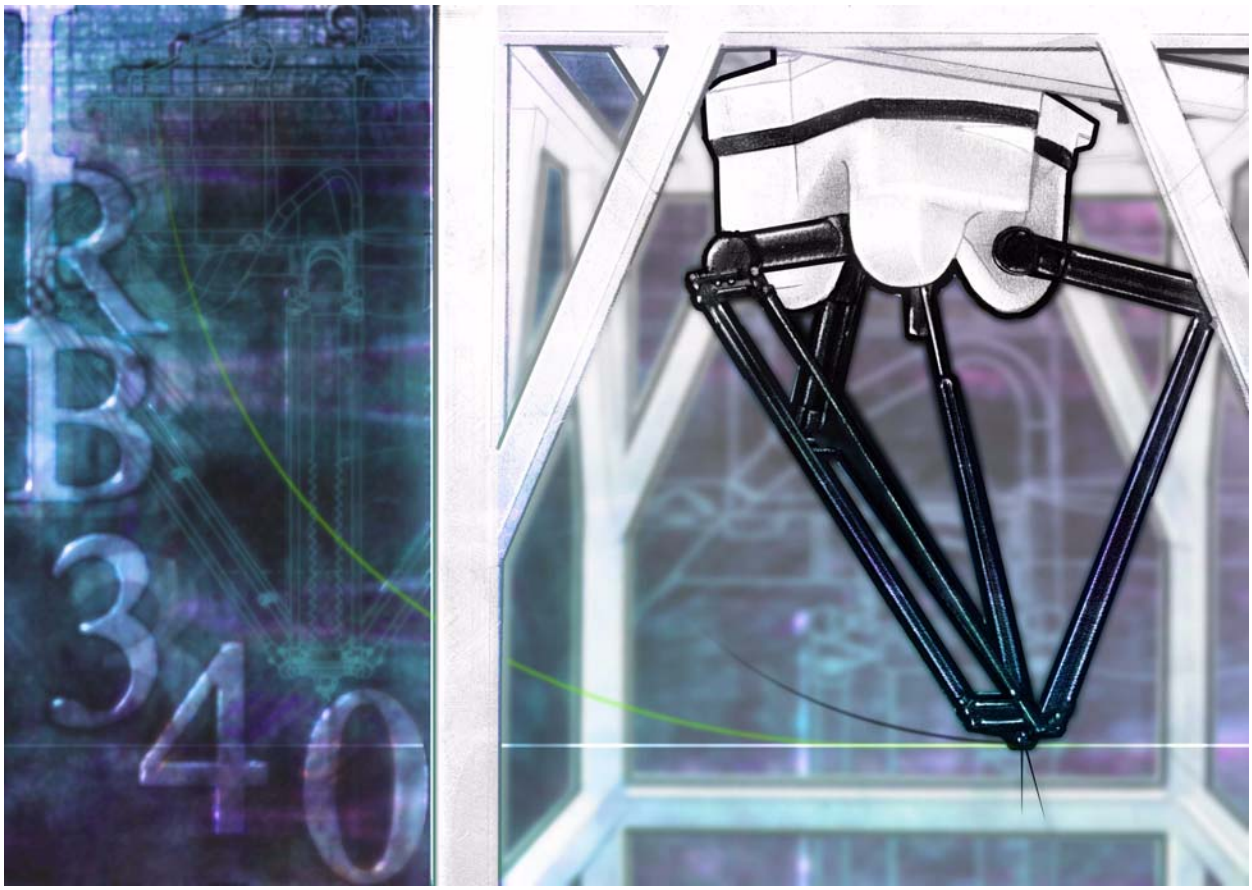
The heart of Robotics

Product specification

Parallel robot

IRB 340
IRB 340 2
IRB 340 SA
IRB 340 SA/2
IRB 340 SAS
IRB 340 SAS/2
M2004/M2000



Product specification

Parallel robot

3HAC 9216-1

Revision H

IRB 340

IRB 340 2

IRB 340 SA

IRB 340 SA/2

IRB 340 SAS

IRB 340 SAS/2

M2004/M2000

ABB AB
Robotics Products
SE-721 68 Västerås
Sweden

Table of Contents

Overview

About this Product specification

It describes the performance of the manipulator in terms of:

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

Users

It is intended for:

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

Contents

Please see Table of Contents on page 3.

Revisions

Revision	Description
Revision H	Update for “Different versions” Typical values for conveyor tracking

Complementary documentation

Product specification	Description
Controller	IRC5 with FlexPendant, 3HAC021785-001
Controller Software IRC5	RobotWare 5.09, 3HAC022349-001
Robot User Documentation	IRC5 and M2004, 3HAC024534-001
Product Manual	**Description**
Manipulator	IRB 340, 3HAC022546-001

1 Description

1.1 Structure

1.1.1 Introduction

Robot family

The IRB 340 family consists of a 4-axes industrial robot in a modular design. It is specially designed for industries with a great need for flexible automation, such as pick and place operations and assembly.

The IRB 340 is extremely powerful with an acceleration of up to 10 g’s, and a handling capacity of up to 2 kg. Thanks to optimized drive-chains and ABB’s patented QuickMoveTM functions it is the fastest robot in its class, up to 180 picks per minute (defined by cycle and load).

Different versions

The robot is available in standard version, WashDown and Stainless WashDown. The difference between the WashDown and the Stainless WashDown versions is that the base box of the Stainless WashDown is made of acid-resisting stainless steel. Standard version to be used in dry applications. WashDown versions are designed to be cleaned and disinfected, and therefor useful in wet applications.

Software product range

We have added a range of software product - 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.

Operating system

The robot is equipped with the RobotWare. RobotWare controls every aspect of the robot, like motion control, development and execution of application programs, communication etc. See Product specification - IRC5 with FlexPendant.

Additional functionality

For additional functionality, the robot can be equipped with optional software for application support - for example communication features - network communication - and advanced functions such as multi-tasking, sensor control, etc. For a complete description on optional software, see Product specification - Controller IRC5 with FlexPendant.

PickMaster is a specific application software for vision guided picking. It is providing a task-oriented programming and executions of fast pick and place operations. See Product specification - PickMaster/PickWare.

1.1.1 Introduction

Clean room

The IRB 340 is classified for clean room class 10 according to US Federal Standard 209 or class 4 according to ISO 14644-1.

The performed clean room test has classify the air cleanliness exclusively in terms of concentration of airborne particles generated by the robot. Other aspects of the clean room test or other clean room requirements are not considered.

