



HERMES
A W A R D
2 0 1 7

Superior Clamping and Gripping



Co-act Meets Cobots
Gripper

The NEW SCHUNK Grippers for
Collaborative Operations

Superior Clamping and Gripping



Henrik A. Schunk, Kristina I. Schunk, brand ambassador Jens Lehmann, and Heinz-Dieter Schunk

Top Performance in the Team

SCHUNK is the world's No. 1 for gripping systems and clamping technology – from the smallest parallel gripper to the largest chuck jaw program.

As a competence leader, we recognize and develop standards with a large potential for the future, which will drive the rapid progress in many industries.

Our customers profit from the expert knowledge, the experience, and the team spirit of more than 2,800 employees in our innovative family-owned company.

The Schunk family wishes you improved end results with our quality products.

Heinz-Dieter Schunk

Henrik A. Schunk

Kristina I. Schunk

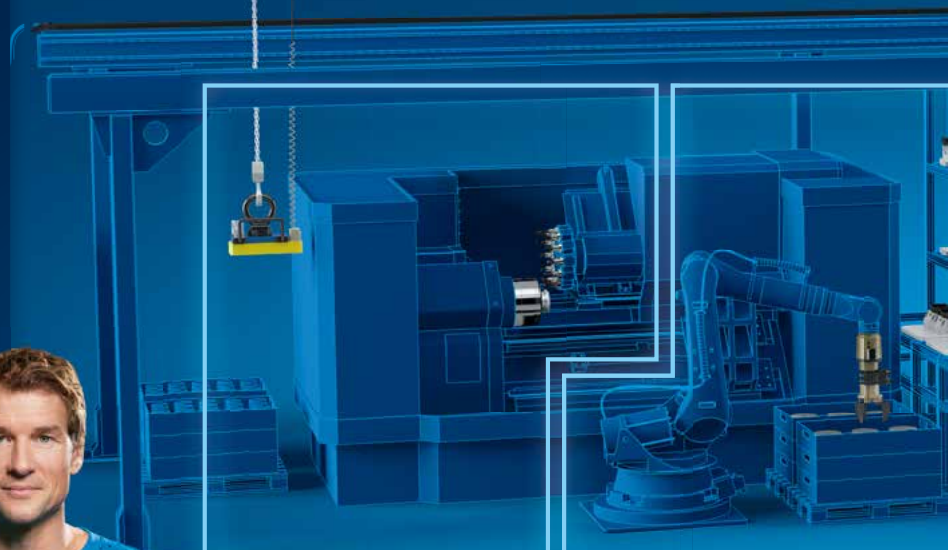
Superior Clamping and Gripping

Jens Lehmann stands for safe, precise gripping and holding. As a brand ambassador of the SCHUNK team, the No. 1 goalkeeper represents our global competence leadership for gripping systems and clamping technology. The top performance of SCHUNK and Jens Lehmann are characterized by dynamics, precision, and reliability.

For more information visit our website:
schunk.com/lehmann



J. Lehmann
Jens Lehmann



... in your
Lathe

... in your
Automated Machine Loading

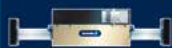
It's time to use your machine's full potential!

Our superior components can unlock potential where you would never expect to find it. In your machine. SCHUNK Synergy – the perfectly harmonized relationship of gripping systems and clamping technology and turns our customers into productivity champions ...



SCHUNK Grippers

Gripping precisely!
From some grams to
more than a ton.



Linear Modules

Exactly moved!
With high speed
in all axes.



Modular Assembly

A unique individuality!
Flexibility due to the use
of a modular system.



Robot Accessories

Perfectly combined!
The interplay of robot
and tool.



Rotary Modules

Controlled rotation!
Limited or endlessly –
free or cycled.



Mobile Gripping Systems

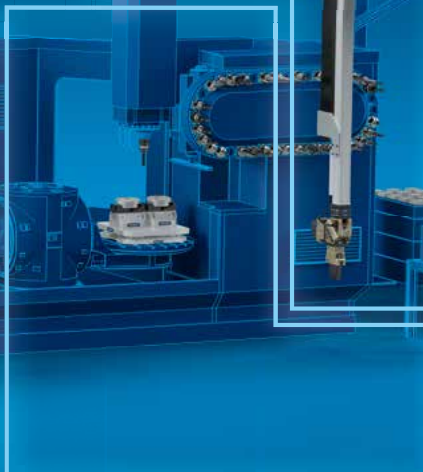
Handling technologies
for the future.



