



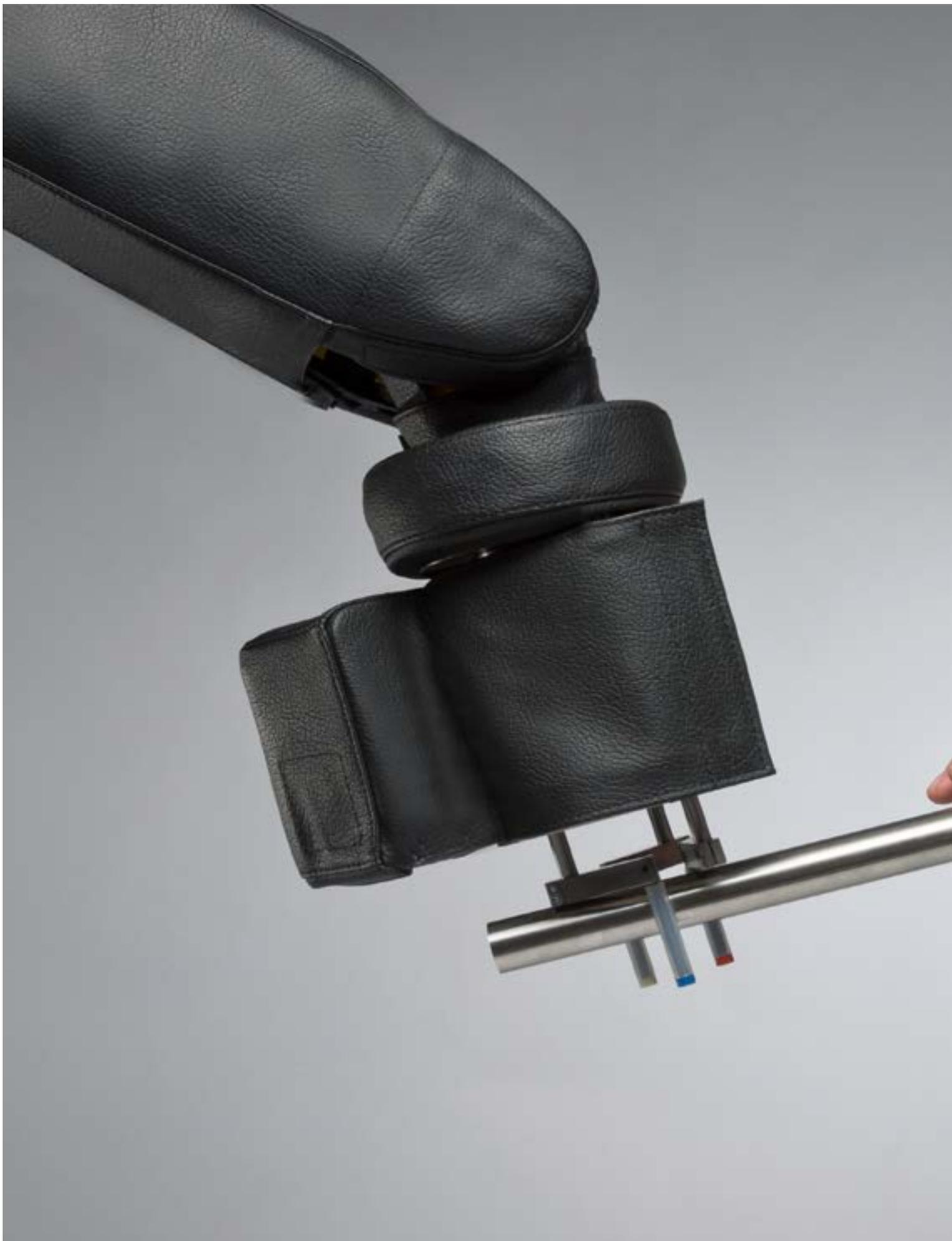
APAS assistant

Your flexible production assistant



BOSCH

Invented for life





The mobile production assistant APAS assistant is the first assistance system certified by the German employers' liability insurance association for the direct collaboration between man and machine. This qualifies the APAS assistant as a flexible helper, which supports the employees at work and increases the productivity of the processes sustainably.

