

# ***D series***

3 convolution



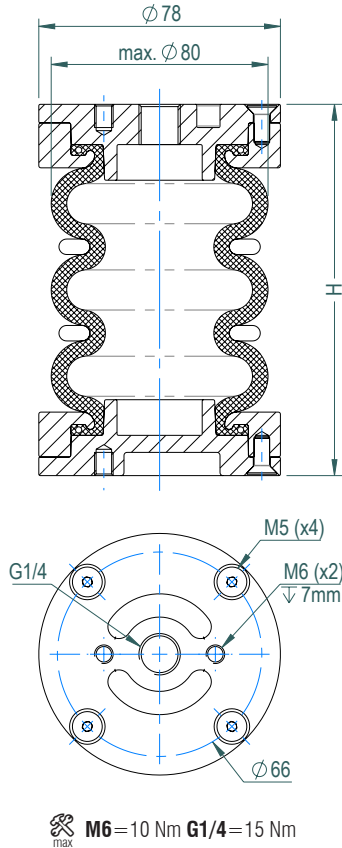
**DATA Sheet**

D SERIES  
Dismountable Design

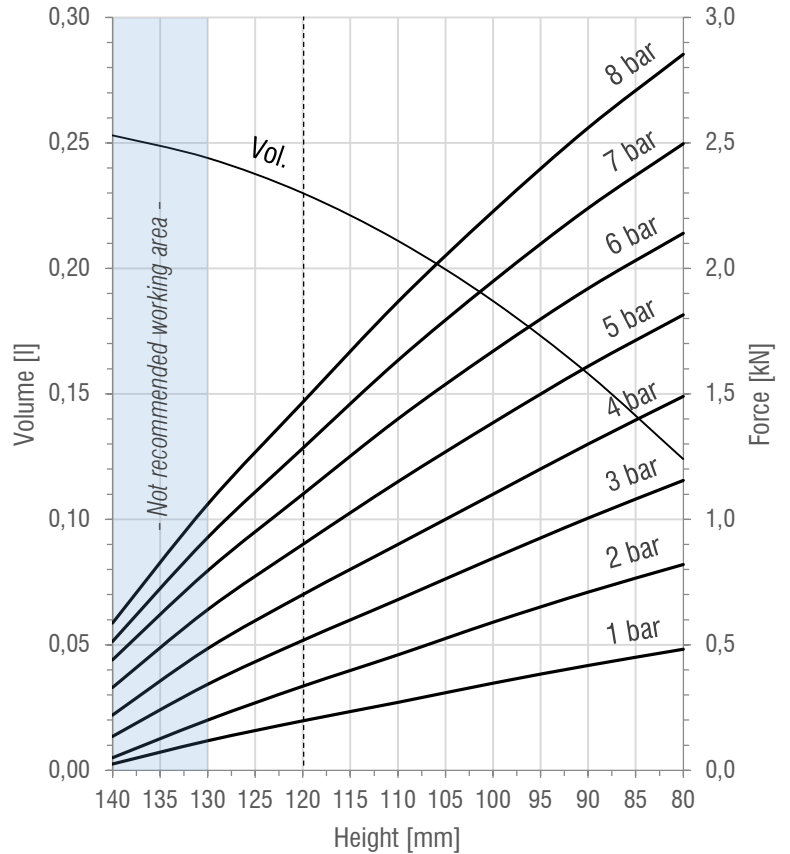
## 2 3/4" X3

TRIPLE  
CONVOLUTION

### DRAWING



### FORCE-HEIGHT CHART



### TECHNICAL DATA

#### PRODUCT CHARACTERISTICS

Static diameter [mm]	70
Max. diameter [mm]	80
Required space diameter [mm]	95
Min. height [mm]	80
Static height [mm]	110
Design height [mm]	120
Max. usable height [mm]	130
Max. stroke [mm]	50
Force to compress to $H_{\min}$ at 0 bar [N]	260
Weight [kg]	0,59

#### REFERENCES

2x3_B	Rubber bellow only
2x3_D	With aluminium end closures

Additional designs on request.

#### DYNAMIC CHARACTERISTICS FOR USE AS ISOLATOR

Pressure [bar]	3	4	5	6	7	Vol. [l]
Load [kN]	0,52	0,70	0,90	1,10	1,28	0,23
Spring rate [N/mm]	24	30	37	44	51	
Natural frequency [Hz]	3,43	3,29	3,22	3,17	3,16	
Isolation rate at 10 Hz	86,6%	87,9%	88,5%	88,8%	88,9%	

Values at recommended design height  $H$ : 120 mm -----

#### STATIC CHARACTERISTICS FOR USE AS ACTUATOR

Pressure [bar]		3	4	5	6	7	Vol. [l]
Height $H$ [mm]	80	1,16	1,49	1,82	2,14	2,50	0,12
	90	1,01	1,30	1,61	1,92	2,24	0,16
	100	0,85	1,10	1,39	1,67	1,95	0,19
	110	0,68	0,90	1,15	1,40	1,63	0,21
	120	0,52	0,70	0,90	1,10	1,28	0,23
	130	0,34	0,49	0,64	0,80	0,93	0,24

Force values [kN]

All Volume [l] values at 7 bar

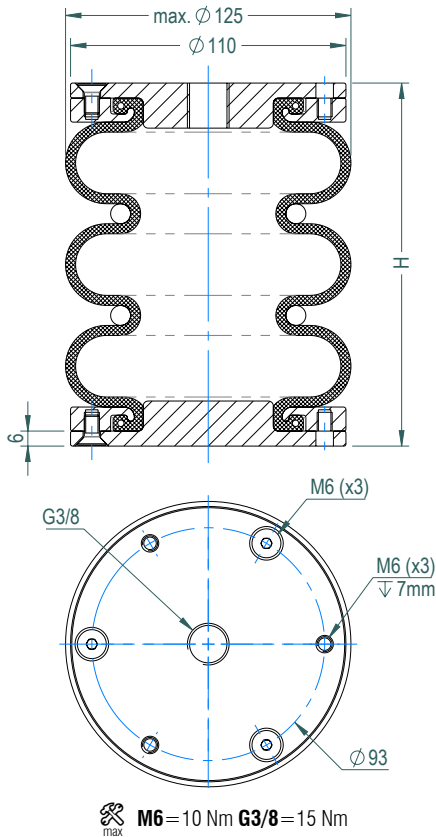
Special guides are required when used as isolators due to lateral instability.

