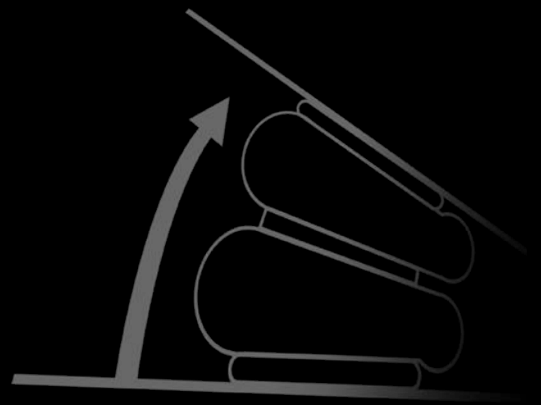




# Air actuators

for pneumatic applications

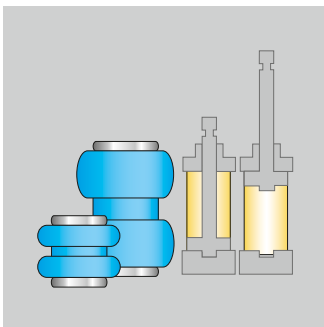


# Air actuators for pneumatic applications

ContiTech air actuators are all-round talents. With a broad product range of C, D, R, and S model series and customized individual developments, they master even difficult pneumatic tasks in machine and plant engineering. They are available for pneumatic applications from 0.5 kN to 440 kN lifting power, with diameters from 60 mm to 950 mm.

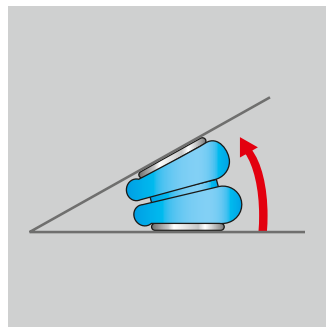
## Advantages:

- › Long service life
- › Maintenance-free
- › Highly operational safety
- › Frictionless
- › Lateral misalignment possible
- › Chemical resistance



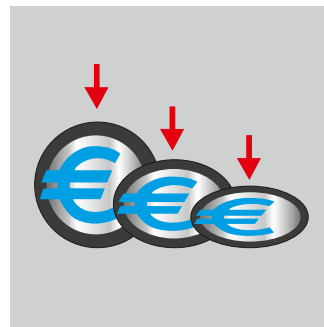
### Low installation height

In comparison to conventional pneumatic cylinders, ContiTech air actuators contain no piston rod, making it possible to reduce the design height considerably. This allows compact constructions to be made.



### Angular movement

Depending on the type, ContiTech air actuators can be used for tilt angles up to 30°. This enables the designer to simplify the articulated construction.




### Low purchase price

The purchasing costs are considerably less than for conventional pneumatic cylinders. And thanks to the long service life and freedom from maintenance, running costs are reduced as well.


**Model series C**

Air actuators with permanently mounted connection parts

A black, ribbed air actuator with a white top plate. The top plate has two circular ports and a central threaded hole. The brand name 'Infinital' is visible on the side of the actuator.


**Model series D**

Air actuators with removable connecting parts

A black, ribbed air actuator with a white top plate. The top plate is secured to the actuator with four screws. It features a central threaded hole and two side ports.


**Model series R**

Air actuators with bead ring connecting parts

A black, ribbed air actuator with a white top plate. The top plate has a black bead ring around its perimeter, which is used for connecting to other parts.

