Gripping Technology and Automation Technology

Product overview

Hand-in-hand for tomorrow

More than **11,000** Standard Components

1 Awards

60 Apprentices & Students per Year

95% Retention rate

3,500 Employees

Sustainability

CoLab

Planning and implementation of industrial automation and robotics applications

9 Plants

34 Subsidiaries worldwide

Represented in **50** countries

Digital Services

Visionary Leader

1945

Founded by Friedrich Schunk in a garage

Cooperation Partner

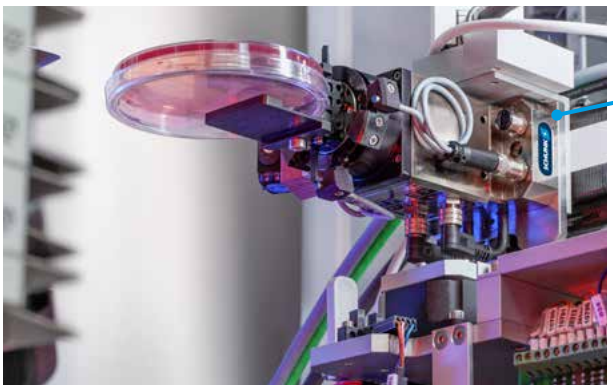
Hand in hand for tomorrow

Shaping the future with innovative technologies – that is the claim of SCHUNK. To this end, the experienced automation and production specialist is pushing the further development and digitalization of its product and service portfolio in order to make industrial processes more efficient, transparent and sustainable. The family-owned company with headquarters in Lauffen/Neckar is a global leader in toolholding and workholding, gripping technology and automation technology.Approximately 3,500 employees in 9 plants and 34 directly owned subsidiaries and distribution partners in more than 50 countries throughout the world ensure an intensive market presence.

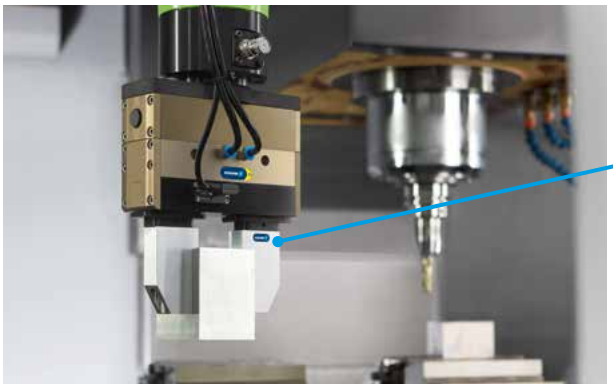
Benefit from the SCHUNK modular system with over 4,000 standard components

For any robot, for any industry, for any handling task.

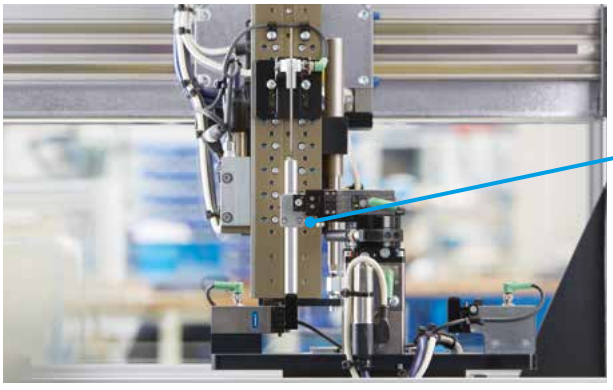
SCHUNK sets standards in all industries world-wide with its components and gripper portfolio. Our robot accessories include a uniquely comprehensive standard range of modules for the mechanical, sensory, and power connection of handling devices and robots. The comprehensive range of robust and long-lasting grippers for small components and universal grippers features high product quality, precision, and numerous monitoring options. What's more, SCHUNK's handling solutions of axis system open up new perspectives for cost and benefit-optimized automation solutions from a single source.



Applications



Gripping technology



Automation technology

Content

Applications from SCHUNK: Easily implement projects with us

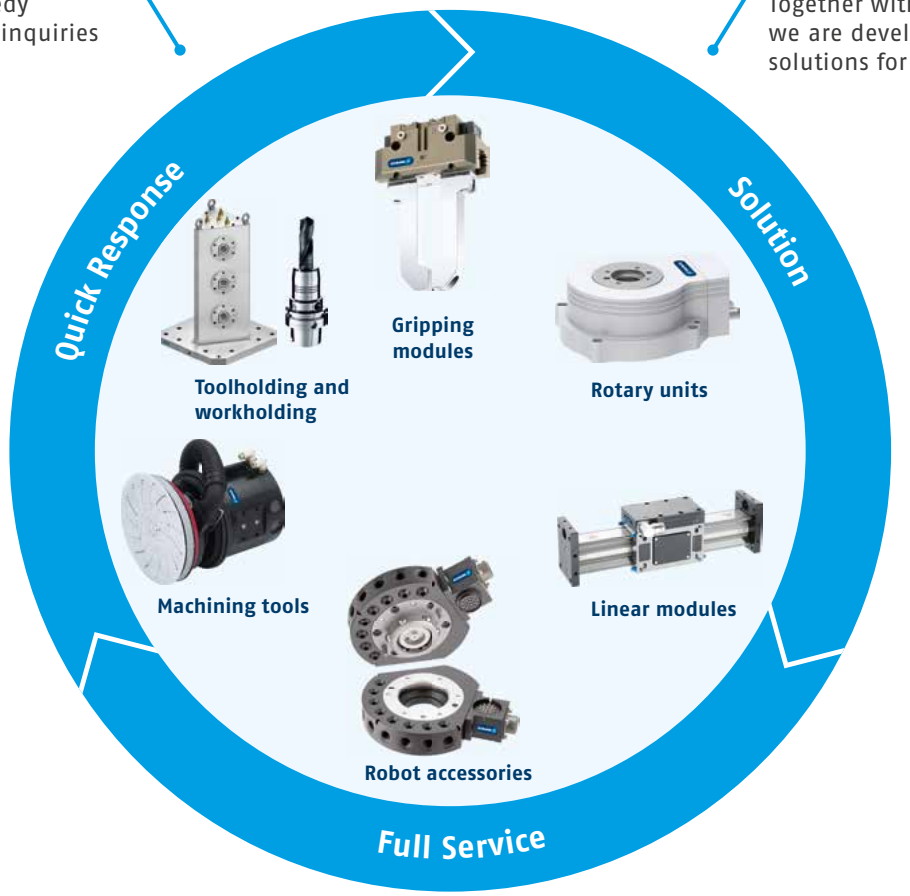
No matter what challenge you are facing in your manufacturing process – with SCHUNK you have the right partner at your side. We create individual concepts for your gripping applications, handling and clamping tasks and take care of their validation in our CoLabs. Thanks to our holistic approach, you benefit from reduced interfaces, and we also take over the design and project planning of your application and thus noticeably relieve your day-to-day project work. Another advantage is our in-house production, which is characterized by a high level of vertical integration, reliable process monitoring, and complete assembly documentation.

Fast response

We ensure a speedy response to your inquiries

Customized solutions

Together with our customers, we are developing individual solutions for their applications

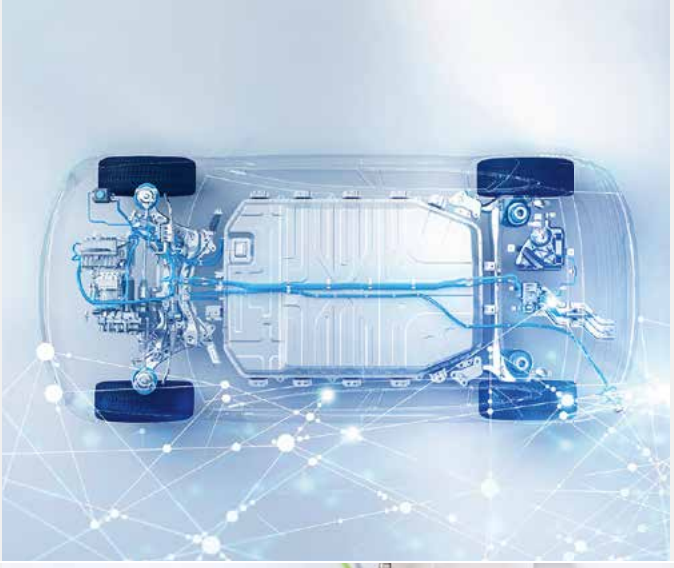


All-in service

You receive everything for your project reliably from one source

E-Mobility

SCHUNK is your reliable partner for production's changeover to e-mobility



Life science

Coordinated product portfolios from SCHUNK meet the high manufacturing standards in the life science sector.

Robots & cobots

SCHUNK offers an extensive program of modules for mechanical, sensory and energetic connection of handling devices, robots and cobots.

Application kits

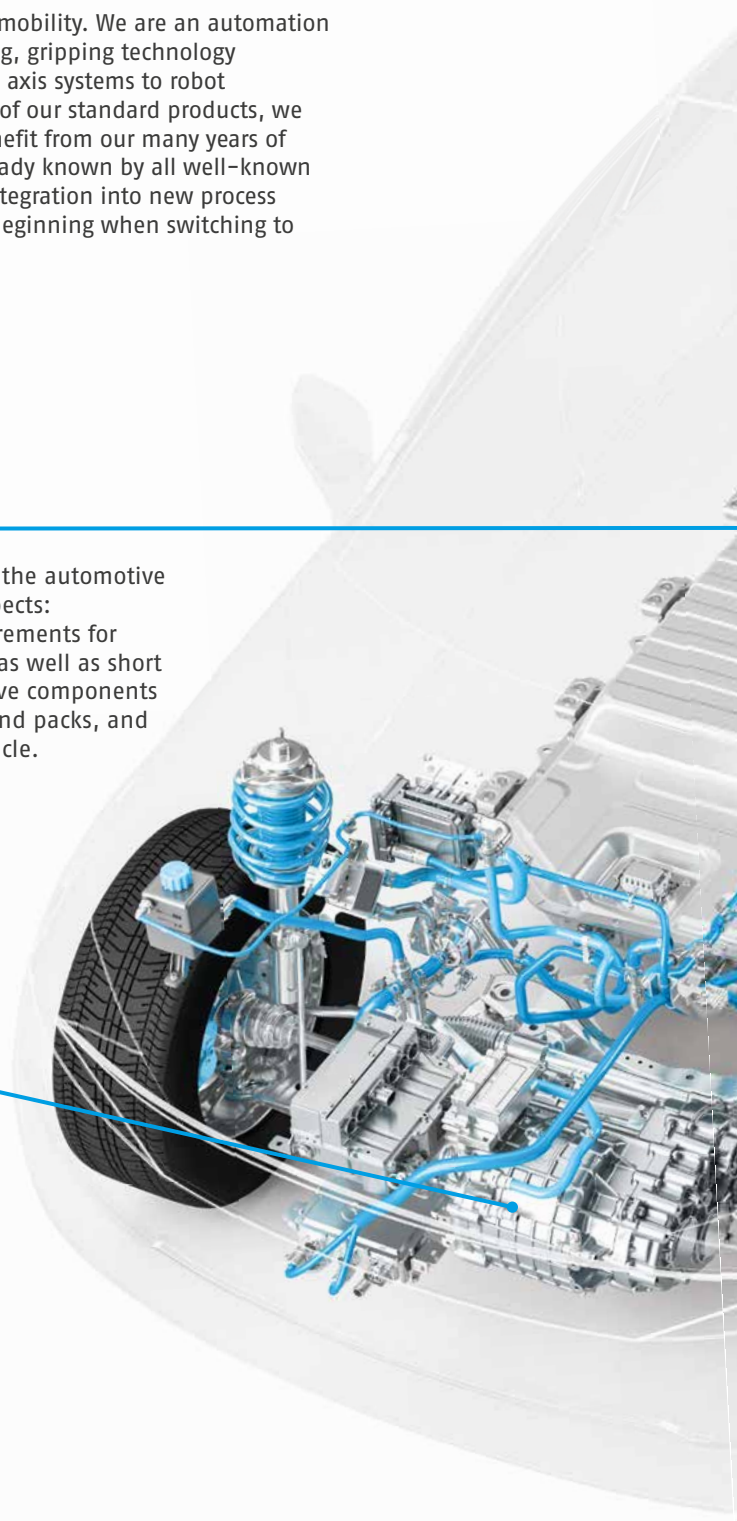
With its MTB application kits and 2D-grasping, SCHUNK offers easy-to-integrate packages for automated gripping, clamping and changing, as well as for gripping and placing of non position-oriented workpieces.

E-Mobility

SCHUNK is your reliable partner for production's changeover to e-mobility. We are an automation specialist and competence leader for toolholding and workholding, gripping technology and automation technology and supply you with everything from axis systems to robot accessories from a single source. Through the clever combination of our standard products, we always find an individually suitable solution for you. You will benefit from our many years of engineering know-how in the industry. SCHUNK products are already known by all well-known automotive manufacturers and their suppliers. This accelerates integration into new process chains enormously and keeps you in the fast lane from the very beginning when switching to e-mobility.

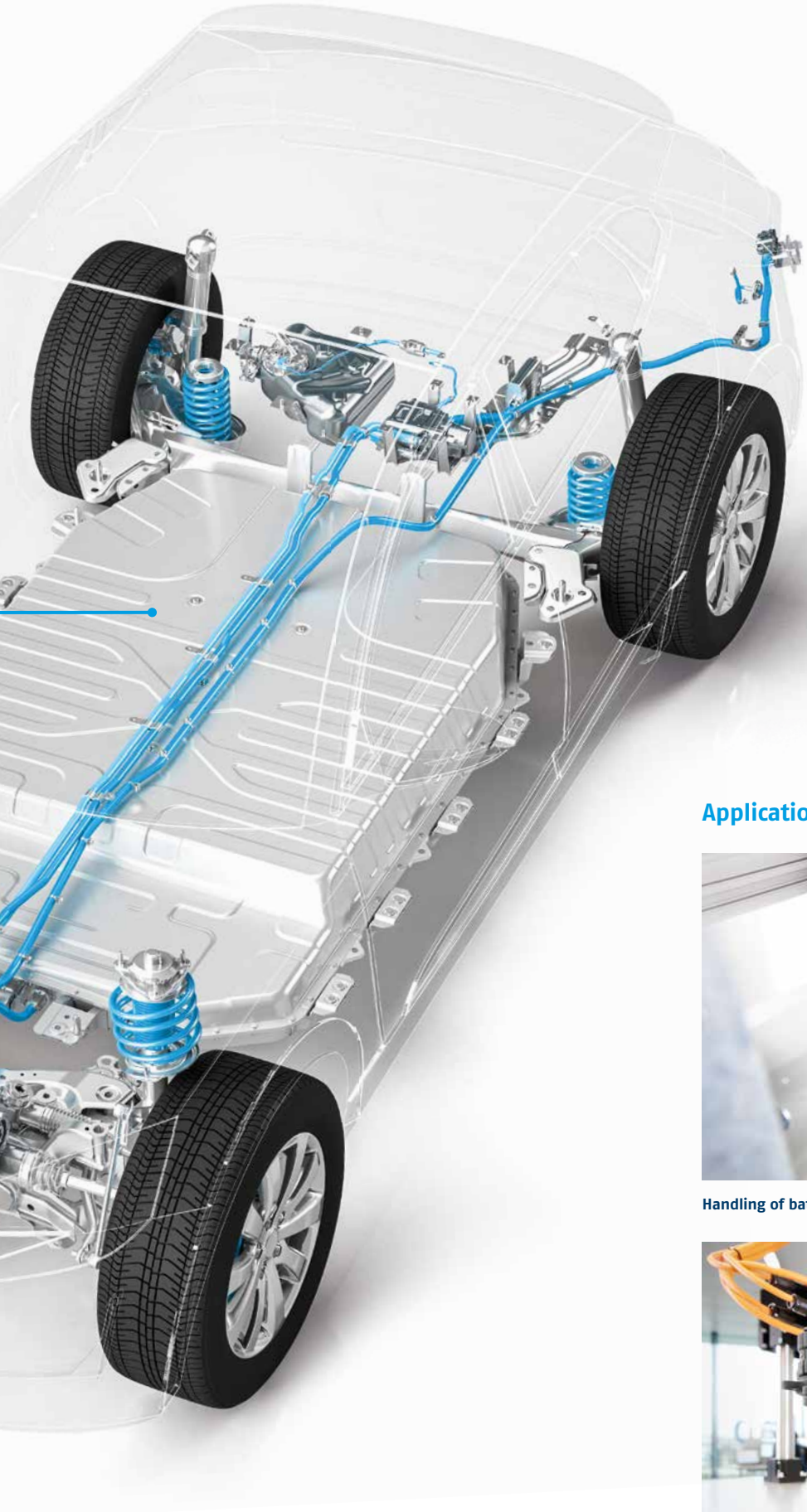
Battery systems

Using batteries brings new challenges to the automotive industry. SCHUNK supports you in all aspects:
Starting with cell production with requirements for cleanroom and dry room environments as well as short cycle times, then on to handling sensitive components during assembly into battery modules and packs, and all the way to final assembly in the vehicle.

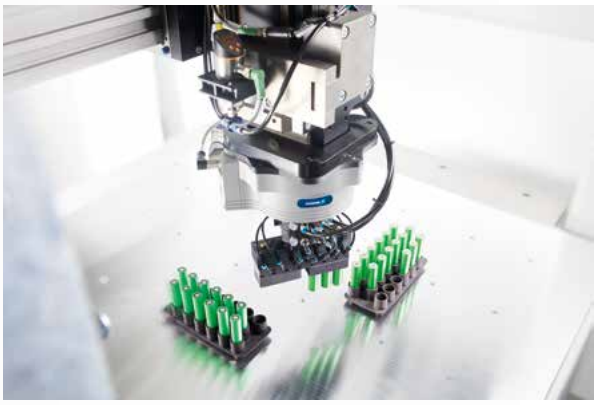


Electric drives

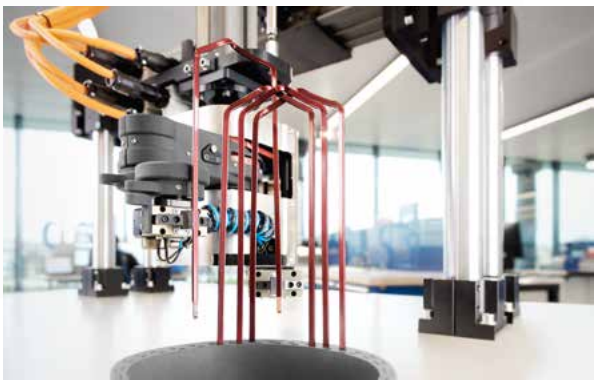
We are at the forefront of every step in the production and assembly of e-drives. Regardless of whether it concerns the specific setting of the hairpins, the handling of the sheet metal packages or the assembly of the components to the finished e-axis – SCHUNK can support you. Thereby we take special process requirements into account, such as flexibility due to the many different hairpins, precision and dynamics for very short cycle times, and maximum reliability for a long service life of the system.



