



- Suitable for use under harsh, dusty environmental conditions
- Can be used under water
- Robust design
- Broad load range from 2 ... 50 kN
- Low installation height
- No stick-slip effect

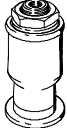
Bellows cylinders EB/EBS

Overview and type codes

FESTO

Special-function drives
Bellows cylinders

5.1

Function	Design	Type	Size [mm]	Stroke [mm]	→ Page
Single-acting	Bellows				
		EB Single-bellows cylinder	145	60	1 / 5.1-3
			165	65	
			215	80	
			250	85	
			325	95	
			385	115	
		EB Double-bellows cylinder	145	100	1 / 5.1-3
			165	125	
			215	155	
			250	185	
			325	215	
			385	230	
	Rolling bellows				
		EBS Rolling tube bellows	80	110	1 / 5.1-11
			100	105	

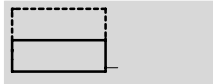
Type		EB		-		250		-		85	
Single-acting											
EB	Bellows										
EBS	Rolling bellows										
Size [mm]											
Stroke [mm]											

Bellows cylinders EB

Data sheet

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Function



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



-  - 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.

General technical data						
Size	145	165	215	250	325	385
Pneumatic connection	G $\frac{1}{8}$	G $\frac{1}{4}$	G $\frac{3}{4}$	G $\frac{3}{4}$	G $\frac{1}{4}$	G $\frac{1}{4}$
Operating medium	Filtered compressed air, lubricated or unlubricated					
Constructional design	Bellows					
Type of mounting	With female thread					
Mounting position	Any					
Operating pressure [bar]	0 ... 8					
Ambient temperature [°C]	-40 ... +70					
Corrosion resistance class CRC ¹⁾	2					

1) Corrosion resistance class 2 according to Festo standard 940 070

Components requiring moderate corrosion resistance. Externally visible parts with primarily decorative surface requirements which are in direct contact with a surrounding industrial atmosphere or media such as cooling or lubricating agents.

Forces [N]						
Size	145	165	215	250	325	385
Single-bellows cylinder						
Force-path characteristic	→ 1 / 5.1-5	→ 1 / 5.1-5	→ 1 / 5.1-5	→ 1 / 5.1-5	→ 1 / 5.1-6	→ 1 / 5.1-6
Resetting force	200	200	200	200	300	300
Double-bellows cylinder						
Force-path characteristic	→ 1 / 5.1-6	→ 1 / 5.1-6	→ 1 / 5.1-7	→ 1 / 5.1-7	→ 1 / 5.1-7	→ 1 / 5.1-7
Resetting force	200	200	200	200	300	300

-  - Note

The entire load-bearing surfaces of the upper and lower plates must be utilised in order to absorb forces.

The wall of the bellows cylinder must not come into contact with other parts during operation.

Bellows cylinders must be exhausted before disassembly.

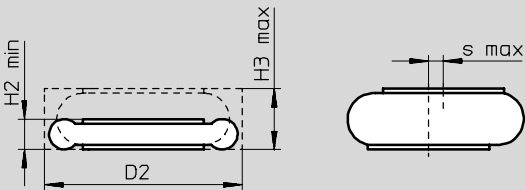
Bellows cylinders EB

Data sheet

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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	
Housing	Galvanised steel
Bellows	Rubber
Material note	Free of copper, PTFE and silicone

Required fitting space	
 The drawing shows two views of a bellows cylinder. The front view (left) shows a horizontal cylinder with a rounded end. Dimensions indicated are D2 (width), H2_min (minimum height at the rounded end), and H3_max (maximum height at the extended end). The side view (right) shows the cylinder's profile with a dimension s_max indicating the maximum offset between mounting surfaces.	D2 Required fitting diameter H2_{min} Minimum installation height H3_{max} Maximum extended end position s_{max} Maximum offset between mounting surfaces

Type	D2 [mm]	H2 _{min} [mm]	H3 _{max} [mm]	s _{max} [mm]
Single-bellows cylinder				
EB-145-60	160	50	110	10
EB-165-65	180	50	115	10
EB-215-80	230	50	135	10
EB-250-85	265	50	140	10
EB-325-95	340	55	150	10
EB-385-115	400	55	170	10
Double-bellows cylinder				
EB-145-100	160	70	170	20
EB-165-125	180	75	200	20
EB-215-155	230	75	230	20
EB-250-185	265	75	260	20
EB-325-215	340	75	290	20
EB-385-230	400	85	310	20

