Bellows cylinders EB

FESTO

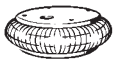
Bellows cylinders EB

Key features, product range overview and type code

Key features

Bellows cylinders function both as driving and pneumatic spring components. Bellows cylinders function as a driving component by providing pressurising and exhaust functions. As the stroke increases, the force generated is reduced in relation the contractional force of the bellows. When bellows cylinders are supplied with permanent pressure, they function as a cushioning component. The simple design consists of two metal plates with a ribbed rubber bellows. There are no sealing components and no moving mechanical parts. Bellows cylinders are single-acting drives that do not require spring returns, as the reset is performed through the application of external force.

Product range overview

Function	Variant	Type	Size	Stroke [mm]
Single-acting	Bellows			
		**EB** Single-bellows cylinder	145	60
			165	65
			215	80
			250	85
			325	95
			385	115
		**EB** Double-bellows cylinder	145	100
			165	125
			215	155
			250	185
			325	215
			385	230

Type codes

EB – 250 – 85

Type	
Single-acting	
EB	Bellows

Size

Stroke [mm]

Bellows cylinders EB

Technical data

FESTO

Function

-N- Diameter
145 ... 385 mm
-T- Stroke length
60 ... 230 mm

General technical data						
Size	145	165	215	250	325	385
Pneumatic connection	G⅛	G¼	G¾	G¾	G¼	G¼
Mode of operation	Single-acting					
Design	Bellows					
Type of mounting	With female thread					
Mounting position	Any					

Operating and environmental conditions		
Operating medium		Compressed air in accordance with ISO 8573-1:2010 [7:–:–]
Note on operating/pilot medium		Operation with lubricated medium possible (in which case lubricated operation will always be required)
Operating pressure	[bar]	0 ... 8
Ambient temperature	[°C]	–40 ... +70
Corrosion resistance class CRC[1)]		2

1) Corrosion resistance class 2 to Festo standard 940 070
Components subject to moderate corrosion stress. Externally visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment or media such as coolants or lubricating agents

Forces [N]						
Size	145	165	215	250	325	385
Single-bellows cylinder						
Force/stroke curve	→ 4		→ 5			
Resetting force	200				300	
Double-bellows cylinder						
Force/stroke curve	→ 6		→ 7			
Resetting force	200				300	

Note

- Bellows cylinders may only be driven against a workpiece, or they must be equipped with stroke limiting stops at the stroke ends, because the bellows would otherwise be overloaded
- A resetting force is required in order to press the bellows cylinder together to its minimum height. As a rule, this is achieved through the applied load
- The entire bearing surfaces of the upper and lower plates must be utilised in order to absorb forces
- Bellows cylinders must be exhausted before disassembly
- The rubber bellows must not come into contact with other parts during operation

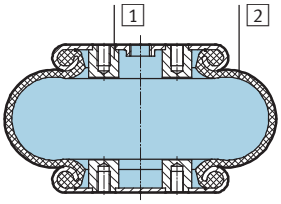
Bellows cylinders EB

Technical data

Weights [g]						
Size	145	165	215	250	325	385
Single-bellows cylinder	900	1,200	2,000	2,300	4,100	5,800
Double-bellows cylinder	1,100	1,500	2,300	3,000	4,800	6,900

Materials

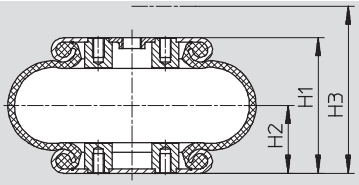
Sectional view



Bellows cylinder		
1	Housing	Galvanised steel
2	Bellows	Rubber
–	Note on materials	Free of copper, PTFE and silicone
		Conforms to RoHS

Thrust F and bellows volume V as a function of the minimum installation height H2 + stroke length

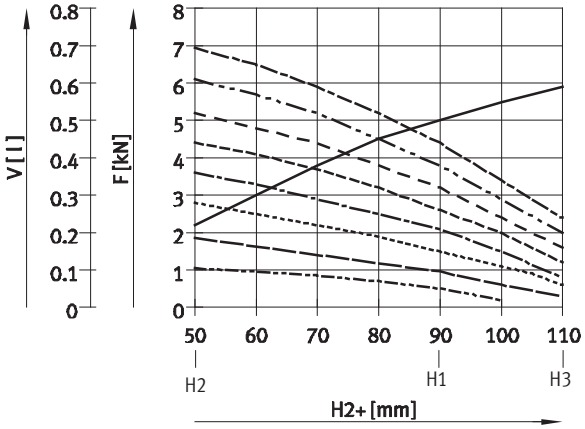
The diagram illustrates the change in thrust F with various working pressures and differing bellows volumes V in relation to stroke length. The minimum installation height H2 must be observed in order to fully reach the indicated forces.



