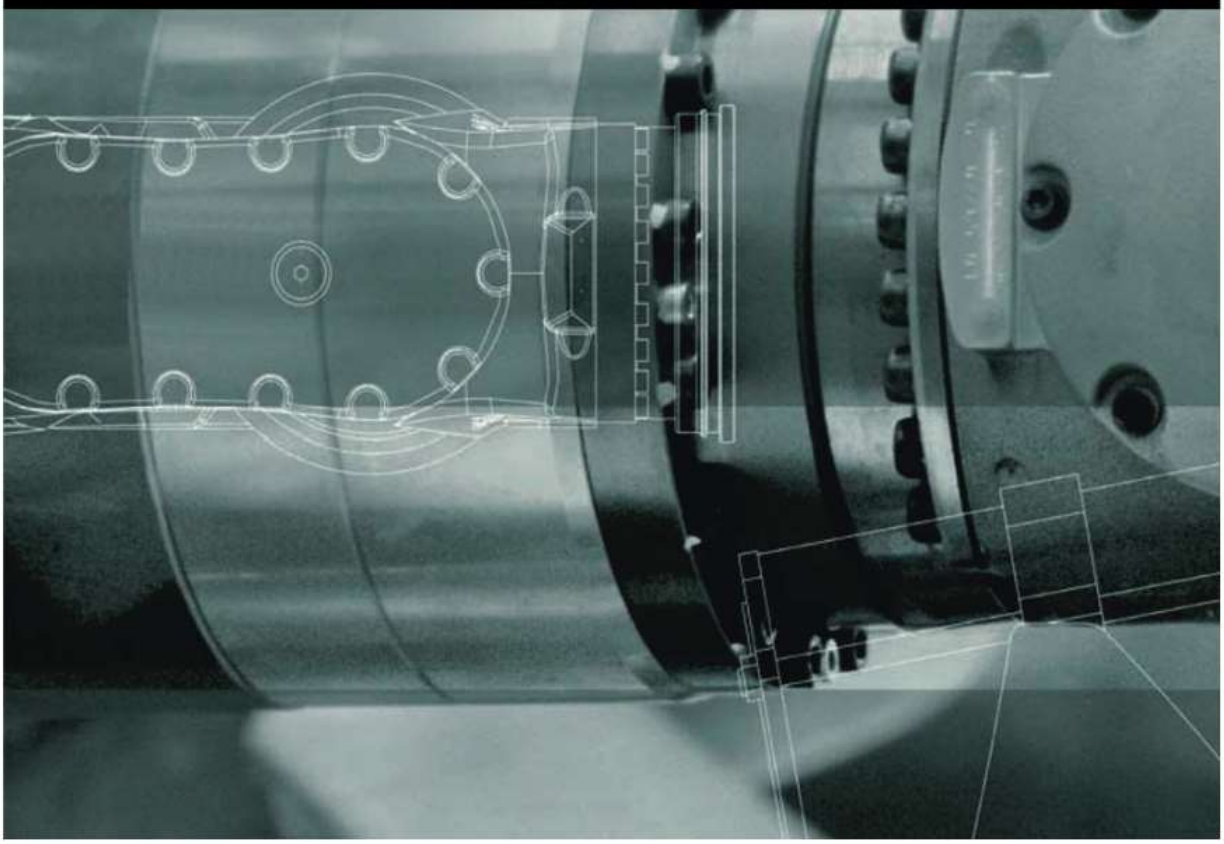
KUKA

Robots

KUKA Roboter GmbH

KR 5 sixx R650, R850 CR

Specification



Issued: 19.07.2011

Version: Spez KR 5 sixx CR V4 en

KUKA Roboter GmbH
Zugspitzstraße 140
D-86165 Augsburg
Germany

Other functions not described in this documentation may be operable in the controller. The user has no claims to these functions, however, in the case of a replacement or service work.

We have checked the content of this documentation for conformity with the hardware and software described. Nevertheless, discrepancies cannot be precluded, for which reason we are not able to guarantee total conformity. The information in this documentation is checked on a regular basis, however, and necessary corrections will be incorporated in the subsequent edition.

Subject to technical alterations without an effect on the function.