... in your Automated
Handling System



... in your
Machining Center



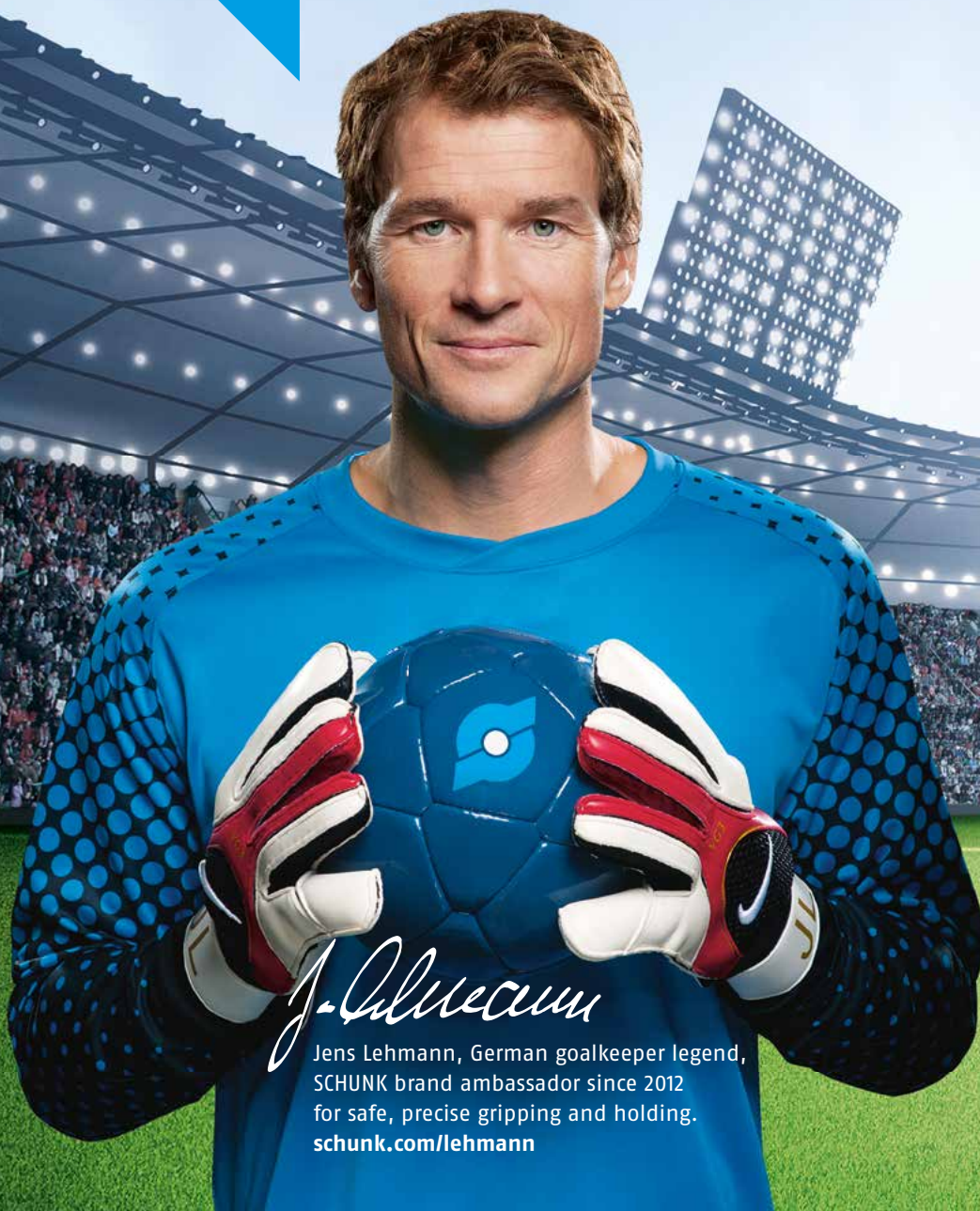
... in your
Automated Assembly



... in your
Service Robotics
Application

“With human to robot collaboration, SCHUNK has technology firmly in its grasp. I am proud to have the SCHUNK gripper for collaborative operations, the **Co-act Gripper JL1**, bear my initials.”

The SCHUNK Co-act Gripper JL1 is characterized by the strengths of world-class goalkeeper and SCHUNK brand ambassador Jens Lehmann: precision, safety, teamwork and No. 1 position.



J. Lehmann

Jens Lehmann, German goalkeeper legend,
SCHUNK brand ambassador since 2012
for safe, precise gripping and holding.
schunk.com/lehmann

The NEW SCHUNK Technology Carrier for Collaborative Gripping

With its NEW SCHUNK technology carrier Co-act Gripper JL1, SCHUNK is setting the stage for the first intelligent gripper for collaborative operations that interacts directly with humans. Adjustments to the gripping processes can be made in real time using diverse sensor systems. In essence, various "senses" are used to record, evaluate and communicate situational, environmental and operational conditions.

In the future, SCHUNK Co-act Grippers will be able to transmit all relevant data about processes and surroundings to the control and production systems. The focus will be on the process optimization, intelligent flow of materials, and continuous documentation. The intuitive interaction between gripper and operator perfectly complements the system.



Capacitive Sensor System

To avoid collision situations due to early detection



Touchscreen

Enables communication with the gripper as well as teaching or switching to various operating modes



Camera

Mounted between the fingers, for detecting the surroundings, differentiating and searching for objects



Parallel and Angular Grips

Two types of grips for gripping any geometries



Safe Force Limitation

The right gripping force for every handling task, even for heavy workpieces



Tactile Sensor System

For in time detection and differentiation of workpieces and humans



Optical Feedback

Through the use of LED lights, the Co-act Gripper JL1 provides information to the operator about the status of the gripper and identification of the workpieces

The Mega Trend of Human-Robot Collaboration

From robots that replace workers to robots that serve as helpful colleagues, the field of robotic automation is experiencing a new trend that represents a huge challenge for component manufacturers.

Whenever full automation of production or assembly lines is not the most economically feasible option, it is necessary to single out individual processes to be delegated between humans and robots. In such situations, autonomous cobots, meaning robots used in the worker's immediate environment, can handle non-ergonomic or monotonous tasks such as assisting with lifting or positioning loads. This reduces the physical workload for workers and makes the process more efficient. At the same time, humans and robots working hand in hand helps to minimize space requirements and increase flexibility.

The number of robotic assistance systems will increase in the future, especially with regard to assembly applications. Reliable grippers, safety functions, sensors and end-to-end integration at the component level will be vital.

As the competence leader for gripping systems and clamping technology, SCHUNK is intensely committed to this new challenge.