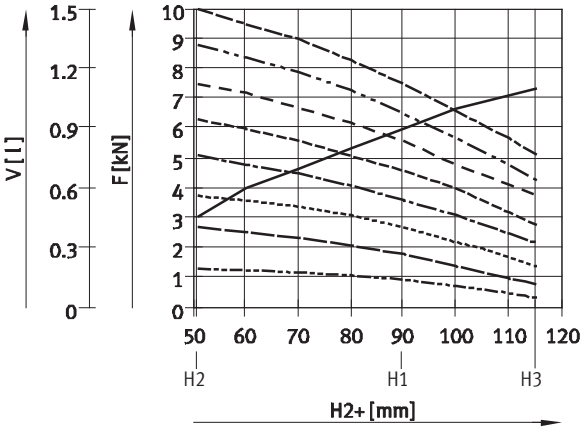
H1 Recommended operating height for cushioning applications at 6 bar
H2 Minimum installation height
H3 Maximum extended end position

Single-bellows cylinder

EB-145-60



EB-165-65

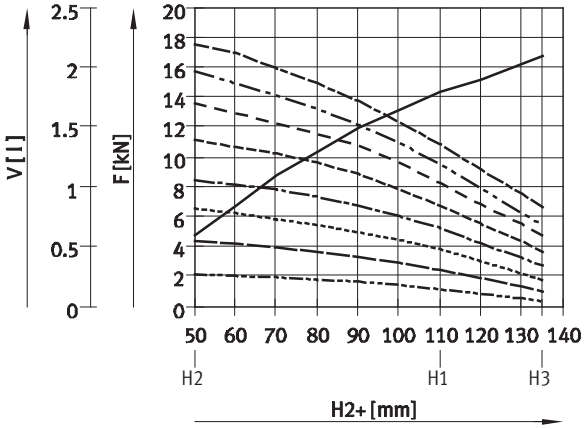


\+ plus stroke length

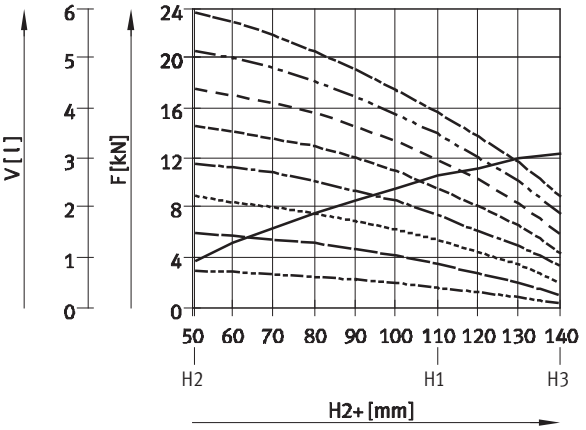
Volume
1 bar
2 bar
3 bar
4 bar
5 bar
6 bar
7 bar
8 bar