Translation of the original documentation

KIM-PS5-DOC

Publication:	Pub Spez KR 5 sixx CR en
Bookstructure:	Spez KR 5 sixx CR V4.1
Label:	Spez KR 5 sixx CR V4 en

Contents

1 Product description

1.1 Overview of the robot system

The robot system consists of the following components:

- Manipulator
- Robot controller
- KCP teach pendant
- Connecting cables
- Software
- Options, accessories

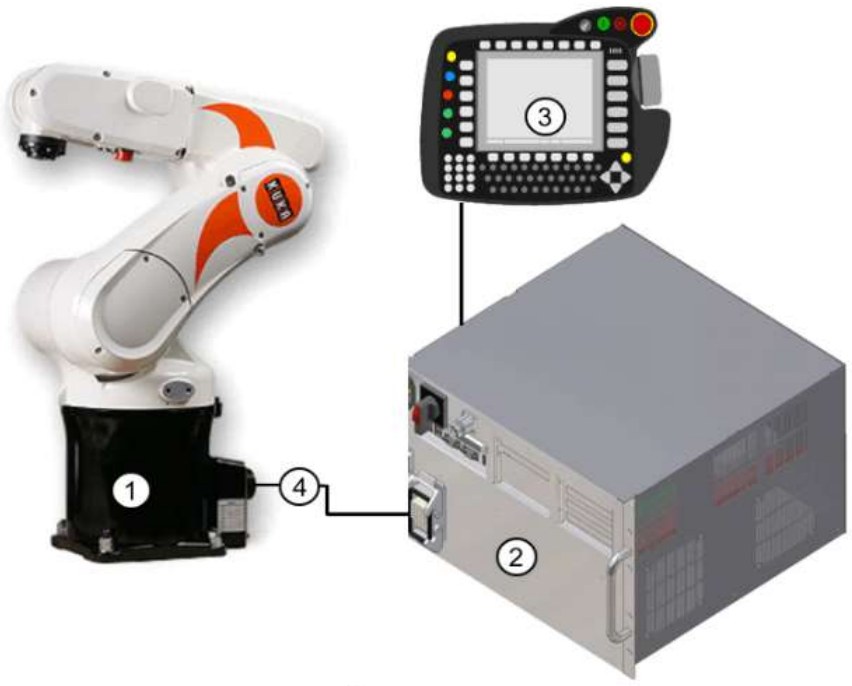


Fig. 1-1: Example of a robot system

1	Robot	3	Teach pendant (KCP)
2	Robot controller	4	Connecting cables

1.2 Description of the robot

Overview

The robot is a 6-axis jointed-arm robot made of cast light alloy. All motor units and current-carrying cables are protected against dirt and moisture beneath screwed-on cover plates.

The robot consists of the following principal components:

- In-line wrist
- Arm
- Link arm
- Rotating column
- Base frame
- Electrical installations

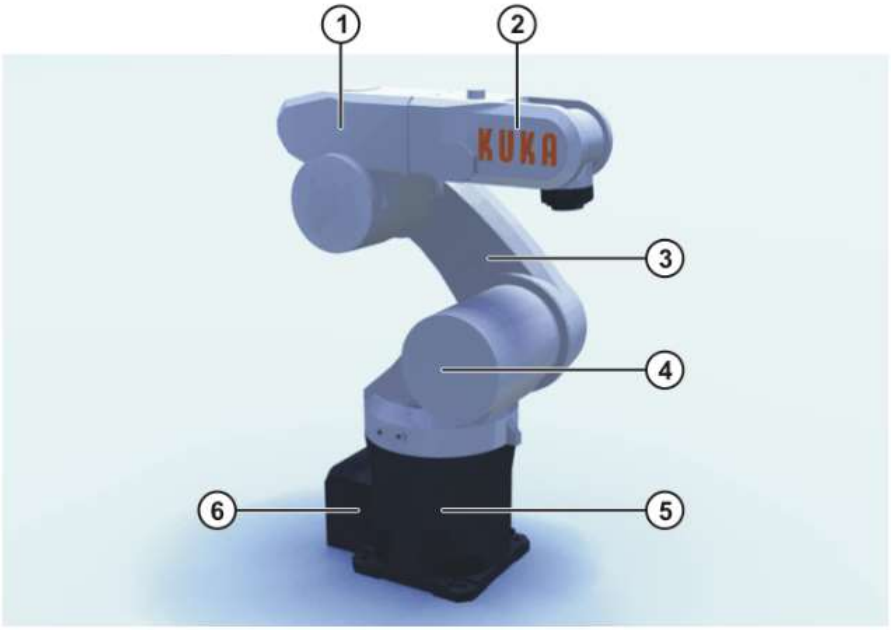


Fig. 1-2: Principal components

1	Arm	4	Rotating column
2	In-line wrist	5	Base frame
3	Link arm	6	Electrical installations

In-line wrist

The robot is fitted with a 3-axis in-line wrist. It is driven by the motors in the arm (axis 4) and in-line wrist. The motor of axis 4 drives the gear unit directly, while axes 5 and 6 are additionally driven by means of a toothed belt. The in-line wrist performs the motions about axes 4, 5 and 6.