**Model series S**

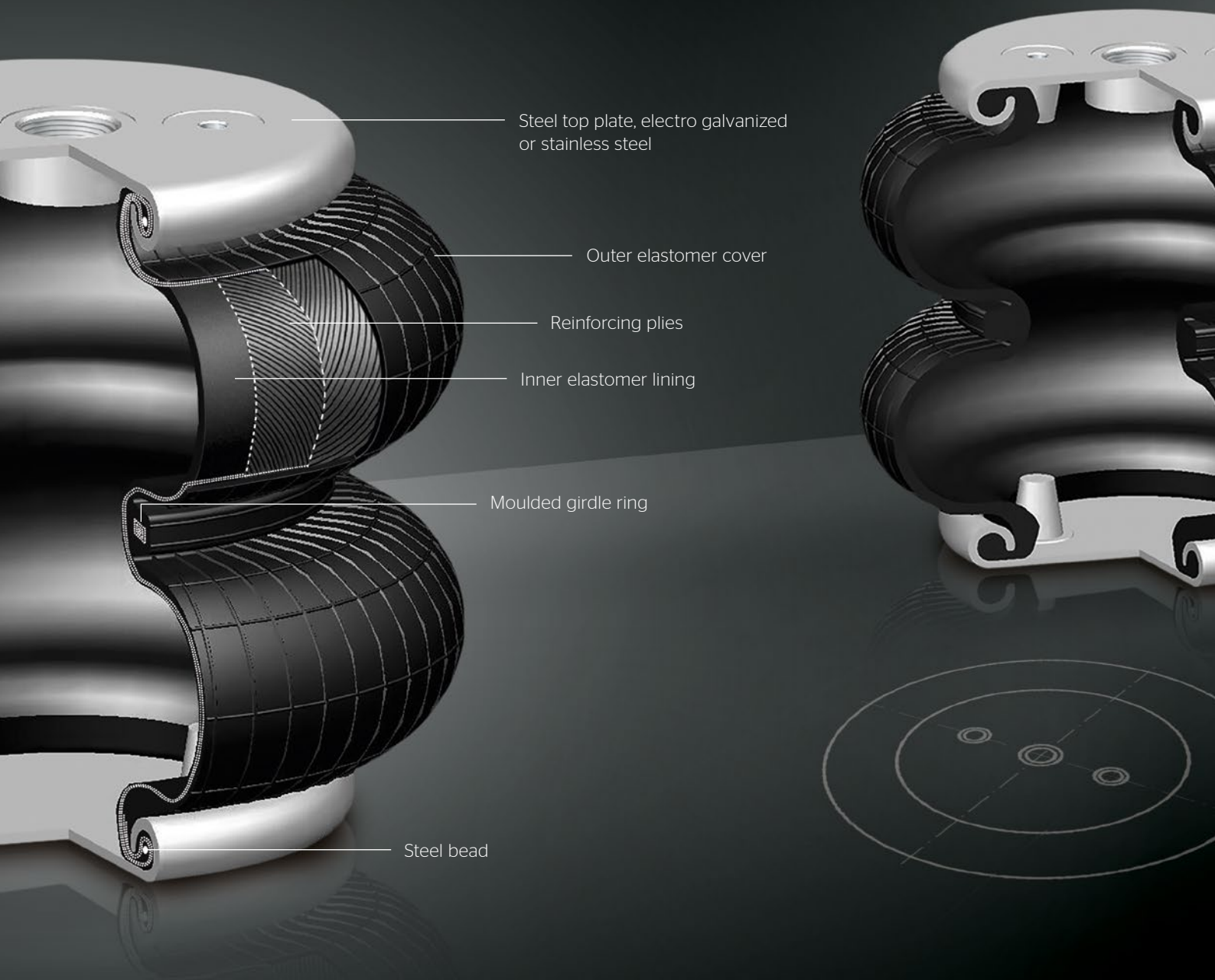
Rolling lobe actuator with plastic connection parts

A white, rolling lobe actuator with a central hub and a series of lobes around the perimeter. It has a white plastic top ring for connection.

# Actuator designs

## General information

ContiTech air actuators are made of high-quality materials. The elastomer bellows is vulcanized as a reliable permanent combination of elastomers, reinforcing plies and embedded metal parts.



**Permissible working media**

- › Compressed air (also containing oil)
- › Nitrogen
- › Water (also with glycol) for air actuators with corrosion-resistant metal parts

**Chemical resistance**

In general, ContiTech air actuators are resistant to:

- › compressed air containing oil
- › chemically non-aggressive dust and dirt
- › alkaline and acidic cleaning agents
- › glycol-based hydraulic fluids
- › effects of weather

ContiTech air actuators are in general not resistant to mineral oils, ester-based oils and solvents. The exception is the temperature-resistant convoluted bellows (ECO), which are also resistant to mineral oils. Please request the ContiTech chemical resistance list before using the air actuators for the first time.

**Temperature range**

- › Standard ›NR‹ convoluted air springs (model series C, D and R): (-60 °C) -40 to +50 °C (+70 °C)
- › Temperature resistant ›ECO‹ convoluted air springs (epichlorohydrin): (-20 ... +50 °C) +50 °C to +115 °C (+130 °C)
- › ›CR‹ convoluted air springs and sleeve type air springs (model series S): -30 to +70 °C (+90 °C)

The numbers in brackets indicate the minimum and maximum permissible application temperatures for the elastomer, whereby a shorter service life must be expected when operated under these conditions.

**Environmental compatibility and protection**

ContiTech air actuators satisfy the most common requirements for environmental compatibility such as Cr(VI)-free corrosion inhibitor, REACH, no lacquer wetting inhibitors, RoHS compliant, etc. Ongoing development advances ensure that our products are constantly at the cutting edge.