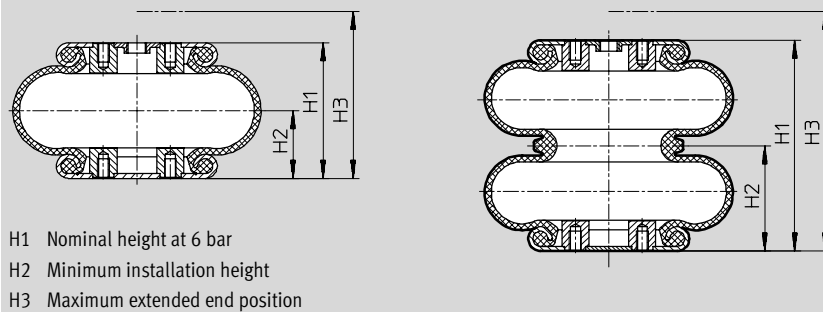
Bellows cylinders EB

Data sheet

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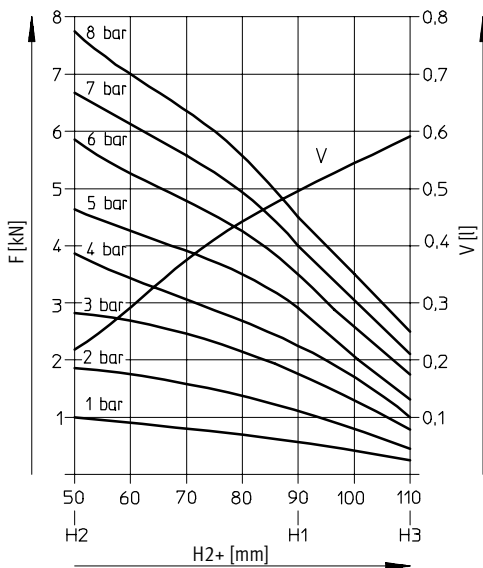
Thrust F and bellows volume V as a function of the minimum installation height H2 + stroke length

The diagrams illustrate the change in thrust F with various working pressures and differing bellows volumes V related to cylinder stroke. The minimum installation height H2 must be observed in order to fully reach the indicated forces.



