



KUKA PALLETIZING ROBOT

PACKAGING, PALLETIZING, DEPALLETIZING AND ORDER PICKING



THE SERIES ○ THE FUTURE IS IN THE DETAILS

KUKA robots work faster, more accurately and more productively than conventional automation solution – with consistently high quality. Solutions that have long since proven their worth in production are also the way of the future for logistics: complex tasks such as packaging, palletizing, depalletizing and order picking, that previously required vast amounts of “manpower” or complex technical systems, are now carried out not only faster and more efficiently by KUKA systems, but also fully automatically and around the clock. They also offer unrivaled flexibility: unlike conventional machines and systems built around a single product, KUKA robots can be freely adapted, again and again, to new or modified products. KUKA offers you the opportunity to make complex packaging and logistical tasks more productive – in particular arduous processes that place a heavy burden on the workforce.



EFFICIENCY



KR 40 PA



KR 50 PA



KR 240 270-2 PA



**KUKA COMPETENCE DOES NOT END
WITH PALLETIZING**

KUKA robots are also ideal for depalletizing and order picking. Unlike manual order picking, robots work almost without the need for breaks. Downtime and faults are virtually excluded. In this way, you reduce costs and workforce fluctuation while simultaneously increasing customer satisfaction.

THE KUKA PRINCIPLE ○ INNOVATION FROM TRADITION

KUKA robots have been making light work of a wide range of tasks for more than 3 decades. Their innovative technology has revolutionized industrial manufacturing. Not only do they automate process sequences with their PC-based controller – but their modular structure can be tailored to individual requirements. Their low weight results in energy savings and enables a high working velocity and maximum acceleration – even at maximum payload. Innovations such as the carbon fiber arm have reduced the weight of various models still further. One thing applies to all variants, however: they are all state-of-the-art robot technology.

3 COMPACT DESIGN

KUKA robots are not only technically superior, but also better-looking. Their streamlined design and the elimination of interference contours ensure optimal use of space.

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.





1

1 ROBOT WRIST

Tools are mounted on the DIN ISO certified standard flange, thus allowing fast tool changes.

2 CARBONARM

In the four-axis palletizing robots, both the main arm and the parallel arm are made of carbon-fiber reinforced plastic which is lightweight and particularly robust. In these variants, the wrist flange is kept parallel to the floor by default and is thus optimized for palletizing applications.



ADVANTAGES OF THE KUKA PRINCIPLE

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

OPTIMUM SPEED: The low weight of the robots means less weight needs to be moved, which ensures optimum acceleration and maximum working velocities minimizing cycle times.

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

FIRST-CLASS SERVICE: KUKA is a committed partner, who is on hand any time, any place, throughout the entire product lifecycle.

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

THE TECHNOLOGY ○ KUKA GETS TO GRIPS WITH WHATEVER COMES ITS WAY

Packaging, palletizing, depalletizing and order picking tasks enable KUKA robots to demonstrate their strengths. These applications involve the handling of numerous different products and packages and a wide range of tasks. Be it mixed or unmixed, cartons, plastic boxes, Styrofoam trays or plastic bags: Using flexible gripper systems that operate by suction, clamping or reaching under products, along with individually configurable palletizing software, and special sensors that distinguish between different products by size, weight, material or appearance, KUKA palletizing robots gets to “grips” with even the most difficult tasks.



PALLETIZING



ORDER PICKING

KUKA offers an extensive range of palletizing robots – from dedicated fast robots for medium payloads to heavy-duty machines that can handle 750 kg. All models are characterized by utmost repeatability, an impressive load-bearing capacity and a long reach.

All this, combined with maximum availability and flexible adaptability to a wide range of different tasks, makes these robots ideal for logistics applications



THE MOST IMPORTANT ADVANTAGES OF KUKA ROBOTS IN LOGISTICS AT A GLANCE:

KUKA robots allow you to perform logistical tasks significantly faster and more cost-effectively.

There is no need for costly and time-consuming conversion. This opens up a broad spectrum of potential applications.

Utmost flexibility in the case of changes of product or procedure ensures high security of investment.

User-friendly graphical user interfaces enable simple and safe commissioning and operation.

High-accuracy order picking enables the implementation of individual customer requests.

KUKA offers robots, application modules and energy supply systems.

Increased throughput by means of continuous operation and fast cycle times.

Shorter planning and commissioning times.

Multiple products can be handled simultaneously to increase utilization.

Food-compatible oil (H1) for handling of sensitive products.