**Storage**

ContiTech air actuators should be stored in dark and dry conditions at normal room temperature (see ISO 2230).

**Special types****ECO**

- › Temperature-resistant air actuators made of the elastomer epichlorohydrin
- › Available in the model series C, D and R
- › Temperature range +50 °C to +115 °C
- › Resistant to mineral oils and fuels

**Niro**

- › Air actuators with stainless steel connecting parts
- › Top plates made of the material 1.4301 and bead rings made of the materials 1.4571 and 1.4404
- › High resistance to media such as acids, chemicals and cleaning agents
- › High wear resistance and durability

**HP**

- › Air actuator with a stronger design HP - High Pressure
- › Pressure range of the stronger design from 0 to 12 bar
- › 16 bar available on request





## Model series C

model	min. design height <sup>(1)</sup> (mm)	max. diameter (mm)	installation space required (mm)	max. recommended stroke (mm)	max. stroke (mm)	force at p = 8 bar			connection part variant	distance D (mm)	distance E (mm)	standard air inlet P1
						min. height (kN)	half stroke (kN)	max. stroke (kN)				
<b>single convolution bellows</b>												
FS 40-6 CI	50	145	160	50	60	6,9	5,2	2,4	1	20,0	-	G $\frac{1}{8}$
FS 50-5 CI	51	150	165	34	44	9,0	5,4	2,2	2	44,5	-	G $\frac{1}{4}$
FS 70-7 CI	51	165	180	54	64	9,9	7,5	5,2	2	44,5	-	G $\frac{1}{4}$
FS 100-10 CI	51	210	225	79	94	14,7	11,0	1,6 <sup>(3)</sup>	2	44,5	-	G $\frac{1}{4}$
FS 120-9 CI	50	215	230	75	85	17,7	12,4	6,6	2	70,0	-	G $\frac{3}{4}$
FS 120-10 CI	51	231	245	79	99	19,5	15,0	4,6	2	70,0	-	G $\frac{3}{4}$
FS 120-12 CI	51	235	250	107	119	18,7	15,9	7,2	2	70,0	-	G $\frac{3}{4}$
FS 200-10 CI	51	250	265	74	89	23,8	17,5	9,1	3	89,0	38,1	G $\frac{3}{4}$
FS 330-11 CI	51	325	340	89	99	43,9	36,7	22,4	3	157,5	73,0	G $\frac{3}{4}$
FS 330-14 CI	51	343	360	100	129	47,3	37,8	13,0	3	157,5	73,0	G $\frac{3}{4}$
FS 530-11 CI	51	385	400	104	124	68,4	53,0	20,8	4	158,8	79,4	G $\frac{3}{4}$
FS 530-14 CI	51	405	420	109	134	69,6	60,2	35,2	4	158,8	79,4	G $\frac{3}{4}$
FS 960-12 CI	63	450	480	102	117	98,3	78,2	40,4	5	114,3	-	G $\frac{3}{4}$
FS 1330-11 CI	63	530	570	87	107	141,6	121,8	63,3 <sup>(4)</sup>	5	152,5	-	G $\frac{3}{4}$

