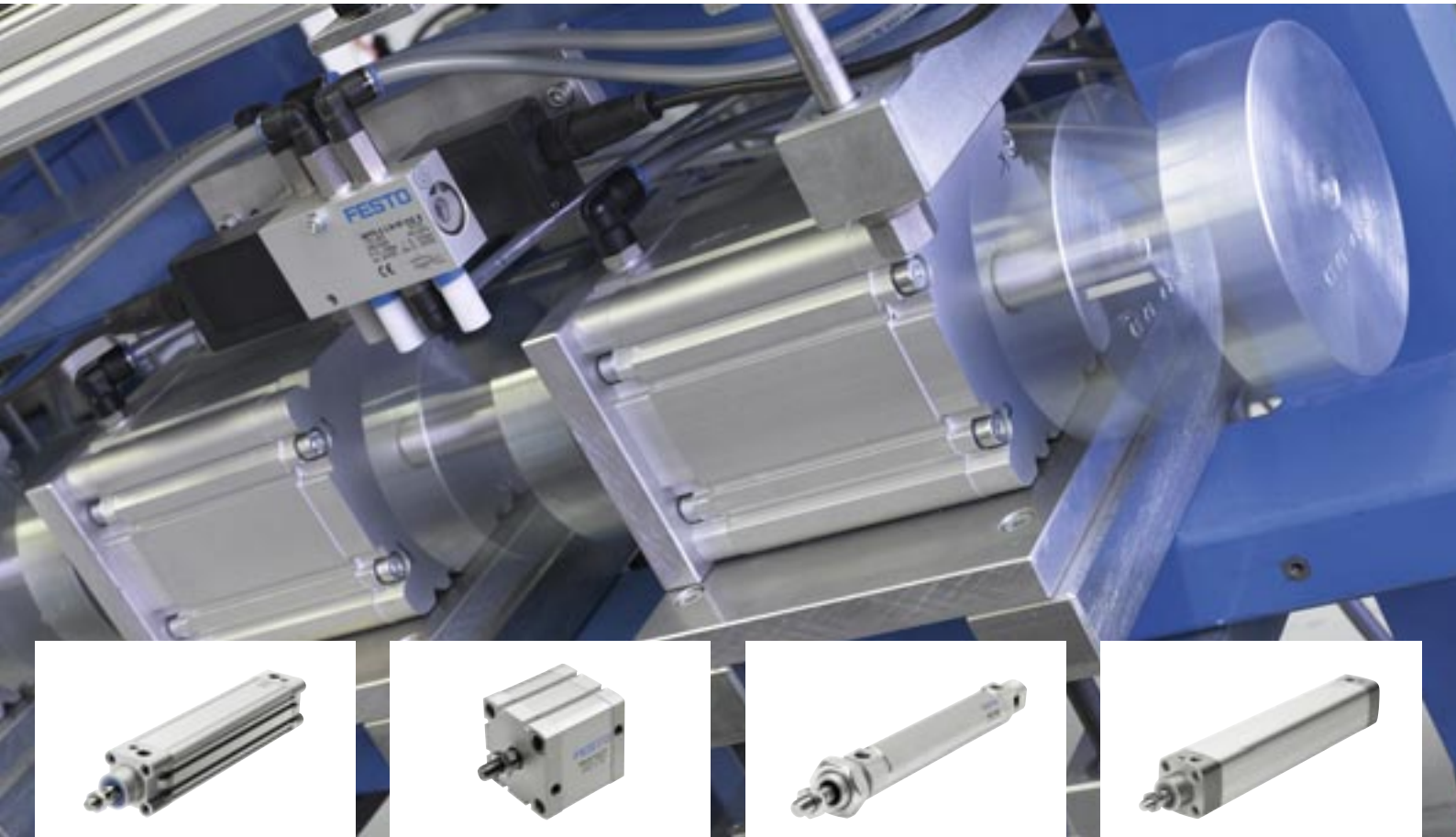


# Standard drives

**FESTO**



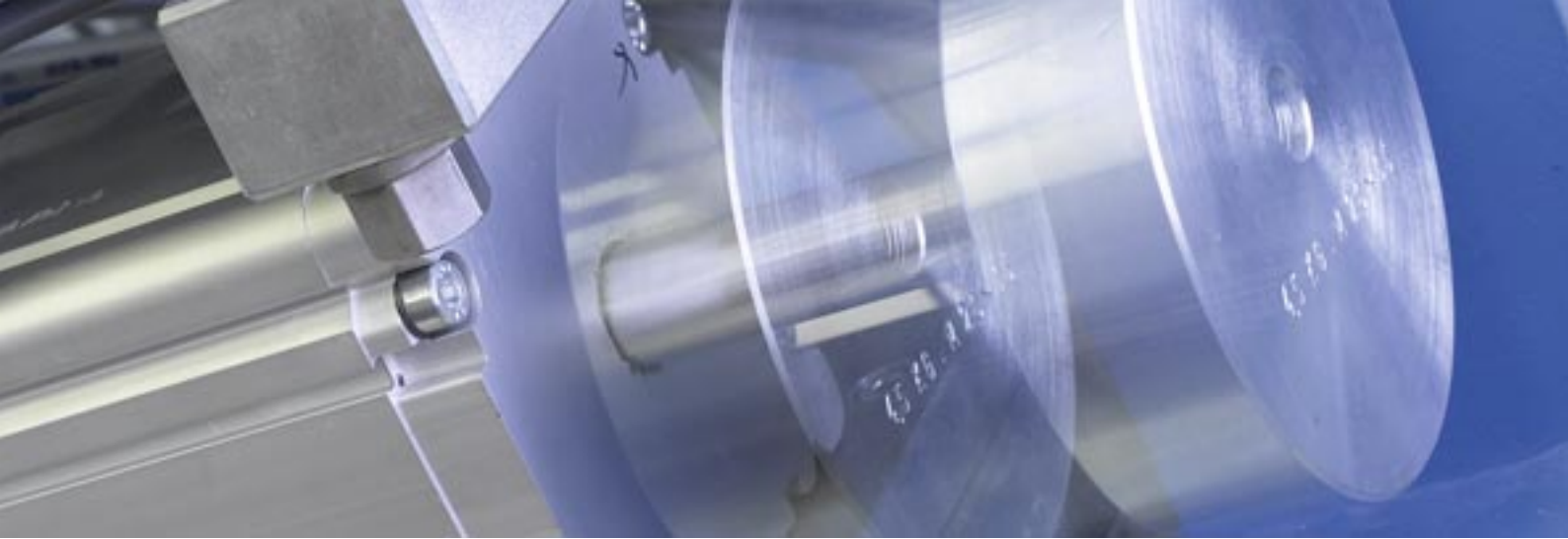


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**Note:**

You will find all standard drives, variants and special cylinders on [www.festo.com](http://www.festo.com) and in our electronic catalogue.



## Relying on new standards

Millions of Festo cylinders are used reliably every day, and they have been for more than 40 years. Whether it's a question of technology, quality or service, you can often only tell how good a cylinder really is when it's put to the test under harsh conditions.



Products with a long service life – quality that pays for itself

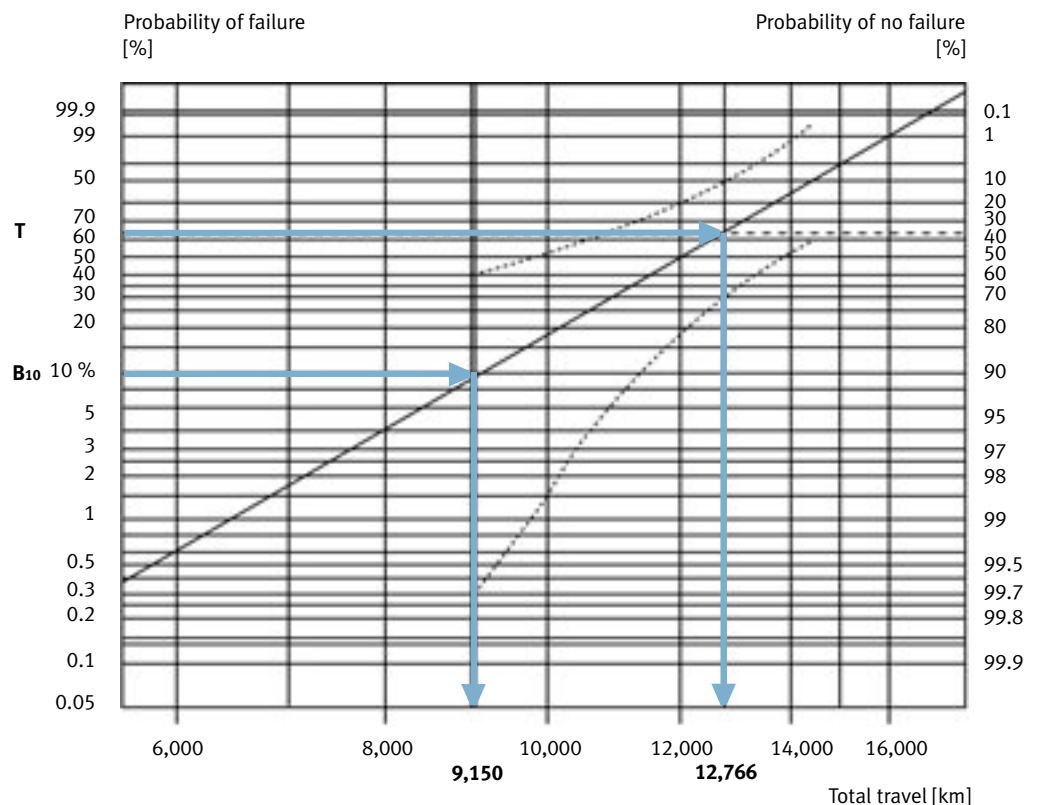