Single-bellows cylinder

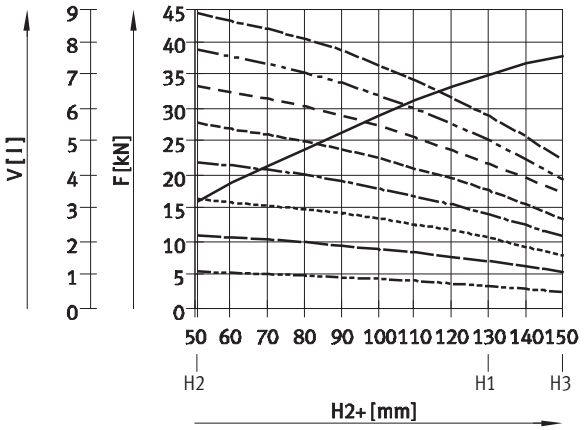
EB-215-80



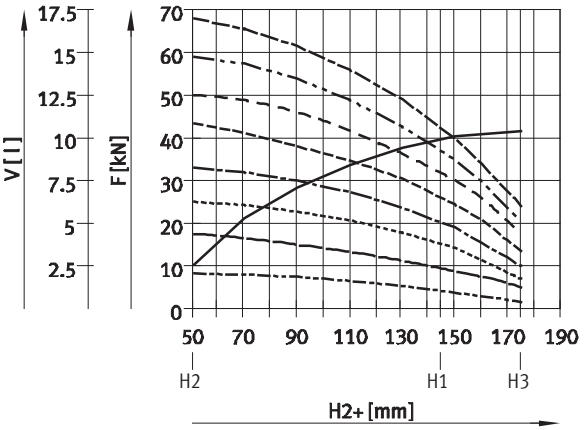
EB-250-85



EB-325-95



EB-385-115

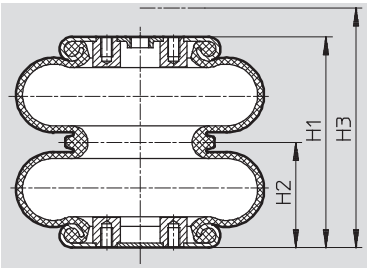


\+ plus stroke length

Volume
1 bar
2 bar
3 bar
4 bar
5 bar
6 bar
7 bar
8 bar

Thrust F and bellows volume V as a function of the minimum installation height H2 + stroke length

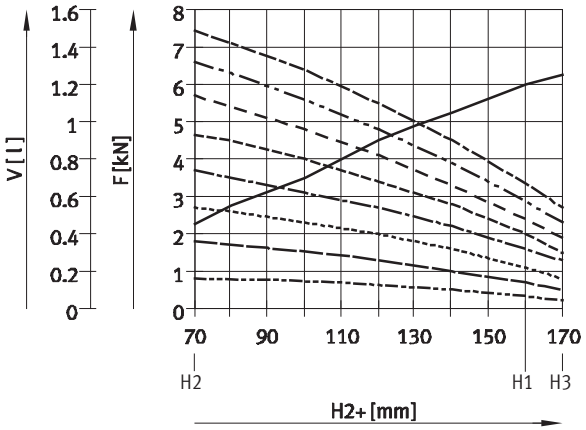
The diagram illustrates the change in thrust F with various working pressures and differing bellows volumes V in relation to stroke length. The minimum installation height H2 must be observed in order to fully reach the indicated forces.



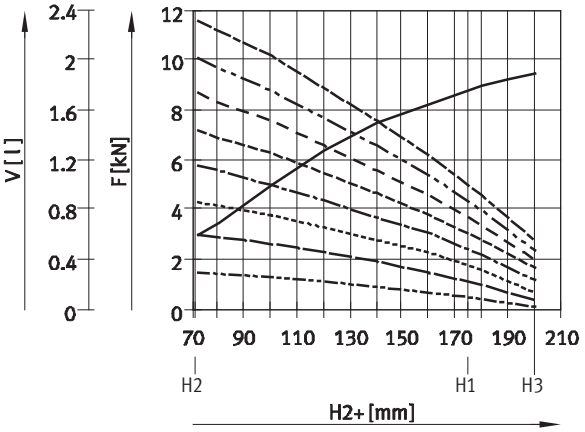
H1 Recommended operating height for cushioning applications at 6 bar
H2 Minimum installation height
H3 Maximum extended end position