Application examples



Handling of battery round cells



Hairpin handling

Life Science

Life science brings together biotechnology, medical technology, and pharmaceuticals. This multidisciplinary collaboration leads to the development of new medical technology products, treatment methods, and medicines. The manufacturing industry plays a key role here – manufacturing uses modern processes for producing high-quality products in the sectors of medical technology, lab automation, and pharmaceuticals. Coordinated product portfolios from SCHUNK meet the strict requirements for manufacturing quality and reliability.

MedTech

Process-reliable manufacturing in medical technology

SCHUNK supplies the manufacturers of medical technology systems or the manufacturing industry of medical products and put its the focus on robustness and absolute process reliability.

Lab automation

Efficient and reliable laboratory processes

SCHUNK supplies numerous ideal components for laboratory equipment and handling systems for lab automation.

Pharma

Cleanroom-compatible performance booster

With cleanroom-compatible and customized solutions in a hygiene-friendly design, SCHUNK enables the handling of sensitive and high-quality pharmaceutical products.

Application examples

Automated handling and preparation of pharmaceuticals

Handling and holding of blood collection tubes

Exact force measurement in rehabilitation

Micro machining for medical technology

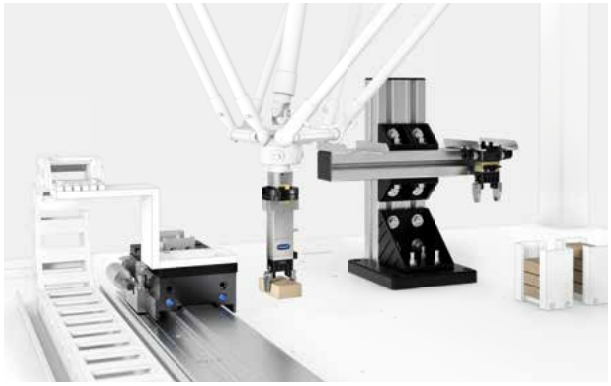
Robots & Cobots

By using robots and cobots, companies can increase their productivity and efficiency, enhance the quality of their products, and relieve their employees at work. However, with new application scenarios and applications, new challenges are involved. To meet these demands, we work closely with leading robot manufacturers. By bundling know-how, it allows us to offer a wide range of end-of-arm solutions tailored to the specific requirements of your applications and various robot manufacturers and their models. For example, our software modules enable the smooth interaction of components and robots.

Application examples

Loading of a machine tool with a jointed-arm robot

Handling of electronic assembly groups with a SCARA robot

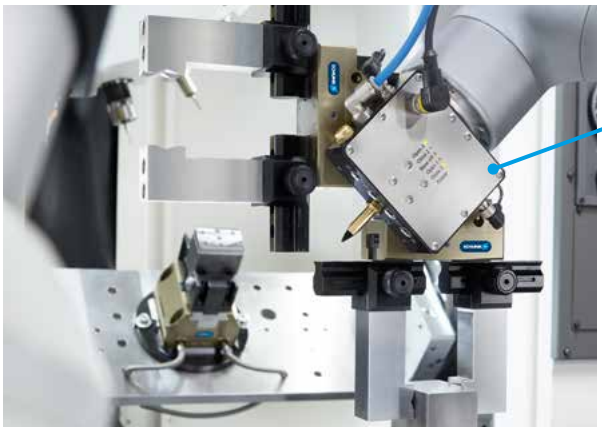


Pick&Place application with a Delta robot

1. **Applications with industrial robots and cobots**
   are available on schunk.com/robots-cobots
2. **Gripping technology for industrial robots and cobots**
   are available starting on page 16
3. **Toolholding and workholding for tools and workpieces**
   are available on schunk.com
4. **Automation technology**
   such as quick-change systems
   are available starrting on page 44

Application kit MTB

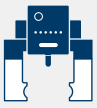
Diverse automation scenarios can now be implemented in no time and with minimal effort. With its MTB application kits, SCHUNK offers easy-to-integrate packages for automated gripping, clamping and changing of workpieces. Components that are well matched to one another, down to the very last detail, merge seamlessly into the machine environment. The kits are equally suitable for automation beginners and professionals.



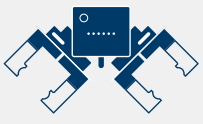
Easy to automate

- **Process reliability**
  By means of a sealed valve box, the electronic system is protected against dust, chips, and oil
- **Increased productivity**
  This is achieved by automated removal of chips and coolant from the workpiece and clamping force block
- **Productivity boost**
  The double gripper kit enables workpiece removal and reloading of the machine in one robot cycle

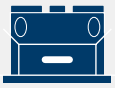
Space-saving:
Single gripper kit
For an easy entry into automated machine loading. Perfect in confined spaces.

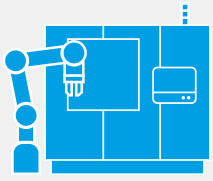


Effective:
Double gripper kit
Loading and unloading in just one cycle. Optimized cycle times for increasing machine productivity.



Reliable:
Clamping force block kit
The interplay between the grippers and the automated clamping force block increases productivity of the metal cutting machine.





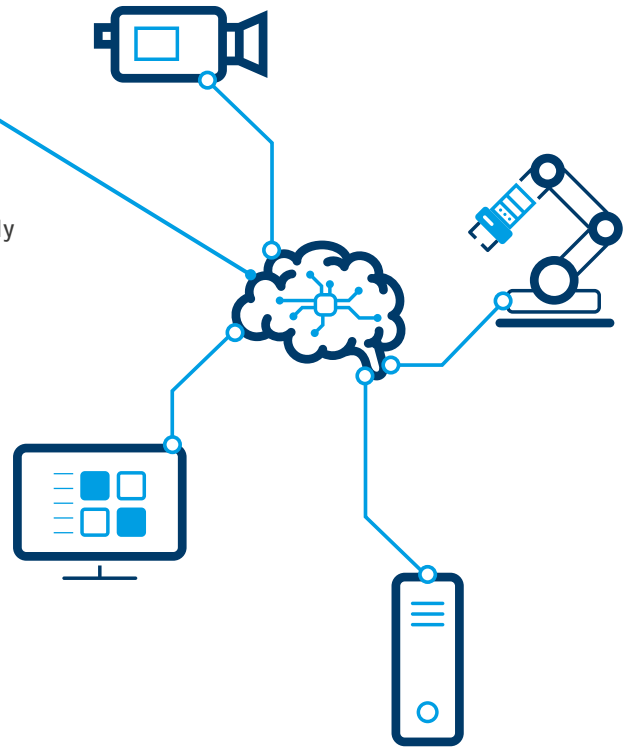
Robot connection package for gripper and clamping force block
For quick and seamless integration. Available as standard for a variety of cobots from different manufacturers.

2D Grasping kit

The perfectly matched application kit for gripping and placing non-position-oriented workpieces consists of a camera system and lens, an application-specific gripping system, SCHUNK's own industrial PC (SVC), as well as a plug-in for easy integration into the robot control system. The core of the system is the AI software developed by SCHUNK, which reliably ensures recognition, even under changing light conditions.

Vision-based
gripping

- **Easy teach-in of components**
  No prior knowledge of image processing system programming necessary
- **Automated gripping planning**
  The software can determine gripping points independently
- **Integrated collision protection**
  Automated calculation of interfering contours of fingers and workpiece
- **Intelligent software**
  The software adapts itself to non-optimal lighting conditions and changing backgrounds
- **Application validation**
  Risk reduction and easier commissioning due to application validation in the SCHUNK CoLab



Gripper variety made by SCHUNK: Your requirements are our motivation

SCHUNK offers the world's most comprehensive portfolio of grippers. Standard grippers, ready-to-install assembly groups, and customized gripping technology solutions for your handling and assembly, automation and robot end-of-arm applications. We always meet the most complicated gripping requirements, and we solve them. The result: Robust and durable gripping solutions which have ensured reliability in systems and machines all over the world for 30 years.

Grippers for Small components

Grippers for handling small, light, and sensitive workpieces

Universal grippers

Grippers for a wide range of applications

Long-stroke grippers

Grippers with long jaw stroke and high gripping force

Pneumatic grippers

Pneumatic grippers from SCHUNK have stood for high quality and reliability for many years. The focus is always on your workpiece: from small to large, from round to square, for every batch size and every application environment.

Electric grippers

For the requirements of modern process flows, electric gripper solutions offer many advantages. In modern process flows, our electric grippers enjoy advantages such as application flexibility and process feedback.

Adhesive grippers

The bionically inspired ADHESO gripper technology is based on the principle of adhesion and uses intermolecularly acting Van der Waals forces to handle various workpieces.

Magnetic grippers

SCHUNK's magnetic grippers move ferromagnetic components in any position and size.

Accessories

To match the gripper range, SCHUNK offers accessories for each kind of application and handling requirement – and also in extreme conditions.

Pneumatic grippers

Tech

The more demanding your application, the more precise the performance of the pneumatic gripper should match the task at hand. With our Tech segment, you have a whole range of "specialists" at your disposal, such as grippers for handling O-rings, gears, or rims.

Premium

In the premium segment you will find grippers of the highest quality with a wide range of variants and options. In addition to more robust grippers, we also offer more maintenance-free gripping cycles and long service life.

		Parallel gripper	
Tech	✚ Process specialists ✚ Maximum service life ✚ Best performance data	 KTG	 DPG-plus
Premium	✚ Best performance data ✚ Maximum service life ✚ Up to 36 months warranty ✚ Wide range of variants and matching accessories	 MPG-plus	 PGN-plus-P
Economy	✚ Proven SCHUNK quality at attractive conditions ✚ Focused performance ✚ Maximum economic efficiency	 MPC	 JGP-P

Economy

In our Economy segment, the focus is not only on performance, but also on economic efficiency: You get real SCHUNK quality under attractive conditions. Optimized for all standard applications in clean environments. The grippers focus on the essential characteristics, and thus ensure efficient use in operation.

The power of our pneumatic grippers

- **Proven**
- **Long service life**
- **Versatile**
- **High-quality**

	Centric grippers			Angular/radial gripper	
					
PSH	ORG	DPZ-plus	PZB-plus	GAP	DRG
					
PHL	MPZ	PZN-plus	PZH-plus	SWG	PRG
					
	JGZ			SGB	

	2-finger parallel gripper			
	Premium			
	Gripper for small components		Universal grippers	
	MPG-plus	KGG	PGN-plus-P	PGL-plus-P
				
Description				
	Powerful, compact gripper for small components with smooth-running roller guide of the base jaws	Narrow gripper with long stroke of up to 60 mm per finger	Guaranteed maintenance-free universal gripper with powerful gripping force and high maximum moments	Universal grippers with a long jaw stroke, integrated sensor system and high maximum moments
	For small to medium-sized workpieces	For light to medium weight workpieces	For light to heavy workpieces	Flexible handling of a wide range of parts
	Areas of application: Assembly, testing, laboratory, pharmaceutical, food	Areas of application: Universally applicable	Areas of application: Universally applicable	Areas of application: Different applications in clean as well as dirty environments
Advantages				
	Maximum gripping force with oval piston drive	High maximum moment due to the robust T-slot guidance	Precise handling due to robust multi-tooth guidance	Secure, certified gripping force maintenance, GripGuard
	Precise gripping thanks to the minimal play junction roller guide	Direct power transmission and high efficiency thanks to pneumatic 2-piston drive concept	Use of long gripper fingers possible	Precise and process-reliable monitori of the complete gripper stroke via IO-Link thanks to the integrated sens system.
	Food-compliant lubrication	Workpiece is clamped centrally using a pinion-rack principle	Process reliability and extended maintenance intervals thanks to permanent lubrication	IP 64 dirt protected as standard
Technical data				
Number of sizes	9	7	11	5
Gripping force [N]	7 .. 370	45 .. 540	180 .. 27000	145 .. 1900
Stroke per jaw [mm]	1 .. 10	10 .. 60	2 .. 45	10 .. 25
Weight [kg]	0.01 .. 0.63	0.09 .. 4.2	0.08 .. 39.8	0.46 .. 7.9
Recommended workpiece weight [kg]	0 .. 125	0 .. 2.7	0 .. 97.5	0 - 7
Closing/opening time [s]	0.01 .. 0.08/0.011 .. 0.08	0.03 .. 0.29/0.03 .. 0.25	0.02 .. 0.8/0.02 .. 0.8	0.03 .. 0.35 / 0.03 .. 0.35
Max. permissible finger length [mm]	80	160	400	100 .. 260
Repeat accuracy [mm]	0.02	up to 0.02	up to 0.01	0.03
Protection class IP	30/54	40	40/64	64/67
Cleanroom class ISO 14644-1	6		7 (sizes 40 - 100)	
Sensor system	++	+	+++	+++
High number of variants	++	++	+++	+++
Ambient conditions				
Clean	●	●	●	●
Contaminated/coarse dust	○	○	●	●
Contaminated/fine dust and liquids			◑	●
Contaminated/aggressive liquids			◑	◑
High-temperature range > 90 °C	◑	○	●	●
Cleanroom	◑	○	◑	◑

● = very highly suitable ◑ = highly suitable ○ = suitable in customized version
+ = medium-sized selection ++ = wide selection +++ = very wide selection

	Long-stroke grippers		Tech	
	Gripper for small components		Universal gripper	
	PHL	PLG	KTG	PGB
				
	Grippers with high maximum moments and a long jaw stroke	Customizable long-stroke gripper with high gripping force and profiled rail guide	Gripper for small components with center bore	Universal centric gripper with high gripping force and high maximum moments and center bore
	For large workpieces and/or a wide range of parts	For very large workpieces and/or a wide range of parts	For small to medium-sized workpieces	For small to medium-sized workpieces
	Areas of application: Mechanical and plant engineering, assembly and handling, automotive	Areas of application: Individually configurable for the application area	Areas of application: If workpiece feeding, sensors or actuators are required	Areas of application: If workpiece feeding, sensors or actuators are required
	Use of long gripper fingers possible	Stroke per jaw configurable to the millimeter from 100 mm to 400 mm	Low weight for weight-optimized handling solutions	Precise handling due to robust multi-tooth guidance
ng or	Workpiece is clamped centrally using a pinion-rack principle	Application-specific standard gripper thanks to diverse variants and options and individual configuration	Large stroke in relation to size	Use of long gripper fingers possible
	Universal and flexible gripper assembly	Integrated IO-Link multi-position monitoring	Precise gripping due to base jaws guided on rolling bearings	Maximum gripping force up to 610 N with oval piston drive
	5	5	1	4
	500 .. 4630	1650 .. 11650N	13	90 .. 610
	30 .. 160	100 .. 400 mm	4.5	4 .. 10
	1.49 .. 23.55	19.03 .. 137.7	0.08	0.28 .. 1.32
	2.5 .. 15.5	8.25 .. 58.25	0.07	0 .. 3.3
	0.11 .. 1.82/0.11 .. 2.91	0.08 .. 1.7/1.1 .. 2.2	0.05/0.05	0.02 .. 0.08/0.02 .. 0.08
	800	800	50	125
	0.02	0.03	0.02	0.01
	41	30	20	40
	++	++	+	++
	++	+++	+	+
	●	●	●	●
	◑	◑	○	◑
	○			
			○	●
			○	○

	2-finger parallel gripper			
	Tech			
	Universal gripper	**Long-stroke grippers**		
	DPG-plus	**PFH**	**PSH**	**SPG**
				
Description				
	Reliably sealed universal gripper according to IP67	Grippers with high torque capacity and long jaw stroke	Gripper with long jaw stroke up to 100 mm and dirt-resistant round guides	Stable grippers with high maximum moments and long jaw stroke
	For small to medium-sized workpieces	For large workpieces and/or a wide range of parts	For large workpieces	For heavy workpieces and a wide variance in parts
	Areas of application: For use in harsh environments such as foundries, grinding shops or forges.	Areas of application: e.g. handling of motor vehicle rims	Applications: for use in harsh environments and with a wide range of workpieces	Areas of application: Assembly, Automotive
Advantages				
	Precise handling of different workpieces thanks to robust multi-tooth guidance	Precise handling of different workpieces thanks to robust guidance	Sealed round guidance for long strokes	Precise handling due to robust guidance
	Permanently secure sealing thanks to lip seal on the outer circular guide	Use of long gripper fingers possible	Use of long gripper fingers possible	Use of long gripper fingers possible
	Use of long gripper fingers possible	Centric clamping thanks to double-piston rack-and-pinion principle	Universal and flexible gripper assembly	High efficiency due to direct drive
Technical data				
Number of sizes	11	4	4	1
Gripping force [N]	110 .. 11250	2200	320 .. 1760	10000
Stroke per jaw [mm]	2 .. 45	150 .. 300	14 .. 100	100
Weight [kg]	0.12 .. 52	18.9 .. 33.6	0.77 .. 8.05	35
Recommended workpiece weight [kg]	0 .. 46.35	0 .. 14.7	0 .. 8.8	50
Closing/opening time [s]	0.03 .. 1.1/0.03 .. 1.1	0.7 .. 1.25/0.7 .. 1.25	0.12 .. 0.4/0.12 .. 0.4	1.5/1.5
Max. permissible finger length [mm]	380	900	300	500
Repeat accuracy [mm]	up to 0.01	0.02	up to 0.05	0.1
Protection class IP	67	30	67	30
Cleanroom class ISO 14644-1	5			
Sensor system	+	++	+	+
High number of variants	++	+	+	+
Ambient conditions				
Clean	●	●	●	●
Contaminated/coarse dust	●	○	●	○
Contaminated/fine dust and liquids	●	○	●	
Contaminated/aggressive liquids	◑		●	
High-temperature range > 90 °C	◑	●	●	
Cleanroom	◑		○	

● = very highly suitable ◑ = highly suitable ○ = suitable in customized version
\+ = medium-sized selection ++ = wide selection +++ = very wide selection

Economy			
Gripper for small components	Universal grippers		Long-stroke gripper
MPC	JGP-P	PGF	PFH-mini
			
Basic gripper for small components with good price-performance ratio	Basic universal gripper with good price-performance ratio	Compact universal gripper with surface-guided base jaws	Gripper with high maximum moments and a long jaw stroke
For small to medium-sized workpieces up to 1.85 kg	For light to medium weight workpieces	Suitable for large workpieces	For large workpieces and/or a wide range of parts
Areas of application: Simple applications in small components handling	Areas of application: Mechanical and plant engineering, assembly, handling, automotive	Areas of application: universally applicable	Areas of application: Mechanical and plant engineering, assembly and handling
Cost-effective alternative	Cost-effective alternative	Very good guidance characteristics due to precise flat guidance	Use of long gripper fingers possible
Wide range of applications thanks to six sizes	Precise handling of different workpieces	Minimal interfering contours despite long stroke	Workpiece is clamped centrally using a pinion-rack principle
Simple, functional gripping system all from a single source	Comprehensive sensor accessories and monitoring of the stroke position with appropriate sensor accessories	Universal and flexible gripper assembly possible	Universal and flexible gripper assembly
6	10	5	3
16 .. 370	180 .. 8200	240 .. 1900	630 .. 2950
2.5 .. 15	2 .. 35	7.5 .. 31.5	30 .. 100
0.05 .. 0.94	0.08 .. 17.2	0.3 .. 5.3	2.65 .. 12.6
0 .. 1.85	0 .. 35	0 .. 7.1	0 .. 13
0.03 .. 0.11/0.03 .. 0.11	0.02 .. 0.7/0.02 .. 0.7	0.03 .. 0.4/0.03 .. 0.4	0.3 .. 1.0/0.3 .. 1.2
60	300	125	250
0.02	up to 0.01	up to 0.02	0.05
30	40	40	41
+	++	+	++
+	+	+	++
●	●	●	●
	◑	○	◑
			○
		●	●
		○	