D SERIES  
Dismountable Design

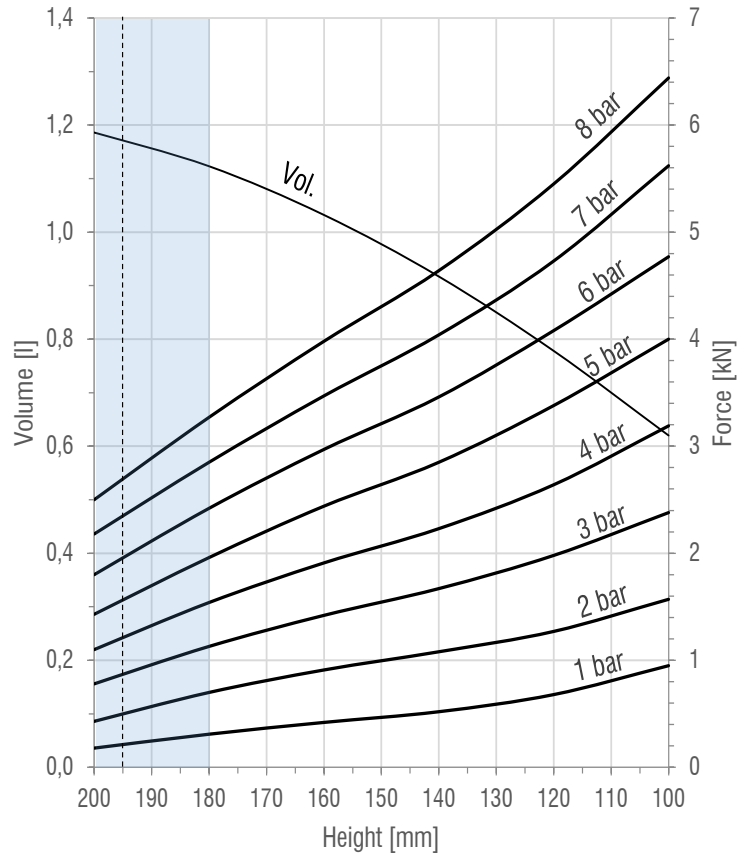
## 4½" x 3

TRIPLE  
CONVOLUTION

### DRAWING



### FORCE-HEIGHT CHART



### TECHNICAL DATA

#### PRODUCT CHARACTERISTICS

Static diameter [mm]	114
Max. diameter [mm]	125
Required space diameter [mm]	140
Min. height [mm]	100
Static height [mm]	145
Design height [mm]	195
Max. usable height [mm]	180
Max. stroke [mm]	80
Force to compress to $H_{min}$ at 0 bar [N]	100
Weight [kg]	1,1

#### REFERENCES

4x3_B	Rubber bellow only
4x3_D	With aluminium end closures

Designs available with stainless steel and high temperature rubber compounds. Additional designs on request.

#### DYNAMIC CHARACTERISTICS FOR USE AS ISOLATOR

Pressure [bar]	3	4	5	6	7	Vol. [l]
Load [kN]	0,85	1,22	1,60	1,98	2,37	1,17
Spring rate [N/mm]	193	254	310	366	417	
Natural frequency [Hz]	2,12	2,03	1,99	1,95	1,91	
Isolation rate at 10 Hz	95,3%	95,7%	95,9%	96,0%	96,2%	

Values at recommended design height H: 195 mm -----

#### STATIC CHARACTERISTICS FOR USE AS ACTUATOR

Pressure [bar]	3	4	5	6	7	Vol. [l]	
Height H [mm]	100	2,38	3,19	4,00	4,77	5,62	0,62
	120	1,98	2,64	3,38	4,08	4,73	0,78
	140	1,67	2,23	2,85	3,46	4,04	0,92
	160	1,42	1,91	2,44	2,97	3,47	1,03
	180	1,13	1,54	1,96	2,42	2,85	1,12
	200	0,78	1,10	1,43	1,80	2,15	1,19

Force values [kN]

All Volume [l] values at 7 bar

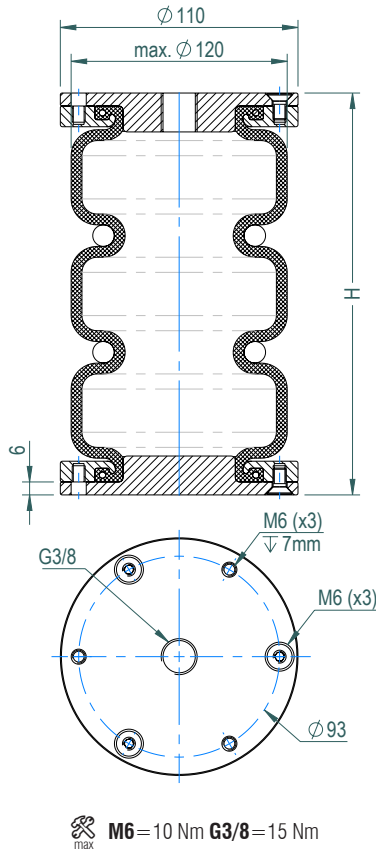
Special guides are required when used as isolators due to lateral instability.

