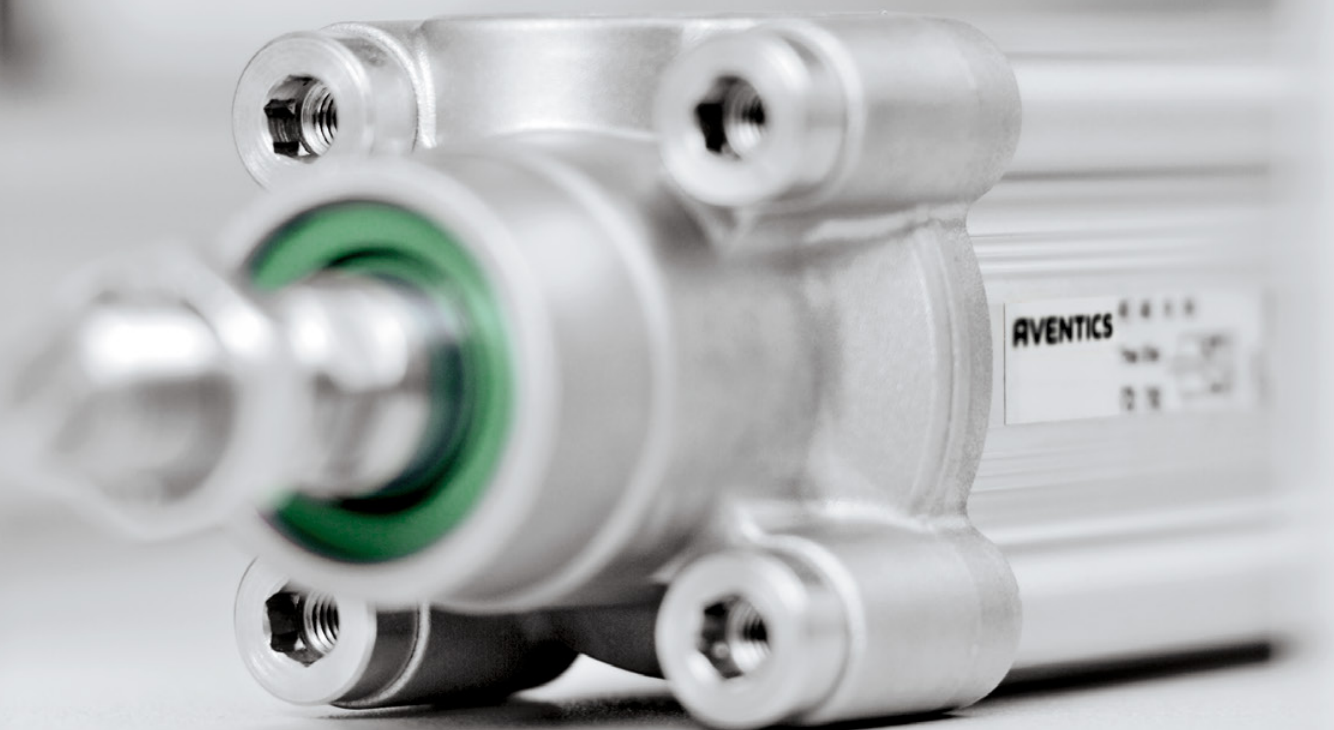
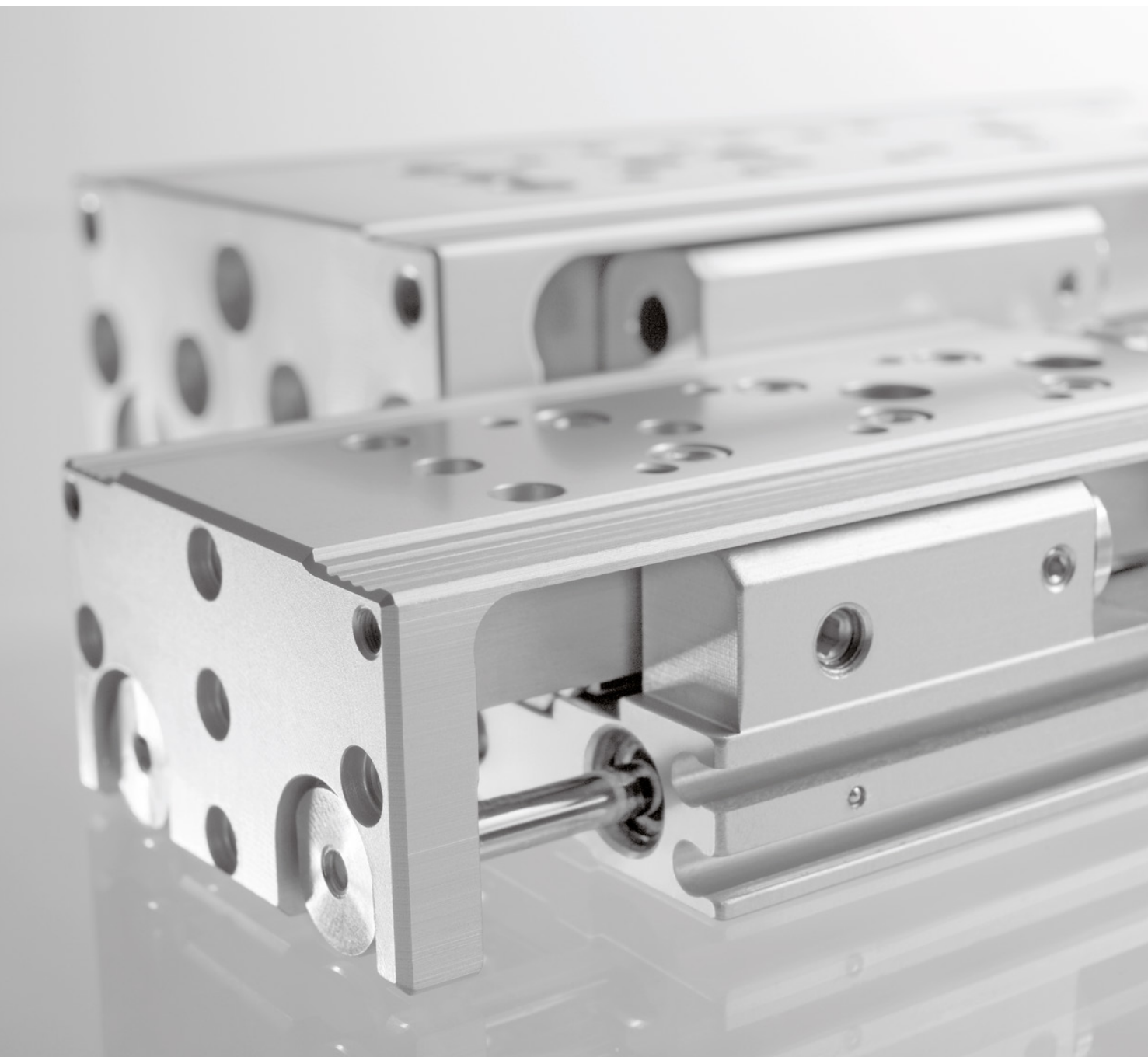


READY AT ANY TIME
AN OVERVIEW OF
PNEUMATIC CYLINDERS

Pneumatics
It's that easy





Everything you need

Today's cylinders must be perfect in every detail and be able to communicate in a variety of ways. Excellently equipped, both outside and inside: from the broad range of electronic and pneumatic connection technologies through the safe and precisely-controlled movements right up to reliable and exact sensors.

Competent and well-designed down to the last detail – application-oriented cylinder technology from AVENTICS

Our customers are demanding. They expect the highest performance from us and our solutions. And that is exactly what we want – because what our customers expect of us is what we expect of ourselves. That applies to all our services, as well as to every single element in our product range – right down to the last detail.

Perfection is our business

Our comprehensive range of perfected cylinder technology meets the demands of modern automation technology and offers suitable solutions for all applications, with all components reflecting our product philosophy of consistently high standards in quality and design.

- Functionality
- Modularity
- Quality and design

And whatever we do, the benefit for the customer is the focus of all our work – in advice and support, research and development, design and production. An absolute practice and solution orientation – but with an eye on trendsetting innovations that open up new possibilities. Function integration, component reduction, alternative materials management – those are just a few of the trends in modern product development that create future advantages and additional benefits that you can expect from AVENTICS as a global supplier of automation technology.

04 Product overview

- 06 Mini and round cylinders
 - 10 Short-stroke and compact cylinders
 - 14 Profile and tie rod cylinders
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 - 27 Customized solutions
 - 28 Cylinder accessories
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-

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The right cylinder solution for every application – perfectly matched to each other

Insight – overview – outlook

This brochure is a fundamental orientation aid for selecting suitable products and provides information on the main features and fields of application of the cylinders. A summary of the program at the end of the brochure serves as an introduction to our detailed catalog.

A comprehensive program with a clear platform strategy

The modern applications for pneumatic cylinders dictate the portfolio. A perfect cylinder has to be not only well designed, easy to integrate, strong, durable, and reliable, but also able to function both powerfully and sensitively and able to adapt to a wide variety of demands – it has to prove its high efficiency and cost-effectiveness day after day. Our product range of pneumatic cylinders meets these demands in every respect and is just as versatile as it is comprehensive.

Product group	Mini and round cylinders	Short-stroke and compact cylinders	Profile and tie rod cylinders
Size/piston diameter	Ø 8 – 100 mm	Ø 12 – 100 mm	Ø 32 – 320 mm
Industrienorm	ISO 6432	ISO 21287 ISO 15524	ISO 15552
Series	 MNI  RPC  CSL  ICM  ICS	 CCI  SSI  KHZ  KPZ	 PRA  TRB  ITS  ICL  CVI
Improved corrosion resistance	ICM, CSL, ICS		ICL
	Pages 6 – 9	Pages 10 – 13	Pages 14 – 17

With all options for specific tasks

The spectrum ranges from extremely compact cylinders for small handling applications to larger cylinders for the most powerful tasks, as well as rodless cylinders with guide slides for long strokes right up to ISO cylinders with a clean design.

- Cylinders with piston rods
- Rodless cylinders
- Handling technology

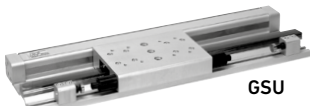
Cylinder selection made easy

With so many cylinder series on offer, there is one question: which cylinder is the right one for my specific task?

AVENTICS has the answer. Our experienced consultants are always on hand to answer your questions, and our latest Engineering Tool, the AVENTICS CylinderFinder, is available around the clock for basic considerations.