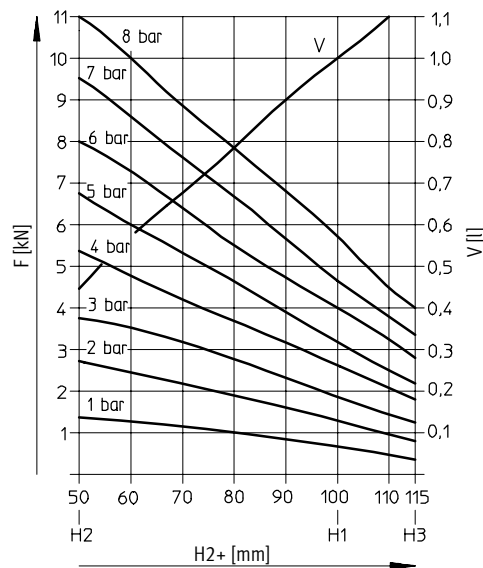
Single-bellows cylinder

EB-145-60

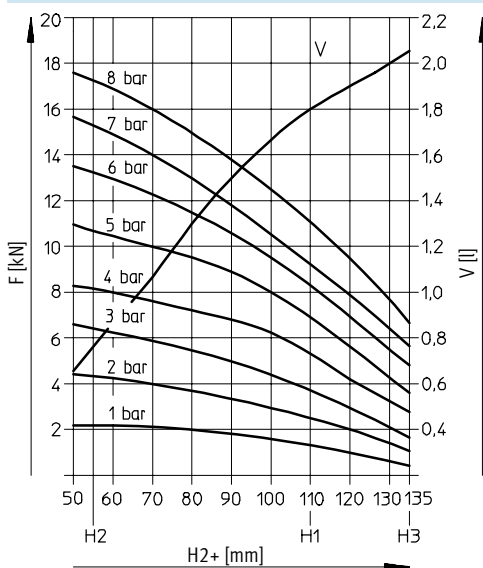


+ plus stroke length

EB-165-65

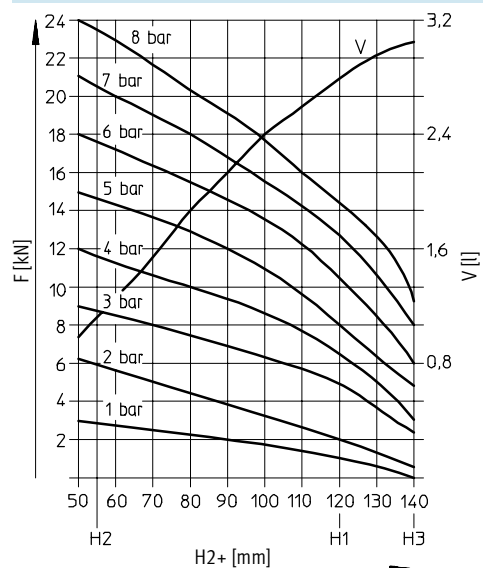


EB-215-80



+ plus stroke length

EB-250-85



Bellows cylinders EB

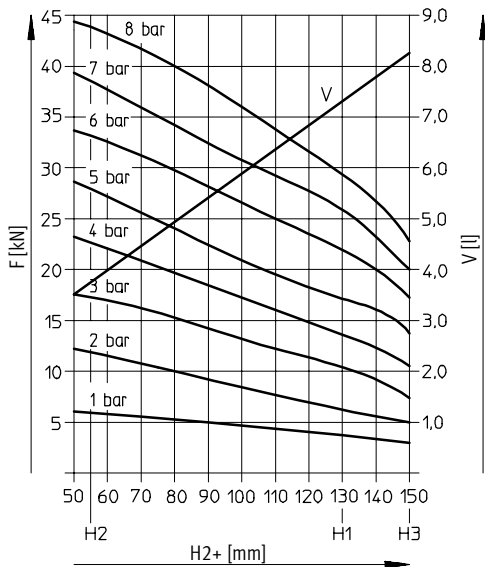
Data sheet

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Special-function drives
Bellows cylinders

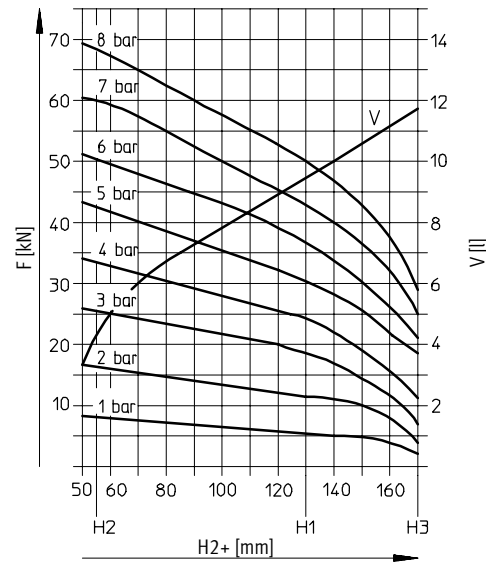
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EB-325-95



