Superior Clamping and Gripping

SCHUNK®

Product Overview

Robot Accessories

Superior Clamping and Gripping

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

For more information visit our website:

Jens Lehmann

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

Top Performance in the Team

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

In order to boost efficiency, SCHUNK customers have bought more than 2,000,000 precision toolholders, 1,000,000 gripping modules, and 100,000 lathe chucks and stationary workholding systems so far.

This makes us proud and motivates us to attain new top performances.

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

Our customers profit from the expert knowledge, the experience, and the team spirit of more than 2,000 employees in our innovative family-owned company.

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

Heinz-Dieter Schunk Henrik A. Schunk Kristina I. Schunk

SCHUNK Robot Accessories

Change Systems

Precise SCHUNK change systems are used to exchange grippers, tools, and other effectors very fast. Unproductive idle times are reduced.
The flexibility of robots is increased.

Page 8

Rotary Feed-Throughs

With SCHUNK pneumatic, electric or combined rotary feed-throughs, mechatronic and pneumatic gripping modules, valves and sensors that are located behind a rotational axis can be controlled with high process stability.

Page 10

Compliant Devices

For robot-assisted joining, assembling or inserting. SCHUNK offers an extensive program designed to compensate for position deviations and tolerances between the robot and the tool.

Page 12

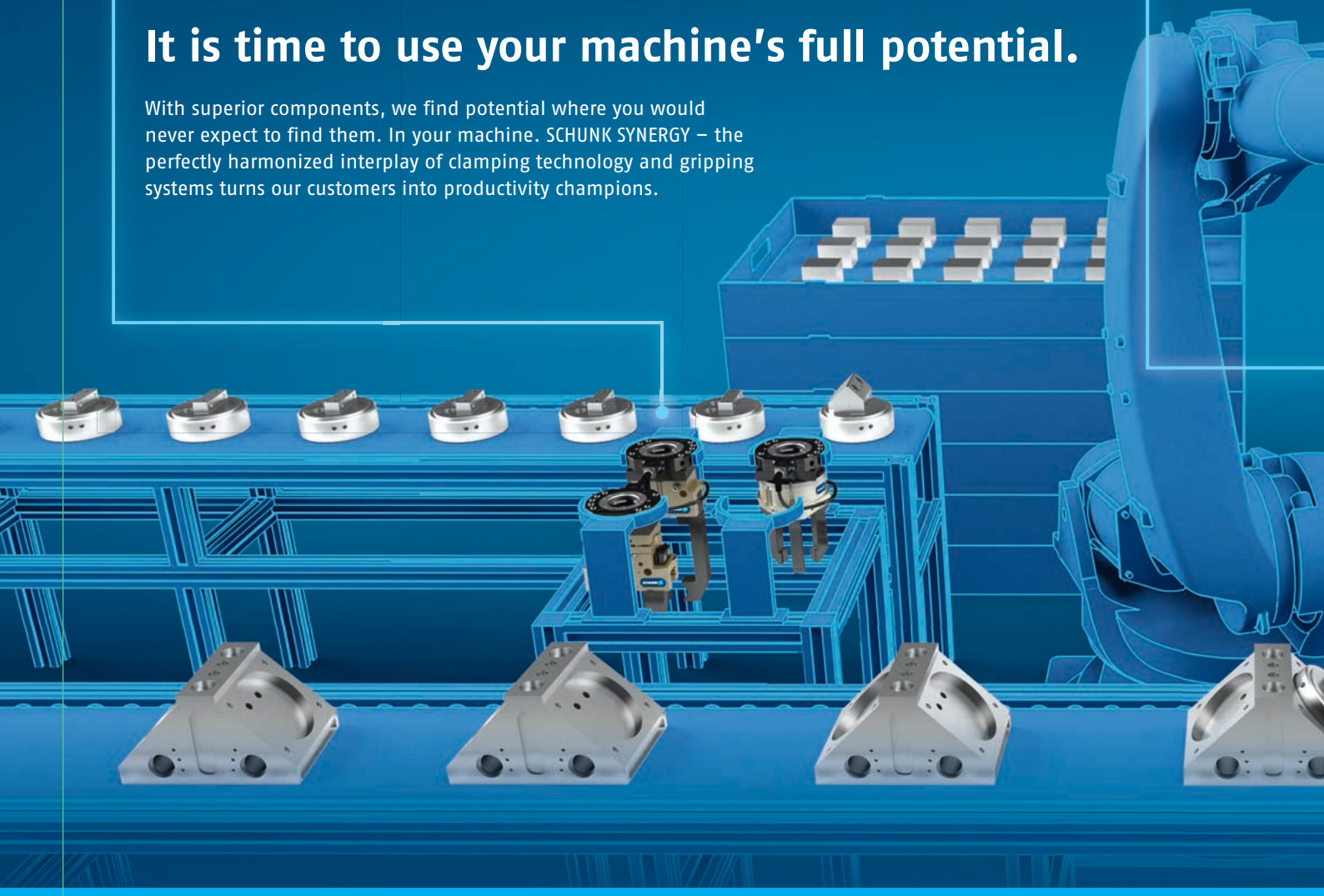
Measuring Systems

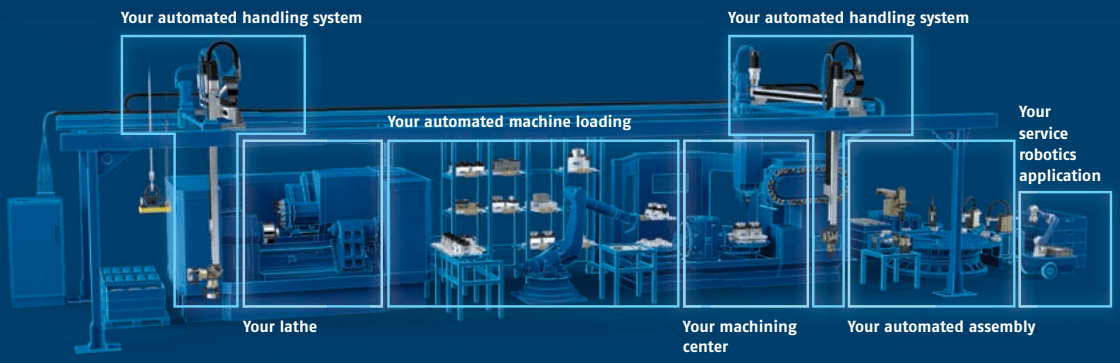
SCHUNK 6-axis force / torque sensors for precise measuring of forces and torques and for avoiding overloads in all six degrees of freedom. For joining or assembly procedures (pressing-in procedures, gluing or polishing tasks for wind channel measurements or in haptics).

Page 14

It is time to use your machine's full potential.

With superior components, we find potential where you would never expect to find them. In your machine. SCHUNK SYNERGY – the perfectly harmonized interplay of clamping technology and gripping systems turns our customers into productivity champions.





Collision and Overload Sensors

Flexible SCHUNK collision and overload sensors serve to monitor, record, and report collisions. In the event of a collision or overload the electrical circuit is interrupted. Your application becomes more process-reliable, so that damage to components can be avoided.