D SERIES  
Dismountable Design

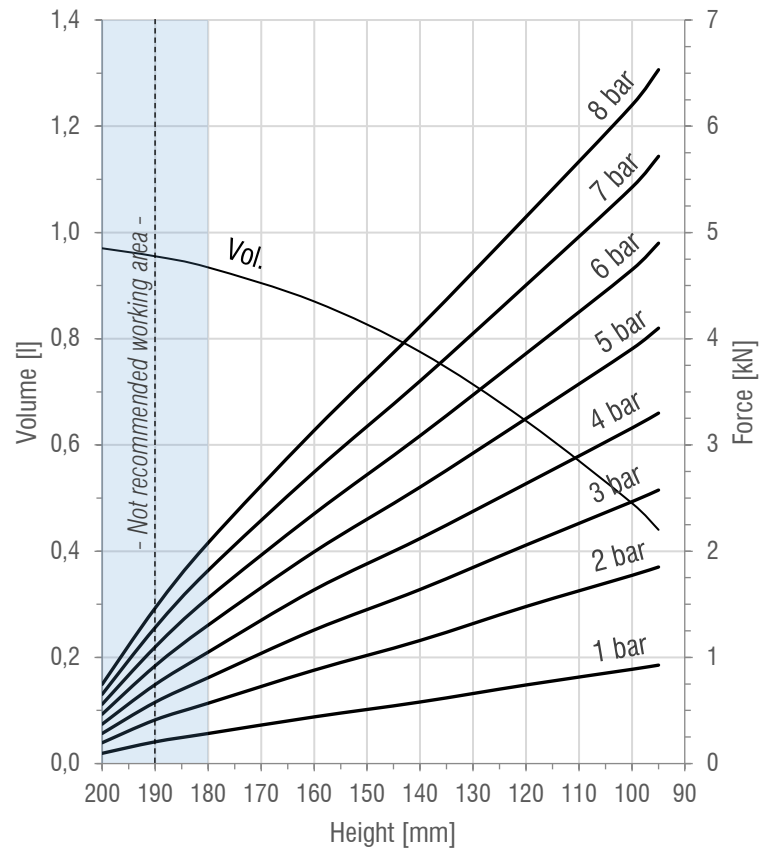
## 4½"X3-E

TRIPLE  
CONVOLUTION

### DRAWING



### FORCE-HEIGHT CHART



### TECHNICAL DATA

#### PRODUCT CHARACTERISTICS

Static diameter [mm]	101
Max. diameter [mm]	120
Required space diameter [mm]	135
Min. height [mm]	95
Static height [mm]	185
Design height [mm]	190
Max. usable height [mm]	180
Max. stroke [mm]	85
Force to compress to $H_{\min}$ at 0 bar [N]	200
Weight [kg]	1,1

#### REFERENCES

4x3-E_B	Rubber bellow only
4x3-E_D	With aluminium end closures

Designs available with stainless steel and high temperature rubber compounds. Additional designs on request.

#### DYNAMIC CHARACTERISTICS FOR USE AS ISOLATOR

Pressure [bar]	3	4	5	6	7	Vol. [l]
Load [kN]	0,58	0,74	0,92	1,10	1,28	0,96
Spring rate [N/mm]	28	36	45	54	62	
Natural frequency [Hz]	3,50	3,50	3,49	3,49	3,49	
Isolation rate at 10 Hz	86,0%	86,1%	86,1%	86,1%	86,1%	

Values at recommended design height  $H$ : 190 mm -----

#### STATIC CHARACTERISTICS FOR USE AS ACTUATOR

Pressure [bar]	3	4	5	6	7	Vol. [l]	
Height $H$ [mm]	100	2,47	3,16	3,91	4,65	5,43	0,49
	120	2,06	2,64	3,25	3,86	4,50	0,65
	140	1,64	2,12	2,60	3,09	3,60	0,78
	160	1,26	1,64	1,99	2,35	2,74	0,87
	180	0,81	1,05	1,30	1,56	1,82	0,93
	200	0,28	0,37	0,47	0,56	0,65	0,97

Force values [kN]

All Volume [l] values at 7 bar

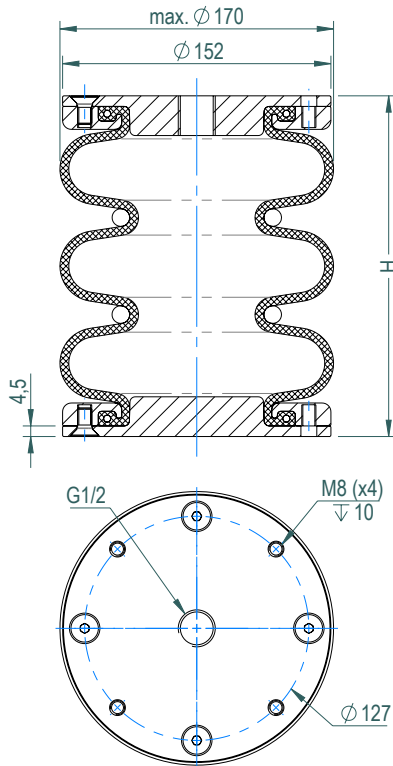
Special guides are required when used as isolators due to lateral instability.