It's that easy!

Page 34

Rodless cylinders	Handling technology	Special cylinders	Accessories
Ø 16 – 80 mm	Ø 6 – 100 mm	Ø 6 – 640 mm	
 RTC  GSU  CKP  GPC  TWC  MSC  MSN  RCM  SWN  RDC  BCP, BCS, BCE  BCC  BCR  BRB ISO 15552 ISO 8139 Function units and shock absorbers  Cylinder and piston rod mountings  Sensors and accessories 			
Pages 18 – 21	Pages 22 – 25	Page 26	Pages 28 – 33

The mini range for maxi applications

Don't underestimate us! Ultra-compact integrated power and intelligence – our mini powerhouses. The continued trend towards product and component miniaturization creates an ever-growing number of applications for our tiny all-rounders. Round cylinders in our signature Clean design are the perfect solution for applications with the strictest hygienic requirements.

Ideal cylinders for small handling and food industry applications

Minimal dimensions are not the only feature that make mini and round cylinders the natural choice for small handling. Excellent precision, infinitely adjustable force control and a low net weight are just some of the added benefits for our users in a wide variety of industries.

Our hygienically designed round cylinders are always the first choice for applications that require optimal component cleaning or corrosion protection and heat resistance due to the use of aggressive media.



Series	MNI	RPC	ICM	CSL	ICS
Corrosion resistance	○	○	+	++	++
Temperature range	+	+	○	+	○
Variety of versions	○	+	○	++	○
ATEX	+	–	–	+	++
Easy to clean	○	○	+	++	++
++ Highly recommended + Recommended ○ Suitable – Not suitable					

Mini and round cylinders from AVENTICS – a wide variety of talents

The cylinder series cover the entire spectrum of applications

Mini and round cylinders from the different series in our program with their specific characteristics, strengths and properties are designed for special applications and industry solutions. The enormous breadth of our product range, including numerous versions, enable tailor-made solutions for specific applications.

MNI series (ISO 6432)

Our proven range of cylinders for general machine construction. This design is characterized by its robustness and long service life. A cylinder for users and developers who rely on the greatest efficiency.

RPC series

The round cylinders from the RPC series offer a wide variety of connection options. They are easy to clean and suitable for packaging applications in the food industry thanks to food-grade lubricants, in addition to standard applications.

ICM series (ISO 6432)

Mini cylinders from the ICM series offer high corrosion resistance and are a reliable, cost-efficient solution – even in harsh environments. The cylinder tube and piston rod are made of stainless steel, the cylinder covers are fashioned from a high-quality polymer.

CSL-RD series (ISO 6432)

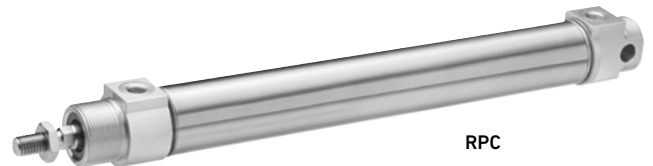
Round cylinder series CSL-RD Stainless Line, optionally in hygienic design or as an ISO version. The CSL-RD has a smooth profile and low surface roughness, and can be used with food-grade lubricants and sealings.

ICS series

The hygienic design of the ICS with smooth surfaces, interlocking seals and cushioning screws prevents dirt pockets from the outset and guarantees optimum cleaning conditions.



MNI



RPC



ICM



CSL

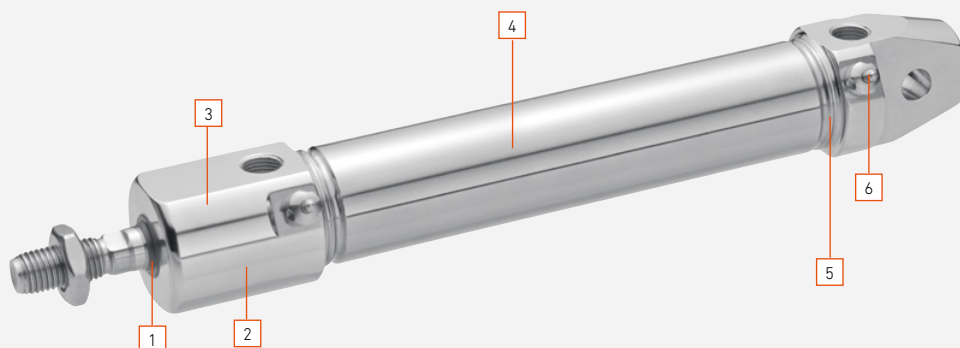


ICS

Overview of variants – basic versions and optional equipment

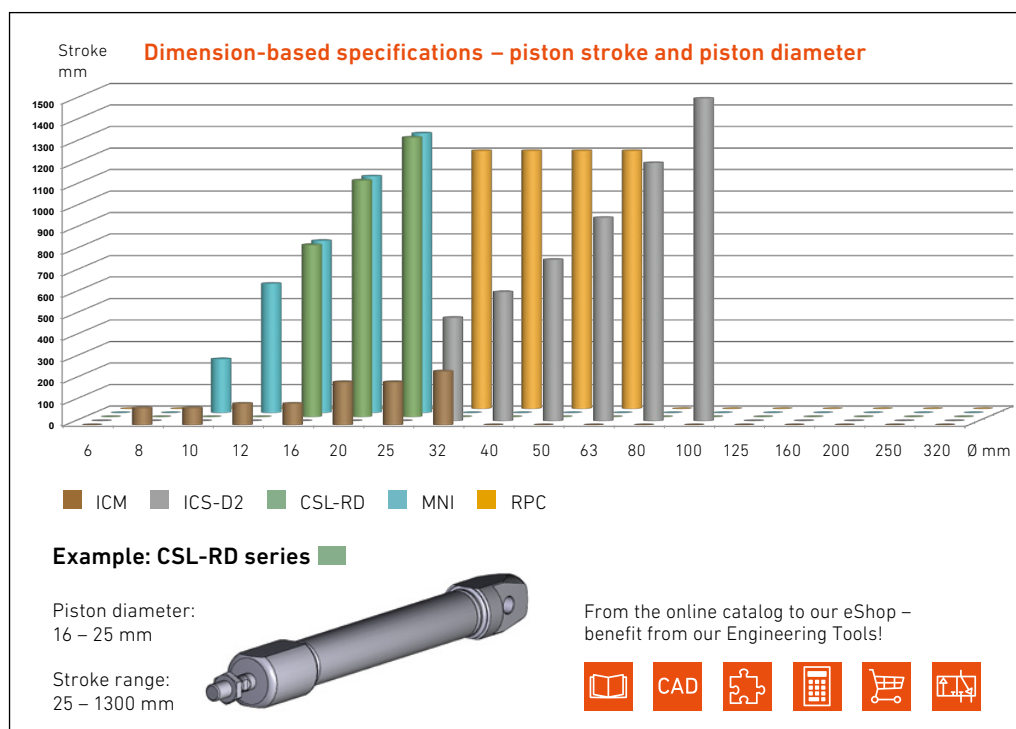
Stainless steel mini cylinders: specialized in food industry applications

Example: CSL-RD hygienic design series, size Ø 20 mm



- 1 | Scraper without an undercut for FRE variant: no possibility for dirt to accumulate, FDA-compliant in accordance with 21 CFR 177.2600
- 2 | Plastic bearing bush: PEEK high-performance plastic, smooth running, long service life
- 3 | Smooth surfaces: stainless steel AISI 304, especially smooth surfaces thanks to electropolishing ($R_a < 0.6 \mu\text{m}$)

- 4 | Grease for food applications: NSF H1-registered, FDA-compliant in accordance with 21 CFR 178.3570
- 5 | Clean tube/cover connection: optimized rolling geometry, sharp edges/nuts are avoided
- 6 | Cushioning screw: cushioning energy up to 2.7 J at 2 m/s, precisely adjustable via 2.5 mm hexagon head for all diameters



Series

Version

- With elastic cushioning

- With pneumatic cushioning



Heat-resistant up to

ISO

Installation standard ISO 6432



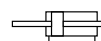
Stainless steel (POM)



Single-acting



Piston rod extension



Through piston rod



ATEX zone 1/21 cat. 2G/D



Food-grade grease NSF-H1



Hygienic design



Short type



Adjusted cushioning



Distance measuring system



Rotated end covers



- Adjusted cushioning for fast commissioning. With the adjusted cushioning version, AVENTICS offers a powerful alternative to the standard version. The cushioning is adjusted to the majority of all applications, saving users the time required for the fine adjustment of the cylinder.
- Sensor holders enable easy, secure mounting. Very lightweight and durable plastic prevents slipping and holds up against conventional industrial cleaners. Use with ST4 and ST6 series sensors.

MNI		RPC		CSL-RD		ICM		ICS	
With magnetic piston	Without magnetic piston	With magnetic piston	Without magnetic piston	With magnetic piston	Without magnetic piston	With magnetic piston	Without magnetic piston	With magnetic piston	Without magnetic piston
120 °C	120 °C	150 °C	150 °C	80 °C	120 °C	120 °C	120 °C	70 °C	70 °C
✓	✓	✓	✓	–	–	✓	✓	✓	–
–	–	–	–	–	–	✓	✓	✓	✓
✓	–	✓	–	(✓)	–	✓	✓	–	✓
✓	✓	✓	✓	✓	✓	✓	✓	(✓)	(✓)
✓	(✓)	✓	(✓)	–	–	(✓)	(✓)	–	–
✓	✓	✓	✓	–	–	✓	✓	–	–
–	–	–	–	✓	✓	✓	✓	✓	✓
–	–	–	–	–	–	✓	✓	–	–
–	–	–	–	✓	–	✓	(✓)	–	–
–	–	–	–	–	–	✓	–	–	–
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–	–	–	–	(✓)	(✓)	–	–	✓	✓

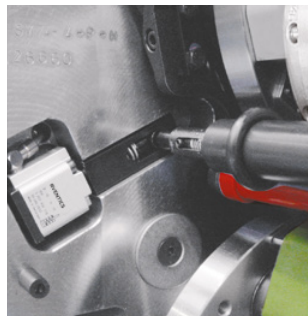
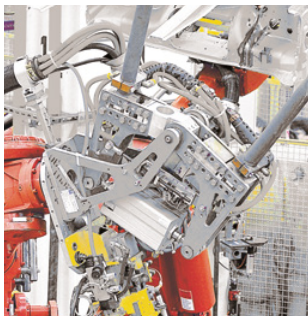
When things get tight, our compacts come out strong

They get very little room to work, but have to move a lot in the tightest spaces. Do a lot with very little – those are the ideal specifications for the use of our miniature power packs. In the strictest sense of the word you can say here: less is more.