	3-finger centric gripper		
	Premium		
	Gripper for small components	Universal gripper	Long-stroke gripper
	MPZ	PZN-plus	PZH-plus
			
Description			
	Small 3-finger centric gripper with base jaws guided on T-slots	Universal 3-finger centric gripper with high gripping force and high maximum moments	Universal 3-finger centric gripper with a long stroke and high maximum moments
	Especially suitable for small workpieces	Flexible handling of a wide range of parts	For large, sensitive workpieces
	Areas of application: Universally applicable	Areas of application: can also be used in areas with special requirements such as temperature, chemical resistance, contamination	Areas of application: can also be used in areas with special requirements such as temperature, chemical resistance, contamination
Advantages			
	Precise gripping with high bearing load capacity thanks to T-slot guidance	Precise handling due to robust multi-tooth guidance	Sensitive gripping for deformation-free handling
	Monitoring of finger positions also possible via FPS	Use of long gripper fingers possible	Precise handling due to robust multi-tooth guidance
	Compact dimensions for minimum interfering contours in handling	High force transmission and synchronized gripping due to wedge-hook design	Use of long gripper fingers possible
Technical data			
Number of sizes	6	11	4
Gripping force [N]	20 .. 310	255 .. 57300	375 .. 4200
Stroke per jaw [mm]	1 – 5	2 .. 45	20 .. 75
Weight [kg]	0.01 .. 0.29	0.13 .. 80	1.5 .. 33
Recommended workpiece weight [kg]	0 .. 1.15	0 .. 227	0 .. 22
Closing/opening time [s]	0.02 .. 0.06/0.02 .. 0.06	0.02 .. 4.6/0.02 .. 3	0.25 .. 1.05/0.2 .. 0.85
Max. permissible finger length [mm]	45	250	400
Repeat accuracy [mm]	0.01	up to 0.01	up to 0.02
Protection class IP	40	40/64	40
Cleanroom class ISO 14644-1	5	5	5
Sensor system	+	+++	+
High number of variants	+	+++	+
Ambient conditions			
Clean	●	●	●
Contaminated/coarse dust	◑	●	◑
Contaminated/fine dust and liquids		◑	○
Contaminated/aggressive liquids		◑	○
High-temperature range > 90 °C		●	○
Cleanroom		◑	

● = very highly suitable ◑ = highly suitable ○ = suitable in customized version
+ = medium-sized selection ++ = wide selection +++ = very wide selection

	Tech			Economy
	Universal grippers			Universal gripper
	DPZ-plus	PZB-plus	PZV	JGZ
				
	Reliably sealed 3-finger centric gripper according to IP67	3-finger centric gripper with high gripping force and high maximum moments and center bore	Multi-finger gripper for applications, in which two or three fingers are insufficient	Universal 3-finger centric gripper of the compact class with T-slot guidance and best cost-performance ratio
	For rough or dirty workpieces	Flexible handling of a wide range of parts	E.g. for cylindrical workpieces	Flexible handling of a wide range of parts
	Areas of application: wide range of applications from wet cells, grinding machines, lathes and milling machines to powder and paint spraying systems.	Areas of application: When workpiece feeding, sensors, actuators or customer-side attachments are required	Areas of application: MedTech, laboratory automation, pharmaceuticals	Areas of application: Mechanical and plant engineering, assembly and handling, automotive
	Precise handling of different workpieces thanks to robust multi-tooth guidance	Precise handling of different workpieces thanks to robust multi-tooth guidance	Process-reliable handling despite interfering contours	Cost-effective alternative
	Permanently secure sealing thanks to lip seal on the outer circular guide	Use of long gripper fingers possible	Precise handling due to robust multi-tooth guidance	Compact dimensions and low weight for minimum interfering contours in handling
	Use of long gripper fingers possible	Multi-functional range of applications due to high gripping forces	High force transmission and synchronized gripping due to wedge-hook design	Use of long gripper fingers possible
	8	9	5	7
	230 .. 16500	340 .. 27400	570 .. 6900	225 .. 7990
	2 .. 25	2 .. 35	4 .. 16	2 .. 16
	0.2 .. 20.1	0.26 .. 53	0.5 .. 10	0.12 .. 8
	0 .. 60	0 .. 100	0 .. 34.5	0 .. 30
	0.03 .. 1.8/0.03 .. 1.8	0.02 .. 2.5/0.02 .. 2.5	0.02 .. 0.15/0.02 .. 0.15	0.02 .. 0.8/0.02 .. 0.8
	160	250	140	200
	up to 0.01	up to 0.01	up to 0.01	up to 0.01
	67	40	40	40
	5			
	+	++	+++	++
	++	+	+	+
	●	●	●	●
	●	◑	◑	◑
	●	○		
	◑	○		
	●	●	◑	
	◑			

	Angular/radial grippers		
	Premium		
	Gripper for small components	Universal gripper	
	SWG	PWG-plus	PRG
			
Description			
	Narrow double-acting 2-finger angular gripper	Robust 2-finger angular gripper with oval piston and bone drive	180° radial gripper with powerful 1-pin crank system and oval piston
	For small to medium-sized workpieces	Flexible handling of a wide range of parts	Flexible handling of a wide range of parts
	Areas of application: Areas which require a stacked, space-optimized gripper arrangement	Areas of application: Can be used in challenging environments	Areas of application: Applications that require a large gripping force with the shortest possible movement sequences at the same time.
Advantages			
	Narrow design, allowing the grippers to be arranged in a row	Variable top jaw design, as grippers are available in jaw version, but also in finger version via intermediate jaws	Almost constant closing torque at closing angles from −5° to +7° due to kinematics.
	Spring-supported gripping force maintenance in the event of a pressure loss	Equipped with gripping force maintenance in the event of a pressure loss	Optimized cycle time due to innovative damping directly in the drive chain
	High force transmission and synchronized gripping due to wedge-hook design	Optional stroke limitation upon opening, for confined spaces and short cycle times	Higher closing moments for longer and more stable gripper fingers due to maximum power density
Technical data			
Number of sizes	8	8	8
Gripping moment [Nm]	0.01 .. 2.8	3.32 .. 1025	2 .. 295
Opening angle per jaw [°]	15	15	30 .. 90
Weight [kg]	0.0025 .. 0.213	0.13 .. 13.6	0.13 .. 6.72
Recommended workpiece weight [kg]	0 .. 0.46	0 .. 23.13	0 .. 6.96
Closing/opening time [s]	0.015 .. 0.03/0.02 .. 0.06	0.06 .. 0.32/0.06 .. 0.46	0.06 .. 0.75/0.06 .. 0.92
Max. permissible finger length [mm]	42	300	240
Repeat accuracy [mm]	0.05	0.02	up to 0.05
Protection class IP	30	30	20
Cleanroom class ISO 14644-1			
Sensor system	+	++	++
High number of variants	+	++	++
Ambient conditions			
Clean	●	●	●
Contaminated/coarse dust	○	◑	○
Contaminated/fine dust and liquids		○	
Contaminated/aggressive liquids		○	
High-temperature range > 90 °C	●	●	●
Cleanroom	○	○	○

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\+ = medium-sized selection ++ = wide selection +++ = very wide selection

* The GAP is an angular parallel gripper, which means the values must be understood as forces [N].

	Tech		Economy	
	Gripper for small components	Universal gripper	Gripper for small components	
	GAP	DRG	SGB	SGW
				
	Compact, double-acting, 2-finger angular parallel gripper for parallel O.D. gripping after swiveling in the gripper finger up to 90 degrees per jaw	Sealed 180° angular gripper for the use in contaminated environments	Small, single-acting, plastic 2-finger angular gripper with spring return	Small, single-acting, plastic 3-finger angular gripper with spring return
	For small to medium-sized workpieces	Flexible handling of a wide range of parts	For small to medium-sized workpieces	For small to medium-sized workpieces
	Areas of application: Applications requiring parallel external gripping with previous swiveling of the gripper fingers up to 90° per jaw.	Areas of application: Can be used in dirty environments	Areas of application: Applications requiring corrosion resistance and anti-static properties.	Areas of application: Applications requiring corrosion resistance and anti-static properties.
	Positively driven angular and parallel movement in a single functional unit	Completely sealed gripper version	Cost-effective alternative	Cost-effective alternative
	Maximum positioning accuracy, due to absolute centric clamping in the parallel stroke	Opening angle adjustable from 20° to 180°	Light and corrosion free, as housing is made from fiberglass-reinforced plastic	Light and corrosion free, as housing is made from plastic
	High force transmission and synchronized gripping due to stable kinematics	Equipped with gripping force maintenance in the event of a pressure loss	High power transmission and synchronized gripping thanks to single-acting double-piston drive with lever transmission	High power transmission and synchronized gripping thanks to single-acting 3-piston drive with lever transmission
	3	5	3	3
	92 .. 430*	8.2 .. 143	0.9 .. 4.95	1.35 .. 7.45
	30 .. 90	10 .. 90	8	8
	0.3 .. 1.33	0.5 .. 4.46	0.04 .. 0.06	0.05 .. 0.17
	0 .. 1.25	0 .. 7.2	0 .. 0.8	0 .. 1.3
	0.09 .. 0.35/0.09 .. 0.35	0.4 .. 0.3/0.5 .. 0.6	0.06 .. 0.08/ 0.04 .. 0.05	0.02 .. 0.02/0.03 .. 0.03
	65	125	50	50
	0.05	0.1	0.1	0.1
	40	67	20	20
	+	++	+	+
	++	++	+	+
	●	●	●	●
	○	●	○	○
		●		
		◑		
		●		
	○	○	○	○

	Special grippers		
	Tech		
	0-ring gripper	Gripper with shaft interface for toolholder	
	ORG	GSW-B	GSW-B with AGE
			
Description			
	6-finger gripper for process-reliable internal and external assembly of 0-rings	Universal gripper	Universal gripper with compensation unit
	For 0-rings, quad-rings, etc. up to 160 mm outer diameter	Flexible handling of a wide range of parts	Flexible handling of a wide range of parts
	Areas of application: Automated assembly	Areas of application: For fully automated loading and unloading of machining centers	Areas of application: For fully automated loading and unloading of clamping devices such as vises
Advantages			
	Exterior and interior assembly with one gripper for flexibility and cost savings	Cost effective module consisting of a universal gripper PGN-plus/PZN-plus and a shank interface	Cost effective module consisting of a universal gripper PGN-plus/PZN-plus and a shank interface
	Reliable performance due to new mounting principle for high availability	Fast, automated gripper change from the tool rack	Fast, automated gripper change from the tool rack
	Standard assembly finger for external assembly for common ring sizes for fast commissioning	Fully automatic tool change without the use of robots or gantries	Fully automatic tool change without the use of robots or gantries
Sensor system	+		
High number of variants	+	++	++
Ambient conditions			
Clean	●	●	●
Contaminated/coarse dust		●	◑
Contaminated/fine dust and liquids		◑	◑
Contaminated/aggressive liquids		◑	◑
High-temperature range > 90 °C		●	●
Cleanroom	○		

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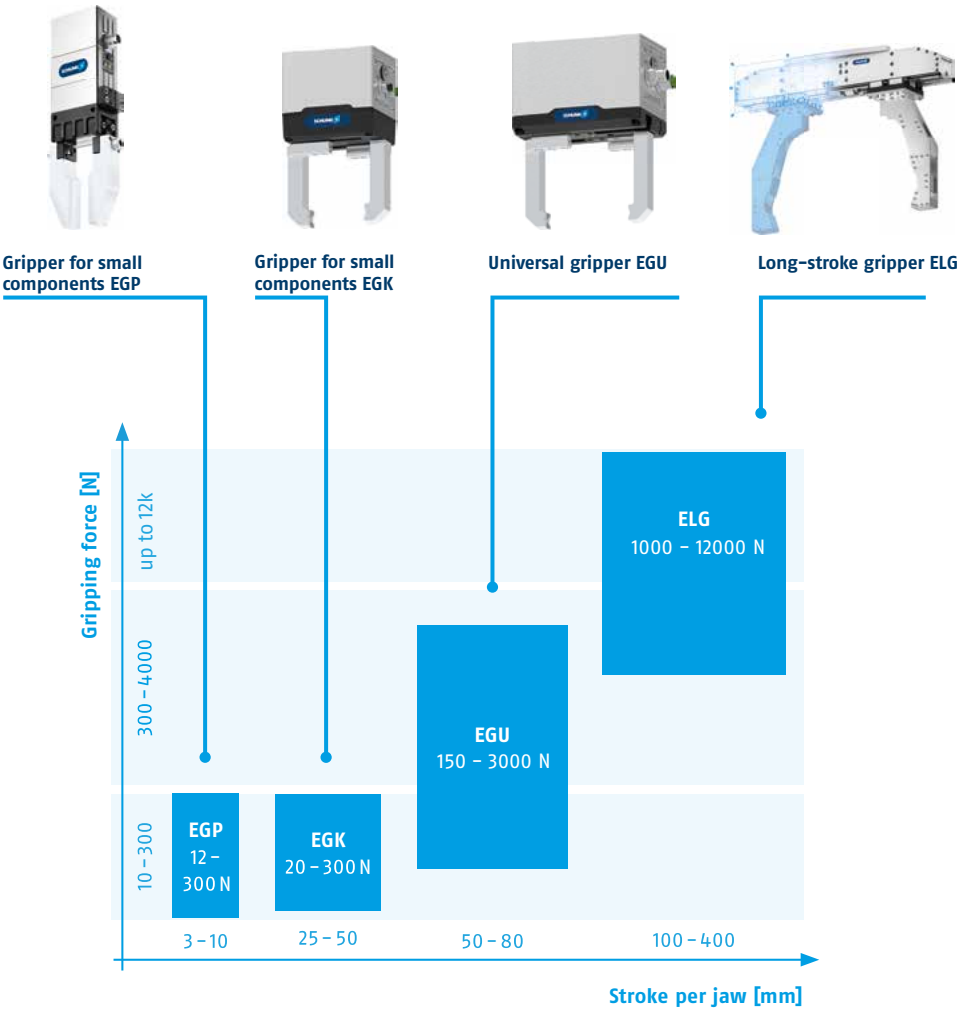
				Internal hole gripper
	GSW-V	GSW-M	RGG	LOG
				
	Vacuum gripper VGS for spindle interfaces	Magnetic gripper for spindle interfaces	Cleaning unit for up to 80 bar operating pressure	Light gripper made of very resistant polyamide with closed diaphragm system
	For flat workpieces weighing up to 4.9 kg	For flat, ferromagnetic workpieces	For machine fluid (filtered, max. particle size of 30 µm) or filtered compressed air in accordance with ISO 8573-1:2010 [7:4:4].	For light workpieces up to 3 kg weight such as small components, plastic components and sand cores
	Areas of application: For fully automated loading and unloading	Areas of application: For fully automated loading and unloading	Areas of application: For cleaning of clamping devices and for automated cleaning of machine tools	Areas of application: Particularly suitable for highly dynamic applications with lightweight workpieces
	Cost-effective unit for flexible automation in the machine	No electricity required, actuated using cooling lubricant	Cost-effective unit for flexible automation in the machine	High dynamics in the application due to low weight
	Fast, automated gripper change from the tool rack	Cost-effective unit for flexible automation in the machine	Fast, automated cleaning for maximum machine utilization	A closed membrane system and internal stop protect the expansion membrane from damage
	Fully automatic tool change without the use of robots or gantries	Fully automatic tool change without the use of robots or gantries	Increased safety for machine operators	A long service life ensures long-lasting economical use
	+	+	+	+++
	●	●	●	●
	○	○	●	●
	○	○	●	●
			●	
			●	
				○

Mechatronic grippers

Our range of electric parallel grippers currently comprises four product series that are optimally adapted for use in various application areas in terms of gripping force and stroke. This allows you to quickly find the right gripping solution for your application.

For the requirements of modern process flows, mechatronic gripper solutions offer many advantages

- **Flexibility:** Variety of parts, adjustment options (positioning, stroke, force, modes), future-proof thanks to new software functions that can be added at a later date
- **Reducing the workload of employees**
  Connectivity: Added value through standardized interfaces (flexible and simple networking with all relevant robot and controller manufacturers)
- **Process feedback:** For greater process stability and reliability due to integrated monitoring and analysis options
- **Independent of compressed air:** For improved availability, cleanliness and sustainability even in mobile applications



Connectivity EGK and EGU

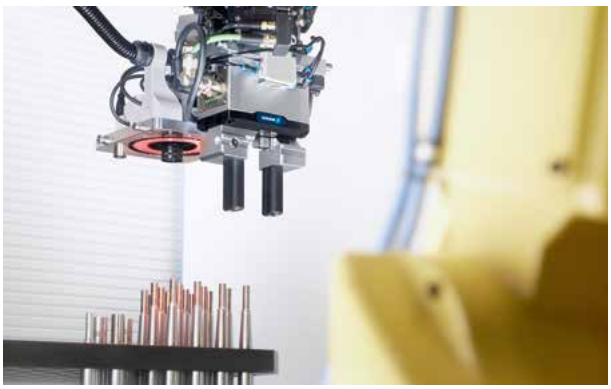
Communication interfaces
For easy integration, the two new mechatronic grippers EGU and EGK are equipped with a variety of communication interfaces.
This allows them to be quickly and easily connected with all relevant robot and controller manufacturers.

PLC integration
For a seamless interaction between gripper and PLC control, function modules for the programming interface of leading manufacturers are available (Allen Bradley, Beckhoff, Siemens). This means that all gripper functions can be used directly without any additional programming effort.

Robot integration
In order to be able to integrate grippers quickly and easily into robot control systems (ABB, FANUC, UR, YASKAWA), software modules are available. These enable the use of all gripper functions without additional programming effort.

