



KUKA SHELF-MOUNTED ROBOTS

THE ALL-ROUNDER FOR CONFINED SPACES

THE SERIES ○ MAXIMUM PERFORMANCE IN A
MINIMUM OF SPACE

In many industries, complex work processes must function smoothly in confined spaces – due to low ceilings or lack of floor space. Integrated on production machines, such as injection-molding machines, machine tools or foundry systems, KUKA shelf-mounted robots ensure extremely productive and process-optimized performance of work operations.

ALL-ROUNDER



KR 30-4 KS



KR 16 KS



WIDE RANGE, LARGE WORK ENVELOPES
 KUKA offers the world's largest range of shelf-mounted robots. And the variants are virtually limitless: There are designs for low, medium and high payloads, each with an arm extension. The latest generation of shelf-mounted robots has been designed with a particularly low base

frame (κs) to extend the depth of the work envelope in a downward direction. The range of applications for KUKA shelf-mounted robot systems is practically unlimited. Whatever the branch of industry, KUKA robots are a flexible and cost-effective automation solution that can perform a wide variety of work procedures.

SERIES

KUKA PRINCIPLE

TECHNOLOGY

CONTROLLER

DATA

THE KUKA PRINCIPLE ○ **GREATER PRODUCTIVITY AS A MATTER OF PRINCIPLE**

KUKA robot technology can be used for anything that moves in automation. No matter what the industry or the application, KUKA robots keep your operations running reliably, around the clock, with high productivity and utmost flexibility. The range of KUKA robotic applications is being continuously expanded, as increased productivity is an important factor in every branch of industry – including yours.

1 SUPPLEMENTARY LOADS

KUKA robots can carry heavy supplementary loads on the arm and link arm. Diverse supply packages (e.g. a valve terminal) can be installed here.

2 TOOL MOUNT

The tools are mounted using a certified standard flange that allows for fast tool changes. The versatility of the various application tools is boundless.

3 ROBOT KNEE

The optimized position of the robot knee – the point of intersection between axes 1 and 2 – ensure maximum reach and a

larger work envelope. This means, for example, that KUKA robots can reach far inside other machines.

4 ENERGY SUPPLY SYSTEM

All energy and fluid supply systems are routed in such a way as not to restrict the motion radii of the axes.

5 AC SERVOMOTOR

Proven KUKA technology, such as maintenance-free AC servomotors, tried and tested thousands of times around the world, ensure maximized operating times and utmost cost-efficiency.