Festo subjects every product series that leaves the factory to long-term functional and endurance tests, both during development and all other phases of the product life cycle.

We aim to constantly optimise our products for a long service life and increased cost effectiveness. The results from these tests, carried out under standard conditions, form the basis for preventative maintenance concepts – to ensure that your systems are always ready for use.

Example standard cylinder  
Tests carried out to Festo standards

$B_{10} \triangleq 9,150$  km

$T \triangleq 12,766$  km





## Convincing innovation

### 3K pistons

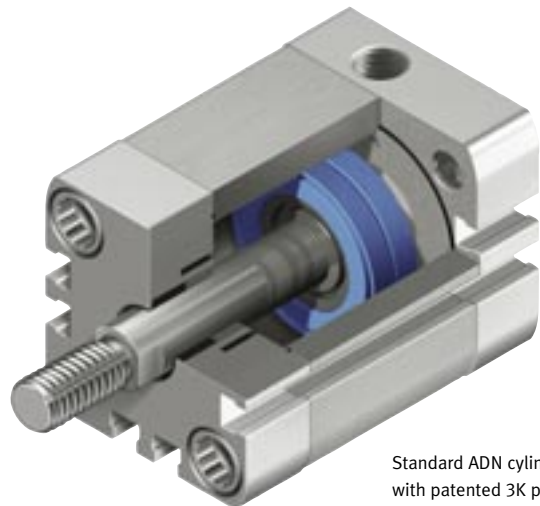
An increase in your productivity – this is what we aim for in research and development at Festo. One example of this is the 3K system piston.