Application examples

Automated machine loading



Assembly and joining tasks

Handling of printed circuit boards

Handling of samples

	2-finger parallel grippers		
	Gripper for small components		Universal gripper
	EGP	EGK	EGU
			
Description			
	2-finger gripper for small components with smooth-running base jaws guided on roller bearings	Flexible 2-finger gripper for small components for maximum workpiece variety with maximum process reliability	Flexible 2-finger universal gripper for the highest level of workpiece variety with maximum robustness
	For precise small components handling with short cycle times	For delicate and fragile workpieces such as printed circuit boards, samples and trays	Universal workpiece handling, even for large and heavy workpieces
	Areas of application: Electronics manufacturing, laboratory automation and assembly automation in rigidly interlinked production processes	Areas of application: Flexible production processes in electronics manufacturing and laboratory automation	Areas of application: Loading and unloading of machine tools, assembly and joining tasks with externally acting process forces, flexible picking and palletizing in logistics
Advantages			
	Compact dimensions for minimum interfering contours in handling	Versatile and productive due to the long and freely programmable jaw stroke with stepless gripping force adjustment	Versatile and productive due to the long and freely programmable jaw stroke with stepless gripping force adjustment
	Control via digital I/O for easy commissioning and rapid integration into existing systems	Gripping force maintenance with loss detection	Gripping force maintenance with loss detection
	Control via IO-Link. Enables pre-positioning of the gripper finger and evaluation of the gripper condition as well as the adjustability of special gripping modes.	Always referenced in the event of both emergency stop and power failure thanks to integrated absolute encoder	Always referenced in the event of both emergency stop and power failure thanks to integrated absolute encoder
Technical data			
Number of sizes	4	3	4
Gripping force [N]	12 .. 300	20 .. 300	150 .. 3000
Stroke per jaw [mm]	3 .. 10	26.5 .. 51.5	41 .. 80
Dead weight [kg]	0.11 .. 0.83	0.58 .. 1.63	1.44 .. 7.88
Max. permissible finger length [mm]	80	130	200
Nominal voltage [V]	24	24	24
Protection class IP	30	67	67
Communication interface	Digital I/O, IO-Link	PROFINET, EtherNet/IP, EtherCAT, IO-Link, Modbus RTU	PROFINET, EtherNet/IP, EtherCAT, IO-Link, Modbus RTU
Sensor system			
High number of variants	+++	+++	+++
Ambient conditions			
Clean	●	●	●
Contaminated/coarse dust		●	●
Contaminated/fine dust and liquids		◑	●
Contaminated/aggressive liquids			
High-temperature range > 90 °C			
Cleanroom	◑	◑	◑

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				Special grippers
	Long-stroke gripper	Collaborating	Centric gripper	Servo-electric 5-finger gripping hand
	ELG	Co-act EGP-C	EZN	SVH
				
	Configurable 2-finger long-stroke gripper with a gripping force of up to 12000 N	Collaborating 2-finger gripper for small components with control via 24 V and digital I/O	3-finger parallel gripper with high maximum moments due to multi-tooth guidance	The servo-electric 5-finger hand grips almost as perfectly as the human hand
	For large, bulky and heavy workpieces	For small and light workpieces	For cylindrical workpieces	For a wide variety of gripping and manipulation tasks
	Applications: customized, handling of crates, boxes, rims, white goods and much more	Areas of application: Applications with direct collaboration between humans and cobots	Areas of application: Loading and unloading of machine tools	Areas of application: mobile robotics, research and development
	Adaptable drive motor for flexible actuation and easy integration into existing control concepts	Plug & Work: Compatible with a wide range of cobots	External electronics for easy integration into existing control concepts via PROFINET	Various gripping operations can be executed with high sensitivity thanks to the moving parts with a total of nine drives
	Application-specific standard gripper thanks to diverse variants and options and individual configurations	Certified by German statutory accident insurance (DGUV)	Centering of cylindrical workpieces	Reliable grip on objects due to elastic gripping surfaces
	Reduced design costs due to simple and fast design of individual long-stroke grippers via the web tool	Functional safety ensured due to inherent safety with current limitation	Possibility of pre-positioning for cycle time reduction due to a short working stroke	Extremely compact design due to integration of the complete control, regulator, and power electronics in wrist
	4	2	2	
	1000 .. 12000	140 .. 230	500 .. 800	
	100 .. 400	6 .. 10	6 .. 10	
	8.1 .. 56.5	0.59 .. 1.38	0.98 .. 2.48	
	800	80	80	
	Motor-dependent	24	24	
	20 .. 40	30	41 .. 65	
	Controller-dependent	Digitale I/O	PROFINET	
				+
	+++	++	++	+
	●	●	●	●
	●		●	
	◑		◑	

ADHESO Adhesive gripper

The ADHESO gripper technology is based on an adhesive system inspired by nature. The adhesive forces used by animals such as geckos for locomotion are now being utilized by SCHUNK for use in handling applications in the most diverse of fields.

The advantages of the ADHESO gripper technology are revolutionary

- **Low operating costs due to energy-efficient gripping** without an additional energy supply
- **Gripping without any visible residues** for sensitive workpieces
- **No particle emission,** making it suitable for clean room applications
- **Versatile in use and ideally adapted** to different ranges of applications

Material and surface

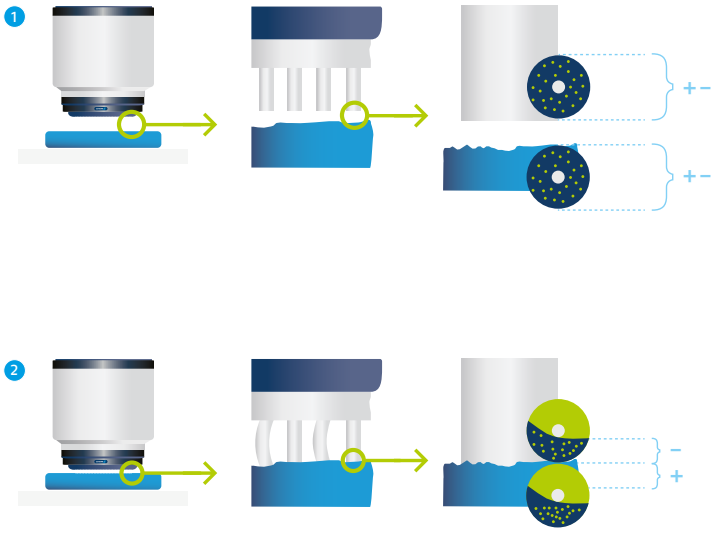
SCHUNK grippers with ADHESO gripper technology have a distinctive surface architecture made of special polymers. The result is a structure of extremely finely structured legs, which adheres residue-free to the different materials and objects. The scalability options and use of different material characteristics allows the adhesive structure to be adapted to different workpieces and surfaces. This makes grippers with ADHESO technology easy to customize for the most diverse workpieces and applications.

IKU
Der Innovationspreis für Klima und Umwelt 2022
Preisträger

The German Federal Ministry for Economic Affairs and Climate Protection awarded the innovative ADHESO gripper technology from SCHUNK with the IKU 2022.

Principle of function

The bionic-inspired ADHESO gripper technology is based on the principle of adhesion, using intermolecularly acting Van der Waals forces for handling various workpieces and materials. Due to the high variability of the adhesive structures, grippers with ADHESO technology can be individually tailored to different applications.



1 Initial situation
2 Gripping process

Application examples

Handling of lab samples

Handling of semiconductors

Handling of vehicle components

Handling of food

Magnetic gripper

As if by superpower, SCHUNK's magnetic grippers move ferromagnetic components in any position and size. Whatever their position – the workpieces are always gripped quickly and securely. A short pulse of current is all it takes to get the magnetic grippers ready for use. Uncomplicated, easy to handle and exceptionally strong – it's time to add the invisible force of magnetism to your production!

The advantages of magnetic gripping technology offer you real added value

- **High holding forces for reliable part handling** in compact systems
- **Actuation via 24 V voltage supply** saves energy and simplifies connection and wiring
- **Workpiece accessibility** from five sides free from interfering contours
- **Low weight for high dynamics** in challenging applications
- **Reliable maintenance of holding force** for process-reliable use even in emergency-stop scenarios

Application examples

Handling of battery round cells

Handling of sheet metal

Bin picking of raw parts

Handling of motors

	Electromagnetic grippers	
	EGM	**EMH**
		
Description		
	Compact electro-permanent magnetic gripper for energy-efficient handling	Compact electro-permanent magnetic gripper for energy-efficient handling with integrated electronics and feedback function
	For ferromagnetic workpieces weighing up to 118 kg	For ferromagnetic workpieces weighing up to 70 kg
	Areas of application: Universally applicable for a wide variety of parts	Areas of application: Universally applicable for a wide variety of parts
Advantages		
	Reliable part handling in compact systems due to high holding forces in very small spaces	Reliable part handling in compact systems due to high holding forces in very small spaces
	Low weight for high dynamics in challenging applications	Compact design due to integrated electronics without additional controller
	Reliable gripping force maintenance for process-reliable use even in emergency-stop scenarios	3:1 ratio of workpiece weight to dead weight for high dynamics in demanding applications
Technical data		
Number of sizes	14	6
Gripping force [N]	780 .. 20370	530 .. 10550
Weight [kg]	1 .. 25	1 .. 8
Recommended workpiece weight [kg]	0 .. 118	0 .. 70
Closing/opening time [s]	0.3	0.2
Nominal voltage [V]	400 AC	24 DC
Nominal current [A]	2.2 .. 12.3	3.1...9.8
Protection class IP	54	52
Communication interface	Controller-dependent	Digitale I/O
High number of variants	+++	++
Motor & controller		
Motor		
Controller	External	Intergrated
Controller type	ECG	
Ambient conditions		
Clean	●	●
Contaminated/coarse dust	●	●
Contaminated/fine dust and liquids	◑	◑
Contaminated/aggressive liquids		
High-temperature range > 90 °C		
Cleanroom	○	○

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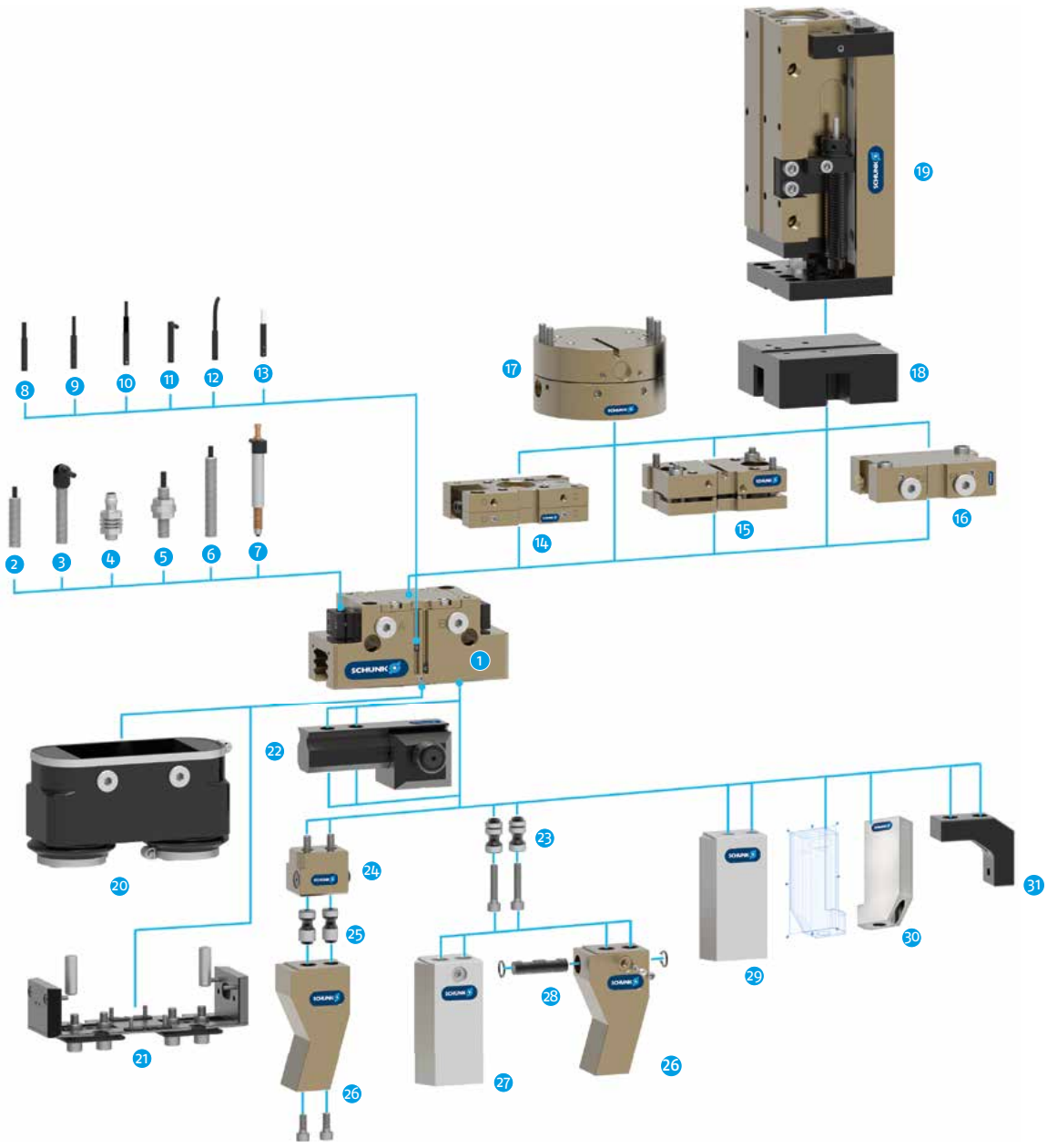
Accessories

SCHUNK also offers suitable accessories for the extensive gripper range. The universal gripper PGN-plus-P, for example, features a large number of variants and a superior range of accessories offering everything needed for flexible use in your specific automation application. For each kind of application and handling requirement – and also under extreme conditions.



1 **PGN-plus-P**
Universal 2-finger parallel gripper with a high gripping force and high maximum moments due to the use of a multi-tooth guidance

Sensor system

2 **IN ...**
Inductive proximity switch with molded cable and straight cable outlet

3 **IN ...-SA**
Inductive proximity switch with molded cable and laberal cable outlet

4 **IN-C 80**
Inductive proximity switch, directly plugable

5 **FPS**
Flexible position sensor for monitoring up to five different, freely selectable positions

6 **APS-Z80**
Inductive position sensor for precise position detection of the gripper jaws with analog output

7 **APS-M1S**
Mechanic measuring system for accurate acquisition of the gripper jaw position with analog output

8 **MMS 22**
Magnetic switch with straight cable outlet for monitoring a position

MMS 22-PI1
Magnetic switch with straight cable outlet for monitoring a freely programmable positions

9 **MMS 22-PI2**
Magnetic switch with straight cable outlet for monitoring two freely programmable positions

10 **MMS 22-PI1-HD**
MMS 22-PI1 in robust design

MMS 22-PI2-HD
MMS 22-PI2 in robust design

11 **MMS 22-SA**
Magnetic switch with lateral cable outlet for monitoring a position

MMS 22-PI1-SA
Magnetic switch with side cable outlet for monitoring a freely programmable position

12 **MMS-P**
Magnetic switch with straight cable outlet for monitoring two freely programmable positions

13 **MMS-A**
Analog magnetic switch with straight cable outlet for measuring the gripper jaw position with analog output and teach function

MMS-IOL
Magnetic switch with straight cable outlet for measuring the gripper jaw position with IOS-Link interface and teach function

Complementary Products

14 **CWS**
Manual change system with integrated air feed-through for simple exchange of the handling components

15 **TCU**
Tolerance compensation unit for compensation of small tolerances in the plane

16 **SDV-P-E-P**
Pressure maintenance valve for temporary force and position maintenance

17 **AGE**
Compensation unit for compensation of large tolerances along the X and Y axes

18 **ASG**
Adapter plate for combining various automation components in the modular system

19 **CLM**
Linear module with pneumatic drive and scope-free pre-loaded junction rollers

20 **HUE**
Sleeve for protection against dirt

21 **SAD**
Dustproof version, retrofit kit

Finger Accessories

22 **UZB**
The universal intermediate jaw allows for the fast tool-free and reliable plugging and shifting of top jaws on the gripper.

23 **BSWS-AR**
Adapter coupling of jaw quick-change system for fast, manual change of top jaws

24 **BSWS-B**
Locking mechanism of the jaw quick-change system for fast, manual change of top jaws

25 **BSWS-A**
Adapter coupling of the jaw quick-change system for adaptation to the customized finger

26 **Customized fingers**

27 **BSWS-ABR**
Finger blank made of aluminum with interface to the jaw quick-change system

BSWS-SBR
Finger blank made of steel with interface to the jaw quick-change system

28 **BSWS-UR**
Locking mechanism for the integration of the jaw quick-change system into customized fingers

29 **ABR/SBR**
Finger blanks made of steel or aluminum with standardized screw connection diagram

30 **FGR**
Configurable, workpiece-specific gripper finger made of aluminum or steel

31 **ZBA**
Intermediate jaws for reorientation of the mounting surface

	Finger accessories			
	Workpiece-specific gripper fingers	**Top jaws blank**	**Jaw quick-change system**	**Jaw quick-change system**
	FGR	**ABR/SBR**	**BSWS-B/-A**	**BSWS-M**
	 30	 29	 24 25	
Description				
	Workpiece-specific, configurable gripper finger made of aluminum or steel	Blanks made of aluminum or steel for rework by the customer	Jaw quick-change system consisting of a base and two adapter pins	Tool-free jaw quick-change system consisting of a base and two adapter pins
	Suitable for many gripper types	Suitable for common gripper types	Handling of various workpieces	Handling of various workpieces
	Areas of application: Universally applicable	Areas of application: For quick and easy creation of top jaws by adding the clamping contour	Areas of application: With highly diverse workpieces for quick jaw changes with any clamping contours	Areas of application: With highly diverse workpieces for quick jaw changes with any clamping contours
Advantages				
	Easy configuration of individual gripper fingers	For jaw blanks with jaw quick-change systems, there are no more interfering mounting holes in the finger contours	Fast replacement of the gripper fingers thanks to the form-fit locking mechanics	One gripper can be used universally in various applications
	Short delivery times for quick availability without tying up your own resources	Easy to assemble due to standardized drilling pattern	Saving time when converting applications	Tool-free jaw change via the unlocking button
	No CAD program or expertise required thanks to license-free web tool	High replacement accuracy due to centering	Firm up to the maximum loadability of the base jaws	Saving time when converting applications

				Complementary products	
	Jaw quick-change system with top jaw blank	**Jaw quick-change system**	**Adjustable intermediate jaw**	**Pressure maintenance valve**	**Protective cover**
	ABR/SBR-BSWS	**BSWS-AR/-UR**	**UZB**	**SDV-P**	**HUE**
		 23 28	 22	 16	 20
	Jaw quick-change system consisting of two adapter pins and a finger blank	Jaw quick-change system consisting of two adapter pins and locking mechanism of the customized finger	Universal intermediate jaw for fast tool-free and reliable plugging and shifting of top jaws on the gripper.	Prevents venting of the module in the event of a loss in air pressure in the supply line.	Protective cover for gripper against external influences in a dirty environment
	Handling of various workpieces	Handling of various workpieces	Handling of various workpieces	This is especially useful for grippers where a mechanical grip force maintence solution is not possible	Suitable for grippers PGN-plus-P, PGN-plus, PZN-plus, EGN and EZN
	Areas of application: With highly diverse workpieces for quick jaw changes with any clamping contours	Areas of application: With highly diverse workpieces for quick jaw changes with any clamping contours	Areas of application: With highly diverse workpieces that can be covered by increasing the clamping width	Areas of application: Temporary force or position maintenance for various pneumatic actuators	Areas of application: Suitable for applications of up to IP65 if an additional sealing of the cover bottom is provided
	Fast replacement of the gripper fingers thanks to the form-fit locking mechanics	Fast replacement of the gripper fingers thanks to the form-fit locking mechanics	Gripper and finger-side centering for universal and flexible assembly of the gripper	Greater operational safety when using pneumatic components	Cost effective for economical handling
	Saving time when converting applications	Saving time when converting applications	Stable guide strip, suitable for long gripper fingers	Long-term reliable application thanks to robust design	Can be retrofitted
	Firm up to the maximum loadability of the base jaws	Firm up to the maximum loadability of the base jaws	Precise and repeatable grid	Universally applicable, as it can be combined with almost any pneumatic actuator	Space-saving due to low interfering contours