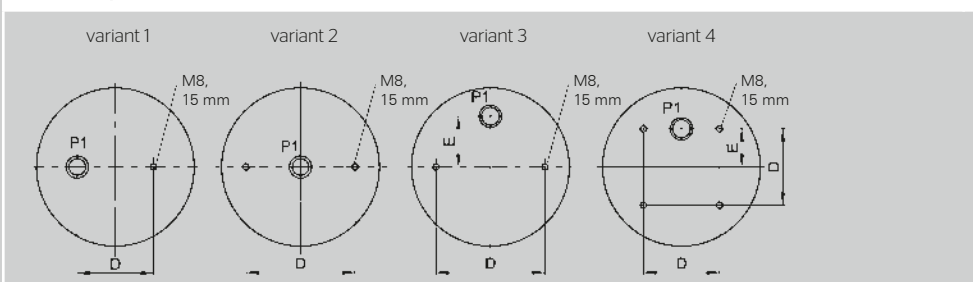
<b>double convolution bellows</b>												
FD 40-10 CI	70	145	160	95	100	7,4	5,5	2,5	1	20,0	-	G $\frac{1}{8}$
FD 70-13 CI	72	165	180	108	128	11,6	7,8	2,6	2	44,5	-	G $\frac{1}{4}$
FD 110-15 CI	72	203	215	123	156	16,5	10,5	2,9	2	70,0	-	G $\frac{3}{4}$
FD 120-17 CI	75	215	230	130	155	18,0	13,1	6,3	2	70,0	-	G $\frac{3}{4}$
FD 120-20 CI	77	218	235	153	193	19,6	14,4	6,6	2	70,0	-	G $\frac{3}{4}$
FD 200-19 CI	75	250	265	165	200	26,1	18,3	5,7	3	89,0	38,1	G $\frac{3}{4}$
FD 200-22 CI	77	255	265	183	218	26,2	17,6	7,0	3	89,0	38,1	G $\frac{3}{4}$
FD 200-25 CI	77	260	275	223	248	25,4	18,8	8,2	3	89,0	38,1	G $\frac{3}{4}$
FD 330-22 CI	75	325	340	190	230	46,4	33,8	14,3	3	157,5	73,0	G $\frac{3}{4}$
FD 330-30 CI	77	340	355	223	283	49,0	39,6	13,7	3	157,5	73,0	G $\frac{3}{4}$
FD 530-22 CI	77	385	400	193	233	65,5	52,9	21,8	3	158,8	79,4	G $\frac{3}{4}$
FD 530-30 CI	77	400	415	223	273	71,2	56,4	21,6	4	158,8	79,4	G $\frac{3}{4}$
FD 530-35 CI	77	405	420	253	313	74,8	57,9	21,0 <sup>(4)</sup>	4	158,8	79,4	G $\frac{3}{4}$
FD 960-22 CI	95	444	490	185	225	101,0	81,1	37,0	5	114,3	-	G $\frac{3}{4}$
FD 1330-25 CI	92	518	570	198	243	145,4	113,0	46,5 <sup>(4)</sup>	5	152,5	-	G $\frac{3}{4}$

<b>triple convolution bellows</b>												
FT 330-29 CI	110	325	345	285	320	46,4	33,7	17,8	3	157,5	73,0	G $\frac{3}{4}$
FT 430-32 CI	115	330	355	265	315	53,4	39,2	17,0	3	157,5	73,0	G $\frac{3}{4}$
FT 530-32 CI	110	384	410	275	325	69,3	54,6	24,7	4	158,8	79,4	G $\frac{3}{4}$
FT 530-35 CI	115	405	430	335	395	77,0	53,8	27,2	4	158,8	79,4	G $\frac{3}{4}$
FT 960-34 CI	120	462	510	290	335	99,9	77,2	32,0	5	114,3	-	G $\frac{3}{4}$
FT 1330-35 CI	120	521	570	290	350	148,2	119,4	26,3 <sup>(2)</sup>	5	152,5	-	G $\frac{3}{4}$

<sup>(1)</sup> not in the case of ECO and HP, <sup>(2)</sup> at p = 5 bar, <sup>(3)</sup> at p = 6 bar, <sup>(4)</sup> at p = 7 bar

other types on request

### connection part variants



- bead plate connecting parts, firmly crimped to the reinforced bead of the elastomer bellows
- NR elastomer as standard type
- also available as special types ECO, Niro and HP