D SERIES  
Dismountable Design

## 6"x3 AL

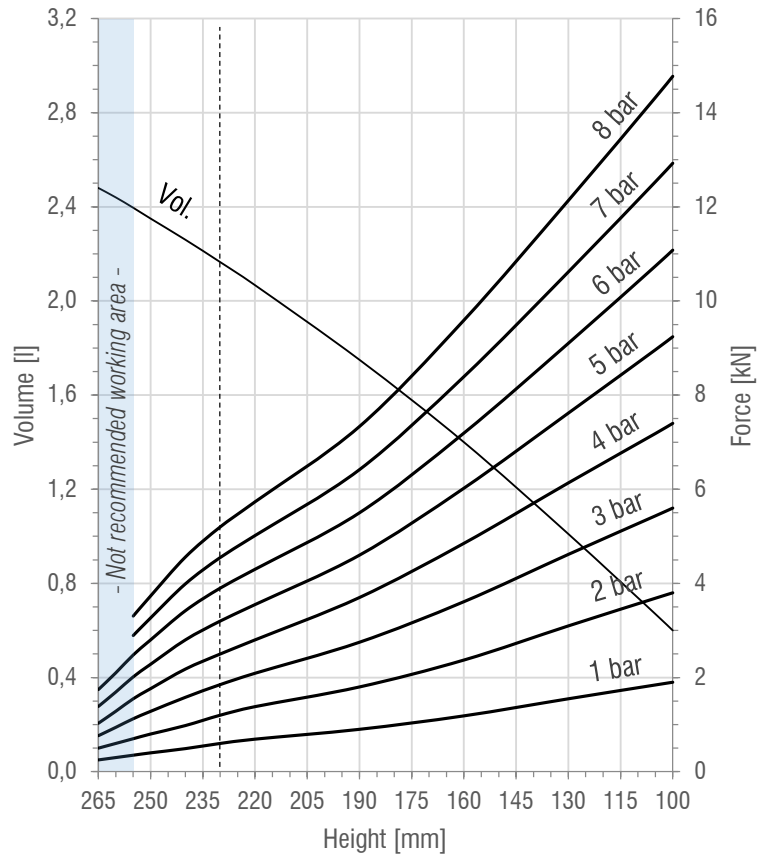
TRIPLE  
CONVOLUTION

### DRAWING



**M8=12 Nm G1/2=25 Nm**

### FORCE-HEIGHT CHART



### TECHNICAL DATA

#### PRODUCT CHARACTERISTICS

Static diameter [mm]	155
Max. diameter [mm]	170
Required space diameter [mm]	185
Min. height [mm]	100
Static height [mm]	185
Design height [mm]	230
Max. usable height [mm]	255
Max. stroke [mm]	155
Force to compress to $H_{min}$ at 0 bar [N]	200
Weight [kg]	2,4

#### REFERENCES

6x3_B	Rubber bellow only
6x3_D_AL	With aluminium end closures

Designs available with stainless steel and high temperature rubber compounds. Additional designs on request.

#### DYNAMIC CHARACTERISTICS FOR USE AS ISOLATOR

Pressure [bar]	3	4	5	6	7	Vol. [l]
Load [kN]	1,9	2,5	3,2	3,9	4,6	2,2
Spring rate [N/mm]	42	51	63	74	85	
Natural frequency [Hz]	2,37	2,27	2,21	2,17	2,16	
Isolation rate at 10 Hz	94,0%	94,6%	94,9%	95,0%	95,1%	

Values at recommended design height H: 230 mm -----

#### STATIC CHARACTERISTICS FOR USE AS ACTUATOR

Pressure [bar]	3	4	5	6	7	Vol. [l]	
Height H [mm]	100	5,6	7,4	9,2	11,1	12,9	0,6
	130	4,6	6,1	7,6	9,1	10,6	1,0
	160	3,6	4,9	6,0	7,2	8,4	1,4
	190	2,8	3,7	4,6	5,5	6,4	1,8
	220	2,1	2,8	3,6	4,3	5,0	2,1
	250	1,3	1,8	2,3	2,8	3,3	2,4

Force values [kN]

All Volume [l] values at 7 bar

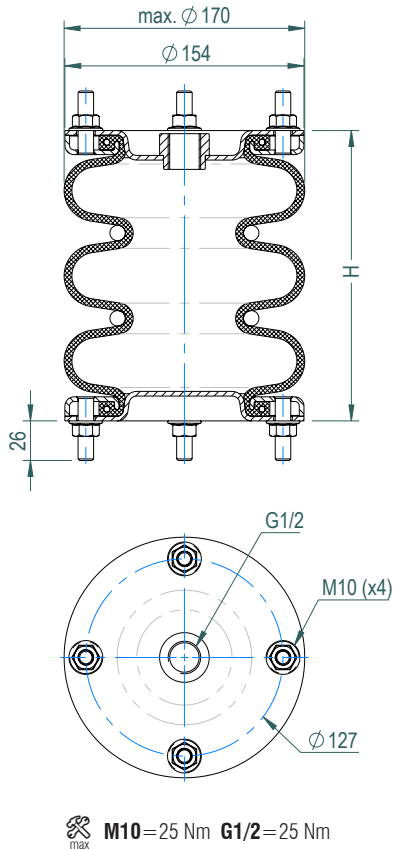
Special guides are required when used as isolators due to lateral instability.