Save where you can!

There is always room for compact AVENTICS cylinders. Save on installation space and costs during the design phase, because our short-stroke and compact cylinder series make it easy to come up with cost-efficient machine constructions. And all that without having to compromise on precision, reliability and innovative technology.

The products from our sophisticated program are backed by the experience from many years of cooperation with users in our core industries. They help to save without making compromises. The comprehensive program with large stroke ranges and piston diameters makes the use of our cylinder series the logical choice in practically any machine environment.



Series	CCI	SSI	KPZ	KHZ
Compactness	+	++	+	++
Variety of versions	++	+	++	+
Standard	ISO 21287	ISO 15524	NFE 49004	none
Diameter range	+	++	+	++
Stroke range	++	+	++	+
Sensor installation	++	++	++	+
Mounting options	++	+	++	○

++ Highly recommended + Recommended ○ Suitable – Not suitable

Short-stroke and compact cylinders from AVENTICS

Concentrated power in a minimum of space

With three different product standards in sizes from 8 mm to 100 mm piston diameter in a very wide range of variants, our short-stroke and compact cylinder program is one of the largest and most varied on the market worldwide. Suitable for strokes from 4 mm. Each series also offers non-rotating versions with a mounted front plate.

CCI series (ISO 21287)

CCI means: innovative, compact construction and an easy-to-clean design. The Internet configurator offers a wide range of variants and design details. For example, non-rotating, with a front plate or in an ATEX version. The CCI is also available in a US version. It is ideal for long strokes and increased requirements for optimized cycle times and moving masses. The sensors can be installed quickly and easily on all sides and over the entire stroke range.



CCI, non-rotating



CCI with sensor

SSI series (ISO 21287)

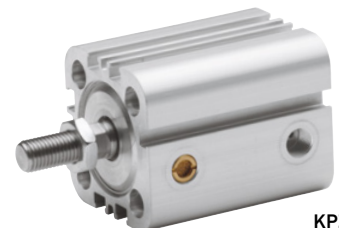
SSI – the short stroke cylinder in accordance with the latest ISO standard 15524. The cylinders are particularly compact and up to 30% lighter than comparable cylinders thanks to weight-optimized profiles and fewer components. In addition, they provide a high degree of flexibility in sensor assembly and extremely effective elastic cushioning.



SSI

KPZ series (NFE 49004)

Series KPZ compact cylinders offer a wide variety of variants. They can be used very flexibly and are suitable for a multitude of applications thanks to their sizing based on the widely used standard NFE 49 004.



KPZ

KHZ series

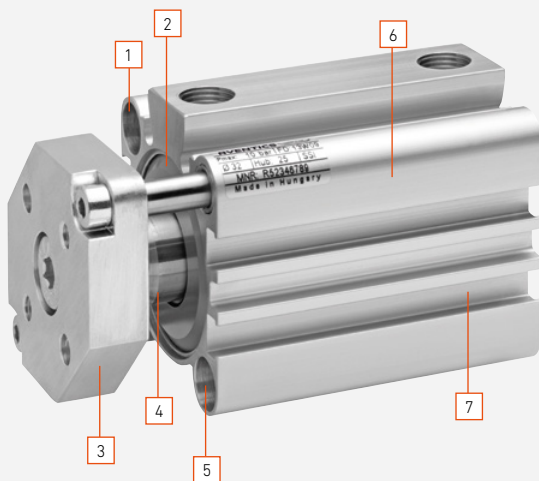
The non-standard short-stroke cylinders in the KHZ series are available from a piston diameter of 8 mm. They are ideal for tight installation spaces and ensure easy, safe integration in machinery.



KHZ

Overview of variants – basic versions and optional equipment

**Lightweight, fine-tuned details,
easy-to-mount and highly compatible:
Example: SSI series with front plate, size Ø 20 mm**



- 1 | Compatible: complying with standards and compatible with many existing applications on the market
- 2 | Low noise and vibrations: up to 60% better cushioning properties than comparable products as standard
- 3 | Variations: configurator, intermediate strokes, many variants and analog distance measurement available
- 4 | Easy mounting: hex flats
- 5 | Easy mounting: universal mounting concept with 4 mounting options for all diameters
- 6 | Lightweight: up to 30% lighter than comparable products due to material-optimized profile
- 7 | Space-saving: fully insertable, direct drop-in sensors, customized intermediate stroke lengths without spacer disks



Series

Version

- Double-acting

- Non-rotating, with front plate



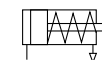
Heat-resistant up to

ISO

Installation standard



Elastic cushioning

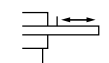


Single-acting

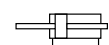


internal thread

external thread



Piston rod extension



Through piston rod



Optional stroke length



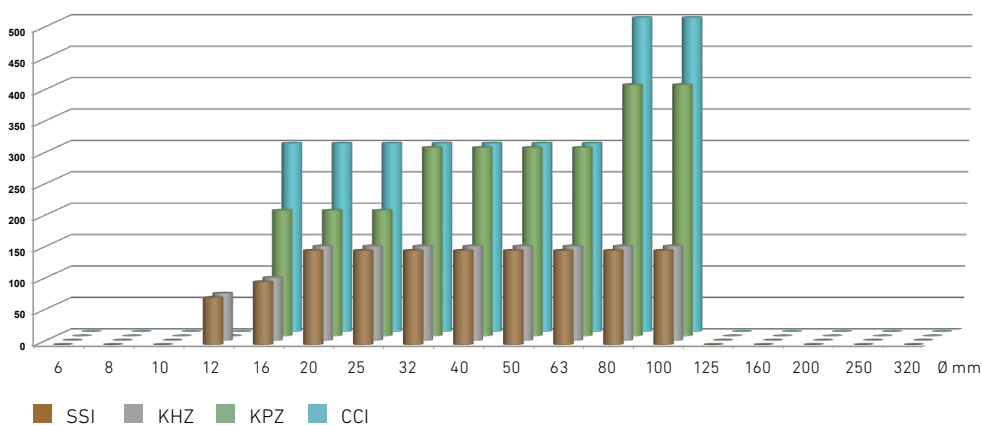
ATEX zone 1/21 cat. 2G/D



Distance measuring system

Stroke
mm

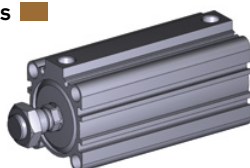
Dimension-based specifications – piston stroke and piston diameter



Example: SSI series

Piston diameter:
12 – 100 mm

Stroke range:
75 – 150 mm



From the online catalog to our eShop –
benefit from our Engineering Tools!



- SSI series: With the flush sitting sensors in the cylinder profiles, the entire sensor program for 4 mm and 6 mm slots can be combined with any cylinder diameter. SM6, ST6, ST4 series



	CCI		SSI			KPZ		KHZ			
	With magnetic piston		With magnetic piston		Without magnetic piston	With magnetic piston		With magnetic piston		Without magnetic piston	
	120 °C	120 °C	80 °C	80 °C	80 °C	120 °C	120 °C	80 °C	80 °C	80 °C	80 °C
	ISO 21287		ISO 15524			-	-	-	-	-	-
	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	✓	-	✓	-	-	✓	-	✓	-	✓	-
	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	✓	✓	✓	-	✓	✓	-	✓	-	✓	-
	✓	✓	✓	-	-	✓	✓	-	-	-	-
	✓	✓	✓	-	✓	✓	✓	-	-	-	-
	✓	(✓)	✓	✓	✓	✓	(✓)	-	-	-	-
	✓	-	-	-	-	✓	-	-	-	-	-
	✓	✓	✓	✓	-	✓	✓	-	-	-	-

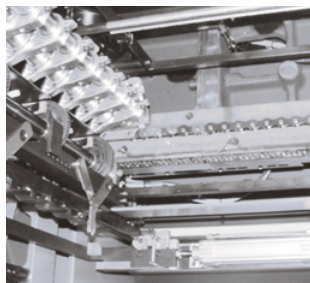
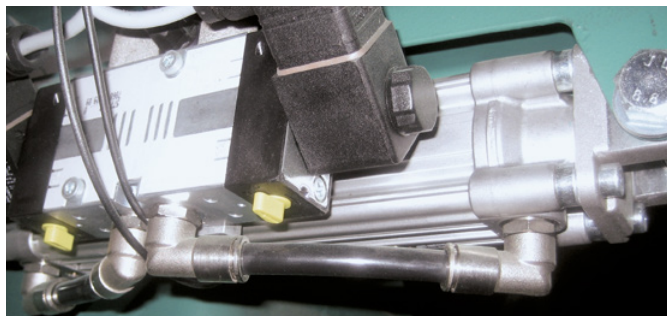
(✓) On request

Sturdy and reliable – quality for standard applications

Standardized to international norms and with an outstanding profile. Our profile and tie rod cylinders, in accordance with ISO-15552, have stood the test of decades of user-oriented practice and have established a firm position in professional pneumatics applications. Sturdy and reliable – and all that worldwide.

Universal solutions in numerous industries

With sizes from 32 mm to 320 mm piston diameter, the profile and tie rod cylinders in these series cover the entire range of applications. Our customers rely on the indestructible quality of our cylinder solutions in machine and system construction with tasks requiring high precision and regulated force, as well as in industries where enormous forces are needed.



- ▲ Cylinder valve units are especially suitable for decentralized applications in large-scale systems.
- ◀ Specific applications include wood and aluminum, steel and automotive, heavy-duty machinery and mining industry, as well as machinery and system engineering.



Series	PRA	TRB	ITS	ICL
Resistance	○	○	+	++
Easy to clean	○	○	○	++
Compactness	++	○	○	+
Variety of versions	+	++	+	○
Configurability	++	++	++	++
Temperature resistance	++	++	++	○

++ Highly recommended + Recommended ○ Suitable – Not suitable

ISO cylinders with tie rods and profiles

Standardized classic

Innumerable design variants and sizes in the different cylinder series make it easy for the user to select the most suitable cylinder solutions for his specific application. The broad range of cylinders allows the cylinders to be specifically chosen, not only the basis of function and quality, but also under strict cost considerations.

PRA series (ISO 15552)

The PRA cylinder program is based on a compactly designed profile with integrated sensor nuts. Thanks to incomparable pneumatic cushioning, it is no problem for the PRA cylinders to transform load into speed and strain into control.