The NEW SCHUNK Grippers for Collaborative Operations





Co-act WSG
Gripper



Co-act JL1
Gripper



Human-Robot Collaboration: Teamwork in Production Automation

The closer humans and robots work together, the more technologies and components are required to meet higher safety requirements. The various forms of interaction between humans and robots are controlled by the relevant standards and guidelines. Differentiations are made between **safe hold**, **hand guiding**, **speed and separation monitoring**, and **power and force limiting**.

For over 30 years, SCHUNK has been setting the benchmarks for technological innovation and gripping system solutions. Our goal is to open up new and sustainable possibilities for more efficient production automation, whether for full automation, functional safety or human-robot collaboration.

Normative Subdivision of Human-Robot Collaboration according to ISO/TS 15066

Method 1 – Safe Hold

The robot system works at normal speed, provided that there is free access in the machining area. When a human enters the area this is monitored i.e. by a laser scanner, and the robot system enters into a safety-monitored stop.

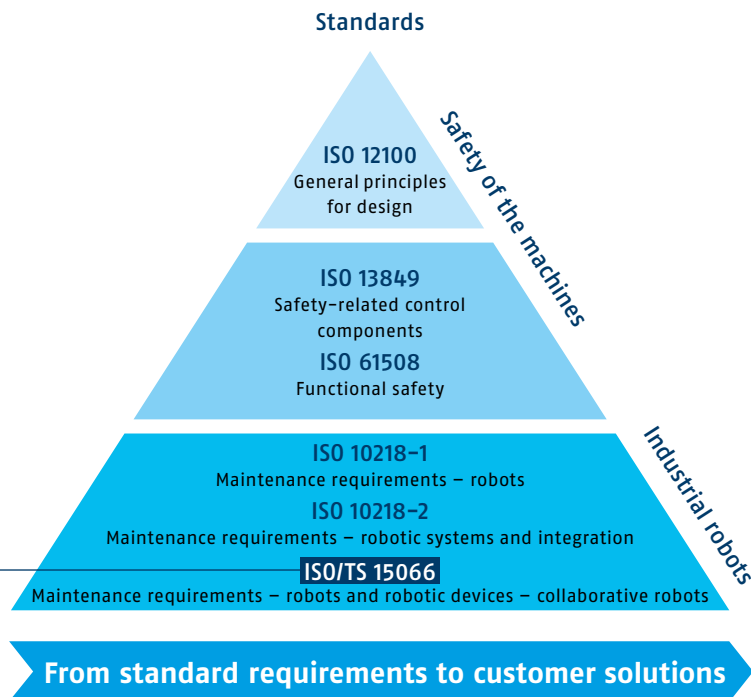


Method 2 – Hand Guiding

The robot system is guided by a human. In order to do so, the system must be able to detect the force of the human e.g. using a force/torque sensor. The robot system only moves when this movement is enabled by the human using a safety switch. Otherwise the robot system is in a safety-monitored stop.



Standards and Guidelines for Human-Robot Collaboration



The listed standards and guidelines are not exhaustive. For every application the applicability of further standards or guidelines have to be determined.

Method 3 – Speed and Separation Monitoring

The machining area of the robot system is divided up into successive zones. If the entry of a human into one of the first zones is detected for instance by a laser scanner, the robot system goes into a lower speed. When the zone directly next to the robot is entered, the robot system goes into a safety-monitored stop.



Method 4 – Power and Force Limiting

The robot system works with limited force and power when collaborating directly with humans. The maximum forces and pressures applied to humans may not exceed the values specified in the technical specifications. This is ensured by an inherently safe design or safety functions.



Source: ISO/TS 15066:2016

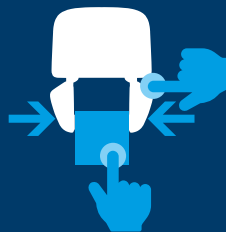
SCHUNK is defining Human-Robot Collaboration with a Focus on Grippers

With the **Co-act Gripper JL1**, SCHUNK is capturing a trend and focusing on the technology carrier in the development of actuators for collaborative operations. The aim is for **SCHUNK Co-act Grippers** to interact and communicate directly with humans in accordance with normative directives.

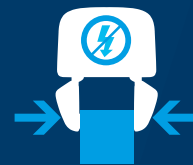
The **SCHUNK Co-act gripper's JL1 technology carrier** is based on three principles derived from the HRC standards on human-robot collaboration. A gripper for collaborative operations does not have to comply with all the principles here.



Grippers
never cause injuries
when gripping



Grippers
always detect
human contact



Grippers
never lose
a workpiece

In implementing these principles, **SCHUNK focuses on interactive perfection between the various technologies and components:**



Force Limitation

A gripping force limitation that is activated in case of direct presence or intervention of a human. Otherwise, the gripper can be operated with any force possible.



Environmental Sensor Systems

The use of different sensor systems for detecting humans and the environment while simultaneously sensing the workpiece and differentiating it from human hands.



Collision Protection

Risks of injury can be reduced or eliminated by means of an optimized design.



Software

Gripper software that evaluates and processes the signals of the environmental sensors. This intelligent software empowers the gripper with artificial intelligence.



Gripping Force Maintenance

Grippers must prevent injuries to humans even with high gripping forces. Gripped parts are held reliably if a process is interrupted.

The Path toward the optimum Gripper for your HRC Application

To determine the optimum gripper for HRC applications, the properties of the task, workpiece and gripper must be taken into account.

The **SCHUNK Co-act team** recommends a structured approach that considers all factors and parameters.



Step 1

Task Description and Feasibility Check

- Are the task and workpiece suitable for human-robot collaboration?