Thanks to its excellent running characteristics and outstanding cushioning performance in the end positions, it can easily accommodate high speeds and machine cycles.

The 3K pistons are also very short; the space saved thus enables the rod bearing to be longer. This guides the rod more precisely and permits increased lateral forces.

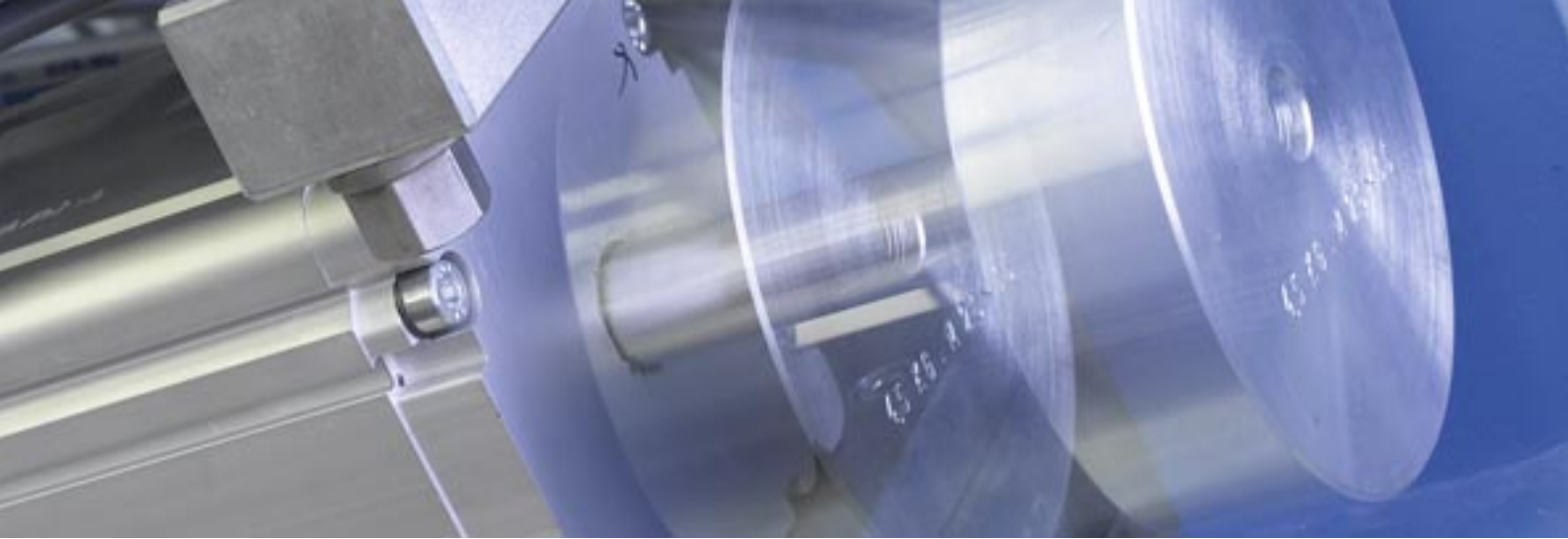
The 3K pistons are used in the profile cylinders DNC and DNCB, in the standard round cylinders

DSNU and the compact cylinders ADN. In production, only one processing step is needed to convert the magnetic strip, bearing tape and piston seal into a 3K piston, ready for operation. This saves time and money, which is reflected in attractively priced products.



Standard ADN cylinder with patented 3K piston





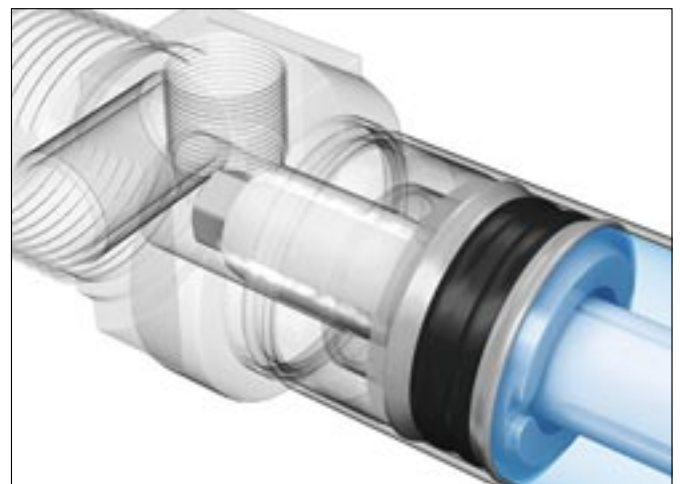
### **Self-adjusting pneumatic cushioning**

It is no longer necessary to adjust the cushioning on the DSNU with PPS. This reduces installation time and simplifies assembly. It is a very interesting alternative to reduce cycle times, especially for OEMs.

The cushioning always adjusts itself, even with changing loads and/or speed. This ensures that all round cylinders DSNU have the same cushioning characteristics under all circumstances. And it means that no accidental changes to the adjustment can be made.