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Machining Tools

Flexible SCHUNK chamfering spindles for use with robots. SCHUNK state-of-the-art standard solution for versatile and robot-guided chamfering of all sorts of workpieces.

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Optional Modules, Storage Systems, Adapter Plates

SCHUNK offers a comprehensive range of electronic, pneumatic, and fluid optional modules for quick-change systems as well as an extensive range of accessories for your application.

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Configuration Examples

Robot Accessories

Your application requires:	Change systems	Rotary feed-throughs
• Fast, automatic changing of tools for chamfering tasks • Collision monitoring with automatic return position	**SWS**  Page 8	
• Continuous rotary movement with media transmission to the tool in the robot's 6th axis • Fast, automatic tool change • Compensation for workpiece holder in XY-axis and rotary axis	**SWS**  Page 8	**DDF 2**  Page 10
• Fast, automatic tool change in heavy-duty applications • Collision monitoring, flexible in the event of overload and with automatic return position • Compensation in XYZ-axis, in order to remove workpieces from undefined positions and to position them	**SWS-L**  Page 8	
• Easy, manual changing of tools for chamfering tasks • Force and moment-controlled chamfering or polishing of workpieces	**HWS**  Page 9	
• Continuous rotary movement with transmission of bus signals as well as air / vacuum to the tool • Fast, automatic tool changing with bus transmission • Compensation in Z-axis, in order to remove workpieces from undefined positions and to position them	**SWS**  Page 8	**DDF-I**  Page 10

Configuration Examples

Robot Accessories

Compliant devices	Measuring systems	Collision and overload sensors	Machining tools	Your SCHUNK solution:
		OPR  Page 16	**FDB**  Page 17	• SWS quick-change system for fast tool changes on the robot • Flexible OPR collision and overload sensor with integrated return position • FDB chamfering spindle or FDB-AC for chamfering workpieces
AGE-XY  Page 12				• DDF 2 rotary feed-through with media feed-through to the tool during rotation • SWS quick-change system for fast tool changing • AGE-XY compensation unit for optimal compensation in XY-axis and rotary axis, optionally with position memory
AGE-S-XYZ  Page 12		**OPR**  Page 16		• SWS-L quick-change system for fast tool changing in heavy duty applications • Flexible OPR collision and overload sensor with integrated return position • AGE-S-XYZ compensation unit for optimal compensation in XYZ-direction
	FT-Sensor  Page 14		**FDB-AC**  Page 17	• 6-axis force / torque sensors for sensitive controlling of a robot. Sensitive tasks can be performed force- and moment-controlled. • HWS manual change system for fast and uncomplicated manual tool changing • FDB, FDB-AC or MFT chamfering spindles for chamfering and polishing workpieces
AGE-Z  Page 12				• DDF-I rotary feed-through for the transmission of bus signals and air / vacuum to the tool • SWS quick-change system with bus transmission for fast and automatic tool changes • AGE-Z compensation unit for optimal flexibility in Z-direction, to compensate for tolerances in Z-direction

Change Systems

Robot Accessories

	Quick-change systems			
	SWS	**SWS-L**	**GWS**	**NSR-A**
	 No-Touch-Locking™	 No-Touch-Locking™		
Product features				
Manual actuation				
Pneumatic actuation	●	●	●	●
Piston stroke monitoring possible	●	●	●	●
Tool presence monitoring possible*	●	●		●
Pneumatic energy transmission	●	●	●	●
Electrical energy transmission	●	●	●	●
Technical data				
Sizes	001 to 300	210 to 1510	064 to 125	100 to 160
Recommended workpiece weight [kg]	1 to 450	270 to 4,080	60 to 170	75 to 300
Moment load M_{xy} [Nm]	3 to 9,870	8,100 to 48,900	225 to 1,200	75 to 600
Moment load M_z [Nm]	3.45 to 8,460	6,900 to 41,700	300 to 1,800	200 to 1,600
Repeat accuracy [mm]	0.01	0.01	0.02	0.02
Weight [kg]	0.25 to 19.1	7.7 to 103	0.85 to 4	0.4 to 1.6
Screwed flange on the robot	Adapter plates / Direct assembly ISO-9409	Adapter plates / Direct assembly ISO-9409	Adapter plates / Direct assembly ISO-9409	Adapter plates ISO-9409
Advantages / Your benefit				
	Patented self-locking locking system for a reliable connection between the quick-change head and the quick-change adapter. **Suitable storage racks for all sizes:** Standardized storage modules available for any size.		**Integrated pneumatic feed-throughs** for reliable electricity, gas and water supply of the tools. **Robust wedge and piston kinematics** for a reliable connection between the gripper change head and the gripper change adapter.	**Form-fitting lock**, self-locking, for a reliable connection between the pallet change head and the pallet change adapter. **Integrated piston stroke monitoring** and **tool presence monitoring** for monitoring the system.
Ambient conditions				
Clean	●	●	●	●
Slightly dirty	●	●	●	●
High-temperature and stainless steel version on request	●	●		

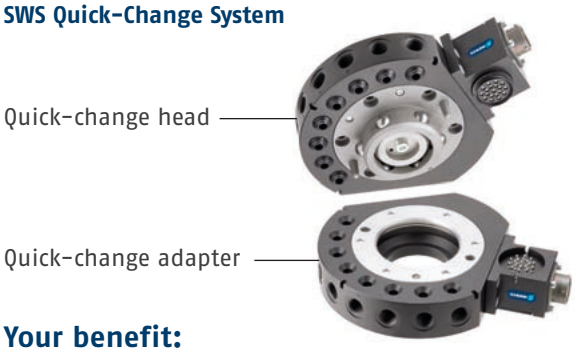
* Tool presence monitoring optionally available only with SWS-110 and SWS-300.

Manual change systems		
HWS	CWS	MWS
 Changing in no time		 The smallest on the market
●	●	●
		●
●	●	●
●		●
040 to 125	050 to 125	20
8 to 54	10 to 28	0.5
150 to 960	75 to 480	1.5
120 to 750	30 to 600	0.5
0.01	0.01	0.01
0.22 to 3.92	0.07 to 0.445	0.016
Adapter plates / Direct assembly ISO-9409	Adapter plates	Adapter plates
Integrated pneumatic feed-throughs for reliable electricity, gas and water supply of the handling modules and tools. **Simple handling** without additional tools; can easily be detached anytime by hand.	**Flat and weight-reduced** through direct assembly of the gripping modules onto the change system without adapter plate. **Integrated pneumatic feed-throughs** for reliable electricity, gas and water supply of the gripping modules.	**Extremely low-profile design** for a minimum of interfering contours. **Built-in feed-throughs** for six pneumatic or electrical signals.
●	●	●
●		
●		

SCHUNK SWS Quick-Change System

Fast effector change for high flexibility in production, handling and assembly.
When changing grippers, tools and other effectors, an automatic quick-change system (as robot accessory) can clearly reduce manual work or even entirely replace it. While manually re-equipping a pneumatic effector takes ten to thirty minutes, a quick-change system reduces this time down to ten to thirty seconds, while the mere locking and unlocking only takes milliseconds.