HANDLING

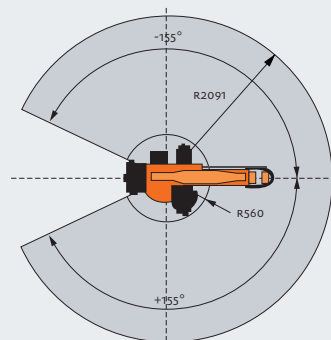
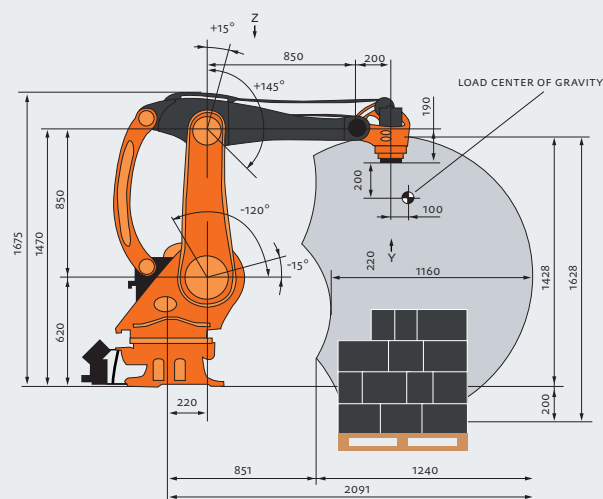
DEPALLETIZING

FOR MEDIUM PAYLOADS

With the KR 40 PA, KUKA now also brings you the perfect solution in the medium payload range. With its lightweight construction, high speed and long reach, it is ideally suited to all order picking, packaging and handling tasks. The new KR 40 PA is the first of its kind to come equipped as standard with a fully integrated energy

supply system. If necessary, an additional energy supply system can be added at any time. The robot can be integrated compactly into any logistics system. Time-consuming tasks can be performed swiftly, reliably and with the highest quality, irrespective of the number of shifts. The two-axis KR 50 PA is particularly suitable for repositioning tasks.

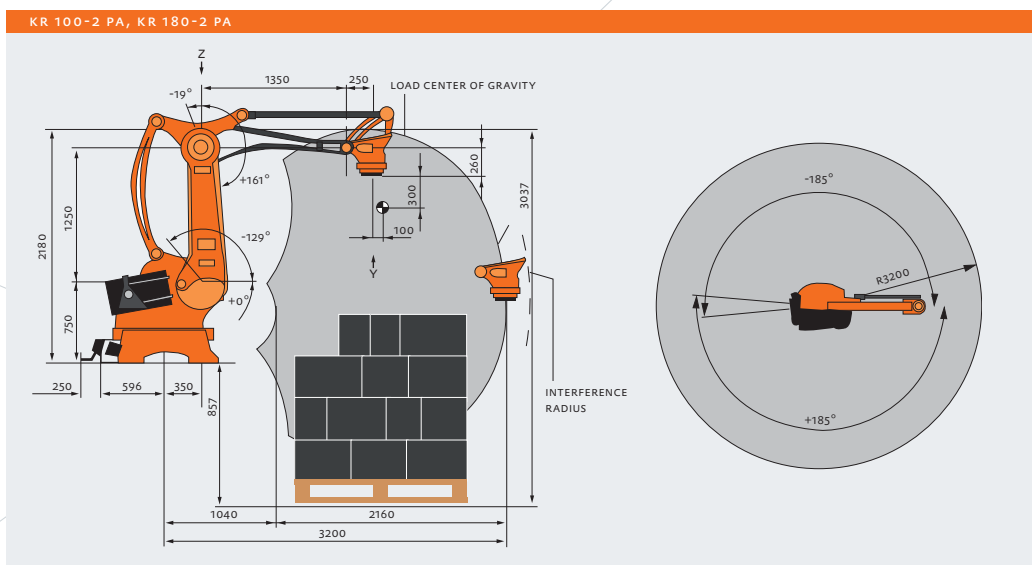
KR 40 PA



FOR HIGH PAYLOADS

Light, fast, powerful – the KUKA KR 100-2 PA and KR 180-2 PA palletizing robots have been developed for high-speed tasks with heavy payloads. Their optimally designed kinematics have been adapted especially for palletizing. The 4-axis robot is characterized by savings in maintenance and