There are three 5/2 pulse valves in the in-line wrist that can be used for controlling tools. The description and the data of the valve group are given in the section "Technical data" (>>>).

The in-line wrist also accommodates the 10-contact circular connector of the wrist I/O cable.

Arm

The arm is the link between the in-line wrist and the link arm. It houses the motor of wrist axis 4. There are 2 variants of arm available.

Link arm

The link arm is installed between the arm and the rotating column. It houses the motors and gear units of axes 2 and 3. The supply lines of the energy supply system and cable harness for axes 2 to 6 are routed through the link arm. There are 2 variants of link arm available.

Rotating column

The rotational motions of axis 1 are performed by the rotating column. This is screwed to the base frame via the gear unit of axis 1 and is driven by a motor in the base frame. The rotating column houses the backup batteries for backing up the axis data of the position sensing system.

Base frame

The base frame is the base of the robot. It constitutes the interface for the connecting cables between the robot, the controller and the energy supply system. All connecting cables are accommodated at the rear of the base frame.

2 Technical data

2.1 Basic data

Basic data

Type	KR 5 sixx R650 CR KR 5 sixx R850 CR
Number of axes	6
Volume of working envelope	KR 5 sixx R650 CR: 1.0 m^3 KR 5 sixx R850 CR: 2.3 m^3
Repeatability (ISO 9283)	KR 5 sixx R650 CR: ±0.02 mm KR 5 sixx R850 CR: ±0.03 mm
Working envelope reference point	Intersection of axes 4 and 5
Weight	KR 5 sixx R650 CR: approx. 28 kg KR 5 sixx R850 CR: approx. 29 kg
Principal dynamic loads	See “Loads acting on the mounting base”
Protection classification of the robot	IP 54, ready for operation, with connecting cables plugged in (according to EN 60529)
Protection classification of the in-line wrist	IP 65
Air cleanliness classes	Class 3 with extraction system at 40% and 80% override (acc. to EN ISO 14644-1) Class 4 without extraction system at 40% and 80% override (acc. to EN ISO 14644-1)
Sound level	< 75 dB (A) outside the working envelope
Mounting position	Floor or ceiling
Surface finish, paintwork	Plastic: white, paintwork: white, base frame: black

Vibration stress

Operation	No permanent vibration stress permissible Brief, one-off: 0.5 g
Storage and transportation	Brief, one-off: 3 g

Ambient temperature

Operation	0 °C to +40 °C (273 K to 313 K) Relative air humidity ≤ 90% No condensation permissible.
Storage and transportation	-10 °C to +60 °C (263 K to 333 K) Relative air humidity ≤ 75% No condensation permissible.

Ambient conditions

Operation	■ Free from inflammable dust, gases and liquids ■ Free from aggressive and corrosive gases and liquids ■ Free from flying parts ■ Free from spraying liquids ■ Free from electromagnetic loads, e.g. from welding equipment or high-frequency converters

Connecting cables

Cable lengths: 4 m, 6 m, 12 m

The connecting cables consist of the motor/data cable and the wrist I/O cable. The following connector designations and connections are used:

Cable designation	Connector designation	Robot controller - Robot
Motor/data cable	X20 - CN22	Harting circular connector
Wrist I/O cable	X32 - CN20	D-Sub circular connector
Ground conductor	PE	M5 cable lug at each end

For detailed specifications of the connecting cables, see

2.2 Axis data

The data are valid for floor-mounted R650 and R850 robots.

Axis data

Axis	Range of motion, software-limited	Speed with rated payload 5 kg
1	+/-170°	375 °/s with R650 250 °/s with R850
2	+45° to -190°	300 °/s with R650 250 °/s with R850
3	+165° to -119°	375 °/s with R650 250 °/s with R850
4	+/-190°	410°/s
5	+/-120°	410°/s
6	+/-358 °	660°/s

The direction of motion and the arrangement of the individual axes may be noted from the following diagram.