Economical: the round cylinder DSNU with self-adjusting pneumatic cushioning – PPS for short.



The PPS cushioning ensures that the end positions are reached dynamically but gently, without the need for manual intervention. This is achieved by longitudinal slots that allow the air to escape in a controlled manner.

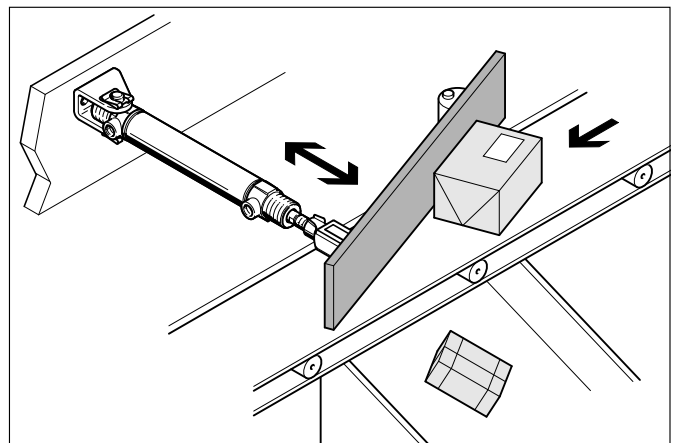


## Self-adjusting pneumatic cushioning DSNU-PPS

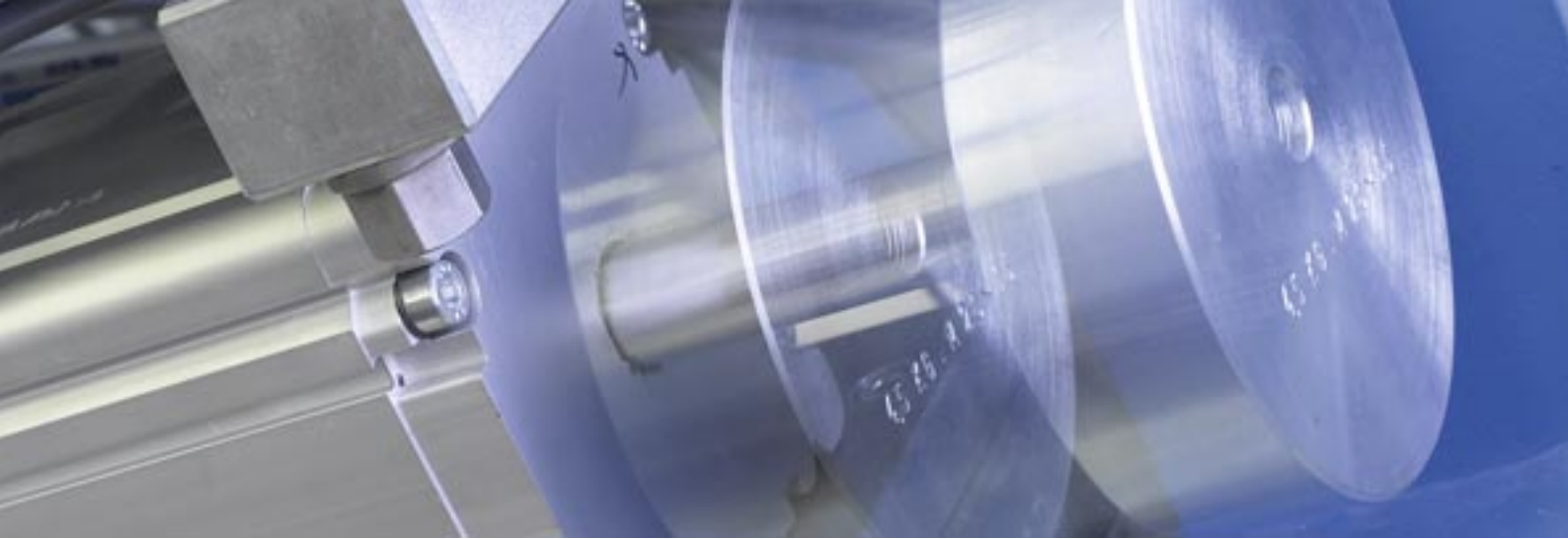
It is not just that time is no longer lost adjusting the cushioning, but the fact that every cylinder is set-up identically that makes the DSNU-PPS unbeatable in its class.

### Example

A system for sorting packages consists of 60 stations, each with one round cylinder DSNU. A total of 60 cylinders are used. Installation and adjustment are reduced by up to 5 minutes per cylinder. This results in a potential saving of 300 minutes or 5 working hours for the 60 cylinders used.



The DSNU with PPS self-adjusting cushioning. For more information see page 5.



## A round cylinder to ISO 6432 for almost every industry sector

A better system – the modular round cylinders DSNU. A combination of a few basic types with a variety of characteristics not only produces the optimum round cylinder for every application, but also produces the best technical solution at the best price.

A comprehensive system – with all the accessories. Proximity sensors, flow control valves and an interesting range of mounting fixtures don't leave much to be desired.

A cost-effective alternative to the DSNU: the DSNU-P to ISO 6432 with end caps made of high performance polymers. You will find more on the subject of high performance polymers on page 9.