Sensors

	Monitoring of one position				Monitoring of several positions
	1 digital switching point				2 digital switching points
	MMS 22	MMS-PI 1	IN	RMS	MMS-PI 2
	 8		 2		 9
Technical data					
Number of sizes	1	1	10	2	1
Operating principle	Magnetic	Magnetic	Inductive	Reed	Magnetic
Max. IP protection	67	67	67	67	67
Supply voltage [V DC]	24	24	24	24	24
Max. current on contact [mA]	50	50	100 .. 200	400	25
PNP version	●	●	●	●	●
NPN version	●	●	●	●	
LED display	●	●		●	●
Min./max. ambient temperature [C°]	-10 .. 70	-10 .. 70	-25 .. 70	-5 .. 70	-10 .. 70
Closer	●	●	●	●	●
Opener			●		
Connection type					
Number of wires	3	3	3	3	4
Cable version	●	●	●		●
Connector M8 version	●	●	●	●	●
Connector M12 version			●		
Ambient conditions					
Clean	●	●	●	●	●
Easily contaminated	●	●	●	●	●
Extremely dirty	●			●	

● = highly suitable/fully supported

Cables

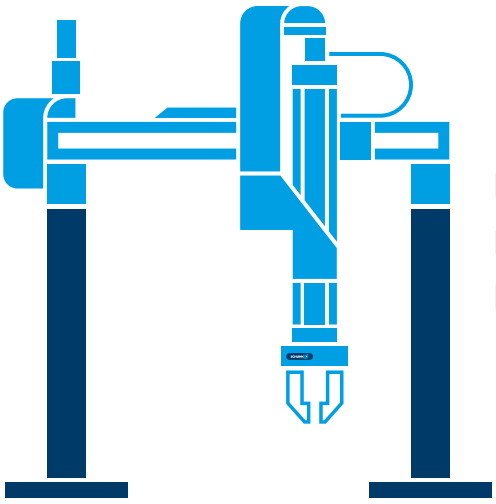
	Cables	
	Sensor cable	Actuator cable
		
Description		
	Optimally suited for signal transmission of SCHUNK sensor technology	Perfectly suited to supply and control SCHUNK components
	Areas of application: For use on all SCHUNK sensors as well as components with integrated sensor technology	Areas of application: The connectors are used for every sensor, gripping, rotary and linear module, and also for numerous components in the robot accessories field
Advantages		
	Industrial standard plug connector	Industrial standard plug connector
	Different connections possible (straight/angled)	Different connections possible (straight/angled)
	Combination with plug-in connector possible	Combination with plug-in connector possible

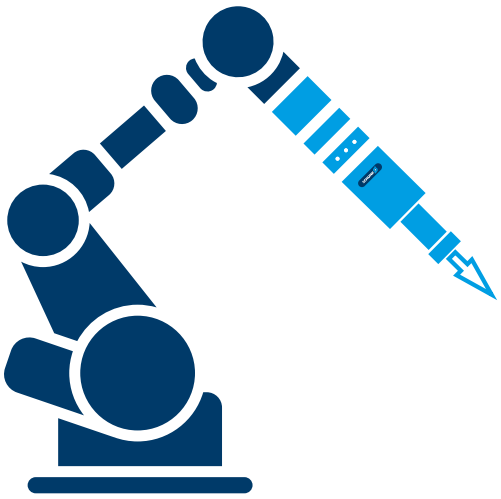
			Monitoring of the overall stroke			
		5 digital switching points	IO-Link signal	Analog signal		
	MMS-P	FPS	MMS 22 IO-Link	APS-M1	APS-Z80	MMS-A
	 12	 5	 13	 7	 6	 13
	1	3	1	1	1	1
	Magnetic	Magnetic	Magnetic	Mechanical	Inductive	Magnetic
	67	67	67	67	67	67
	24	24	24	24	24	24
	100	200	25			
	●	●	●			
	●		●			●
	5 .. 55	-25 .. 70	5 .. 55	0 .. 60	-10 .. 70	5 .. 55
	●	●	●			
	4	7	3	4	3	3
	●	●		●	●	
	●		●		●	●
			●			●
	●	●	●	●	●	●
	●	●	●	●	●	●

			Plug connector
	Communication cable	Power/sensor cable	Plug-in connectors
			
	Optimally suited for reliable transmission of bus signals from the higher-level control system to the mechatronic SCHUNK components	Perfectly suited to supply and control SCHUNK components	For the assembly of cables for sensors and actuators
	Areas of application: The connectors are used for every sensor, gripping, rotary and linear module, and also for numerous components in the robot accessories field	Areas of application: The connectors are used for every sensor, gripping, rotary and linear module, and also for numerous components in the robot accessories field	Areas of application: in connection with sensors, actuators, distributors and cables. Wherever customized cable lengths are required
	Industrial standard plug connector	Industrial standard plug connector	Industrial standard plug connector
	Different connections possible (straight/angled)	Different connections possible (straight/angled)	Different connections possible (straight/angled)
	Available in torsion or cable track capability	Suitable for connection to the respective SCHUNK component	Easy assembly

Automation with SCHUNK: We can help you to master any challenge

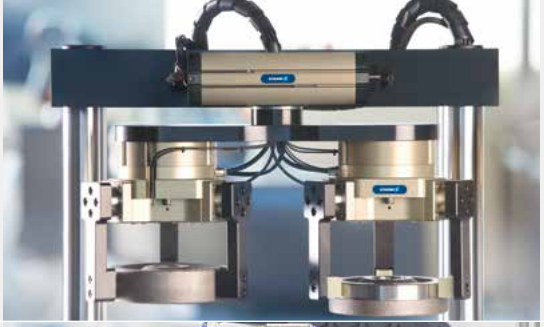
SCHUNK offers the world's most comprehensive product portfolio for technical solutions for automated handling of workpieces. Whether pick & place units, linear modules or multi-axis systems – as a complete supplier of handling solutions, we will be happy to advise you. Application-specific automation systems provide high dynamics during short cycle times – from small parts assembly in the production of electronics to the loading and unloading of machine tools, to the handling of food products, pharmaceuticals or medical devices.





Swivel units

SCHUNK offers a unique range of swivel and rotary modules with various options.



Swivel units

Linear modules & axis systems

Whether it's a variety of linear technology from a single source for high-speed assembly automation or an extensive axis portfolio for machine loading and unloading – SCHUNK is your partner for every type of handling process automation.

Linear modules & axis systems

Change systems & feed-through modules

In the field of automation, SCHUNK offers the most comprehensive portfolio of components for robot applications from small components to heavy load handling.

Change systems & feed-through modules

Rotary feed-throughs

SCHUNK rotary feed-throughs are the modern standard for stationary use and for automation.

Rotary feed-throughs

Compensation units & collision protection

To prevent damage to tools or workpieces, SCHUNK compensation units ensure the necessary flexibility. Moreover, monitoring modules are an effective tool for process-reliable manufacturing in automated handling processes.

Compensation units & collision protection

Force/torque sensors

Where precise results are needed, intelligent force/torque sensors are in trend and provide robots with the required sensitivity.

Force/torque sensors

Machining tools

Deburring, grinding and polishing – demanding tasks such as removing material or finishing workpieces can be automated quickly and easily with the help of the R-EMENDO tools.

Machining tools

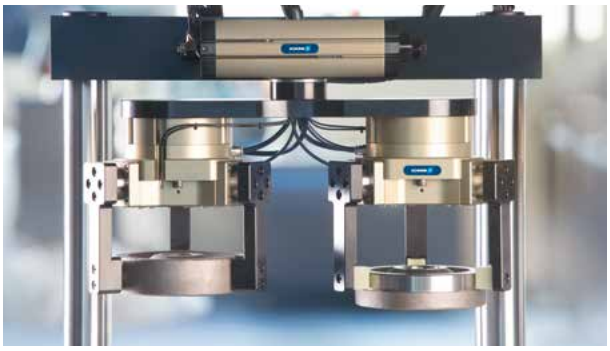
Pneumatic swivel units

Swiveling and rotating are universal processes required in any industrial situation comprising automated handling of workpieces. The requirements for the components used are very high and also very specific. SCHUNK offers a unique range of swivel and rotary modules with various options.

Pneumatic swivel units from SCHUNK offer you many advantages:

- **The right product for your application**
  available as standards thanks to a diverse range of series
- **Numerous options available**
  e.g. integrated media and electrical feed-through and pneumatic center position
- **Specially developed shock absorbers**
  for high mass inertias and fast cycle times
- **Online configurator for gripper-swivel units**
  makes it easier to find the right product
- **Wide range of accessories available**

Application examples



Handling of raw and finished parts

Sheet metal handling

Electric swivel units

The electric swivel units from SCHUNK more than meet the high requirements for swivel and rotary movements in automation. In addition to the diverse options and the wide range of variants, the universal use of the swivel and rotary modules are perfect for custom applications of any kind.

Electric swivel units from SCHUNK offer you many advantages:

- **The right product for your application**
  Available as standard thanks to series diversity
- **The possibility of any intermediate position enables great process versatility**
  and optimal adaptation to the relevant application
- **Extensive consulting service**
  ranging from choosing the appropriate technology to design tasks
- **Various actuation options**
  facilitate easy integration into existing control concepts
- **Numerous options available,**
  e.g. integrated media and electrical feed-through and integrated holding brake

Application examples

Handling of battery round cells

Handling of electronic components

Handling of finished products

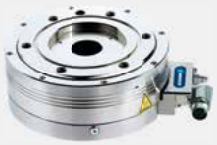
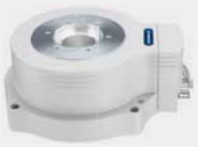
	Swivel units		Swivel head	Vane swivel unit
	SRM	**SRU-plus**	**SRH-plus**	**SFL**
				
Description				
	Universal swivel unit for rotating and swiveling movements	Universal swivel unit for rotating and swiveling movements	Universal swivel head for simultaneous loading and unloading of workpieces with integrated fluid and electrical feed-through	Miniature vane swivel unit for light swiveling tasks up to 180°
	Usable with any swiveling movements	Usable with any swiveling movements	Recommended for loading and unloading machine tools	Multi-functional range of applications
Advantages				
	Finely graded series with a steady increase in torque	Finely graded series with a steady increase in torque	Eight electrical signals can be fed through without cables	Compact design allows several modules to be mounted next to each other
	Large central bore for feed-through of cables and hoses with the same unit height	Swivel angle 90° or 180° selectable, application-specific angles are available on request	Significant minimization of wear and shorter loading times due to high damping power thanks to hydraulic shock absorbers	Versatile setting of the swivel angle from 0 -180°
	Pre-adjusted shock absorber stroke for simple and fast start-up	Choice of end position adjustability: +3°/-3° (small) or +3°/-90° (large)	Media feed-through and drive connection via screw connection or hose-free direct connection possible	Fine adjustment of the swivel angle for sensitive adjustment of the end positions
Technical data				
Angle of rotation < 360° [°]	0 .. 180	0 .. 180	180	90 .. 180
Angle of rotation > 360° [°]				
Number of sizes	8	8	7	3
Torque [Nm]	0.45 .. 23.7	3 .. 115	3 .. 69.9	0.1 .. 3.6
Dead weight [kg]	0.252 .. 9.74	1.2 .. 26.5	2.1 .. 21.2	0.09 .. 0.71
Max. permissible mass moment of inertia [kgm²]	0.0007	32	2.6	0.005
Repeat accuracy [°]	0.03 .. 0.06	0.05	0.05	0.05
Protection class IP	40/65	67	67	52
Gripping force [N]				
Stroke per jaw [mm]				
Recommended workpiece weight [kg]				
Closing/opening time [s]				
Max. permissible finger length [mm]				
Options/Variants				
Center bore	●	●	●	
Pneumatic rotary feed-through	●	●	●	
Electric rotary feed-through	●	●	●	
Center position	●	●		
ATEX certified		●	●	
Gripping force maintenance device				
Monitoring options				
Inductive proximity switch	●	●	●	
Magnetic switch	●	●	●	●
Ambient conditions				
Clean	●	●	●	●
Easily contaminated	●	●	●	●
Extremely dirty	●	●	●	

● = fully supported

	Rotary indexing table	Swivel finger	Gripper swivel module with garallel gripper
RM-W	**RST-D**	**GFS**	**GSM-P**
			
Universal vane swivel unit with high torque up to 22 Nm for fast swivel tasks	Ring indexing unit for endless turning with a rotation angle up to 90° per cycle	Swivel finger for turning workpieces that are held by a gripper, for example, or it can also be used as a special swivel unit	Compact rotary gripping combination, consisting of a powerful rotor drive, an end-position and damping device and a 2-finger parallel gripper
For fast movement cycles		Multi-functional range of applications	For gripping and swiveling small to medium-sized workpieces in clean environments
Stop system with integrated fine adjustment of the swivel angle for sensitive adjustment of the end positions	Right, left, or alternating operation are possible	Integrated hydraulic end position dampers for rapid swiveling cycles	Space-saving since the rotary drive, end-position damping unit and gripper are merged in one compact module
Highest repeat accuracy due to direct drive of the rotary table with integrated rotor cylinder	Maximum damping power due to the use of hydraulic shock absorbers when using large rotary tables	End positions free from play for maximum positioning accuracy	Cost-saving since adapter plates are not needed and also due to the reduction in project planning and engineering design costs
Extremely compact design for minimal interfering contours	Large center part for simple attachment of further components	Idler unit without drive and damping as a cost-effective version of the second bearing position	Powerful for even greater masses and inertias due to the variant with hydraulic shock absorbers
90/180		90 .. 180	0 – 180
	with cycle 22.5° ... 90°		
4	3	4	4
0.7 .. 22	3.1 .. 29.3	0.64 .. 10	0.3 .. 2.9
0.65 .. 8.3	1...8.3	0.55 .. 5	0.37 .. 1.51
0.27	0.6		
up to 0.036	0.04 .. 0.09°	0.07	0.02
40	50	54	30
			39 .. 162
			1.5 .. 10
			0.2 .. 0.61
			0.01 .. 0.05 / 0.01 .. 0.05
			64
	●		
	●		
			●
●	●		●
	●	●	●
●	●	●	●
●	●	●	

	Swivel units		
	ERM	**PRH**	**ERD**
			
Description			
	Electric heavy-duty rotary module with adaptable servomotor, rotary angle > 360°, center bore, and optional feed-throughs.	Servo-electric miniature rotary unit with angle of rotation > 360°, center bore, and precision gear	Miniature rotary unit with powerful torque motor with absolute-value transducer and electric and pneumatic rotary feed-through
Advantages			
	Modular drive concept for adaptation of all common servomotors like Bosch and Siemens	Brushless DC servomotor for flexible use by controlled position, velocity, and torque	Absolute path measuring system for less programming effort and time saving when commissioning and in operation
	Easy system integration through use of a preferenced motor and already established field bus and safety technology	High torque, velocity, and precision for rapid acceleration and short cycle times with high precision	High dynamics for shorter cycle times resulting in high productivity
	Drive can be swiveled 90° for optimum adaptation to portals or robots	Complete integration of the entire control, regulating and power electronics for setting up a decentralized control system	Integrated air and electric feed-through for reliable electricity, gas and water supply of the grippers
Technical data			
Number of sizes	1	3	3
Torque [Nm]	75	0.75 .. 6.8	0.4 .. 1.2
Max. speed [RPM]	62.5	35 .. 117	600
Dead weight [kg]	15.5	0.75 .. 1.55	1.2 .. 1.8
Max. permissible mass moment of inertia [kgm²]	20	0.3	0.011
Repeat accuracy [°]	0.035	0.004	0.01
Gear ratio	48	30 .. 100	
Intermediate circuit/nominal voltage [V]	Motor-dependent	24	530
Nominal current [A]		1.3 .. 6.5	0.43 .. 1.6
Diameter of center bore [mm]	22		
Number of electric feed-throughs	0	0	4
Number of pneumatic feed-throughs	8	0	2
Protection class IP	65	54 .. 65	40 .. 54
Type of measuring system	Motor-dependent	Incremental	Absolute, measuring system HIPERFACE and DRIVE-CLiQ
Angle of rotation [°]	> 360°	> 360°	> 360°
Gripping force [N]/opening angle [Nm]			
Stroke/opening angle per jaw [mm]/[°]			
Recommended workpiece weight [kg]			
Closing / opening time [s]			
Max. permissible finger length [mm]			
Motor & controller			
Motor	Adaptable	Integrated	Integrated
Controller	External	Integrated	External
Controller type	Motor-dependent		Bosch Rexroth, Siemens*
Options/Variants			
Center bore	●	●	
Pneumatic rotary feed-through	●		●
Electric rotary feed-through			●
Brake	●		
Ambient conditions			
Clean	●	●	●
Easily contaminated	●	●	●
Extremely dirty	●	●	

● = highly suitable/fully supported * = Additional controllers available upon request

			Gripper swivel module with parallel gripper
	ERS	**ERT**	**EGS**
			
	Electric universal rotary unit with torque motor and angle of rotation > 360° as well as optional holding brake rotary feed-through and IP54	Flat electric universal rotary unit with torque motor and angle of rotation > 360°, protection class IP40 and optional electric holding brake	Electric 2-finger parallel gripper swivel module with smoothly running base jaw guidance on roller bearings
	Integrated torque motor for high torque and flexible use by controlled position, velocity and torque	Integrated torque motor for high torque and flexible use by controlled position, velocity and torque	Control via digital I/O for easy commissioning and rapid integration into existing systems
	Large center hole for feeding through cables and hoses	Extremely flat design for minimal interfering contours and use in confined spaces	Virtually no wear parts for high machine availability and low operating costs
	Compact design for minimal interfering contours and use in confined spaces	Absolute path measuring system for less programming effort and time saving when commissioning and in operation	Low space requirement thanks to the compact merging of rotary drive and gripper
	3	4	2
	2.5 .. 10	1.4 .. 32	0.04 ..0.11
	140 .. 2300	150 .. 600	
	2.7 .. 10.9	2.4 .. 23.8	0.45 .. 1.2
	0.6	5.53	0.00018
	up to 0.01	up to 0.01	1
	560	560	24
	1.2 .. 1.8	0.96 .. 4.4	1.6
		25 .. 92	
	8	0	
	1	0	
	40	40 .. 54	30
	Incremental	Absolute, measuring systems HIPERFACE®, HIPERFACE DSL® and DRIVE-CLiQ	
	> 360°	> 360°	30 .. 270
			15 .. 140
			3 .. 6
			0 .. 0.55
			0.03 .. 0.22
			50
	Integrated	Integrated	Integrated
	External	External	Integrated
	Bosch Rexroth, Siemens*	Bosch Rexroth, Siemens*	
	●	●	
	●		
	●		
	●	●	
	●	●	●
		●	

Linear modules & axis systems

For positioning and motion tasks or for any other kind of automation for handling processes. SCHUNK offers the diversity of linear technology from a single source. Different types of standard modules can be combined into a complete system. A wide range of variants is available for both the drive and the guide concept.

