

Bellows cylinder EB

FESTO



Characteristics

At a glance

Bellows cylinders can be used both as driving and pneumatic spring components. By pressurising and exhausting the bellows cylinders, they can be used as a drive component. As the stroke increases, the force generated is reduced in relation to the contractional force of the bellows. When bellows cylinders are supplied with permanent pressure, they act as a cushioning component. The simple design consists of two metal connecting plates with a rubber bellows attached to them. There are no sealing components and no moving mechanical parts. Bellows cylinders are single-acting drives that do not require a spring return, as they are reset by the application of external force.

- Suitable for use in harsh, dusty ambient conditions
- Can be used under water
- Low installation height
- No stick-slip effect
- Maintenance-free

Type code

001	Series	
EB	Bellows, single-acting	

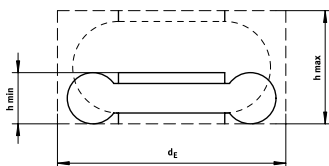
002	Size [mm]	
80	80	
145	145	
165	165	
215	215	
250	250	
325	325	
385	385	

003	Stroke [mm]	
20	20	
45	45	
60	60	
65	65	
80	80	
85	85	
95	95	
100	100	
115	115	
125	125	
155	155	
185	185	
215	215	
230	230	

Datasheet

Prerequisites for using a bellows cylinder

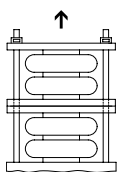
Space required



Observe the installation space to ensure that the bellows cylinder does not come into contact with other machine parts as it expands.

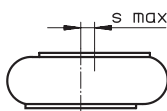
Size	80	145	165	215	250	325	385
Required installation diameter	95 mm	160 mm	180 mm	230 mm	265 mm	340 mm	400 mm

Combined installation



When using two or more bellows cylinders, the necessary mounting plates must be inserted between the cylinders to prevent them from spreading out sideways.

Lateral offset

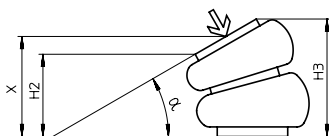


The maximum lateral offset must not be exceeded.

Size	80	145	165	215	250	325	385
Max. offset ¹⁾	5 mm, 10 mm	10 mm, 20 mm					

1) Single-bellows cylinder, double-bellows cylinder

Tilted installation



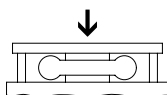
The maximum tilting angle α must not be exceeded to prevent the bellows walls from touching.

Bellows cylinders can perform their stroke along a circular path, but the specified tilting angle α must not be exceeded. During setup the minimum height must be observed and the maximum height must not be exceeded at any given point.

Size	80	145	165	215	250	325	385
Max. angle of inclination ¹⁾	10 deg, 15 deg	20 deg, 30 deg			20 deg, 25 deg	15 deg, 20 deg	

1) Single-bellows cylinder, double-bellows cylinder

Minimum height



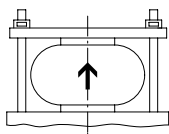
The bellows cylinder must not fall below a minimum height, otherwise it will be damaged.

Size	80	145	165	215	250	325	385
Min. installation height ¹⁾	50 mm, 65 mm	50 mm, 70 mm	51 mm, 72 mm	50 mm, 75 mm	51 mm, 75 mm		51 mm, 77 mm

1) Single-bellows cylinder, double-bellows cylinder

Datasheet

Maximum height



The bellows cylinder must not exceed a maximum height, otherwise it will be damaged.

Size	80	145	165	215	250	325	385
Max. extended height ¹⁾	70 mm, 110 mm	110 mm, 170 mm	115 mm, 200 mm	135 mm, 230 mm	140 mm, 275 mm	150 mm, 305 mm	175 mm, 310 mm

1) Single-bellows cylinder, double-bellows cylinder

General technical data – Single-bellows cylinder

Size	80	145	165	215	250	325	385
Pneumatic connection	G1/4	G1/8	G1/4	G3/4		G1/4	
Stroke	20 mm	60 mm	65 mm	80 mm	85 mm	95 mm	115 mm
Mode of operation	Single-acting						
Type of mounting	Via female thread						

General technical data – Double-bellows cylinder

Size	80	145	165	215	250	325	385
Pneumatic connection	G1/4	G1/8	G1/4	G3/4		G1/4	
Stroke	45 mm	100 mm	125 mm	155 mm	185 mm	215 mm	230 mm
Mode of operation	Single-acting						
Type of mounting	Via female thread						

Operating and environmental conditions

Size	80	145	165	215	250	325	385
Operating medium	Compressed air to ISO 8573-1:2010 [---:4]						
Note on operating and pilot medium ¹⁾	Lubricated operation not possible						
Operating pressure	0 ... 8 bar						
Ambient temperature	-40 ... 70°C						
Corrosion resistance class CRC ²⁾	0 - No corrosion stress	2 - Moderate corrosion stress					

1) Other operating media on request.

2) More information www.festo.com/x/topic/crc

Weight – Single-bellows cylinder

Size	80	145	165	215	250	325	385
Product weight	500 g	900 g	1,200 g	2,000 g	2,300 g	4,100 g	5,900 g

Weight – Double-bellows cylinder

Size	80	145	165	215	250	325	385
Product weight	500 g	1,100 g	1,500 g	2,300 g	3,000 g	4,800 g	6,900 g

Materials

Size	80	145	165	215	250	325	385
Material housing	Die-cast aluminium	Steel, Galvanised					
Material bellows	CR	NR/BR					
LABS (PWIS) conformity	VDMA24364-B1/B2-L						
RoHS status	RoHS compliant in accordance with EU directive						

Forces – Single-bellows cylinder

Size	80	145	165	215	250	325	385
Reset force	400 N	120 N	200 N			300 N	

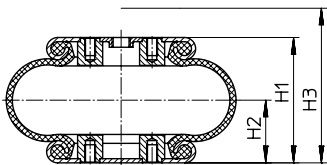
Datasheet

Forces – Double-bellows cylinder							
Size	80	145	165	215	250	325	385
Reset force	200 N					300 N	400 N

