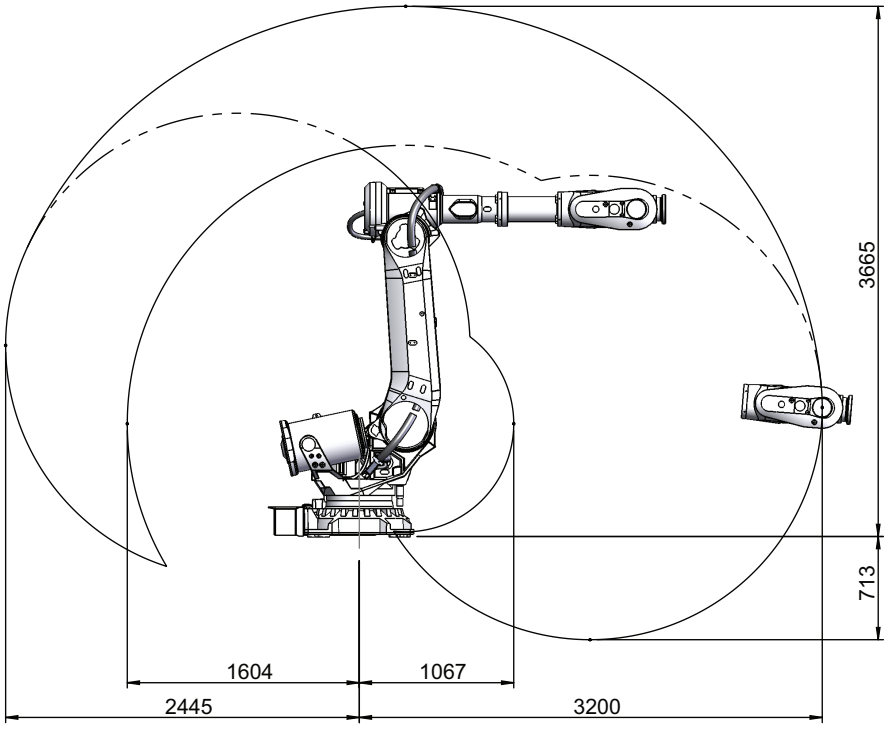
1.8.1 Robot motion

Continued

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



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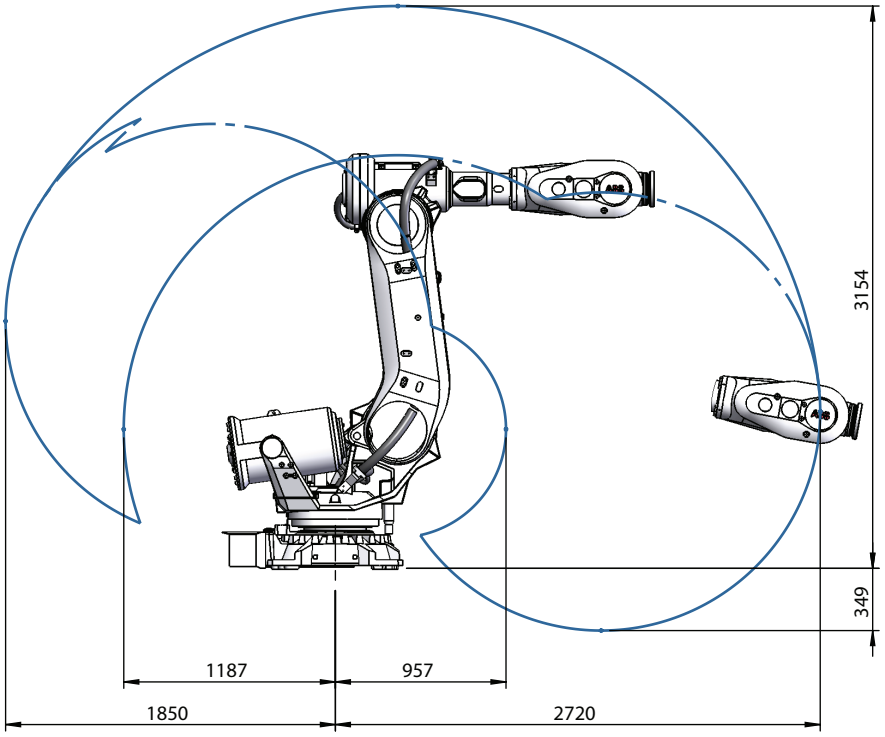
1.8.1 Robot motion
Continued

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



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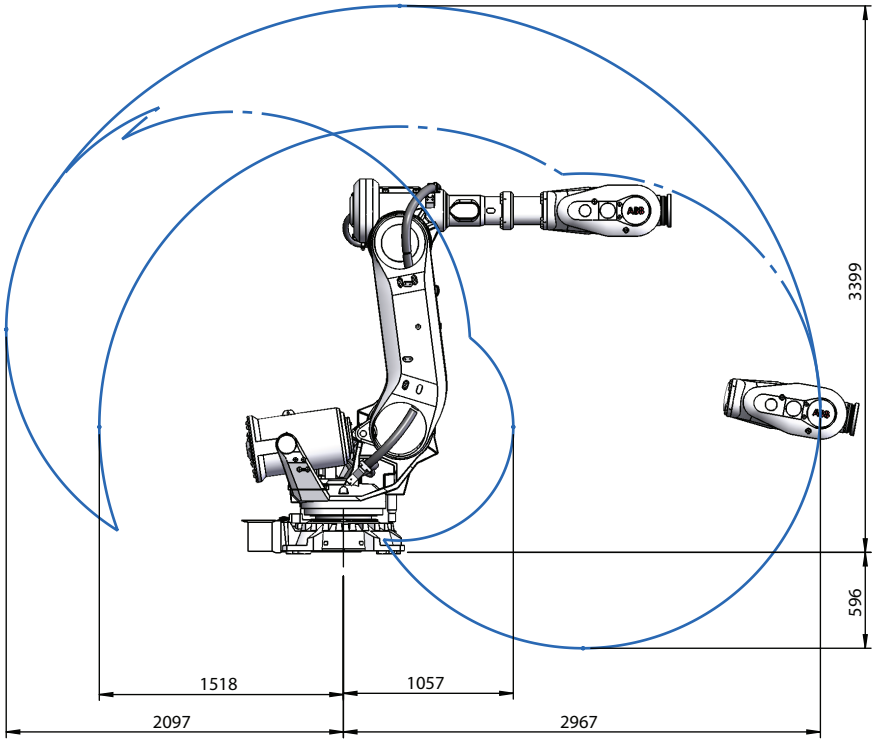
1.8.1 Robot motion

Continued

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



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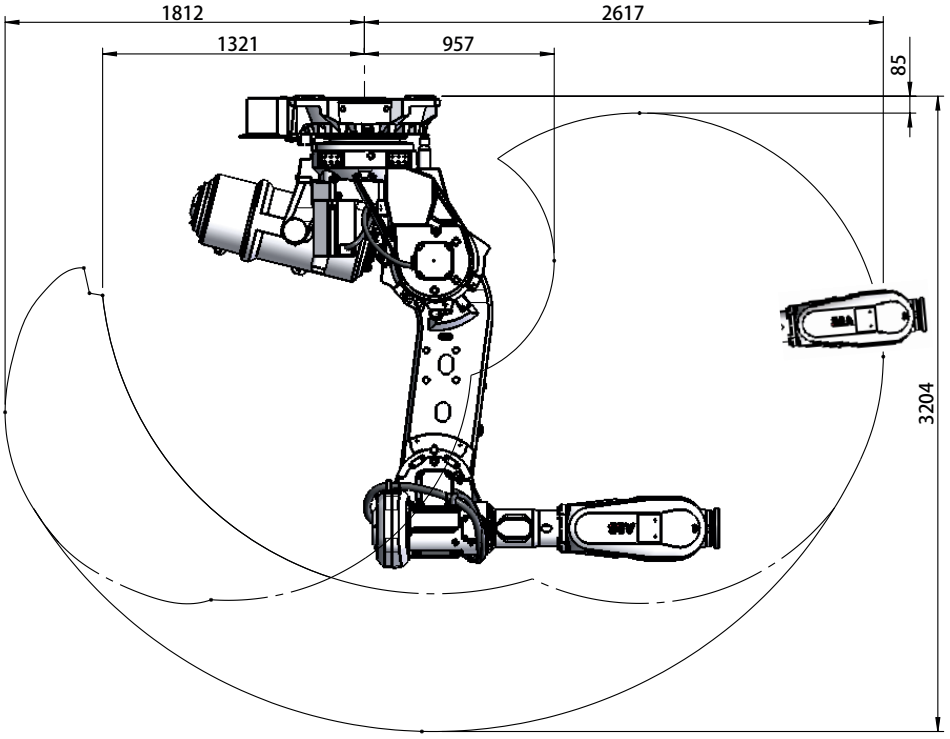
Robot type	Handling capacity (kg)	Reach (m)
IRB 6700Inv	300	2.60



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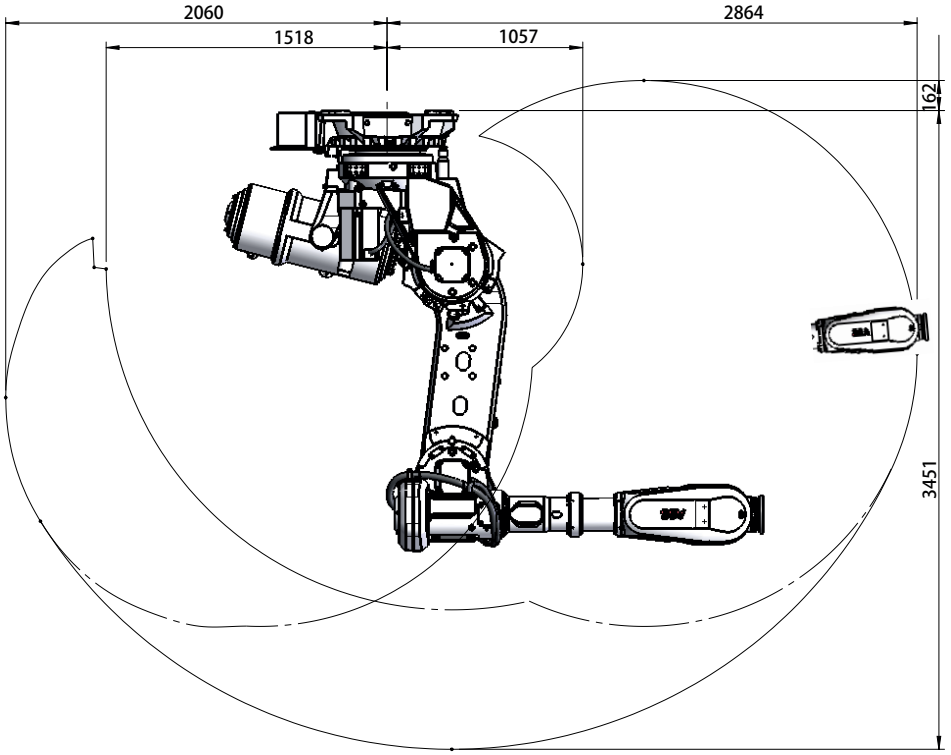
1.8.1 Robot motion

Continued

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



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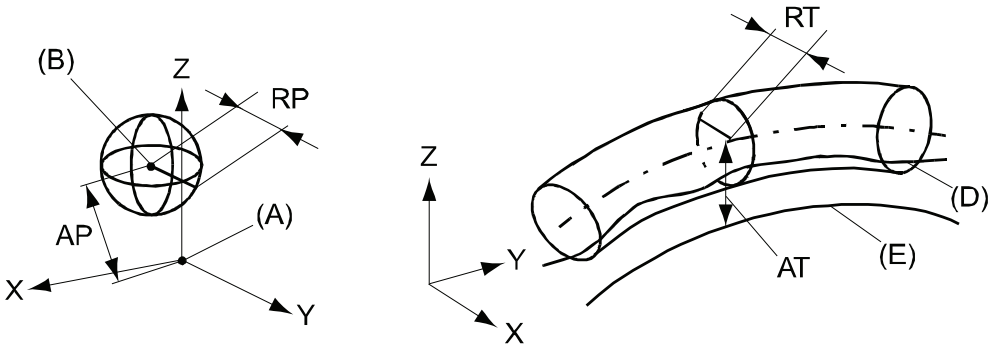
1.8.2 Performance according to ISO 9283

General

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

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



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

IRB 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.

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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.

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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).

Axis resolution

0.001° to 0.005°.

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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*).

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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.

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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.