TRB series (ISO 15552)

TRB cylinders are among the most frequently employed cylinders in the process industry, automotive industry, and wood processing industry. The series meets every wish for product variety, durability and adaptability to existing processes.

ITS series (ISO 15552)

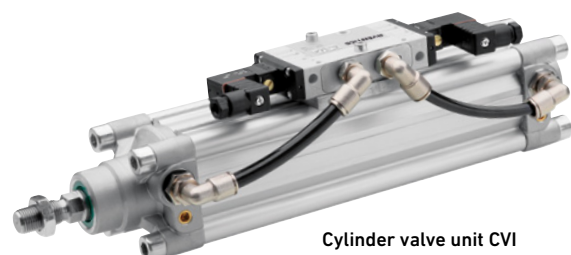
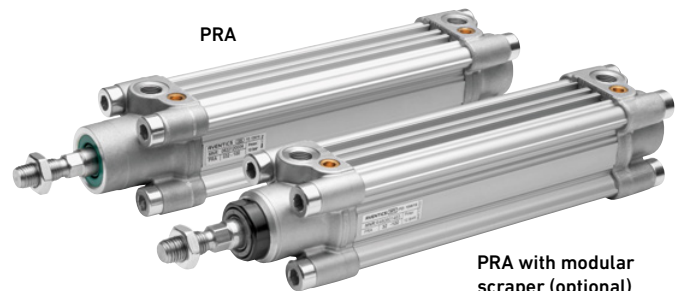
The cylinders in the ITS series are the "big brothers" of the TRB series cylinders. They are always specifically used when extremely large masses are involved that have to be moved efficiently and under control with the familiar ease of operation. Thanks to the versatility of the modular sealing system, the ITS can be optimally adapted to every application.

ICL series (ISO 15552)

This cylinder in clean design is produced specifically for packaging applications in the food industry. It is characterized by practical sensor mountings and its hygienic design that combines simple cleaning with low maintenance.

CVI series (ISO 15552)

Typical uses for the CVI series are open/close functions such as flap controls and spool applications. With two ISO cylinder series and five freely combinable valve series, you can custom-configure individual units online.



Large variety with perfect equipment details

Example: ITS series ISO cylinder, size Ø 250 mm



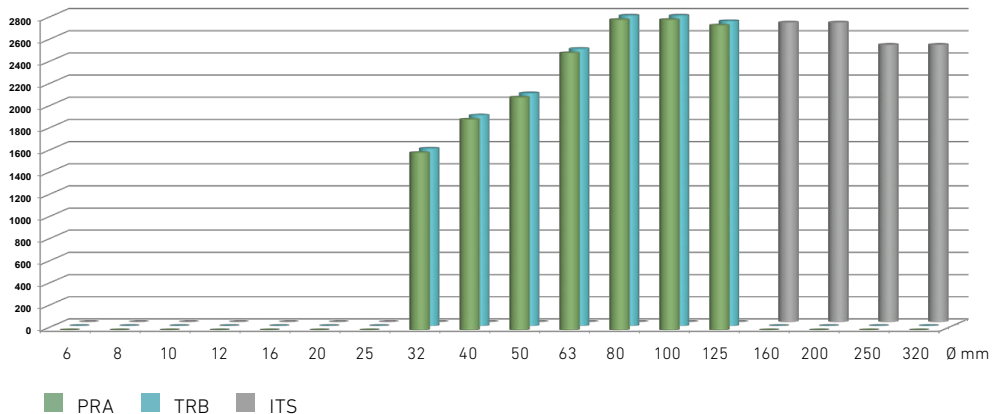
- 1 | Modular scraper
- 2 | Stainless steel piston rod as standard
- 3 | Material-optimized aluminum, die-cast or aluminum chill casting
- 4 | Elastic or pneumatic cushioning system
- 5 | Aluminum body, anodized
- 6 | Stainless steel tie rod as standard



▲ Adjustable pneumatic cushioning is critical for strong cylinder performance. Well-adjusted cushioning not only saves energy, but also reduces cycle times. Only a few turns of the screw are sufficient to ideally adjust the cushioning to the workpiece weight and the dynamics of the movement.

Stroke
mm

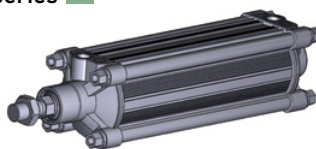
Dimension-based specifications – piston stroke and piston diameter



Example: PRA series

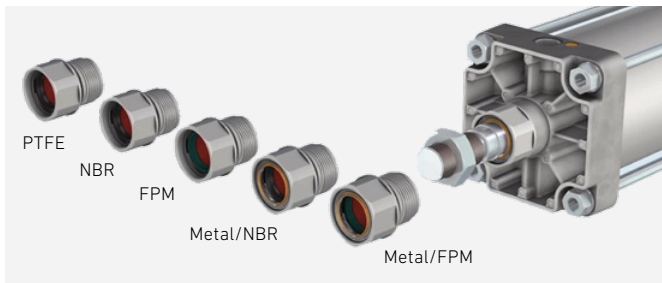
Piston diameter:
32 – 125 mm

Stroke range:
25 – 2800 mm



From the online catalog to our eShop – benefit from our Engineering Tools!





◀ The unique modular sealing system enables tailor-made solutions for specific applications and working environments that also function efficiently and minimize maintenance. In addition, the system permits an easy, fast exchange of scraper modules without needing to remove the cylinder. ITS series cylinders feature the modular sealing system as an integrated standard, a USP in the market. For the PRA and TRB series, the modular sealing system can be obtained as optional equipment.

Series	PRA/TRB				ITS			
	With magnetic piston		Without magnetic piston		With magnetic piston		Without magnetic piston	
- With elastic cushioning								
- With pneumatic cushioning								
Heat-resistant up to	120 °C	120 °C	150 °C	150 °C	120 °C	120 °C	150 °C	120 °C
Piston rod extension	✓	✓	✓	✓	✓	✓	✓	✓
Through piston rod	✓	✓	✓	✓	✓	✓	✓	✓
Modular scraper	✓	✓	✓	✓	✓	✓	✓	✓
Trunnion mounting	✓	✓	✓	✓	✓	✓	✓	✓
Smooth-running	PRA	PRA	TRB	TRB	—	—	—	—
Zone 21, category 2G/D* Zone 22, category 3G/D*	—	✓	—	—	✓	✓	✓	✓
	—	—	—	—	✓	✓	✓	✓
Rotated end covers	✓	✓	✓	✓	✓	✓	✓	✓
Holding unit/ dynamic brake	✓	✓	✓	✓	—	—	—	—
Holding unit	✓	✓	✓	✓	—	—	—	—
Distance measuring system	✓	✓	✓	✓	✓	✓	✓	✓
With mounted valve*	✓	✓	✓	✓	✓	✓	✓	✓

* Not for order in combination with heat-resistant version.

Precise guidance, large distances, enormous flexibility – and “Easy-2-Combine”

The ideal shuttle service: operates exactly as required. Quick, direct, without detours and always on time. The rodless cylinder concept impresses with absolute repetitive precision, functions highly dynamically with reliable accuracy and is thereby highly cost-effective.

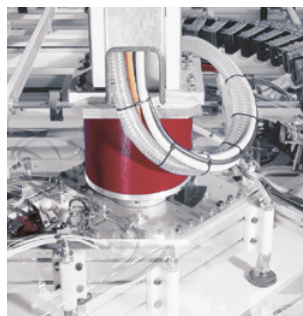
The basis for numerous handling applications

Thanks to their high functionality and drive force in a minimum of space and the wide range of sizes and design variants, the rodless cylinders and slide units are predestined for use as basic modules in handling technology. The great flexibility of the pneumatic connections and mechanical interfaces facilitates machine design and integration into existing configurations. Perfect function integration and practical details, such as size-optimized connections and ducts and optimized cushioning systems, are further guarantees of safe and reliable continuous operation.

The wide range of design variants with different connection options allow targeted use in automated handling technology in many industries.



Here, AVENTICS focuses on Easy-2-Combine interfaces that do not require transition plates and thus enable simplified machine designs.



Series	RTC-BV	RTC-CG	RTC-HD	CKP	GSU
Load capacity	○	+	++	++	+
Precision	–	+	+	++	++
Easy-2-Combine interface	–	++	++	++	++
Longer strokes	++	○	+	+	–
Stroke limitation with shock absorbers	○	++	++	++	++

++ Highly recommended + Recommended ○ Suitable – Less suitable

Rodless cylinders and slide units with perfect guidance

Precision and speed for long strokes

The rodless cylinders permit an optimum stroke length in relation to their size. This saves space and facilitates machine design. The application range covers piston diameters from 16 mm to 80 mm and stroke lengths up to 9,900 mm. A wide speed range of 0.05 m/s to 5 m/s can be achieved with extremely high repetitive precision.

RTC series

The compact form and unique properties of the RTC series open up completely new application possibilities. Compared with a round piston, the oval piston can withstand higher loads and torques. The slide and piston as a single unit mean high load capacity and reliability. High load capacity with small cylinder dimensions enables a simplified and compact machine design. The RTC series program is based on three variants with different key strengths. For large loads, very precise movement and positioning and a wide range of speeds. Stroke lengths and porting available in metric and inch dimensions.

CKP series

CKP series cylinders are particularly suitable for moving heavy loads in machine environments with limited space. They are equipped with integrated pneumatic cushioning and ensure extremely precise, sturdy guidance with high repetitive precision.

GSU series

This high-performance slide unit forms a sturdy basis for a large number of handling applications. The stroke length and position can be set variably over the entire length of the slide unit – individually from both sides, further underlining the enormous flexibility for installation. The very low overall height and an option for ventilation and exhaust on one side further expand the integration possibilities.