Illustration

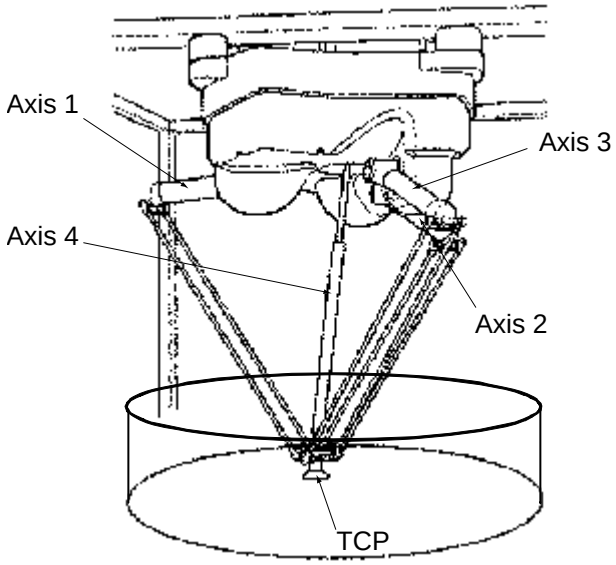


Figure 1 The standard version of the IRB 340 manipulator.

1.1.2 Different robot version

General

The IRB 340 is available in different versions depending on handling capacity and environment adaptation. The following different robot types are available:

Pay load	Standard	WashDown	WashDown Stainless
1 kg	IRB 340	IRB 340 SA	IRB 340 SAS
2 kg	IRB 340/2	IRB 340 SA/2	IRB 340 SAS/2

Weight

Manipulator	Weight
Standard	140 kg
WashDown Stainless	165 kg

Other technical data

Data	Description	Note
Airborne noise level	The sound pressure level outside the working space	< 70 dB (A) Leq (acc. to Machinery directive 89/392 EEC)

Power consumption

Power consumption	Values
Average	625 W
Max	743 W

Above values are for 0,1 kg payload. At 1 kg the consumption drops 10 % since the robot moves slower.

1.1.2 Different robot version

Illustration standard version

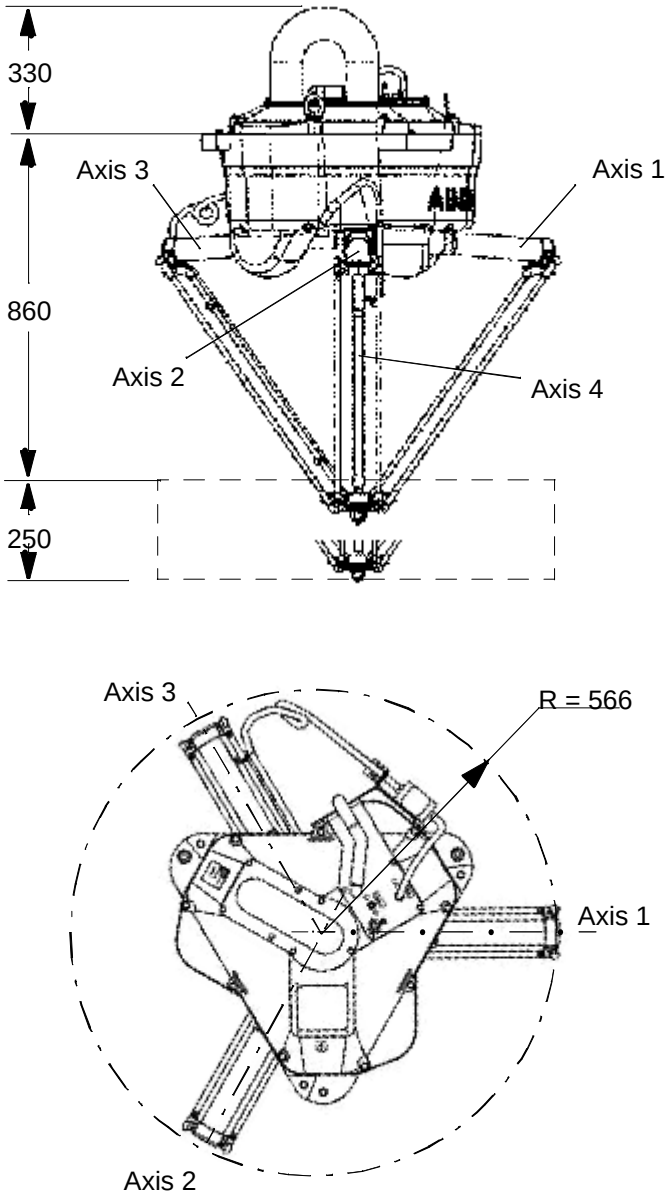


Figure 2 Views of the manipulator in the standard version (dimensions in mm).

Illustration WashDown version

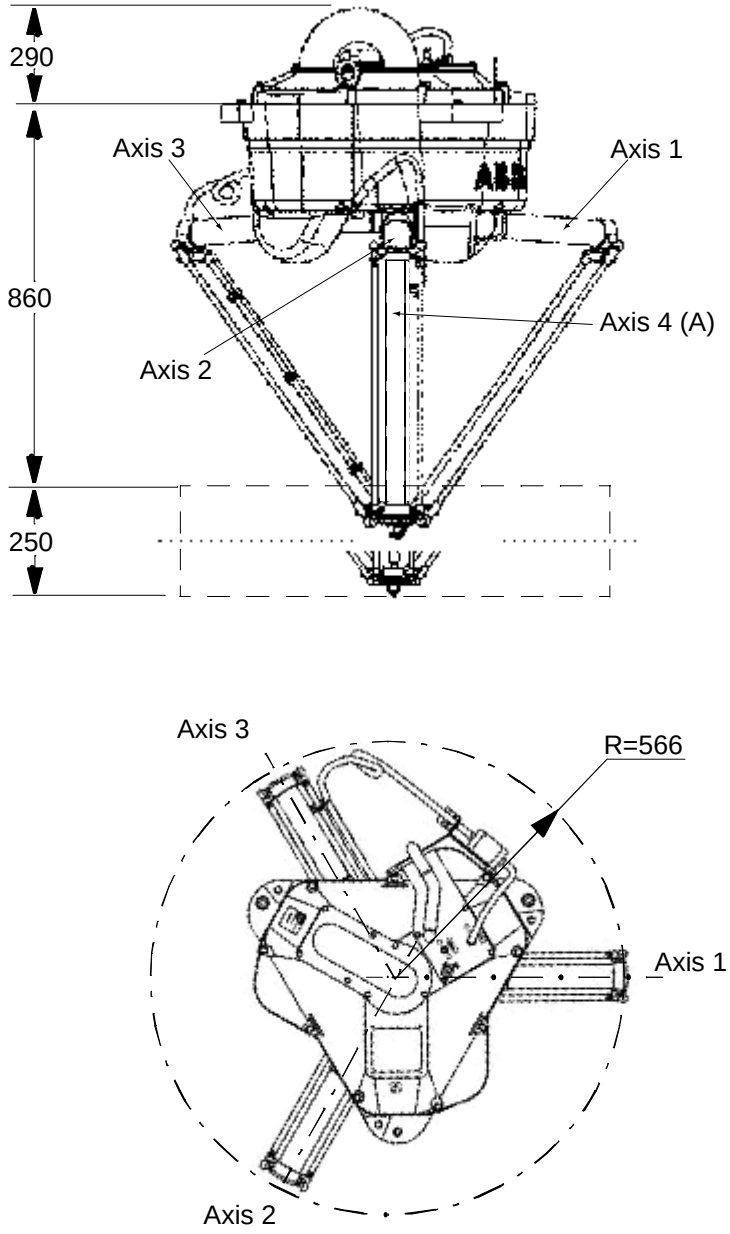


Figure 3 Views of the manipulator in the WashDown version (dimensions in mm).