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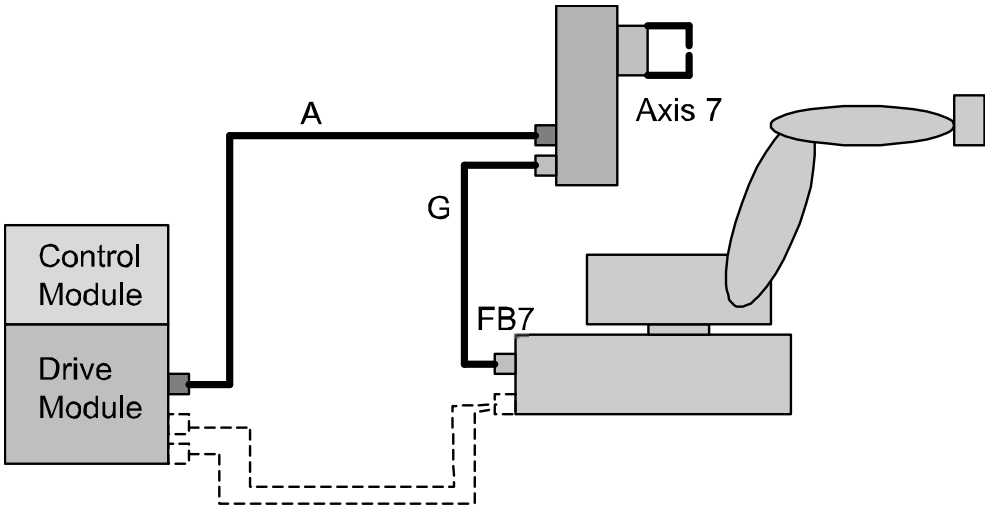
1.10.2 Stationary gun

General



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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.	*Product specification - Controller IRC5*
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.	*Product specification - Controller IRC5*

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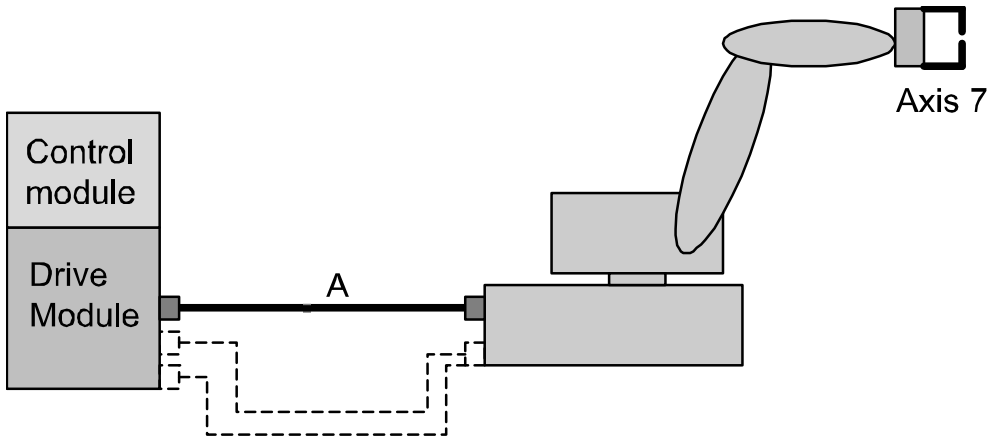
1.10.3 Robot gun

General



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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.	*Product specification - Controller IRC5*
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.	*Product specification - Controller IRC5*

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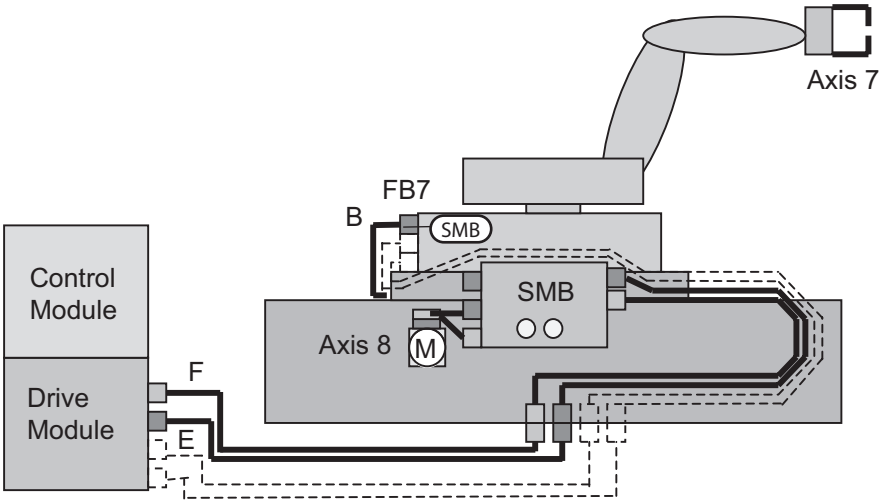
1.10.4 Robot gun and track motion

General



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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.

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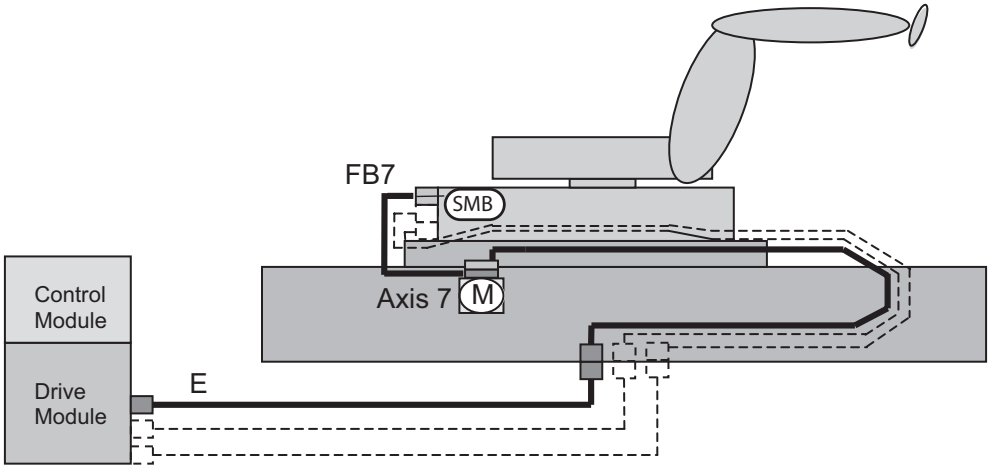
1.10.5 Track motion

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.



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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.	*Product specification - IRBT 4004/6004/7004*
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).	

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2 DressPack and SpotPack

2.1 Introduction

2.1.1 Included options

DressPack

Includes options for upper arm, lower arm and floor pos C, D and E, 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, process media (water and/or air) and power feeding (for spot welding power) for customer use.

Necessary supports and brackets are also included.

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

Note

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

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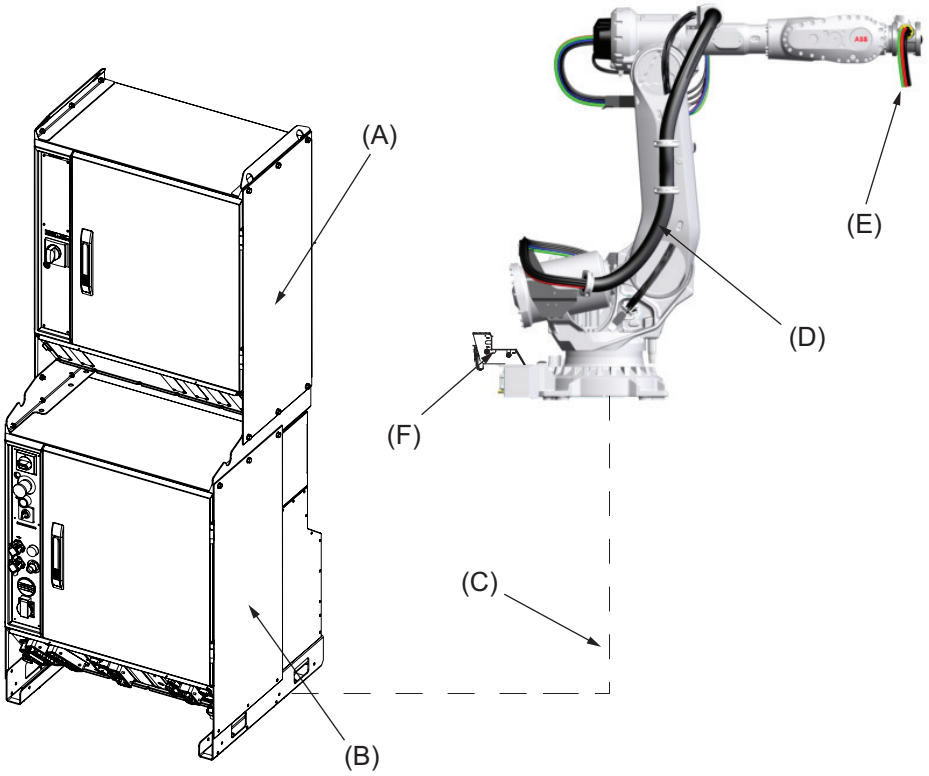
2.1.1 Included options
Continued

SpotPack

The package supplies the transformer gun/gripper with necessary media, such as compressed air, cooling water and electrical power. It includes the above described DressPack + Spot Welding cabinet, Water And Air unit pos A and F (if included) and software, see the following figure.



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Pos	Description
A	SpotPack, spot welding cabinet
B	Robot controller, (including 7th axis drive for servo gun)
C	DressPack, floor
D	DressPack, lower arm
E	DressPack, upper arm
F	SpotPack, water and air unit

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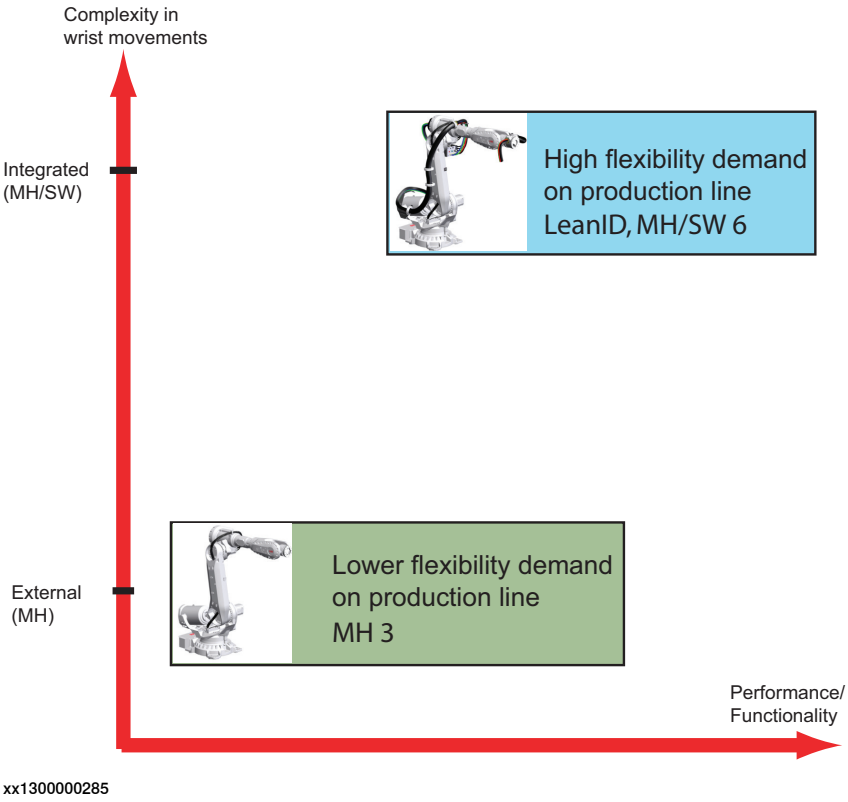
2.1.2 Product range

DressPack solutions for different users needs

The different robot types can be equipped with the well integrated cable and hose packages in the SpotPack or 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.

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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 or Water and Air unit (if such is mounted).
- Might restrict working range, see *Working range axis 5 and axis 6 for LeanID, option 780-4 on page 82*.

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°

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2.1.4 Impact on 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 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.

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2.1.5 Information structure

General

The information for SpotPack and DressPack is structured in the following way.

The SpotPack and DressPack can be delivered in five 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	SpotPack for handling the part against electrical servo driven transformer guns stationary mounted.

Spot welding application / SpotPack and DressPack

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

Spot welding cabinet

Section	Option	Description
2.5	Spot Welding Cabinet	Includes general description of Spot Welding cabinet with common information.

Water and air unit

Section	Option	Description
2.6	Water and Air unit	Includes general description of Water and Air unit with common information.

Connector kits

Section	Option	Description
2.7	Connector Kits	Includes general description of connector kits for SpotPack and DressPack.

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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	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

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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.

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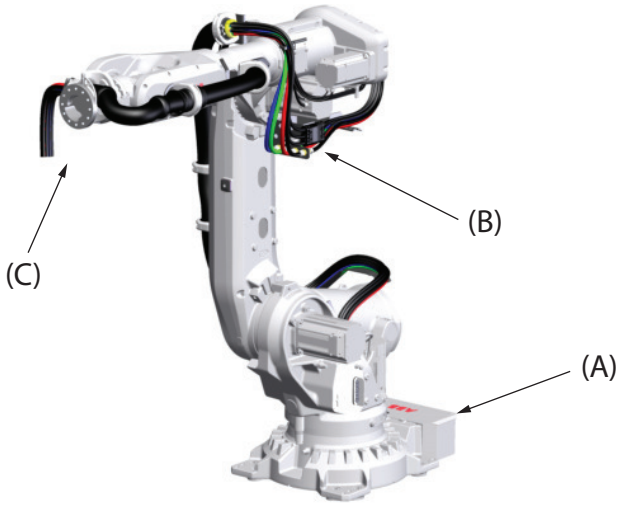
2.2.3 Interface descriptions for DressPack

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*.