SWS Quick-Change System



Your benefit:

- **1.4 kg to 4,080 kg** payload possible
- **Patented** self-locking locking system
- **No-Touch locking™** Reliable locking without the need to touch for the SWS, even if SWK and SWA do not contact.
- **Complete series** with 21 sizes
- For an **optimal size selection** and a **large range of applications**
- All functional components made of **hardened steel** for a **high bearing load capacity** of the change system
- **Transmission possibility** for electric, pneumatic and fluid media
- For a **process-reliable connection** between the quick-change head and the quick-change adapter
- Available with **self-sealing couplings**

Optional Modules

Broad range of electronic and fluid modules for various energy transmission options.

See page 18

Rotary Feed-Throughs

Robot Accessories

	Rotary feed-throughs		
	DDF 2	**DWS**	**DDF-I**
			
	Turns continuously		Transmission of bus signals
Product features			
Continuous rotary movement	●	●	●
Screwed flange according to ISO-9409 standard	●	●	●
Pneumatic energy transmission	●	●	●
Vacuum energy transmission			●
Electrical energy transmission	●	●	●
Bus transmission			●
Technical data			
Sizes [correspond to ISO-9409]	031 to 160	031 to 050	040 to 063
Recommended workpiece weight [kg]	8 to 250	16	20
Max. speed [RPM]	70 to 120	120	120
Continuous torque [Nm]	0.8 to 22	0.5	0.7
Starting torque [after shutdown] [Nm]	1.3 to 25	2	2
Forces F_z [N]	1,000 to 9,000	4,000	2,000
Moments M_x, M_y [Nm]	15 to 600	70	60
Moments M_z [Nm]	10 to 400	70	60
Pneumatic energy transmissions	2 to 4	1	1
Electrical energy transmission	4 to 10	14	2 (Profibus)
Weight [kg]	0.5 to 14.2	0.8	1.9
Advantages / Your benefit			
	Three varieties to choose from **Option 1:** for the feed-through of pneumatic and electrical signals. **Option 2:** for the feed-through of pneumatics. **Option 3:** for the feed-through of electrical signals.	**Combined pneumatic and electrical feed-through** with built-in quick-change system for comprehensive supply of the tool or gripping system at the front end of the robot.	**Standardized connection for Profibus** allows for easy connection of your control unit, valve clusters, electric grippers etc.
Combined pneumatic and electrical feed-through	●	●	●
ISO flange pattern, simple assembly on most types of robot without additional adapter plates.	●	●	●
Field of application			
	Rotary feed-through for reliable pneumatic and electrical feed-through in the event of robot applications with continuous rotary movements.	Compact rotary change system for applications with continuous rotary movements. In combination with a quick-change system with built-in micro-valve technology.	With built-in bus technology for a larger number of signal transmissions in the event of robot applications with continuous rotary movements.
Ambient conditions			
Clean	●	●	●
Slightly dirty	●		●

	Stationary rotary feed-throughs
	DDF-SE
	
	●
	●
	●
	80 to 120
	300 to 500
	4 to 13
	5 to 20
	2,000 to 4,000
	60 to 250
	60 to 250
	4 to 6
	6 to 8
	3.3 to 9
	Standardized shaft end for easy assembly of gears. **Revolutions of up to 500 RPM** Your gripping system is reliably supplied with pneumatics and electronics even in the event of fast, continuous rotary movements of up to 500 RPM.
	●
	Ideally suited for use on rotary indexing tables and for stationary applications.
	●
	●

SCHUNK DDF 2 Rotary Feed-Through

More powerful. More versatile. More energy-efficient.
The DDF 2 is the latest standard for state-of-the-art robot and assembly applications. It guarantees highest process reliability even with 360° continuous rotary movements. SCHUNK offers the DDF 2 in two versions: for the feed-through of pneumatic or electrical signals or for the combined version. A significantly increased load allows the use of a steel shaft for transmitting dynamic forces and moments. Due to a specially developed seal, the DDF 2 ensures a long service life and energy efficiency since the use of smaller drives is possible.

DDF 2 Rotary Feed-Through

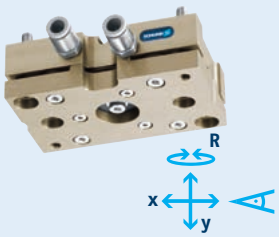
Your benefit:

- **85% longer service life** due to newly developed seals
- **50% greater moment load** due to transmission of the dynamic forces and moments via a steel shaft
- **20% greater load capacity**
- Newly developed, **more smoothly running** and especially **durable seals** produce a smaller starting and continuous torque, which allows you to use smaller, i.e. more economical drives
- Depending on the size, **two and four pneumatic feed-throughs** are standard or between **four and ten electrical transmissions** for signals 1 A / 60 V
- **Allows for 360° continuous rotation**
- Complete series with **14 sizes** for optimal size selection
- **Electrical connector contacts** enable rapid and easy replacement in the event of cable breakage at the robot arm or gripper
- **Protection class IP65**

Compliant Devices

Robot Accessories

	Compliant devices		
	AGE-XY	AGE-Z	AGE-S-XYZ
			
Product features			
Pneumatic locking	●	●	●
Position memory	●		●
Screwed flange acc. to ISO-9409 standard	●	●	●
Monitoring via proximity switch	●	●	●
Technical data			
Sizes	050 to 080	050 to 080	100 to 200
Compensation stroke XY [mm]	± 2.5 to ± 4		± 4 to ± 12
Compensation stroke Z		8	10 to 14
Rotatory compensation [°]	12		
Spring force [N]		10 to 240	240 to 1,500
Extend piston force Z at 6 bar [N]		300 to 840	800 to 3,000
Retract piston force Z at 6 bar [N]		270 to 600	
Weight [kg]	0.46 to 1.5	0.35 to 1.1	2.6 to 29.5
Locking force at 6 bar [N]	235 to 580		800 to 2,700
Horizontal payload [kg]	4 to 10	1 to 5	5.5 to 100
Vertical payload [kg]	6 to 15	1 to 10	9 to 160
Repeat accuracy [mm]	0.01	0.01	0.01
Axial force F_z [N]	1,700 to 3,200	350 to 800	110 to 2,000
Moment load capacity M_x, M_y [Nm]	16 to 30	4 to 10	30 to 500
Twist moment M_z			
Deflection x [°]			
Deflection y [°]			
Deflection z [°]			
Advantages / Your benefit			
	Robust guidance for high moment loads even with minimal space requirements.	**Locking** in order to switch the unit rigid in retracted or extended position.	**Three compensation directions XYZ** in one unit. **Compact design** for minimal design heights.
ISO flange pattern, simple assembly on most types of robot without additional adapter plates.	●	●	●
Field of application			
	Universally applicable for assembling, palletizing and inserting workpieces with high precision.		
Ambient conditions			
Clean	●	●	●
Slightly dirty			●
High-temperature version on request	●	●	●