RTC-BV



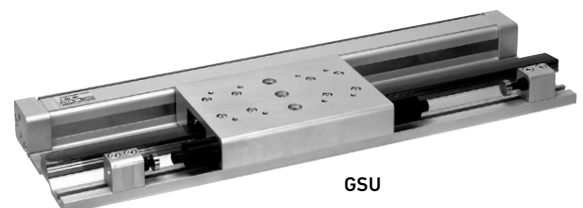
RTC-CG



RTC-HD



CKP



GSU

Overview of variants – basic versions and equipment details

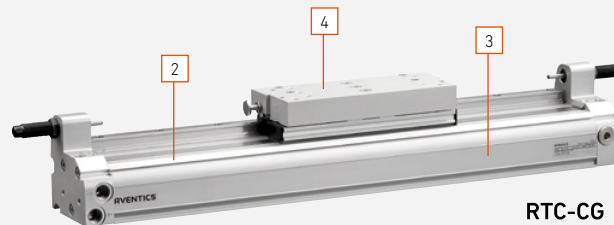
Example: RTC series

**Complete product range for numerous tasks
and special applications**

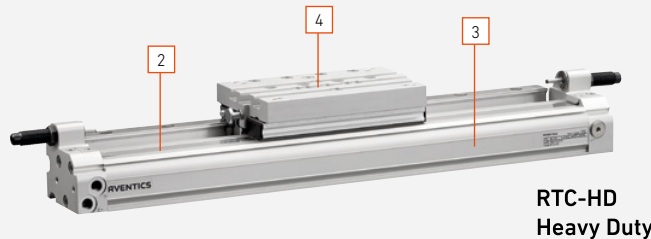
- 1 | High-tech sealing and lubrication for a wide range of speeds with best-in-class tightness, long service life and high reliability
- 2 | One-piece slide and pistons: increased strength, reduced installation space
- 3 | Oval pistons: an oval piston design permits unusually high loads and bending moments, as well as an even compacter machine design
- 4 | Easy-2-Combine interface: simplified machine design and reduced mounting effort saves time and money



**RTC-BV
Basic Version**

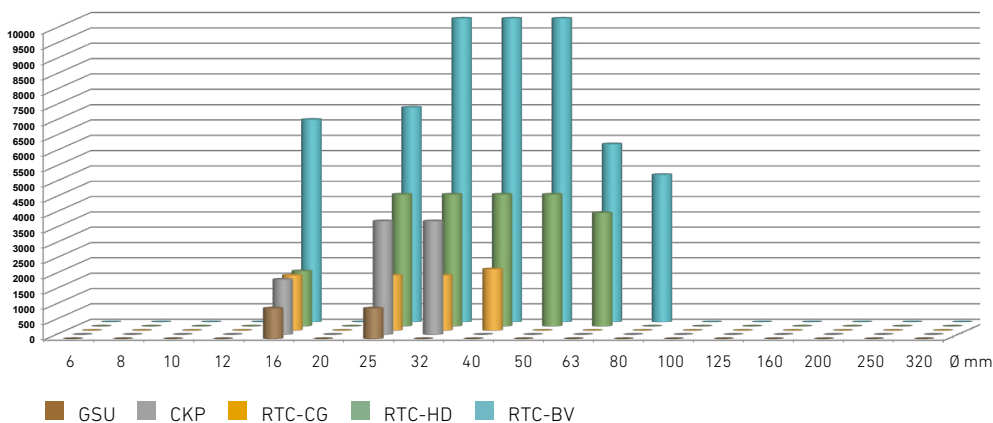


**RTC-CG
Compact Guide**



**RTC-HD
Heavy Duty**

Dimension-based specifications – piston stroke and piston diameter



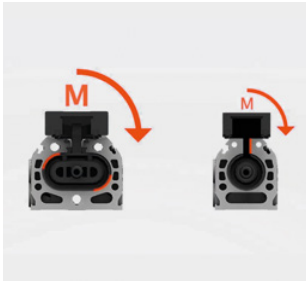
Example: RTC-HD series

Piston diameter: 16 – 63 mm Stroke range: 200 – 4300 mm

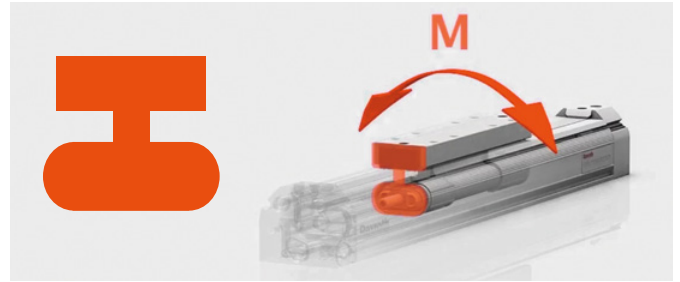


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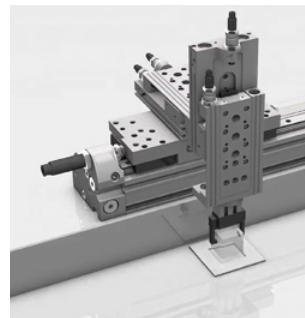




- ◀ Oval piston provides an optimal distribution of transverse forces. Permanently connected to the slide, the oval piston can withstand higher loads and moments than the round piston. Users achieve the same performance with far more compact cylinders, which cuts down on weight and costs.



- ◀ Adjustable stroke limitation can be used to fix a variable stroke length and position over the entire stroke range. Adjustments can be easily made using different shock absorbers without special tools.



- ◀ Standardized Easy-2-Combine interfaces make it possible to integrate the guided slide units into multi-axis systems without additional connection plates. This simplifies machine design and construction, and saves time and money.

Series	RTC-BV	RTC-CG	RTC-HD	CKP	GSU
Version	With magnetic piston			With magnetic piston	With magnetic piston
- With pneumatic cushioning					
- With hydraulic cushioning					
Adjustable cushioning	✓	✓	✓	✓	-
Oval piston	✓	✓	✓	✓	✓
Ball rail guide	-	✓	✓	✓	✓
Adjustable stroke limitation	-	✓	✓	✓	✓
Easy-2-Combine interface	-	✓	✓	✓	✓

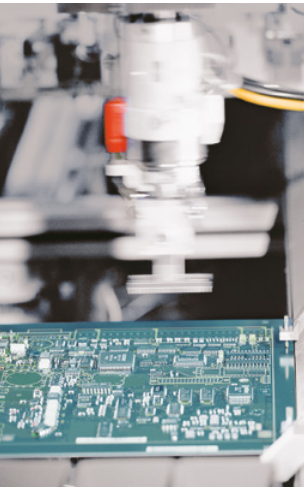
We are the guide for handling technology

Turning and driving – no more, no less. And all from a single source. AVENTICS. We not only guide objects and workpieces exactly into their positions with our components and complete solutions – we have also established a leading position for ourselves as providers of handling technology.

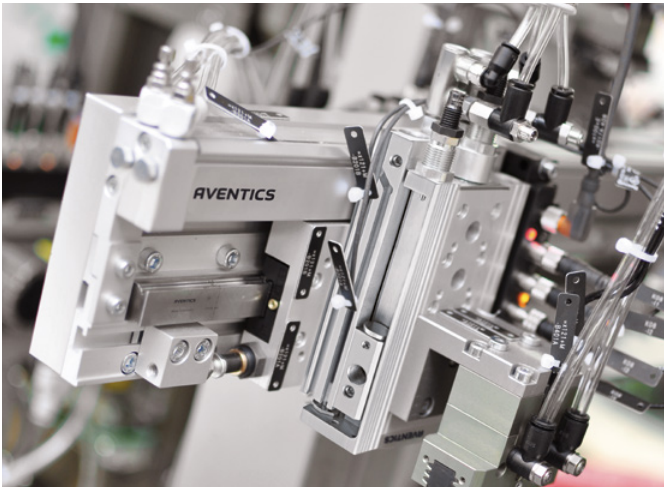
Great solutions for small handling

Adequate solutions for practically all conceivable functions in handling technology can be found in AVENTICS comprehensive pneumatics program. Finely-tuned components and elements that perfectly fit together thanks to this consistent product philosophy, combined with sophisticated sensor technology for high precision, make these pneumatic solutions perfect. Modularity and ease of installation of the individual components are always key features of our product offerings in addition to pure functionality. Easy-2-Combine with the online configurator – it pays off!

- Assembly and handling
- Electronics industry
- Semiconductor production



◀ In addition to rotary modules and guide components, AVENTICS also offers the appropriate valve technology for optimum solutions.



Series	GPC	TWC	MSC	MSN
Compactness	–	+	++	++
Load capacity	○	○	++	–
Precision	+	○	++	++
Easy-2-Combine	+	–	++	++
Cushioning capacity	+	–	++	–
Stroke range	+	+	+	–
Stroke limitation	○	–	++	–
++ Highly recommended + Recommended ○ Suitable – Less suitable				

Components for moving and positioning

Handling technology from a single source

Rotary drives and modules, mini slides, guide units, compact and rodless cylinders – the program offers the right components for a full range of applications.

GPC series

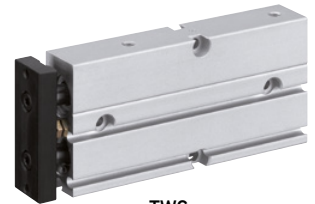
The GPC series sets itself apart with high side load capacities and torsion protection. The robust, precise drive and guide absorb high torques and transverse forces.



GPC

TWC series

Double pistons make the TWC extremely powerful. At the same time, they ensure torsion protection and increase the load capacity of the cylinder with minimum piston rod play.



TWC

MSC series

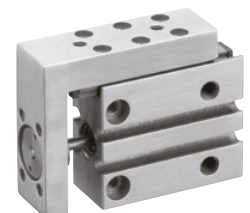
The mini slides from the MSC series have a compact design, require little installation space and reliably ensure the necessary dynamics in the system. They provide maximum rigidity for high torques and loads and feature particularly gentle operation thanks to a unique cushioning system. Air supply options from three sides ensure maximum flexibility when installing the system and variable stroke adjustment enables different strokes within the individual sizes.



MSC

MSN series

The mini slides offer a precise guide without play in a slim package. Thanks to an especially wide variety of mounting and air supply options, they can be used in virtually any position and location.