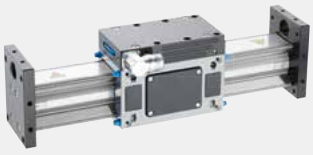
The advantages of SCHUNK linear modules and axis systems

- **Flexible and extensive combinations**
  with different drive concepts
- **Over 25 years of experience in the field of linear technology**
- **Extensive axis system portfolio with more than 450 standard components,**
  pneumatic and electric
- **Extensive consulting service**
  ranging from choosing the appropriate axis technology to design tasks
- **Pre-assembled units for minimum installation effort**
  and immediate commissioning incl. commissioning support

High number of variants

Pneumatic linear axes

Electric linear axes

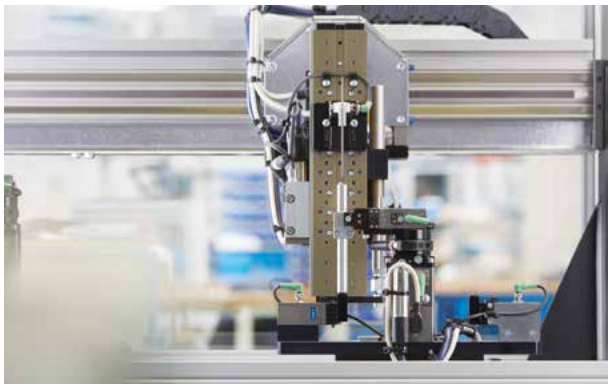


Axis systems

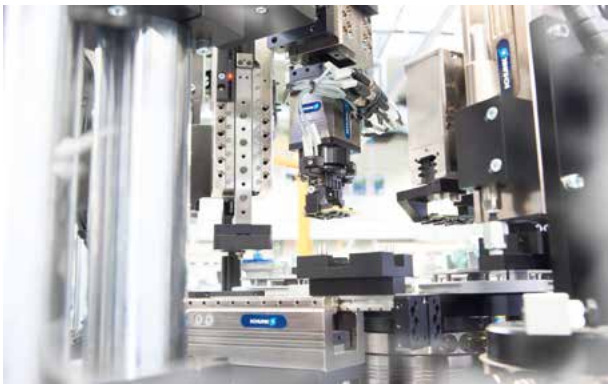
Application examples

Depaneling of circuit boards

Automatic change of grinding wheels



Assembly automation



Handling of electronic components

Handling of gears

Assembly of gears

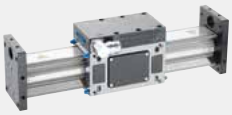
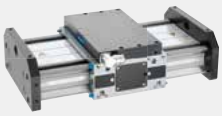
	Pneumatic linear modules	
	Universal linear module	
	LM	**KLM**
		
Description		
	Linear module with pneumatic drive and pre-loaded crossed roller bearings, free from play in prism rails	Linear module with pneumatic drive and ball bushing guide
Advantages		
	Closed slide construction for high rigidity	Double bearing of the guide shafts in the ball bushings for high load absorption and repeat accuracy < 0.015 mm
	Shock absorbers and proximity switches integrated in the projecting surfaces for vibration-free movements and end position monitoring	Shock absorbers and proximity switches integrated in the projecting surfaces for vibration-free movements and end position monitoring
	Compact dimensions for minimal interfering contours in the entire system	Heavy-duty sized guide shafts
Technical data		
Number of sizes	5	4
Number of pistons	1	1
Repeat accuracy [mm]	up to 0.01	up to 0.02
Nominal stroke [mm]	0 .. 450	0 .. 300
Max. driving force [N]	753	753
Dead weight [kg]	0.44 .. 15.81	0.5 .. 13.2
Adjustable end positions	Yes	Yes
Max. end positions adjustment per side [mm]	25	25
Type of guide	Junction roller guide	Ball bushing guide
High number of variants	+++	++
Required maintenance	Hydraulic shock absorbers, lubrication of the guide, replacement of seals	Hydraulic shock absorbers, lubrication of the guide, replacement of seals
Remark	Optionally available with up to two intermediate positions and with rod lock	Optionally available with up to two intermediate positions, rod lock and dustproof version
Drive type		
Piston rod cylinders	●	●
Rodless cylinder		
Ambient conditions		
Clean	●	●
Easily contaminated		●
Extremely dirty		○

● = fully supported ○ = technically possible
+ = medium-sized selection ++ = wide selection +++ = very wide selection

	Compact slide	Stroke module	Gantry axis
	CLM	HLM	PMP
			
	Linear module with optimized length, with pneumatic drive and pre-loaded crossed roller bearings, free from play	Stroke module with optimized length, with pneumatic drive and pre-loaded crossed roller bearings, free from play	Linear axis with integrated pneumatic drive cylinder and pretensioned recirculating ball-bearing guides, free from play
	Crossed roller guide design and solid construction ensures high load bearing capacities and end position accuracy in all installation positions	Crossed roller guide design and solid construction ensures high load bearing capacities and end position accuracy	High moment load bearing capacity through the use of high-performance profiled rails
	Pre-loaded junction roller guides and therefore free from play	Pre-loaded junction roller guides in all installation positions, therefore free from play	High axis rigidity thanks to special extruded profile geometry
	High load bearing capacity in all directions	High load bearing capacity in all directions	A ground serration ensures high precision and surface quality of the base jaws as well as an increased service life
	6	4	2
	1	1	1
	up to 0.01	up to 0.01	0.04
	0 .. 150	0 .. 150	0 .. 3700
	482	482	250
	0.07 .. 5.32	0.5 .. 5.64	3 .. 44.91
	Yes	Yes	Yes
	25	25	50
	Junction roller guide	Junction roller guide	(Double) profiled rail guide
	++	+	+++
	Hydraulic shock absorbers, lubrication of the guide, replacement of seals	Hydraulic shock absorbers, lubrication of the guide, replacement of seals	Hydraulic shock absorbers, lubrication of the guide, replacement of seals
	Optionally available with rod lock	Optionally available with rod lock	Optionally available with bellow, several intermediate positions and cable track
	●	●	●
	●	●	●
			●

	Electric linear modules		
	Linear direct axes		
	Compact linear module	**Compact linear module**	**Stroke module**
	ELP	**ELB**	**LDK**
			
Description			
	Electric linear module with direct drive and integrated controller, backlash-free, pre-loaded roller guides	Short-stroke axis with linear direct drive and cross roller guides	Compact short stroke axis with linear motor and roller guidance
Advantages			
	Control via digital I/O for easy commissioning and rapid integration into existing systems	Integrated motor and measuring system in the axis minimize interfering contours and space requirements	Almost no wearing parts for long service life and reliability of the system
	Speed of retraction and extension can be adjusted in ten increments for high flexibility in the cycle time	Can be upgraded with absolute path measuring system for less programming effort and time saving when commissioning and in operation	No mechanical play between the drive elements for fast response and high positioning accuracy
	For almost wear-free use and a long service life	High dynamics for shorter cycle times resulting in high productivity	Low vibrations and high holding force for the shortest positioning times and process stability
Technical data			
Number of sizes	3	1	2
Repeat accuracy [mm]	±0.01	±0.01	±0.01
Max. useful stroke [mm]	200	125	200
Max. driving force [N]	104	150	500
Max. speed [m/s]	auto-learn function	4	4
Max. acceleration [m/s²]	auto-learn function	100	40
Type of measuring system		Absolute or incremental	Absolute or incremental
Type of guide	Junction roller guide	Junction roller guide	Roller guide
Variant variety	++	+++	++
Required maintenance	Maintenance-free	Cleaning of the magnetic tracks, lubrication of the guide	Cleaning of the magnetic tracks
Remark	Stop position axis with mechanically adjustable stop positions, optionally available with load balance	Freely programmable, optionally available with rod lock, brake or load balance	Freely programmable, optionally available with brake, limit switch, reference switch, cable track, supported profile
Drive type			
Spindle drive			
Toothed belt drive			
Rack and pinion drive			
Direct drive (linear motor)	●	●	●
Motor & controller			
Motor	Integrated	Integrated	Integrated
Drive controller	Integrated	Bosch Rexroth, Siemens*	Bosch Rexroth, Siemens*
Interfaces	Digtal I/O	Sercos III, EtherNet/IP, EtherCAT, PROFINET, PROFIBUS DP, PowerLink, CANopen	Multi-Ethernet (Sercos III, PROFINET IO, EtherNet/IP, EtherCAT), PROFIBUS
Ambient conditions			
Clean	●	●	●
Easily contaminated			

● = fully supported
\+ = medium selection ++ = large selection +++ = very wide selection
* = Additional controllers available upon request

	Universal linear modules			Flat linear module
	LDN	LDM	LDT	LDL
				
	Universal linear axis with single X-profile, linear motor, and roller guidance	Universal linear axis with double X-profile, linear motor, and roller guidance	Universal linear axis with triple X-profile, linear motor, and roller guidance	Flat linear axis with linear motor and profile rail guidance
	Almost no wearing parts for long service life and reliability of the system	Almost no wearing parts for long service life and reliability of the system	Almost no wearing parts for long service life and reliability of the system	Almost no wearing parts for long service life and reliability of the system
	No mechanical play between the drive elements for fast response and high positioning accuracy	No mechanical play between the drive elements for fast response and high positioning accuracy	No mechanical play between the drive elements for fast response and high positioning accuracy	No mechanical play between the drive elements for fast response and high positioning accuracy
	Low vibrations and high holding force for the shortest positioning times and process stability	Low vibrations and high holding force for the shortest positioning times and process stability	Low vibrations and high holding force for the shortest positioning times and process stability	Low vibrations and high holding force for the shortest positioning times and process stability
	2	2	2	2
	±0.01	±0.01	±0.01	±0.01
	2700	2700	2700	3800
	500	1000	1500	500
	4	4	4	4
	40	40	40	40
	Absolute or incremental	Absolute or incremental	Absolute or incremental	Absolute or incremental
	Roller guide	Roller guide	Roller guide	Roller guide
	+++	++	++	+
	Cleaning of the magnetic tracks	Cleaning of the magnetic tracks	Cleaning of the magnetic tracks	Cleaning of the magnetic tracks
	Freely programmable, optionally available with brake, limit switch, reference switch, cable track, supported profile	Freely programmable, optionally available with brake, limit switch, reference switch, cable track, supported profile	Freely programmable, optionally available with brake, limit switch, reference switch, cable track, supported profile	Freely programmable, optionally available with brake, limit switch, reference switch, cable track
	●	●	●	●
	Integrated	Integrated	Integrated	Integrated
	Bosch Rexroth, Siemens*	Bosch Rexroth*	Bosch Rexroth, Siemens*	Bosch Rexroth, Siemens*
	Multi-Ethernet (Sercos III, PROFINET IO, EtherNet/IP, EtherCAT), PROFIBUS	Multi-Ethernet (Sercos III, PROFINET IO, EtherNet/IP, EtherCAT), PROFIBUS	Multi-Ethernet (Sercos III, PROFINET IO, EtherNet/IP, EtherCAT), PROFIBUS	Multi-Ethernet (Sercos III, PROFINET IO, EtherNet/IP, EtherCAT), PROFIBUS
	●	●	●	●

	Electric linear modules	
	Mechanical axes	
	Linear table	**Universal linear module**
	Alpha	**Beta**
		
Description		
	Flat linear table with spindle drive and double-profiled rail guide	Universal linear module with optional toothed belt or spindle drive and various guiding options
Advantages		
	Adaptable drive motor for flexible actuation and easy integration into existing control concepts	Adaptable drive motor for flexible actuation and easy integration into existing control concepts
	Double-profiled rail guide for very high force and moment loads	Choice of toothed belt or spindle drive for optimum drive for the application
	Extremely flat design for minimal interfering contours	Various guidance options for optimum adaptation to the application
Technical data		
Number of sizes	4	12
Repeat accuracy [mm]	±0.03	0.03 bzw. 0.08**
Max. useful stroke [mm]	2540	7720
Max. driving force [N]	18000	18000**
Max. speed [m/s]	2.5	8
Max. acceleration [m/s²]	20	60
Type of measuring system	Motor-dependent	Motor-dependent
Type of guide	Double-profiled rail guide	Double-profiled rail guide
Variant variety	++	+++
Required maintenance	Lubrication of the guide and the spindle	Lubrication of the guide and, if necessary, the spindle. Replacement of the cover tape
Remark	Freely programmable, optionally available with customer-specific motor, limit switch and reference switch	Freely programmable, optionally available with customer-specific motor, limit switch and reference switch
Drive type		
Spindle drive	●	●
Toothed belt drive		●
Rack and pinion drive		●
Direct drive (linear motor)		
Motor & controller		
Motor	Adaptable	Adaptable
Drive controller	Motor-dependent	Motor-dependent
Interfaces	Controller-dependent	Controller-dependent
Ambient conditions		
Clean	●	●
Easily contaminated	●	●

● = fully supported
\+ = medium selection ++ = large selection +++ = extremely large selection
* = Additional controllers available upon request ** = Depending on the drive type

	Flat linear module	Universal linear module
	Delta	**Gamma**
		
	Flat linear module with optional toothed belt or spindle drive	Toothed belt or rack and pinion driven universal linear module with closed profile and double profiled rail guide
	Extremely flat design for minimal interfering contours	Adaptable drive motor for flexible actuation and easy integration into existing control concepts
	Double-profiled rail guide for maximum rigidity and precision in the application	Choice of toothed belt or rack-and-pinion drive for optimum drive for the application
	Choice of toothed belt or spindle drive for optimum drive for the application	Double-profiled rail guide for very high force and moment loads
	5	3
	up to ±0.03**	up to ±0.05
	7700	7685
	12000**	4000
	5	5
	60	60
	Motor-dependent	Motor-dependent
	Double-profiled rail guide	Double-profiled rail guide
	+++	+++
	Lubrication of the guide and, if necessary, the spindle. Replacement of the cover tape	Lubrication of the guide and (if necessary) the gear rack
	Freely programmable, optionally available with customer-specific motor, limit switch and reference switch	Freely programmable, optionally available with customer-specific motor, limit switch and reference switch
	●	
	●	●
		●
	Adaptable	Adaptable
	Motor-dependent	Motor-dependent
	Controller-dependent	Controller-dependent
	●	●
	●	●

	Pick&Place unit
	PPU-E
	
Description	
	Compact 2-axis unit for a faster, flexible running of any curve on one plane
	For the rapid and precise transfer or controlled press-in operation of workpieces in high-speed assembly
Advantages	
	High reliability and long service life of the system, as there is no cable break due to moving motors and moving motor cables
	High productivity due to low cycle time
	Maximum flexibility in the application, as both axes can be controlled and regulated independently from each other
Technical data	
Number of sizes	3
Horizontal stroke in Y [mm]	0 .. 280
Horizontal stroke in X [mm]	
Vertical stroke [mm]	0 .. 150
Swivel angle [°]	
Nominal load [kg]	0 – 5
Repeat accuracy X-axis [mm]	
Repeat accuracy Y-axis [mm]	±0.01
Repeat accuracy Z-axis [mm]	±0.01
Repeat accuracy, rotary [°]	
Dead weight [kg]	15 .. 35
Max. cycle time/picks per minute	110
Control	External controller
Protection class IP	40
Type of guide	Profiled rail guide
Number of possible combinations	
Variant variety	++
Motor & controller	
Motor	Integrated
Drive controller	Bosch Rexroth, Siemens*
Options/Variants	
Rod lock	●
Center position	
Integrated valve	●
Additional C-axis	●
Drive package	
Ambient conditions	
Clean	●
Easily contaminated	

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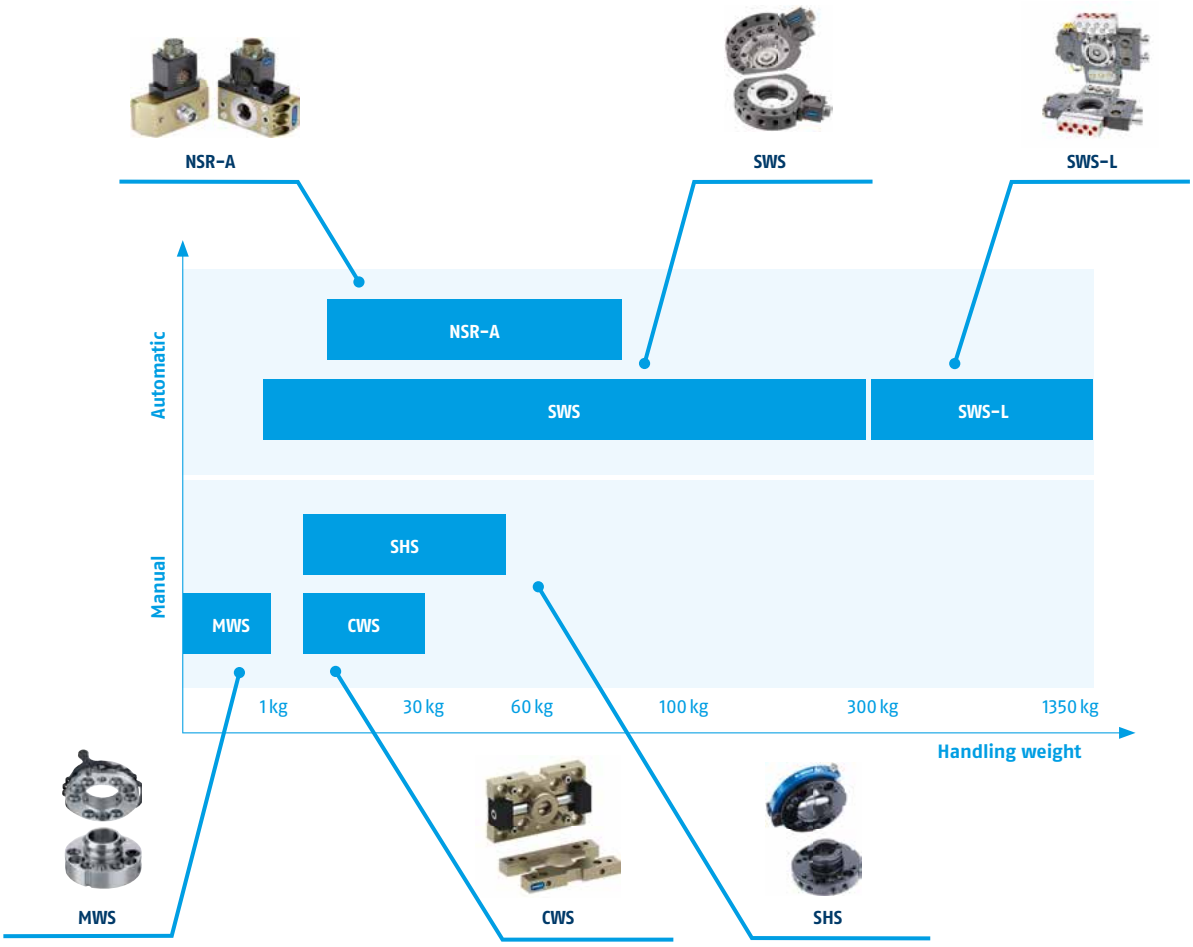
Axis systems	
Line gantry LPE	**Room gantry**
	
Line gantry with a horizontal, electric toothed belt axis, and a vertical, electric spindle axis	Room gantry with two electric toothed belt axes in a horizontal direction, and one electric spindle axis in a vertical direction
Areas of application: To easily conduct the most common two-dimensional handling and assembly tasks for medium-sized and heavy workpieces	Areas of application: To easily conduct the most common three-dimensional handling and assembly tasks for medium-sized and heavy workpieces
Maximum flexibility in application, freely programmable in the plane	Maximum flexibility in application, freely programmable in the plane
Optimum running smoothness due to the use of high-quality linear axes with precision profiled rail guides	Optimum running smoothness due to the use of high-quality linear axes with precision profiled rail guides
Easy and fast product selection due to pre-defined parameters	Easy and fast product selection due to pre-defined parameters
2	2
500 .. 1500	500 .. 1500
	500 .. 1500
100 .. 500	100 .. 500
0 – 20	0 – 20
	±0.08
±0.08	±0.08
±0.03	±0.03
Controller on external motor	Controller on external motor
40	40
Profiled rail guide	Profiled rail guide
90	150
+	+
Adaptable	Adaptable
Bosch Rexroth, Siemens*	Bosch Rexroth, Siemens
●	●
●	●
●	●

Change systems

By using SCHUNK change systems for robots, at their front ends, you increase the flexibility, efficiency, cycle rate and process reliability of your application. Grippers, tools, and other effectors are changed fast with the help of automatic and manual change systems. In the field of automation, SCHUNK also offers the most comprehensive portfolio of components for robot applications, from small components to heavy load handling.