Hand in hand with the **APAS assistant**

Current robot applications normally must operate in fully protected zones. APAS assistant changes that. Certified by the German employers' liability insurance association, the mobile and flexible production assistant allows the direct collaboration between man and machine.

Since many years machines and robots serve as tools to offload staff workload. Despite all its benefits, conventional systems are mostly stationary, rigidly operating and shielded in a complex way to protect the production staff. This, however, makes it more and more difficult to integrate these systems into today's flexible working world. Therefore Bosch for quite a while has been paying special attention to the development of new automation concepts.

Hand in hand with the APAS assistant

As a flexible solution in the area of retroactive automation of manual workplaces and small series production, the APAS assistant supports the workers in case of heavy, monotonous and dirty tasks. Certified by the German employers' liability insurance association, the APAS assistant is the first and up to now only assistance system, which allows the direct collaboration with people without additional shielding. This collaboration is made possible by using a highly sensitive sensor skin. This skin enables the APAS assistant within a very short period of time to react, when a staff member approaches.

Before there is any contact between man and machine, the APAS assistant stops and only then continues to operate, when the person has left the danger zone.

Slim, flexible and mobile

The APAS assistant not only impresses with its slim and compact design. Thanks to its casters and the easy to use locking mechanism, the assistant can be used at different locations in a fast and easy way. There is no need for an exact and permanent fixation at the workplace. Its sensitive three-finger-gripper enables the APAS assistant to grip a variety of complex shaped parts in a flexible way. Integrated cameras support the APAS assistant to analyze the environment and to recognize parts to be gripped in a self-contained way. Additionally the image recognition ensures a high precision in gripping and placing of parts. In this way the requirements for parts feeding can be kept low. Force and position control of the gripper fingers allow the APAS assistant to grip parts smoothly as well as firmly. In this way different parts can be handled without extensive mechanical changeovers.



The APAS assistant can directly collaborate with people.



With the help of a dialog-controlled user interface new tasks can be easily taught.



Paving the way to the smart factory of the future:

Already today the APAS assistant shows the technologies used by the future Industry 4.0.

In the corresponding intelligent and interlinked factories, the so-called smart factories, people, machines and products will be communicating and cooperating with each other more closely.

Managing reliably changing tasks

Today's machines are precise, fast and with a high degree of repeat accuracy. At the same time they have high demands on their process environment.

In most cases, the machines are only suitable for a few specialized tasks. They are only insufficiently adaptable to changing production conditions. As a consequence, next to the costs of investment, often high additional costs will follow.

Compared to that, with the APAS assistant it is possible to configure new product variants and tasks not only fast, but also cost-efficiently. By using so-called work plans the production assistant can be taught new tasks and can be adapted to changed conditions within a very short time.

Work plans are graphical step-by-step representations of

the tasks, which the APAS assistant should carry out. Once the tasks have been taught, they are stored and can be repeated anytime at the push of a button effortlessly. In this way product changeovers can be kept short. Already existing work plans can be exchanged via a cloud especially established for this purpose. With the help of a graphical user interface, the configuration of such work plans supports the operator, by leading with dialogs through the menus. Therefore programming skills are not required.

With the APAS assistant Bosch adopts an innovatory approach to the interaction between man and machine, creating new ergonomic and cost-efficient jobs.

Accompany us on this path.