Note on forces

- Bellows cylinders may only be moved against a workpiece, or they must be equipped with limit stops at the end of the stroke, otherwise the bellows walls would be overloaded or it would result in internal damage
- A resetting force is required to press the bellows cylinder to its minimum height. In most applications, the applied weight force will provide this.
- The entire bearing surfaces of the upper and lower plates must be utilised to absorb forces
- Bellows cylinders must be exhausted before disassembly The walls of bellows cylinders must not come into contact with other parts during operation

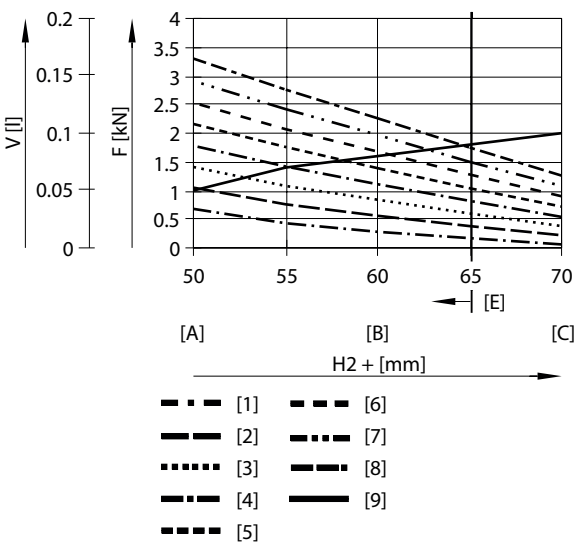
Single-bellows cylinder – thrust F and bellows volume V as a function of the stroke length H



The graph illustrates the change in thrust F with various working pressures and the change in bellows volume V in relation to the stroke length. The minimum installation height H2 must be observed to achieve the indicated forces.

- H1 = Recommended operating height
- H2 = Min. installation height
- H3 = Max. extended height

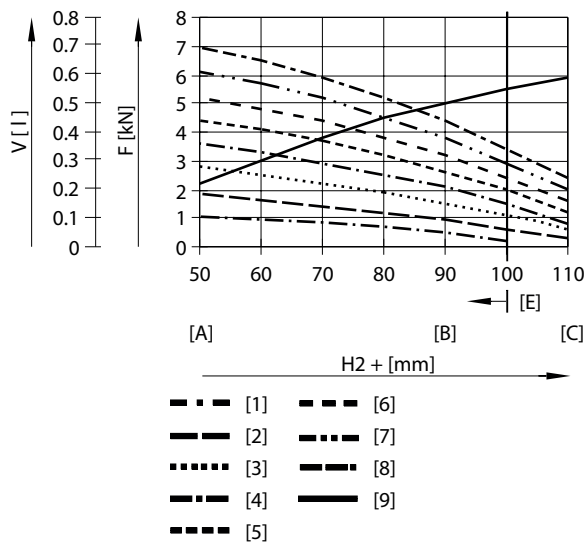
EB-80-20



- [1] 1 bar
 - [2] 2 bar
 - [3] 3 bar
 - [4] 4 bar
 - [5] 5 bar
 - [6] 6 bar
 - [7] 7 bar
 - [8] 8 bar
 - [9] Volume
- [A] Min. installation height
[B] Recommended operating height for cushioning application at 6 bar
[C] Max. extended height
[E] Preferred range of application: outside this range, the force reduces to a level where the next largest size is recommended.

Datasheet

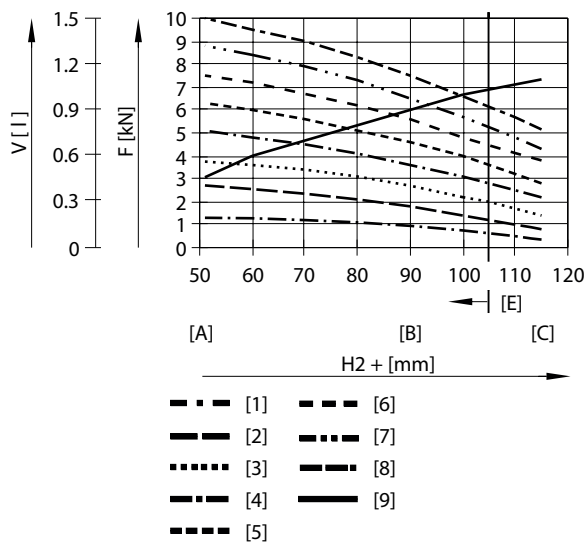
EB-145-60



- [1] 1 bar
- [2] 2 bar
- [3] 3 bar
- [4] 4 bar
- [5] 5 bar
- [6] 6 bar
- [7] 7 bar
- [8] 8 bar
- [9] Volume

[1] Min. installation height
 [2] Recommended operating height for cushioning application at 6 bar
 [3] Max. extended height
 E Preferred range of application: outside this range, the force reduces to a level where the next largest size is recommended.

EB-165-65

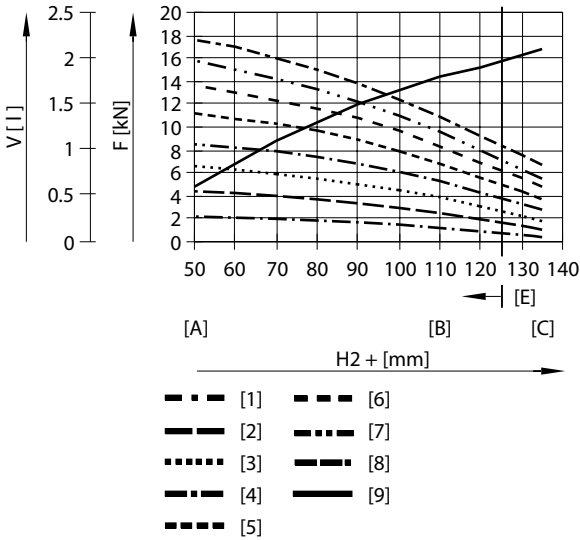


- [1] 1 bar
- [2] 2 bar
- [3] 3 bar
- [4] 4 bar
- [5] 5 bar
- [6] 6 bar
- [7] 7 bar
- [8] 8 bar
- [9] Volume

[1] Min. installation height
 [2] Recommended operating height for cushioning application at 6 bar
 [3] Max. extended height
 E Preferred range of application: outside this range, the force reduces to a level where the next largest size is recommended.