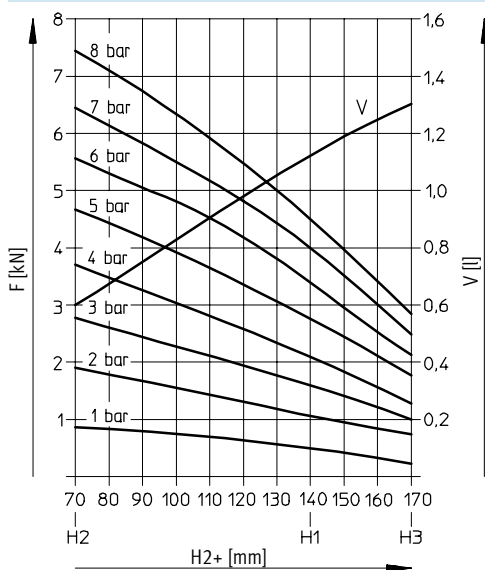
+ plus stroke length

EB-385-115



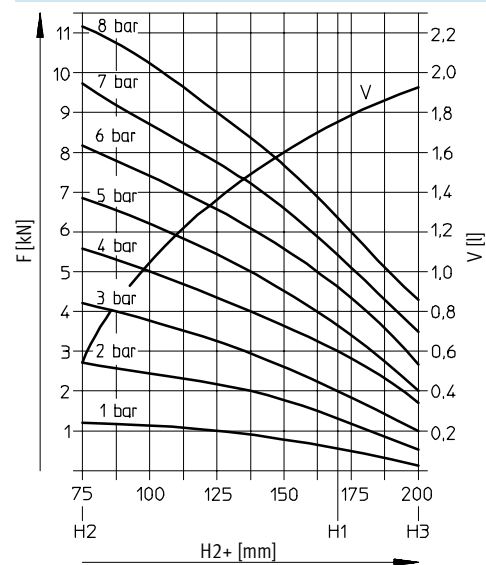
Double-bellows cylinder

EB-145-100



+ plus stroke length

EB-165-125



Bellows cylinders EB

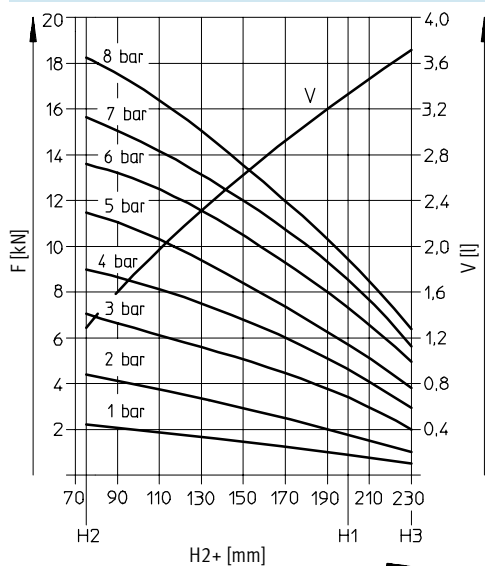
Data sheet

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Special-function drives
Bellows cylinders

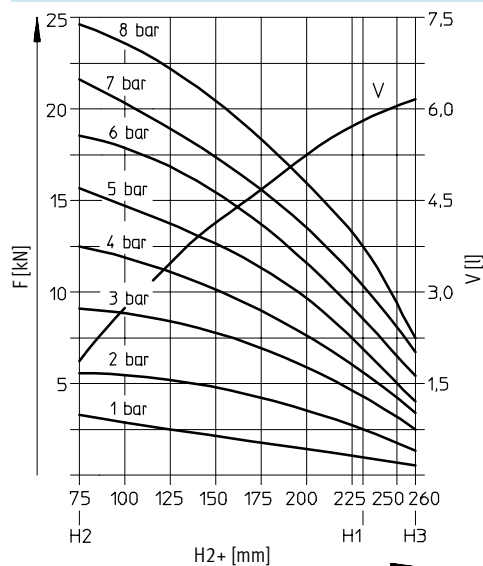
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EB-215-155