MSN

RCM series

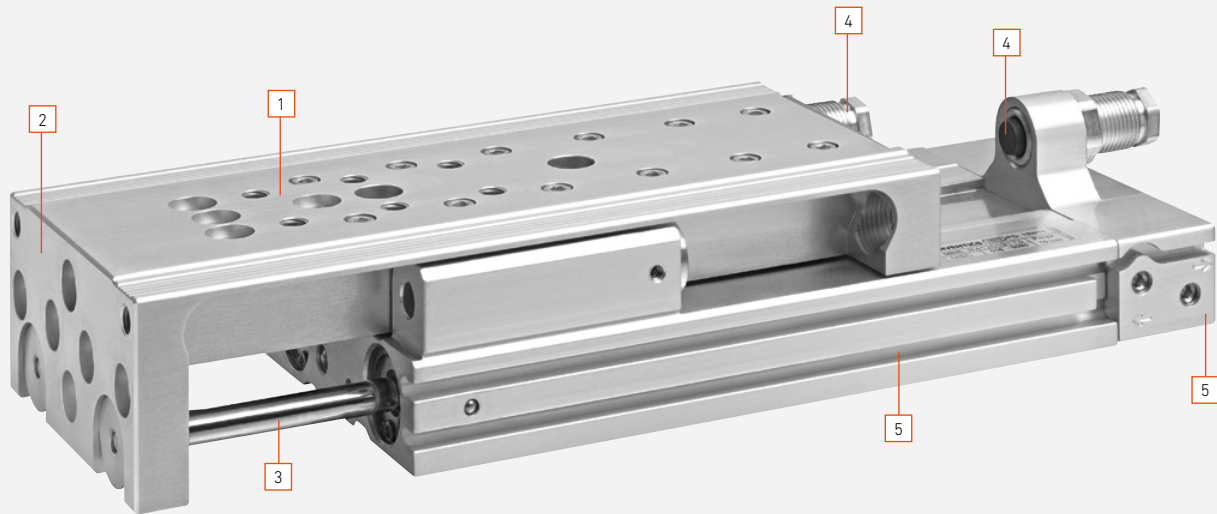
Practically all standardized rotary and swivel movements can be performed with the rotary modules in the RCM series. These modules can be installed directly on mini slides and equipped with mechanical grippers.



RCM

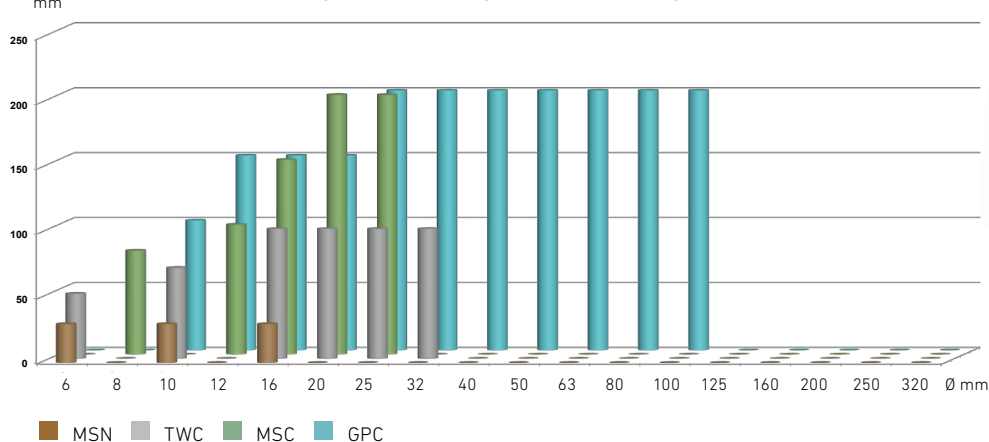
Overview of variants – basic versions and optional equipment

Mini slides from the new-generation MSC series offer the highest standards paired with highly flexible equipment options.



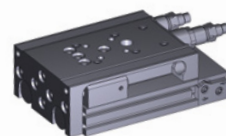
- 1 | Maximum rigidity: The pre-tensioned guide system without play and one-piece slide table offers maximum stability and reliable precision with minimal tolerance values.
- 2 | Compact and strong: Optimal load bearing capacity, drive force and functionality within a small cross-section enable especially compact machine designs.
- 3 | Maximized payload: The symmetrically operating double-piston system of the guide unit offers maximum load bearing capacity. The MSC can be equipped with one or two pistons.
- 4 | Low-maintenance cushioning: Integrated pneumatic cushioning for the same long service life and the same maintenance intervals as the piston drive. The hydraulic shock absorbers can be replaced without resetting the stroke, which minimizes machine downtimes. The elastic cushioning elements are maintenance-free.
- 5 | Functional design: Sensors, stroke settings and air connections can be installed on both sides. This allows optimal adjustment to the installation situation in the machine.

Stroke mm **Dimension-based specifications – piston stroke and piston diameter**



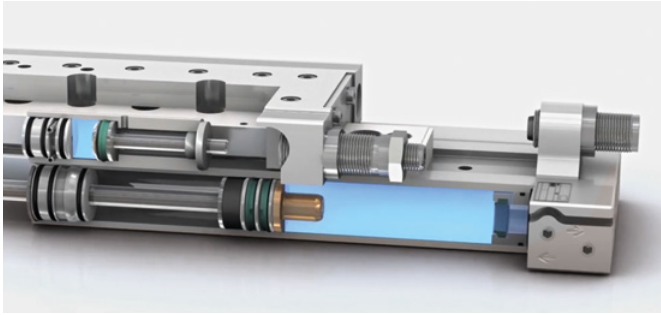
Example: MSC series

Piston diameter: 8 – 25 mm Stroke range: 10 – 200 mm

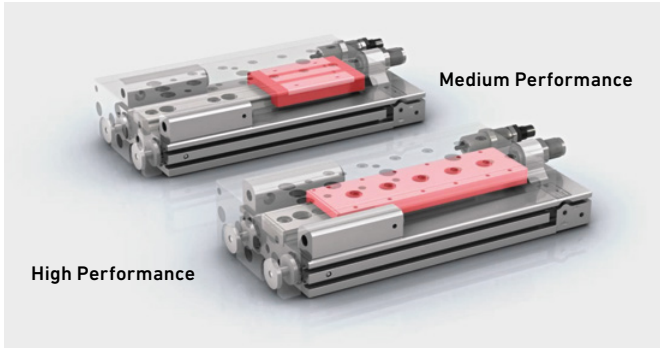


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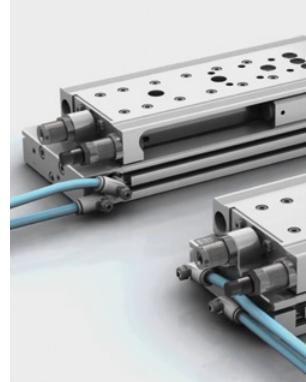




◀ The guided slide units offer several cushioning options. Pneumatic cushioning provides a new, unique option that, in addition to the elastic cushioning elements and hydraulic shock absorbers, ensures especially gentle operation.



▲ The integrated guide unit is available in the quality standards "medium performance" and "high performance", which differ in terms of precision, rigidity, and load bearing capacity.



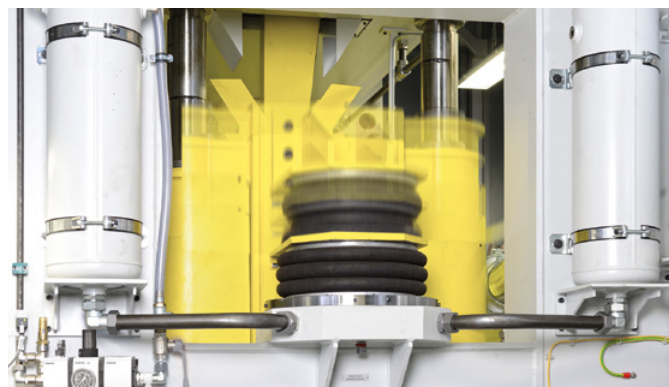
◀ Depending on the mounting situation, end plates with different air connections can be used. Connections from three sides or in the compact version with connections only at the rear.

Series	MSN	MSC	GPC-BV	GPC-E	TWC	RCM
Version	With magnetic piston	With magnetic piston	With magnetic piston		With magnetic piston	With magnetic piston
- With elastic cushioning	✓	✓	✓		✓	✓
- With pneumatic cushioning			✓			
- With hydraulic cushioning		✓		✓		✓
 Number of pistons	1	1 or 2	2	1	1	2
 Ball rail guide	✓	✓	✓	-	-	-
 High-performance ball rail guide	-	✓	✓	-	-	-
 Slide bearing	-	-	-	✓	✓	-
 Ball bearing	-	-	-	✓	✓	-
 Easy-2-Combine interface	✓	✓	✓	✓	✓	-

Special cylinders for special applications

Bellow actuators – BCP, BCC, BCE, BCS, BCR, BRB series

AVENTICS offers six series of bellow actuators. The various designs, equipment, and materials mean that each series is predestined for specific tasks. All bellow actuators permit high forces in small installation spaces. They operate practically without wear or the need for maintenance.

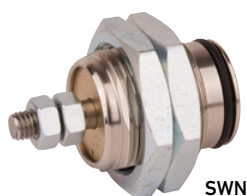


SWN series screw-in cylinders

The cylinders in the SWN series can be easily installed without further accessories. Thanks to a thread integrated directly into the cylinder body, they can be installed in their working environment without taking up space.

RDC series flexible diaphragm cylinders

Thanks to their low friction, the RDC cylinders can be actuated at low pressure. These cylinders permit precise balancing of forces, particularly in finely-tuned systems.



SWN



RDC

BCP



BCC



BCE and BCS



BRB



BCR



When you need a highly specialized solution: tailor-made cylinders and components

Customized solutions

Our special departments develop customized solutions with functions that are tailored to specific applications. This can include newly designed cylinders or slightly but vitally modified components from the standard cylinder program. Contact our experts! They have know-how from decades of individual design and development work. If there's an individual solution for your application, we'll find it.

- Task analysis and function definition
- Application-specific configuration
- Punctual delivery and installation
- Test run with function optimization

Rely on our competence from the outset! From the first discussion, the search for a solution, building of prototypes through the test phases, right up to series production of your individual pneumatics solution.

- Modification of standard components
- Combining different functions in a single product
- Product development with additional specifications



▲ Square today, round tomorrow.
Tailor-made products are the icing on the cake



▶ Cylinder with modified piston rods, specially designed profiles, materials and additional functions

The right accessories for all operating conditions and machine environments

They are unimposing but essential. They simply belong there: the right accessories for the job. AVENTICS has always attached great importance to having an extensive program of accessories in order to ideally meet the needs of the most varied applications.

We've thought of everything!

Whether it's a secure cylinder mounting, simple piston rod nut, or plain sensor bracket – the importance of these small parts only becomes apparent when they are missing or don't fit. That is no problem for AVENTICS customers.

- Exactly matched to the product program
- Mountings complying with ISO standard
- Best material and manufacturing quality
- Delivery units configured exactly to the product

Accessories are an integral part of the scope of supply and have the same high quality as the entire product range. Practical experience from decades of user-oriented work has also gone into perfecting product accessories. This is a precondition and guarantee for efficient and generally trouble-free continuous operation of machines and systems.

Cylinder rod mountings CM1 series

Bolts, flange mountings, foot mountings, clevis mountings, rear eyes, bearing blocks, nuts for cylinder rod mountings, trunnion mountings, intermediate flanges.