Datasheet

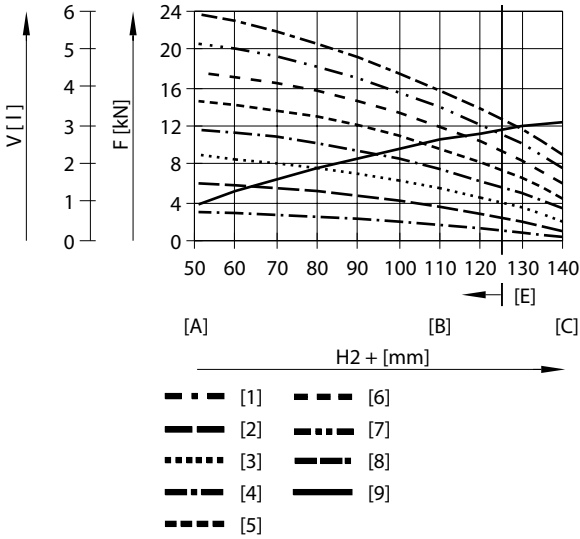
EB-215-80



- [1] 1 bar
- [2] 2 bar
- [3] 3 bar
- [4] 4 bar
- [5] 5 bar
- [6] 6 bar
- [7] 7 bar
- [8] 8 bar
- [9] Volume

[1] Min. installation height
 [2] Recommended operating height for cushioning application at 6 bar
 [3] Max. extended height
 E Preferred range of application: outside this range, the force reduces to a level where the next largest size is recommended.

EB-250-85

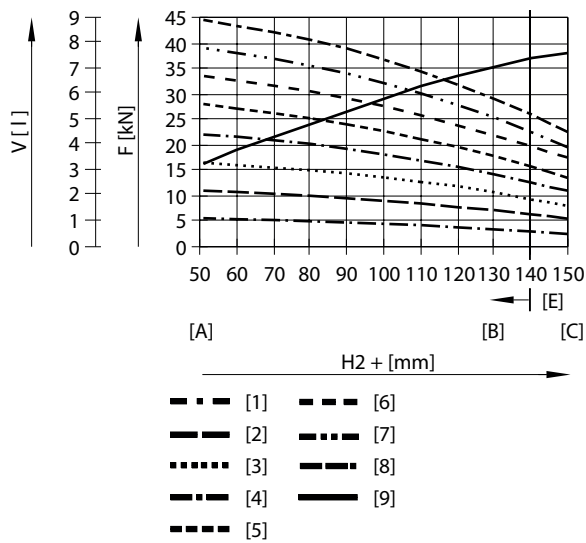


- [1] 1 bar
- [2] 2 bar
- [3] 3 bar
- [4] 4 bar
- [5] 5 bar
- [6] 6 bar
- [7] 7 bar
- [8] 8 bar
- [9] Volume

[1] Min. installation height
 [2] Recommended operating height for cushioning application at 6 bar
 [3] Max. extended height
 E Preferred range of application: outside this range, the force reduces to a level where the next largest size is recommended.

Datasheet

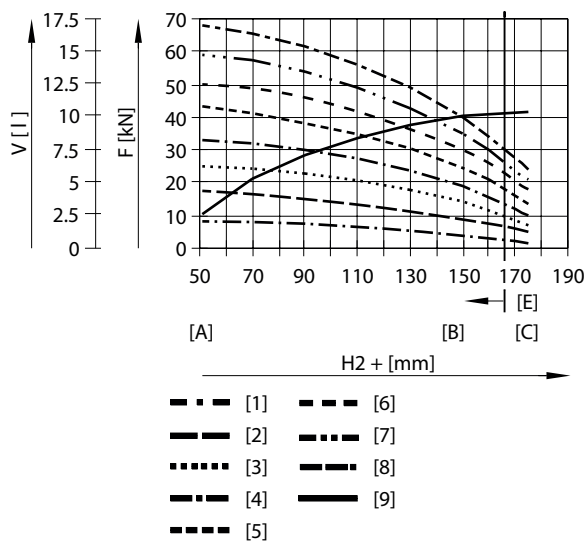
EB-325-95



- [1] 1 bar
- [2] 2 bar
- [3] 3 bar
- [4] 4 bar
- [5] 5 bar
- [6] 6 bar
- [7] 7 bar
- [8] 8 bar
- [9] Volume

[1] Min. installation height
 [2] Recommended operating height for cushioning application at 6 bar
 [3] Max. extended height
 E Preferred range of application: outside this range, the force reduces to a level where the next largest size is recommended.

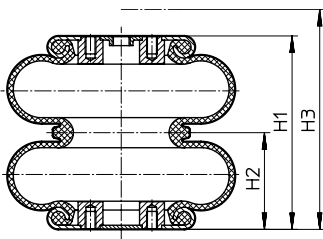
EB-385-115



- [1] 1 bar
- [2] 2 bar
- [3] 3 bar
- [4] 4 bar
- [5] 5 bar
- [6] 6 bar
- [7] 7 bar
- [8] 8 bar
- [9] Volume

[1] Min. installation height
 [2] Recommended operating height for cushioning application at 6 bar
 [3] Max. extended height
 E Preferred range of application: outside this range, the force reduces to a level where the next largest size is recommended.