### Overview

#### DSNU - basic cylinder

- Threaded bearing cap
- End cap (AD) with threaded spigot and swivel mounting

#### DSNU - MQ

- Threaded bearing cap
- Short end cap with lateral supply port

#### DSNU - MA

- Threaded bearing cap
- Short end cap with axial supply port

#### DSNU - MH

- Direct mounting on bearing cap (block design)
- Short end cap with lateral supply port



## The standard DNC cylinder range: tried and tested millions of times

It can be found in almost all industry sectors. The large number of variants of the DNC range covers virtually every option. One example is positive locking in the end positions (EL) on the modular DNC system, designed as an extremely reliable drop guard to protect sensitive system components or tools. Thanks to integrated mechanical end-position locking, the cylinder does not drop if there is a decrease in pressure, thus preventing damage to systems.



### Overview

#### DNC to ISO 15552

- Stroke lengths up to 2000 mm
- Proximity sensors fit flush on 3 sides in the sensor slot
- The wide range of variants enables a variety of applications

- Selected types conform to ATEX directive for explosive atmospheres

#### DNCB to ISO 15552

- Ideally suitable for simple tasks
- Attractively priced
- The piston is very compact and can sustain significantly high levels of impact energy. The space saved enables the bearing length to be increased

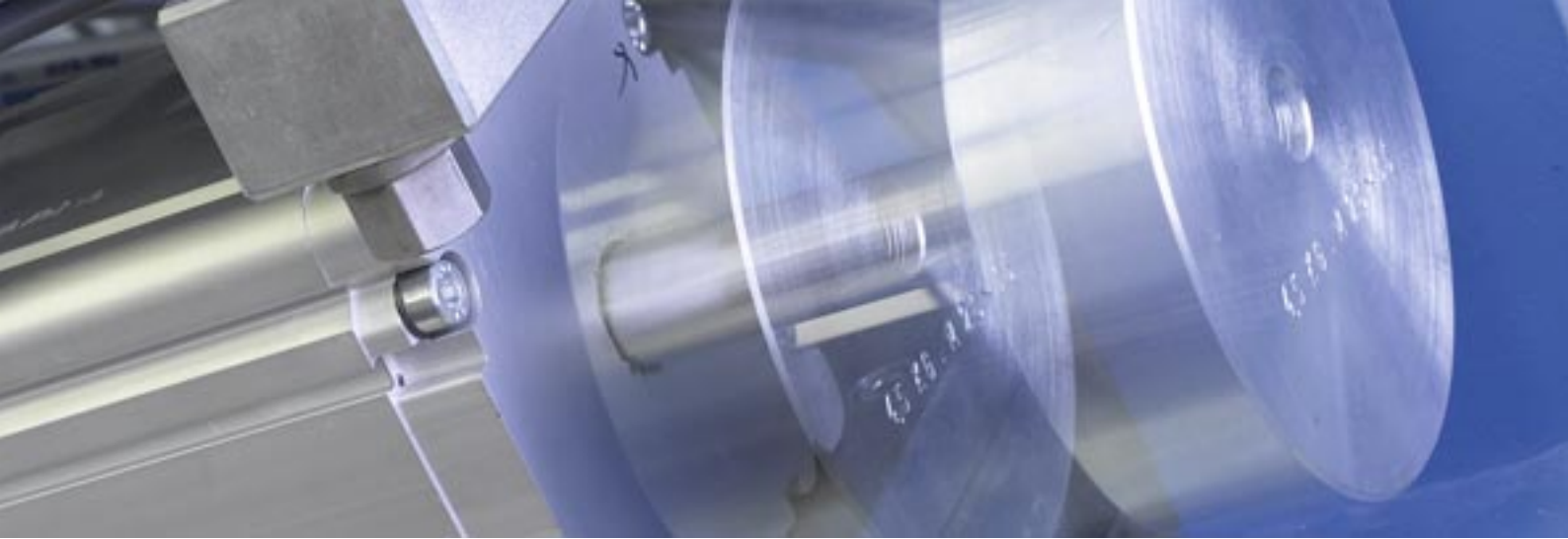
- Outstanding running characteristics
- All the accessories and mounting components from the DNC range are available

#### DNCI

- Piston-rod drive with integrated, incremental displacement encoder
- Measuring head in the bearing cap and measuring strips in the piston rod
- Controlled acceleration and braking of large masses at high speeds in connection with the SPC11 Soft Stop

- Force and path regulation and sequence control with SPC200
- Simplest possible combination of movement and measuring functions with transducer DADE





## Alternative materials – potential savings for you

Helmets, bicycles, automobile and aircraft components are all products that are expected to provide maximum safety and that are no longer only made of metallic materials. With good reason. For technopolymers no longer have a great deal in common with the old plastic materials; nowadays their material properties are much more similar to those of heavier metals.

Only pay for the functions that you really need. Innovative materials and attractively priced Festo products are a promising option to optimise the efficiency of your pneumatic applications – without compromising product quality.

Convince yourself of the surprising characteristics of modern, high performance polymers, 50% reinforced with glass fibre.

Property	Die-cast aluminium	Die-cast zinc	Technical polymer
Tensile strength [MPa] 20 °C, dry	220–240	280–300	280
Tensile strength [MPa] 80 °C, dry	190–200	40–50	170
Tension-E-module [MPa] 20 °C, dry	70000	85000	20000
Flexibility [%]	1	3	1.8
Pulsating tensile stress [MPa] after 10 <sup>6</sup> load changes	50	55	60
Density [g/cm <sup>3</sup> ]	2.7	6.7	1.64
Resistance to media	Good	Average	Good

### Standard drive with high performance polymer



ADNP to ISO 21287



DSNUP to ISO 6432



## Compact and short-stroke cylinders

When the compact cylinder ADVU was launched 10 years ago, it was the first in its class. And it immediately set new standards.