Double-bellows cylinder

EB-145-100



EB-165-125

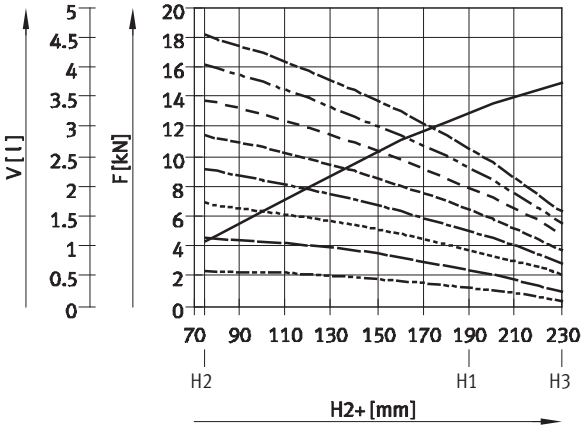


\+ plus stroke length

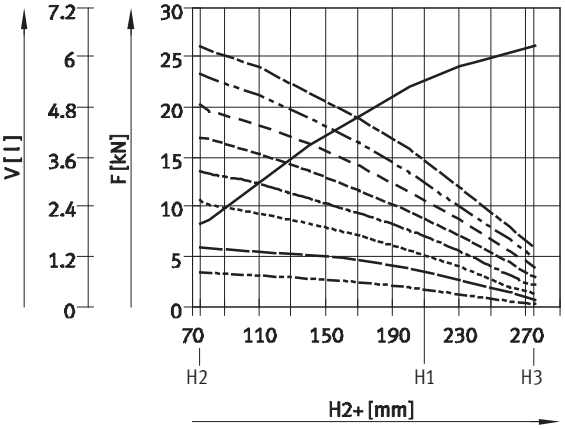
Volume
1 bar
2 bar
3 bar
4 bar
5 bar
6 bar
7 bar
8 bar