Step 2

Selection of the Robot or Cobot

- Definition of the basic system with mechanical and electrical connection of the peripheral devices
- Ensuring that the coordinates for a stop are defined



Step 3

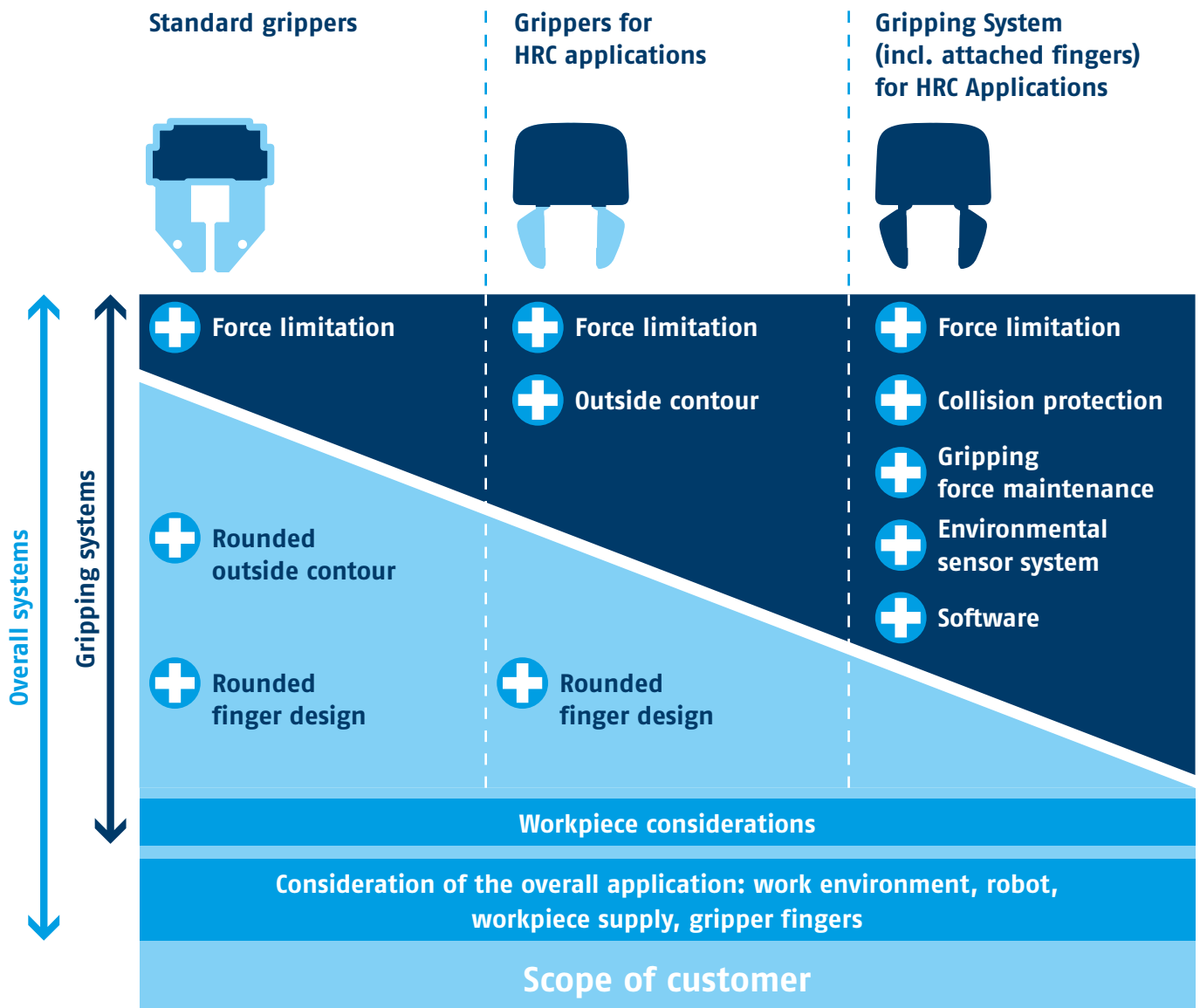
Selecting the Gripper in Collaboration with the SCHUNK Co-act team considering the following Points:

- Workpiece with respect to gripping position, required gripping force and required stroke
- Pick and place position and in turn analysis of the interfering contour
- Connection to the superordinate mechanical and electrical periphery
- Clamping and shearing points on the gripper or the attached fingers



SCHUNK Gripping Competence for HRC Applications

In the context of its technology carrier, SCHUNK is oriented toward real-world applications within a variety of industries with its gripper concepts for HRC applications. The experience gained as a result will influence the ongoing development of **SCHUNK Co-act Grippers**.



Aim: The results of this technology carrier are intended for the specific development of a certified overall Co-act Gripper system. Therefore, the gripper, the finger design, the environmental recognition, as well as other factors such as the work environment, robot and workpiece supply are all considered.

Co-act meets Cobots

Applications

Humans and Robots working in a Team



Co-act MPG-plus Gripper

Industry: Electronics

HRC topic: Collaborative assembly of mechatronic assembly groups

Application: Using a Co-act Gripper MPG-plus, robots precisely insert electronic components in the housing. The final assembly and functional test are carried out by the employee.

Customer benefits: Increase in efficiency due to simultaneous work processes and taking over tasks that require high concentration.



Co-act EGP Gripper

Industry: Automotive

HRC topic: Collaborative assembly of heavy workpieces

Application: Using a Co-act Gripper EGP, robots guide motor adapters to motor blocks, position them and hold them in position while fitting the screws. The fine adjustments and screw fittings are carried out manually by the employee.

Customer benefits: Improvement of ergonomics and increase of efficiency due to simultaneous work processes.