Pos	Description
A	WashDown version

1.2 Safety/Standards

1.2.1 Standards

The robot conforms to the following standards:

Standard	Description
EN ISO 12100 -1	Safety of machinery, terminology
EN ISO 12100 -2	Safety of machinery, technical specifications
EN 954-1	Safety of machinery, safety related parts of control systems
EN 60204	Electrical equipment of industrial machines
EN ISO 60204-1:2005	Safety of machinery - Electrical equipment of machines
EN ISO 10218-1:2006[a]	Robots for industrial environments - Safety requirements
EN 61000-6-4 (option)	EMC, Generic emission
EN 61000-6-2	EMC, Generic immunity

a. There is a deviation from paragraph 6.2 j in that only worst case stop distances and stop times are documented.

Standard	Description
IEC 60529	Degrees of protection provided by enclosures

Standard	Description
ISO 9787	Manipulating industrial robots, coordinate systems and motions

Standars	Description
ANSI/RIA 15.06/1999	Safety Requirements for Industrial Robots and Robot Systems
ANSI/UL 1740-1998 (option)	Safety Standard for Robots and Robotic Equipment
CAN/CSA Z 434-03 (option)	Industrial Robots and Robot Systems - General Safety Requirements

The robot complies fully with the health and safety standards specified in the EEC's Machinery Directives.

Safety function	Description
The Service Information System (SIS)	The service information system gathers information about the robot's usage and determines how hard the robot is used. The usage is characterized by the speed, the rotation angles and the load of every axis. With this data collection, the service interval of every individual robot of this generation can be predicted, optimized and service activities planned ahead. The collection data is available via the FlexPendant or the network link to the robot. The Process Robot Generation is designed with absolute safety in mind. It is dedicated to actively or passively avoid collisions and offers the highest level of safety to the operators and the machines as well as the surrounding and attached equipment. These features are presented in the active and passive safety system. The time the robot is in operation (brakes released) is indicated on the FlexPendant. Data can also be monitored over network, using for example WebWare.

The Active Safety System	Description
General	The active safety system includes those software features that maintain the accuracy of the robot's path and those that actively avoid collisions which can occur if the robot leaves the programmed path accidentally or if an obstacle is put into the robot's path.
The Active Brake System (ABS)	All robots are delivered with an active brake system that supports the robots to maintain the programmed path in General Stop (GS), Auto Stop (AS) and Superior Stop (SS). The ABS is active during all stop modes, braking the robot to a stop with the power of the servo drive system along the programmed path. After a specific time the mechanical brakes are activated ensuring a safe stop. The stopping process is in accordance with a class 1 stop. The maximum applicable torque on the most loaded axis determines the stopping distance. In case of a failure of the drive system or a power interruption, a class 0 stop turns out. Emergency Stop (ES) is a class 0 stop. All stops (GS, AS, SS and ES) are reconfigurable. While programming the robot in manual mode, the enabling device has a class 0 stop.
The Self Tuning Performance (STP)	The Process Robot Generation is designed to run at different load configurations, many of which occur within the same program and cycle. The robot's installed electrical power can thus be exploited to lift heavy loads, create a high axis force or accelerate quickly without changing the configuration of the robot. Consequently the robot can run in a "power mode" or a "speed mode" which can be measured in the respective cycle time of one and the same program but with different tool loads. This feature is based on QuickMove™. The respective change in cycle time can be measured by running the robot in NoMotionExecution with different loads or with simulation tools like RobotStudio.

1.2.1 Standards

The Active Safety System	Description
The Electronically Stabilised Path (ESP)	The load and inertia of the tool have a significant effect on the path performance of a robot. The Process Robot Generation is equipped with a system to electronically stabilize the robot's path in order to achieve the best path performance. This has an influence while accelerating and braking and consequently stabilizes the path during all motion operations with a compromise of the best cycle time. This feature is secured through TrueMove™.
Over-speed protection	The speed of the robot is monitored by two independent computers.
Restricting the working space	The movement of each axis can be restricted using software limits.
Collision detection (option)	In case of an unexpected mechanical disturbance, such as a collision, electrode sticking, etc., the robot will detect the collision, stop on the path and slightly back off from its stop position, releasing tension in the tool.

The Passive Safety System	Description
General	The Process Robot Generation has a dedicated passive safety system that by hardware construction and dedicated solutions is designed to avoid collisions with surrounding equipment. It integrates the robot system into the surrounding equipment safely.

The Internal Safety Concept	Description
General	The internal safety concept of the Process Robot Generation is based on a two-channel circuit that is monitored continuously. If any component fails, the electrical power supplied to the motors shuts off and the brakes engage.
Safety category 3	Malfunction of a single component, such as a sticking relay, will be detected at the next MOTOR OFF/MOTOR ON operation. MOTOR ON is then prevented and the faulty section is indicated. This complies with category 3 of EN 954-1, Safety of machinery - safety related parts of control Systems - Part 1.
Selecting the operating mode	The robot can be operated either manually or automatically. In manual mode, the robot can only be operated via the FlexPendant, that is not by any external equipment.
Reduced speed	In manual mode, the speed is limited to a maximum of 250 mm/s (600 inch/min.). The speed limitation applies not only to the TCP (Tool Center Point), but to all parts of the robot. It is also possible to monitor the speed of equipment mounted on the robot.
Three position enabling device	The enabling device on the FlexPendant must be used to move the robot when in manual mode. The enabling device consists of a switch with three positions, meaning that all robot movements stop when either the enabling device is pushed fully in, or when it is released completely. This makes the robot safer to operate.
Safe manual movement	The robot is moved using a joystick instead of the operator having to look at the FlexPendant to find the right key.

The Internal Safety Concept	Description
Emergency stop	There is one emergency stop push button on the controller and another on the FlexPendant. Additional emergency stop buttons can be connected to the robot's safety chain circuit.
Safeguarded space stop	The robot has a number of electrical inputs which can be used to connect external safety equipment, such as safety gates and light curtains. This allows the robot's safety functions to be activated both by peripheral equipment and by the robot itself.
Delayed safeguarded space stop	A delayed stop gives a smooth stop. The robot stops the same way as at a normal program stop with no deviation from the programmed path. After approx. 1 second the power supplied to the motors is shut off.
Hold-to-run control	"Hold-to-run" means that you must depress the start button in order to move the robot. When the button is released the robot will stop. The hold-to-run function makes program testing safer.
Fire safety	Both the manipulator and control system comply with UL's (Underwriters Laboratories Inc.) tough requirements for fire safety.
Safety lamp (option)	As an option, the robot can be equipped with a safety lamp mounted on the manipulator. This is activated when the motors are in the MOTORS ON state.