Double-bellows cylinder – thrust F and bellows volume V as a function of the stroke length H

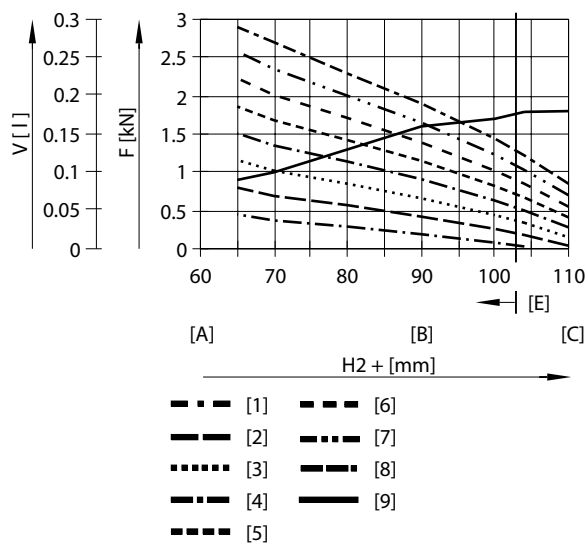


The graph illustrates the change in thrust F with various working pressures and the change in bellows volume V in relation to the stroke length. The minimum installation height H2 must be observed to achieve the indicated forces.

H1 = Recommended operating height
 H2 = Min. installation height
 H3 = Max. extended height

Datasheet

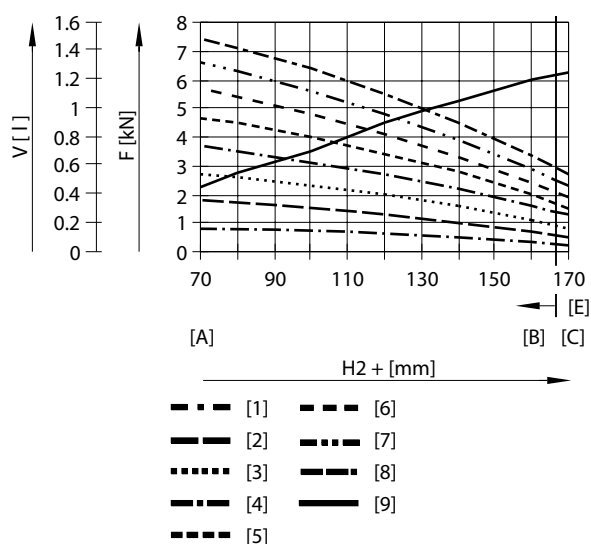
EB-80-45



- [1] 1 bar
- [2] 2 bar
- [3] 3 bar
- [4] 4 bar
- [5] 5 bar
- [6] 6 bar
- [7] 7 bar
- [8] 8 bar
- [9] Volume

[A] Min. installation height
 [B] Recommended operating height for cushioning application at 6 bar
 [C] Max. extended height
 [E] Preferred range of application: outside this range, the force reduces to a level where the next largest size is recommended.

EB-145-100

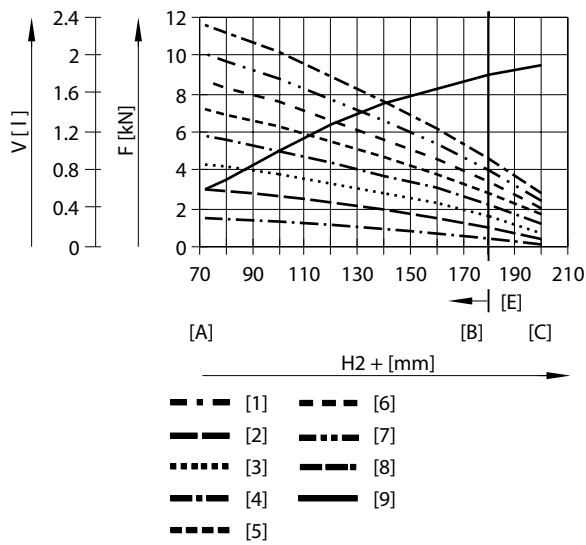


- [1] 1 bar
- [2] 2 bar
- [3] 3 bar
- [4] 4 bar
- [5] 5 bar
- [6] 6 bar
- [7] 7 bar
- [8] 8 bar
- [9] Volume

[A] Min. installation height
 [B] Recommended operating height for cushioning application at 6 bar
 [C] Max. extended height
 [E] Preferred range of application: outside this range, the force reduces to a level where the next largest size is recommended.

Datasheet

EB-165-125



- [1] 1 bar
- [2] 2 bar
- [3] 3 bar
- [4] 4 bar
- [5] 5 bar
- [6] 6 bar
- [7] 7 bar
- [8] 8 bar
- [9] Volume

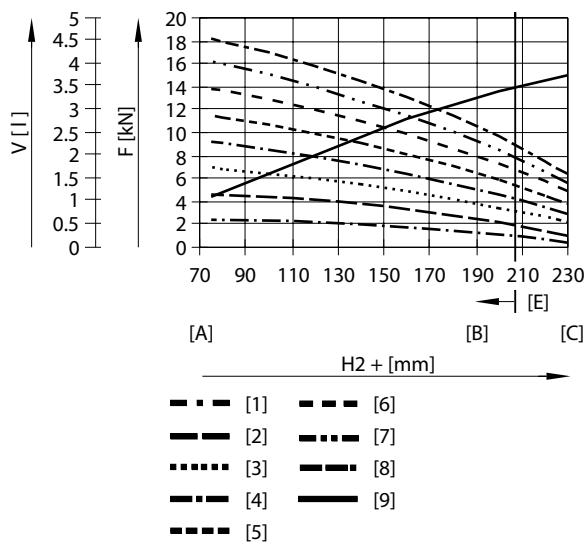
[A] Min. installation height

[B] Recommended operating height for cushioning application at 6 bar

[C] Max. extended height

[E] Preferred range of application: outside this range, the force reduces to a level where the next largest size is recommended.