Piston rod mountings CM2 series

Compensating couplings, rod clevises, ball eye rod ends, piston rod extensions, nuts for piston rod mountings.



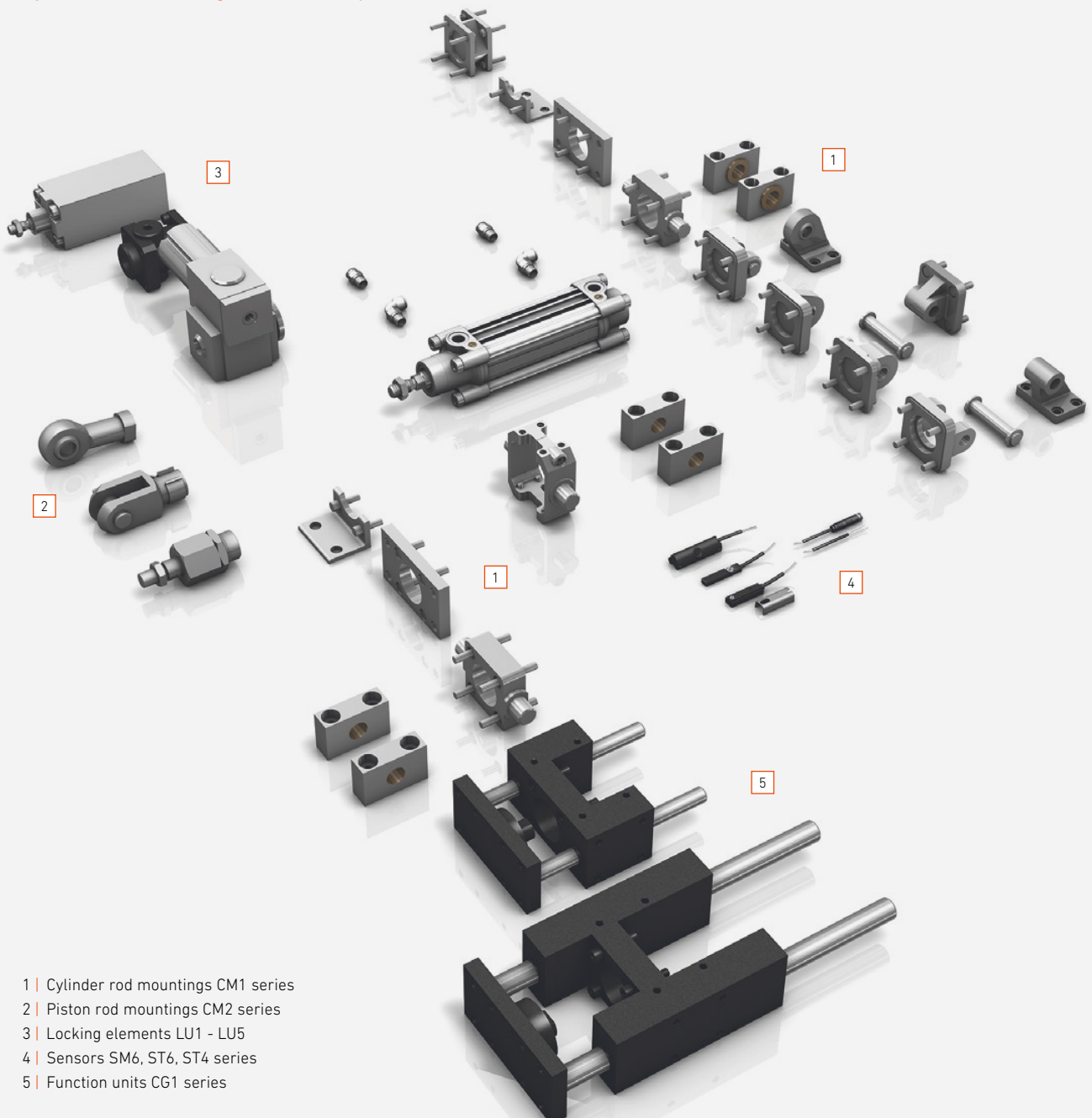
Function units CG1 series



Shock absorbers SA1, SA2, 370 series



Example: accessories range for the PRA cylinder series

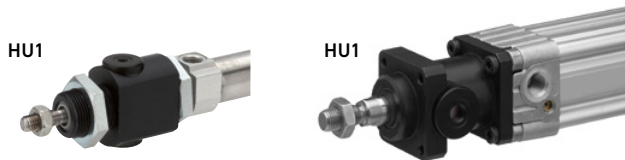


- 1 | Cylinder rod mountings CM1 series
- 2 | Piston rod mountings CM2 series
- 3 | Locking elements LU1 - LU5
- 4 | Sensors SM6, ST6, ST4 series
- 5 | Function units CG1 series

Holding, locking, braking – non-stop machine safety

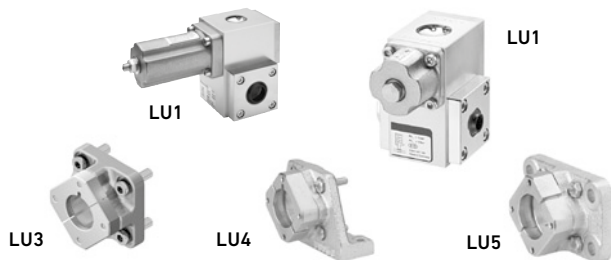
Holding unit HU1

Holds piston rods using spring force. Mounting to cylinder via a corresponding adapter. Holding cartridge can be exchanged in case of wear.



Locking unit LU1 - LU5

Eccentric movement holds the piston rod in any position. Flange mounting to cylinder.



LU6 locking unit/dynamic brake

The LU6 is a mechanical locking unit/brake for piston rods in pneumatic cylinders according to ISO 15552 or comparable round bars. It is a safety component in accordance with the Machinery Directive 2006/42/EC (CE mark) and can be used in safety-relevant controls. When used in category 2 to 4 controls with a higher performance level, further mechanical control measures are required in accordance with DIN EN ISO 13849-1.



- Prevention of hazardous movement (cat. 1 up to max. PL c, "proven component")
- Secure hold in upper end position through clamping and one-sided pressurization (cat. 4 up to max. PL e)
- Interruption of a hazardous movement (emergency stop)
- High B_{10d} dynamic braking values: 2 million cycles
- High B_{10d} static holding values: 5 million cycles
- Optional function query on LU6 by IN1 sensor

Detailed information on the topic of machine safety can be found on our homepage.

www.aventics.com/en/machine-safety/



▲ Holding unit, series LU6, holding force up to 12,000 N

Modular sealing system – even more process efficiency

More flexibility, better sealing quality, longer service life, lower costs

Whether it's just loose dirt or sticky fluids, or stubborn hard materials that cling to the piston rod – scrapers on the modular sealing system adapt to your application, no matter the requirements.

- For series PRA and TRB: cylinder versions with a specific selection of scrapers (optional)
- For series ITS: choice of scrapers as a standard feature

You are free to decide which scrapers mean the greatest benefits for your application and industry. You can even implement a different scraper model with the same cylinder if your needs change.

- Effective scraping, longer service life
- Protected piston rod seal
- Easy exchange, low-maintenance
- Application-specific scraper technology
- Excellent flexibility thanks to a modular concept



Modular scraper for series PRA/TRB and ITS cylinders

Five scrapers modules are available for each of the cylinder series. They are available separately as spare parts with fully installed seals and bushings and can be exchanged at any time, quickly and easily, without removing the cylinder.

Modular scrapers for ITS

Modular scrapers for PRA/TRB



Ø 32 – 40 mm Ø 50 – 125 mm



Ø 160 – 320 mm

Cylinders	Series PRA/TRB, Ø 32 to Ø 125 mm					Series ITS, Ø 160 to Ø 320 mm				
Modular scrapers	NBR/PEE	NBR/PTFE	FKM/PTFE	PUR/metal	FKM/metal	NBR	FKM	PUR/metal	FKM/metal	PTFE
Seal	NBR	NBR	FKM	PUR	FKM	NBR	FKM	PUR	FKM	PTFE
Scraper 1	PEE	PTFE	PTFE	FKM	FKM	NBR	FKM	PUR	FKM	PTFE
Scraper 2				metal	metal			metal	metal	
Temperature resistance	-20 to +80 °C	-20 to +80 °C	-10 to +150 °C	-20 to +80 °C	-10 to +150 °C	-20 to +80 °C	-10 to +150 °C	-40 to +80 °C	-10 to +150 °C	-10 to +150 °C
General industry										
Woodworking industry										
Steel industry										
Paper/printing industry										
Textile industry, food industry										
chemical industry										

NBR = acrylonitrile butadiene rubber, PTFE = polytetrafluoroethylene, FKM = fluorocarbon rubber, PU = polyurethane, PEE = polyester elastomer, Metall = brass

Our sensor technology for pneumatic cylinders

Matching sensors for all cylinders including accessories

In addition to high-precision measurements, excellent flexibility during mounting and adjustment are also required to meet varied demands.

- Sensors with cable connection, push-in fitting, M8 plug with knurled screw, contactless, in an ATEX version
- Sensor solutions for all AVENTICS cylinder series
- Mountings, cable holders, connecting cables, angled connector

ST4 /ST4-2P series

Sensors for 4-mm slots offer high-tech in the tightest space and are always the right choice when every millimeter counts – ideal for pneumatic actuators in small handling.



ST6 series

Universal sensors for standardized 6-mm slots: their optimized form permits flush fitting in the existing slots and even space-saving integration in any machine environment using sensor mountings.



SM6 series

With four versions, series SM6 distance measuring sensors flexibly cover any required measurement range. They are easy to assemble and can be adjusted as needed within the maximum measurement range.

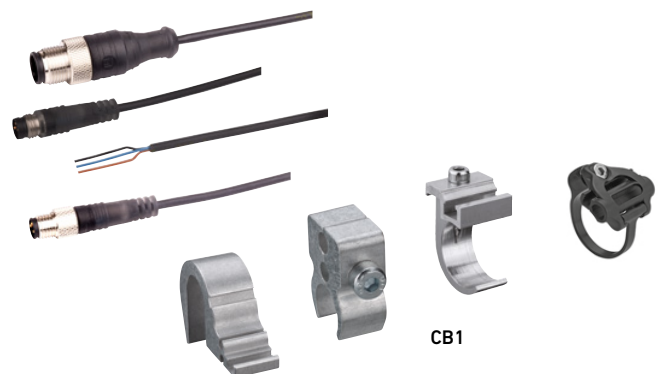


SM6-AL series

The SM6-AL analog distance measuring sensor also enables high-resolution distance measurement across the entire range of 107 to 1,007 millimeters. The distance measuring sensor is thus ideal for the continuous recording of piston movements in pneumatic cylinders. A robust, chemical-resistant aluminum housing, as well as a cable sleeve support, guarantee a long sensor service life and reduce maintenance costs.