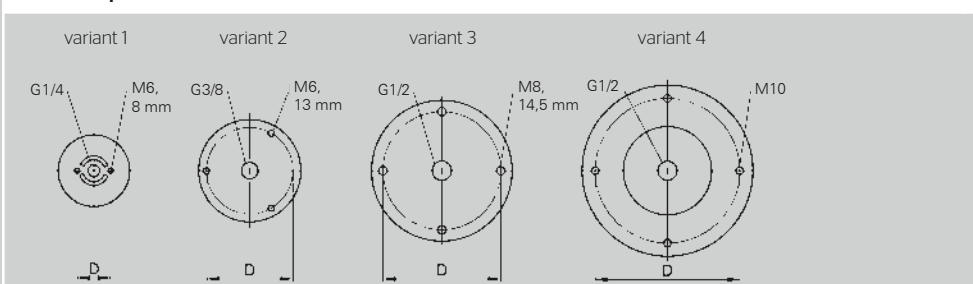
## Model series D

model	min. design height <sup>(1)</sup> (mm)	max. diameter (mm)	instal- lation space required (mm)	max. recom- mended stroke (mm)	max. stroke (mm)	force at p = 8 bar			connec- tion part variant	distance D (mm)	
						min. height (kN)	half stroke (kN)	max. stroke (kN)			
<b>single convolution bellows</b>											
FS 22-3DI CR	2¾x1	50	80	95	17	20	3,3	2,3	1,3	1	36,0
FS 44-5DI CR	4½x1	50	125	140	35	40	6,9	4,4	2,0	2	93,0
FS 76-7DI CR	6x1	55	175	190	45	55	15,0	8,7	4,8	3	127,0
FS 76-7DS CR	6x1	50	175	190	45	55	15,0	9,6	4,8	4	127,0
FS 138-8 DS	8x1	50	230	245	65	80	25,0	15,3	8,6	4	155,5
FS 210-10 DS	10x1	50	280	300	85	100	33,8	24,4	11,5	4	181,0
FS 412-10 DS	12x1	50	330	350	85	100	51,8	38,3	18,6	4	232,0
FS 614-13 DS	14x1	50	400	425	100	125	77,4	50,2	20,2 <sup>(2)</sup>	4	282,5
FS 816-15 DS	16x1	50	420	445	125	140	80,8	61,0	25,6 <sup>(2)</sup>	4	282,5
<b>double convolution bellows</b>											
FD 22-4DI CR	2¾x2	65	80	95	39	45	3,0	1,9	0,9	1	36,0
FD 44-10DI CR	4½x2	65	125	140	75	85	7,4	4,5	1,7	2	93,0
FD 76-14DI CR	6x2	80	175	190	95	115	14,5	9,3	4,7	3	127,0
FD 76-14DS CR	6x2	75	175	190	95	115	14,5	9,3	4,7	4	127,0
FD 138-18 DS	8x2	75	230	245	145	175	24,7	11,3	5,0	4	155,5
FD 209-21 DS	9¼x2	75	255	270	185	205	31,2	18,5	7,5 <sup>(2)</sup>	4	168,0
FD 210-22 DS	10x2	75	270	300	170	225	35,0	21,1	7,1 <sup>(2)</sup>	4	181,0
FD 412-18 DS	12x2	75	330	350	170	225	53,6	36,1	15,4	4	232,0
FD 614-26 DS	14x2	75	400	425	215	265	79,0	52,6	19,7 <sup>(2)</sup>	4	282,5
FD 816-30 DS	16x2	75	435	460	275	315	84,2	58,4	21,1 <sup>(2)</sup>	4	282,5
<b>triple convolution bellows</b>											
FT 22-6DI CR	2¾x3	90	80	95	50	60	2,7	2,0	0,8	1	36,0
FT 44-15DI CR	4½x3	90	125	140	90	110	6,9	4,5	2,3	2	93,0
FT 76-20DI CR	6x3	100	175	190	160	190	14,7	8,8	3,5	3	127,0
FT 76-20DS CR	6x3	95	175	190	160	190	14,7	8,8	3,5	4	127,0
FT 138-26 DS	8x3	100	230	245	205	250	24,6	14,9	6,9	4	155,5
FT 210-32 DS	10x3	100	270	300	250	330	35,3	19,8	7,9 <sup>(2)</sup>	4	181,0
FT 412-32 DS	12x3	100	330	350	250	330	54,6	34,7	15,9	4	232,0
FT 614-36 DS	14x3	100	400	425	320	380	79,1	53,4	19,2 <sup>(2)</sup>	4	282,5
FT 816-40 DS	16x3	120	430	455	355	430	85,7	60,0	24,5 <sup>(2)</sup>	4	282,5

<sup>(1)</sup> not in the case of ECO, <sup>(2)</sup> at p = 7 bar

other types on request

### connection part variants



- metal connecting parts can be dismantled
- NR elastomer as standard type
- CR elastomer (butyl temperature range) and ECO-elastomer (high-temperature applications) types available