	Tolerance compensation unit
AGE-F	TCU
	
	●
●	●
031 to 080	050 to 200
± 1.5 to ± 5	
	1
0.1 to 3.1	0.08 to 2.45
1.5 to 32.3	0.5 to 0.8
0.03 to 0.08	0.1 to 0.02
100 to 2,800	
3.5 to 50	3 to 55
	1.0 to 32
	1 to 2
	1
	1 to 1.5
Spring return in three spring stiffnesses. Defined centric position with a high repeat accuracy.	**Pneumatic locking.** Long-lasting elastomers, rigid unit during travel.
Direct assembly of parallel and centric grippers. SCHUNK PGN-plus, PZN-plus grippers can be mounted onto AGE-F without additional adapter plate.	**Direct mounting of parallel and centric grippers,** no additional adapter plate required.
Assembling, palletizing and inserting workpieces without feeding external media.	In the fields of assembly automation and machine tool loading.
●	●
	●

SCHUNK AGE-S-XYZ Compensation Unit

Palletizing, joining, and assembling with flexibility. The AGE-S compensation unit extends the AGE series (AGE-XY/AGE-Z/AGE-F) for the medium and heavy load range. The compensation unit provides the required flexibility between the effector and the robot arm. The AGE-S-XYZ helps you avoiding damage to the system and malfunctions, while increasing process reliability. During handling in XY- as well as Z-direction, the unit can be made rigid using the integrated pneumatic lock and eccentrically locked using the position memory in XY-direction.

AGE-S-XYZ Compensation Unit

Your benefit:

- The housing consists of **high-strength, hard-coated aluminum alloy**
- The functional components are made of **hardened steel**
- **Three compensation directions** in one unit, compact design for minimal heights
- **Centric locking** for rigid switching of the unit in a defined centric position
- **Pneumatic position memory** for eccentric locking in deflected position

Measuring Systems

Robot Accessories

	6-axis force / torque sensors	
	FTN	**FTD**
	 NET	 DAQ
IP protection class		
Without IP protection	●	●
IP60	●	●
IP65	●	●
IP68	●	●
Technical data		
Sizes	NANO-17 to OMEGA-331	NANO-17 to OMEGA-331
Calibration	SI-12-0.12 to SI-40,000-6,000	SI-12-0.12 to SI-40,000-6,000
Electronic processor	Net box	DAQ card
Weight of sensor [kg]	0.09 to 47	0.09 to 47
Range of measurement F_x, F_y [N]	± 12 to ± 40,000	± 12 to ± 40,000
Range of measurement F_z [N]	± 17 to ± 88,000	± 17 to ± 88,000
Range of measurement M_x, M_y [Nm]	± 0.12 to ± 6,000	± 0.12 to ± 6,000
Range of measurement M_z [Nm]	± 0.12 to ± 6,000	± 0.12 to ± 6,000
Resolution F_x, F_y [N]	1 / 120 to 1 / 320	1 / 120 to 1 / 320
Resolution F_z [N]	1 / 60 to 1 / 320	1 / 60 to 1 / 320
Resolution M_x, M_y [Nm]	1 / 64 to 3 / 2,000	1 / 64 to 3 / 2,000
Resolution M_z [Nm]	1 / 64 to 3 / 4,000	1 / 64 to 3 / 4,000
Advantages / Your benefit		
	FTN sensor Evaluation via Ethernet, DeviceNet, optional Profinet	**FTD sensor** Evaluation via DAQ card (PCI, USB)
Sizes with different ranges of measurement	16	16
High measured-value resolution and fast data transmission for nearly real-time control	●	●
Robust version, high overload range for a long life span	●	●
Rotation and translation of the coordinate systems in all three planes	●	●
Easy operation, minimized start-up time	●	●
Field of application		
	Universally applicable in robot applications such as haptics, medicine, grinding, testing, joining as well as research and development.	
Ambient conditions (sensor)		
Clean	●	●
Slightly dirty	●	●
Extremely dirty	●	●
Humid	●	●

	FTS	FTL
		
	Stand-Alone	CAN
	●	●
	●	
	●	
	●	
	NANO-17 to OMEGA-331	FTL-050
	SI-12-0.12 to SI-40,000-6,000	150-3
	Stand-alone controller	built-in
	0.09 to 47	0.3
	± 12 to ± 40,000	150
	± 17 to ± 88,000	150
	± 0.12 to ± 6,000	3
	± 0.12 to ± 6,000	3
	1 / 160	
	1 / 130 to 1 / 160	
	1 / 32 to 3 / 1,000	
	1 / 32 to 3 / 2,000	
	FTS sensor Evaluation via analog voltage (0-10 V or DIO)	**FTL sensor** Evaluation via CAN bus or USB (adapter)
	16	1
	●	●
	●	●
	●	●
	●	●
	Universally applicable in robot applications such as haptics, medicine, grinding, testing, joining as well as research and development.	Ideally suited for research and development (laboratory).
	●	●
	●	
	●	
	●	

SCHUNK FTN 6-axis Force / Torque Sensor

Interface variety with Ethernet, Ethernet / IP, DeviceNet and a CAN bus interface.
With its high-speed data output, four possible communication protocols, remote monitoring via LAN and configuration via web interface, the FTN 6-axis force / torque sensor is currently the most multi-functional force / torque sensor for industrial automation. Suitable for machining tasks such as grinding, polishing, robot assemblies and robotic surgery as well as applications in rehabilitation and neurological applications. The sensor can be used for the automation of sophisticated assembly, machining and finish tasks, that could previously only be performed by hand or using complex special machines.

6-axis Force / Torque Sensor

Your benefit:

- **16 sizes**
- **Torque ranges** between **0.12 Nm** and **6,000 Nm** selectable
- **Load ranges** between **12 N** and **40,000 N** selectable
- **Compact system design** due to low module height
- **The sensor measures the force and the torque** in all **six degrees of freedom.**
- **Simple process integration** due to simple interface compatibility
- Possible **remote monitoring**, possible via **LAN connection**

Collision and Overload Sensors

Robot Accessories

	Collision and overload sensors	
	OPS	**OPR**
		 Automatic return position
Product features		
Pneumatic actuation	●	●
Built-in spring optionally available		●
Technical data		
Sizes	080 to 200	048 to 221
Moments M_x, M_y [Nm]	7.5 to 430	6 to 2,000
Forces F_z [N]	500 to 7,000	440 to 14,000
Axial deflection [mm]	9.5 to 12	5.1 to 16
Angle deflection [°]	± 4 to ± 12	± 8 to 13
Rotatory deflection [°]	45 to 360	20
Repeat accuracy [mm]	± 0.02 to ± 0.05	± 0.025
Operating pressure range [bar]	0.5 to 6.0	1.4 to 6.2
Weight [kg]	0.4 to 7.0	0.24 to 11.4
Advantages / Your benefit		
Automatic return position for faster resuming of production after a collision		●
Integrated monitoring for signal transmission in the event of a collision	●	●
Triggering force and moment can be set via the operating pressure for optimal protection of robot and components	●	●
ISO adapter plates are optional for simple assembly on most types of robot without additional production costs	●	●
Field of application		
Standard solution for all robot applications where robots, tools, or workpieces are to be monitored for possible collisions	●	●
Ambient conditions		
Clean	●	●
Slightly dirty		●
Humid		●

SCHUNK OPR, Collision and Overload Sensor

The effective protection both for robots and for handling devices against damage as a result of collision or overload. Unique with automatic return position.

