

Brackenheim-Hausen, April 5, 2017

Information for customer-specific Co-act grippers

Dear Sir or Madam,

Thank you for inquiry regarding human/robot collaboration.

In the future, SCHUNK will offer its gripping technology products for human/robot collaboration under the new brand name Co-act (collaborative actuator). At Automatica 2016, SCHUNK grippers were presented in live applications for the first time as Co-act gripper versions (Co-act Gripper Meets Cobots).

We want to respond in depth to your inquiry concerning human/robot collaboration. For this purpose, we have formed a special Co-act team with specially trained employees.

In order to answer inquiries in this field, our team requires detailed information about your application. This is the only way we can determine the optimum design for your gripping system and manufacture it. In addition, we have compiled important information that must be observed when using our products. You will find this information on the following pages.

If you have any questions, please feel free to contact the Co-act team. The contact data is provided below.

Kind regards

Your Co-act team
SCHUNK GmbH & Co. KG

Contact data

Phone number: +49-7133-103-3444
E-mail: co-act-team@de.schunk.com

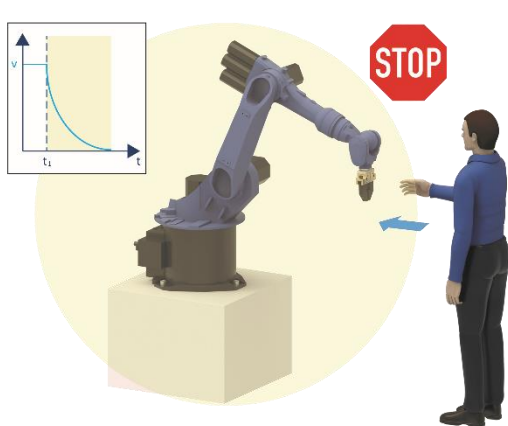
Enclosure

- Overview of the four types of human/robot collaboration
- Information about offers and orders for SCHUNK Co-act grippers
 - For applications with hand guiding
 - For applications with power and force limitation

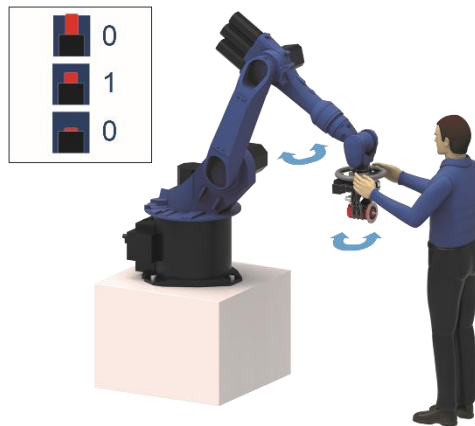
Overview of the four types of human/robot collaboration

ISO/TS15066:2016 describes four methods or types of human/robot collaboration. They are depicted below for a general overview.

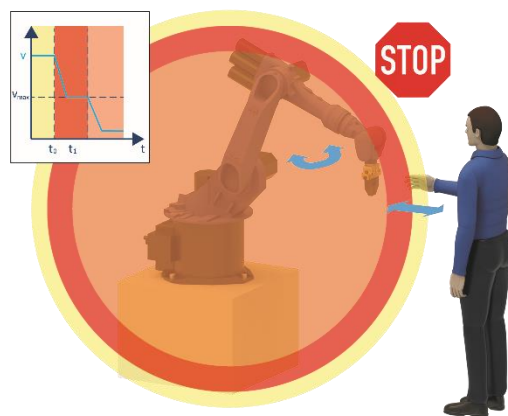
For more information, refer to ISO/TS 15066:2016.



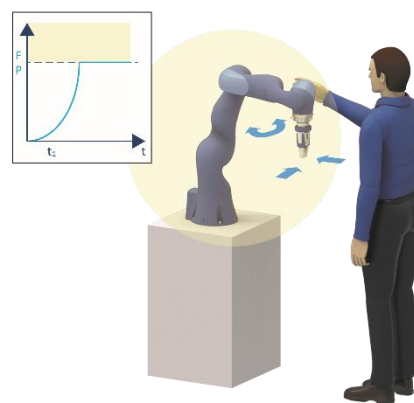
Method 1 - Safety-rated monitored stop



Method 2 – Hand guiding



Method 3 - Speed and separation monitoring



Method 4 – Power and force limitation

Source: ISO/TS 15066:2016 -Robots and robotic devices – Collaborative robots

Offers and Orders for Co-act Grippers

Information about collaboration type 2 – hand guiding

The following information applies to offers and orders that are prepared for you with respect to gripping systems used for human/robot collaboration.