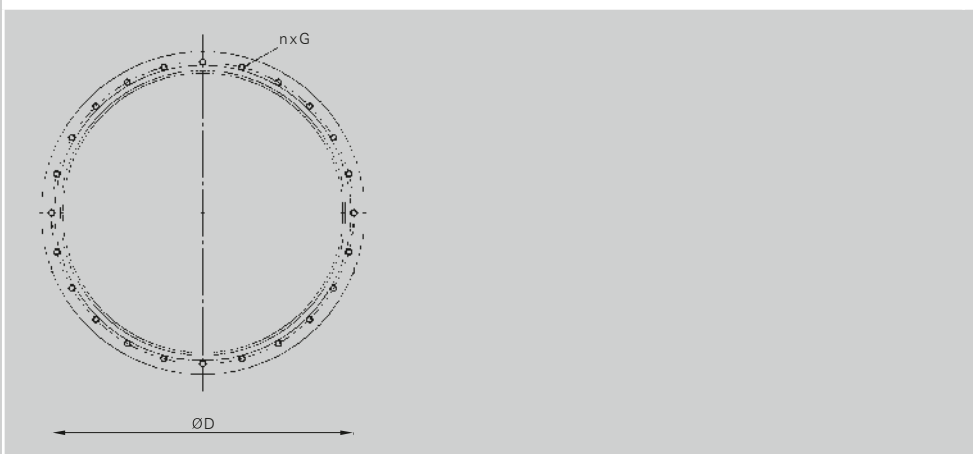
## Model series R

model	min. design height <sup>(1)</sup> (mm)	max. diameter (mm)	installation space required (mm)	max. recommended stroke (mm)	max. stroke (mm)	force at p = 8 bar			reference circle Ø D (mm)	thread n x G
						min. height (kN)	half stroke (kN)	max. stroke (kN)		
<b>single convolution bellows</b>										
FS 960-12 RS	51	442	480	107	124	104,0	78,3	31,3 <sup>(2)</sup>	350	18 x M10
FS 1330-11 RS	51	530	570	94	114	142,4	119,0	66,1	419	24 x M10
FS 1710-12 RS	51	580	620	102	126	182,5	147,2	61,4 <sup>(2)</sup>	482	24 x M10
FS 2870-16 RS	51	715	760	135	164	298,0	238,0	81,0 <sup>(2)</sup>	596	32 x M10
FS 5450-16 RS	64	950	1000	122	151	520,1	437,9	200,8 <sup>(2)</sup>	830	40 x M10
<b>double convolution bellows</b>										
FD 960-22 RS	84	444	490	185	226	106,3	84,1	21,8 <sup>(2)</sup>	350	18 x M10
FD 1120-30 RI	90	500	540	260	315	120,0	89,3	25,7 <sup>(3)</sup>	354	16 x M8
FD 1330-25 RS	84	518	570	200	246	144,2	114,0	42,7 <sup>(2)</sup>	419	24 x M10
FD 1710-25 RS	84	577	620	200	251	185,4	137,6	48,0 <sup>(2)</sup>	482	24 x M10
FD 1730-40 RI	100	610	650	325	400	161,1	134,1	54,1	395	16 x M16
FD 2380-24 RS	84	660	710	186	231	241,3	202,8	80,3 <sup>(2)</sup>	558	24 x M10
FD 2470-40 RI	100	710	750	325	400	246,0	209,2	117,0	495	16 x M16
FD 2870-30 RS	84	709	760	226	271	276,6	232,0	87,8 <sup>(2)</sup>	596	32 x M10
FD 5450-28 RS	107	950	1000	233	283	515,5	410,7	206,0 <sup>(2)</sup>	830	40 x M10
<b>triple convolution bellows</b>										
FT 960-34 RS	114	462	510	290	336	109,0	77,2	29,5 <sup>(2)</sup>	350	18 x M10
FT 1330-35 RS	114	521	570	286	356	148,7	115,6	38,0 <sup>(2)</sup>	419	24 x M10
FT 1710-38 RS	114	580	630	305	356	187,5	149,1	61,8 <sup>(2)</sup>	482	24 x M10
FT 2870-45 RS	115	720	770	365	455	289,0	231,0	46,2 <sup>(2)</sup>	596	32 x M10
FT 5450-44 RS	140	950	1000	350	440	526,7	448,0	218,1 <sup>(2)</sup>	830	40 x M10

<sup>(1)</sup> not in the case of ECO and HP, <sup>(2)</sup> at p = 6 bar, <sup>(3)</sup> at p = 7 bar

other types on request

### connection diagram



- › bead ring connecting parts can be dismantled
- › NR elastomer as standard type
- › also available as special types ECO, Niro and HP