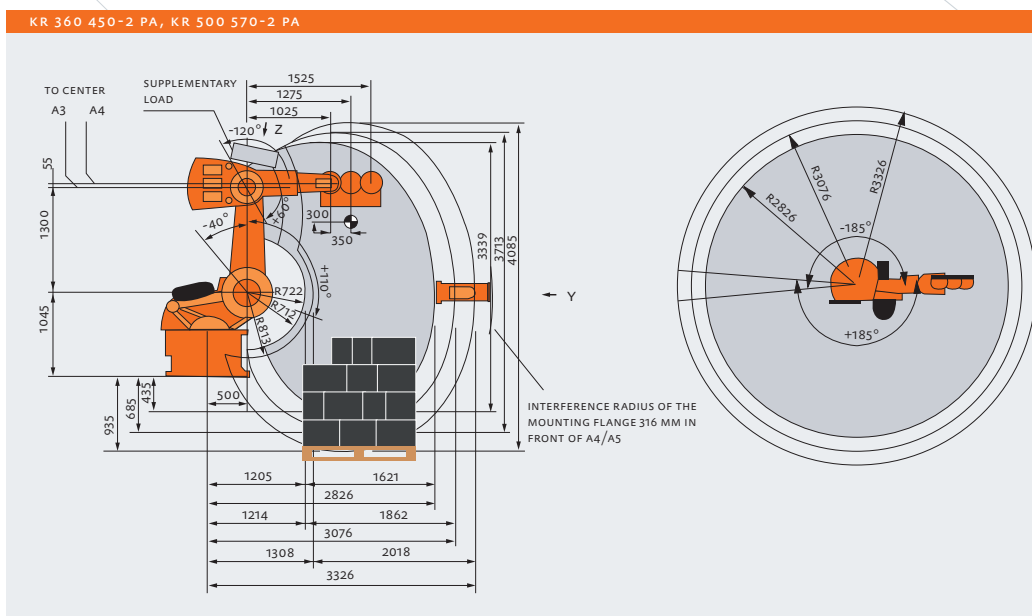
servicing. The high value creation and rapid investment payback make it attractive for all industries and applications. The KR 100-2 PA and KR 180-2 PA can achieve maximum net stacking heights of 3,000 mm on europallets. The KR 240 270-2 PA is a specialist for heavy payloads.



FOR HEAVY PAYLOADS

The KUKA KR 360 and KR 500 heavy-duty robots are also available in a palletizing version. The reach of each specific robot

can be adapted optimally to the requirements of the application through the use of the available arm extensions.



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VERSATILE

THE BEST SOLUTION

The food and beverages industry without KUKA palletizing robots has become inconceivable. From packaging to delicate transfer tasks (e.g. of baked goods), and from the stacking of heavy beverage crates to the handling of Tetra Paks on the periphery of filling systems – KUKA palletizing robots are an ideal choice.

VERSATILE

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THE APPLICATIONS ○ **TAILORED EXACTLY TO SPECIFIC REQUIREMENTS**

Not everyone needs the same things in the same quantities. That is why we offer our customers made-to-measure solutions. Modular hardware and software packages that can be combined as required for the food, furniture and pharmaceutical industry, distribution centers or environments with extremely low temperatures. At KUKA, you receive all the necessary components from a single source: robot, controller and software.



PALLETIZING AND MUCH MORE BESIDES

These special KUKA robots may be called “palletizing robots” – but they can do much more besides: packaging, sorting, depalletizing and order picking, for example, but also stacking and handling special products, such as frozen foods. Unlike with manual handling, KUKA palletizing robots perform all tasks with minimized downtime and error rates and without a drop in quality, e.g. due to breakages. The automation of the order picking process renders it comprehensible and allows it to be documented. A further benefit in the logistics process.



1 FOODSTUFFS INDUSTRY

Dairy and other food products require gentle handling. Once again, KUKA offers the optimal solution.

2 PALLETIZING

Different sized cartons of different weights are transferred effortlessly by the KUKA palletizer.

3 FROZEN FOOD INDUSTRY

In top form, even at -30 degrees – the KUKA deep-freeze palletizing robot works without the need for a protective suit or extra heating.

TOP PICTURE:

Sensitive puzzles and games are palletized without the packaging being damaged.

ROBOT



CONTROLLER



SOFTWARE

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. 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 the most complex systems can be started up quickly and easily and adapted at any time to new requirements or tasks.