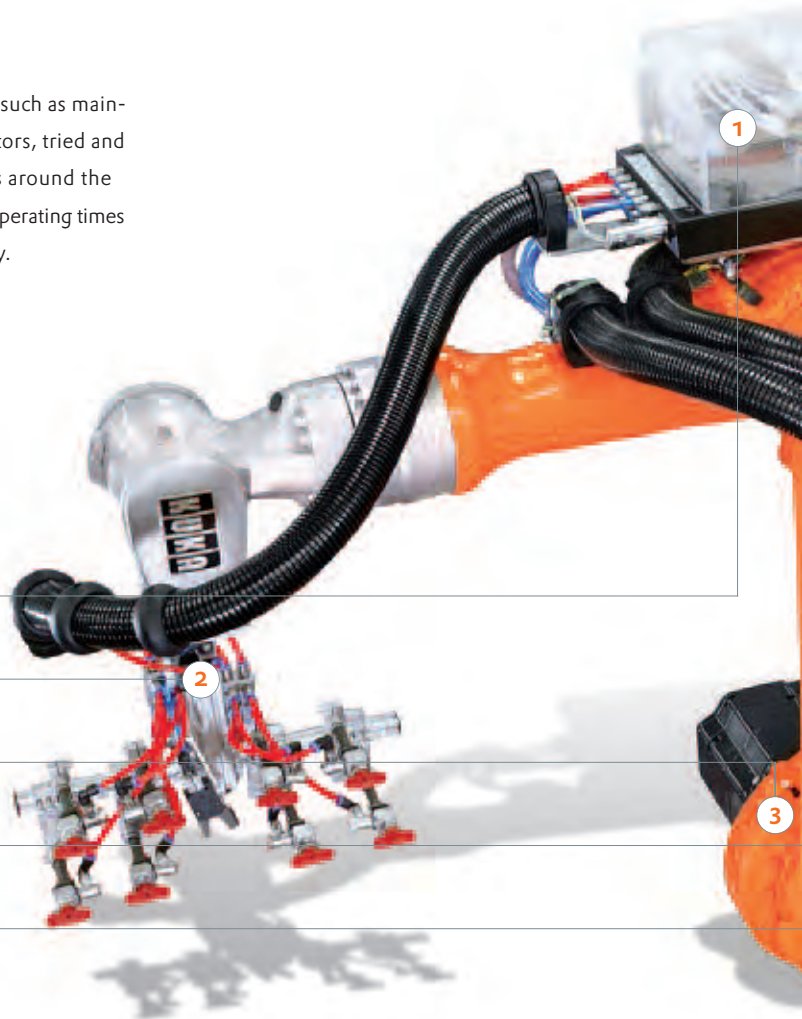
1 SUPPLEMENTARY LOADS

2 TOOL MOUNT

3 ROBOT KNEE

4 ENERGY SUPPLY SYSTEM

5 AC SERVOMOTOR



ADVANTAGES OF THE KUKA PRINCIPLE

UTMOST PRECISION: Highly accurate link-and-gear combinations and optimized control loops in the kinematic chain provide unrivaled repeatability.

HIGH SPEED: The low weight of the robots ensures optimum acceleration values and maximum working velocities. This allows minimized cycle times.

USER-FRIENDLY CONTROLLER: The Windows™-based kuka control technology enables simple installation, start-up and programming of the robot.

FIRST-CLASS SERVICE: From planning and configuration, on-site commissioning, start-up support, production tests, system optimization and professional maintenance management to operator training during ongoing production – kuka supports you with a wide range of services.



COMPACT DESIGN

kuka robots are not only technically superior, but also better-looking. The streamlined, compact design and the elimination of interference contours have earned them a variety of awards, including the IF Design Award.

MODULARITY

The modular structure (such as arm extension) ensures that the overall system can be adapted at any time to individual customer requirements.



THE TECHNOLOGY ○ **VERSATILE AGILITY**

Many tasks which were previously only capable by linear feed systems – due to the investment costs involved – can now also be carried out by the far more flexible KUKA shelf-mounted robots. In this way, even complex unloading operations are possible. For example, the robot can be integrated into an injection-molding machine, a die-casting machine or a machine tool.



THE TECHNOLOGICAL HIGHLIGHTS:

SPACE-SAVING: Integration on injection molders, die-casting machines or machine tools enables optimal utilization of the space available.

ERGONOMIC: Positioning the robot on top of the machine leaves the machine highly accessible and allows products to be unloaded from above with the safety gates closed.

INTEGRATED: Compact system concepts from a single provider allow savings on process costs, as robots can use the non-productive times for machining.

MODULAR: Customized variant design using our modular system so that you always have the ideal KUKA shelf-mounted robot for your requirements.

PRODUCTIVE: Greater availability of the shelf-mounted robot compared with alternative handling devices increases the productivity of the system.

MOBILE: Mounting robots on linear units extends their work envelope and makes it possible to link multiple production machines.

HEAT-RESISTANT: Foundry version with protection rating IP 67, special seals and heat-resistant paintwork. (More detailed information can be found in the brochure "KUKA in the foundry industry".)

OPEN: Forced or delicate demolding of complex 3D parts from intricate molds.



1 FOUNDRY INDUSTRY

When the heat is on, KUKA robots keep a cool head – thanks to their foundry specific equipment.

2 METALWORKING INDUSTRY

When precision in confined spaces is required, KUKA shelf-mounted robots offer ideal system solutions for the metalworking industry and other sectors.