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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

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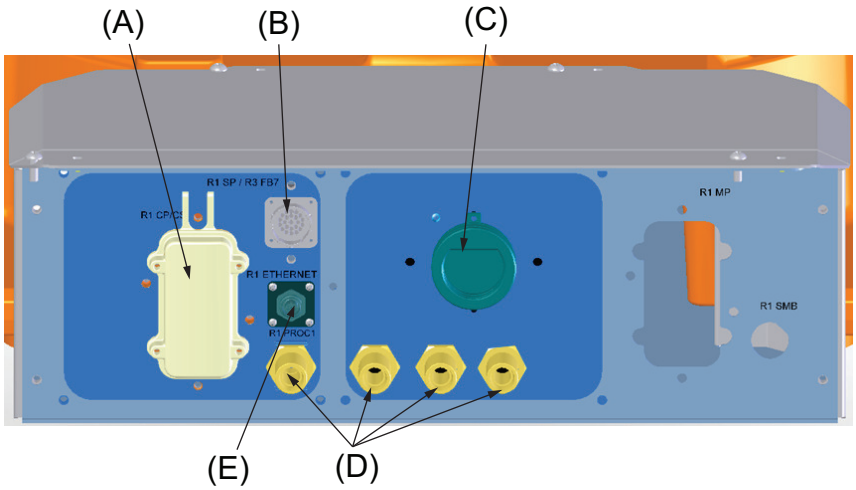
Base

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

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

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

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



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For corresponding parts of the tool, see *Connection kits on page 161*.

Pos	Description
A	R1.CP/CS
B	R1.SP (Spot Welding Servo gun) or FB7 (Resolver connection)
C	R1.WELD 3x35mm^2. (Spot Welding)
D	R1.PROC 1 (Material Handling/Spot Welding 1/2”, M22x1.5, 24 degree seal) R1.PROC 2 - 4 (Spot Welding 1/2”, M22x1.5, 24 degree seal)
E	R1.ETHERNET (M12 connector, when EtherNet communication is selected)

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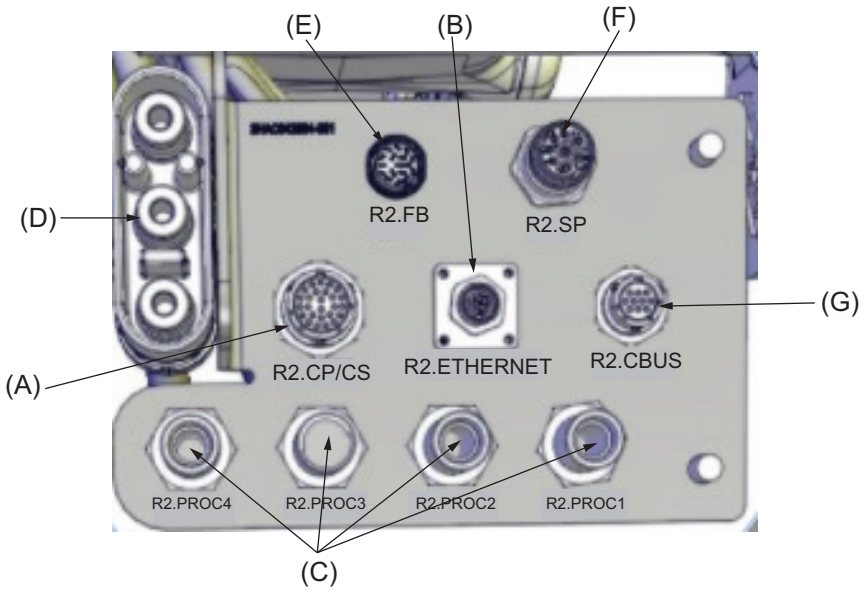
Axis 3

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

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

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

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



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For corresponding parts of the tool, see *Connection kits on page 161*.

Pos	Description
A	R2.CP/CS
B	R2.ETHERNET (M12 connector, when EtherNet communication is selected)
C	R2.PROC 1 (Material Handling 1/2”, M22x1.5, 24 degree seal) R2.PROC 2-4 (Spot Welding 1/2”, M22x1.5, 24 degree seal)
D	R2.WELD 3x35mm^2 (Spot Welding)
E	R2.FB7
F	R2.SP (Spot Welding Servo gun)
G	R2.CBUS (UTOW connector when Profibus or DeviceNet communication is selected)

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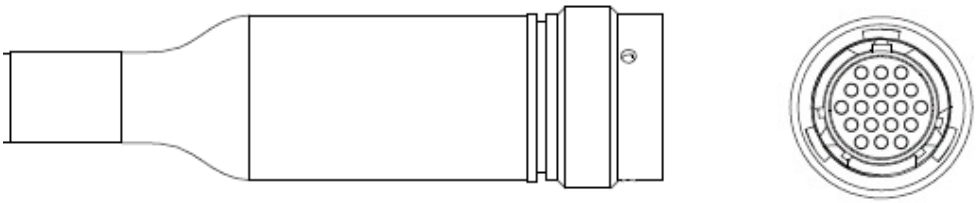
Axis 6

External

Material handling (option 780-3), 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 161*):



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EtherNet connector

Material handling (option 780-3), 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).

Name	Harting article
PIN connector, R3.ETHERNET	21 03 882 1405
PIN	61 03 000 0094
Sealing cap M12x1	3HAC033600-001 ABB article

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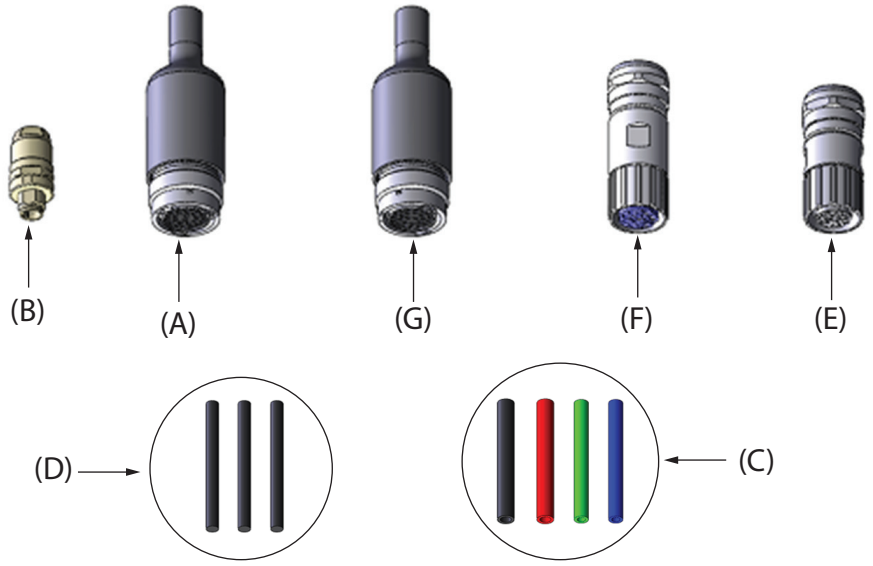
Integrated

Material Handling/Spot Welding option 780-4 (LeanID), 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 161* and within the UTOW product offer.



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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)

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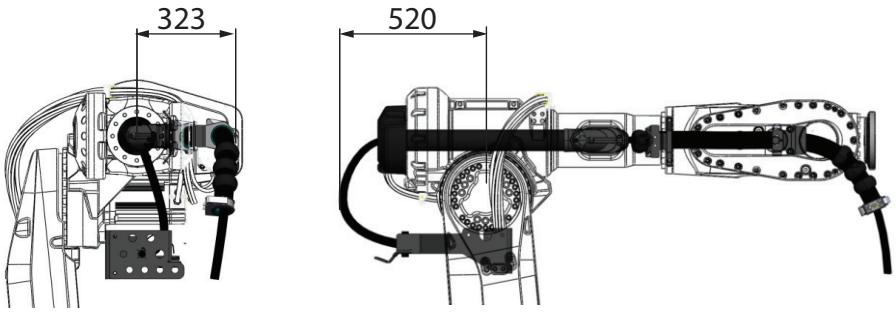
2.2.4 Dimensions

Dimensions for robot with DressPack

Dimensions are shown in figures below.



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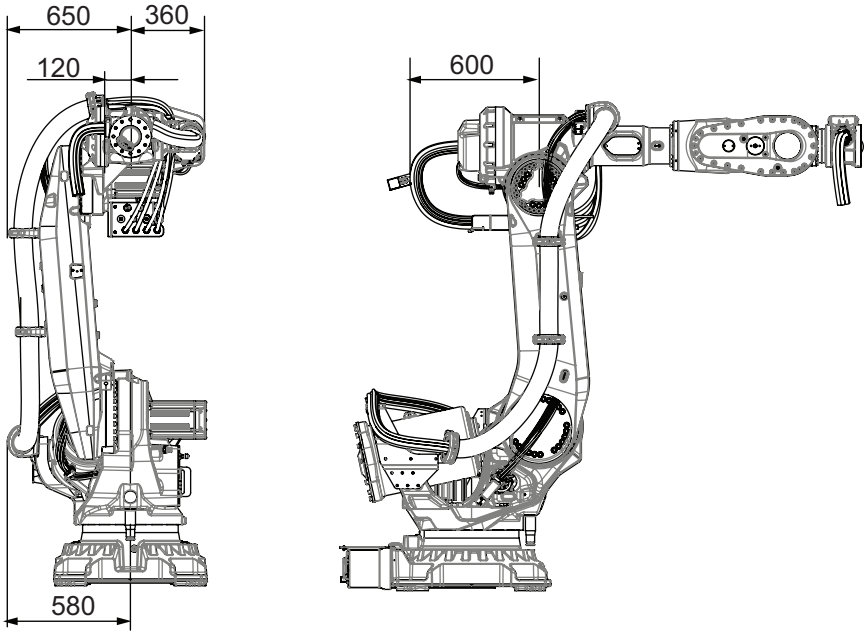
Axis 3 to axis 6 (option 780-3)



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

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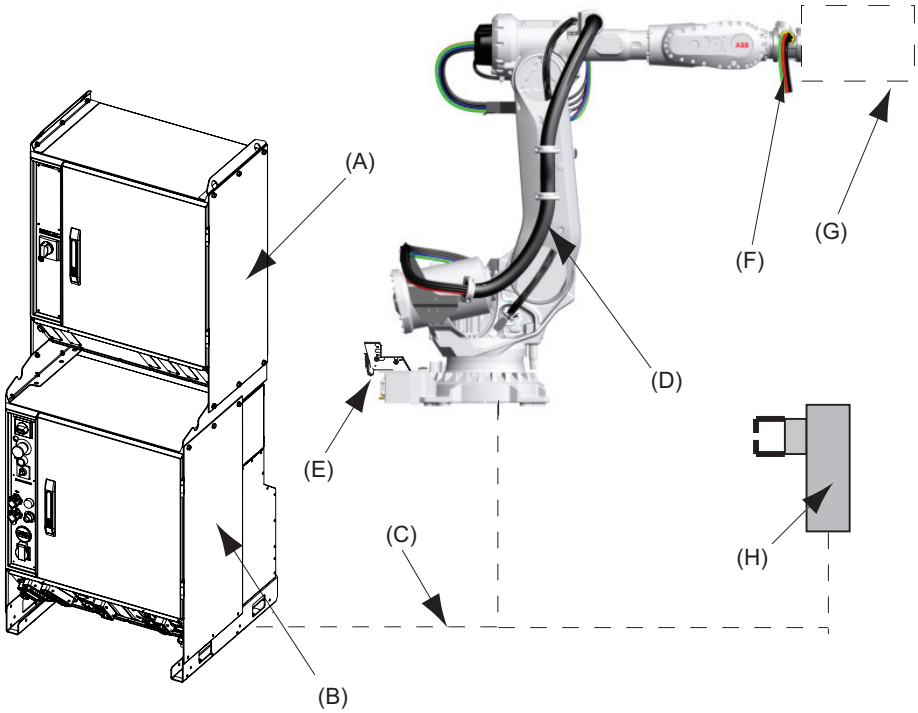
2.3 Type H/HSe

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.



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Pos	Name	
A	Spot Welding cabinet	For type HSe
B	Robot Cabinet IRC5	Incl. 7:th axis drive for servo gun, HSe
C	DressPack, Floor	
D	DressPack, Lower arm	
E	Water and Air unit with hoses	
F	DressPack, Upper arm	For type H and HSe
G	Robot Gripper	
H	Stationary gun	Pneumatic or servo controlled and HSe

Available configurations with linked option numbers are described below.

Continues on next page

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2.3.1 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 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.

Applicatioon 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	Option 780-3, Axis 3 to 6 External routing
		Option 780-4, Axis 3 to 6 Internal routing

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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, 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 [i]
Protective earth		1	0.75 mm^2	250 VAC [i]
Customer Signals (CS)				
Signals twisted pair	12	12 (6x2) [ii]	0.2 mm^2	50 V DC, 1 A rms
Signals twisted pair and separate shielded	8	8 (4x2)	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

[i] For option 780-3 50 VAC / 60 VDC.
[ii] For option 780-3 8 signals.

Continues on next page

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2.3.2 Configuration result for Type H HSe
Continued

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 [i]
Protective earth		1	0.75 mm^2	250 VAC [i]
Customer Signals (CS)				
Signals twisted pair	12	12 (6x2) [ii]	0.2 mm^2	50 V DC, 1 A rms
Signals twisted pair and 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

[i] For option 780-3 50 VAC / 60 VDC.
[ii] For option 780-3, 8 signals instead of 12.