The OPR collision and overload sensors from SCHUNK effectively monitor the robot as well as handling devices. SCHUNK OPR features an automatic return position, enabling the system to resume production as soon as possible after a collision. In case of overloads or collisions, the tool plate deflects and, at the same time, automatically actuates the system's emergency off. The system's sensitivity can be adjusted via the operating pressure.

Your benefit:

- **Automatic return position** in center position
- **Overload detection** occurs in **X-, Y- (+/-)** and **Z-direction** and equally **during rotation** around the **X-, Y- and Z-direction**
- **Integrated cable breakage control** to avoid malfunctions
- Also available as **IP65** protected version
- **Triggering forces and moments** can be adjusted via operating pressure

	Chamfering spindle		Polishing spindle
	FDB	**FDB-AC**	**MFT**
			
Product features			
Pneumatic actuation	●	●	●
Technical data			
Compensation	Radial	Axial	Axial
Sizes	151 to 660	90 to 180	390
Power [W]	150 to 660	250	390
Compensation path [mm]	5.1 to 9.0	4	7.5 to 15
Recommended compensation path [mm]	2.5 to 5.5	2	7.5
Compensation force [N]	3.1 to 45.4	1 to 25	14 to 74
Deflecting torque [Nm]	0.09 to 0.16		1.4
Compensating pressure [bar]	1 to 4.1	1 to 3	0.34 to 4.1
Idle speed [minimum rpm]	65.000 to 40.000	30.000	5.600
Idle air consumption [l/s]	1.4 to 5.4	6.6	9
Air consumption blocked [l/s]	3.8 to 17.9		
Collet diameter [mm]	3 to 8		10
Weight [kg]	1.1 to 2.2	0.51	3.3
Drive noise [dB]	70	75 to 87	70
Your advantages and benefits			
Flexible high-frequency spindle for maximum flexibility for chamfering	●	●	
Polishing spindle for maximum flexibility for polishing or brushing			●
Rigidity of the **milling spindle adjustable via compressed** air for clean chamfering in any installation position	●	●	
High RPM for high feed rates	●	●	●
Versatile use on robot arms or as stationary unit	●	●	●
Field of application			
	Standard solution for flexible and robot-guided chamfering of all sorts of workpieces.		
Ambient conditions			
Clean	●	●	●
Extremely dirty	●	●	●

SCHUNK FDB Chamfering Spindle

The solution for perfect final machining. SCHUNK standard solution for versatile and robot-guided chamfering of all sorts of workpieces. The unit is driven by a pneumatic spindle with a size-dependent speed of up to 65,000 rotations per minute. To enable it to also compensate for tolerances during machining, the shank has oscillating bearings.

Your benefit:

- Flexible **high-frequency spindle** for **maximum versatility** for chamfering
- **Adjustable rigidity** of the chamfering spindle by means of the pneumatics
- For **clean chamfer edges** in every installation position
- **High RPM**
- For **high** feed rates
- **Versatile use** on the **robot arm** or applicable as **stationary** unit

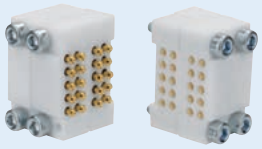
Optional Modules for Change Systems

Robot Accessories

A wide variety of additional optional modules available on request

Electronic modules for SWS and SWS-L

B15



E10

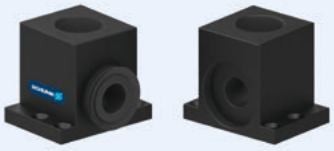
G19

Module designation	**B15**	**E2A**	**E3A**	**E10**	**A15**	**E20**
Electrical data	3 A / 50 VAC	3 A / 50 VAC	3 A / 50 VAC	3 A / 50 VAC	3 A / 50 VAC	3 A / 50 VAC
Number of pin contacts	15	20	30	10	15	20
Compatible with SWS sizes	005	005	005	005 – 011	011	011
Tool coding for SWA						
Module designation	**K14**	**K19**	**K21**	**K26**	**KG19**	**KM14**
Electrical data	3 A / 50 VDC	2 A / 50 VDC	6 A / 50 VDC	5 A / 50 VDC	4 A / 50 VDC	12 x 5 A / 250 VAC 2 x 13 A / 250 VAC
Number of pin contacts	14	19	21	26	19	14
Compatible with SWS sizes	020, 021, 060	020, 021, 060	020, 021, 060	020, 021, 060	020, 021, 060	020 – 060
Tool coding for SWA	0 – 9		0 – 9			
Module designation	**G10**	**G14**	**G17**	**G19**	**G21**	**G26**
Electrical data	3 A / 250 VAC	3 A / 250 VAC	3 A / 250 VAC	5 A / 250 VAC	3 A / 250 VAC	3 A / 250 VAC
Number of pin contacts	10	14	17	19	21	26
Compatible with SWS sizes	040 – 300	040 – 300	040 – 300	040 – 300	040 – 300	040 – 300
Tool coding for SWA	0 – 99	0 – 9			0 – 9	
Module designation	**GF19**	**MT8**	**MT9**	**MT14**	**PG0**	**R10**
Electrical data	3 A / 250 V	20 A / 500 VAC	28 A / 500 VAC	13 A / 500 VAC	600 A / 800 VAC	5 A / 250 VAC
Number of pin contacts	19	8	9	14	1	10
Compatible with SWS sizes	040 – 300	040 – 300	040 – 300	040 – 300	040 – 300	040 – 300
Tool coding for SWA						0 – 99
Module designation	**R14**	**R17**	**R19**	**R21**	**R26**	**R32**
Electrical data	5 A / 250 VAC	3 A / 250 VAC	5 A / 250 VAC	3 A / 250 VAC	3 A / 250 VAC	3 A / 250 VAC
Number of pin contacts	14	17	19	21	26	32
Compatible with SWS sizes	040 – 300	040 – 300	040 – 300	040 – 300	040 – 300	040 – 300
Tool coding for SWA	0 – 9	0 – 99		0 – 9		
Module designation	**RF19**	**S10**	**S14**	**S19**	**S21**	**S26**
Electrical data	3 A / 250 V	5 A / 250 VAC	5 A / 250 VAC	5 A / 250 VAC	3 A / 250 VAC	3 A / 250 VAC
Number of pin contacts	19	10	14	19	21	26
Compatible with SWS sizes	040 – 300	040 – 300	040 – 300	040 – 300	040 – 300	040 – 300
Tool coding for SWA		0 – 99	0 – 9			
Module designation	**SF19**	**T10**	**T14**	**T19**	**TB**	**TD**
Electrical data	3 A / 250 V	5 A / 250 VAC	5 A / 250 VAC	5 A / 250 VAC	Profibus 4 A / 24 VAC	Devicenet 5 A / 24 VAC
Number of pin contacts	19	10	14	19	10	10
Compatible with SWS sizes	040 – 300	040 – 300	040 – 300	040 – 300	040 – 300	040 – 300
Module designation	**TE**	**X7B**	**X7C**	**X7D**		
Electrical data	Ethernet 5 A / 48 VAC	Coax 75 Ohm BNC	Coax 3 A / 2000 VAC, 30 kHz	Coax 5 A / 500 VAC		
Number of pin contacts	10	1	1	1		
Compatible with SWS sizes	040 – 300	040 – 300	040 – 300	040 – 300		