Co-act EGP Gripper

Industry: Assembly and handling

HRC topic: Collaborative handling of workpieces in partially automated assembly

Application: During gripper assembly, the employee is assisted by a robot with Co-act Gripper EGP. The components are fed by the gripper and the employee performs the assembly.

Customer benefits: Increase in efficiency and relief in terms of monotonous assembly work.



Co-act EGP Gripper

Industry: Assembly and handling

HRC topic: Collaborative handling of workpieces in dangerous areas

Application: After the set-screw installation with screw fastening, the robot with Co-act Gripper EGP removes the protruding adhesive residues on a sharp-edged extraction plate. The worker performs the assembly and carries out a quality check.

Customer benefits: Improvement of the ergonomics and reduction of the risk of injury for the employee.

To determine the optimum SCHUNK Co-act Gripper, we recommend completing the following checklist and sending it to the SCHUNK Co-act team. This checklist is also available online at: schunk.com/checklist-co-act

Contact data		
Company	Name	Department
Street	ZIP Code	City and country
Phone	Fax	Email
Date	Consultant	
Order number	Offer number	

Application	
Field of application of the Co-act Gripper:	
☐ Assembly	☐ Handling ☐ Quality check ☐ Other

Short description of the application	
☐ Integration into existing system	☐ New workstation ☐ Replaces previous workstation

Robot type	
☐ Specified by the customer	☐ Suggestion desired ☐ Industrial robot, type _____
☐ FANUC CR 35iA	☐ KUKA iiwa 7 ☐ COMAU Racer5 Collabor ☐ UR 3 ☐ Rethink Robotics Sawyer
☐ FANUC CR 7iA	☐ KUKA iiwa 14 ☐ COMAU AURA 110 ☐ UR 5 ☐ BOSCH APAS Assistant
	☐ ABB YuMi ☐ COMAU AURA 60 ☐ UR 10 ☐ Other
Portable robot version	☐ Yes ☐ No

HRC type of collaboration	
☐ Safe hold	☐ Hand guiding ☐ Speed and separation monitoring ☐ Force and power limiting

Required gripping force	
Note: For collisions with a hand, exact limits of 140 N of applied force and ~200 N/cm ² pressure are valid; other safety aspects are to be observed for higher forces (e.g. sensor system in gripper fingers, actuation of grippers in a separate area).	
Type of gripping:	☐ Form-fit gripping ☐ Friction ☐ 2 fingers ☐ 3 fingers
	☐ Parallel

Preliminary gripper selection

☐ Collision protection cover required

Finger design

☐ Supplied by the customer ☐ SCHUNK

Material of the attached fingers ☐ Steel ☐ Alu ☐ Plastic ☐ Other _____

Accuracy at the fingers _____

Are interfering contours to be taken into consideration when removing workpieces? ☐ Yes ☐ No

3D data of point of removal available ☐ Yes ☐ No

Actuation

Robot via

☐ PROFIBUS ☐ CAN ☐ PROFINET ☐ Ethernet ☐ Other _____

Gripper via

☐ Pneumatics ☐ Digital I/O ☐ PROFINET ☐ Ethernet ☐ Other _____

Safety

☐ FT sensor in gripper necessary for collision detection (no redundant FT sensor available)

☐ Support from SCHUNK desired for safety concept

Pictures available

☐ Workpiece ☐ Workpiece deposit and mounting ☐ Existing system

Drawings available

☐ Workpiece ☐ Workpiece deposit and mounting ☐ Existing system

Notes



We would be happy to advise you on the optimum SCHUNK Co-act Gripper for your application. Please copy the checklist, complete and email it to: co-act-team@de.schunk.com You can reach the Co-act team under the following number: **+49-7133-103-3444**

Catalog Order

Copy, complete, fax to +49-7133-103-2779



schunk.com/catalogorder

The SCHUNK Gripper Catalog

The world's most comprehensive gripper portfolio of more than 1,800 pages. Order now!

Gripping Systems

Quantity

Highlights New Products

Current innovations in SCHUNK Gripping Systems

☐

Complete Program Gripping Systems

Catalogs SCHUNK Grippers, Rotary Modules, Linear Modules, Robot Accessories

☐

Catalog SCHUNK Grippers

The compact SCHUNK Gripping Competence on over 1,760 pages

☐

Catalog Linear Modules

The whole variety of SCHUNK Linear Modules on over 750 pages

☐

Catalog Rotary Modules

Cutting-edge technology for rotary movements on more than 610 pages

☐

Catalog Robot Accessories

The SCHUNK End-of-Arm Competence on over 830 pages
The optimum interaction between the robot arm and gripper

☐

Product Overview SCHUNK Grippers

SCHUNK Gripper at a glance

☐

Product Overview Rotary Modules

SCHUNK Rotary Modules at a glance

☐

Product Overview Linear Modules

SCHUNK Linear Modules at a glance

☐

Product Overview Robot Accessories

SCHUNK Robot Accessories at a glance

☐

Product Overview Modular Assembly Automation

Comprehensive range from the modular system

☐

Product Overview Mechatronics³

Alternative – Adaptable – Intelligent

☐

Depanelling Machine

Product Overview Depanelling Machine

Solutions for the complete spectrum of depanelling technology

☐

Clamping Technology

Quantity

Highlights New Products

Current innovations in SCHUNK Clamping Technology

☐

Complete Program Clamping Technology

Catalogs Toolholders, Stationary Workholding, Lathe Chucks, Chuck Jaws

☐

Catalog Toolholders

The complete precision toolholder range for perfect machining on around 520 pages

☐

Catalog Lathe Chucks

Lathe chucks for sophisticated machining of world-renowned quality on 650 compact pages