3 HANDLING

Process reliability, high availability and rapid payback make the KUKA shelf-mounted robot a useful helper.

4 PLASTICS INDUSTRY

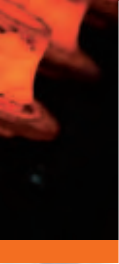
Innovative technologies for quality inspection of plastic surfaces.



FOR SPECIAL REQUIREMENTS

KUKA offers the right shelf-mounted robot system for every application. Whatever the industry, KUKA robots are a flexible,

reliable and cost-effective automation solution. Their system openness means that KUKA robots can be integrated into higher-level control structures.



2

3

4



SYSTEM SOLUTIONS FOR THE INJECTION-MOLDING INDUSTRY

KUKA shelf-mounted robots take care of all work processes, from unloading and cutting parts, to hanging them in transport frames.

SYSTEM SOLUTIONS FOR THE DIE-CASTING INDUSTRY

In addition to loading and unloading, shelf-mounted robots can also clean the dies, spray parting agent and coolant, and perform all the finishing tasks required in the die-casting industry.

SYSTEM SOLUTIONS FOR PRODUCTION

KUKA shelf-mounted robots can take care of diverse applications in practically every branch of industry: from deburring plastic parts with a cutter and measuring tolerance deviations to inspecting moving parts and handling complex operations.

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FEATURES OF SHELF-MOUNTED ROBOTS

KUKA shelf-mounted robots are weight-optimized and have an enormous reach and an exceptionally large work envelope. The low KS base frame with its small footprint offers a number of decisive advantages: the depth of the work envelope in a downward direction is increased reducing the vertical space requirement.

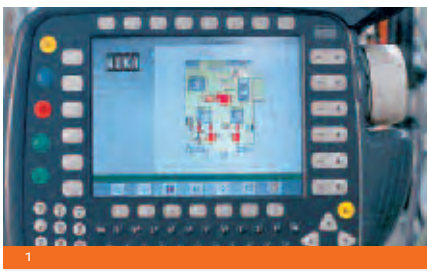
KUKA shelf-mounted robots can be integrated directly into a machine. The shorter lifting distances and longer reach due to the low base frame help to reduce cycle times in machine tending tasks. The optimized mechanical system allows the execution of machine loading and unloading processes and the finishing of completed parts in a single operation.

The KUKA modular system, complemented by specially-developed options, enables simple integration into your plant:

- Synchronization with the production machine
- Standardized energy supply system from axis 1 to 6
- Electrical interfaces for reliable dialog with the production machine
- Various software packages
- Standardized fluids supply unit on axis 3

THE CONTROLLER ○ COMMUNICATION THROUGH INTEGRATION

KUKA robots open up enormous potential. Intelligent control systems and software solutions from KUKA help to exploit this potential to the fullest potential. KUKA robot controllers are based on user-friendly Windows™-compliant user interfaces offering maximum functionality which can be mastered with a minimum of training. In this way, even complex systems can be started up quickly and easily and adapted at any time to new requirements or tasks.



- 1 **PLC CONTROLLER (KUKA.PLC)**
Integration of a KUKA Soft PLC allows the KUKA robot controller to assume control of the entire manufacturing cell. This saves hardware costs and increases flexibility.
- 2 **SIMULATION (KUKA.SIM)**
KUKA.Sim makes it possible to simulate the planned application. This enables processes to be visualized and optimized before commissioning.

PERFORMANCE FEATURES OF THE KUKA CONTROL PANEL (KCP):

- Ergonomic design for easy operation
- Predefined forms for quicker entry of commands
- Efficient operator guidance
- Fast teaching with the 6D mouse
- Familiar Windows-style operation

KUKA CONTROL PANEL (KCP)

The KCP teach pendant is fitted with an 8" color display, 6D mouse and customer-specific softkeys and hardkeys to make handling the controller even easier.