A wide variety of additional optional modules available on request

Pneumatic, fluid, and hydraulic modules for SWS from size 040 – 300 and for SWS-L from size 210 – 1210


P05


V34


FG4

Module designation	P05	P12A	P14	P238	P18	P38A	P186
Pneumatics	●	●	●	●	●	●	●
Vacuum	●	●	●	●	●	●	●
Number of media feed-throughs	10	2	2	2	4	4	6
Connections	M5	G 1/2"	G 1/4"	G 3/8"	G 1/8"	G 3/8" axial	G 1/8"
Maximum pressure [bar]	8	8	8	8	8	8	8

Module designation	P186A	FG2	FG4	FHG4	V34	VF1	V200A	V200
Pneumatics	●	●	●					
Vacuum	●				●	●	●	●
Fluid		●	●					
Hydraulics				●				
Self-sealing		●	●	●				
Number of media feed-throughs	6	2	4	1	1	1	1	1
Connections	G 1/8" axial	G 3/8"	G 3/8"	G 1/4"	G 3/4"	1	2	2
Compatible with SWS sizes	040 – 300	040 – 300	040 – 300	040 – 300	040 – 300	040 – 300	040 – 300	040 – 300
Maximum pressure [bar]	8	8	8	8				

Accessories for all electronic modules


KAS-19B-0


KAS-19B-90

Designation	KAS-19B-0	KAS-19B-90	KAS-26B-0	KAS-26B-90	KAS-19G-0	KAS-19G-90	KAS-26G-0	KAS-26G-90
Number of pin contacts	19	19	26	26	19	19	26	26
Electrical data	5 A / 250 VAC	5 A / 250 VAC	3 A / 250 VAC	3 A / 250 VAC	5 A / 250 VAC	5 A / 250 VAC	3 A / 250 VAC	3 A / 250 VAC
Version	Straight	At an angle	Straight	At an angle	Straight	At an angle	Straight	At an angle
Compatible with electronic modules	K19, K14, KG19, R19, R14, R10, G19, G14, G10, S19, S14, S10	K19, K14, KG19, R19, R14, R10, G19, G14, G10, S19, S14, S10	K26, K21, R26, R21, R17, G26, G21, G17, S26, S21	K26, K21, R26, R21, R17, G26, G21, G17, S26, S21	MT14, M19, T19, T14, T10, SA2, SA3, SA4, VB2, VB3, VB4	MT14, M19, T19, T14, T10, SA2, SA3, SA4, VB2, VB3, VB5	SA2, VA2	SA2, VA3

Optional Modules for Change Systems

Robot Accessories

A wide variety of additional optional modules available on request

Optional modules for SWS-L

AH2

JU2 and JU3

DL5

	Actuation modules						Signal modules	
Module designation	**JB2**	**JB3**	**JD2**	**JD3**	**JU2**	**JU3**	**SA2**	**SA3**
Pneumatic actuation	2 Air connections	2 Air connections	Single-acting valve	Single-acting valve	Double-acting valve	Double-acting valve		
Electrical data							3 A / 250 VAC	3 A / 250 VAC
Number of pin contacts							19	15
Compatible with SWS-L sizes	210	310 – 510	210	310 – 510	210	310 – 510	210 – 1210	210 – 1210
Tool coding for SWA								0 – 9

	Signal modules					Bus modules		
Module designation	**SA4**	**VA6**	**VB2**	**VB3**	**VB4**	**DL5**	**DA2**	**VG3**
Electrical data	3 A / 250 VAC	3 A / 250 VAC	3 A / 250 VAC	3 A / 250 VAC	3 A / 250 VAC	Profinet	DeviceNet	Profibus
Number of pin contacts	11	19	19	15	11			10
Compatible with SWS-L sizes	210 – 1210	210 – 1210	210 – 1210	210 – 1210	210 – 1210	210 – 1210	210 – 1210	210 – 1210
Tool coding	0 – 99			0 – 9	0 – 99	0 – 99999	0 – 9	
Unlocking lock on the holding station		●	●	●	●	●	●	

	Pneumatic modules						Fluid modules		Hydraulic modules
Module designation	**AF2**	**AG2**	**AH2**	**AK2**	**AM2**	**AQ2**	**FH6**	**FC2**	**HB3**
Pneumatics	●	●	●	●	●	●	●	●	
Fluid							●	●	
Hydraulics									●
Vacuum	●	●		●					
Self-sealing		●	●	●	●	●	●	●	●
Number of media feed-throughs	8	4 x pneumatics 2 x vacuum	8	10	2	4	4	8	2
Connections	G 3/8“	2 x G 3/8“ 2 x G 3/4“	G 3/8“	G 1/4“	G 1/2“	G 1/2“	G 1/2“	G 3/8“	G 3/8“
Maximum pressure [bar]	8	8	8	8	8	8	8	8	158

Cable connector for optional electrical modules

KV-5-SWK-19F-0

KV-5-SWK-19F-90

KAS-A15-0

Module designation	**KV-5-SWK-19F-90 ***	**KV-3-SWA-19F-0 ***	**KAS-08G-0**	**KAS-08G-90**	**KAS-15-0**
Number of pin contacts	19	19	8	8	15
Electrical data	3 A / 125 VAC	3 A / 125 VAC	20 A / 500 VAC	20 A / 500 VAC	3 A / 50 VAC
Connection plug version	At an angle	Straight	Straight	At an angle	Straight
Compatible with electronic modules	RF19, GF19, SF19, KF19	RF19, GF19, SF19, KF19, RF14, GF14, KF14	MT8	MT8	A15, B15

* Plug connectors with coated cables

SCHUNK SWM Modular Storage Racks

The SWM storage racks are perfectly suited for applications that require short change times between the robot and the tool.
SCHUNK offers three systems:

SWM-S and SWM-M Systems

Suitable for smaller and medium SCHUNK change systems. The upright profiles are extruded and extremely sturdy, making them excellently suited for mounting on platforms. The centering pins that belong with them consist of durable stainless steel, providing additional stability to the systems. Depositing plates can optionally be equipped with proximity switches.
The proximity switches allow you to monitor the assigned places. The quick-change adapter is deposited without force and without the use of holding mechanics. This guarantees smooth changing processes.

SWM-L System

Suitable for SCHUNK change systems in heavy load applications. Sturdy, heavy-duty all steel welded construction with a long life span and maximum versatility. The system can be customized to individual application requirements on request. This system is predominately used in the automotive industry.