Continues on next page

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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, 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 [i]
Protective earth		1	0,75 mm^2	250 VAC [i]
Customer Signals (CS)				
Signals twisted pair	12	12 (6x2) [ii]	0,2 mm^2	50 V DC, 1 A rms
Signals twisted pair and 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 diameter	Max. air pressure 16 bar/230 PSI

[i] For option 780-3 50 VAC / 60VDC.
[ii] For option 780-3, 8 singals instead of 12.

Continues on next page

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2.3.2 Configuration result for Type H HSe
Continued

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 [i]
Protective earth		1	0.75 mm^2	250 VAC [i]
Customer Signals (CS)				
Signals twisted pair	11	12 (4x3, 1 is N.C.) [ii]	0.2 mm^2	50 V DC, 1 A rms
Signals twisted pair and separate shielded	10	10 (5x2)	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 [iii]
Media				
Air (PROC 1)		1	12.5 mm inner diameter	Max. air pressure 16 bar/230 PSI

i For option 780-3 50 VAC / 60 VDC.
ii For option 780-3, 8 signals instead of 12.
iii Ethernet with wire colors according to PROFINET standard, M12-connectors.

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Required general options for Type HSe

To enable the SpotPack IRB 6700 to perform as intended, 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

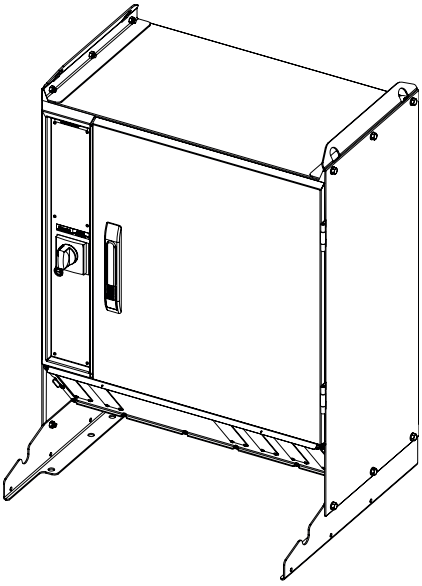
To enable the spot welding function package SpotPack IRB 6700 to run with a servo controlled gun, some additional (additional to those described in *Required general options for Type HSe on page 123*) servo drive options are required. These standard options are described under other chapters and are 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.

Required Spot Welding cabinet options for Type HSe

The SpotPack IRB 6700 also requires a Spot Welding cabinet (option 768-4) to perform as intended. Weld timer brand and weld capacity are stated by choosing the variant. Additional features could then be added to the cabinet variant. All these options are further described under *Spot Welding cabinet on page 145* but are also mentioned in this chapter.



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2.3.2 Configuration result for Type H HSe
Continued

Option	Type	Description
782-13	Bosch MFDC ProfiNet	This option gives a basic Spot Welding cabinet equipped with a weld timer from Bosch with an integrated inverter with basic capacity. Type Bosch PSI 61C0.751OEM.

Additional options to the Spot Welding cabinet are mentioned below. For further technical details as well as restrictions in combinations see *Spot Welding cabinet on page 145*

Option	Type	Description
788-1	Forced air cooling	Offers a cooling fan with housing placed on the rear of the Spot Welding cabinet which forces air on the cooling surface/grids of the thyristor or MFDC inverter.
789-1	Earth fault protection unit	Offers an earth fault protection integrated with the circuit breaker for the weld power.
790-1	Contactor for weld power	Offers a weld contactor with necessary wiring placed inside the Spot Welding cabinet.
791-1	Weld power cable, 7 m	Offers floor cable of 7 m length for weld power.
791-2	Weld power cable, 15 m	Offers floor cable of 15 m length for weld power.
809-1	Process cable to stationary gun, 7 m	Offers floor cable of 7 m length for process signals between the Spot Welding cabinet and to the stationary gun.
809-2	Process cable to stationary gun, 15 m	Offers floor cable of 15 m length for process signals between the Spot Welding cabinet and to the stationary gun.
858-1	Bosch Adaptive control	Offers additional functionality for adaptive welding regulation. Only possible with option 782-11.

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2.3.3 Interface description for stationary gun

General

The interface towards the stationary gun includes 3 common parts and 2 extra for servo gun.

Common parts:

- Signal interface with a signal connector type modular Harting

  (Cable option 809-1, -2).
- Power cable with a Multi Contact interface (Cable option 791-1 or option 791-2)

  (Ending Multi contact type MC TSB 150/35).
- Water and air connections made by the customer directly on the water and air unit. See *Water and air unit on page 153*.

Extra for servo gun:

- Servo power cable (Option 786-1,-2,-3 or -4). Cable goes from robot control cabinet to stationary gun and ends with a 23 pin Souriau connector (Type UT 061823SH).
- Resolver signal cable, 7 m length (included in option 785-5). Cable goes from robot foot R3.FB7 to stationary gun and ends with 8 pin Souriau connector

  (Type UT 06128SH)

The connector configurations are described in the circuit diagram.

The Harting connector is shown below. The different main parts within the connector are showed both with name and Harting article number. Corresponding parts at the tool are available within the Harting product offer.

Name	Harting article No.
Hood	09 30 010 0543
Hinged frame, hood	09 14 010 0303
Multicontact, female (HD)	09 14 025 3101
Multicontact, female (DD)	09 14 012 3101
Multicontact, female (EE)	09 14 008 3101

For the contacts above corresponding female crimp-contacts for the different cable diameters are required.

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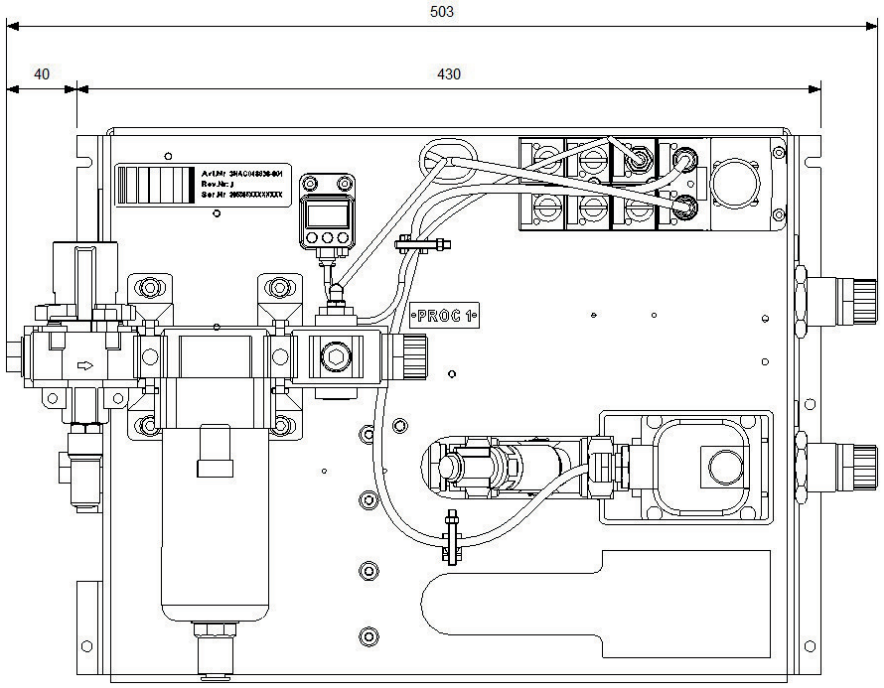
2.3.3 Interface description for stationary gun
Continued

Required Water and Air unit options for Type HSe

The SpotPack IRB 6700 also requires Water and Air unit options to perform as intended. These options are further described under *Water and air unit on page 153* and are also mentioned in this chapter.



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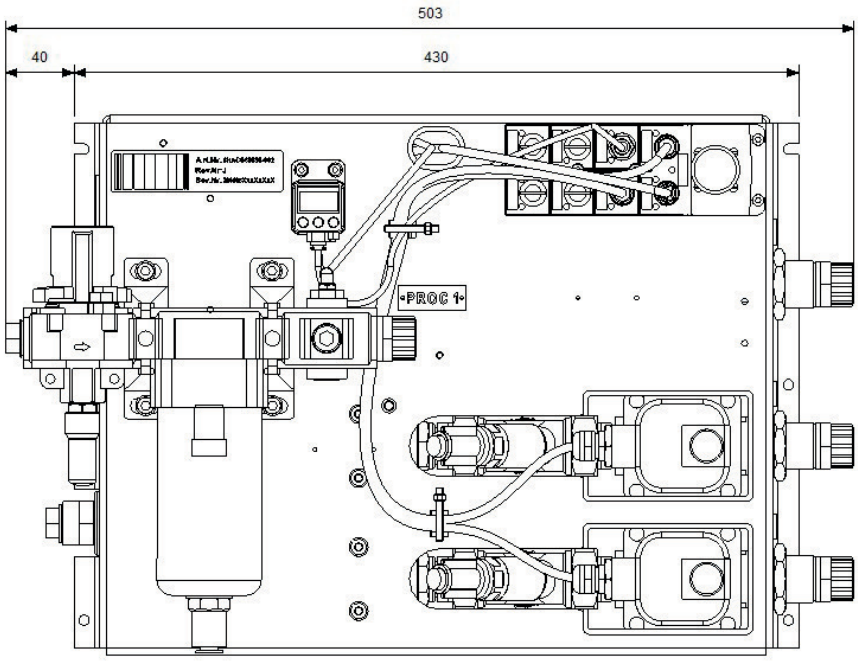

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Option	Type	Description
792-2	Water and Air unit, type HS	Offers the basic water and air unit for type HS including splitbox for signal distribution.
793-1	Second water return	Offers an additional water return circuit.
797-1	Cable to split box, 7 m	Offers floor cable of 7 m length for signals between the cabinet and to the split box placed on the water and air unit.
797-2	Cable to split box, 15 m	Offers floor cable of 15 m length for signals between the cabinet and to the split box placed on the water and air unit.
797-3	Cable to split box, 22 m	Offers floor cable of 22 m length for signals between the cabinet and to the split box placed on the water and air unit.
797-4	Cable to split box, 30 m	Offers floor cable of 30 m length for signals between the cabinet and to the split box placed on the water and air unit.

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2.3.4 Summary common options Type H HSe

General

The following options are the minimum required to form a complete SpotPack 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)
- Option778-1. Material Handling
- Option 798-3. DressPack Lower arm (Routing type to be stated)
- Option 780-3, -4. DressPack Upper arm (Routing type to be stated)

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2.3.5 Summary options required for Type HSe

General options

- Option 727-1. 24V 8 Amps power supply
- Option 635-6. Spot (only for type HS)

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

Spot Welding cabinet

- Option 768-4. Spot Welding large
- Option 782-13. Weld timer capacity
- Option 791-1. Power cable 7 m (other lengths available)
- Option 809-1. Process cable to stationary gun (other lengths available)

Water and air unit

- Option 792-2. Water and air unit, Type HS
- Option 797-1. Splitbox cable 7 m. (other lengths available)

Other described options depend on specific system need and performance.

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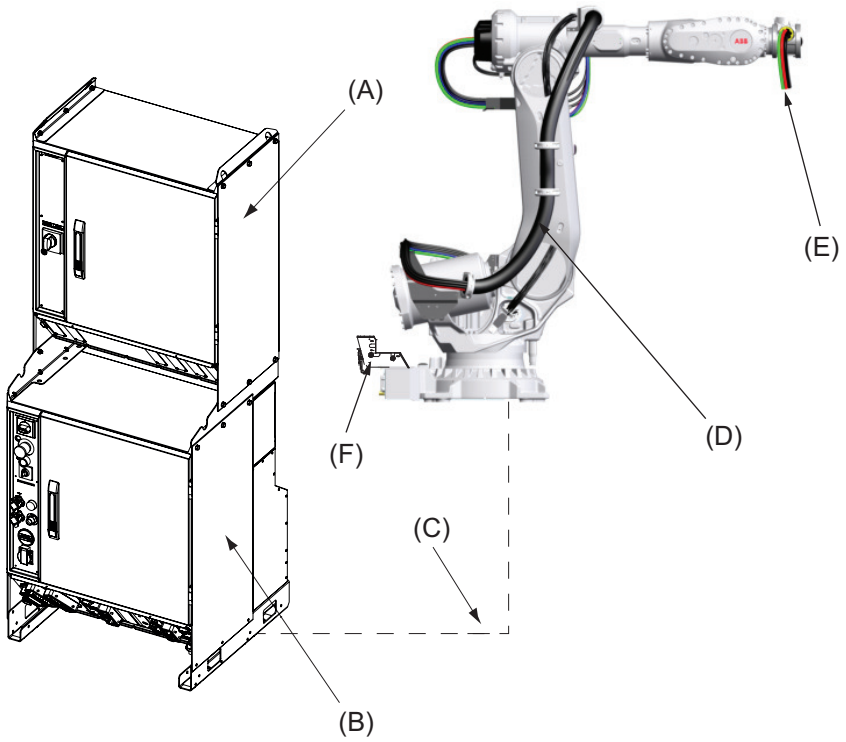
2.4 Type Se

2.4.1 Introduction

General

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



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Position	Name
A	Spot Welding cabinet
B	Robot Cabinet IRC5 (including 7th axis drive), Se
C	DressPack, Floor
D	DressPack, Lower arm
E	DressPack, Upper arm
F	Water and Air unit with hoses

Available configurations with linked option numbers are described below. To achive the specific servo motor connections within the DressPack for Type Se option *785-1 Robot gun* must also to be chosen. See *Robot gun on page 100* for details.