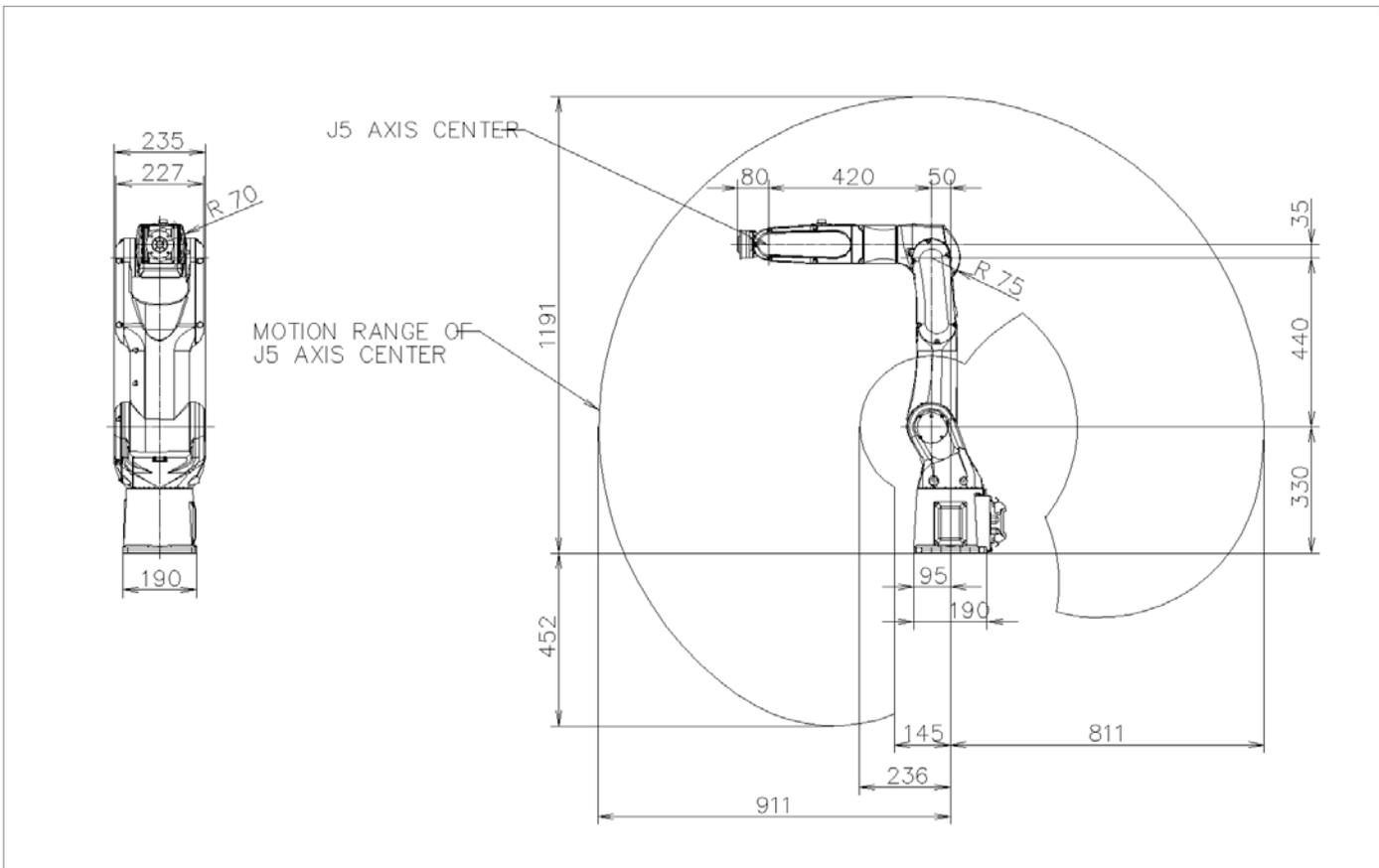
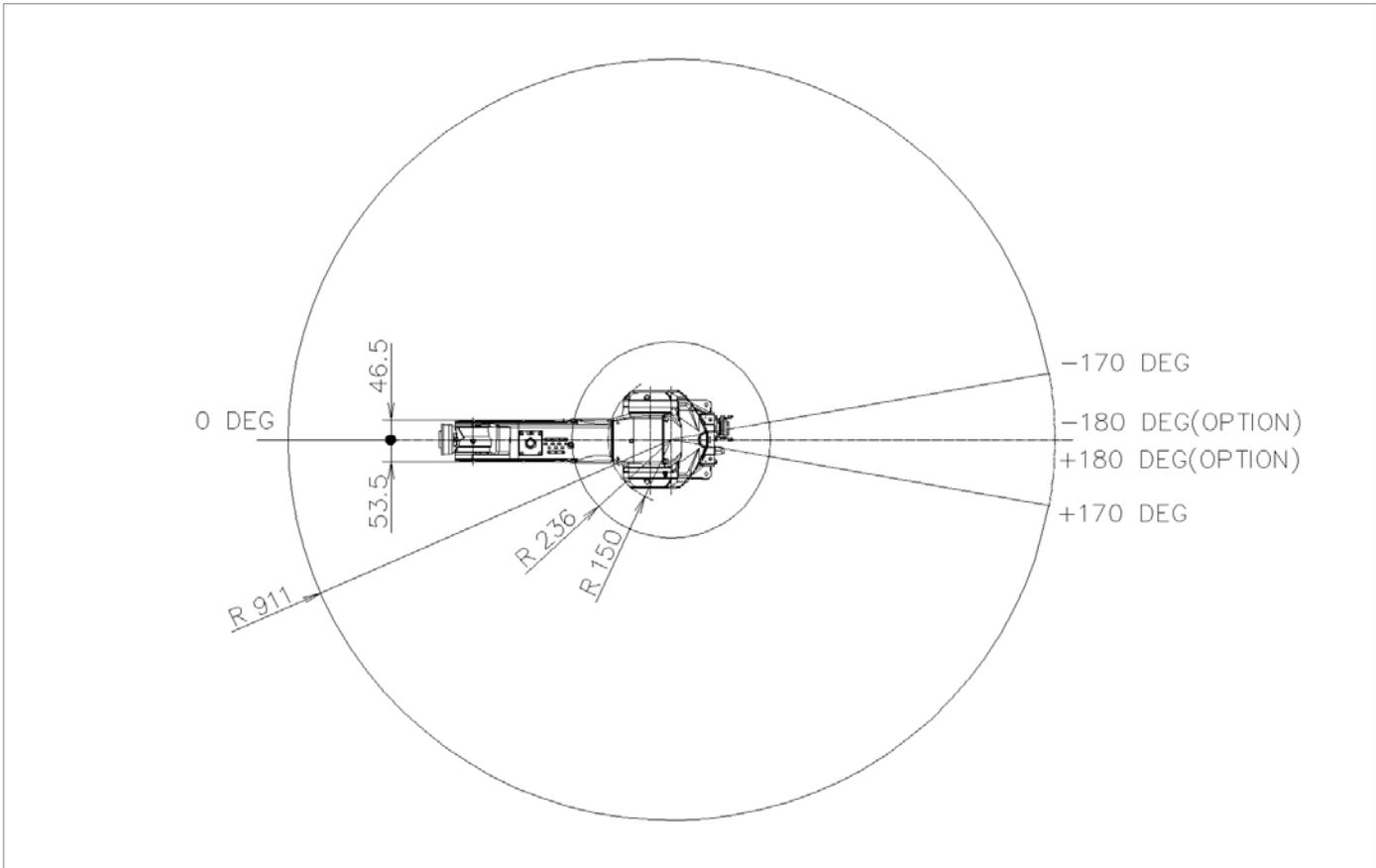