D SERIES  
Dismountable Design

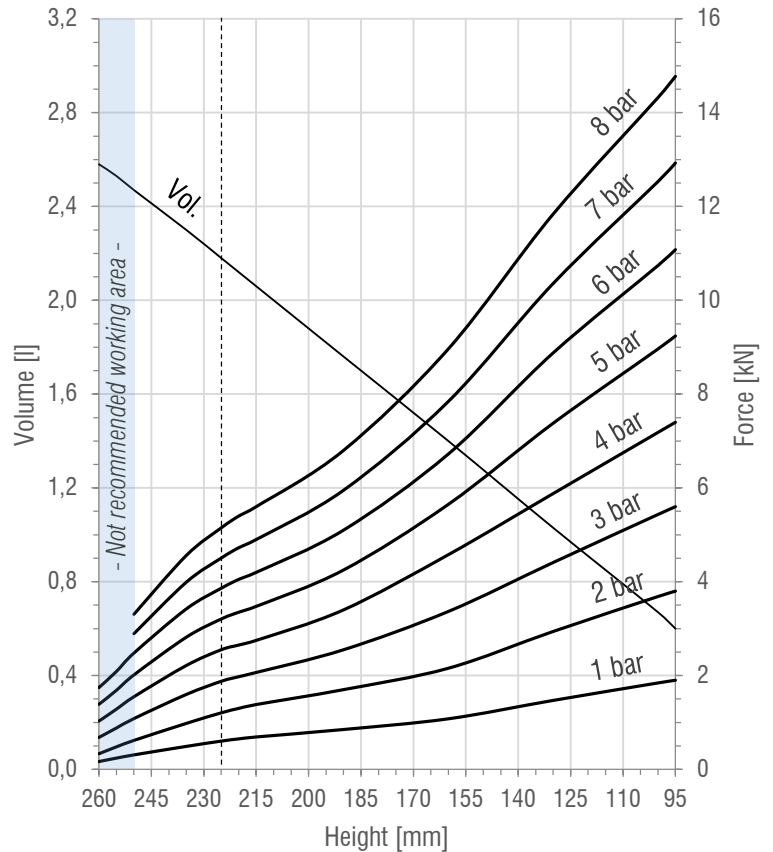
## 6"x3 ST

TRIPLE  
CONVOLUTION

### DRAWING



### FORCE-HEIGHT CHART



### TECHNICAL DATA

#### PRODUCT CHARACTERISTICS

Static diameter [mm]	155
Max. diameter [mm]	170
Required space diameter [mm]	185
Min. height [mm]	95
Static height [mm]	180
Design height [mm]	225
Max. usable height [mm]	250
Max. stroke [mm]	155
Force to compress to $H_{min}$ at 0 bar [N]	200
Weight [kg]	2,90

#### REFERENCES

6x3_B	Rubber bellow only
6x3_D_ST	With steel end closures

Designs available with stainless steel and high temperature rubber compounds. Additional designs on request.

#### DYNAMIC CHARACTERISTICS FOR USE AS ISOLATOR

Pressure [bar]	3	4	5	6	7	Vol. [l]
Load [kN]	1,9	2,6	3,2	3,9	4,5	2,2
Spring rate [N/mm]	42	51	62	73	85	
Natural frequency [Hz]	2,37	2,23	2,20	2,18	2,17	
Isolation rate at 10 Hz	94,0%	94,8%	94,9%	95,0%	95,1%	

Values at recommended design height H: 225 mm -----

#### STATIC CHARACTERISTICS FOR USE AS ACTUATOR

Pressure [bar]		3	4	5	6	7	Vol. [l]
Height H [mm]	100	5,4	7,2	9,0	10,7	12,5	0,7
	130	4,4	5,9	7,4	8,9	10,4	1,0
	160	3,4	4,6	5,6	6,7	7,8	1,4
	190	2,6	3,4	4,3	5,1	6,0	1,8
	220	2,0	2,7	3,4	4,1	4,7	2,1
250	1,1	1,5	2,0	2,5	2,9	2,5	

Force values [kN]

All Volume [l] values at 7 bar

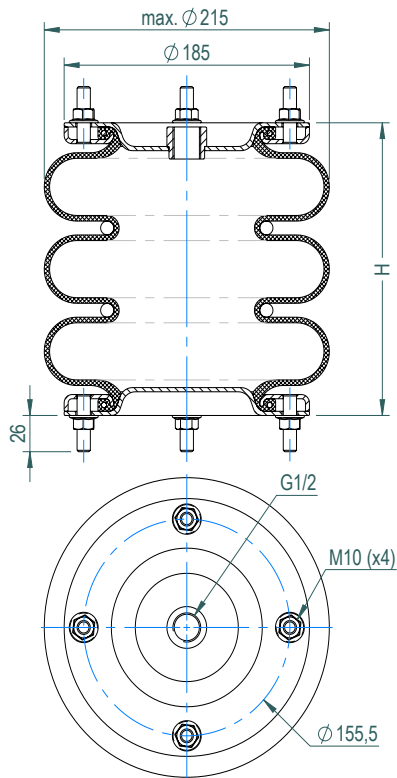
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D SERIES  
Dismountable Design

## 8"x3

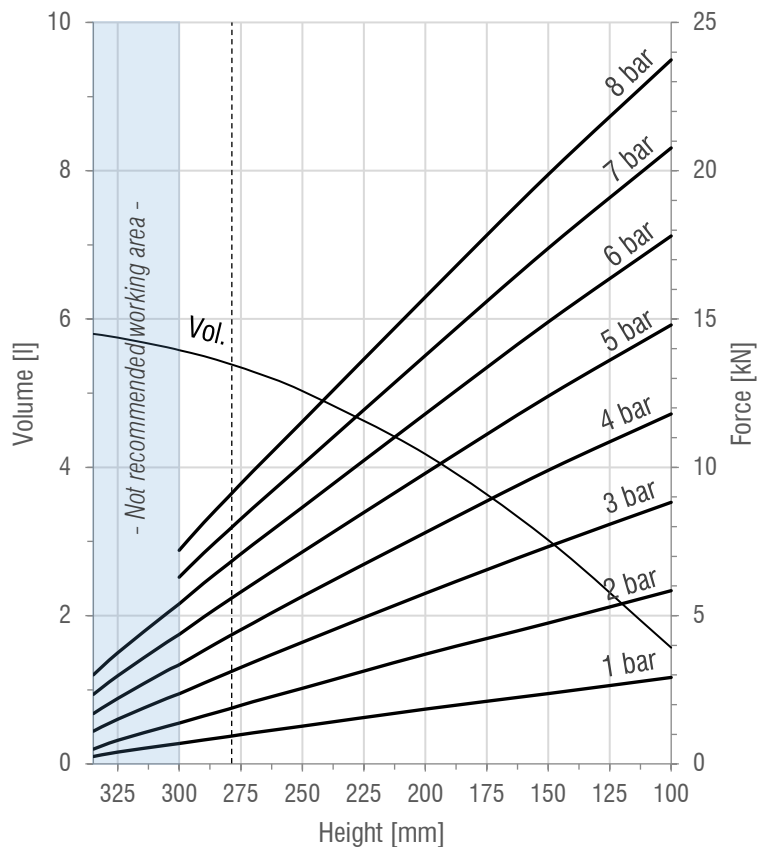
TRIPLE  
CONVOLUTION

### DRAWING



**M10**=25 Nm **G1/2**=25 Nm

### FORCE-HEIGHT CHART



### TECHNICAL DATA

#### PRODUCT CHARACTERISTICS

Static diameter [mm]	203
Max. diameter [mm]	215
Required space diameter [mm]	230
Min. height [mm]	100
Static height [mm]	205
Design height [mm]	280
Max. usable height [mm]	300
Max. stroke [mm]	200
Force to compress to $H_{min}$ at 0 bar [N]	200
Weight [kg]	4,2

#### REFERENCES

8x3_B	Rubber bellow only
8x3_D	With steel end closures

Designs available with stainless steel and high temperature rubber compounds. Additional designs on request.