Your benefit:

- **Modular system** permits a versatile, application-specific assembly
- **V-shaped points of support** for exact positioning of the place of deposit and repeatability
- **Aluminum profiles (SWM-S/M) or sturdy all steel welded construction (system SWM-L) as base body** or use of your existing design
- Corrosion-free hardened support pins **Sensor monitoring** available as an option
- **Standardized depositing plates** available for all sizes
- **Dirt protection cover** to protect the deposited tools available as an option

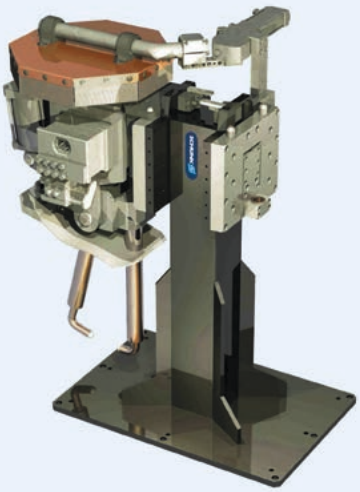
SWM-S

SWM-S System: suitable for change systems of the sizes SWS-005 to SWS-021.

SWM-M

SWM-M System: suitable for change systems as of sizes SWS-040 to SWS-150.

SWM-L



SWM-L System: suitable for sizes SWS-L 210 – 510.

Standardized Adapter Plates! Process-reliable “End-of-Arm” Handling Solutions.

SCHUNK adapter plates ensure complete precision of fit between robot accessory components and ISO flange interfaces.

Geometrically customized to your needs: adapter plates with a large center bore, integrated media feed-through or individual screw connection diagrams ensure unrestricted freedom of movement in your robot applications.

The extensive robot accessories range and the appropriate adapter plates from SCHUNK ensure process-reliable handling solutions. Comprehensive, secure and flexible!

ISO flange
(note: no adapter plate is needed if the DDF 2 is fitted directly)

DDF 2
Rotary feed-through

Adapter plate

OPR or OPS
Collision and overload sensor

Adapter plate

SWK or HWK
Quick-change head / manual change head

SWA or HWA
Quick-change adapter / manual change adapter

Adapter plate

TCU
Tolerance compensation unit

PGN-plus
2-finger universal gripper with multi-tooth guidance

Accurately fitting!

The screw connection diagram is adapted to each component’s geometry, ensuring precise mounting that is free from play and twisting.

Illustration shows a sample combination of SCHUNK robot accessory components.

Your benefit:

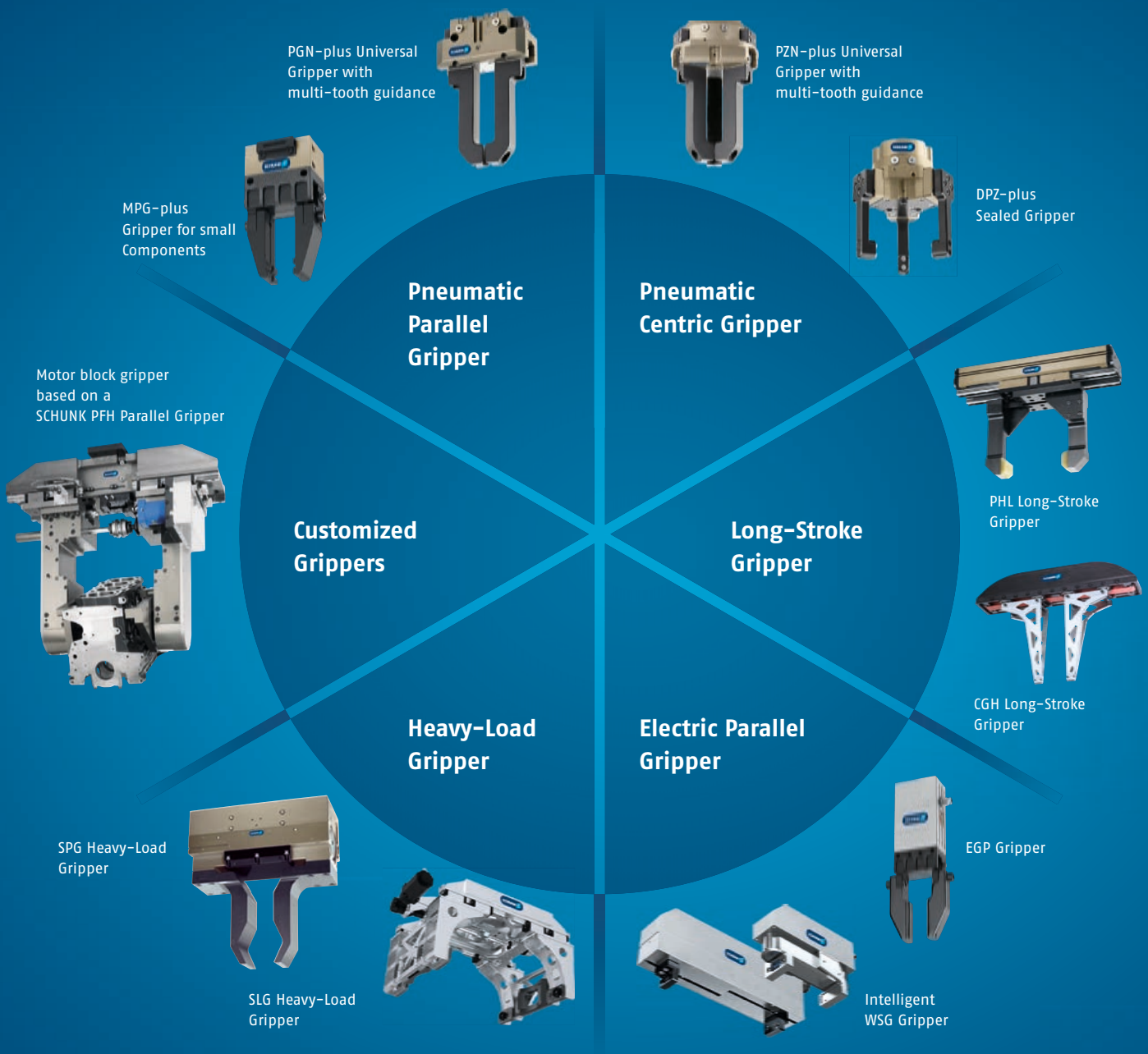
- **No time-consuming in-house production**
- **Complete accuracy of fit** due to **standardized interfaces**
- **Optimal air and cable feed-through** increases the life span of cables
- **Shorter project lead times** due to standardized systems
- **Process-reliable implementation and planning security** without extra project costs, e. g. due to confusion about component connection
- **Time savings and no extra costs** for additional engineering work and customized production

The Perfect Addition! Schunk Gripper Modules.

SCHUNK gripper modules have been setting the benchmark in automation world-wide for more than 30 years now. Our comprehensive range of small component grippers and universal gripper modules stands out due to high product quality, precision, and a large number of monitoring options. The dimensions of the optimally differentiated series cover the full range of workpiece sizes. Being the pioneer in gripping technology, we shape the future of gripping systems not last due to our continual innovative force and consistent standardization efforts. When it comes to customized tasks, the full range of our experience, customer orientation, and development expertise come into their own. From standard components through to customized systems.