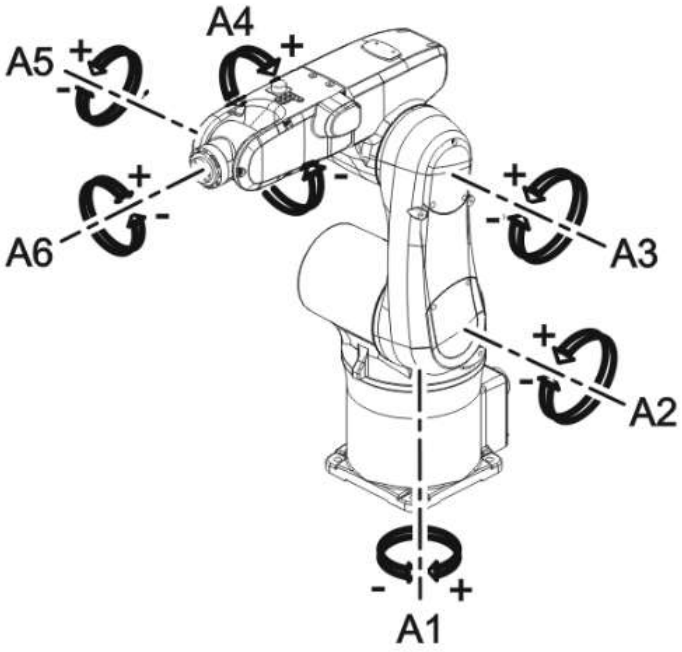
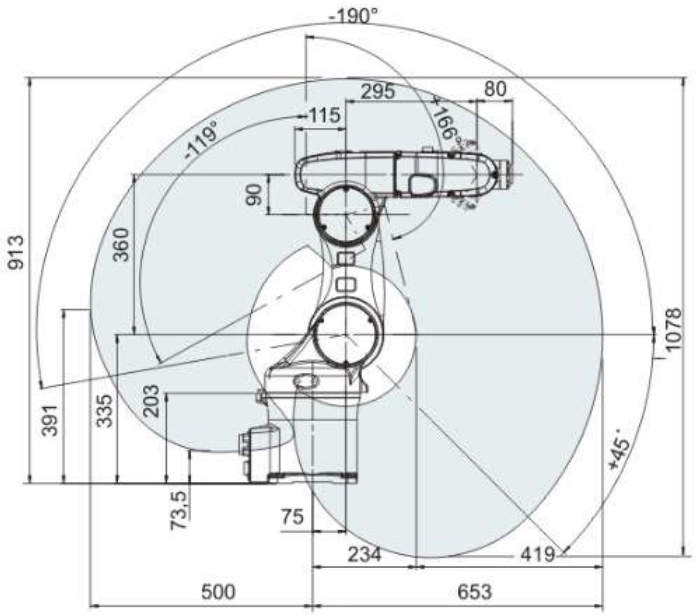


Fig. 2-1: Robot axes

Working envelope

The following diagram shows the shape and size of the working envelope.

Dimensions: mm



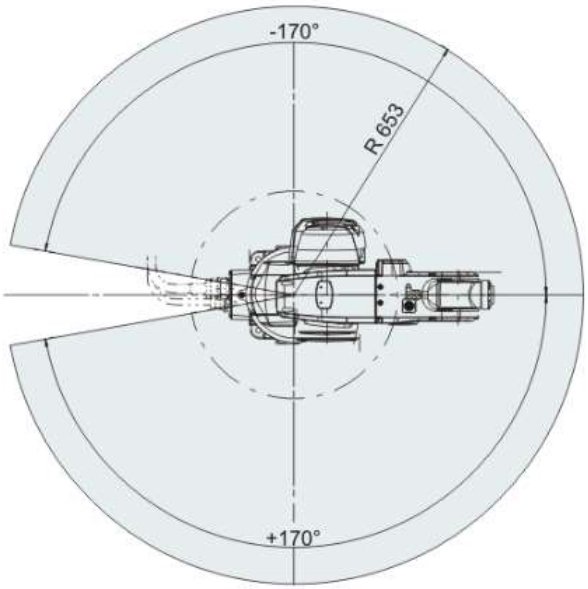


Fig. 2-2: Working envelope R650