#### DYNAMIC CHARACTERISTICS FOR USE AS ISOLATOR

Pressure [bar]	3	4	5	6	7	Vol. [l]
Load [kN]	3,1	4,3	5,5	6,8	7,9	5,4
Spring rate [N/mm]	46	61	73	86	100	
Natural frequency [Hz]	1,94	1,88	1,82	1,79	1,78	
Isolation rate at 10 Hz	96,1%	96,4%	96,6%	96,7%	96,7%	

Values at recommended design height H: 280 mm -----

#### STATIC CHARACTERISTICS FOR USE AS ACTUATOR

Pressure [bar]		3	4	5	6	7	Vol. [l]
Height H [mm]	100	8,8	11,8	14,8	17,8	20,8	1,6
	150	7,3	9,9	12,4	14,9	17,4	3,0
	200	5,8	7,8	9,8	11,8	13,8	4,2
	250	4,1	5,7	7,2	8,7	10,1	5,0
	300	2,4	3,4	4,4	5,4	6,3	5,6

Force values [kN]

All Volume [l] values at 7 bar

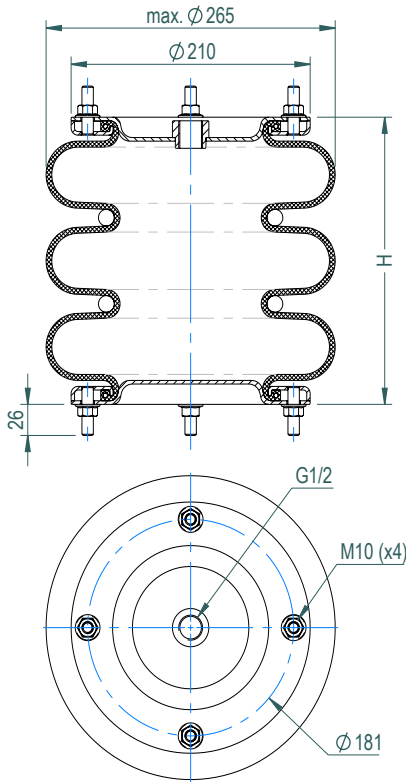
Special guides are required when used as isolators due to lateral instability.

D SERIES  
Dismountable Design

# 10"x3

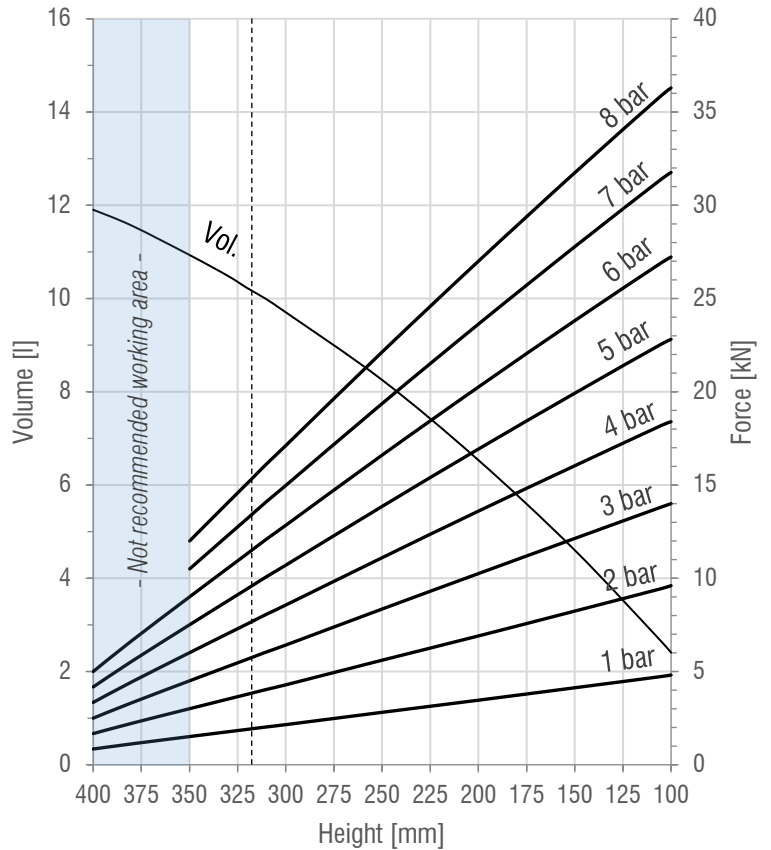
TRIPLE  
CONVOLUTION

## DRAWING



**M10**=25 Nm **G1/2**=25 Nm

## FORCE-HEIGHT CHART



## TECHNICAL DATA

### PRODUCT CHARACTERISTICS

Static diameter [mm]	252
Max. diameter [mm]	265
Required space diameter [mm]	295
Min. height [mm]	100
Static height [mm]	225
Design height [mm]	320
Max. usable height [mm]	350
Max. stroke [mm]	250
Force to compress to $H_{min}$ at 0 bar [N]	110
Weight [kg]	5,8

### REFERENCES

10x3_B	Rubber bellow only
10x3_D	With steel end closures

Designs available with stainless steel and high temperature rubber compounds. Additional designs on request.