WashDown Statement

All components have been found to comply with USDA/FDA, Code of Federal Regulations Title 21 regarding choice of material, material behaviour, and sanitary operations. (Relevant chapters of CFR are part 100-199). The intended use is incidental food contact. Any gripper to be used must be investigated separately.

1.3 Installation

1.3.1 Introduction

General

Depending on robot version an end effector of max weight 1 to 2 kg including payload, can be mounted on the robot's mounting flange. See 1.4 Load diagrams. Other equipment, such as a hose, can be mounted on the upper and lower arm, max weight 300 g/m. See 1.5 Extra equipment mounted on the manipulator arms.

1.3.2 Operating requirements

Protection standards

Description	Protection standard IEC529
Manipulator IRB 340, IRB 340/2	IP55
Manipulator IRB 340 SA, IRB 340 SA/2	IP67
Manipulator IRB 340 SAS, IRB 340 SAS/2	IP67

Cleanroom standards

Cleanroom class 10 for manipulator according to:

Standards	Description
DIN EN ISO 14666	Cleanrooms and associated controlled environments
US Federal Standard 209	e-Air-clean-classes

Explosive environments

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

Ambient temperature

Description	Temperature
Manipulator during operation	(above) 0°C (+32°F) to +52°C (+126°F)
For the controller, standard	+0°C (+32°F) to +45°C (+113°F)
For the controller, option	+0°C (+32°F) to +52°C (+126°F)
Complete robot during transportation and storage	-25°C (-13°F) to +55°C (+131°F)

Note: If the robot operates in low temperature or temperature >+35°C, the air flow, generated by the internal fan, is recommended to be evacuated. Harsh environment and a lot of starts and stops may cause condensation inside the base and requires external air to keep the base dry.

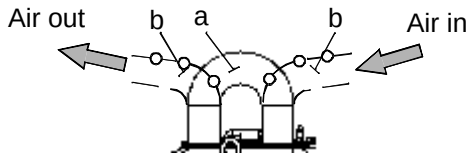


Figure 4 The standard version requires the short cut hose (a) to be replaced by external hoses (b). For the WashDown version option 12-1, plate for external air circulation, replaces the plate for internal air.

Relative humidity

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

1.3.3 Mounting the manipulator

Maximum force in each fixing points is 500 N referring to the z-direction in the base coordinate system.

Robot frame is not included in the delivery.

Required stiffness of frame: Lowest natural frequency of frame with robot > 17 Hz.

The working space is shown in Figure 15

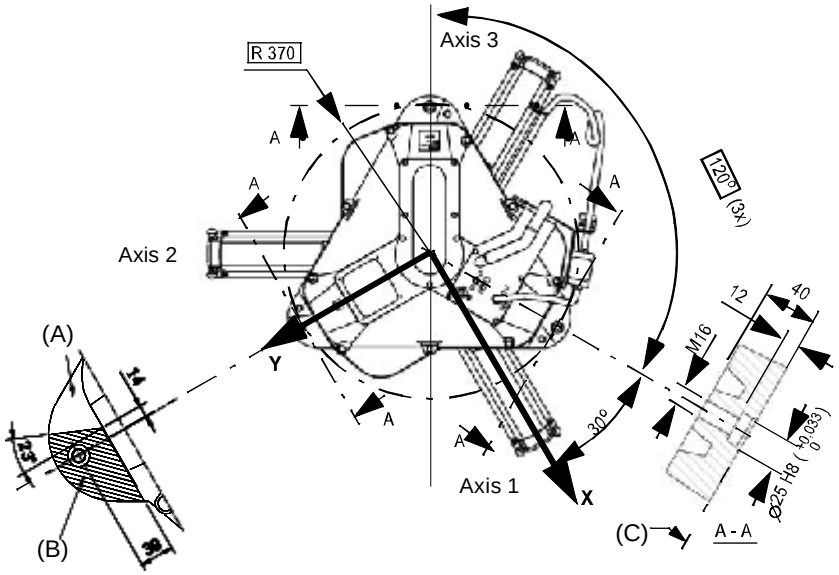


Figure 5 Hole configuration (dimensions in mm).

Pos	Description
A	Area for calibration tool
B	Area available for clamping of manipulator
C	Clamping plane

Fastening the robot

Two guiding pins are enough to fasten the robot. The corresponding holes in the frame can be, on circular and one oval according to Figure 6.

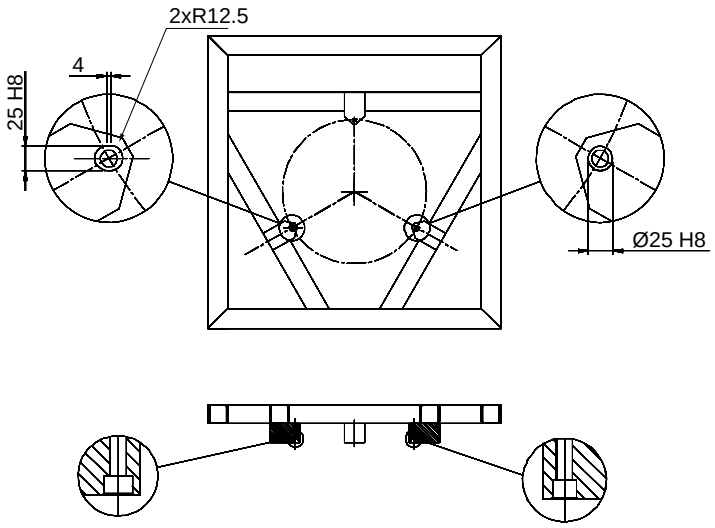


Figure 6 Example of fastening the manipulator (dimensions in mm).

1.4 Load diagrams

1.4.1 Introduction

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 outside load diagram is used the following parts can be damaged due to overload:

- motors
- gearboxes
- mechanical structure

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

1.4.2 Load diagrams

Note: The weight permitted for loads includes grippers etc.

IRB 340, IRB 340SA and IRB SAS

Load 100g:

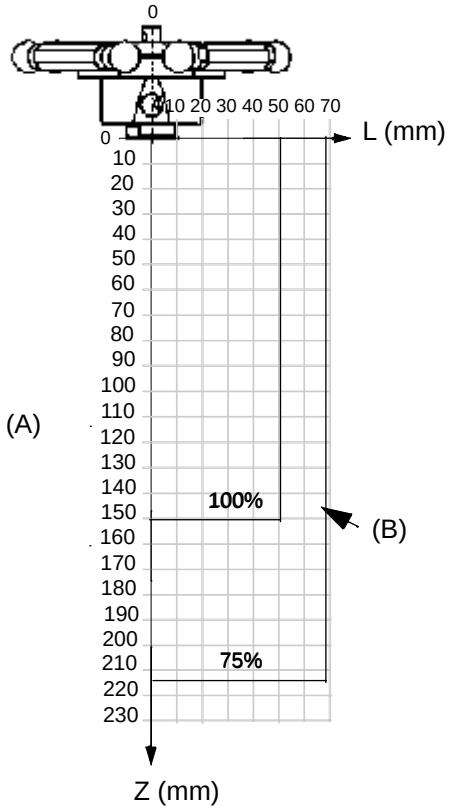


Figure 7 Maximum weight permitted for load (100 g) mounting on the mounting flange at different positions (center of gravity).