EB-215-155



- [1] 1 bar
- [2] 2 bar
- [3] 3 bar
- [4] 4 bar
- [5] 5 bar
- [6] 6 bar
- [7] 7 bar
- [8] 8 bar
- [9] Volume

[A] Min. installation height

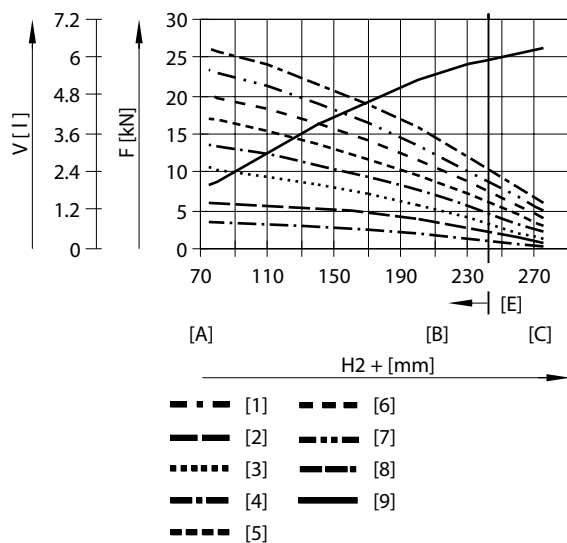
[B] Recommended operating height for cushioning application at 6 bar

[C] Max. extended height

[E] Preferred range of application: outside this range, the force reduces to a level where the next largest size is recommended.

Datasheet

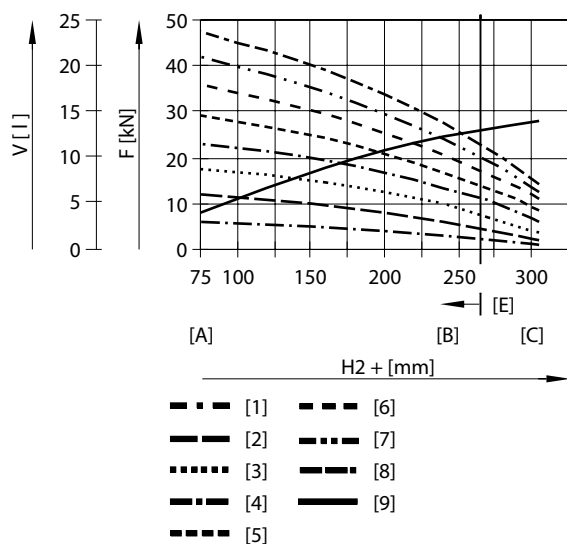
EB-250-185



- [1] 1 bar
- [2] 2 bar
- [3] 3 bar
- [4] 4 bar
- [5] 5 bar
- [6] 6 bar
- [7] 7 bar
- [8] 8 bar
- [9] Volume

[A] Min. installation height
 [B] Recommended operating height for cushioning application at 6 bar
 [C] Max. extended height
 [E] Preferred range of application: outside this range, the force reduces to a level where the next largest size is recommended.

EB-325-215

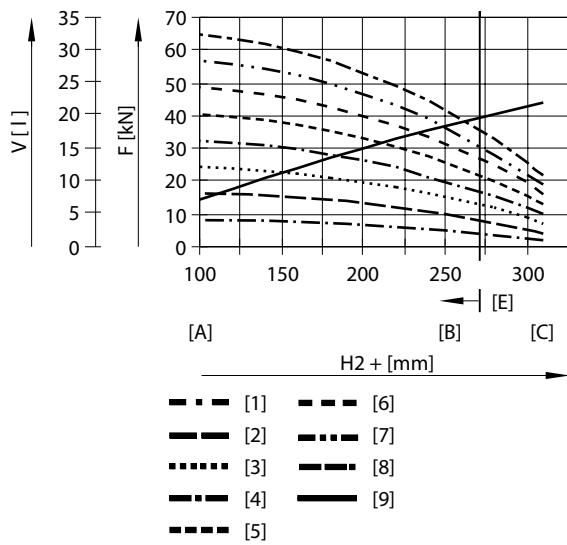


- [1] 1 bar
- [2] 2 bar
- [3] 3 bar
- [4] 4 bar
- [5] 5 bar
- [6] 6 bar
- [7] 7 bar
- [8] 8 bar
- [9] Volume

[A] Min. installation height
 [B] Recommended operating height for cushioning application at 6 bar
 [C] Max. extended height
 [E] Preferred range of application: outside this range, the force reduces to a level where the next largest size is recommended.

Datasheet

EB-385-230



- [1] 1 bar
- [2] 2 bar
- [3] 3 bar
- [4] 4 bar
- [5] 5 bar
- [6] 6 bar
- [7] 7 bar
- [8] 8 bar
- [9] Volume