Increase your productivity with SCHUNK change systems

- **Six different series**
  for the optimum solution to your application case
- **Maximum flexibility**
  due to a load range of 0 – 1350 kg
- **Proven and safe locking mechanisms**
  for fast and reliable tool changes
- **Extensive range of feed-through modules**
  and accessories for a comprehensive complete solution from a single source.



Automatic change systems

SWS / SWS-L
- Patented fail-safe locking mechanism
- No-touch-locking™ for simplified teaching
- All functional components made of hardened steel for high bearing load capacity of the change system
- Suitable storage racks for all sizes

NSR-A
- Pneumatic pallet change system with patented locking
- Extremely compact design for space-saving changing and direct coupling on the machine table

Manual Change Systems

SHS
- Compact, reliable and intuitive system for convenient manual change without tools
- Perfectly suited to flexible production of products with a large range of variants
- ISO flange pattern for simple assembly on most types of robots without additional adapter plates

CWS
- Compact, manual change system with integrated air feed-throughs for the most important SCHUNK gripping and compensation modules
- Flat and weight-optimized through direct assembly of the gripper on the change system without an adapter plate

MWS
- Miniature change system – perfect for use in micro-systems technology, particulary for handling tiny components
- Extremely flat design for minimal interfering contours

Application examples

Handling of battery round cells

Automated gripper change

Automated gripper change

Automated machine loading

	Quick-change systems		
	SWS	**SWS-L**	**NSR-A**
			
Description			
	Pneumatic tool change system with patented locking mechanism and up to ten integrated air feed-throughs for pneumatic grippers	Pneumatic tool change system with patented locking system for heavy loads up to a handling weight of 4080 kg	Pneumatic pallet change system with patented locking and 4000 Nm maximum moments
Advantages			
	Complete series with 14 sizes for optimum selection of sizes and a wide range of applications	Patented self-sustaining locking system for a reliable connection between the quick-change head and the quick-change adapter	Saved time due to automatic pallet change
	Patented self-sustaining locking system for a reliable connection between the quick-change head and the quick-change adapter	Manual emergency unlocking possible, no counter-forces from springs	Extremely compact design for space-saving changing and direct coupling on the machine table
	Manual emergency unlocking possible, no counter-forces from springs	All functional components made of hardened steel for high bearing load capacity of the change system	Form-fit, patented locking system with self-locking and high locking force
Technical data			
Number of sizes	15	4	2
Recommended handling weight [kg]	0 .. 300	0 .. 1350	
Moment load Mxy [Nm]	2.8 .. 7170	7600 .. 13500	75 .. 600
Moment load Mz [Nm]	3.45 .. 3800	4060 .. 16200	200 .. 1600
Repeat accuracy [mm]	up to 0.01	0.01	0.02
Dead weight [kg]	0.05 .. 9.3	7.8 .. 28	0.4 .. 1.6
Screwed flange on the robot	Adapter plates/direct mounting ISO-9409	Adapter plates/direct mounting ISO-9409	Adapter plates ISO-9409
Product features			
Manual actuation			
Pneumatic actuation	●	●	●
Locking monitoring possible	●	●	●
Tool presence monitoring possible	●	●	●
Pneumatic energy transmission	●	●	●
Electric energy transmission	●	●	●
Ambient conditions			
Clean	●	●	●
Easily contaminated	●	●	●
High-temperature and stainless steel version on request	●	●	●

● = fully supported

Manual change systems			
	SHS	**CWS**	**MWS**
			
	Manual tool change system with integrated air feed-through, locking monitoring, and optional electric feed-through.	Compact, manual change system with integrated air feed-throughs for the most important SCHUNK gripping and compensation modules.	Manual tool change system with integrated air feed-through and optional electric feed-through
	Series with six sizes for optimum selection of sizes and a wide range of applications	High productivity through fast manual gripper changes, especially with small and medium-sized lot sizes	Extremely flat design for minimal interfering contours
	Integrated pneumatic feed-through for secure energy supply of the handling modules and tools	Flat and weight-optimized through direct assembly of the gripper on the change system without an adapter plate	Simple handling without additional tools; can easily be detached anytime by using the handle
	The locking lever is opened to the side, allowing the changer to be operated easily even in confined spaces	Series with five sizes for optimum selection of sizes and a wide range of applications	Central bore for feed-through of parts, camera, laser beams, etc.
	6	5	2
	0 .. 58	0 .. 28	0 .. 1
	45 .. 960	20 .. 160	0.5 .. 1
	75 .. 2325	10 – 200	0.2 .. 0.75
	0.02	0.01	0.1
	0.2 .. 4	0.07 .. 0.445	0.007 .. 0.016
	Direct mounting ISO-9409	Adapter plates	Adapter plates
	●	●	●
	●		
	●		
	●	●	●
	●		●
	●	●	●
	●		
	●		

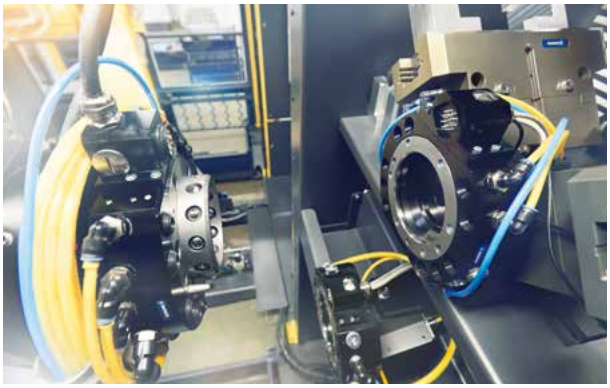
Feed-through modules

Safe and reliable tool change also includes safe and reliable control and supply of the changed tools. That is why the SCHUNK SWO feed-through modules are the perfect complement to the SCHUNK SWS, SWS-L, SHS and NSR-A change systems. From simple signals to welding currents, a wide range of tools can be supplied. In addition, various modules are available for the implementation of pneumatics, fluids, vacuum and hydraulics.

Benefit from SCHUNK implementation modules

- **Perfect for easy combination**
  with any size of SCHUNK change system
- **Wide range of variants**
  for feeding through various electric and fluid media
- **Combination of several option modules**
  for maximum flexibility of the change system
- **Minimum wear for a high number of change cycles**
  and a long service life
- **Complete solution available from a single source**
  with cable plugs, cable extensions and protective covers

Application examples



Use of a signal module for safe feed-through of sensor signals

Controlling electric deburring spindle RCE

Feed-through modules for change systems SWS, SHS and NSR-A

The SWO-E and SWO-F series can be easily attached to the change systems either directly or via adapter plates. Suitable modules are available for all change system sizes.

Electrical feed-through modules SWO-E

Over 50 standard modules for the implementation of

Signals

Communication

Performance

Servo signals

Fluid feed-through modules SWO-F

Over 20 standard modules for the implementation of

Pneumatics

Liquids

Vacuum

Hydraulics

Feed-through modules for the heavy load range

Special feed-through modules are also available for the SWS-L heavy-load changer series. Above all, these are characterized by the option of safe unlocking and locking, as well as larger (volume) flows. Any module in the normal series can also be used on SWS-L with adapter plates.

Modules from the SWO-L-E series for signal transmission and control of the change system

Modules from the SWO-L-F series for the passage of fluids and hydraulics

Rotary feed-throughs

With SCHUNK rotary feed-throughs, the feed-through of electrical signals and pneumatics for use in stationary applications and on robots is child's play – even with endless rotation. The rotary feed-throughs are optimally designed for the force moments occurring with the new robot generation. Particularly developed long-lasting and smoothly running seals permit the use of small and economical drives.

Reliable execution of electrical signals and pneumatics

- **For robot applications and rotary indexing tables**
- **Rotary feed-throughs facilitate endless rotation** without hoses and cables twisting around the axis.
- **Combined pneumatic and electric feed-through** for comprehensive supply of gripping systems and tools
- **Safe energy transfer even at higher speeds** thanks to slip ring contacts

Application examples

Toolholder packing

Toolholder balancing

Product packaging labeling

	Rotary feed-through	Stationary rotary feed-through
	DDF 2	**DDF-SE**
		
Description		
	For feeding through electric signals and pneumatics for use on robots even when they are endlessly rotating at a maximum RPM of 120	For feeding through electric signals and pneumatics for stationary use
Advantages		
	Combined pneumatic and electric feed-through for comprehensive supply of gripping systems/tools	Combined pneumatic and electric feed-through for comprehensive supply of gripping systems/tools
	ISO flange pattern for simple assembly on most types of robots without additional adapter plates	Standardized shaft end for easy assembly of gears
	Complete series with 12 sizes for optimal size selection	Rotations up to 500 RPM, even at fast endless rotations of up to 500 RPM, a reliable supply of pneumatic and electrical power for your gripping system is ensured
Technical data		
Number of sizes	12	2
Recommended workpiece weight [kg]	0 .. 250	
Max. speed [RPM]	90 .. 120	300 .. 500
Continuous torque [Nm]	0.5 .. 22	4 .. 13
Starting torque [after shutdown] [Nm]	0.7 .. 25	6 .. 20
Max. tensile force F_z [N]	240 .. 9000	2000 .. 4000
Max. contact force F_z [N]	2000 .. 18000	
Moments M_x, M_y [Nm]	15 .. 550	50 .. 180
Moments M_z [Nm]	10 .. 400	
Pneumatic energy transmissions	2 .. 4	4 .. 6
Electrical energy transmission	4 .. 10	6 .. 8
Dead weight [kg]	0.35 .. 14.2	3.3 .. 9
Product features		
Continuous rotary movement	●	●
Screwed flange acc. to ISO-9409 standard	●	
Pneumatic energy transmission	●	●
Vacuum energy transmission		
Electric energy transmission	●	●
Bus transmission		

● = fully supported

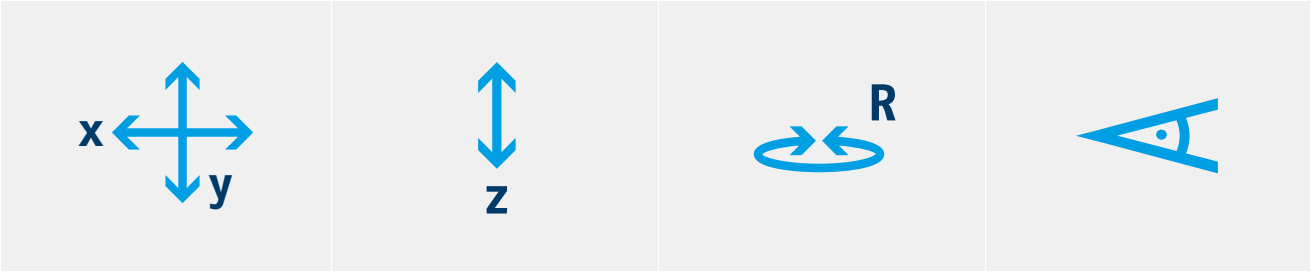
Compensation units

Connecting, assembling, inserting, loading and unloading workpieces are everyday challenges of automation. To prevent damage to tools or workpieces, SCHUNK compensation units with compensation in all six degrees of freedom ensure the necessary flexibility between the robot and the tools, for example. This avoids system malfunctions caused by imprecise tolerances and increases process reliability.

More process stability with SCHUNK compensation units

- **Seven different series –**
  optimally adapted for your application
- **Units for tolerance compensation**
  available in all six degrees of freedom
- **Centric reset for a defined position of the components**
  after the compensation process
- **Various sensor options for increased process reliability**
  and simplified commissioning
- **Customer-specific solutions**
  for particularly heavy workpieces or tolerance compensation in the horizontal plane, for example.

Compensation in every direction



XY compensation | Z-axis compliance | Rotational compensation | Angular compensation

Application examples

Pick&Place of product packaging

Loading a lathe

Raw material handling

Handling of motor blocks

	Compensation units		
	AGE-U	**AGE-XY**	**AGE-Z 2**
			
Description			
	Compensation unit with rotational and angular compensation, allowing the end effector to fully adapt to the component position	Compensation unit with XY compensation with up to 4 mm compensation stroke	Compensation unit with Z-axis compliance with up to 10 mm compensation path
Advantages			
	Deflection in both rotation and angle compensates for inaccuracies in component position and saves time, cost and effort through reduced robot programming effort	Robust guidance for high moment loads with minimal space requirements	Locking for rigid switching of the unit at a defined extended or retracted position
	Centric reset enables a defined position for the components	Centric locking for centering the unit in a defined position	Compact design for minimum installation height
	Spring-supported return of the unit, adjustable via compressed air for optimum deflection	Pneumatic position memory for eccentric locking in deflected position	Can be combined with AGE-XY without additional adapter plate
Technical data			
Number of sizes	1	3	3
Compensation stroke XY [mm]	±2.7	±2.5 .. ±4	
Compensation stroke Z	6.1		8 .. 10
Rotatory compensation [°]	±8	±12 .. ±16	
Spring force [N]			20 .. 120
Piston force Z at 6 bar in extended position [N]			500 .. 1500
Piston force Z at 6 bar in retracted position [N]			280 .. 1450
Dead weight [kg]	0.6	0.46 .. 1.5	0.55 .. 1.7
Locking force at 6 bar [N]		235 .. 580	
Horizontal payload [kg]	0 .. 5	0 .. 10	
Vertical payload [kg]		0 .. 15	0 .. 12
Repeat accuracy [mm]		0.1	0.02
Locking force F_z [N]		235 .. 580	280 .. 1500
Max. tensile force F_z [N]		300 .. 750	200 .. 500
Max. contact force F_d [N]		1700 .. 3200	800 .. 1500
Moment load capacity M_x, M_y [Nm]	6.8	16 .. 30	10 – 30
Twist torque M_z [Nm]	3.4	3.5 .. 9	20 .. 80
Angular compensation x [°]	3°		
Angular compensation y [°]	3°		
Angular compensation z [°]			
Product features			
Pneumatic locking	●	●	●
Position memory		●	
Screwed flange acc. to ISO-9409 standard	●	●	●
Monitoring via proximity switch	●	●	●
Ambient conditions			
Clean	●	●	●
Easily contaminated	●		
High-temperature version on request		●	●

● = fully supported

	Tolerance compensation unit		
	AGE-S	**AGE-F**	**TCU**
	 	 	 
	Compensation unit with XY and Z-axis compliance with up to 12 mm compensation path	Compensation unit with XY compensation and integrated spring return for a handling weight of up to 32 kg	For compensation of smaller position deviations with up to 3° maximum deflection for assembly and handling applications
	Three compensation directions in one unit, compact design for minimal heights	Spring return in three spring stiffnesses for a defined centric position at a repeat accuracy of 0.02 mm	Compensation of workpiece-related tolerances and position inaccuracies reduces the risk of jamming; necessary assembly forces are reduced and wear of the workpiece and handling device is minimized
	Centric locking for rigid switching of the unit in a defined centric position	Direct assembly of grippers means there is no need for additional adapter plates	Direct assembly of grippers means there is no need for additional adapter plates
	Pneumatic position memory for eccentric locking in deflected position	Junction roller guide for smooth compensation at low compensation forces	Compact design, low height and weight
	4	4	8
	±4 .. ±12	±1.5 .. ±5	
	10 .. 14		
			1 .. 1.5
	240 .. 1100	1.5 .. 150	
	800 .. 3000		
	2.6 .. 29.5	0.1 .. 3.1	0.1 .. 2.1
	800 .. 2700		30 .. 800
	0 .. 100	0 .. 32	
	0 .. 160		
	0.1	0.01	up to 0.02
	800 .. 2700		30 .. 800
	110 .. 2000	100 .. 2800	
	500 .. 4000	200 .. 12000	500 .. 6200
	30 .. 500	3.5 .. 50	5 .. 120
	30 .. 250	6 .. 150	15 .. 160
			±1 .. 2
			±1
			±1.2 .. 2
	●		●
	●		
	●		
	●	●	●
	●	●	●
	●		●
	●		

Collision protection

Collisions and overloads on the robot may cause damage to the tools, workpieces or the machines. In the automated handling process, the SCHUNK monitoring modules offers an effective instrument for process reliable production, and preventing expensive downtimes in production.