Convincing arguments for gripper modules from SCHUNK:

- Unparalleled quality and service
- Simple commissioning
- High moment capacity
- Strong kinematics for a long life span
- High gripping forces
- Large stroke ranges in relation to the size
- Economical solutions and fast delivery
- Pneumatic, electrical or hydraulic



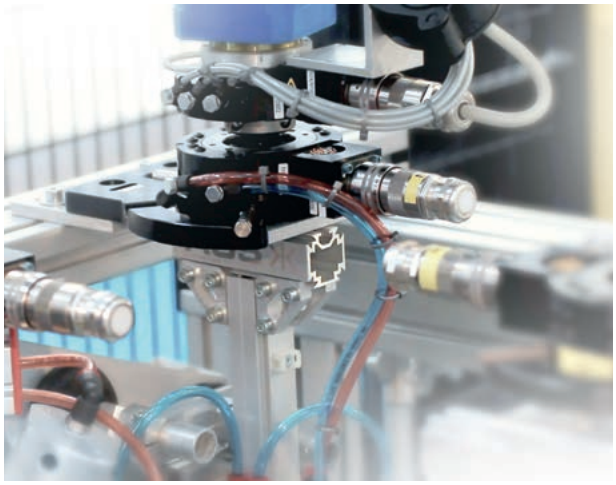
A robot with a SCHUNK SWS quick-change system loads SCHUNK TANDEM plus clamping force blocks outside of the machining center and exchanges these, fully equipped with a pneumatic SCHUNK 2-fold PGN-plus gripping unit, into the vertical machining center. The clamping devices are equipped almost in parallel, requiring the machine to stop only very briefly for the exchange of the clamping force blocks.

SCHUNK Robot Accessories leading in Robot Handling Solutions

Change systems for end-of-arm robot solutions, rotary feed-throughs, compliant devices, driven tools, and a large variety of sensors. When customer-specific quick-change solutions are required, customers benefit from our decades of experience in all fields of application.

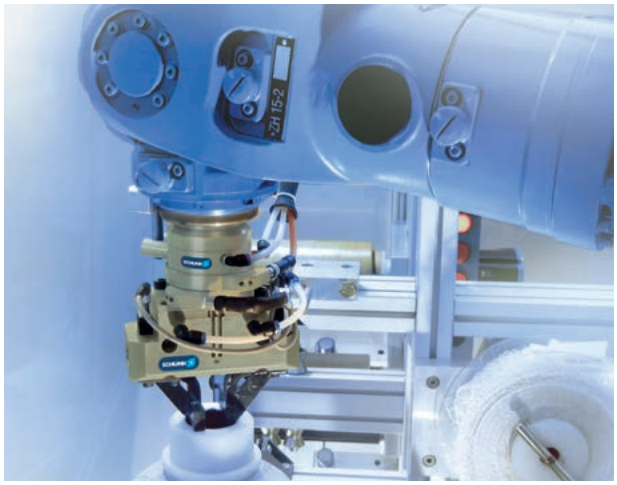
Modular SCHUNK SWM-S storage rack used with a welding gas plant

The SWM-S storage rack is the ideal solution if numerous change processes are to be performed in very confined spaces. The system can be assembled according to individual needs due to its modular design. The handling process of this welding gas plant also uses the SCHUNK's SWS-020 quick-change system consisting of the SWK quick-change head and the SWA quick-change adapter.



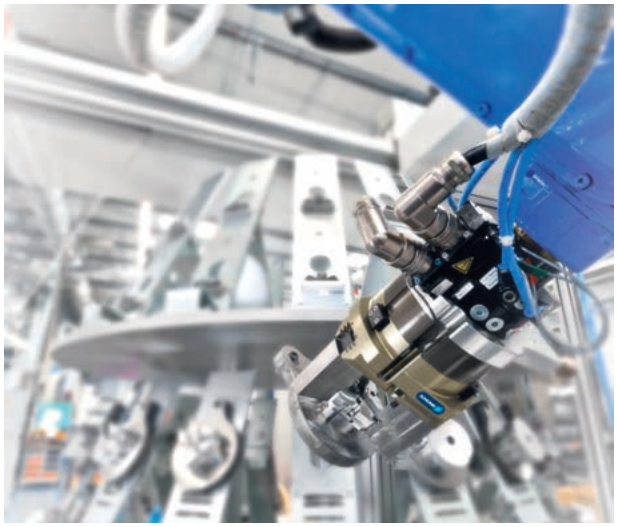
Automated handling of a coil for synthetic fibers with a DDF 2 rotary feed-through from SCHUNK

Coil handling for synthetic fibers requires SCHUNK powerful DDF 2 rotary feed-through with top process reliability in rotary processes. The PGN-plus universal gripper from SCHUNK, which is mounted in combination, guarantees highest accuracy in the gripping process due to its unique multi-tooth guidance. Individually manufactured form fingers ensure that the coil is held accurately.



SCHUNK PZN-plus centric gripper with an SWS quick-change system for automated picking of raw material for machine loading.

The robot picks up raw material using the pneumatic SCHUNK PZN-plus 3-finger centric gripper from one of the storage racks accessible from the outside. After machining in a machining center, the workpiece is put down again using a second PZN-plus centric gripper which was exchanged using the SCHUNK SWS quick-change system.



SCHUNK Service

Competent and skilled personnel ensure optimal availability of your SCHUNK products, and make sure that their value will be maintained.

Your advantage:

- Fast supply of original spare parts
- Reduction of down-times
- The complete spectrum of components from one source
- Quality and availability that can only be guaranteed by the original manufacturer
- 12-month warranty

Initial operation

- Professional assembly
- Fast and trouble-free

Inspection

- Inspection is carried out by skilled service engineers
- Avoiding unplanned failures of workholding and toolholding equipment

Maintenance

- Regular maintenance carried out by skilled service engineers
- Increasing and ensuring the availability of your workholding and tool-holding equipment

Repairs

- Short down-times due to fast intervention of the SCHUNK service engineers
- Spare parts and accessories

Training

- Fast and practical training
- Efficient use of your SCHUNK products by training of the operating personnel
- The basis for proper machining of workpieces
- Ensures longevity of your SCHUNK products

Individual service – for better results

- Hotline to our inside technical consultants weekdays from 7 a.m. to 6 p.m.
- Project-oriented and on-site technical advice at your location
- Training on innovations and SCHUNK products – across the world in our local subsidiaries

Online service – for a fast overview

All information in digital form, clearly structured and up-to-date on our website at www.schunk.com

- List of contact persons
- Online product search based on product descriptions
- Product news and trends
- Data sheets
- Order forms for easy and convenient ordering
- Free download area for pages from our product catalogs and technical data, for software and calculation programs for your gripping and rotary modules
- Free 2-D / 3-D CAD design models, provided in a wide range of different CAD formats – for easy integration into your design!

No. 1

Concentrated, safe holding on the front line.

852 minutes without a goal against him in the Champions League

681 minutes without a goal against him in the national team

2 intercepted penalties in the 2006 World Cup

1 headed goal as a goalie

0 defeats English Soccer Champion

and

More than **2,000,000** sold precision toolholders

About **1,000,000** delivered gripping modules

More than **100,000** lathe chucks and stationary workholding systems are in use worldwide

More than **16,000,000** sold standard chuck jaws

More than **75,000** implemented hydraulic expansion customer-specific solutions

Jens Lehmann, German goalkeeper legend,
brand ambassador of SCHUNK, the family-owned company, since 2012
www.gb.schunk.com/Lehmann

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