# Bellows cylinders EB

FESTO

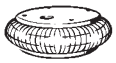
# Bellows cylinders EB

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 | | Filtered compressed air, lubricated or unlubricated |
| 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

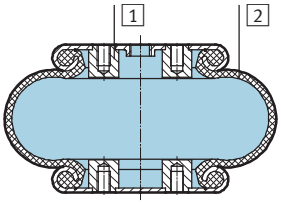
# Bellows cylinders EB

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

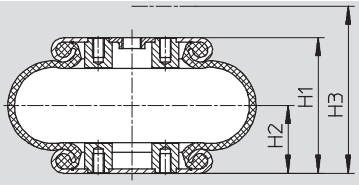
Sectional view




| 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

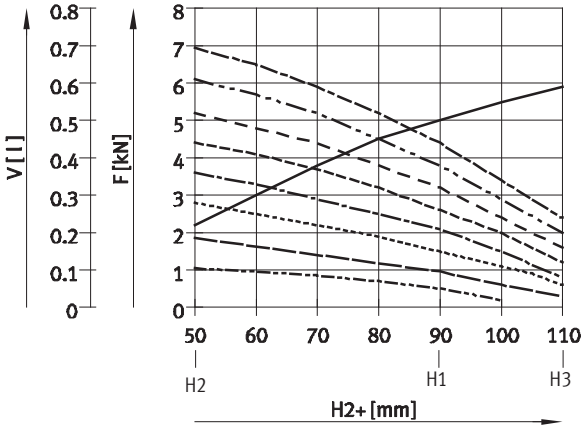
The diagram illustrates the change in thrust F with various working pressures and differing bellows volumes V in relation to stroke length. The minimum installation height H2 must be observed in order to fully reach the indicated forces.



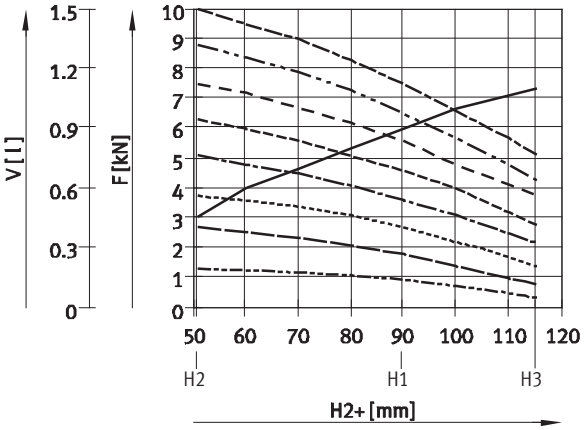

H1 Recommended operating height for cushioning applications at 6 bar
H2 Minimum installation height
H3 Maximum extended end position

## Single-bellows cylinder

EB-145-60




EB-165-65

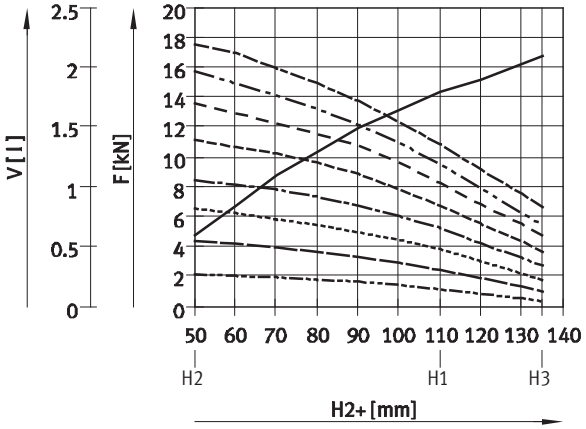



\+ plus stroke length

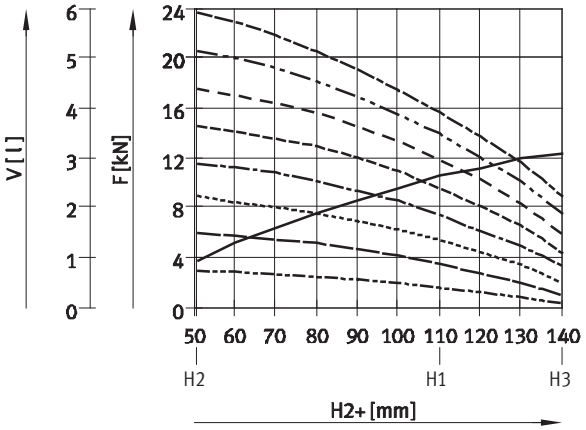
Volume
1 bar
2 bar
3 bar
4 bar
5 bar
6 bar
7 bar
8 bar