The new standard cylinder ADN with its compact design represents the second generation and is again setting standards in the areas of safety, design and assembly.

It has standardised dimensions and innovative technology, offers excellent performance and needs even less space for installation.

The compact cylinders ADN and ADVU as well as the short-stroke cylinder ADVC are used in almost every industry sector.



### Overview

#### ADN/AEN to ISO 21287

- ISO 21287 standard
- Compact design
- Broad area of application
- The comprehensive, modular product range has many variants that can be combined as required

- Flexible cushioning rings as standard to absorb residual energy facilitate high speeds and fast machine cycles
- Long service life thanks to exceptional cushioning characteristics and minimal friction

#### ADVC to ISO 1552

- Optimised fitting space and height

- There is a choice of suitable housing and piston variants for each application

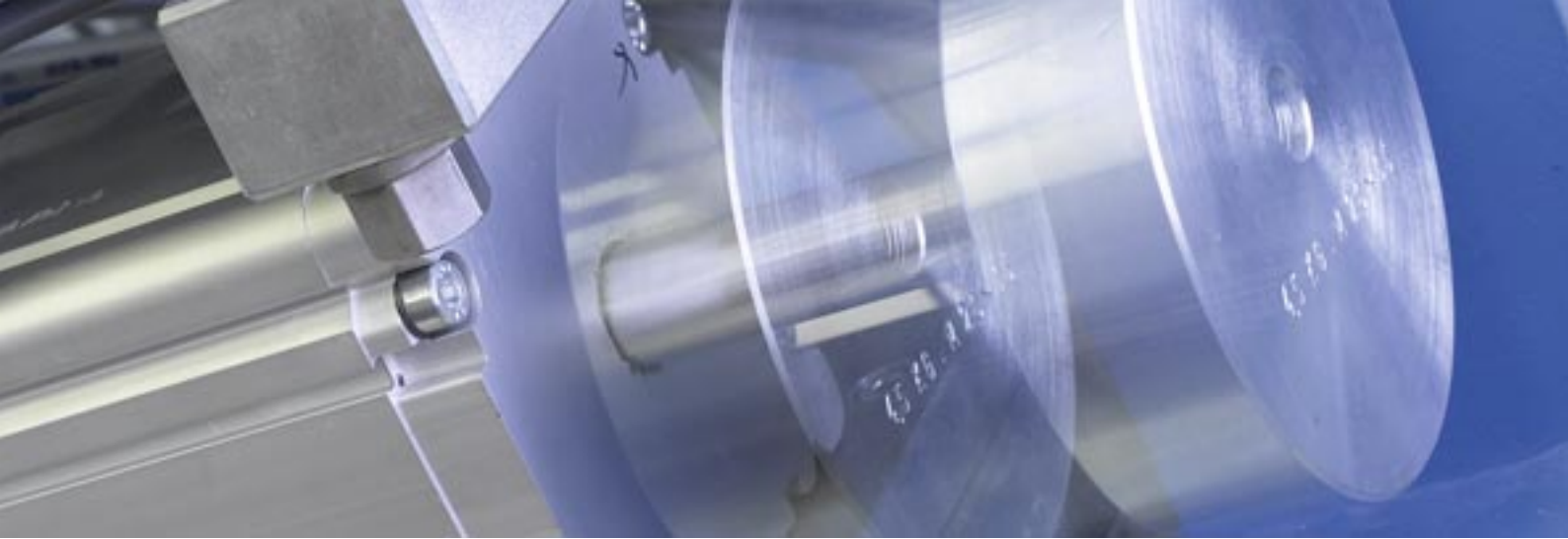
#### ADNP to ISO 21287

- Low weight thanks to polymer bearing and end caps and integrated QS fittings

- Attractive price thanks to the use of the latest materials

#### ADVU

- The ADVU range has been used for over 10 years and has proved itself a million times over.



**Modular variety with the ADN series (ISO 21287)**



**Main features**

**Non-rotating compact cylinder**

- Double-acting with guide rods
- Non-rotating with plain-bearing guide
- For correctly oriented feeding

and to absorb low torques and lateral forces.

- Piston: 12 ... 125 mm
- Stroke: 1 ... 500 mm

**Non-rotating compact cylinder**

- Double-acting with guide rods
- Non-rotating with plain-bearing guide
- For correctly oriented feeding

and to absorb low torques and lateral forces.

- Piston: 12 ... 100 mm
- Stroke: 1 ... 400 mm

**High-force cylinders**

- If the force is insufficient or installation space is tight
- Up to 4 times the force for the

same cross-section

- Piston: 25, 40, 63, 100 mm
- Stroke: 1 ... 150 mm

**Multi-position cylinders**

- The in-line connection of multiple cylinders of different lengths facilitates advancing of

up to 5 positions

- Piston: 25, 40, 63, 100 mm
- Stroke: 1 ... 400 mm

**ADN with clamping unit (KP)**

- Double-acting, mechanical locking for secure clamping in the event of a pressure drop

which is effective over the entire stroke range

- Piston: 20 ... 100 mm

**ADN with end position locking (EL)**

- Double-acting, positive locking in the end position to avoid

uncontrolled movements

- Piston: 20 - 100 mm
- Stroke: 10 ... 500 mm



## DGC rodless cylinders

Whether in a basic version, or with a plain guide and ball bearing guide, the large sizes are outstanding because of their high load carrying capacity and precision for moving large masses dynamically.