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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

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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, 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 twisted pair	12	12 (6x2)	0.2 mm^2	50 V DC, 1 A rms
Signals twisted pair and 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 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 mm^2, only upper arm, 135 A rms

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

Type Se	At terminals in cabinet	At connection point. Base, axis 2/3 or axis 6	Cable/part area	Allowed capacity
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 twisted pair	12	12 (6x2)	0.2 mm^2	50 V DC, 1 A rms
Signals twisted pair and 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 resolver	-	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 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 mm^2, only upper arm, 135 A rms

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2.4.2 Configuration result for Type Se
Continued

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 twisted pair	12	12 (6x2)	0.2 mm^2	50 V DC, 1 A rms
Signals twisted pair and 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 mm^2, only upper arm, 135 A rms

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

Type Se	At terminals in cabinet	At connection point. Base, axis 3 or axis 6	Cable/part area	Allowed capacity
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 twisted pair	12	12 (6x2)	0.2 mm^2	50 V DC, 1 A rms
Signals twisted pair and separate shielded	4	4 (2x2)	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 resolver	-	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 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 mm^2, only upper arm, 135 A rms

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2.4.2 Configuration result for Type Se
Continued

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 twisted pair	12	12 (6x2)	0,2 mm^2	50 V DC, 1 A rms
Signals twisted pair and 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 mm^2, only upper ar, 135 A rms

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

Type Se	At terminals in cabinet	At connection point. Base, axis 3 or axis 6	Cable/part area	Allowed capacity
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 twisted pair	12	12 (6x2)	0,2 mm^2	50 V DC, 1 A rms
Signals twisted pair and separate shielded	4	4 (2x2)	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 resolver	-	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 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 mm^2, only upper arm, 135 A rms

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2.4.2 Configuration result for Type Se
Continued

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 twisted pair	12	12 (6x2)	0.2 mm^2	50 V DC, 1 A rms
Signals twisted pair and 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, 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 mm^2, 135 A rms

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

Type Se	At terminals in cabinet	At connection point. Base, axis 2/3 or axis 6	Cable/part area	Allowed capacity
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 twisted pair	12	12(6x2)	0.2 mm^2	50 V DC, 1 A rms
Signals twisted pair and 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 resolver	-	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 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, 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 mm^2, 135 A rms

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2.4.2 Configuration result for Type Se
Continued

Required general options for Type Se

To enable the SpotPack IRB 6700 to perform as intended, 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 options for servo gun, type Se

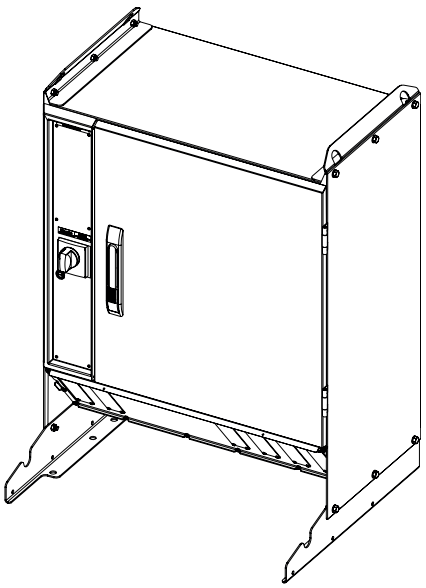
To enable the spot welding function package SpotPack IRB 6700 to run with a servo controlled gun, some additional (additional to those described in *Required general options for Type Se on page 140*) servo drive options are required. These standard options are described under other chapters and are also 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.

Required Spot Welding cabinet options for Type Se

The SpotPack IRB 6700 also requires a Spot Welding cabinet (option 768-4) to perform as intended. Weld timer brand and weld capacity are stated by choosing the variant. Additional features could then be added to cabinet variant. All these options are further described under *Spot Welding cabinet on page 145* and are also mentioned in this chapter.



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Option	Type	Description
782-13	Bosch MFDC ProfiNet	This option gives a basic Spot Welding cabinet equipped with a weld timer from Bosch with an integrated inverter with basic capacity. Type Bosch PSI 61C0.751OEM.

Additional options to the Spot Welding cabinet are mentioned below. For further technical details as well as restrictions in combinations see *Spot Welding cabinet on page 145*

Option	Type	Description
788-1	Forced air cooling	Offers a cooling fan with housing placed on the rear of the Spot Welding cabinet which forces air on the cooling surface/grids of the thyristor or MFDC inverter.
789-1	Earth fault protection unit	Offers an earth fault protection integrated with the circuit breaker for the weld power.
790-1	Contactor for weld power	Offers a weld contactor with necessary wiring placed inside the Spot Welding cabinet.
791-1	Weld power cable, 7 m	Weld power cable, 7 m
791-2	Weld power cable, 15 m	Offers floor cable of 15 m length for weld power.
858-1	Bosch Adaptive control	Offers additional functionality for adaptive welding regulation. Only possible with option 782-11.

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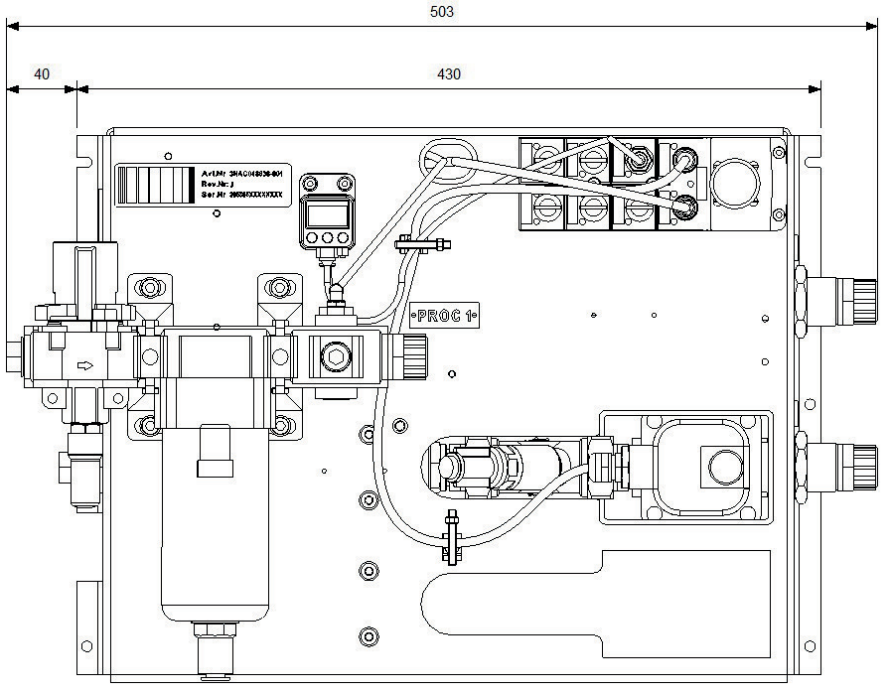
2.4.2 Configuration result for Type Se
Continued

Required Water and Air unit options for Type Se

The SpotPack IRB 6700 also requires Water and Air unit options to perform as intended. These options are further described under *Water and air unit on page 153* and are also mentioned in this chapter.



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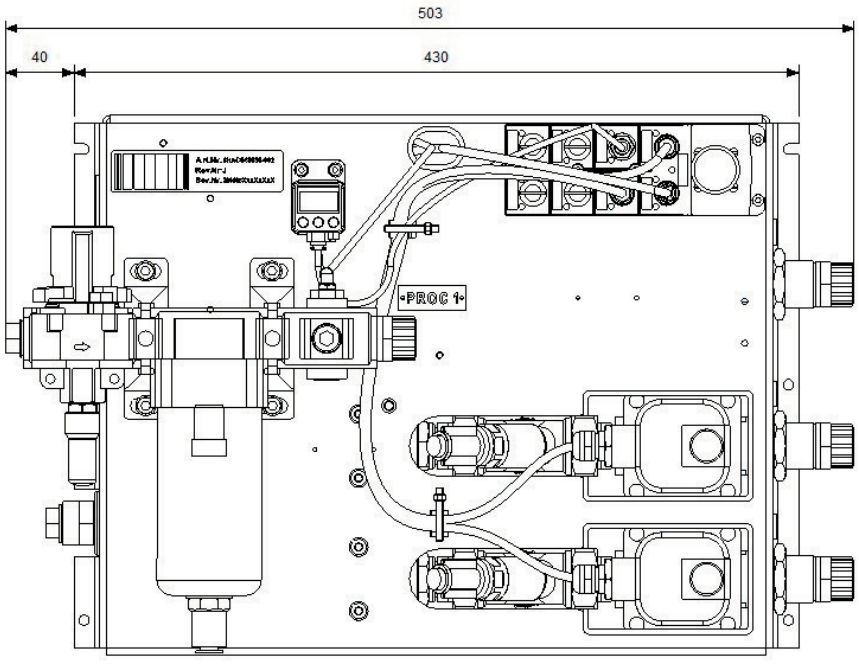

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Option	Type	Description
792-1	Water and Air unit, type S	Offers the basic water and air unit for type S including splitbox for signal distribution.
793-1	Second water return	Offers an additional water return circuit.
797-1	Cable to split box, 7 m	Offers floor cable of 7 m length for signals between the cabinet and to the split box placed on the water and air unit.
797-2	Cable to split box, 15 m	Offers floor cable of 15 m length for signals between the cabinet and to the split box placed on the water and air unit.
797-3	Cable to split box, 22 m	Offers floor cable of 22 m length for signals between the cabinet and to the split box placed on the water and air unit.
797-4	Cable to split box, 30 m	Offers floor cable of 30 m length for signals between the cabinet and to the split box placed on the water and air unit.

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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

General options

- Option 727-1. 24V 8 Amps power supply
- Option 635-6. Spot. (only for type S)

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

Spot Welding cabinet

- Option 768-4. Spot Welding large
- Option 782-13. Weld timer capacity
- Option 791-1. Power cable 7 m (other length available)

Water and air unit

- Option 792-1. Water and air unit, Type S
- Option 797-1. Splitbox cable 7 m (other lengths available)

Other described options depend on specific system need and performance.

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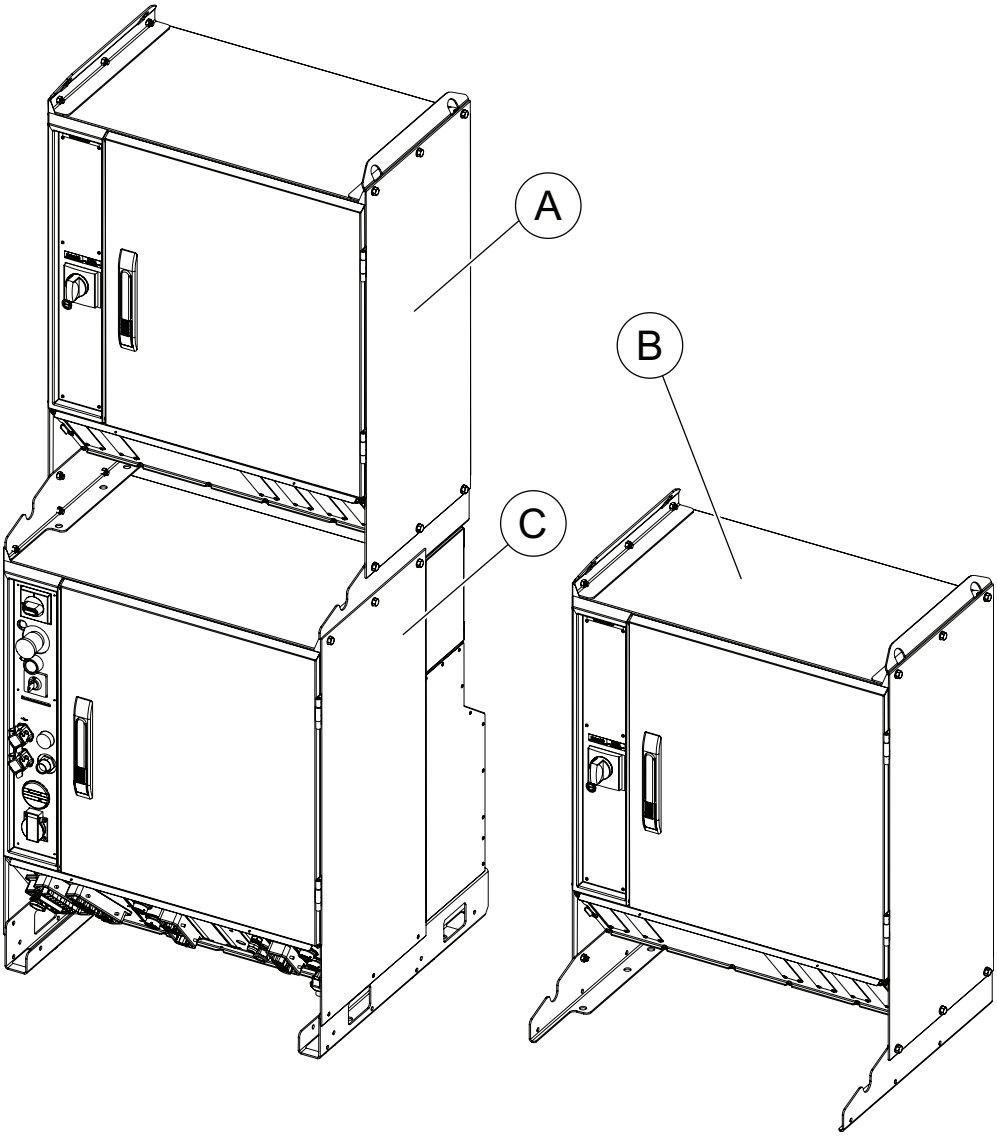
2.5 Spot Welding cabinet

2.5.1 Introduction to Spot Welding cabinet

General

The Spot Welding cabinet for SpotPack contains the electric components and circuits needed for spot welding application. The Spot Welding cabinet, with the welding controller build in, is controlled from the robot controller via the processor software. The capacity and functionality depends on the choice of different option combinations.