## Single-bellows cylinder

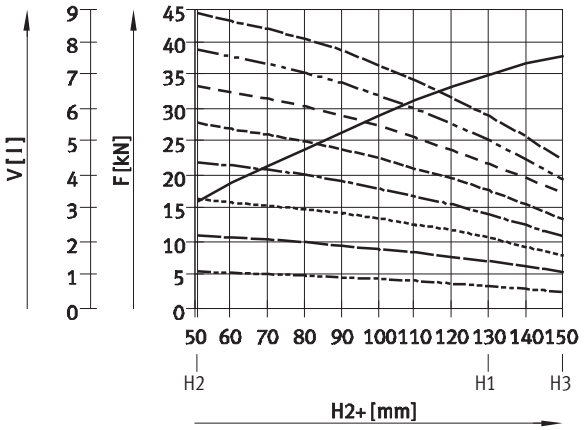
EB-215-80



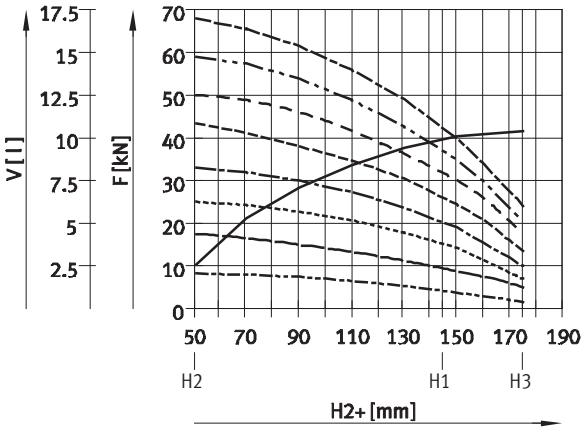

EB-250-85




EB-325-95




EB-385-115

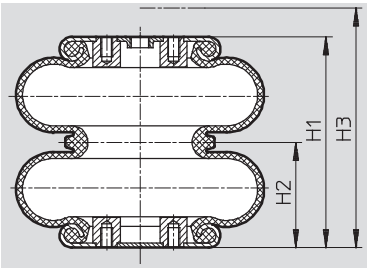



\+ plus stroke length

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

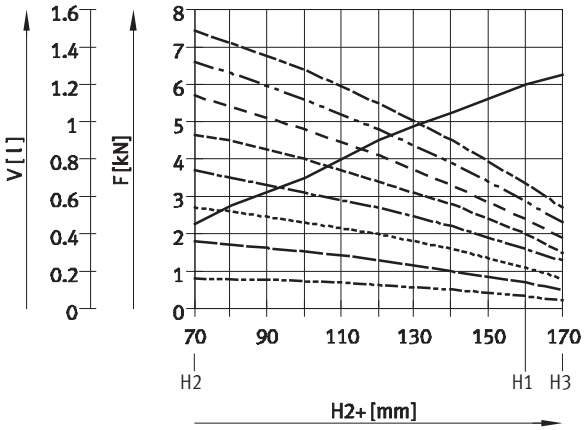
The diagram illustrates the change in thrust F with various working pressures and differing bellows volumes V in relation to stroke length. The minimum installation height H2 must be observed in order to fully reach the indicated forces.



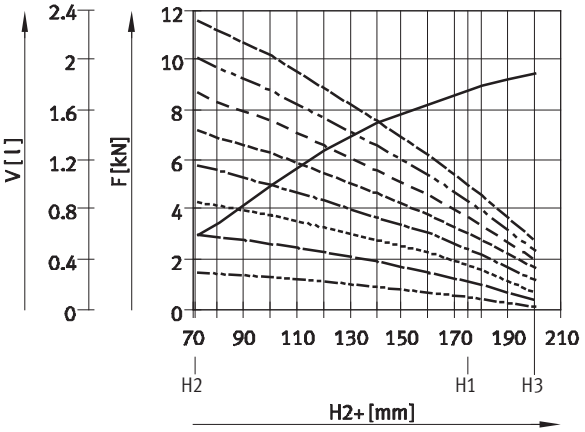

H1 Recommended operating height for cushioning applications at 6 bar
H2 Minimum installation height
H3 Maximum extended end position