HUMAN MACHINE INTERFACE (HMI STUDIO)

SIMULATION (KUKA.SIM)

PERFORMANCE FEATURES OF THE KUKA CONTROL PANEL (KCP):

- Ergonomic KUKA Control Panel for easy operation
- Predefined forms for quicker entry of commands
- Efficient operator guidance
- Fast teaching with the 6D mouse
- Familiar Windows-style operation
- Application-specific user interface for easy robot operation

KUKA SOFTWARE SOLUTIONS

Logistics solutions must be fast and safe and easily adapted to changing conditions. With various palletizing algorithms for mixed or unmixed palletizing (KUKA.Pallet); KUKA.Sim for simulation and offline programming; sensors, such as CCD cameras and laser scanners, for depalletizing; and tools for cell visualization and cell control (KUKA.PLC), KUKA offers the perfect solution for every application – individually configurable, easy to program and simple to operate.

PERFORMANCE FEATURES OF THE KUKA KR C2 ROBOT CONTROLLER:

- Open, network-capable PC technology
- Integrated control and drive concept for the entire robot range
- Easy exchange of components, without the need for tools
- DeviceNet (master) and Ethernet (in Windows system) as standard
- Room for installation of up to 2 external axes
- 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 MOTION CONTROL (KMC)

A whole range of tasks that until now have predominantly been carried out manually, such as depalletizing (e.g. from roll containers, lattice boxes or pallets), conveying, configuring mixed pallets to customer orders, positioning, etc., can now be fully automated using KUKA robots. No matter whether you are using a jointed-arm robot or a gantry robot, KUKA Motion Control offers the perfect control technology for integrating and controlling all components.



UNMIXED PALLETIZING

In KUKA.PalletPro, KUKA has developed the perfect palletizing software for creating layer patterns and palletizing unmixed rectangular products. This allows the configuration of all commonly used pallet types and sizes. The KUKA palletizing software offers clear advantages over time-consuming conventional programming: since product change cycles are becoming ever shorter, the KUKA palletizing software enables our customers to create new patterns and flexibly configure cells – even without prior programming experience. This means that there is no need for a KUKA service technician in the case of frequent changes of product.

MIXED PALLETIZING ONLINE AND OFFLINE

In the case of mixed offline palletization, the pallet is planned with the ideal configuration for the specific customer order. With the online palletizing software, a limited number of articles from a dynamic buffer serve as the basis for local optimization of the pallet. Compared with manual palletization, both software variants ensure faster, more stable, error-free results.

OFFLINE PROGRAMMING AND SIMULATION

KUKA.Sim simulation software supports you when designing the cell, and during cycle time and return on investment analyses. Because we employ reliable technology in the form of standard components, you save time and money during development, have shorter delivery times, and can thus reduce your planning risks to a minimum. Moreover, all of the components can be adapted flexibly to your customers' requirements.

KUKA.GRIPPERTECH

KUKA.GripperTech enables the robot system to control and monitor tools and devices in its work environment.

KUKA.USERTECH

KUKA.UserTech allows the user to create command macros with the aid of predefined modules.

KUKA.CONVEYOR

KUKA.Conveyor enables synchronization of the robot program sequence (motions, logic and I/O processing) with an externally controlled conveyor.

ADVANTAGES OF PROGRAMMING WITH THE KUKA PALLETIZING SOFTWARE:

Rapid and flexible configuration of up to 30 conveyor belts and pallet stations and up to 4 slipsheets or pallets

Shorter commissioning times

Automatic and manual product change via PLC

No gripper collision (automatic adaptation to pallet heights)

Dynamic load data for full and empty grippers enable improved cycle times and maximum velocity

THE OPTIONS ○ **EVERYTHING FROM A SINGLE SOURCE**

Together with our partners, we offer innovative solutions and application-related services from a single source. Thanks to the modular nature of the hardware and software components and the use of standardized interfaces, application solutions with KUKA components can be customized to meet your exact requirements.



SENSORS

KUKA Robots are true logistics experts – not only for packing and palletizing, but also for depalletizing and order picking, e.g. in large goods distribution centers. The demands placed on robotic automation solutions by depalletizing tasks differ greatly from those placed on them by palletizing tasks: some layer patterns may be unfamiliar or may have shifted during transportation. Result: sensors or other hardware must be used, e.g. image recognition for depalletizing. Using standardized image processing and software components, KUKA offers simple and reliable solutions for locating the objects to be gripped.

DETECTION AND GRIPPING

The 3D surface profile scan, specially developed by KUKA for logistics applications, helps you to locate a wide range of different articles without the need for the time-consuming teaching of features. This image processing component and the software variants for mixed palletizing enable fast and cost-effective depalletizing and order picking.