### DYNAMIC CHARACTERISTICS FOR USE AS ISOLATOR

Pressure [bar]	3	4	5	6	7	Vol. [l]
Load [kN]	5,7	7,5	9,4	11,3	13,2	10,2
Spring rate [N/mm]	64	84	103	122	141	
Natural frequency [Hz]	1,68	1,66	1,65	1,64	1,64	
Isolation rate at 10 Hz	97,1%	97,2%	97,2%	97,2%	97,3%	

Values at recommended design height H: 320 mm -----

### STATIC CHARACTERISTICS FOR USE AS ACTUATOR

Pressure [bar]		3	4	5	6	7	Vol. [l]
Height H [mm]	100	14,0	18,4	22,8	27,2	31,8	2,4
	150	12,1	16,0	19,9	23,8	27,8	4,6
	200	10,3	13,6	16,9	20,3	23,6	6,5
	250	8,4	11,1	13,9	16,6	19,4	8,3
	300	6,4	8,6	10,7	12,8	15,0	9,7
	350	4,5	6,0	7,5	9,0	10,5	10,9

Force values [kN]

All Volume [l] values at 7 bar

Special guides are required when used as isolators due to lateral instability.

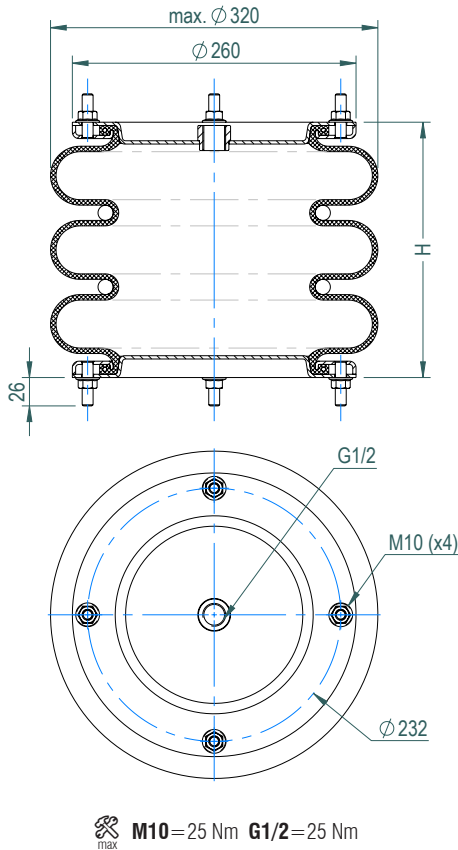


D SERIES  
Dismountable Design

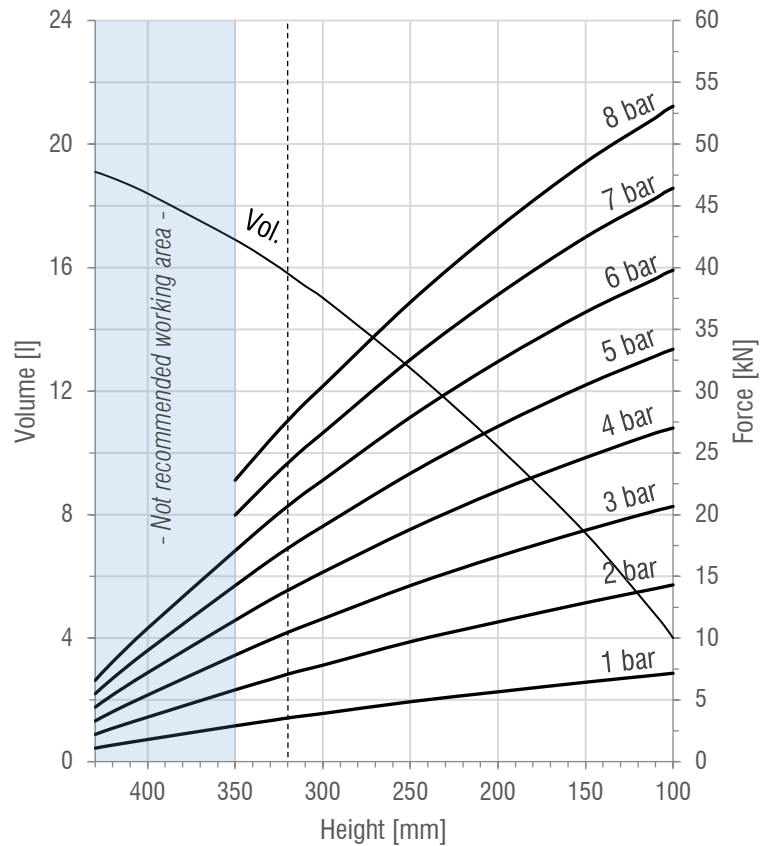
# 12"x3

TRIPLE  
CONVOLUTION

## DRAWING



## FORCE-HEIGHT CHART



## TECHNICAL DATA

### PRODUCT CHARACTERISTICS

Static diameter [mm]	305
Max. diameter [mm]	320
Required space diameter [mm]	340
Min. height [mm]	100
Static height [mm]	235
Design height [mm]	320
Max. usable height [mm]	350
Max. stroke [mm]	250
Force to compress to $H_{min}$ at 0 bar [N]	160
Weight [kg]	8,3

### REFERENCES

12x3_B	Rubber bellow only
12x3_D	With steel end closures

Designs available with stainless steel and high temperature rubber compounds. Additional designs on request.