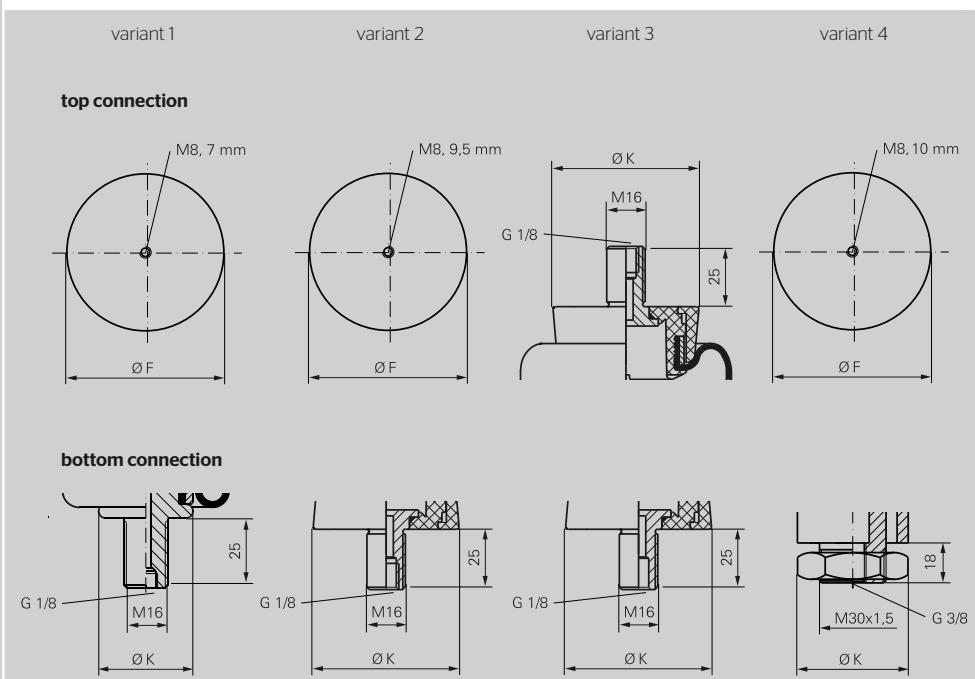
## Model series S

model	min. design height (mm)	max. diameter (mm)	installation space required (mm)	max. recommended stroke (mm)	max. stroke (mm)	force at p = 8 bar			minimum pressure (bar)	connection part variant	top connection part Ø F (mm)	bottom connection part Ø K (mm)
						min. height (kN)	half stroke (kN)	max. stroke (kN)				
SK 19-4	30	60	70	26	33	1,4	0,8	0,4	-	1	34,0	34,0
SK 37-6P02	38	88	100	37	46	3,1	2,6	1,5	-	2	76,0	61,0
SK 37-8P02	38	88	100	62	72	3,1	3,0	1,2	-	2	76,0	61,0
SZ 37-10	65	100	120	85	95	3,5	3,0	0,5 <sup>(1)</sup>	-	3	61,0	61,0
SZ 35-11	95	80	100	100	110	2,2	2,2	1,9	0,9	4	76,5	50,0
SZ 50-11	95	97	115	95	105	3,3	3,3	2,8	0,9	4	86,5	60,5
SZ 70-11	95	123	140	85	105	5,7	5,7	5,0	0,9	4	106,5	81,0
SZ 100-11	95	151	170	85	105	7,8	7,8	5,4	0,9	4	126,5	89,0
SZ 140-11	95	173	190	90	105	11,0	10,9	7,9	0,9	4	148,0	114,0

<sup>(1)</sup> at p = 6 bar

other types on request

### connection part variants



- > sleeve-type air spring design
- > elastomer bellows pressed permanently to the connecting parts by metal rings
- > plastic connecting parts
- > CR elastomer
- > SZ air actuators require a minimum pressure

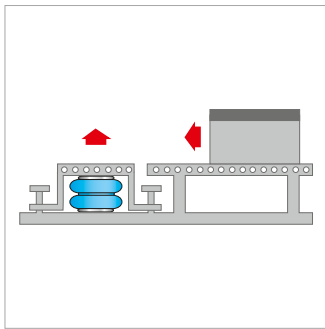
# Applications and product characteristics

Thanks to their special product characteristics in comparison to pneumatic or hydraulic cylinders, air actuators are ideal for a wide variety of applications. A broad product range and many special designs open the way to a diverse scope of application possibilities.

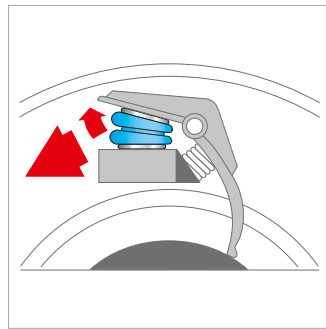


## **ContiTech air actuators can be used in nearly all branches of industry, such as:**

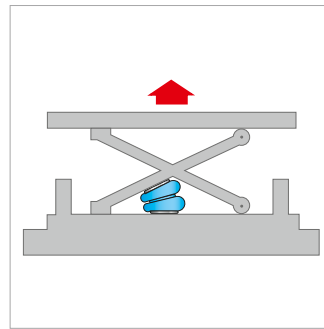
- › vehicle applications
- › automation technology
- › conveyor systems
- › agricultural machinery
- › food industry
- › paper and textile equipment
- › pantograph drives
- › sawmill machinery
- › punch and forming presses