### Double-bellows cylinder

EB-145-100




EB-165-125

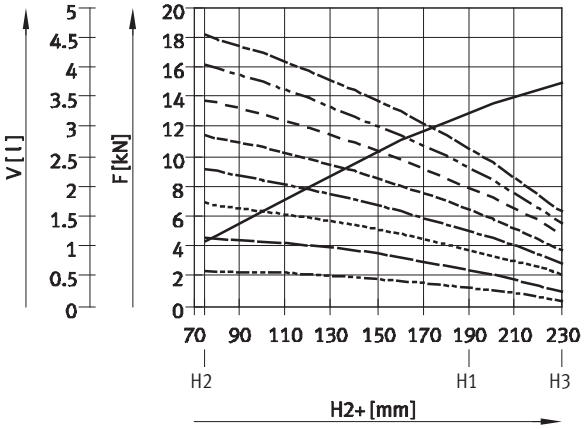



\+ plus stroke length

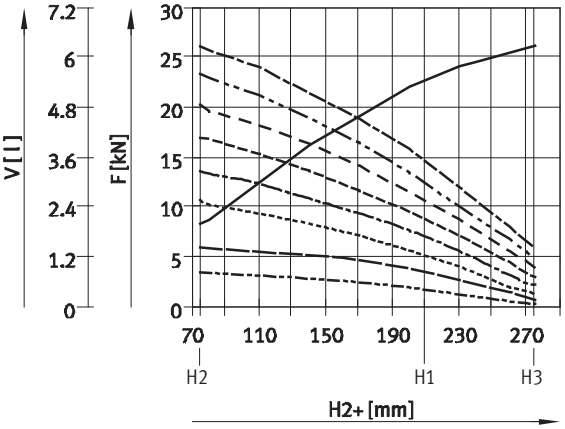
Volume
1 bar
2 bar
3 bar
4 bar
5 bar
6 bar
7 bar
8 bar