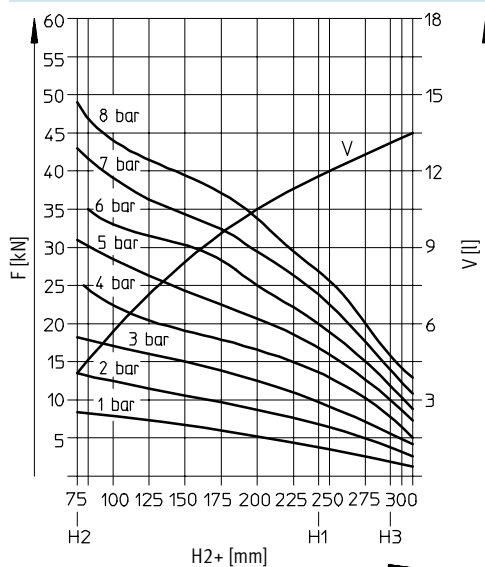


+ plus stroke length

EB-250-185

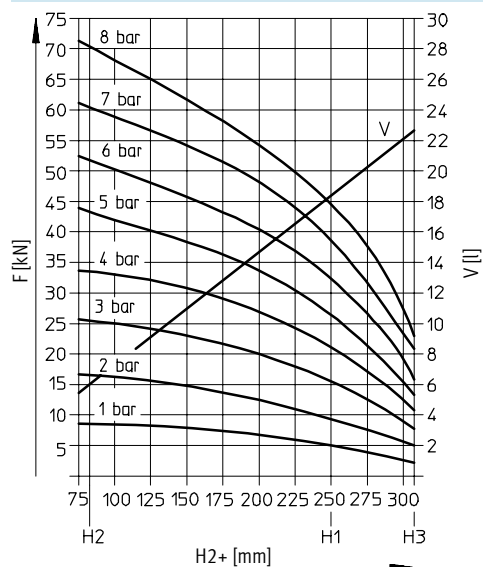


EB-325-215



+ plus stroke length

EB-385-230



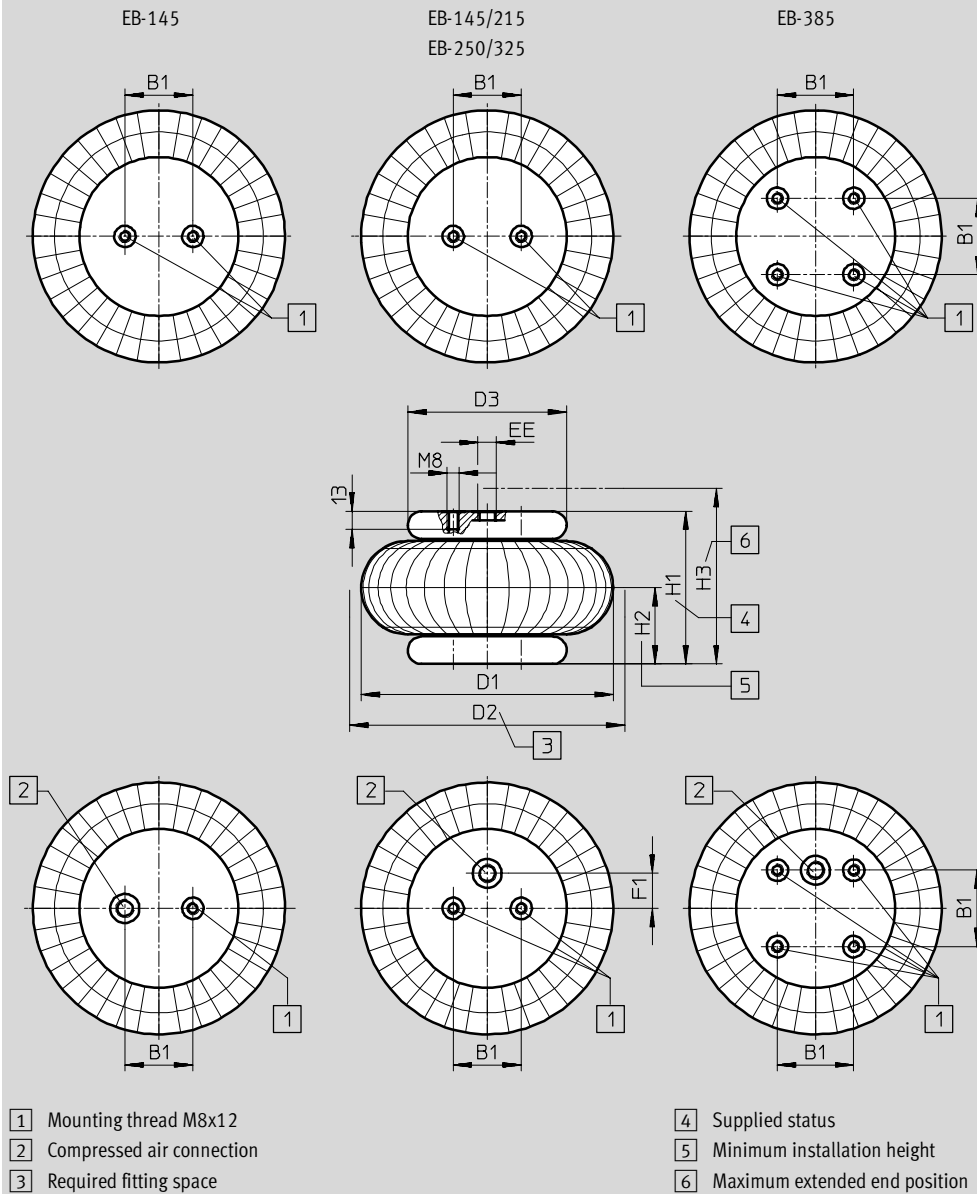
Bellows cylinders EB

Data sheet

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Dimensions – Single-bellows cylinder