Note: (A) loaddata and tooldata with moment of inertia must be used!
Note: (B) Acceleration must be reduced by “AccSet” in each robot program.

	Description
Z	See the above diagram and the coordinate system in Product specification - IRC5 with FlexPendant.
L	Distance in X-Y plane from Z-axis to the mass center of gravity of the load. See 75% performance curves.
	Loads with mass center of gravity outside the 100% performance curve can be used with reduced acceleration, The performance must be reduced manually by using the RAPID “AccSet” in the robot program.
loaddata	Weight on the gripper (kg). The center of gravity of the gripper (mm). The moment of inertia of the gripper (kgm^2).

1.4.2 Load diagrams

	Description
tooldata	Weight of the product (kg). The center of gravity of the product (mm). The moment of inertia of the product (kgm^2). No value or wrong value may damage the robot. For more information see RAPID Reference Manual.
	For max acc performance Jo $\leq$ 8,3 x 10^{-4} kgm. Jo=own moment of inertia of the total handle weight.

Note: The weight permitted for loads includes grippers etc.

IRB 340, IRB 340 SA and IRB 340 SAS

Load 300g:

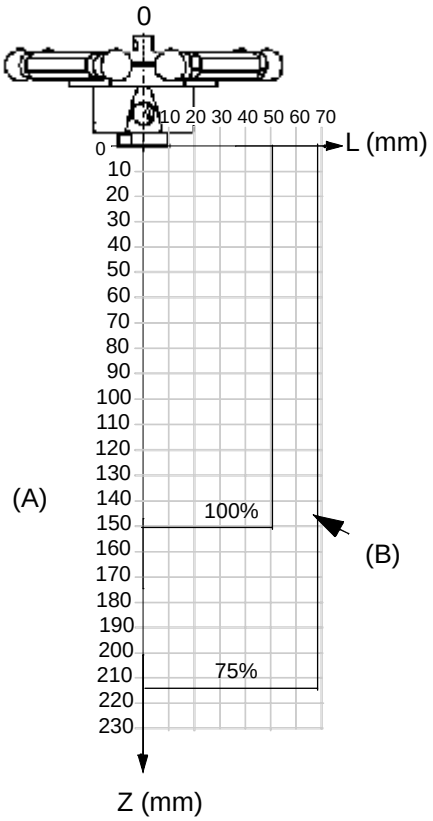


Figure 8 Maximum weight permitted for load (300 g) mounting on the mounting flange at different positions (center of gravity).

Note: (A) loaddata and tooldata with moment of inertia must be used!

Note: (B) Acceleration must be reduced by “AccSet” in each robot program.

	Description
Z	See the above diagram and the coordinate system in Product specification - IRC5 with FlexPendant.
L	Distance in X-Y plane from Z-axis to the mass center of gravity of the load. See 75% performance curves.
	Loads with mass center of gravity outside the 100% performance curve can be used with reduced acceleration, The performance must be reduced manually by using the RAPID “AccSet” in the robot program.
loaddata	Weight on the gripper (kg). The center of gravity of the gripper (mm). The moment of inertia of the gripper (kgm^2).

1.4.2 Load diagrams

	Description
tooldata	Weight of the product (kg). The center of gravity of the product (mm). The moment of inertia of the product (kgm^2). No value or wrong value may damage the robot. For more information see RAPID Reference Manual.
	For max acc performance $J_o \leq 8{,}3 \times 10^{-4}$ kgm. J_o=own moment of inertia of the total handle weight.

Note: The weight permitted for loads includes grippers etc.

IRB 340, IRB 340 SA and IRB 340 SAS

Load 500g:

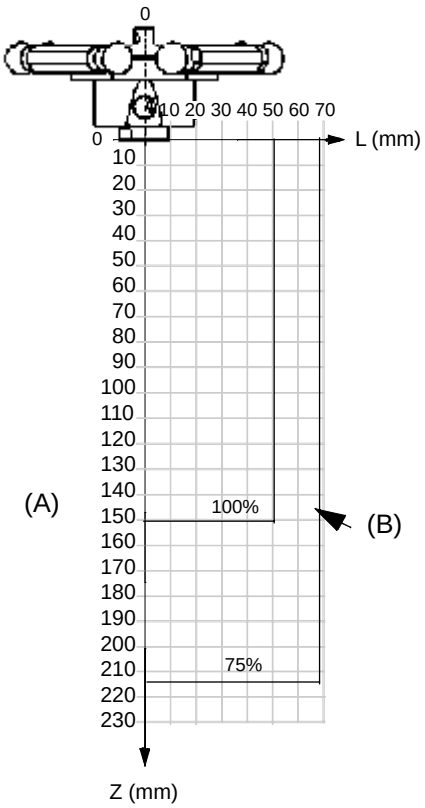


Figure 9 Maximum weight permitted for load (500 g) mounting on the mounting flange at different positions (center of gravity).

Note: (A) loaddata and tooldata with moment of inertia must be used!

Note: (B) Acceleration must be reduced by “AccSet” in each robot program.

	Description
Z	See the above diagram and the coordinate system in Product specification - IRC5 with FlexPendant.
L	Distance in X-Y plane from Z-axis to the mass center of gravity of the load. See 75% performance curves.
	Loads with mass center of gravity outside the 100% performance curve can be used with reduced acceleration, The performance must be reduced manually by using the RAPID “AccSet” in the robot program.
loaddata	Weight on the gripper (kg). The center of gravity of the gripper (mm). The moment of inertia of the gripper (kgm^2).

1.4.2 Load diagrams

	Description
tooldata	Weight of the product (kg). The center of gravity of the product (mm). The moment of inertia of the product (kgm^2). No value or wrong value may damage the robot. For more information see RAPID Reference Manual.
	For max acc performance $J_o \leq 8{,}3 \times 10^{-4}$ kgm. J_o=own moment of inertia of the total handle weight.

Note: The weight permitted for loads includes grippers etc.

IRB 340, IRB 340 SA and IRB 340 SAS

Load 750g:

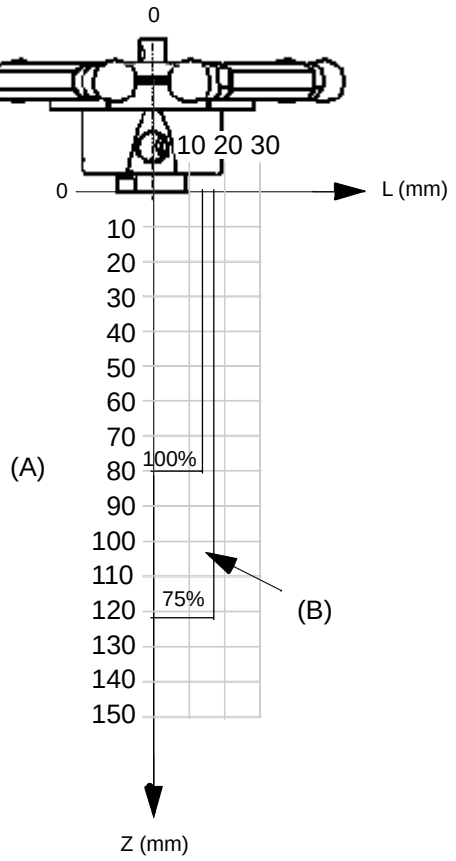


Figure 10 Maximum weight permitted for load (750 g) mounting on the mounting flange at different positions (center of gravity).

