



TECHNICAL SHEET

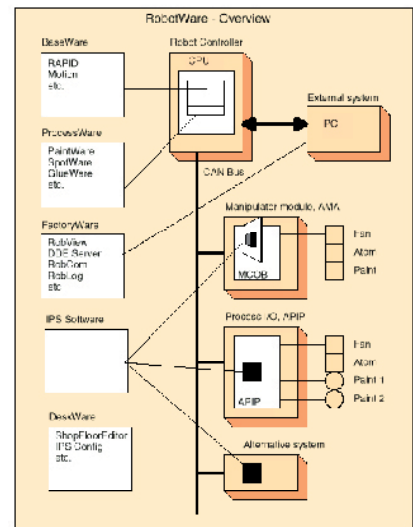
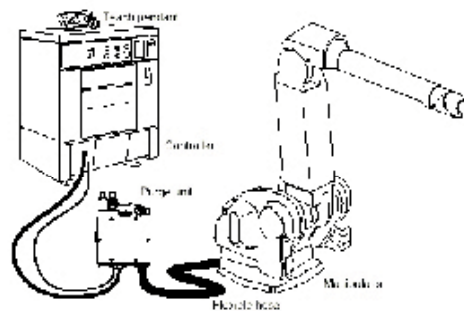
ROBOT DI SMALTATURA IRB-540 *PAINTING ROBOT IRB-540*



The robot is made up of two main parts, the manipulator and the controller.

The controller includes the control electronics and the control software.

The manipulator is the working part of the



robot and is available in a number of different versions.

The control software

The robot is controlled by the RAPID program. Other programs are available for different purposes such as software for controlling the paint system, off-line editing etc.

The control systems

The robot includes various control systems such as the central computer module, axis motor control system, I/O systems etc. The control systems are mostly located in the control cabinet, but some systems are located in the manipulator and in external systems.

The control cabinet

The control cabinet includes the control electronics for the robot and associated systems.

The manipulator

Different types of manipulators, also called robot, are available for different types of operations. All manipulators are equipped with maintenance-free AC motors, which have electromechanical brakes. The brakes lock the motors when the robot is inoperative for more than three minutes.

including the RAPID programming language, as well as software options that run on top of this operating system. The software options represent functionality for robot users that need to do more: run multitasking, do file transfer, perform advanced motion tasks, etc. The Base Ware program is running in the main computer in the robot controller.

Process Ware

The Process Ware software is designed for specific applications, like painting, spot welding, gluing, etc. They are software options that run on top of the operating system in the robot controller. The option needed for painting is called Paint Ware.

Factory Ware

Factory Ware is a set of powerful Windows-based software products running on a PC. They are intended to be used in PCs, connected to the robots on the factory floor. The products are typically used for programmable operator interfaces, monitoring, cell supervision and

SOFTWARE SYSTEM

The following illustration and descriptions give a short overview of the different software systems available.

Base Ware

The Base Ware software includes the basic operating system for the robot controller



IPS Software

The IPS software controls the spraying fan from the applicator by controlling fluid- and air flows. The IPS software can run in the manipulator module or an external module beside the robot.

Desk Ware

Desk Ware is a set of powerful Windows-based software products running on a PC. They are used to train people, for creating and editing robot programs (CAP), etc

CONTROL SYSTEM

Basic control system concept

The illustration and description below give a short overview of the control system for the robot.

Axis motor control

3 drive units and a DC Link (Rectifier) control the axis motors. The position of the motors (resolver position) is fed back to the control system via the measuring board, located in the manipulator base.

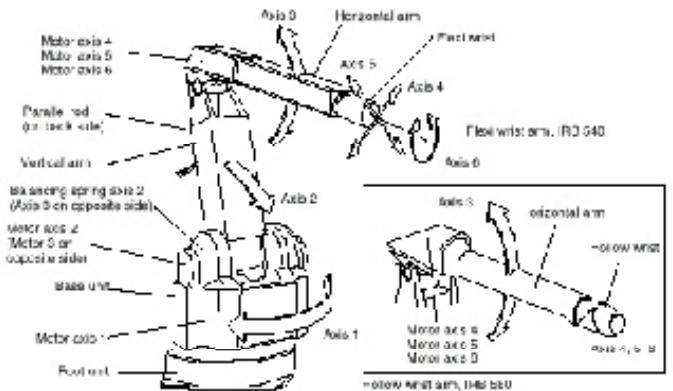
I/O System

The I/O system provides a range of different modules for functions such as extra digital and analog I/O, encoder for conveyor tracking and modules for communication with external PLC systems via Interbus-S,

Allen Bradley RIO, Profibus, etc.

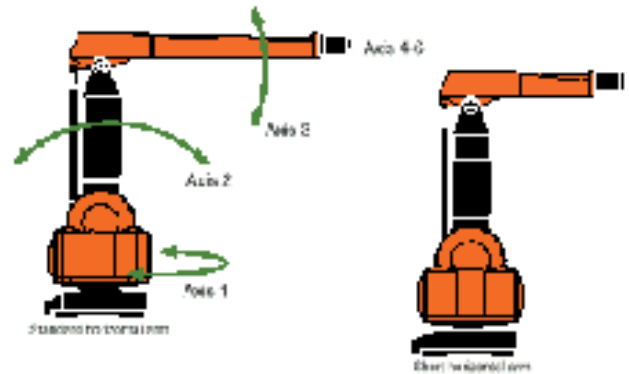
IRB 500 MANIPULATOR

The IRB 500 robots are 6 axes, versatile robots. The IRB 540 has the flexi wrist for easy point-to-point programming. The IRB 580 has the hollow wrist which enables paint- and air supply hoses to be laid internally in the robot arm.