[A] Min. installation height

[B] Recommended operating height for cushioning application at 6 bar

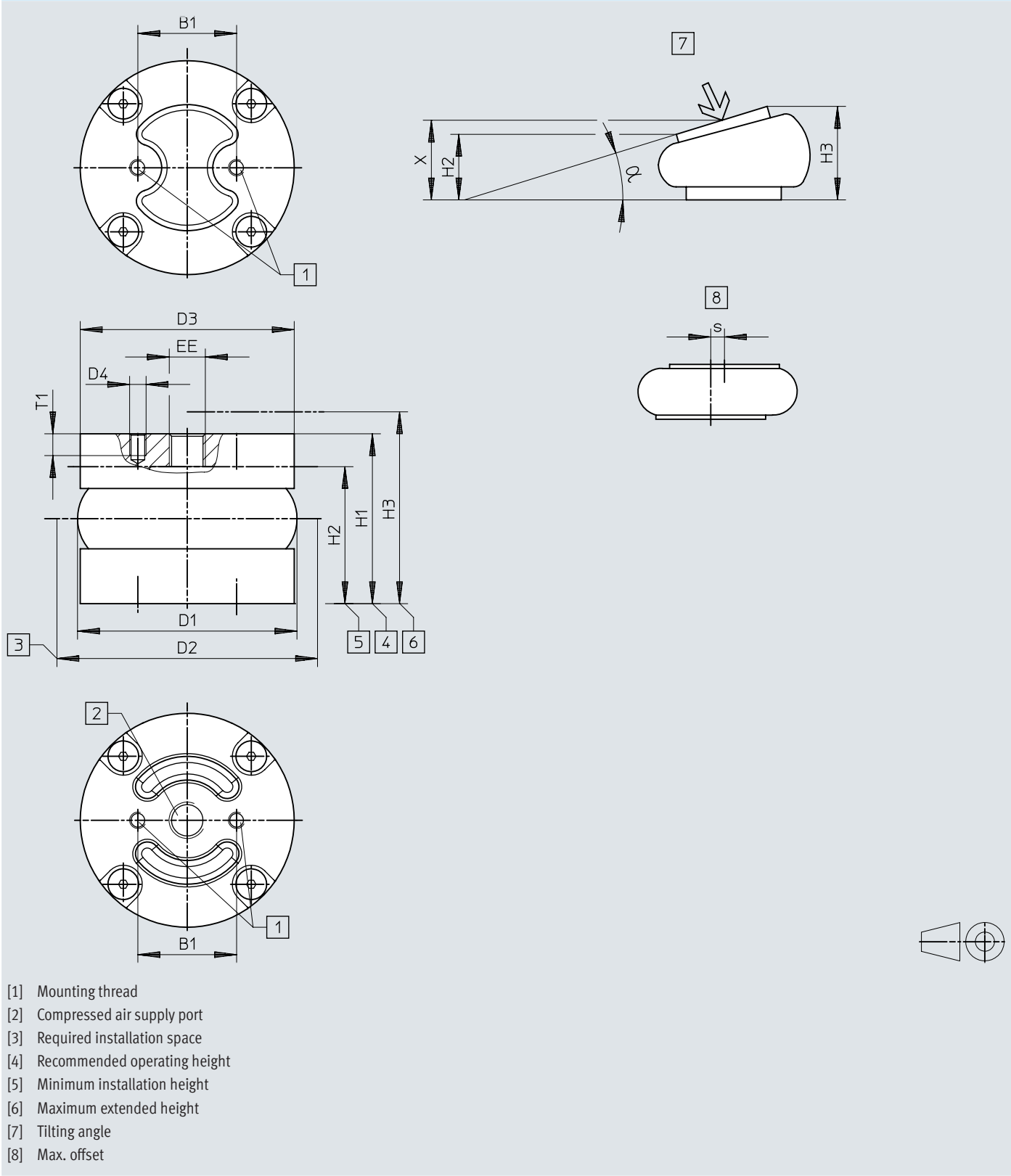
[C] Max. extended height

[E] Preferred range of application: outside this range, the force reduces to a level where the next largest size is recommended.

Dimensions

Dimensions – Single-bellows cylinder – EB-80

Download CAD data www.festo.com



	B1	D1 ø max.	D2 ø	D3 ø	D4	EE	H1	H2 min.	H3 max.	T1 min.	s _{max}	1) max.
EB-80-20	36	80	95	78	M6	G1/4	60	50	70	8	5	10°