Double-bellows cylinder

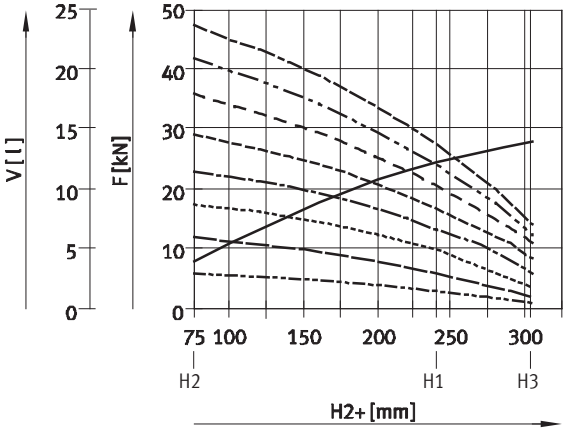
EB-215-155



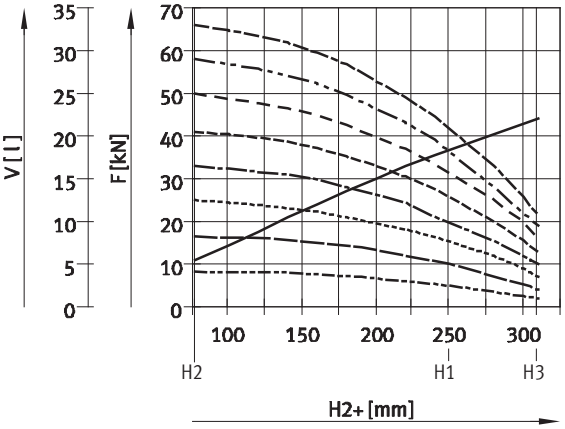
EB-250-185



EB-325-215



EB-385-230



\+ plus stroke length

Volume
1 bar
2 bar
3 bar
4 bar
5 bar
6 bar
7 bar
8 bar

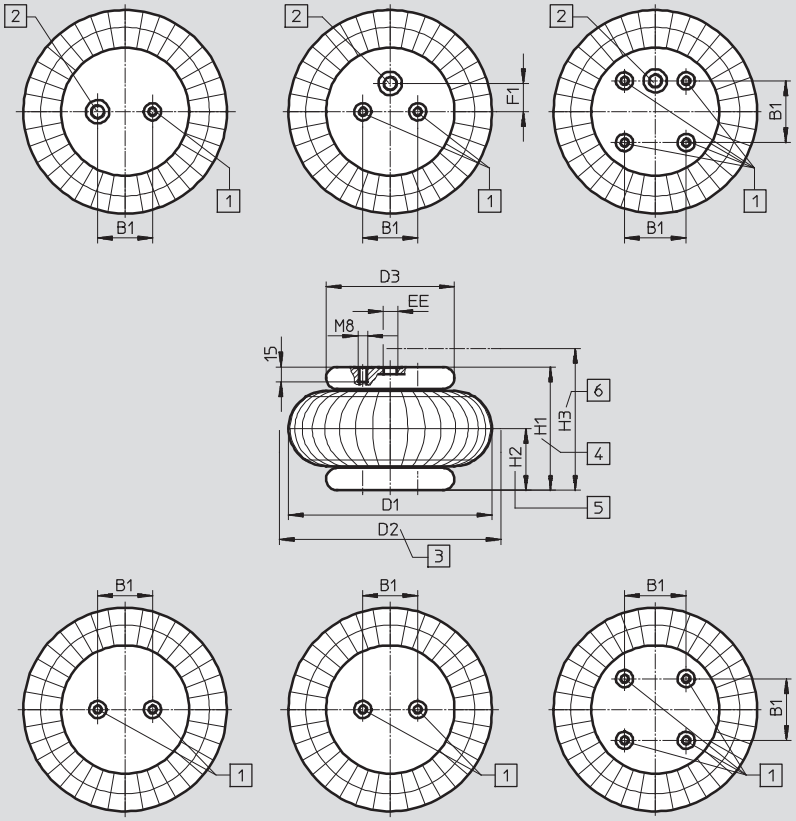
Dimensions – Single-bellows cylinder

Download CAD Data ➔ **www.festo.com/us/cad**

EB-145

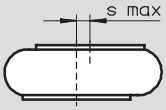
EB-165
EB-215
EB-250
EB-325

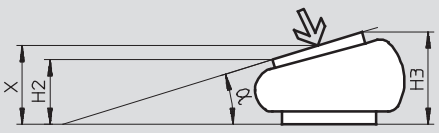
EB-385



1 Mounting thread
2 Compressed air connection
3 Required fitting space
4 Status upon delivery
5 Minimum installation height
6 Maximum extended end position

Maximum offset between the mounting surfaces





Note

The stroke of the bellows cylinder can be made to describe a circular arc, in which case the indicated tilt angle α must not be exceeded. During setup it must be observed that the minimum height H2 is not fallen short of, and that the maximum height H3 is not exceeded at any given point. The height at the centre of the plate X is the decisive factor in the calculation of the thrust.

Bellows cylinders EB

Technical data

Type	B1 ±0.2	D1 ∅ max.	D2 ∅	D3 ∅	EE	F1 ±0.2	H1	H2 min.	H3 max.	s_{max}	Tilt angle α max.
EB-145-60	20	145	160	90	G⅛	–	90	50	110	10	20°
EB-165-65	44.5	165	180	108	G¼	0	90	51	115	10	20°
EB-215-80	70	215	230	141	G¾	0	110	50	135	10	20°
EB-250-85	89	250	265	161	G¾	38.1	110	51	140	10	20°
EB-325-95	157.5	325	340	228	G¼	73	130	51	150	10	15°
EB-385-115	158.8	385	400	287	G¼	79.4	145	51	175	10	15°

Ordering data – Single-bellows cylinder

Size	Stroke [mm]	Part No.	Type
145	60	**36 486**	**EB-145-60**
165	65	**36 487**	**EB-165-65**
215	80	**36 488**	**EB-215-80**
250	85	**36 489**	**EB-250-85**
325	95	**193 788**	**EB-325-95**
385	115	**193 789**	**EB-385-115**