Thanks to its casters, it is possible to change the work location of the APAS assistant in a fast and easy way.



Integrated cameras support the APAS assistant in automatically recognizing parts to be gripped.

Specifications	
Basic Data	
Measurements	775 mm x 730 mm x 1670 mm
Weight	approximately 230 kg
Power supply	230 VAC
Pick & Place cycle time	4 s - 8 s
Interfaces	Ethernet, EtherCAT, E/A optodecoupled
Safety concept	
Triggering sensor	touchless (capacitive)
Safe switching distance	approximately 50 mm
Certificate	German employer's liability insurance association
Arm	
Range	911 mm
Maximum weight of part	2 kg
Track velocity	0,5 m / s
Repeatability	+/- 0,03 mm (depending on IP method)
Gripper	
Principle	universal three-finger-gripper
Force regulation	adjustable in gripping action 40-120 N
Position control	0-130 mm opening radius
Form-fit	by handle sleeves
Vision	
Overview camera	2D monochrome
Positioning camera	3D, calibrated stereo cameras, color
Image field	250 mm ² x 250 mm ²
Integrated lighting	1 x infrared, 1 x color strips projection



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This document is a schematic representation and not an operating manual. There may be some differences in illustrations compared to the operating manual. Please refer to the operating manual with regard to the proper use of the system.