We are happy to offer our partners support with the development of gripper systems for logistics applications.

GRIPPERS

Intelligently modularized gripper systems significantly reduce the amount of development work required. A great variety of gripper tools is available, some with tool changing mechanisms, integrated sensor systems, a gripper rack, or a gripper for empty pallets. A full range of standard gripper systems is available, from suction cups and clamp grippers to grippers that reach under products and special grippers.

ACCESSORIES

In addition to robots and controllers, we offer a wide range of other components, such as energy supply systems (some with vacuum air for suction cups), linear units, platforms, field bus interfaces, and conveyor synchronization and safety systems, to name just a few.



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THE DATA ○ TECHNICAL DATA



KR 40 PA

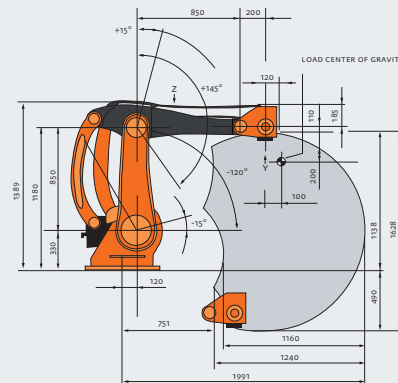
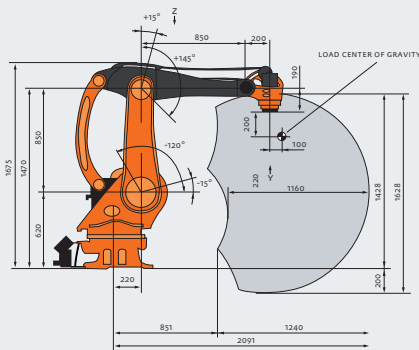


KR 50 PA

TECHNICAL DATA

Payload	40 kg	50 kg
Suppl. load, arm / link arm / rotating column	20 kg	20 kg
Max. reach	2,091 mm	1,991 mm
Repeatability	± 0.25 mm	± 0.25 mm
Number of axes	4	2
Controller	KR C2	KR C2
Weight (excluding controller) approx.	700 kg	492 kg
Mounting position	Floor	Floor, Ceiling, Wall

SPECIFICATIONS OF WORKING ENVELOPE



KR 100-2 PA

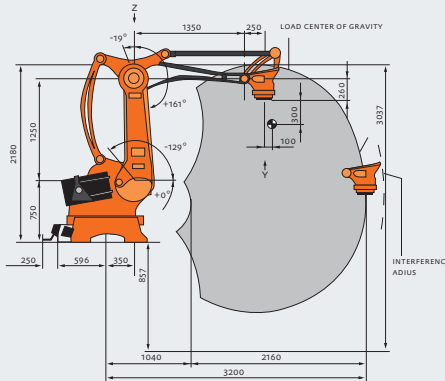
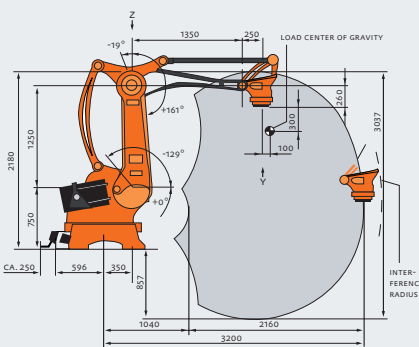


KR 180-2 PA

TECHNICAL DATA

Payload	100 kg	180 kg
Suppl. load, arm / link arm / rotating column	250 kg	250 kg
Max. reach	3,200 mm	3,200 mm
Repeatability	± 0.25 mm	± 0.25 mm
Number of axes	4	4
Controller	KR C2	KR C2
Weight (excluding controller) approx.	1,200 kg	1,200 kg
Mounting position	Floor	Floor