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Type	B1 ±0.2	D1 Ø max.	D2 Ø	D3 Ø	EE	F1 ±0.2	H1 [4]	H2 [5] min.	H3 [6] max.	Tilt angle max.
EB-145-60	20	145	160	90	G1/8	–	90	50	110	20°
EB-165-65	44.5	165	180	108	G1/4	–	100	50	115	20°
EB-215-80	70	215	230	141	G3/4	–	110	50	135	20°
EB-250-85	89	250	265	161	G3/4	38.1	120	50	140	20°
EB-325-95	157.5	325	340	228	G1/4	73	130	55	150	15°
EB-385-115	158.8	375	400	287	G1/4	79.4	130	55	170	15°

Bellows cylinders EB

Data sheet

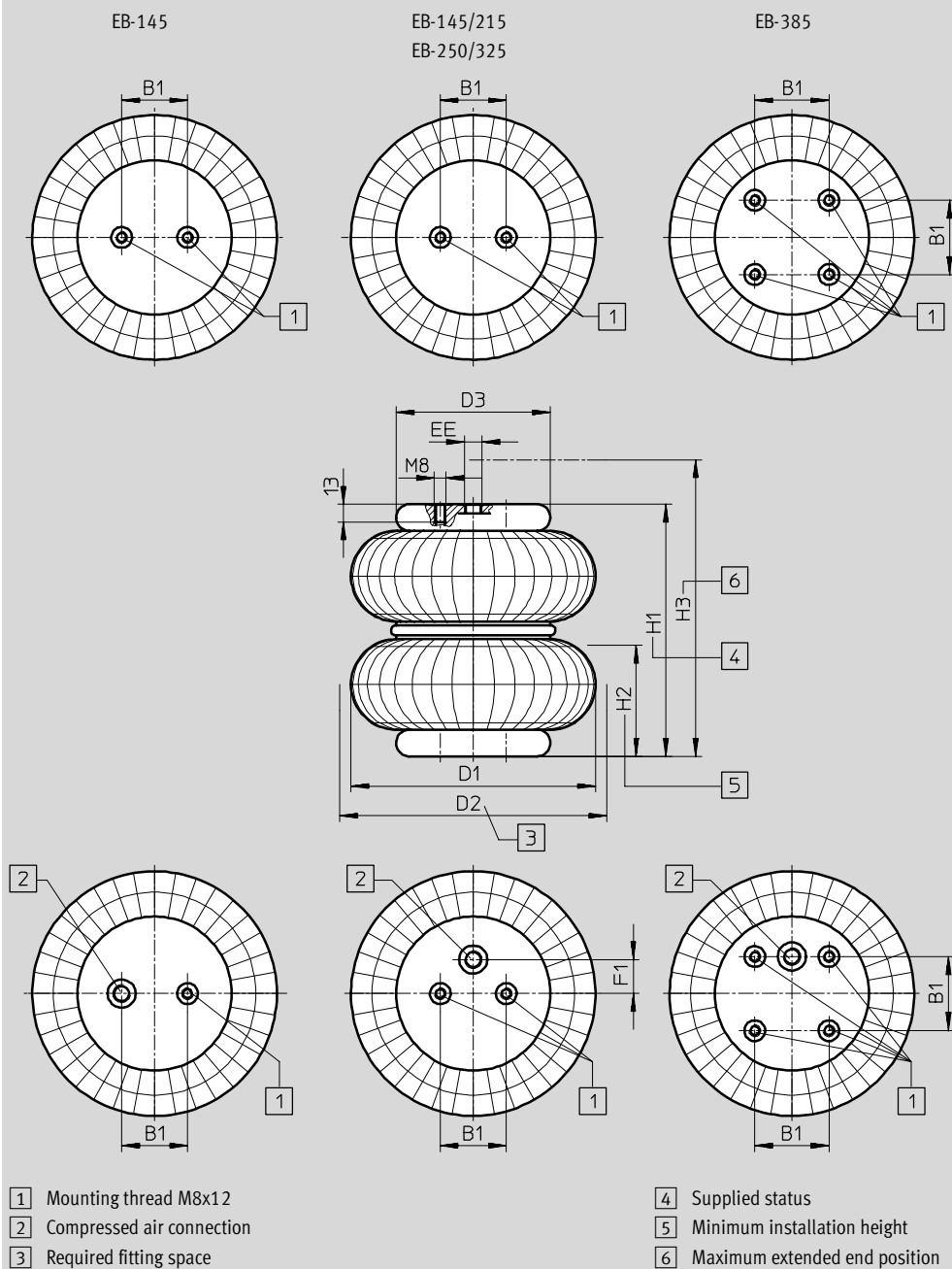
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Special-function drives
Bellows cylinders