### DYNAMIC CHARACTERISTICS FOR USE AS ISOLATOR

Pressure [bar]	3	4	5	6	7	Vol. [l]
Load [kN]	10,5	13,9	17,3	20,7	24,2	15,8
Spring rate [N/mm]	107	136	167	197	228	
Natural frequency [Hz]	1,60	1,57	1,55	1,54	1,54	
Isolation rate at 10 Hz	97,4%	97,5%	97,5%	97,6%	97,6%	

Values at recommended design height H: 320 mm -----

### STATIC CHARACTERISTICS FOR USE AS ACTUATOR

Pressure [bar]	3	4	5	6	7	Vol. [l]	
Height H [mm]	100	20,7	27,0	33,4	39,8	46,4	4,0
	150	18,7	24,6	30,5	36,4	42,5	7,4
	200	16,6	21,9	27,2	32,4	37,8	10,2
	250	14,3	18,8	23,4	27,9	32,6	12,7
	300	11,6	15,3	19,1	22,8	26,6	15,0
	350	8,6	11,4	14,3	17,1	20,0	16,9

Force values [kN]

All Volume [l] values at 7 bar

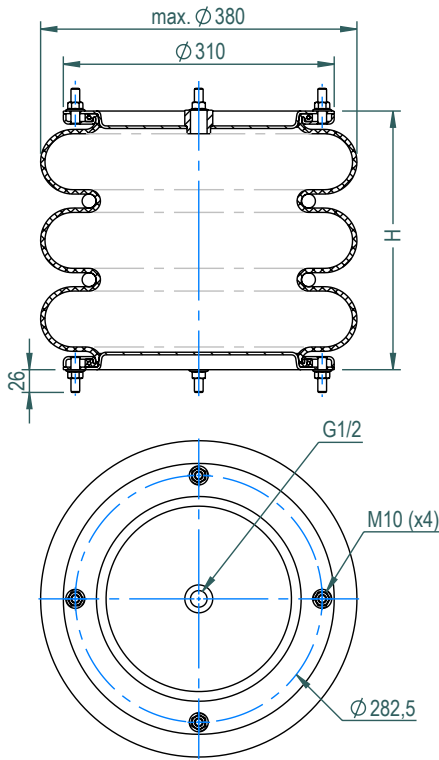
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D SERIES  
Dismountable Design

# 14½" x 3

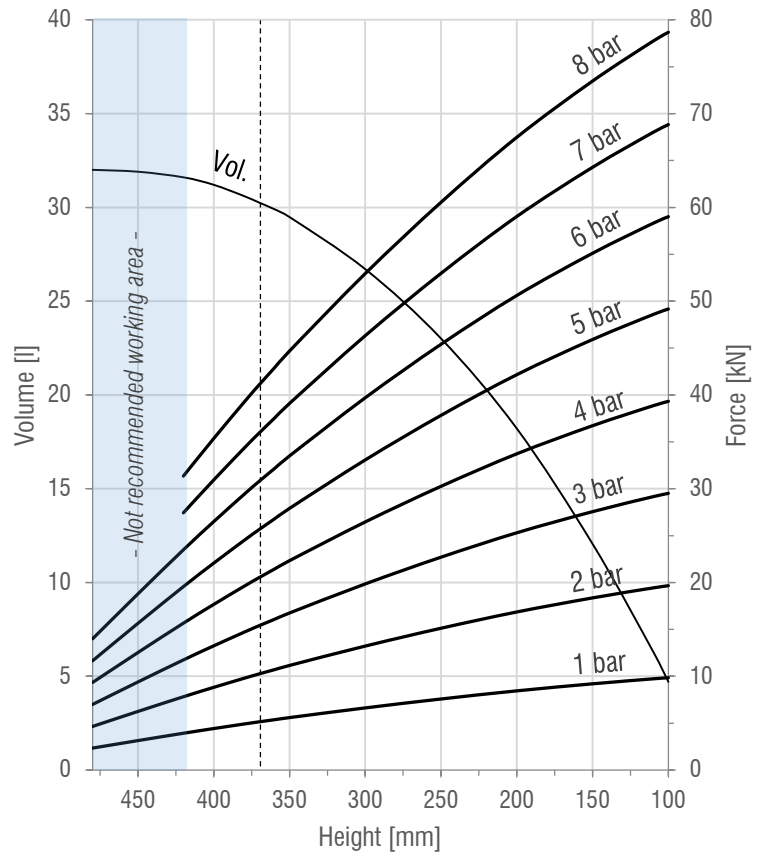
TRIPLE  
CONVOLUTION

## DRAWING



**M10=25 Nm** **G1/2=25 Nm**

## FORCE-HEIGHT CHART



## TECHNICAL DATA

### PRODUCT CHARACTERISTICS

Static diameter [mm]	365
Max. diameter [mm]	380
Required space diameter [mm]	405
Min. height [mm]	100
Static height [mm]	260
Design height [mm]	370
Max. usable height [mm]	420
Max. stroke [mm]	320
Force to compress to $H_{min}$ at 0 bar [N]	150
Weight [kg]	11,7

### REFERENCES

14x3_B	Rubber bellow only
14x3_D	With steel end closures

Designs available with stainless steel and high temperature rubber compounds. Additional designs on request.

### DYNAMIC CHARACTERISTICS FOR USE AS ISOLATOR

Pressure [bar]	3	4	5	6	7	Vol. [l]
Load [kN]	15,4	20,5	25,7	30,8	35,9	30,3
Spring rate [N/mm]	101	133	164	195	226	
Natural frequency [Hz]	1,28	1,27	1,26	1,26	1,25	
Isolation rate at 10 Hz	98,3%	98,4%	98,4%	98,4%	98,4%	

Values at recommended design height H: 370 mm -----

### STATIC CHARACTERISTICS FOR USE AS ACTUATOR

Pressure [bar]		3	4	5	6	7	Vol. [l]
Height H [mm]	100	29,5	39,3	49,2	59,0	68,8	4,7
	150	27,6	36,7	45,9	55,1	64,3	12,1
	200	25,3	33,7	42,2	50,6	59,0	18,2
	250	22,7	30,3	37,8	45,4	53,0	23,0
	300	19,9	26,5	33,1	39,7	46,3	26,7
	350	16,8	22,3	27,9	33,5	39,1	29,5
	400	13,3	17,7	22,1	26,5	30,9	31,2

Force values [kN]

All Volume [l] values at 7 bar

Special guides are required when used as isolators due to lateral instability.