IRB 540 MANIPULATOR SPECIFICATION

The IRB 540 is a lighter painter robot in the IRB robot family, and has a more limited reach than IRB 5400. The robot is equipped with flexi wrist. The manipulator is available with 2 different lengths of the horizontal arm. The robot will normally include paint control systems on the vertical arm.



Technical specifications, IRB 540

General

- Number of axes: 6
- Weight: 610 kg (incl. foot unit)
- Dimensions: See figure - Standard horizontal arm
See figure - Short horizontal arm
- Payload: See Permitted load on arm and Permitted load on wrist

Working area

- Range of motion: Axis 1: +150° - -150°
Axis 2: +75° - -70°
Axis 3: +35° - -60°

Working area drawings: See figure - Standard horizontal arm
See figure - Short horizontal arm

Performance

- Static repeatability: 2.0 mm
- Velocity: *1
Axis 1: 112°/s
Axis 2: 112°/s
Axis 3: 112°/s

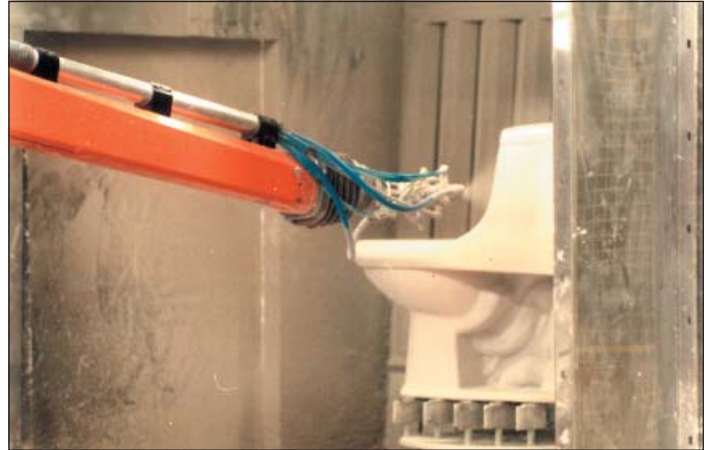
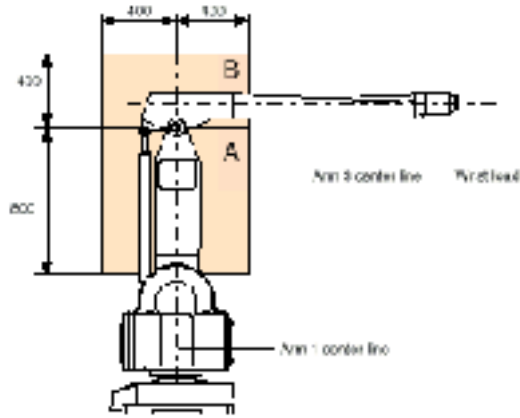
*1 Supervision prevent overheating during intensive and frequent



	Endurance load in operation	Max. load at emergency stop
Force xy		$\pm 2900 \text{ N}$ $\pm 3500 \text{ N}$
Force z	$+ 6000 \pm 1000 \text{ N}$	$+ 6000 \pm 1000 \text{ N}$
Moment xy	$\pm 5300 \text{ Nm}$	$\pm 6000 \text{ Nm}$
Moment z	$\pm 1500 \text{ Nm}$	$\pm 3000 \text{ Nm}$

rules:

1. Sum of load in boxes A and B must not exceed 20 kg.
2. Maximum 15 kg can be mounted in the base, axis 1, if the distance from the center of rotation to the center of gravity of the load is less than 400 mm.
3. The above maximum weights can be exceeded if the total extra load on the robot axes does not exceed the following maximum values (evaluated with arm angles in worst case position):



Permitted load on arm

Various equipment such as spray-gun, spraying fan control valves, fluid pumps, colour change valves etc. may be mounted on the manipulator. The following sections describe how the maximum loads which can be mounted on the arm can be found. For information on load which can be mounted on the wrist, see Permitted load on wrist under next section: Flexi wrist specifications.

All loads described refer to a 'naked' robot. If extra components are already present, the weight of these components must be subtracted from the calculated weights.

Keep in mind that any load on the manipulator will decrease the robot's capability to accelerate. As this might have consequences for the cycle time, the load should be kept as low as possible, and should be mounted as close to the center of rotation or to the base of the manipulator as possible.

The calculation of the extra loads which can be mounted on the robot arm refers to 2 boxes; box A and B as shown in figure. The boxes also stretch symmetrically 400 mm to each side of the center line, i.e. into- and out from the 2D plane shown in the drawing.

Extra load must be mounted with the center of gravity inside the three boxes A and B.

Box A applies for load on the vertical arm, and box B apply for the horizontal arm. The extra load permitted must comply to the following