5.1

Dimensions – Double-bellows cylinder

Download CAD data → www.festo.com/en/engineering



Type	B1	D1 Ø	D2 Ø	D3 Ø	EE	F1	H1 [4]	H2 [5] min.	H3 [6] max.	Tilt angle max.
	±0.2	max.				±0.2				
EB-145-100	20	145	160	90	G1/8	–	140	70	170	30°
EB-165-125	44.5	165	180	108	G1/4	–	170	75	200	30°
EB-215-155	70	215	230	141	G3/4	–	200	75	230	30°
EB-250-185	89	250	265	161	G3/4	38.1	230	75	260	25°
EB-325-215	157.5	325	340	228	G1/4	73	240	75	290	20°
EB-385-230	158.8	375	400	287	G1/4	79.4	250	85	310	20°

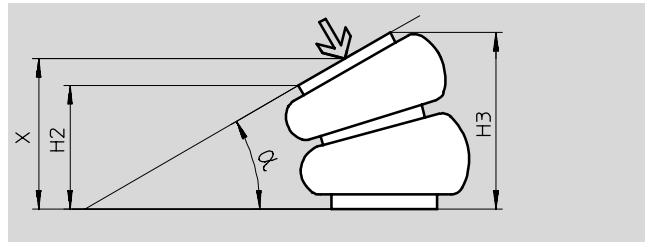
Bellows cylinders EB

Data sheet

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-  - Note

The stroke of the bellows cylinder can be made to describe a circular path, in which case the indicated tilt angle α may 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.



Ordering data – Single-bellows cylinder			
Size [mm]	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

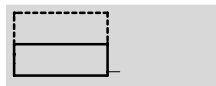
Ordering data – Double-bellows cylinder			
Size [mm]	Stroke [mm]	Part No.	Type
145	100	36 490	EB-145-100
165	125	36 491	EB-165-125
215	155	36 492	EB-215-155
250	185	36 493	EB-250-185
325	215	193 790	EB-325-215
385	230	193 791	EB-385-230

Bellows cylinders EBS

Data sheet

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Function



-  - Diameter
80 and 100
-  - Stroke length
105 and 110



-  - 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.

Rolling tube bellows require a minimum pressure of 0.9 bar in order to be able to roll on the piston. Consequently they must not be pushed

back to their initial position when in the pressureless status as this will damage the tube.

General technical data		
Size	80	100
Pneumatic connection	G3/8	
Operating medium	Filtered compressed air, lubricated or unlubricated	
Constructional design	Rolling bellows	
Type of mounting	With female thread	
Mounting position	Any	
Operating pressure [bar]	0.9 ... 8.0	
Ambient temperature [°C]	-40 ... +70	
Corrosion resistance class CRC ¹⁾	2	

1) Corrosion resistance class 2 according to Festo standard 940 070

Components requiring moderate corrosion resistance. Externally visible parts with primarily decorative surface requirements which are in direct contact with a surrounding industrial atmosphere or media such as cooling or lubricating agents.

Forces [N]		
Size	80	100
Force-path characteristic	→ 1 / 5.1-12	→ 1 / 5.1-12
Resetting force	350	450

-  - Note

The entire load-bearing surfaces of the upper and lower plates must be utilised in order to absorb forces.

The wall of the bellows cylinder must not come into contact with other parts during operation.