Dimensions – Double-bellows cylinder

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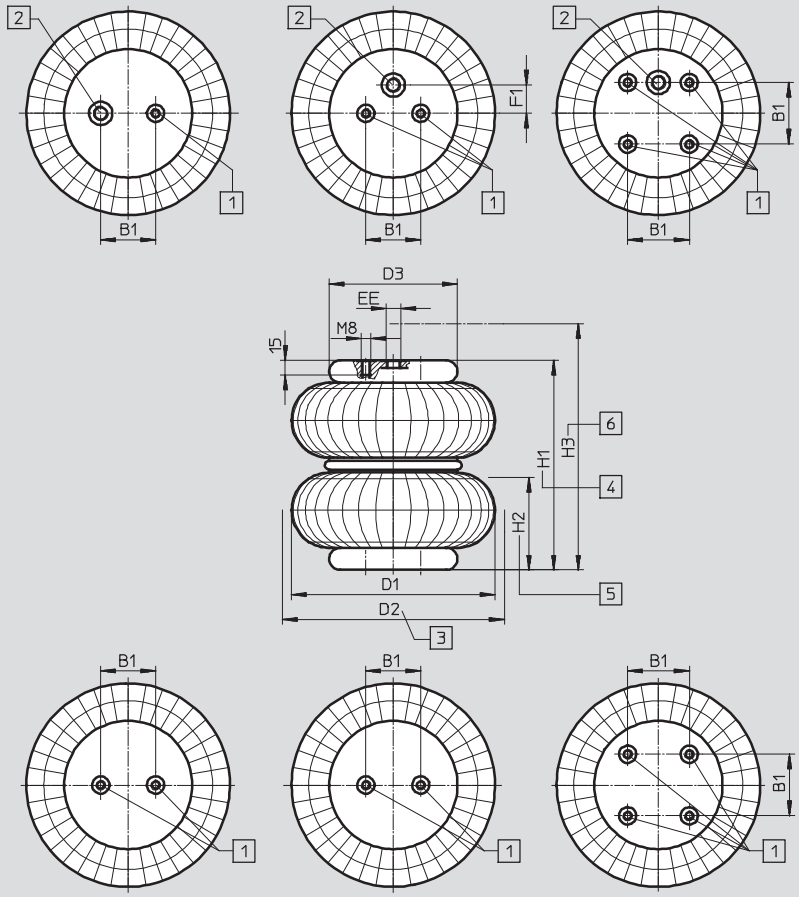
EB-145

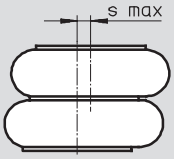
EB-165
EB-215
EB-250
EB-325

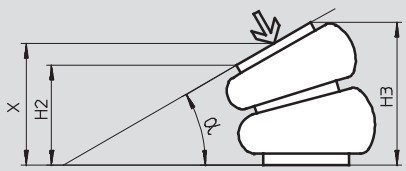
EB-385



1 Mounting thread
2 Compressed air connection
3 Required fitting space
4 Status upon delivery
5 Minimum installation height
6 Maximum extended end position

Maximum offset between the mounting surfaces





Note

The stroke of the bellows cylinder can be made to describe a circular arc, in which case the indicated tilt angle α must not be exceeded. During setup it must be observed that the minimum height H2 is not fallen short of, and that the maximum height H3 is not exceeded at any given point. The height at the centre of the plate X is the decisive factor in the calculation of the thrust.

Bellows cylinders EB

Technical data

Type	B1 ±0.2	D1 ∅ max.	D2 ∅	D3 ∅	EE	F1 ±0.2	H1	H2 min.	H3 max.	s_{max}	Tilt angle α max.
EB-145-100	20	145	160	90	G⅛	–	160	70	170	20	30°
EB-165-125	44.5	165	180	108	G¼	0	175	72	200	20	30°
EB-215-155	70	215	230	141	G¾	0	190	75	230	20	30°
EB-250-185	89	250	265	161	G¾	38.1	210	75	275	20	25°
EB-325-215	157.5	325	340	228	G¼	73	240	75	305	20	20°
EB-385-230	158.8	385	400	287	G¼	79.4	250	77	310	20	20°

Ordering data – Double-bellows cylinder

Size	Stroke [mm]	Part No.	Type
145	100	**36 490**	**EB-145-100**
165	125	**36 491**	**EB-165-125**
215	155	**36 492**	**EB-215-155**
250	185	**36 493**	**EB-250-185**
325	215	**193 790**	**EB-325-215**
385	230	**193 791**	**EB-385-230**

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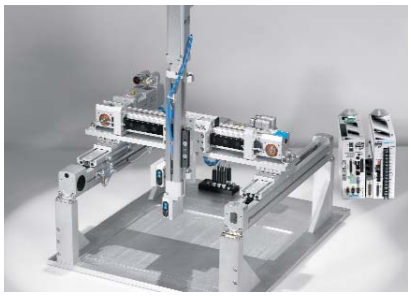

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