The Spot Welding cabinet is designed to be placed on top of the robot controller cabinet (Single cabinet version option 700-3), see Figure below. This is also how it is assembled at delivery.



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A	Spot welding cabinet, mounted on IRC5 controller

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2.5.1 Introduction to Spot Welding cabinet
Continued

B	Spot welding cabinet, standing on the floor
C	IRC5 controller

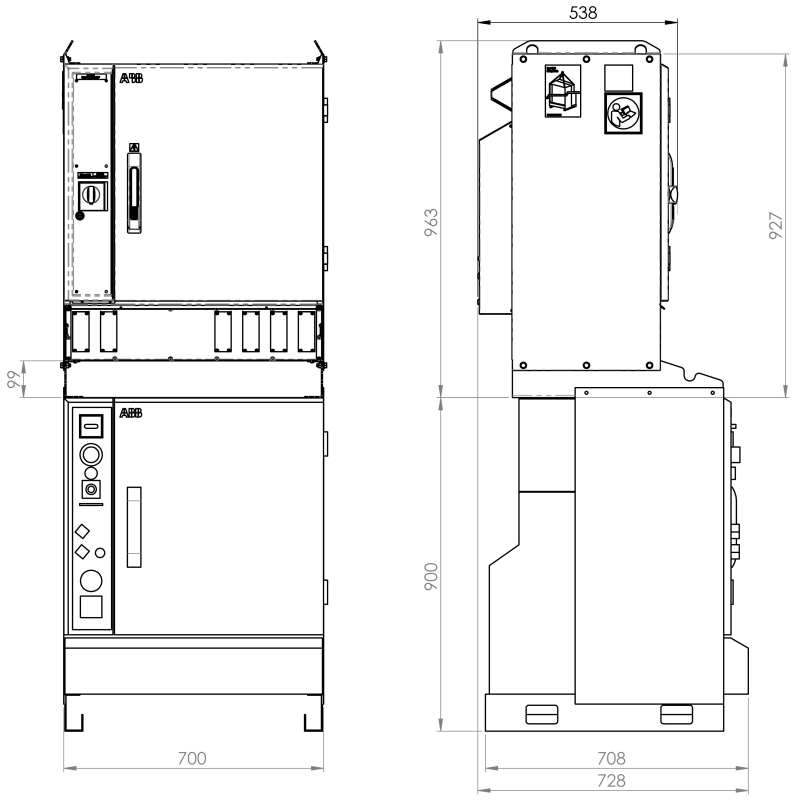
There are interface cables between the robot controller cabinet and the Spot Welding cabinet (cable length 1.5 m, connected at rear of the control cabinet and at front of Spot Welding cabinet). These cables includes power feeding for control circuits, process signals to the welding gun, safety signals, communication towards weld timer and I/O:s for indication and control. Depending on chosen options wiring will differ (see option descriptions below for further details).

The Spot Welding cabinet has the following common main features.

- Modular build for easy repair and installation (see Figure below)
- Rotary switch with adjustable thermal release and short circuit release
- Cross connection of signal handling with separate fusing for different circuits to achieve selectivity
- Programmable weld timer with proportional valve control
- A compact cabinet family based on a common platform prepared for additional options and for easy exchange

Note

Dimensions of the large cabinet within brackets.



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Weld power circuit

The electrical circuits of the Spot Welding cabinet consists of weld power circuit and control circuits to control the welding. The welding power for the welding gun is fed through a circuit breaker and inverter (for MFDC welding) and further out to the welding power cable. The cabinet is prepared for power feeding from the floor or from top. The welding power cable (outgoing feeding) is connected, via cable gland, directly to terminals inside the Spot Welding cabinet.

The circuit breaker has a built in thermal release that could be adjusted for customer specific needs to protect welding equipment and to get selectivity in the power circuit. The thermal release is set at 100 A at delivery. The maximum level should not exceed 100 A.

Control Circuits

Power feeding 240/115 V AC and 24V DC for the control circuits is fed from the robot controller cabinet. Also, the safety circuits in the robot controller cabinet are used to interlock the welding timer.

A welding timer (Bosch), integrated with the air cooled inverted, controls the welding current. The welding timer includes control program that gives possibility to program different weld sequences. The programming is normally done on a programming device or a PC that is connected directly to the welding timer. The interface between the robot system and the welding timer is handled via a field bus interface (ProfiNet). Examples of signals are weld start, weld ready, weld programs choice and error handling.

Also, cross connections, of interface signals and interlocking between the robot system (I/O-boards), the water and air unit, signals to DressPack or stationary gun, are done within the Spot Welding cabinet.

Programming device for the welding timer is not included in the delivery.

If the option 744-1 is chosen there will follow a door interlock with the Spot Welding cabinet.

Note

For more information see:

- Product manual for DressPack/SpotPack
- Circuit diagrams
- Separate manuals for the Bosch equipment

The welding capacity as well as the weld timer brand described below. Additional features could then be added to each of the cabinet variants.

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2.5.1 Introduction to Spot Welding cabinet
Continued

Option 782-13 Bosch MFDC ProfiNet

This option gives a basic Spot Welding cabinet equipped with a weld timer from Bosch with an integrated inverter with basic capacity.

General technical data

Technical data	IEC
Weld timer and inverter	Bosch PSI 61C0.751OEM
Max wire range, incoming power	3x70 mm^2
Power feeding	400-480 V AC
Max welding current	110 A rms, 20 kA weld current
Protection class	IP54

Specific technical data large cabinet

Technical data	IEC
Main breaker (ABB Sace XT1), thermal release	100 A (adjustable) 70-100 A
Main breaker, magnetic release	36 kA

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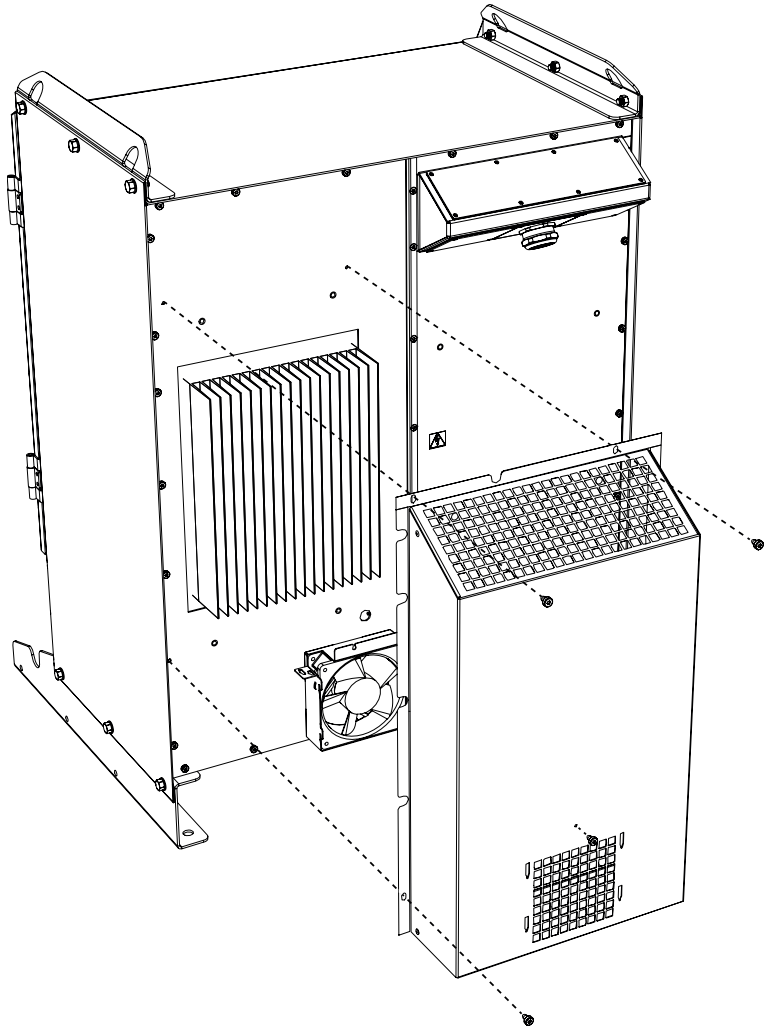
Option 788-1 Forced air cooling

Offers a cooling fan with housing placed on the rear of the Spot Welding cabinet which forces air on the cooling surface/grids of the thyristor or MFDC inverter (see pictures below). Cabling to the fan goes via a cable gland at the rear of the Spot Welding cabinet. The fan runs continuously when the welding system is powered up.

The fan is required to be used together with Bosch MFDC (option 782-13).



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Option 789-1 Earth fault protection unit

Offers an earth fault protection integrated with the circuit breaker for the weld power. If an earth fault occurs the circuit breaker is tripped.

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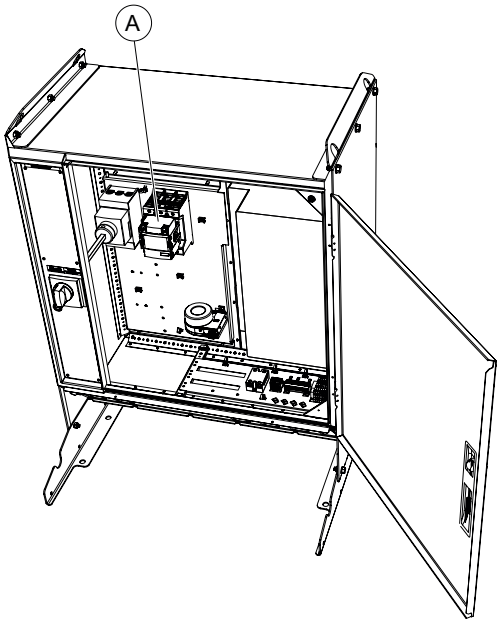
2.5.1 Introduction to Spot Welding cabinet
Continued

Option 790-1 Contactor for weld power

Offers a weld contactor with necessary wiring placed inside the Spot Welding cabinet. The contactor is mounted after the inverter and opens up the weld circuit out from the cabinet. It is recommended to be used for increasing safety or when using tool change for weld guns. The contactor is open when the robot system is in motor off mode or when an specific I/O is set.



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Pos	Description
A	Weld contactor

Option 791-1 Weld power cable, 7 m

Offers floor cable of 7 m length for weld power (3x35 mm^2). One end of the weld power cable is connected at terminal to the weld timer (Bosch) or the contactor (when option 790-1 is chosen). The cable enters the Spot Welding cabinet cia cable gland. The other end is equipped with an MC connector TSB160/35 and is connected at either the manipulator base (for robot gun Type S or Se) or to the stationary gun (for Type HSe).

Option 791-2 Weld power cable, 15 m

Offers floor cable of 15 m length for weld power (3x35 mm^2). See option 791-1 for further details.

Option 809-1 process cable to stationary gun, 7 m

Offer floor cable of 7 m length for process signals between the Spot Welding cabinet and the stationary gun. This option also includes internal cross connections between I/O, weld timer and power feeding etc.

One end of the process cable enters the Spot Welding cabinet via cable gland and is connected at Phoenix terminals. The other end is equipped with a HD Harting 3 modules and is connected to the stationary gun (for Type HSe).

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Option 809-2 process cable to stationary gun, 15 m

Offer floor cable of 15 m length for process signals between the Spot Welding cabinet and the stationary gun. See option 809-1 for further details.

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2.5.2 Interface description for spot welding cabinet

General

The interface towards the Spot Welding cabinet is described in the tables below.

Connections for Spot Welding cabinet

Type	Pcs	Specification	Allowed capacity
Incoming power from line[i]	1		400-480 VAC, Max. 100 A rms, 50/60 Hz
Outgoing power to robot	1	Cable gland (min 24 mm / max 28 mm cable diameter)	Max. 150 A rms, 50/60 Hz
Floor cable	2	35 mm^2	Max. 600 VAC, 150 A rms at + 20°C (68°F) ambient temperature
Floor cable protect-ive earth	1	35 mm^2	Max. 600 VAC, 150 A rms at + 20°C (68°F) ambient temperature

i Incoming power connection made by customer. For incoming power and safety recommendations see *Product manual - DressPack/SpotPack IRB 6700*.

Connections for Signals

Type	Pcs	Specification	Allowed capacity
Water and air unit (on IRC5, option 782-13)	1	Modular Harting connector, type DD	24 V DC, Max 0.5 A / output
Stationary gun (on IRC5, option 782-13) customer plate	1	Cable gland	24 V DC, Max 0.5 A / output See interface description Stationary gun type HSe

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2.6 Water and air unit

2.6.1 Introduction

General

The Water and Air unit contains components for water and air distribution and control within the SpotPack. The water and air unit is controlled from the robot controller via the process software. Wiring is made via the Spot Welding cabinet.