Note: (A) loaddata and tooldata with moment of inertia must be used!
Note: (B) Acceleration must be reduced by “AccSet” in each robot program.

	Description
Z	See the above diagram and the coordinate system in Product specification - IRC5 with FlexPendant.
L	Distance in X-Y plane from Z-axis to the mass center of gravity of the load. See 75% performance curves.
	Loads with mass center of gravity outside the 100% performance curve can be used with reduced acceleration, The performance must be reduced manually by using the RAPID “AccSet” in the robot program.
loaddata	Weight on the gripper (kg). The center of gravity of the gripper (mm). The moment of inertia of the gripper (kgm^2).

1.4.2 Load diagrams

	Description
tooldata	Weight of the product (kg). The center of gravity of the product (mm). The moment of inertia of the product (kgm^2). No value or wrong value may damage the robot. For more information see RAPID Reference Manual.
	For max acc performance $J_o \leq 8{,}3 \times 10^{-4}$ kgm. J_o=own moment of inertia of the total handle weight.

Note: The weight permitted for loads includes grippers etc.

IRB 340, IRB 340 SA and IRB 340 SAS

Load 1000g:

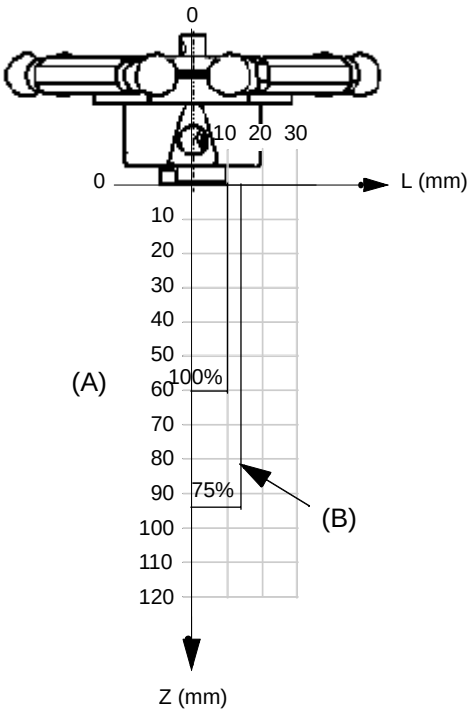


Figure 11 Maximum weight permitted for load (1000 g) mounting on the mounting flange at different positions (center of gravity).

Note: (A) loaddata and tooldata with moment of inertia must be used!

Note: (B) Acceleration must be reduced by “AccSet” in each robot program.

	Description
Z	See the above diagram and the coordinate system in Product specification - IRC5 with FlexPendant.
L	Distance in X-Y plane from Z-axis to the mass center of gravity of the load. See 75% performance curves.
	Loads with mass center of gravity outside the 100% performance curve can be used with reduced acceleration, The performance must be reduced manually by using the RAPID “AccSet” in the robot program.
loaddata	Weight on the gripper (kg). The center of gravity of the gripper (mm). The moment of inertia of the gripper (kgm^2).

1.4.2 Load diagrams

	Description
tooldata	Weight of the product (kg). The center of gravity of the product (mm). The moment of inertia of the product (kgm^2). No value or wrong value may damage the robot. For more information see RAPID Reference Manual.
	For max acc performance $J_o \leq 8{,}3 \times 10^{-4}$ kgm. J_o=own moment of inertia of the total handle weight.

Note: The weight permitted for loads includes grippers etc.

IRB 340/2, IRB 340 SA / 2, IRB 340 SAS/2

Load 2000g:

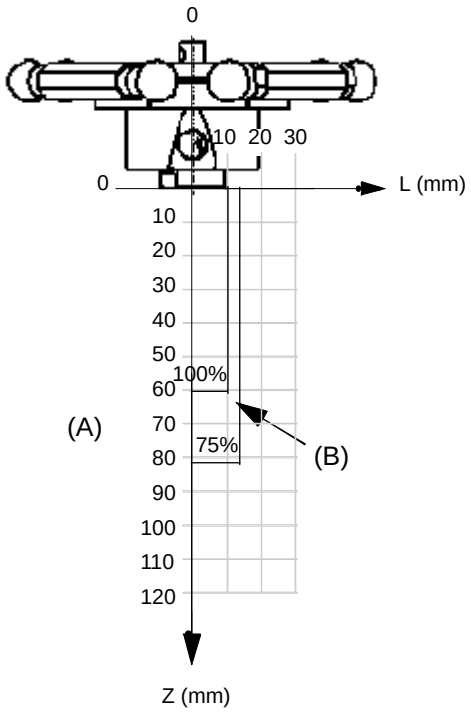


Figure 12 Maximum weight permitted for load (2000 g) mounting on the mounting flange at different positions (center of gravity).

Note: (A) loaddata and tooldata with moment of inertia must be used!

Note: (B) Acceleration must be reduced by “AccSet” in each robot program.

	Description
Z	See the above diagram and the coordinate system in Product specification - IRC5 with FlexPendant.
L	Distance in X-Y plane from Z-axis to the mass center of gravity of the load. See 75% performance curves.
	Loads with mass center of gravity outside the 100% performance curve can be used with reduced acceleration, The performance must be reduced manually by using the RAPID “AccSet” in the robot program.
loaddata	Weight on the gripper (kg). The center of gravity of the gripper (mm). The moment of inertia of the gripper (kgm^2).
tooldata	Weight of the product (kg). The center of gravity of the product (mm). The moment of inertia of the product (kgm^2). No value or wrong value may damage the robot. For more information see RAPID Reference Manual.

1.4.2 Load diagrams

	Description
	For max acc performance $J_o \leq 13{,}8 \times 10^{-4}$ kgm. J_o=own moment of inertia of the total handle weight.