1) Angle of inclination

Dimensions

Dimensions – Single-bellows cylinder – EB-145 ... 385

Download CAD data www.festo.com

EB-165

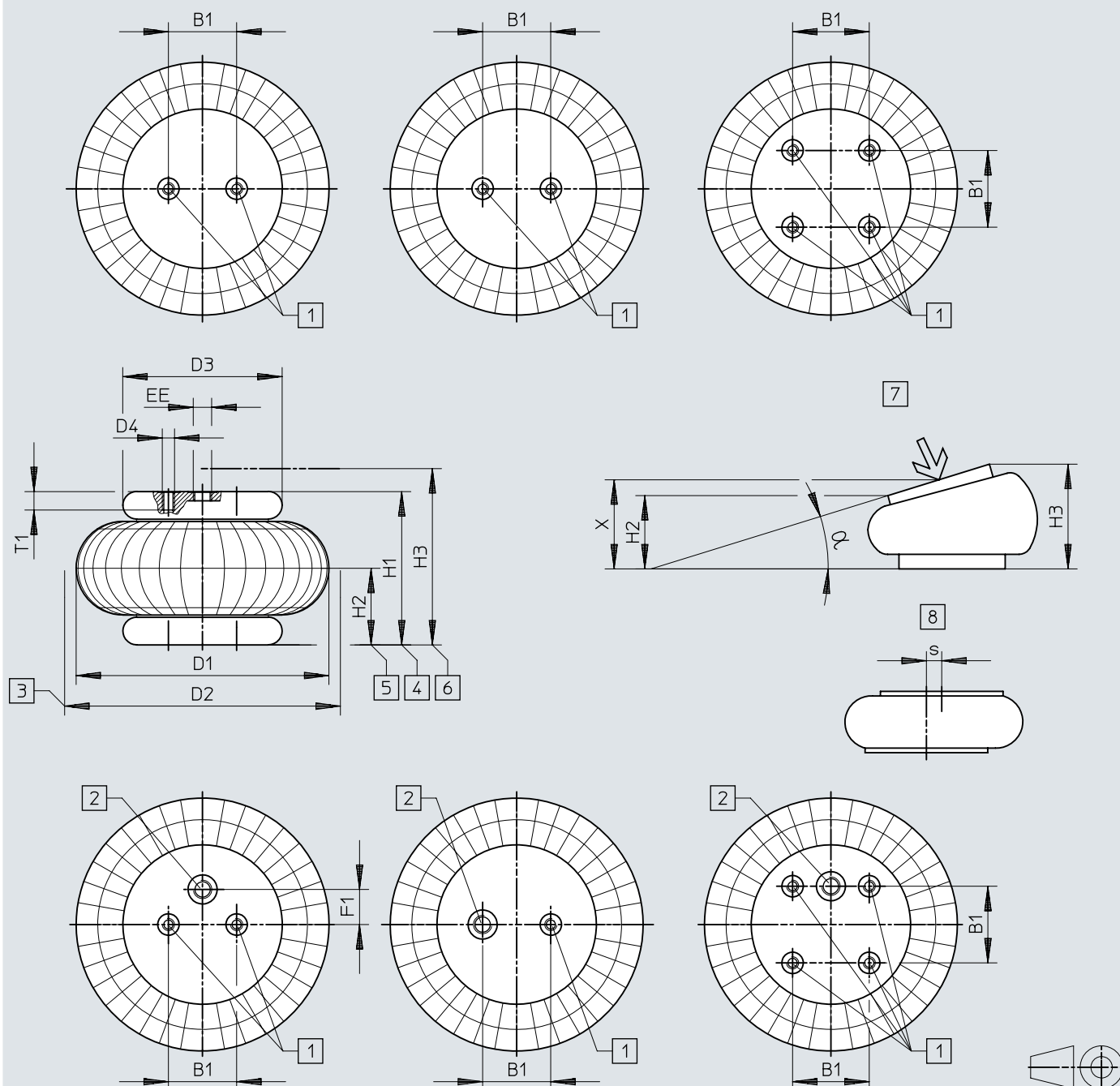
EB-215

EB-250

EB-325

EB-145

EB-385



- [1] Mounting thread
- [2] Compressed air supply port
- [3] Required installation space
- [4] Recommended operating height
- [5] Minimum installation height
- [6] Maximum extended height
- [7] Tilting angle
- [8] Max. offset

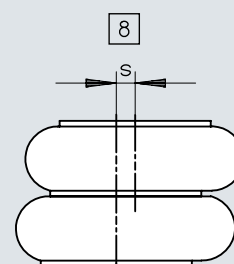
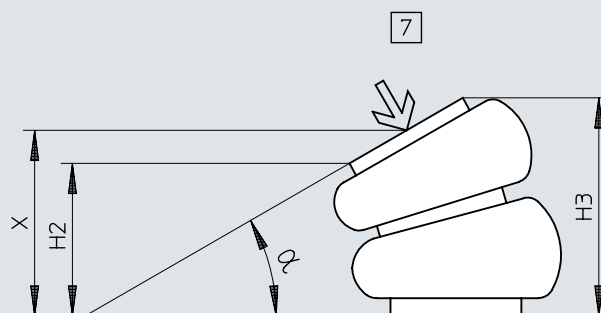
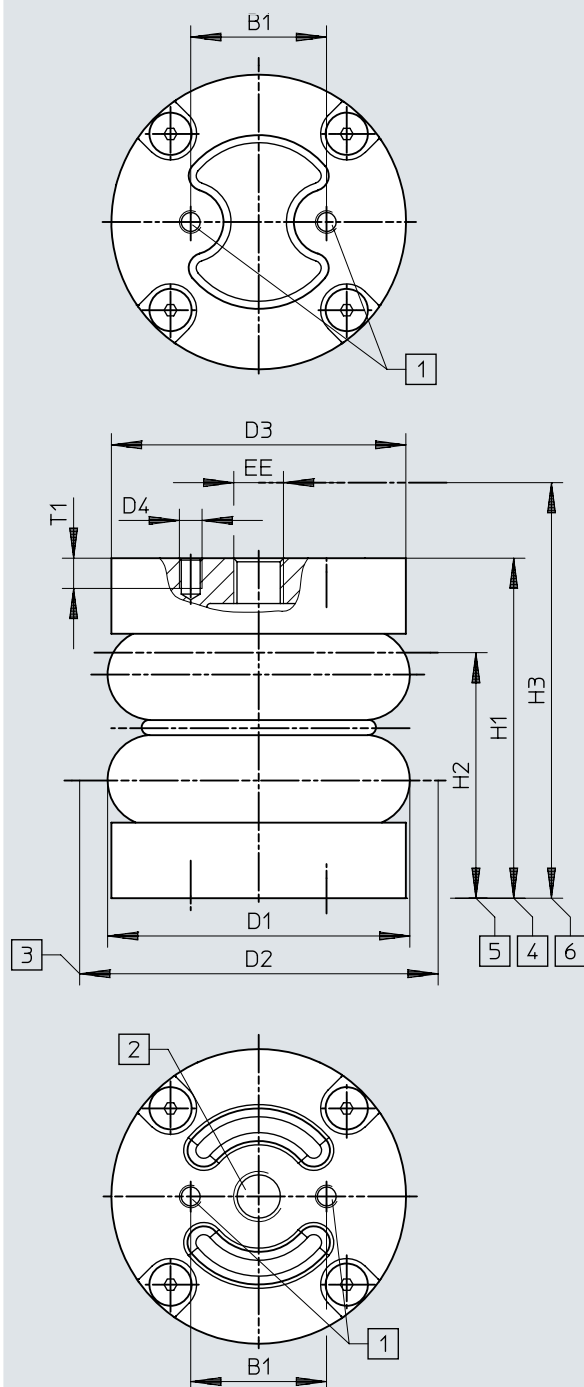
Dimensions

	B1 ±0,2	D1 ∅ max.	D2 ∅	D3 ∅	D4	EE	F1 ±0,2	H1	H2 min.	H3 max.	T1 min.	S _{max}	1) max.
EB-145-60	20	145	160	90	M8	G1/8	–	90	50	110	15	10	20°
EB-165-65	44,5	165	180	108	M8	G1/4	0	90	51	115	15	10	20°
EB-215-80	70	215	230	141	M8	G3/4	0	110	50	135	15	10	20°
EB-250-85	89	250	265	161	M8	G3/4	38,1	110	51	140	15	10	20°
EB-325-95	157,5	325	340	228	M8	G1/4	73	130	51	150	15	10	15°
EB-385-115	158,8	385	400	287	M8	G1/4	79,4	145	51	175	15	10	15°

1) Angle of inclination

Dimensions

Dimensions – Double-bellows cylinder – EB-80

Download CAD data www.festo.com

- [1] Mounting thread
- [2] Compressed air supply port
- [3] Required installation space
- [4] Recommended operating height
- [5] Minimum installation height
- [6] Maximum extended height
- [7] Tilting angle
- [8] Max. offset



Dimensions

	B1	D1 Ø max.	D2 Ø	D3 Ø	D4	EE	H1	H2 min.	H3 max.	T1 min.	s _{max}	1) max.
EB-80-45	36	80	95	78	M6	G1/4	90	65	110	8	10	15°