Bellows cylinders must be exhausted before disassembly.

Bellows cylinders EBS

Data sheet



Weights [g]		
Size	80	100
Product weight	400	500

Materials	
Housing	Galvanised steel
Bellows	Rubber
Material note	Free of copper, PTFE and silicone

Required fitting space

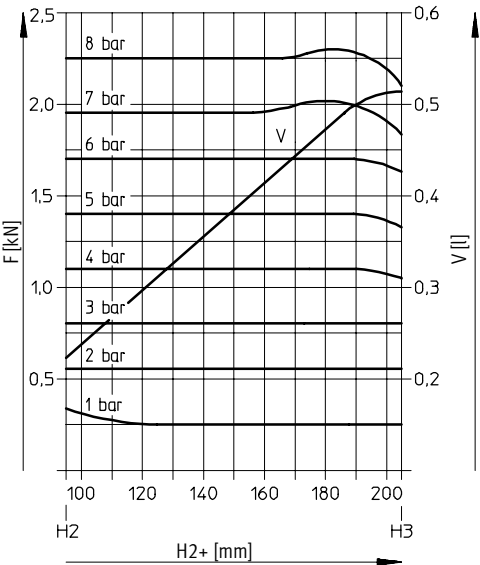
D2 Required fitting diameter
H2_{min} Minimum installation height
H3_{max} Maximum extended end position
S_{max} Maximum offset between mounting surfaces

Type	D2 [mm]	H2 _{min} [mm]	H3 _{max} [mm]	S _{max} [mm]
EBS-80-110	100	95	205	10
EBS-100-105	115	95	200	10

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

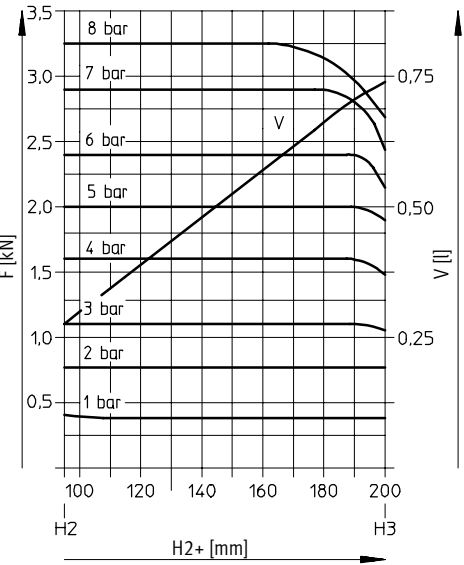
The diagrams illustrate the change in thrust F with various working pressures and differing bellows volumes V related to cylinder stroke. The minimum installation height H2 must be observed in order to fully reach the indicated forces.

EBS-80-110



+ plus stroke length

EBS-100-105



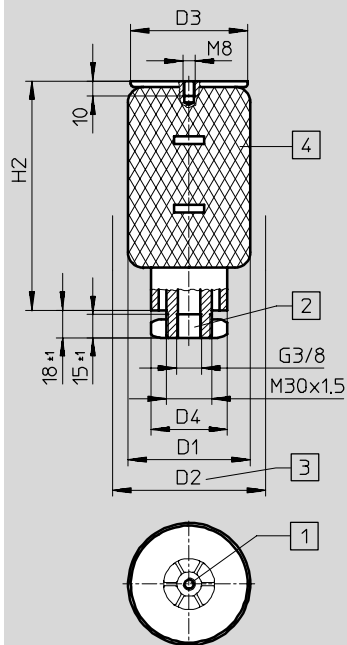
Bellows cylinders EBS

Data sheet

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Dimensions

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- 1 Mounting thread M8x10
- 2 Compressed air connection
- 3 Required fitting space
- 4 Supplied status

Type	D1 Ø max.	D2 Ø	D3 Ø ±1	D4 Ø ±0.5	H2 min.	H3 max.	Tilt angle max.
EBS-80-110	80	100	76.5	50	95	205	15°
EBS-100-105	97	115	86.5	60.5	95	200	15°

Ordering data

Size [mm]	Stroke [mm]	Part No.	Type
80	110	193 794	EBS-80-110
100	105	193 795	EBS-100-105

Special-function drives
Bellows cylinders

5.1