PERFORMANCE FEATURES OF THE KUKA KR C2 ROBOT CONTROLLER:

- Open, network-capable PC technology
- Integrated control and drive concept for all robots
- Easy exchange of components, without the need for tools
- DeviceNet (master) and Ethernet (in Windows system) available as standard; additional bus systems and real-time Ethernet optionally available
- Room for installation of up to 2 external axes (or more with a top-mounted cabinet)
- Proven drive systems in conjunction with PC technology for industrial environments
- Remote diagnosis options via modem or network
- Compact control cabinet, small footprint (approx. 0.3 m²)

KUKA KR C2 ROBOT CONTROLLER

The KR C2 is highly versatile and can be expanded at any time and integrated into networks via a bus. A wide range of software expansions are optionally available.

3 SAFE OPTION

Safe Option is a software-based machine protection and operator safety package that monitors the entire axis range and ensures maximum safety in the workspace.

HUMAN MACHINE INTERFACE (HMI STUDIO)

HMI Studio provides components for quick and easy creation of extensive production screens and cell visualization. With HMI Studio, complex sequences can be clearly visualized in a way that is readily comprehensible.

KUKA SOFTWARE SOLUTIONS

KUKA robots stand for maximum dynamism and innovative drive. Their intelligence is derived from a wide range of software options from the field of system integration and also from industry-specific software solutions.



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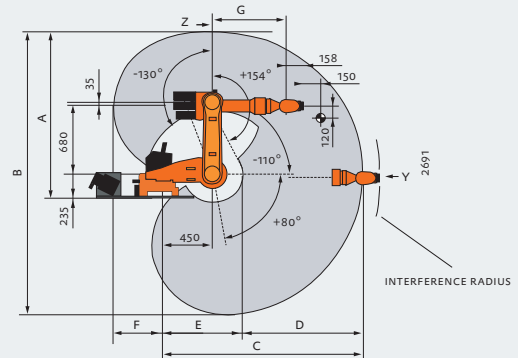
DATA

WORK ENVELOPE

TECHNICAL DATA

KR 16 KS

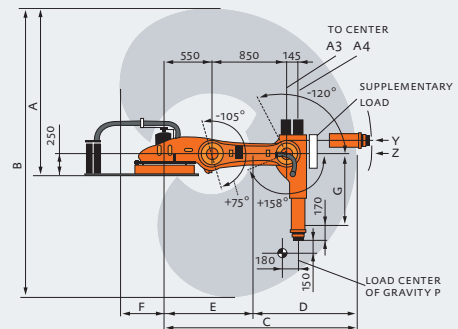
Payload	16 kg
Supplementary load	10 kg variable 20 kg
Max. total load	46 kg
Number of axes	6
Wrist variant	In-line wrist 16 kg (Foundry)
Installation position	Floor, ceiling
Repeatability	± 0.1 mm
Controller	KR C2



TECHNICAL DATA

KR 30-4 KS

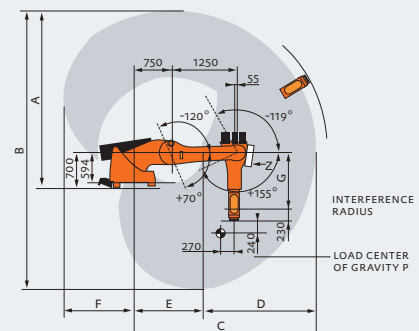
Payload	30 kg
Supplementary load	35 kg
Max. total load	65 kg
Number of axes	6
Wrist variant	F (foundry), $\leq 180^\circ\text{C}$ (10 s/min)
Installation position	Shelf
Repeatability	± 0.15 mm
Controller	KR C2



TECHNICAL DATA

KR 210-2 K

Payload	210 kg
Supplementary load	50 kg
Max. total load	610 kg
Number of axes	6
Wrist variant	F (foundry), $\leq 180^\circ\text{C}$ (10 s/min)
Installation position	Floor, Shelf
Repeatability	± 0.20 mm
Controller	KR C2



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