With diameters from 8 to 63 mm, there is almost no problem that cannot be solved. In addition, with the external intermediate position module for the DGC-25 and DGC-32 one or more intermediate positions can easily be approached, while the end stops with integrated shock absorbers ensure high precision in the end positions as well as dynamic movements.



1 drive - 3 guide variants

### Overview

#### DGC

- Rodless drive
- With optional shock absorber and second slide
- Excellent guide quality, high characteristic load values and torque resistance

- The key to compact and higher performance machines due to minimised installation space and proximity switch integrated into the profile

#### DGCI - the DGC with a displacement encoder

- Developed for pneumatic positioning and soft-stop applications

- Sets standards for precision, reliability and load carrying capacity
- Cost effective



#### Basic design

- Backlash < 0.2 mm



#### Plain-bearing guide

- Backlash < 0.05 mm

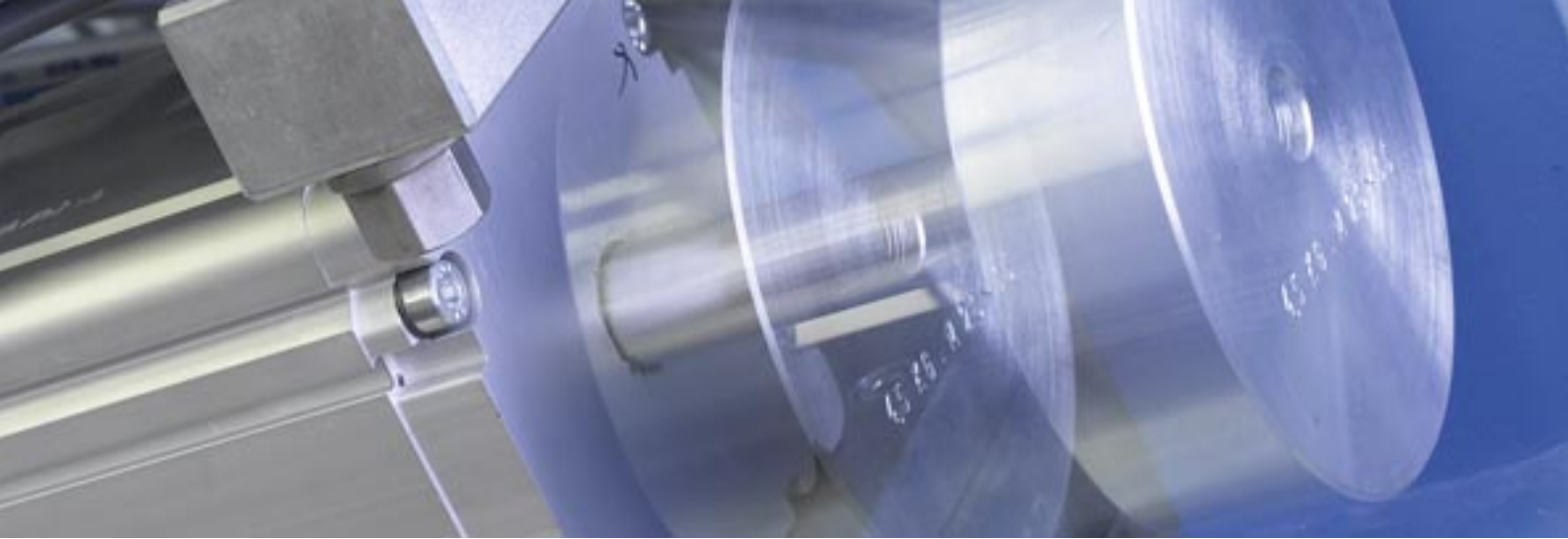


#### Recirculating ball bearing guide

- Backlash-free

**Maximum energy efficiency:  
the effectively leak-free sealing  
system of the DGC**





## Proximity sensor and position transmitter

The highest level of process reliability, optimum performance and maximum safety. Our new and comprehensive sensor portfolio combines these key features and ensures smooth and efficient production processes.

Festo's proximity sensors are position sensors specially adapted and optimised for use with Festo cylinders. Given their special measuring methods, however, this does not prevent them from being used in many other applications where magnetic fields are to be detected.

As a system supplier, Festo offers specifically tailored sensing solutions for a broad range of applications. The range of proximity sensors includes stockable parts with fixed or variable configuration according to the module type.

The analogue position transmitter presents the logical development of the binary proximity sensor.



### Fits in all profile slot cylinders: SMT-/SME-8M proximity sensor

One for all: universal sensory and mechanical compatibility with all Festo drive units. It fits securely in the slot. Vibration, shock and tensile forces applied to the cable will neither cause the sensor to become loose nor

- lead to unreliable functioning.
- Contactless or contacting sensing
- Voltage: 24 V AC/DC
- Plug M5, M8, M12, open end



### Proximity sensor type SMT-/SME-10

Reliable sensing solution for Festo drive technology with slot type 10. The sensors can also be fitted in type 8 slots with an installation kit.

- Contactless or contacting variant
- Voltage 24 V DC
- M8 plug, open end



### Fits in all profile slot cylinders: position transmitter SMAT-8E

It opens up new areas of application for pneumatic cylinders. An analogue, proportional output signal indicates the cylinder piston position within a range of 50 mm. Its integrated OOR (out of range) sensor indicates when the piston leaves the sensing range.