Maximum Pressure Force

Maximum pressure force in X, Y and Z-direction	100 N
Maximum torque of axis 4	1 Nm

1.5 Extra equipment mounted on the manipulator arms

1.5.1 General

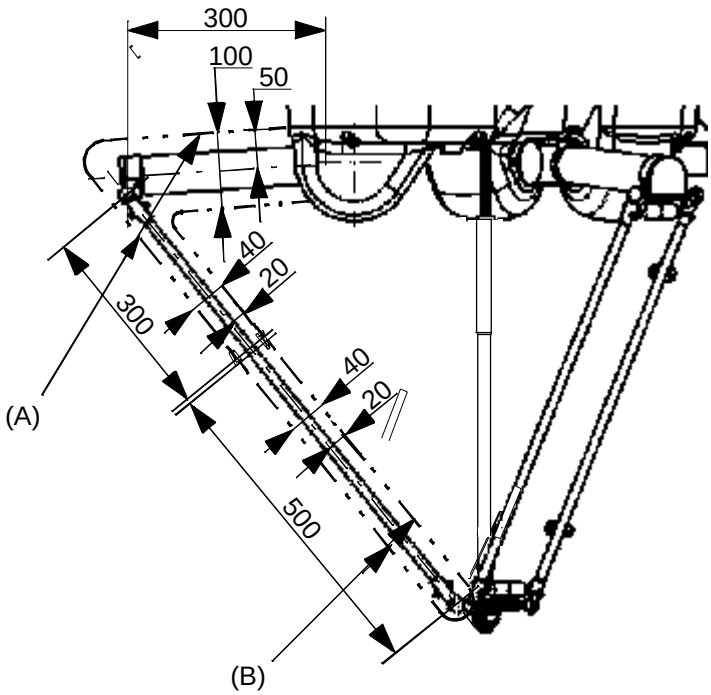


Figure 13 Definition of extra load on robot arms (measures in mm).

Pos	Description
A	Limitation lines for center of gravity for M2
B	Limitation lines for center of gravity for M1

Vacuum system or medium sized hose (options)

The robot is tuned for the vacuum system (option 218-9) or medium sized hose (option 174-2). If one of these options is used no extra load should be defined.

If neither the vacuum system nor the medium sized hose is chosen:

- and both M1 and M2 are less than 175 g each, the robot can run with full performance and no extra load should be defined.
- and M1 is more than 175 g, an extra load should be defined in the load definition. The extra load should be M1-175 g.
  Maximum extra load allowed is 175 g (M1 max = 350 g).
- and M2 is more than 175 g, an extra load should be defined in the load definition. The extra load should be M2-175 g.
  Maximum extra load allowed is 175 g (M2 max = 350 g).

1.5.1 General

The extra load should be defined in TCP 0.

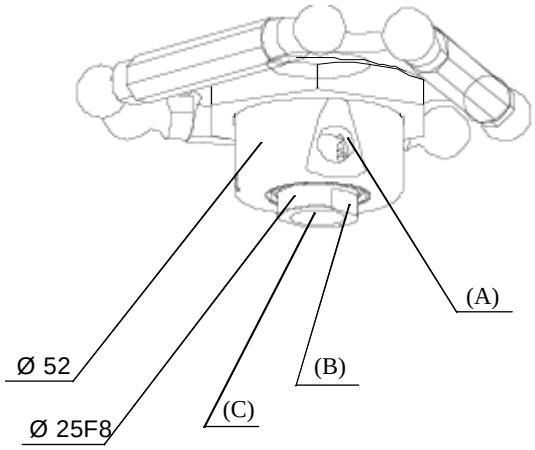


Figure 14 The mechanical interface (mounting flange), dimensions in mm.

Pos	Description
A	2xR1/4” (vacuum and media connection)
B	Key grip 22 h7 H=6
C	Mounting flange R3/8” depth 14 Witworth ISO-228/1

1.6 Maintenance and Troubleshooting

1.6.1 Introduction

General

The robot requires only a minimum of 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 gear boxes.
- All cabling is fixed, no movemets.
  In the unlikely event of a failure, its modular design makes it easy to change.

The maintenance intervals depends on the use of the robot. For detailed information on maintenance procedures, see the Maintenance section in the Product Manual.

1.7 Robot Motion

1.7.1 Introduction

The extreme position of the robot arm is shown in Figure 16

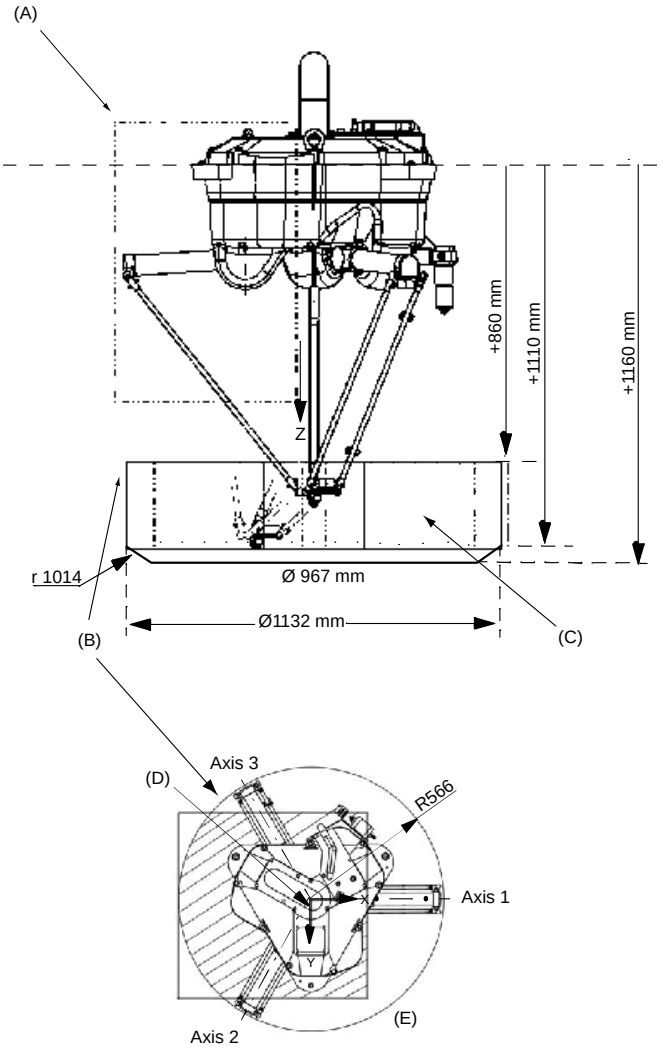


Figure 15 Working space of IRB 340 (dimensions in mm).

Pos	Description
A	Extreme position
B	Maximum working space inside cylinder. Working space can be reduced in x-y-z coordinates.
C	Marked area = actual working area
D	Base coordinate system
E	The numbers of the axes are marked at the bottom of the clamping surface respectively.

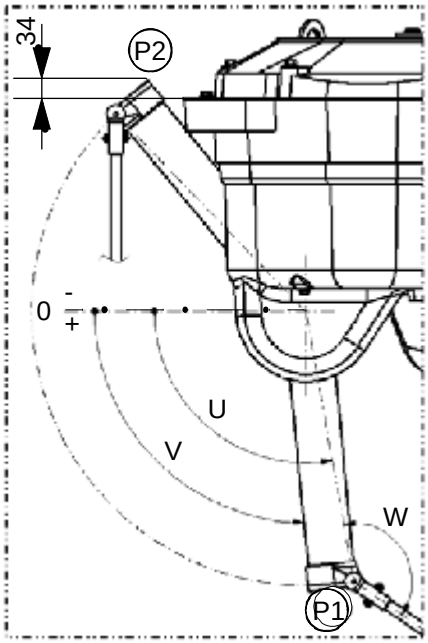


Figure 16 The extreme positions of robot arms.