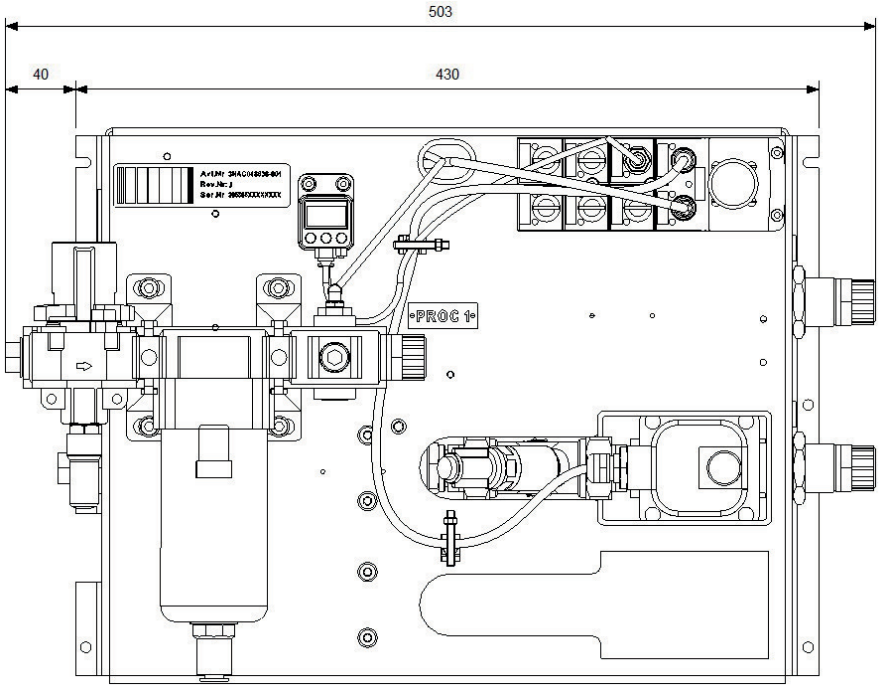
The capacity and functionality depends on the choice of different option combinations, see water and air unit options under this chapter.

The unit is only used for the spot welding application

The water and air unit

The Water and Air unit has the following main features (see figure below):

- Adjustable, high speed water flow sensors.
- Adjustable digital pressure switch for air.
- Air filter with auto draining.
- Possibility to balance water flow for complete package and for individual circuits.
- Preparation for additional options and preparation for easy exchange of complete unit or separate circuits.
- Equipped with extra (plugged) air outlets.



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The standard water and air unit consists of four main assemblies.

- Water in circuit

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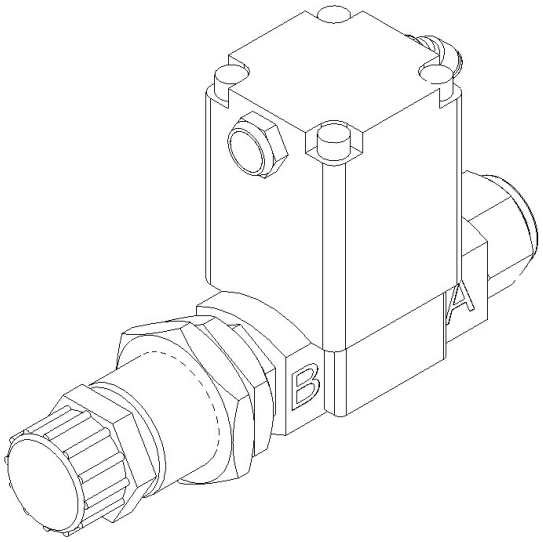
2.6.1 Introduction
Continued

- Water return circuit
- Air supply circuit
- Split box

Cables and hoses required for Water and Air unit are defined and described under each option for water and air unit.

Water in circuit

The function of the water in circuit is to open / close the cooling water supply to the Spot welding gun (see figure below). An air operated 2 port valve is used. The valve is controlled by a 3 port direct operated valve that is controlled by a digital signal from the robot control system. The circuit from left to right begins with a G1/2" thread used for the connection of the factory water supply system and ends with a male M22 x 1.5. (Suitable for a Swivel nut adapter DIN 20 078 A, we recommend a Parker 39C82-15-8BK fitting). From this point the water is led to the gun/robot base.



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Water return circuit

The water return circuit monitors the flow of the returning cooling water from the Spot welding gun (see figure below). The flow switch detects if the water flow is too low in the cooling water circuit.

The flow switch gives a digital signal to the robot control system, which automatically shuts off the electrical shut off valve in the water in circuit if the flow is too low.

The system and the supply of cooling water are then automatically stopped to minimize risk of damage to the system.

The water return circuit is delivered with a pre-set flow limit, set to 8 liters per minute at 0.2 MPa water pressure.

The water return circuit begins from right with a Swivel Nut adapter (suitable for a Swivel nut adapter 20 078 A, we recommend a Swivel nut adapter 39C82-15-8BK fitting).

Continues on next page

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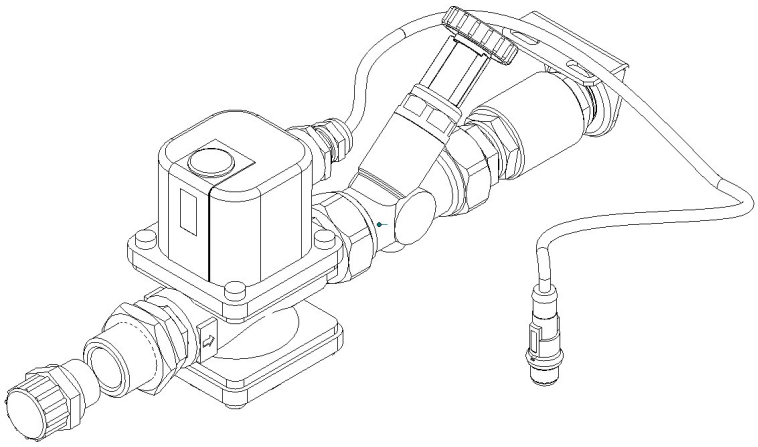
It is also equipped with a flow control valve; the flow control can adjust the water flow to the desired flow level. The flow rate can be monitored by the scale on the flow control valve. The scale can be rotated so that easy reading can be performed. This will serve as a rough function check in the flow range between 1 to 8 litres per minute.

The flow control valve is when delivered adjusted for maximum flow.

The circuit ends with a check-valve that will stop any reversing water flow and ends with an internal G ½" thread. From this point the water is led to the factory water system.



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A second water return, option 793-1, is also available with the same specification as above.

Air supply circuit

The air supply circuit provides the function package with filtered air (see figure below).

The air supply circuit begins with a internal G ½" thread, manually operated shut off valve with residual pressure release though a silencer, air filter with nominal filtration of 5 µm with a metal protection of the bowl, a digital pressure switch and a cross interface containing plugged air outlet ports (internal G 3/8" thread).

There is a digital pressure switch to monitor the air pressure and to give a signal to the control system if the pressure becomes too low.

The pressure switch is delivered with pre-set pressure limit. There is a lower limit set to 5 bar which means customer needs to provide at least 6 bar to overcome the 1 bar pressure drop over the air preparation unit.

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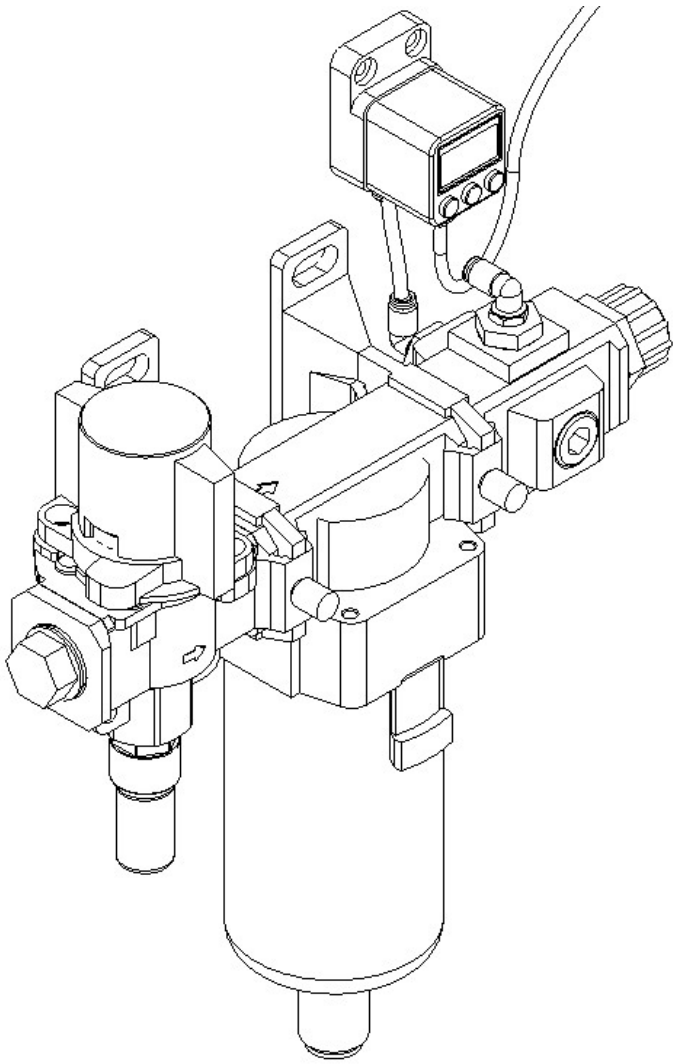
2.6.1 Introduction
Continued

The air supply circuit ends with a Swivel Nut adapter (suitable for a Swivel Nut adapter 20 078 A, we recommend a Parker 39C82-15-8BK fitting).



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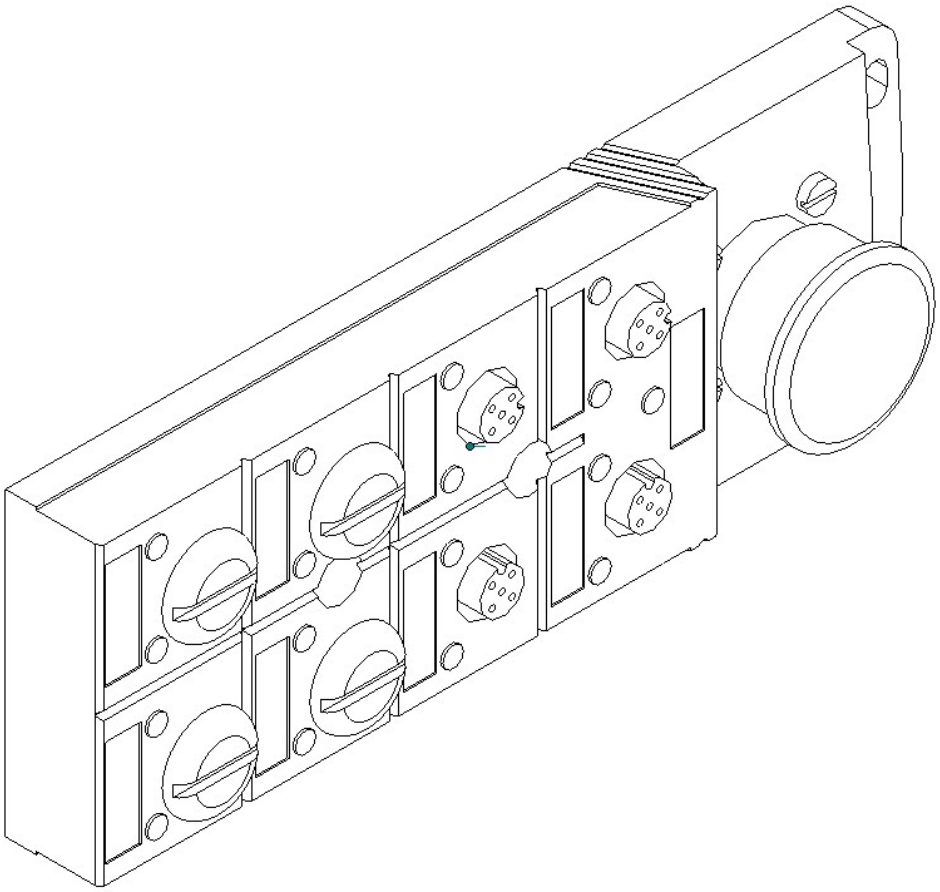
Split box/Connection box

With the split box, the 24VDC supply and signals are connected and distributed to the different units on the water and air unit, see figure below. The design makes disconnection of separate items for service and repair on the water and air unit very easy. The split box has a protection class IP67, which means it is well protected against dust and water leakage.