1) Angle of inclination

Dimensions

Dimensions – Double-bellows cylinder – EB-145 ... 385

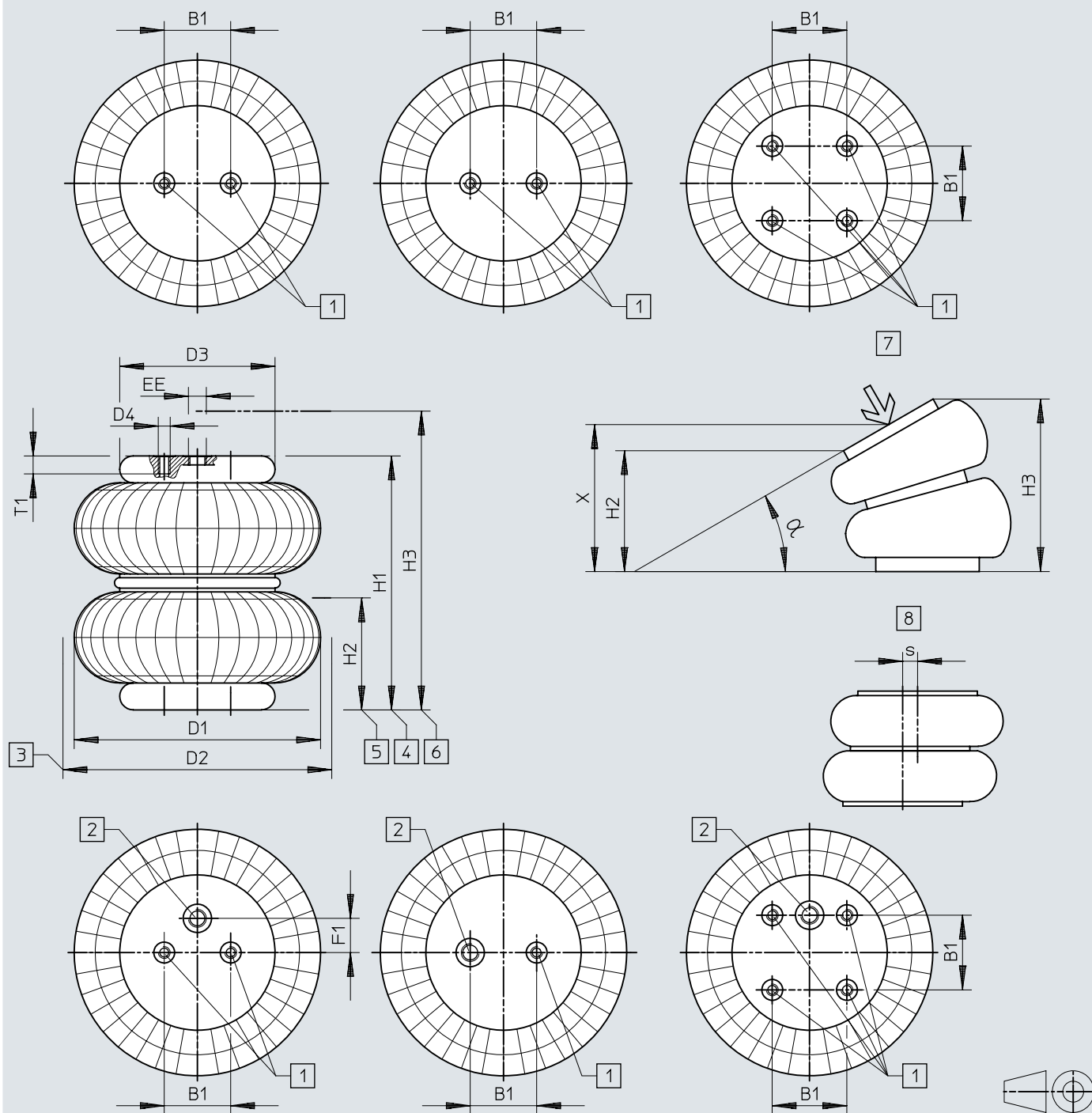
Download CAD data www.festo.com

EB-165, EB-215

EB-250, EB-325

EB-145

EB-385



- [1] Mounting thread
- [2] Compressed air supply port
- [3] Required installation space
- [4] Recommended operating height
- [5] Minimum installation height
- [6] Maximum extended height
- [7] Tilting angle
- [8] Max. offset

Dimensions

	B1 ±0,2	D1 ∅ max.	D2 ∅	D3 ∅	D4	EE	F1 ±0,2	H1	H2 min.	H3 max.	T1 min.	s _{max}	1) max.
EB-145-100	20	145	160	90	M8	G1/8	–	160	70	170	15	20	30°
EB-165-125	44,5	165	180	108	M8	G1/4	0	175	72	200	15	20	30°
EB-215-155	70	215	230	141	M8	G3/4	0	190	75	230	15	20	30°
EB-250-185	89	250	265	161	M8	G3/4	38,1	210	75	275	15	20	25°
EB-325-215	157,5	325	340	228	M8	G1/4	73	240	75	305	15	20	20°
EB-385-230	158,8	385	400	287	M8	G1/4	79,4	250	77	310	15	20	20°

1) Angle of inclination

Ordering data

Single-bellows cylinder				
	Size	Stroke	Part no.	Type
	80	20 mm	2748903	EB-80-20
	145	60 mm	36486	EB-145-60
	165	65 mm	36487	EB-165-65
	215	80 mm	36488	EB-215-80
	250	85 mm	36489	EB-250-85
	325	95 mm	193788	EB-325-95
	385	115 mm	193789	EB-385-115

Double-bellows cylinder				
	Size	Stroke	Part no.	Type
	80	45 mm	2748904	EB-80-45
	145	100 mm	36490	EB-145-100
	165	125 mm	36491	EB-165-125
	215	155 mm	36492	EB-215-155
	250	185 mm	36493	EB-250-185
	325	215 mm	193790	EB-325-215
	385	230 mm	193791	EB-385-230