Mountings, connecting cables and plugs



Overview of the basic compatibility between the sensor series and cylinder series

Recommended sensors
for on-cylinder mounting:

- via the nut: ●
- via sensor mounting: ○



	SM6 series	SM6-AL series	ST4 series	ST4-2P series	ST6 series	ST9 series	SN2 series
MNI  ICM 	○		○	○	○		○
CSL 			○	○	○		○
RPC 					○		
CCI/KPZ 	●				●		
SSI 	●		●	●	●		
KHZ 					○	●	
PRA/CVI 	●	○	●	●	●		○
TRB/CVI 	○				○		○
ITS 	○	○			○		○
ICL 					○		
RTC 		○	●		○		
GSU/CKP 			●				
GPC 	●		●	●	●		
MSC 			●	●			
MSN 			●	●			
RCM 			●	●			

The crucial difference: all-round support until everything is running

We are only satisfied when you are!

Apart from competent advice on the implementation of future-oriented solutions with products of the highest quality, our exemplary support is what customers can also count on. On request, that also includes professional assembly as well as thorough instruction in the operation of the machines and systems until everything is running smoothly..

- Cylinders and sensor technology
- Valves, valve systems, field bus connections
- Gripper and vacuum technology
- Compressed air preparation, assembly material, accessories

Our understanding of cooperation goes well beyond the boundaries of individual projects. We are constantly in dialog with our customers and are always a competent contact for both technical and economic questions. The know-how contained in our comprehensive pneumatic product range gives us a solid foundation for our work.

A two-way flow of ideas keeps us a step ahead of the competition and ensures solutions ideally matched to our customers' needs. The outcome? We're right where the action is, staying on the offensive to safeguard technological edges for ourselves and our customers.

- Cross-technology solutions
- Technological updates
- User-friendly Engineering Tools

The innovative Engineering Tools help you configure pneumatics solutions even more quickly and easily. Our latest example: the AVENTICS CylinderFinder – unique, powerful, easy!

How to find the perfect cylinder for your application

Simply enter the key performance parameters for your new cylinder to get an overview of all possible cylinders. Additional filters and comparison analyses narrow down your results. After you have made a decision, you are forwarded to the directly linked configuration program.

Product series	Drive	Cushioning	Guide	Weight (kg)	Air Consumption (Nl/cycle)	Debug	Report	Select
PRA	32	1-Elastic	000 Plain InternaBushino	0.72	1.08			
PRA	32	1-Elastic	L01 Plain LinearGuide	0.72	1.08			
PRA	32	2-Pneumatic	000 Plain InternaBushino	0.72	1.08			
PRA	32	2-Pneumatic	L01 Plain LinearGuide	0.72	1.08			
TRB	32	1-Elastic	000 Plain InternaBushino	0.70	1.08			
TRB	32	1-Elastic	L01 Plain LinearGuide	0.70	1.08			
TRB	32	2-Pneumatic	000 Plain InternaBushino	0.70	1.08			
TRB	32	2-Pneumatic	L01 Plain LinearGuide	0.70	1.08			

- ▲ Application data input: stroke, mass load, time, load movement direction and pitch angle, cycles per hour, additional detailed data as an option – intuitive navigation with help information.

- ▲ As a result, all possible cylinder series are listed with the key basic data and additional comparison values – weight, speed, air consumption, etc.

- The selection can be refined according to the desired specifications via the comprehensive filter menu.

Glossary

Symbol	Designation
	Piston rod cylinder without magnet, with elastic cushioning
	Piston rod cylinder with magnet, with elastic cushioning
	Piston rod cylinder without magnet, with pneumatic cushioning
	Piston rod cylinder with magnet, with pneumatic cushioning
	Piston rod cylinder without magnet, non-rotating, with front plate
	Piston rod cylinder with magnet, non-rotating, with front plate
	Rodless cylinder with magnet, with hydraulic cushioning
	Rodless cylinder with magnet, with pneumatic cushioning
	Heat-resistant versions for use up to the specified ambient temperature in °C
ISO	Versions comply with the specified installation standards
	Version in stainless steel, corrosion-resistant steel x5CrNi 18 – 10, x5CrNi 18 – 9, x17CrNi 16 – 2
	Cylinder with compressed air supply on one side only, return to home position with tension springs
	Piston rod length can be configured as needed within the technically feasible range
	Piston rod guided through cover and bottom, mounting on both ends
	Versions are suitable for ATEX applications (zones and corresponding categories)
	Grease used as a lubricant is suitable for use in the food industry acc. to NSF-H1
	Cylinder pistons have a special form with an oval cross-section
	Number of pistons for slide operation, MSC mini slides, can be operated with 1 or 2 pistons as desired
	Rotated end covers, clean pipe-cover connection thanks to optimized rolling geometry
	Elastic cushioning elements, mainly polymers, to absorb stopping energy in end position
	Stroke length can be configured as needed within the entire stroke range
	Smooth-running versions

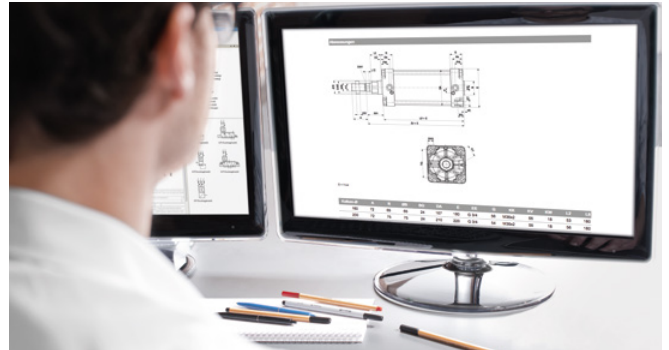
Glossary

Symbol	Designation
	Piston rods available with internal or external thread
	Cylinders can be individually equipped with the modular sealing system
	Cylinder can also be mounted using a trunnion mounting
	For safe machine applications, cylinder is suitable for use as a mechanical holding and brake unit
	For safe machine applications, cylinder is suitable for use as a mechanical holding and locking unit
	Cylinder is also available as a preassembled working unit with valve and tubing
	Adjustable cushioning on the cylinder can be adjusted as needed.
	Pneumatic cushioning adjusted at factory, optimized for standard applications
	Slide is guided by a ball rail
	High-performance ball rail guide with optimized precision, rigidity and load capacity
	Stroke can be limited using shock absorbers situated as needed across the cylinder stroke range
	Cylinders have an Easy-2-Combine interface, mounting without additional transition plates
	Hydraulic shock absorber to reduce the stopping energy of the cylinder piston
	Cylinder suitable for sensors for continuous distance measurement of the piston position
	Slide guide based on a special slide bearing
	Slide guide based on a special ball bearing
	4 mm C-slot integrated in cylinder profile for all 4 mm sensors in the ST4, ST4-2P series
	6 mm T-slot integrated in cylinder profile for all 6 mm sensors in the ST6, SM6 series
	Dovetail slot integrated in cylinder profile for ST9 series sensors

Configure your application online

Use the interactive tools – save time and money

With AVENTICS unique product configurator, you come to a result quickly and easily online. Just describe the intended application and you get a reply within a few seconds showing the proposed cylinder dimensions. The result also includes recommended cylinder speeds and the corresponding valve sizes and hose dimensions. The final result is a complete parts list including, for example, the cylinder switches and fittings. Furthermore, a material number is created that, depending on the user's wishes, represents the product as a kit including assembly parts or as a preassembled unit. For the project documentation, the user receives the relevant documents, the parts list, defined application parameters, calculation results, and complete assembly instructions. CAD data is also supplied. As we said – unique!



Your homepage for non-stop service

The AVENTICS Internet Portal never sleeps. In the online catalog, you can find additional information covering the entire product range, including all technical details, as well as the use of user-friendly Engineering Tools.

www.engineering-tools.com



Online catalog

The fastest point of entry is via our online catalog. Here you can start your search directly by entering a part number or keyword.



CAD

Your desired object can be issued here directly as a CAD file in various formats, as a PDF file, or for further configuration in your software.



Configurators

The configurator can be reached by clicking the selected product. After selecting your product, you can begin to adapt it to your own specifications.



Calculation programs

Here you can specify the dimensions or loadbearing capacity of your components with a wide variety of calculation options. We also provide an air consumption calculator as a special feature.



Circuit diagram software

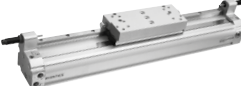
With the D&C Scheme Editor, you can quickly and easily create circuit diagrams that are based on your component layout and linked to your catalog selection.



eShop

The eShop is our online shop that answers your price requests and monitors the whole order process up to delivery.

Cylinders		
Diameter		Series
6 – 16 mm		SWN
10 – 25 mm		MNI ISO 6432
8 – 32 mm		ICM ISO 6432
16 – 25 mm		CSL ISO 6432
32 – 63 mm		RPC
25 – 125 mm		ICS
16 – 100 mm		CCI ISO 21287
12 – 100 mm		SSI ISO 15524
8 – 100 mm		KHZ
16 – 100 mm		KPZ NFE 49004
32 – 125 mm		PRA ISO 15552
160 – 320 mm		ITS ISO 15552
25 – 125 mm		ICL ISO 15552
32 – 125 mm		TRB ISO 15552
52,5 – 115 mm		RDC

Cylinders/handling technology		
Diameter		Series
32 – 125 mm		CVI ISO 15552
16 – 80 mm		RTC
16 – 32 mm		CKP
16 – 25 mm		GSU
145 – 640 mm		BCP, BCE, BCS
80 – 435 mm		BCC
442 – 950 mm		BCR
60 – 173 mm		BRB
6 – 16 mm		MSN
8 – 25 mm		MSC
6 – 32 mm		TWC
10 – 100 mm		GPC
0,17 – 6,5 Nm		RCM

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The data specified above only serve to describe the product. No statements concerning a certain condition or suitability for a certain application can be derived from our information. The information given does not release the user from the obligation of own judgment and verification. It must be remembered that our products are subject to a natural process of wear and aging.