☐

Catalog Chuck Jaws

With 1,200 Types – the world's largest chuck jaw program on over 720 pages

☐

Catalog Stationary Workholding

The largest modular system for individualists with more than 500 variants for workpiece clamping on around 830 pages

☐

Product Overview Lathe Chuck Technology

The whole World of Lathe Chucks

☐

Product Catalog MAGNOS Magnetic Clamping Technology

5-sided workpiece machining in one set-up

☐

Product Catalog PLANOS Vacuum Clamping Technology

The universal, modular designed clamping system with high holding forces

☐

Catalog Hydraulic Expansion Technology

More than 75,000 implemented customized clamping solutions for tool and workpiece

☐

Product Catalog TRIBOS Micromachining

The No. 1 in Micromachining

☐

Synergy SCHUNK

Competence Catalog Clamping Technology | Gripping Systems

The SCHUNK No. 1 service provider for your processing machines and automated production processes

☐

Company

Name

Department

Street

ZIP

City

Tel.

Fax

E-Mail



Germany – Head Office

SCHUNK GmbH & Co. KG
Spann- und Greiftechnik
Bahnhofstr. 106 – 134
74348 Lauffen/Neckar
Tel. +49-7133-103-0
Fax +49-7133-103-2399
info@de.schunk.com
schunk.com



Austria

SCHUNK Intec GmbH
Friedrich-Schunk-Straße 1
4511 Allhaming
Tel. +43-7227-22399-0
Fax +43-7227-21099
info@at.schunk.com



Belgium, Luxembourg

SCHUNK Intec N.V./S.A.
Industrielaan 4 | Zuid III
9320 Aalst-Erembodegem
Tel. +32-53-853504
Fax +32-53-836351
info@be.schunk.com



Brazil

SCHUNK Intec-BR
Av. Santos Dumont, 733
BR 09015-330 Santo André – SP
Tel. +55-11-4468-6888
Fax +55-11-4468-6883
info@br.schunk.com



Canada

SCHUNK Intec Corp.
370 Britannia Road E, Units 3
Mississauga, ON L4Z 1X9
Tel. +1-905-712-2200
Fax +1-905-712-2210
info@ca.schunk.com



China

SCHUNK Intec Precision Machinery Trading
(Shanghai) Co., Ltd.
Xinzhuang Industrial Park,
1F, Building 1, No. 420 Chundong Road,
Minhang District
Shanghai 201108
Tel. +86-21-54420007
Fax +86-21-54420067
info@cn.schunk.com



Czech Republic

SCHUNK Intec s.r.o.
Tuřanka 115 | CZ 627 00 Brno
Tel. +420-513-036-213
Fax +420-513-036-219
info@cz.schunk.com



Denmark

SCHUNK Intec A/S
Forskerparken 10 C
DK-5230 Odense M
Tel. +45-43601339
Fax +45-43601492
info@dk.schunk.com



Finland

SCHUNK Intec Oy
Valtakatu 49
53100 Lappeenranta
Tel. +358-9-23-193861
Fax +358-9-23-193862
info@fi.schunk.com



France

SCHUNK Intec SARL
Parc d'Activités des Trois Noyers
15, Avenue James de Rothschild
Ferrières-en-Brie
77614 Marne-la-Vallée, Cedex 3
Tel. +33-1-64663824
Fax +33-1-64663823
info@fr.schunk.com



Great Britain, Ireland

SCHUNK Intec Ltd.
Cromwell Business Centre
10 Howard Way
Interchange Park
Newport Pagnell MK16 9QS
Tel. +44-1908-611127
Fax +44-1908-615525
info@gb.schunk.com



Hungary

SCHUNK Intec Kft.
Bocskaí út 134 – 146 | 1113 Budapest
Tel. +36-1-211-2402
Fax +36-1-211-2400
info@hu.schunk.com



India

SCHUNK Intec India Private Ltd.
80 B, Yeshwanthpur, Industrial Suburbs
Bangalore 560022
Tel. +91-80-40538999
Fax +91-80-40538998
info@in.schunk.com



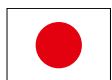
Indonesia

Trade Representative Office of
SCHUNK Intec Pte. Ltd.
JL Boulevard Utama BSD
Foresta Business Loft 1 Blok C no. 16
Tangerang, 15339
Tel. +6221-3003-2993
Fax +6221-3003-2995
info@id.schunk.com



Italy

SCHUNK Intec S.r.l.
Via Barozzo | 22075 Lurate Caccivio (CO)
Tel. +39-031-4951311
Fax +39-031-4951301
info@it.schunk.com



Japan

SCHUNK Intec K.K.
Minamishinagawa JN Bld. 1F
2-2-13 Minamishinagawa
Shinagawa-ku Tokyo 140-0004, Japan
Tel. +81-3-6451-4321
Fax +81-3-6451-4327
info@jp.schunk.com



Mexico

SCHUNK Intec S.A. de C.V.
Calle Pirineos # 513 Nave 6
Zona Industrial Benito Juárez
Querétaro, Qro. 76120
Tel. +52-442-211-7800
Fax +52-442-211-7829
info@mx.schunk.com



Netherlands

SCHUNK Intec B.V.
Titaniumlaan 14
5221 CK 's-Hertogenbosch
Tel. +31-73-6441779
Fax +31-73-6448025
info@nl.schunk.com



Norway

SCHUNK Intec AS
Dyrøkkeveien 13 | 1448 Drøbak
Tel. +47-210-33106
Fax +47-210-33107
info@no.schunk.com



Poland

SCHUNK Intec Sp. z o.o.
ul. Puławska 40A
05-500 Piaseczno
Tel. +48-22-7262500
Fax +48-22-7262525
info@pl.schunk.com