- Process monitoring/measurement: quality, wear, process feedback
- Object detection: status, position, separating good/bad parts
- Object acquisition: clamping, pressing



### SMAT-8M position transmitter



As a position transmitter in the size of a cylinder sensor, it was designed for all applications where installation space is restricted. Its compact design opens up new areas of application, especially for compact cylinders and grippers. The

- piston sensor gives the position as an analogue voltage signal.
- Power supply: 15-30 V
- Measurement principle: contactless, magnetic
- Measuring range: up to 40 mm, depending on the drive
- Protection class: IP65 and 68




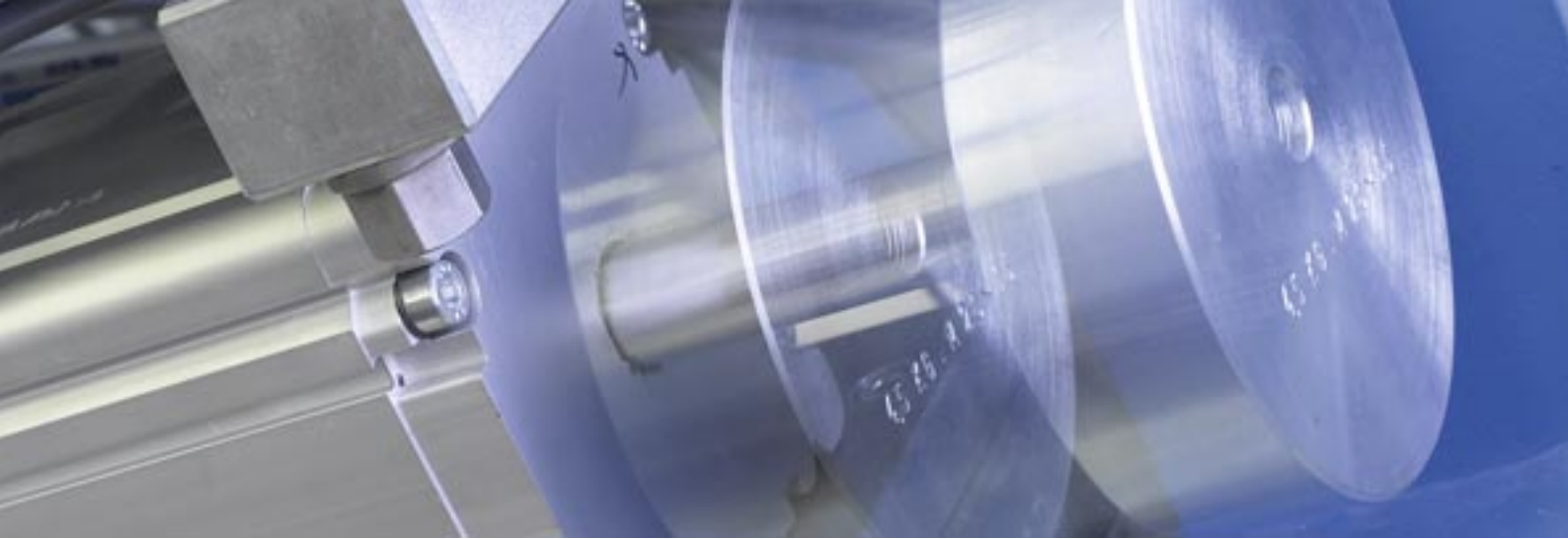
## An overview of standard cylinders

### Standard cylinder



Type	Standards	Diameter [mm]	Force [N]	Stroke [mm]	Special feature
Standard cylinder DSNU/ESNU 	ISO 6432	8 ... 25 30 ... 63	30 ... 1870	1 ... 500	For almost all industry sectors
Standard cylinder DSNUP 	ISO 6432	16 ... 25		25 ... 100	End cap made of glass-fibre reinforced plastic

### Short stroke and compact cylinders



Type	Standards	Diameter [mm]	Force [N]	Stroke [mm]	Special feature
Compact cylinder ADN/AEN 	ISO 21287	12 ... 125	68 ... 7363	1 ... 500	For almost all sectors, many variants, requires little installation space
Compact cylinder ADVU/AEVU 		12 ... 125	68 ... 7363	1 ... 400	Selected types to ATEX guidelines
Compact cylinder ADNP 	ISO 21287	20 ... 50	188 ... 1178	50 ... 80	End cap made of glass-fibre reinforced plastic
Short-stroke cylinders ADVC/AEVC 	ISO 1552	4 ... 100	7.5 ... 4712	2.5 ... 25	




### Cylinders for special applications

Type	Standards	Diameter [mm]	Force [N]	Stroke [mm]	Special feature
Compact cylinder Clean Design CDC cylinder 	ISO 21287	20 ... 80	141 ... 3016	1 ... 500	Easy-to-clean design
Profile cylinder Clean Design CDN cylinder 	ISO 15552	32 ... 100	483 ... 4712	10 ... 2000	Easy-to-clean design

### Standard cylinder

Type	Standards	Diameter [mm]	Force [N]	Stroke [mm]	Special feature [mm]
Standard cylinder DNC 	ISO 15552	32 ... 125	10 ... 2000	10 ... 2000	For almost all industry sectors, many variants
Standard cylinder DNCB 	ISO 15552	32 ... 100	483 ... 7363	2 ... 2000	Cost-effective standard cylinder for almost all industry sectors

### Rodless cylinder

Type	Diameter [mm]	Force [N]	Stroke [mm]	Special feature
DGC linear drive 	8 ... 63	30 ... 1870	1 ... 5000	Very precise guides, optimised size, simple and easy installation

#### Note:

This overview only shows a selection from Festo's cylinder portfolio. Other cylinders can be found in the catalogue on [www.festo.com](http://www.festo.com)

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