Please note that this list of information is not exhaustive. Other points can arise from your research of standards or from your risk analysis. We will be glad to assist you with further information.

As delivered condition – scope of delivery

At the current time, we can deliver gripping systems from our standard portfolio. The robot is guided by means of a so-called hand wheel, which is included in the scope of delivery if required. The system can also include a force-moment sensor. The safety functions are to be ensured by the robot system, consisting of the robot and the robot controller. They are to be designed in accordance with the relevant standards. If a hand wheel is used, we recommend at least using redundant hand switches, which are designed as 3-position switches. More detailed specifications can be found in the standards.

Specification of gripping force

The gripping forces specified in our catalogs and data sheets are the minimum guaranteed gripping forces. Depending on the gripper that is delivered, the nominal gripping force can be up to twice as high. During the gripping process and at the moment when the gripper fingers come into contact with the workpiece, impulses up to four times as high can occur for up to 50 ms. The respective effective gripping forces must be taken into account in the risk assessment. It is also recommended to conduct a measurement of the actual effective forces.

Limitation of operating pressure and nominal voltage

Furthermore, the specified gripping forces are reached at operating pressure or nominal voltage. If there is a possibility of a higher pressure or higher voltage, this must be taken into account in the risk analysis. It is recommended to provide failsafe means for limiting the pressure or voltage.

Loss of gripping force

Some pneumatic gripper variants have a means of maintaining the gripping force. However, this is not a failsafe design. A means of maintaining the gripping force is currently not available for electric grippers. In your risk analysis you must therefore assess the workpiece loss in case of intentional or unintentional disconnection of the power supply (pneumatic line or voltage supply) to the gripper.

Control

The grippers are controlled by means of valves, digital signals or industrial bus systems. These systems are not considered to have a failsafe design.

Offers and Orders for SCHUNK Co-act Grippers

Information about collaboration type 4 – power and force limiting

The following information applies to offers and orders that are prepared for you with respect to gripping systems used for human-robot collaboration.

Please note that this list of information is not exhaustive. Other points can arise from your research of standards or from your risk analysis. We will be glad to assist you with further information.

As delivered condition – scope of delivery

At the present time we deliver only gripping systems that are within a low gripping force range and that are equipped with an anti-collision protective shell. These anti-collision protective shells are constructed in accordance with the BG/BGIA recommendations for risk assessment according to the machinery directive “Design of workplaces with collaborative robots” of February 2011. At the present time the gripping systems do not feature certified failsafe gripping force limitation.

Specification of gripping force

The gripping forces specified in our catalogs and data sheets are the minimum guaranteed gripping forces. Depending on the gripper that is delivered, the nominal gripping force can be up to twice as high. During the gripping process and at the moment when the gripper fingers come into contact with the workpiece, impulses up to four times as high can occur for up to 50 ms. The respective effective gripping forces must be taken into account in the risk assessment. It is also recommended to conduct a measurement of the actual effective forces.

Limitation of operating pressure and nominal voltage

Furthermore, the specified gripping forces are reached at operating pressure or nominal voltage. If there is a possibility of a higher pressure or higher voltage, this must be taken into account in the risk analysis. It is recommended to provide failsafe means for limiting the pressure or voltage.

Loss of gripping force

Some pneumatic gripper variants have a means of maintaining the gripping force. However, this is not a failsafe design. A means of maintaining the gripping force is currently not available for electric grippers. In your risk analysis you must therefore assess the workpiece loss in case of intentional or unintentional disconnection of the power supply (pneumatic line or voltage supply) to the gripper.

Finger design

It is recommended to design the gripper fingers so that the edges have the largest possible radius. The gripper fingers affect the forces and pressures that are applied to the bodies. This must be taken into account in the risk analysis and confirmed with measurements (such as collision measurements) after configuration of the unit.

Control

The grippers are controlled by means of valves, digital signals or industrial bus systems. These systems are not considered to have a failsafe design.