Romania

SCHUNK Intec SRL
Magheranului 113
550125 Sibiu
Tel. +40-269-702767
Fax +40-269-702744
info@ro.schunk.com



Russia

SCHUNK Intec 000
ul. Belostrovskaya, 17, korp. 2, lit. A
St. Petersburg, 197342
Tel. +7-812-326-78-35
Fax +7-812-326-78-38
info@ru.schunk.com



Singapore

SCHUNK Intec Pte. Ltd.
25 International Business Park
03-51/52 German Centre
Singapore 609916
Tel. +65-6240-6851
Fax +65-6240-6852
info@sg.schunk.com



Slovakia

SCHUNK Intec s.r.o.
Levická 7 | SK-949 01 Nitra
Tel. +421-37-3260610
Fax +421-37-3260699
info@sk.schunk.com



South Korea

SCHUNK Intec Korea Ltd
1207 ACE HIGH-END Tower 11th,
361 Simin-daero, Dongan-gu,
Anyang-si, Geonggido, 14057, Korea
Tel. +82-31-382-6141
Fax +82-31-382-6142
info@kr.schunk.com



Spain, Portugal

SCHUNK Intec S.L.U.
Avda. Ernest Lluch, 32
TCM 3-6.01, ES-08302 Mataró (Barcelona)
Tel. +34-937-556-020
Fax +34-937-908-692
info@es.schunk.com



Sweden

SCHUNK Intec AB
Morabergsvägen 28
152 42 Södertälje
Tel. +46-8-554-421-00
Fax +46-8-554-421-01
info@se.schunk.com



Switzerland, Liechtenstein

SCHUNK Intec AG
Im Ifang 12 | 8307 Effretikon
Tel. +41-52-35431-31
Fax +41-52-35431-30
info@ch.schunk.com



Taiwan

SCHUNK Intec Taiwan Ltd.
No.420, Yunchun East 1st Rd.
Nantun District, Taichung City 40877
Taiwan (R.O.C.)
Tel. +886-4-23801788
Fax +886-4-23805511
info@tw.schunk.com



Turkey

SCHUNK Intec Bağlama Sistemleri ve
Otomasyon San. ve Tic. Ltd. Şti.
Cumhuriyet Mah.
Kartepe Sokak No: 4/1
34876 Kartal İstanbul
Tel. +90-216-366-2111
Fax +90-216-366-2277
info@tr.schunk.com



USA

SCHUNK Intec Inc.
211 Kitty Hawk Drive
Morrisville, NC 27560
Tel. +1-919-572-2705
info@us.schunk.com



Argentina

Rubén Costantini S.A.
Ing. Huergo 1320 (Parque Industrial) 2400
San Francisco | Córdoba
Tel. +54-3564-421033
Fax +54-3564-428877
info@costantini-sa.com | costantini-sa.com

TEC MAHE

Av. De Los Constituyentes 1500 (B1650lwg)
Villa Maipú | San Martín | Buenos Aires
Tel. +54-011-4752-3811
info@tecmahe.com | tecmahe.com



Australia

Romheld Automation PTY. LTD.
Unit 30 | 115 Woodpark Road
Smithfield NSW 2164
Tel. +61-2-97211799
Fax +61-2-97211766
sales@romheld.com.au | romheld.com.au



Chile

Comercial Araneda y CIA. LTDA.
Vargas Fontecilla # 4550
Quinta Normal | Santiago, RM
Tel. +56-2-7248123
Fax +56-2-7102036
ventas@rotar.cl | rotar.cl

MIRS - MI ROBOTIC SOLUTIONS S.A.
Av Presidente Kennedy 6660
Vitacura - Santiago
Tel. +56-224-811-555
contacto@mirs.cl | mirs.cl



Colombia

CAV Ingenieros -
Control y Automatización Virtual Ltda.
Calle 78 # 63-29 | Bogotá
Tel. +57-1-5410383
Fax +57-660-8719
info@cavingenieros.com
cavingenieros.com



Costa Rica

RECTIFICACION ALAJUELENSE, S.A.
100 Mts Oeste y 75 Mts Sur
Cementerio General | Alajuela
Tel. +506-2430-5111
Fax +506-2430-5138
rect.alajuelense@gmail.com
cdspeddes@rectificacionalajuelense.com
rectificacionalajuelense.com



Croatia

Bibus Zagreb d.o.o.
Anina 91 | 10000 Zagreb
Tel. +385-138-18004
Fax +385-138-18005
info@bibus.hr | bibus.hr

Okret d.o.o.
Majurina 16 | 21215 Kastel Luksic
Tel. +385-21-228449
Fax +385-21-228464
okret@okret.hr | okret.hr



Ecuador

ELIMED CIA. LTDA.
Calle El Progreso 0e1-111 Y Manglaralto
Quito, Pichincha
Tel. +593-302-267-9788
Fax +593-302-291-1980
ventasuo@elimed.com.ec
elimed.com.ec



Estonia

DV-Tools OÜ
Peterburi tee 34/4 | 11415, Tallinn
Tel. +372-6030508
Fax +372-6030508
info@dv-tools.ee | dv-tools.ee



Greece

G. Gousoulis & Co. OE
27, Riga Fereou Str.
14452 Metamorfosi-Athens
Tel. +30-210-2846771
Fax +30-210-2824568
mail@gousoulis.gr | gousoulis.gr



Iceland

Formula 1 ehf
Breidamörk 25 | 810 Hveragerdi
Tel. +354-5172200
Fax +354-5172201
formula1@formula1.is