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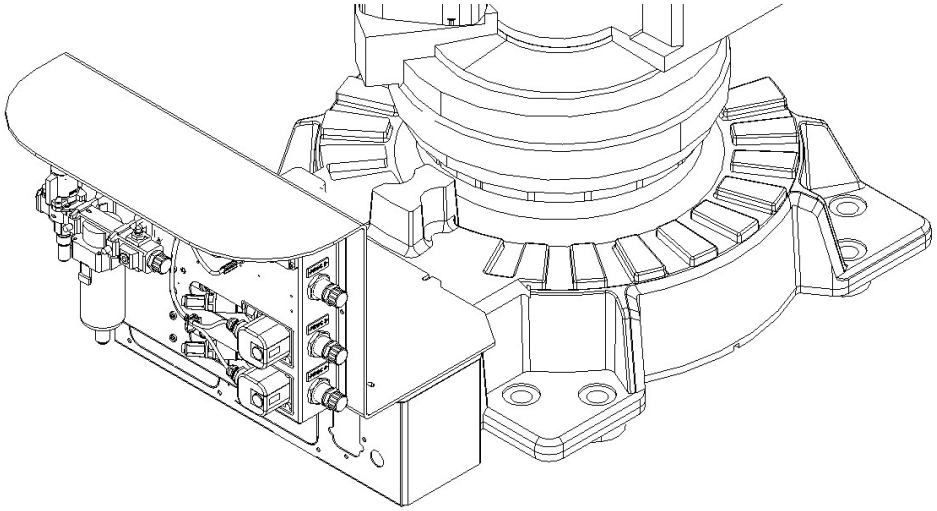
2.6.1 Introduction
Continued

Mounting

Type S, robot mounted spot welding gun, is mounted at the robot at factory and water and air hoses are included and connected to the robot base.



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Type HS, robot handles part against a pedestal mounted spot welding gun, the Water and Air panel is delivered in a box together with the robot.

Signals for water and air unit

Electrical connections to robot I/O board are made via the Split box on the Water and Air unit or to connection box at robot base (the figure below shows Split box, for connection box see the circuit diagram).

8 x M12 connections (4 pins) are available. The number in use depends on option choices. But at least two are free connection and can be used for customer purposes.

The Split box has six connections prepared for the following units:

- 1. Electric water shut off valve
- 2. Pressure switch
- 3. Flow switch 1
- 4. Flow switch 2 (Option 793-1 Second Water Return)
- 5. Proportional valve: Prop. ref. signal & pressure OK signal
- 6. Proportional valve: Power supply

Continues on next page

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The cable and cable length between the Split box and the Spot Welding cabinet must be specified (see option 797-1,-2,-3,-4). See the circuit diagram.

Option	Type	Description
792-1	Water and Air unit, type S	The basic water and air unit for type S is equipped for a robot handled gun and with the following components: Water in circuit Water return circuit Air supply circuit Split box 1/2 " hose between air supply circuit and manipulator base (PROC 1)[i] 1/2 " hose between water in circuit and manipulator base (PROC 2)[i] 1/2 " hose between water return circuit and manipulator base (PROC 3)[i]
792-2	Water and Air unit, type HS	The basic water and air unit for type HS is equipped for a pedestal/stationary gun. Hoses between water and air unit, welding equipment and robot are not supplied. These have to be arranged by the customer. [i]
793-1	Second water return	The option adds an additional water return circuit. See Water return circuit. An additonal 1/2” water hose (PROC 4) from the Water and Air unit to manipulator base is included.
797-1	Cable to split box, 7 m	Offers floor cable of 7 m length for signals to the split box placed on the water and air unit. This cable is connected to the cabinet with a modular Harting and it ends with a quick connector at the split box.
797-2	Cable to split box, 15 m	Offers floor cable of 15 m length for the split box. See description of option 797-1.
797-3	Cable to split box, 22 m	Offers floor cable of 22 m length for the split box. See description of option 797-1.
797-4	Cable to split box, 30 m	Offers floor cable of 30 m length for the split box. See description of option 797-1.

[i] For IRB 6700Inv hoses and adapter are not supplied. These have to be arranged by the customer.

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2.6.2 Technical data

Media interface description

The interface towards the Water and Air unit is described in table below.

Type	Pcs	Specification
Incoming water	1	G 1/2” thread[i]
Outgoing water	1	G 1/2” thread (M22 x 1.5)[i]
Incoming air	1	G 1/2” thread[i]
Extra air outlet	1	G 3/8” thread[ii]

i Connection to be made by customer.
ii Plugged at delivery (to be used for tip-dresser or other equipment).

General data

Water	Description
Operating pressure	Max. 0.6 MPa / 87PSI
Proof pressure	1.2 MPa / 174 PSI
Maximum pressure drop	< 0.2 MPa at 8 litre/minute[i]
Flow regulating (each circuit)	1 - 16 l/min
Water quality	140-170 mesh, 100 µm

i The pressure drop is measured under the following conditions:
- Measuring point 1: Incoming water connection at water and air unit.
- Measuring point 2: Outgoing water connection at water and air unit.

The water hoses (Proc 2 and Proc 3) are cross-connected at the end at axis 6 (the pressure drop is measured without any tool).

Air	Description
Operating pressure	Max. 1.0 MPa / 145 PSI
Flow capacity	Approximately 4000 litres/min. (at 0.7 MPa with a 0.1 MPa pressure drop
Pressure switch set range	0.100 - 1.000 MPa
Air quality	Use clean air. When there is excessive condensate, install a device that eliminates water such as dryer or water separator (Drain Catch) on the inlet side of the air filter.

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2.7 Connection kits

General

For detailed information on connection location see *Interface descriptions for DressPack on page 111*

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

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2.7.1 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, (½", M22x1,5 Brass, 24 degree seal))
- Connector with:

1 pcs Hood Foundry (Harting)	HAN EMC / M 40
1 pcs Hinged frame (Harting)	Shell size 16
2 pcs Multicontact, female (Harting)	Type HD (25 pin)
1 pcs Multicontact, female (Harting)	Type DD (12 pin)
1 pcs Multicontact, female (Harting)	Type EE (8 pin)
10 pcs Female crimp contacts	For 1,5 mm^2
10 pcs Female crimp contacts	For 0,5 mm^2
10 pcs Female crimp contacts	For 1,0 mm^2
10 pcs Female crimp contacts	For 2,5 mm^2
12 pcs Female crimp contacts	For 0,14– 0,37 mm^2
45 sockets	For 0,2– 0,56 mm^2
Assembly Accessories to complete connector	
Assembly instruction	

Continues on next page

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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	

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2.7.2 Axis 3 - Connector kits

Available options

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

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2.7.3 Axis 6 - Connector kits

Available options

				Description
Option	Name	780-3 (MH 3)	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, Seperate 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	

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2.7.3 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 ½", M22x1,5) and (2x 3/8", M16x1.5))
- 1 Multi contact connector (Female) type including:
-

1 pc Welding connector	3x25 mm^2
1 pc Cable gland	Diameter 24-28 mm
1 pc End housing	0,21-0,93 mm^2
1 pcs Reducing coupling	PG36/PG29
Assembly Accessories to complete connector	
Assembly instruction	

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3 Specification of variants and options

3.1 Introduction to variants and options

General

The different variants and options for the IRB 6700 are described in the following sections. The same option numbers are used here as in the specification form.

Related information

For the controller see *Product manual - OmniCore C30*.

For the software options see *Application manual - Controller software IRC5*.

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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 9* for a complete description of protection type Foundry Plus 2.

Warranty

Option	Type	Description
438-1	Standard warranty	Standard warranty is 12 months from *Customer Delivery Date* or latest 18 months after *Factory Shipment Date*, whichever occurs first. Warranty terms and conditions apply.
438-2	Standard warranty + 12 months	Standard warranty extended with 12 months from end date of the standard warranty. Warranty terms and conditions apply. Contact Customer Service in case of other requirements.

Continues on next page

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

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.

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3.3 Equipment

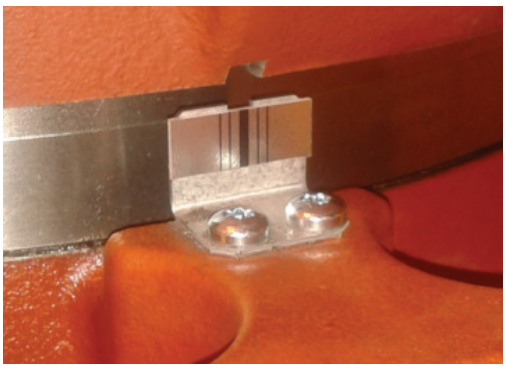
General

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.
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.
37-1	Base plate	Can also be used for IRB 7600. See *Installation on page 20*, for dimension drawing.[ii]
87-1	Cooling fan for axis 1 motor (IP54)	For in use recommendations see *Cooling fan for axis 1 motor on page 97*. Not for protection Foundry Plus. Not together with track motion.
430-1	Upper arm covers	See Figure in *Upper arm cover on page 171*. 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 Its recommended to remove the fork lift devices after use
ii Can not be used for IRB 6700Inv.

Synchronization labels

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



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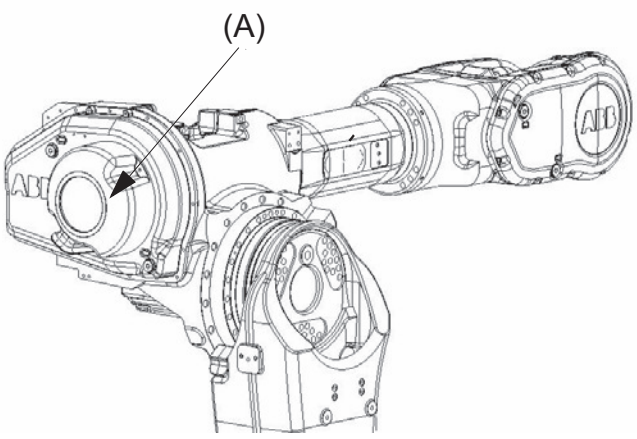
Upper arm cover



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Pos	Description
A	Option 430-1

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.

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 Plus Cable Guard	For extra protection of cables. Requires option 287-3 Foundry Plus.

Continues on next page

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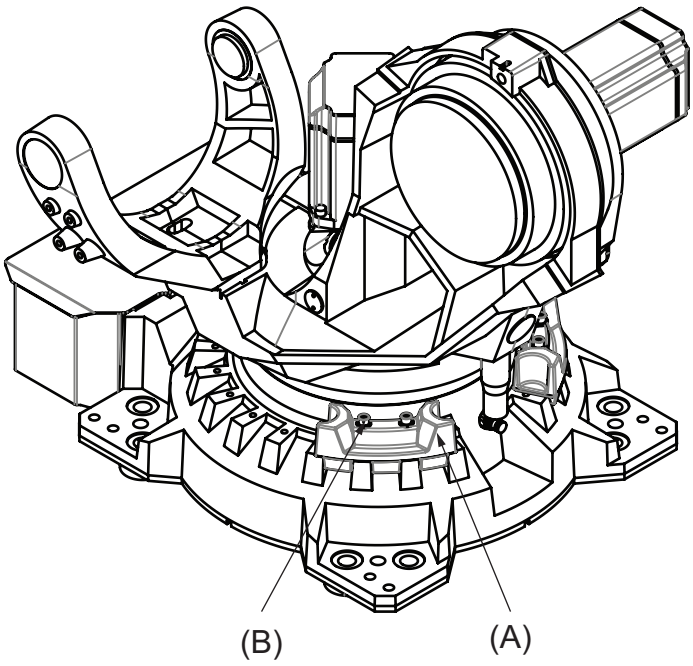
Working range limitation

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

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



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

Extended working range

Option	Type	Description
561-1	Extended work range axis 1	To extend the working range on axis 1 from ± 170° to ± 220°. When the option is used the mechanical stop shall be disassembled. EPS (Electronic Position Switches) functionality (option 810-1 or -2) is required.[i]

[i] This option is not available for IRB 6700Inv.

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.

Continues on next page

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Option	Type	Description
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.

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3.4 Floor cables

General

Additional floor cables for SpotPack options, see *SpotPack Floor Cables on page 180*.

Manipulator cable length

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

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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. For information about the limited number of signals available, see *Type H/HSe on page 117*, and *Type Se on page 130*.

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

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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	

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3.7 DressPack Lower and Upper arm

DressPack process configuration

Note

For more information about the process cable packages, see *DressPack on page 109*

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 35*

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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 161*.

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.

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3.9 Servo Gun

Content

For technical description see *Servo gun on page 98*.

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 98*.

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

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3.10 SpotPack Floor Cables

Weld Power Cable

Following information specifies the cable length for the Weld Power cable, from the Spot Welding process cabinet to the manipulator base.

Option	Lengths	Description
791-1	7 m	
791-2	15 m	

Process Cable to Stationary Gun

Following information specifies the cable length for the Process Cable to the Stationary Gun, from the Spot Welding process cabinet to the Stationary Gun.

Option	Lengths
809-1	7 m
809-2	15 m

Cable to Split Box

Following information specifies the cable length for the cable to Split Box, from the Spot Welding process cabinet to the Split box on the manipulator base.

Option	Lengths
797-1	7 m
797-2	15 m
797-3	22 m
797-4	30 m

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3.11 Process cabinet

Empty cabinet

Option	Type	Description
768-1	Empty cabinet small	See *Product specification - Controller IRC5 with FlexPendant*
768-2	Empty cabinet large	See *Product specification - Controller IRC5 with FlexPendant*
715-1	Installation kit	See *Product specification - Controller IRC5 with FlexPendant*

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3.12 Water and air

Water and air unit

Option	Type	Description
792-1	Type S	DressPack floor
792-2	Type HS/HSe	DressPack floor

Second water return

Option	Type	Description
793-1	Second water return	DressPack floor

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3.13 User documentation

User documentation

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

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

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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 with FlexPendant* and *Product specification - Controller software IRC5*.

Robot peripherals

- The Track Motion is not adapted for the remote connector plate on IRB 6790 and the air supply needed for the overpressure in manipulator and the air pressure supervision.
- Motor Units

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3HAC044265-001, Rev M, en

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