Process-reliable manufacturing with collision and overload sensors from SCHUNK

- **Integrated monitoring for signal transmission without delay in case of collisions**
  so that the robot can be stopped immediately
- **Mechanical flexibility for compensation of the robot's reaction pathway**
  in the event of a collision or overload
- **Triggering force and torque can be adjusted**
  via the operating pressure for optimum protection of your robots and components

Application examples

Pick&Place with magnetic grippers

Bin picking

	Collision and overload sensors	
	Manual reset	**Automatic reset**
	OPS	**OPR**
		
Description		
	For monitoring of robots and handling units in the event of collisions or overload conditions	For monitoring of robots and handling units in the event of collisions or overload conditions from a deflection force of 24 N
Advantages		
	Triggering force and torque can be adjusted via the operating pressure for optimum protection of your robots and components	Automatic reset position for faster resuming of production after a collision
	Integrated monitoring for signal transmission without delay in case of collisions so that the robot can be stopped immediately	Triggering force and torque can be adjusted via the operating pressure for optimum protection of your robots and components
	ISO adapter plates are optional for simple assembly on most types of robots without additional production costs	Integrated monitoring for signal transmission without delay in case of collisions so that the robot can be stopped immediately
Technical data		
Number of sizes	4	7
Moments M_x, M_y [Nm]	7.5 .. 430	6 .. 2000
Triggering force F_d [N]	500 .. 7000	440 .. 14000
Axial deflection [mm]	9.5 .. 12	5.1 .. 16
Angle deflection [°]	4 .. 12	8 .. 13
Rotatory deflection [°]	45 .. 360	20
Repeat accuracy [mm]	up to ±0.02	±0.025
Operating pressure range [bar]	0.5 .. 6.0	1.4 .. 6.2
Dead weight [kg]	0.4 .. 7.0	0.24 .. 11.7
Product features		
Pneumatic actuation	●	●
Built-in spring optionally available		●
Ambient conditions		
Clean	●	●
Easily contaminated		●
Humid		●

● = fully supported

Force/torque sensors

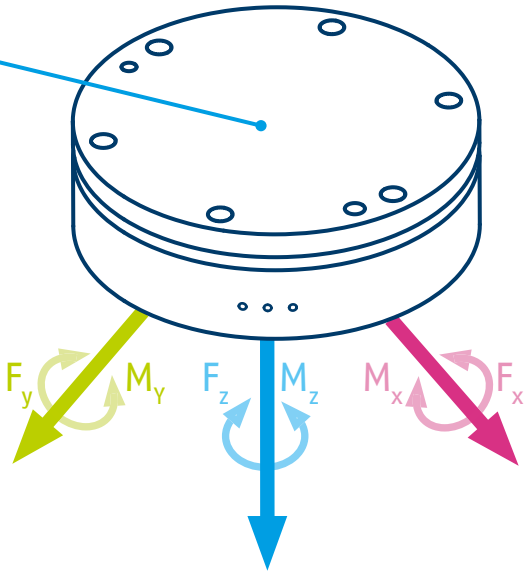
Where precise results are needed, force/torque sensors are in trend and provide robots with the required sensitivity. The sensors precisely detect the occurring process forces and transmit them to the control unit. This allows for highly precise correction of the robot path. The result are constant forces, and hence constant machining patterns.

The advantages of SCHUNK force/torque sensors

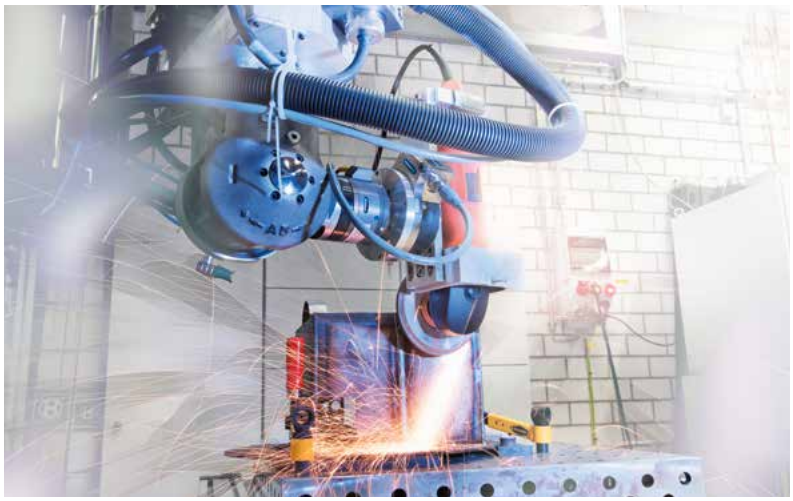
- **Rigid 6-axis force/torque sensors**
  for precision measuring in all six degrees of freedom.
- **Universally applicable in robotic applications**
  such as medicine, grinding, testing, inserting, and research and development
- **Silicon gauges provide a signal 75 times stronger than conventional foil gauges.**
  This signal is amplified resulting in near-zero noise distortion.
- **Robust design due to a higher overload range**
  for a long service life

Dimensions
of forces and moments

The strain gauges (DMS) of the 6-axis force/torque sensors measure the strain applied in all six degrees of freedom (F_x, F_y, F_z, M_x, M_y and M_z). The DMS signals are amplified in the sensor.



Application examples



Automated grinding of supply air chambers for stoves

Automated grinding with the robot

Haptic measurements of vehicle components

	6-axis force/torque sensors	
	FT-AXIA	**FTN**
		
Description		
	6-axis force/torque sensors for high-precision measuring in all six degrees of freedom	6-axis force/torque sensors for high-precision measuring in all six degrees of freedom
	Universally applicable in robotic applications such as grinding, inserting, and research and development	Universally applicable in robotic applications such as grinding, quality assurance, joining, haptics, medicine, and research and development
Advantages		
	Compact design due to space-saving set-up with integrated electronics	Wide range of options with up to three different ranges of measurement per size
	Up to two calibrations are available to ensure maximum flexibility in the process	Easy integration via Ethernet/IP (optional Profinet) as well as possible access via web server for easy configuration
	Plug & Work directly compatible with KUKA and Universal Robots via software module	
Technical data		
Number of sizes	3	17
Calibration	SI-75-4 .. SI-4000-300	SI-12-0.12 .. SI-40000-6000
Evaluation electronics	Integrated	NetBox
Weight of sensor [kg]	0.3 ... 1.9	0.01 .. 47
Range of measurement F_x F_y [N]	±75 .. ± 4000	±12 .. ±40000
Range of measurement F_z [N]	± 235 .. ± 6000	±17 .. ±88000
Range of measurement $M_{x\ My}$ [Nm]	± 4 .. ± 300	0.12 .. ±6000
Range of measurement M_z [Nm]	± 4 .. ± 300	0.12 .. ±6000
Resolution F_x F_y [N]	0.04 .. 1.67	0.003 .. 6.25
Resolution F_z [N]	0.04 .. 1.67	0.003 .. 16.7
Resolution M_x M_Y [Nm]	0.002 .. 0.07	0.00001 .. 1.5
Resolution M_z [Nm]	0.002 .. 0.07	0.00001 .. 0.75
IP protection class		
Without IP protection		●
IP60		●
IP64	●	
IP65		●
IP67	●	
IP68		●

● = fully supported

	FTE	FTD
		
	6-axis force/torque sensors for high-precision measuring in all six degrees of freedom	6-axis force/torque sensors for high-precision measuring in all six degrees of freedom
	Universally applicable in robotic applications such as grinding, quality control, joining, haptics, medicine, and research and development	Universally applicable in robotic applications such as grinding, quality control, joining, haptics, medicine, and research and development
	Wide range of options with up to three different ranges of measurement per size	Wide range of options with up to three different ranges of measurement per size
	Integrated electronics from size Gamma	Sensor system can be used with a wide range of DAQ cards
	14	17
	SI-12-0.12 .. SI-16000-2000	SI-12-0.12 .. SI-40000-6000
	ECAT interface box (Nano/Mini) or integrated (from Gamma)	DAQ card (available externally)
	0.01 .. 31.8	0.01 .. 47
	±12 .. ±16000	±12 .. ±40000
	±17 .. ±32000	±17 .. ±88000
	0.12 .. ±2000	±12 .. ±6000
	0.12 .. ±2000	±12 .. ±6000
	0.003 .. 4	0.003 .. 6.25
	0.003 .. 8	0.003 .. 16.7
	0.00001 .. 0.5	0.00001 .. 1.5
	0.00001 .. 0.5	0.00001 .. 0.75
	●	●
	●	●
	●	●
	●	●

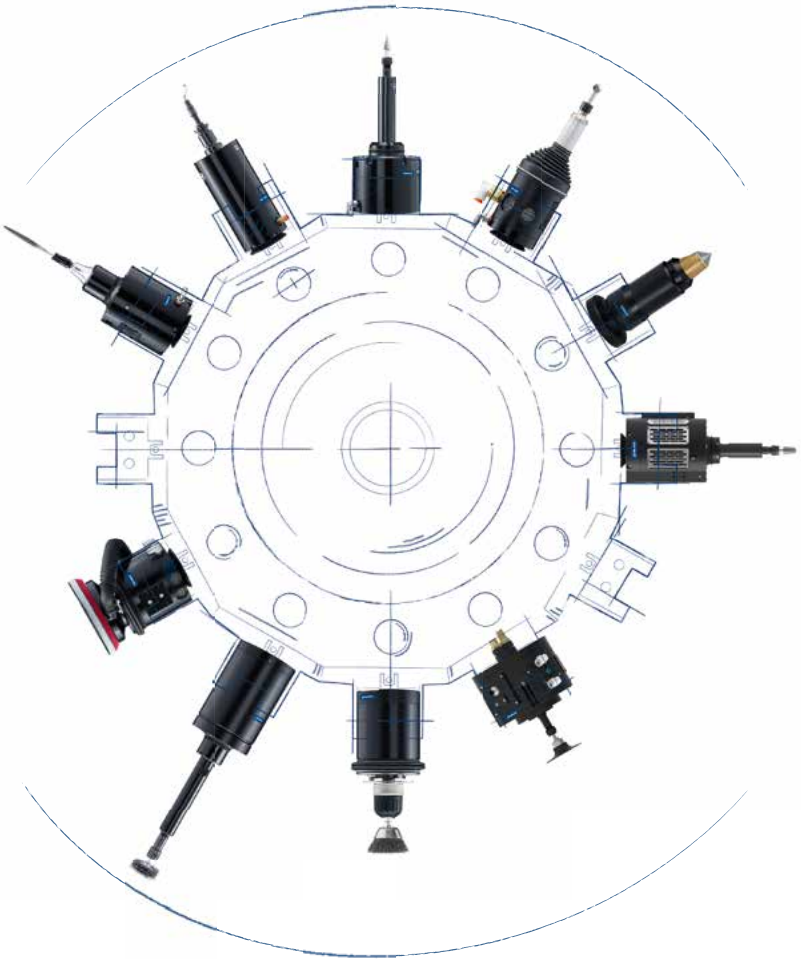
R·EMENDO Machining tools

With the new SCHUNK tools, a large range of machining steps that used to be manually performed, can now be automated. The result: Higher productivity, consistently perfect machining results, lower unit costs. Manual machining of workpieces with hand tools is also often associated with putting ergonomic strain on employees. In addition, health risks are often incurred due to fine particle emissions such as abrasive dust or chips.

Create added value with a changeover to robot-assisted machining

- **Minimize health risks**
- **Consistent quality of the machining results**
- **Increased safety and ergonomic working conditions**
- **Reduction of the machining time**
- **Increase in machining capacity**

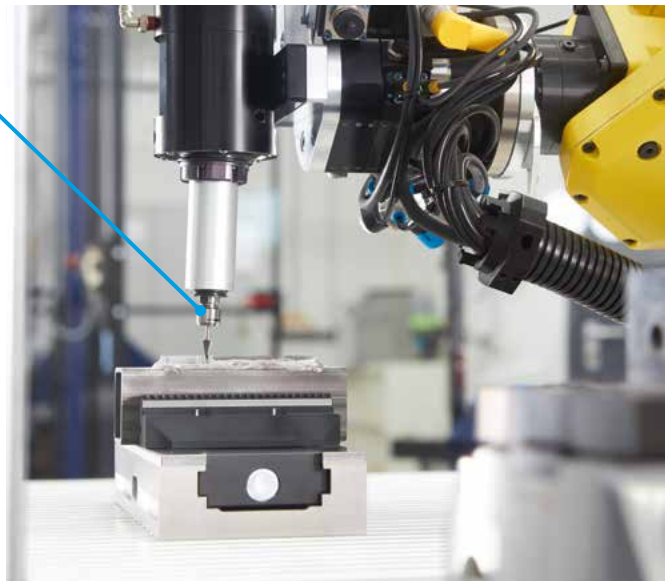
Deburring



Grinding and polishing

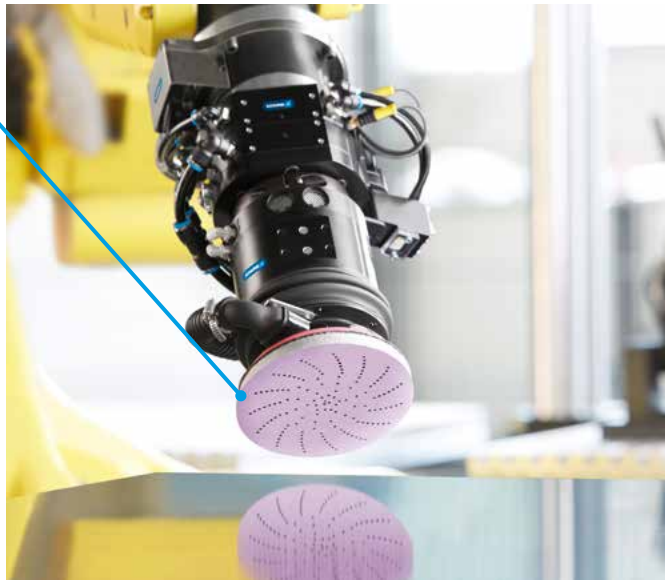
Deburring

One of the classic finishing operations in the metalworking industry is the smoothing of sharp edges and the removal of burrs. However, manual deburring operations not only have low added value, they are also very monotonous and often lead to injuries. SCHUNK offers a wide range of tools for deburring with the robot – including one with a brushless electric motor.



Grinding

Grinding workpieces before polishing and finishing the surfaces is physically demanding and time-consuming. SCHUNK tools for automated grinding are ideally suited for uniform material removal from small and large-surface workpieces.



Polishing

Polishing is usually the final machining step. This gives the workpiece its finish. The contact force is decisive for the result. This should be constant and adapted to the application. With SCHUNK tools, workpieces can be automatically machined. The result: uniform surfaces for a perfect end result.

	Deburring tools		Deburring spindles		
	CDB	**CRT**	**RCV**	**RCE**	**FDB**
					
Description					
	Flexible tool for deburring with the robot and proven deburring tools with radial compensation force adjustable up to 76 N	Pneumatically driven file with radial compensation for machining workpieces operating at up to 12,000 strokes RPM	Pneumatic deburring tool with radial compensation for deburring workpieces operating at up to 40,000 RPM	Electric deburring spindle with radial compensation and adjustable speed of rotation for machining workpieces operating at up to 50,000 RPM	Flexible deburring spindle for use with robots operating at up to 65,000 RPM
Advantages					
	Adjustable rigidity of the tool for flexible use and ideal results with different materials	The compensation force can be adjusted using compressed air for high-quality deburring results in any installation position	The compensation force can be adjusted using compressed air for high-quality deburring results in any installation position	Brushless electric motor for high efficiency, long service life and adjustable speed for more flexibility	Flexible high-frequency spindle for maximum flexibility for chamfering. Oil-free operation for increased cleanliness
	Optional tool changing system for automatic changing of different deburring tools	Flexible use on robot arms or as a stationary unit	Flexible use on robot arms or as a stationary unit	Variable speed control for the flexible machining of different workpieces with different tools and only one electric deburring tool	Adjustable rigidity of the spindle via compressed air for clean chamfering in any installation position
	Use of proven deburring tools for simple automation of manual deburring processes	Use of proven files for simple automation of manual deburring processes	Rotating piston air engine with high torque for high feed rates and a reduced machining time	The rigidity of the tool can be adjusted using compressed air for high-quality deburring results in any installation position	High speeds for a high surface quality
Actuation					
	Pneumatic	Pneumatic	Pneumatic	Electric	Pneumatic
Technical data					
Compensation	Axial & Radial	Radial	Radial	Radial	Radial
Number of versions	2	1	2	2	7
Power [W]			250 .. 490	230 .. 710	150 .. 1040
Compensation path [mm]	Axial 8 Radial ±6	±8	±7.1 .. ±8.3	± 4.6 .. ±7.1	±5.. ±9
Min./max. compensation force [N]	Radial = 25/76 Axial = 13/67	18/62	9/54 .. 7/53	1.8/8.5 .. 24.5/80	3.1/6.7 .. 28.9/86.7
Idle speed [RPM]		12000	30000 .. 40000	13000 .. 50000	25000 .. 65000
Toolholder mounting	Blade holder for deburring tools Type B, C, D, E, F	File holders Ø 36 mm	Collet ER-11 Ø 6, 8 mm	Collet ER-11 Ø 6, 8 mm	collet Ø 36 mm
Dead weight [kg]	1.04 .. 1.09	3.08	1.71 .. 3.36	1.7 .. 5.35	1.1 .. 3.45

● = fully supported

	Polishing spindles		Orbital sander tool	Compensation unit
FDB-AC	MFT	MFT-R	AOV	PCFC
				
Flexible deburring spindle for use with robots	Flexible polishing spindle for use with robots operating at up to 5,600 RPM	Pneumatic polishing spindle with radial compensation, perfect for polishing and brushing workpieces operating at up to 5,600 RPM	Pneumatic orbital sander tool with axial compensation up to 12.7 mm for grinding and polishing workpiece surfaces	Pneumatic, axial compensation unit for flexible adjustment of compensation or pressure forces
Axially flexible spindle in compact format gets into hard-to-reach places	Flexible high-frequency spindle for maximum flexibility for polishing	The rigidity of the tool can be adjusted using compressed air for high-quality deburring results in any installation position	Adjustable compensation by means of a double-action pneumatic cylinder for a constant contact force regardless of the orientation of the tool	Adjustable compensation by means of a double-action pneumatic cylinder for a constant contact force
Adjustable rigidity of the spindle via compressed air for clean chamfering in any installation position	Adjustable contact force of the spindle via compressed air for clean surfaces in any installation position	Flexible use on robot arms or as a stationary unit	Optional media change system for automated exchange of grinding or polishing wheels	Integrated path measuring system for monitoring and control of the process
Axial compensation with conical cutter ensures uncomplicated use, even for sensitive tasks	Rotating piston air engine with high torque	Rotating piston air engine with high torque	Optional connection for suction for reduced contamination and susceptibility to faults	Integrated weight force compensation for constant pressure forces independent of the orientation of the tool, especially in robot-guided applications
Pneumatic	Pneumatic	Pneumatic	Pneumatic	Pneumatic
Axial	Axial	Radial	Axial	Axial
1	2	1	4	3
250	390	390		
±4.1	±7.5	±7.1	12.7	12
1 .. 25	9.7 .. 45	9.4/70	Extended = 13.3/66.7 Retracted = 6.7/33.3	Extended = 85/240 Retracted = 18/49
25000	5600	5600	10000	
	Quick-action chuck up to Ø 9.5 mm	Collet DA Ø 6-8 mm	Velcro fastener Ø 125-150 mm	
0.51	3.3	4.42	2.68	3.54 .. 3.63

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