Indonesia

PT. Metaltech Indonesia
Manisjaya Jatiuwung
Jl. Gatot Subroto Km 8 | Tangerang 15136
Tel. +6221-55657435
Fax +6221-5918553
info@metaltechindonesia.com
metaltechindonesia.com



Iran

Iran Int. Procurement of Industries Co.
(I.I.P.I.)
No. 10, First alley, Golshan St.,
Khoramshahr Ave. | Tehran, 1554814771
Tel. +98-21-88750965
Fax +98-21-88750966
info@iipico.com
iipico.com



Israel

Ilan and Gavish Automation Service Ltd.
26, Shenkar St. | Qiryat-Arie 49513
Tel. +972-3-9221824
Fax +972-3-9240761
nava@ilan-gavish.com
ilan-gavish.co.il

M. K. Sales
Arimon 41 St. | Mosave Gealya 76885
Tel. +972-52-8283391
Fax +972-8-9366026
mkobo@zahav.net.il
mk-sales.com

Neumo-Vargus Marketing Ltd.
26, Hamashbir St. | 58859 Holon
Tel. +972-3-53732-75
Fax +972-3-53721-90
neumo@neumo-vargus.co.il
neumo-vargus.co.il



Latvia

Sia Instro
Lacplesa 87 | Riga, 1011
Tel. +371-67-288545
Fax +371-67-287787
instro@instro.lv | instro.lv



Malaysia

Precisetech Sdn. Bhd
Plant 1, 15 Lorong Perusahaan Maju 11
13600 Perai | Prai Penang
Tel. +60-4-5080288
Fax +60-4-5080988
sales@precisetech.com.my
precisetech.com.my

SK-TEC
Automation & Engineering Sdn. Bhd
No. 54-A, Jalan PU7/3,
Taman Puchong Utama
47100 Puchong, Selangor D.E.
Tel. +60-3-8060-8771
Fax +60-3-8060-8772
jeffery.koo@sk-tec.com.my
sk-tec.com.my

PGTC Industries
No. 35-1 (1st Floor), Jalan Putri
4/1, Bandar Puteri Puchong
47100 Puchong, Selangor D.E.
Tel. +603-8060-3348
Fax +603-8060-7848
sales@pgtc.com.my



Peru

ANDES TECHNOLOGY S.A.C.
Av. Flora Tristán 765
Urb. Santa Patricia La Molina | Lima 12
Tel. +51-1-3487611
ventas@andestechnology.com
jazzcoytia@andestechnology.com
andestechnology.com

MAQUINAS CNC, S.A.C.
Jr. Los Jazmines 149
Urb. Valle Hermoso Surco | Lima
Tel. +51-1-279-2014
Fax +51-1-2236717
info@cncperu.com
cncperu.com

MIRS - MI ROBOTIC SOLUTIONS S.A.
Av. Camino Real 456, Torre Real
Oficina 1603, San Isidro | Lima
Tel. +51-1-7130494
contacto@mirs.cl
jclucero@mirs.cl
mirs.cl



Philippines

MESCO
Mesco Building
Brixton Streets | Pasing City
Tel. +63-631-1775
Fax +63-631-4028
mesco@mesco.com.ph
mesco.com.ph



Romania

S.C. Inmaacro S.R.L.
Industrial Machines and Accessories
Romania
Avram Iancu Nr. 86
505600 Sacele-Brasov
Tel. +40-368-443500
Fax +40-368-443501
info@inmaacro.com
inmaacro.com



Saudi Arabia

Alruqee Machine Tools Co. Ltd.
Head Office
New al Kharj Road Exit-18
11565 Riyadh
Tel. +966-3-8470449
Fax +966-3-8474992
mailbox2@alruqee.com
alruqee.net



Singapore

BALLUFF ASIA PTE LTD
18 Sin Ming Lane
06-41 Midview City | Singapore 573960
Tel. +65-625-24384
Fax +65-625-29060
balluff@balluff.com.sg
balluff.com.sg

Eureka Tools Pte Ltd.
194 Pandan Loop, # 04-10 Pantech,
Industrial Complex | Singapore 128383
Tel. +65-687-45781
Fax +65-687-45782
eureka@eureka.com.sg
eureka.com.sg



Slovenia

MB-Naklo Trgovsko Podjetje D.O.O.
Toma Zupana 16 | 04202 Naklo
Tel. +386-42-771700
Fax +386-42-771717
mb-naklo@mb-naklo.si
mb-naklo.si



South Africa

AGM Maschinenbau Pty. Ltd.
42 Sonneblom Road, East Village
Sunward Park 1459, Boksburg
Tel. +27-11-913-2525
Fax +27-11-913-2994
alfred@agm-machinery.com
agm-machinery.com



South Korea

Mapal Hiteco Co., Ltd.
27, MTV24-R0, Siheung-Si,
Gyeonggi-do, 15117
Tel. +82-1661-0091
Fax +82-31-3190-861
hiteco@kornet.net
hiteco.co.kr



Thailand

BRAINWORKS CO., LTD.
1/161-162 Soi Watcharapol 2/7, Tharang
Bangkhen, Bangkok 10220
Tel. +66-2-0241470 to 1
Fax +66-2-0241472
chatchai@brainworks.co.th
brainworks.co.th



Ukraine

Center of Technical Support „Mem“ LLC
Malysheva str., 11/25
Dnipropetrovsk 49026
Tel. | Fax. +38-056-378-4905
maxim.bayer@gmail.com
ctp-mem.com.ua



Venezuela

ALPIN VENEZUELA
Pirineos 515 Nave 18
Parque Micro-Industrial Santiago
Zona Industrial Benito Juárez
Querétaro, Qro.
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co-act-team@de.schunk.com

 schunk.com

 youtube.com/schunkhq

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