## Double-bellows cylinder

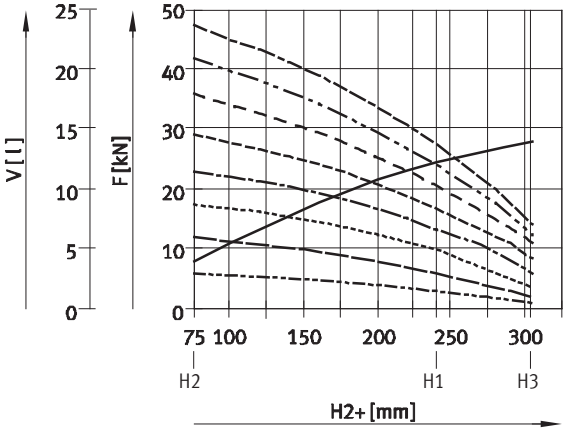
EB-215-155



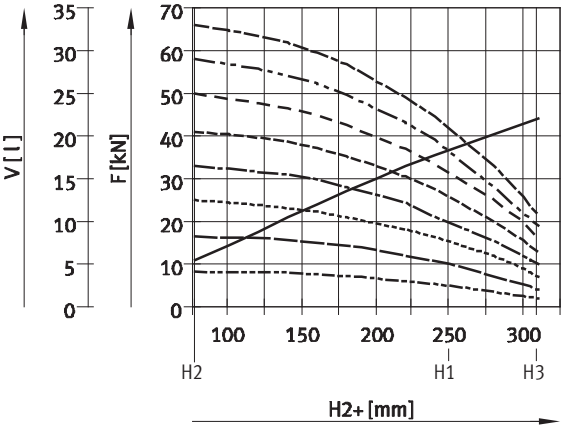

EB-250-185




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

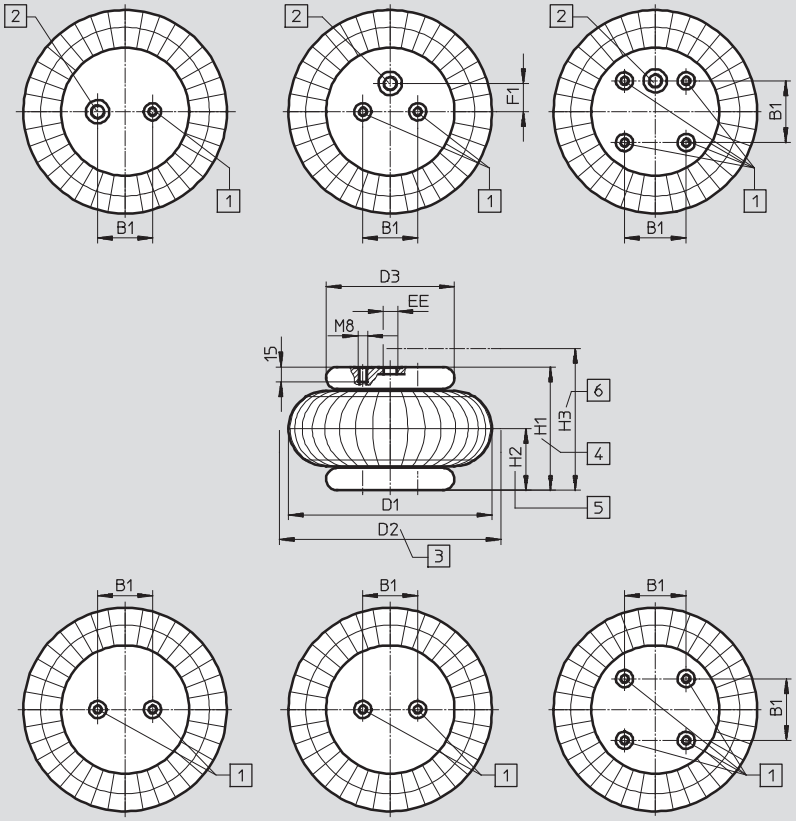
## Dimensions – Single-bellows cylinder

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

EB-145

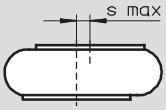
EB-165
EB-215
EB-250
EB-325

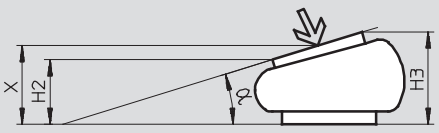
EB-385




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<br>±0.2 | D1<br>∅<br>max. | D2<br>∅ | D3<br>∅ | EE | F1<br>±0.2 | H1 | H2<br>min. | H3<br>max. | $s_{max}$ | Tilt angle α<br>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<br>[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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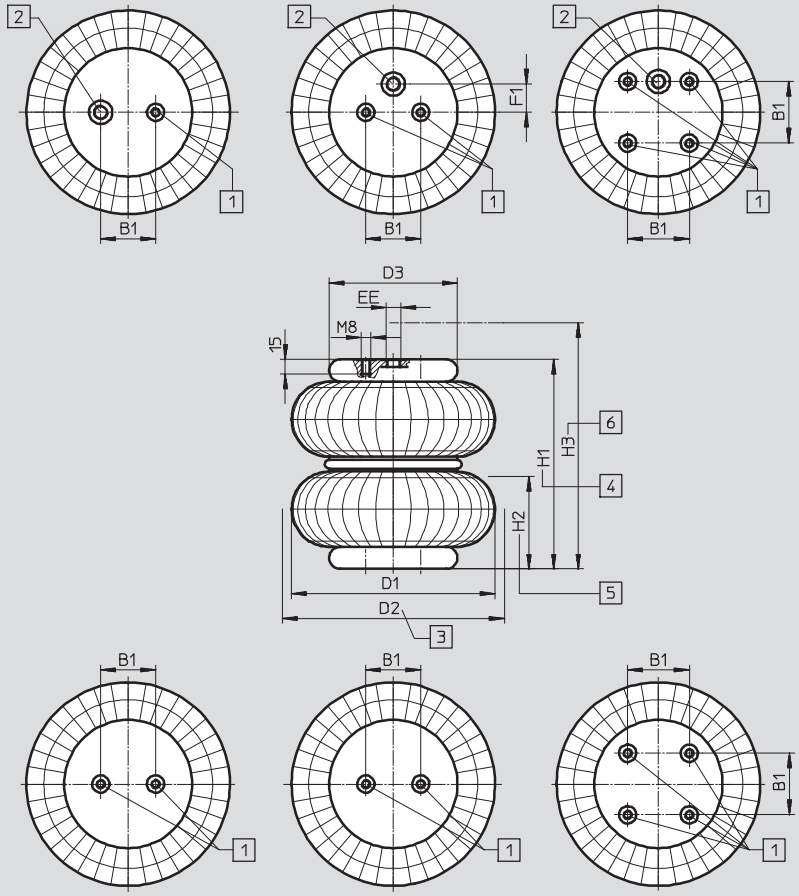
EB-145

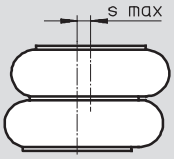
EB-165
EB-215
EB-250
EB-325

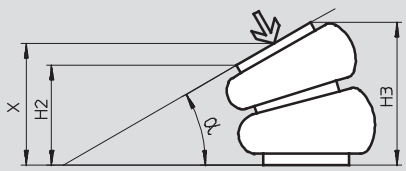
EB-385




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 $\alpha$ 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<br>±0.2 | D1<br>∅<br>max. | D2<br>∅ | D3<br>∅ | EE | F1<br>±0.2 | H1 | H2<br>min. | H3<br>max. | $s_{max}$ | Tilt angle α<br>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<br>[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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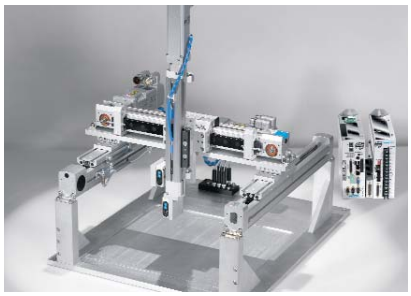

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