SPECIFICATIONS OF WORKING ENVELOPE





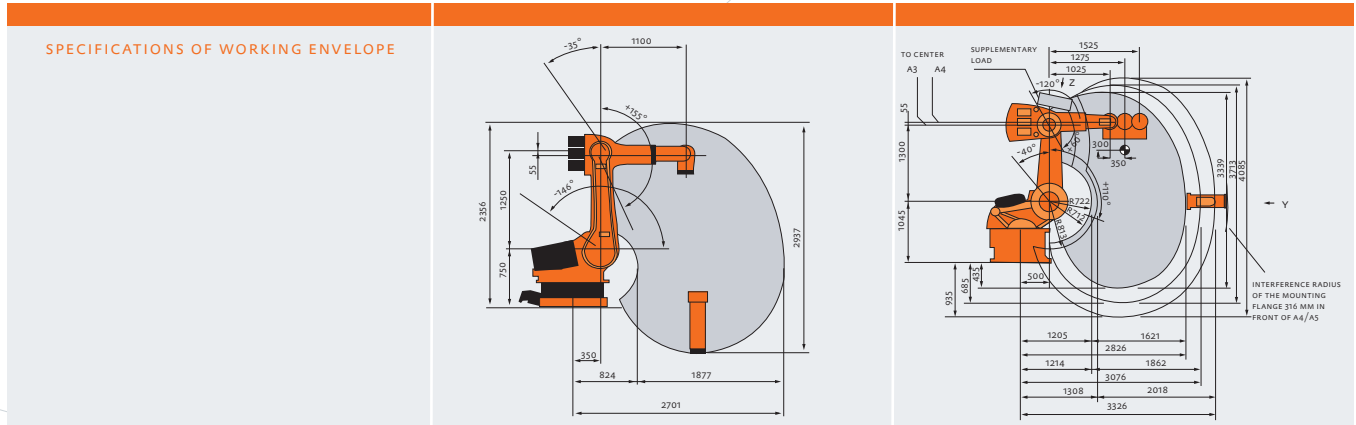
KR 240 270-2 PA



KR 360 450-2 PA

TECHNICAL DATA

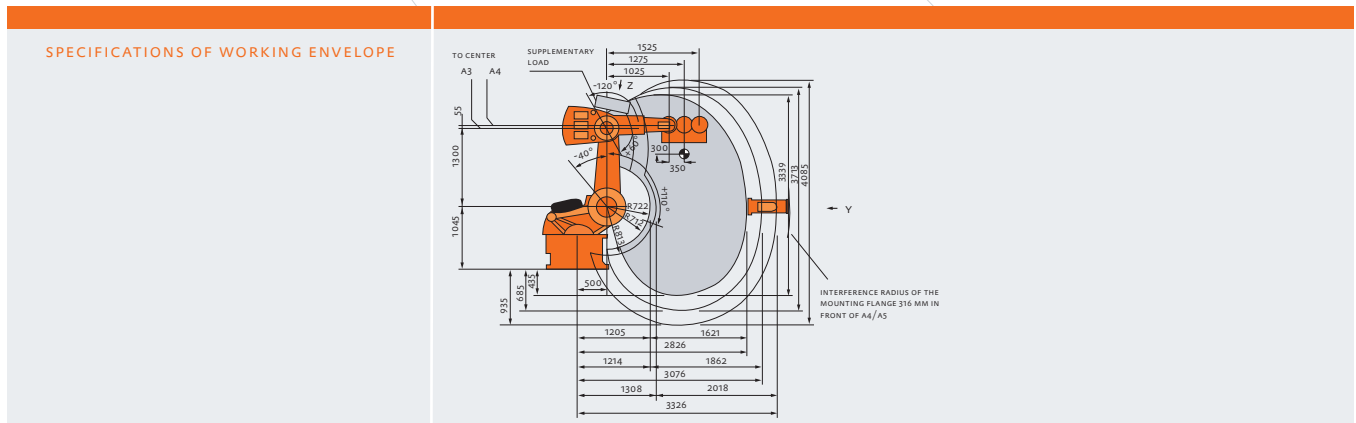
Payload	270/235/200 kg	280/340/450 kg
Suppl. load, arm / link arm / rotating column	450 kg	550 kg
Max. reach	2,700/2,900/3,100 mm	3,326/3,076/2,826 mm
Repeatability	± 0.12 mm	± 0.15 mm
Number of axes	6	6
Controller	KR C2	KR C2
Weight (excluding controller) approx.	1,267/1,277/1,285 kg	2,385/2,370/2,350 kg
Mounting position	Floor	Floor, Ceiling



KR 500 570-2 PA

TECHNICAL DATA

Payload	420/480/570 kg
Suppl. load, arm / link arm / rotating column	550 kg
Max. reach	3,326/3,076/2,826 mm
Repeatability	± 0.15 mm
Number of axes	6
Controller	KR C2
Weight (excluding controller) approx.	2,385/2,375/2,350 kg
Mounting position	Floor, Ceiling



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