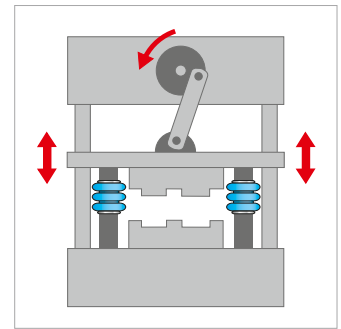
Transfer station



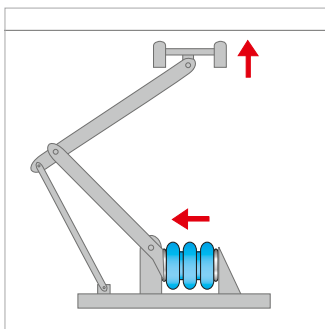
Bark peeling machine



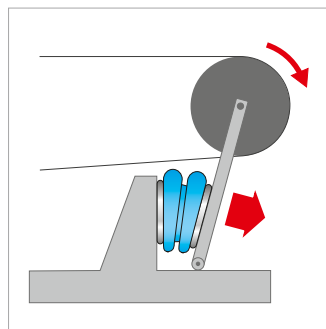
Scissors-type lifting table



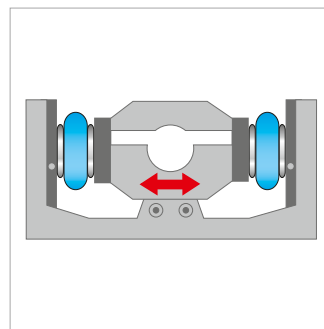
Automatic ram weight adjustment



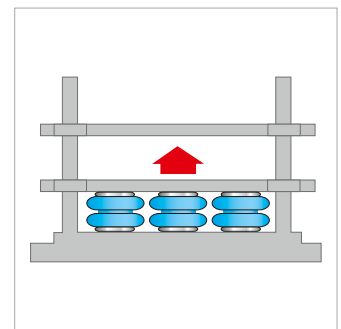
Pantograph



Tensioning station



Edge control



Veneering press

#### › Maintenance-free

ContiTech air actuators perform efficiently even when operating in adverse conditions. They are devoid of sliding seals and articulations, making ContiTech air actuators maintenance-free, even under adverse conditions such as dirt, dust, granular materials, sediments, etc.

#### › Long service life

Dynamically, ContiTech air actuators are highly durable. They have a long service life even when subjected to large loads. They are unaffected by weathering, environmentally induced factors and numerous chemicals. Their materials have been tried and tested in the production of commercial and passenger vehicles as well as rolling stock.

#### › Extensive product range

ContiTech air actuators can be used instead of pneumatic cylinders in a wide range of applications. They have diameters of between 60 mm and 950 mm and can execute strokes up to 455 mm. Various materials cover an application temperature range of -60 °C to +130 °C.

#### › No friction = smooth operation

ContiTech air actuators have no parts or seals that move against each other. Consequently, there is no breakaway friction to overcome (stick-slip-effect), so the actuators respond immediately and uniformly even to extremely small variations in pressure.

#### › Lateral misalignment possible

ContiTech air actuators will continue to operate reliably with a misalignment of up to 30 mm. Unlike actuators based on pneumatic or hydraulic cylinders, air springs have no seals that are subject to blockage or wear. In addition, there is no need for precision guides which are sensitive to the effects of dust and other contaminants.

#### › Easy economic installation

When depressurized, ContiTech air actuators can be installed quickly and easily, thereby saving time and money. The elastomer bellows is flexible enough to compensate for any slight misalignments.

#### › Highly reliable in operation

As stipulated by safety standards, the burst pressure is several times greater than the maximum working pressure.

#### › Resistance to various media

Although designed primarily to be operated pneumatically using compressed air, ContiTech air actuators can be operated equally well with other gaseous media such as nitrogen. At low pressures, hydraulic media such as water and glycol can be used as well. ContiTech air actuators can operate with oil-free compressed air and can therefore be used for special applications, e. g. in the food industry.

# ContiTech

## Air Spring Systems

### Market segment

Air springs for industrial applications

### Contact

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### Your local contact

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[www.contitech.de/airactuator](http://www.contitech.de/airactuator)

In partnership with numerous industries, the ContiTech division of the Continental Corporation develops high-quality functional parts, components and systems that it supplies as original equipment for a wide range of applications.

With its know-how in rubber and plastics technology, ContiTech contributes significantly to industrial progress and safe, comfortable and eco-friendly mobility.

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