Extreme values of the angles

Angles defined according to Figure 16:

Position P1	Position P2
U = 100°	U = -46.1°
V = 95.5°	V = -50.6°
W = 134.5°	W = 43.9°

Mechanical stop

When angle V = 57º mechanical stop is reached.

1.7.2 Performance according to ISO 9283

General

At rated load and 0.8 m/s velocity on the inclined ISO test plane with all four robot axes in motion.

Type of ISO test	At 0.1 kg pay-load	At 1.0 kg pay-load
Pose accuracy, AP (mm)	0.04	0.08
Pose repeatability, RP (mm)	0.07	0.07
Pose stabilization time, Pst (s)	0.05	0.03
Path accuracy, T (mm)	1.0	0.79
Path repeatability, RT (mm)	0.24	0.25

The values at 2.0 kg pay-load are not yet available.

Typical values for conveyor tracking

All values measured with PickMaster and IRC5.

Constant conveyor speed (mm/s)	Repeatabillity (mm)
200	1.0
350-750	1.5
800-1400	5.0

Start/stop conveyor (mm/s)	Repeatabillity (mm)
500 (start/stop in 0.2 sec.)	3.5

Backlash axis 4

Description	Value
Standard	0.4°
WashDown	1.5°

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

1.7.3 Velocity

Direction	Description
x, y, z	10 m/s
θ	3600 º/s

Supervision is required to prevent overheating in applications with intensive and frequent movements.

1.7.4 Acceleration

Direction	IRB 340, SA, SAS	IRB 340/2, SA/2, SAS/2
x, y, z	100 m/s^2	60 m/s^2
θ	1200 rad/s^2	720 rad/s^2

1.8 Typical cycle times

1.8.1 Introduction

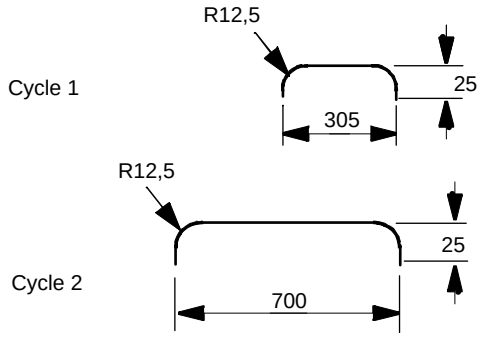


Figure 17

Approx. cycle times

	IRB 340, IRB 340 SA, IRB 340 SAS	IRB 340, IRB 340 SA, IRB 340 SAS	IRB 340/2, IRB 340 SA/2, IRB 340 SAS/2
	0.1 kg	1.0 kg	2.0 kg
Cycle 1	0.33 s	0.38 s	0.65 s
Cycle 2	0.44 s	0.55 s	0.83 s

1.8.1 Introduction

2 Specification of Variants and Options

2.1 Introduction

2.1.1 General

The different variants and options for the IRB 340 are described below. The same numbers are used here as in the Specification form. For software options, see Product specification - IRC5 with FlexPendant and Product specification - RobotWare Options.

2.1.2 Manipulator

Variants

Option	Description
435-33	IRB 340
435-34	IRB 340 SA WashDown
435-35	IRB 340 WashDown Stainless
435-47	IRB 340/2
435-48	IRB 340 SA/2 WashDown
435-49	IRB 340 SAS/2 WashDown Stainless

Application interface

Media outlet:

Option	Description
218-5	Signals and Power The customer signal and power are connected directly to the robot base to one FCI 12-pin UT001412SHT (R2.CP) and one FCI 23-pin UT001823SHT (R2.CS) connector. The cable between manipulator and controller is included. The signal and power are connected to one 12-pole screw terminal in the controller.

2.1.2 Manipulator

Option	Description
218-9	Vacuum System An integrated vacuum system for picking of products with suction-cups. The system includes ejector, valves, filter and hose (D=15/10) to tool point. The system has three signals: grip, drop and vacuum level guard. • The ejector is of venturi principle and needs: air supply: 4-6 bar • air quality: dry and clean • maximum particle size 5 μm • air consumption: 270-380 l/min • vacuum level: max –0.9 bar • ejector capacity: 39 l/min –0.7 bar • 180 l/min –0.3 bar The signal cable between the manipulator and the controller is included. The cable is connected to one 12-pole screw terminal in the controller. **Note**: Only one of option 218-5 and option 218-9 can be selected.

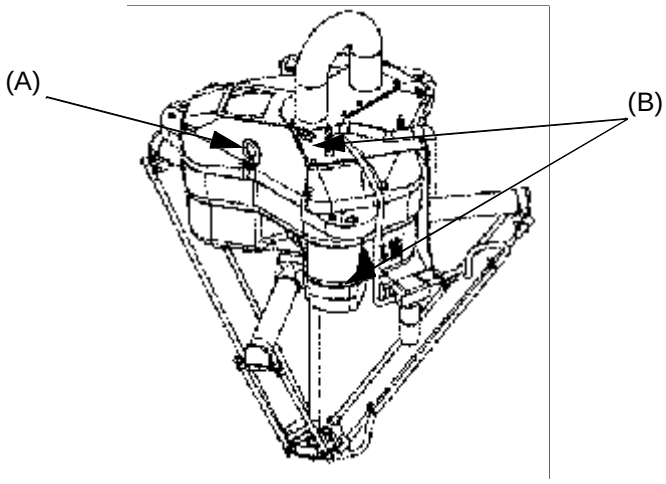


Figure 18

Pos	Description
A	Connection of signals and power
B	The vacuum system

Hose to tool point

Not available together with option 218-9 (hose included).

Option	Description
174-2	Medium, D = 15/10 mm
174-1	Large, D = 20/27 mm

Connection to cabinet

(Cable lengths)

Option	Description
94-1	7m
94-2	15m
94-3	22m
94-4	30m

Safety lamp

Option	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.
12-1	In/outlet for external air (only needed for WashDown version) Plate for connecting external air into the base of the manipulator (inlet and outlet, diameter 76 mm) for internal air circulation. Recommended for warm or cold environments, and at the risk of getting condensation inside.

Manipulator Cable - length

Option	Description
210-1	3 m (only for M2004)
210-2	7 m
210-3	15 m
210-4	22 m
210-5	30 m

2.1.2 Manipulator

3 Accessories

There is a range of tools and equipment available, specially designed for the robot.

Basic software and software options for robot and PC

For more information, see Product specification - IRC5 Controller with FlexPendant and Product specification - RobotWare Options.

PickMaster and Vision system

For more information, see PickMaster Product specification and PickMaster User’s Guide.

3HAC 9216-1, Revision H, en

ABB AB
Robotics Products
S-721 68 VÄSTERÅS
SWEDEN
Telephone: +46 (0) 21 344000
Telefax: +46 (0) 21 132592