

D series

2 convolution



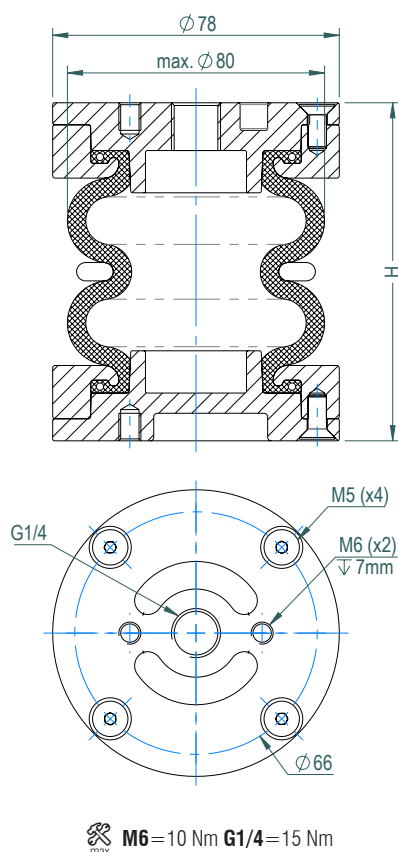
DATA Sheet

D SERIES
Dismountable Design

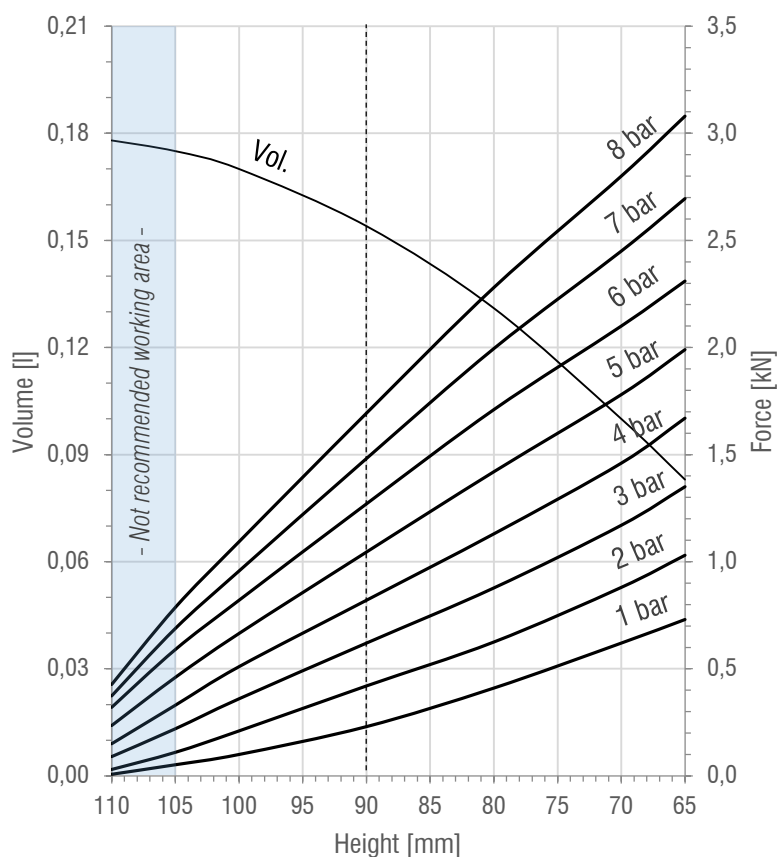
2 3/4" x 2

DOUBLE
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]	65
Static height [mm]	90
Design height [mm]	90
Max. usable height [mm]	105
Max. stroke [mm]	40
Force to compress to H_{min} at 0 bar [N]	180
Weight [kg]	0,54

REFERENCES

2x2_B	Rubber bellow only
2x2_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]	0,62	0,82	1,05	1,27	1,48	0,15
Spring rate [N/mm]	39	47	57	67	78	
Natural frequency [Hz]	3,94	3,77	3,69	3,63	3,62	
Isolation rate at 10 Hz	81,6%	83,4%	84,3%	84,8%	84,9%	

Values at recommended design height H: 90 mm -----

STATIC CHARACTERISTICS FOR USE AS ACTUATOR

Pressure [bar]		3	4	5	6	7	Vol. [l]
Height H [mm]	70	1,17	1,46	1,78	2,10	2,45	0,10
	80	0,88	1,13	1,42	1,71	2,00	0,13
	90	0,62	0,82	1,05	1,27	1,48	0,15
	100	0,36	0,51	0,67	0,82	0,96	0,17

Force values [kN]

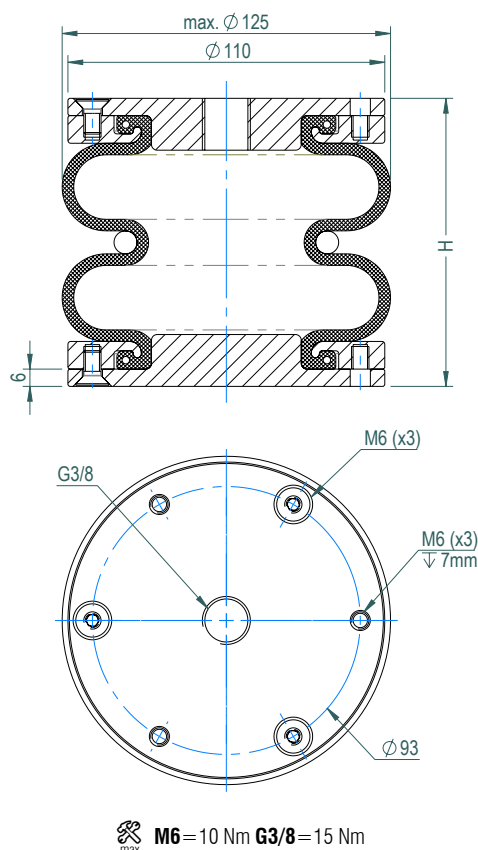
All Volume [l] values at 7 bar

D SERIES
Dismountable Design

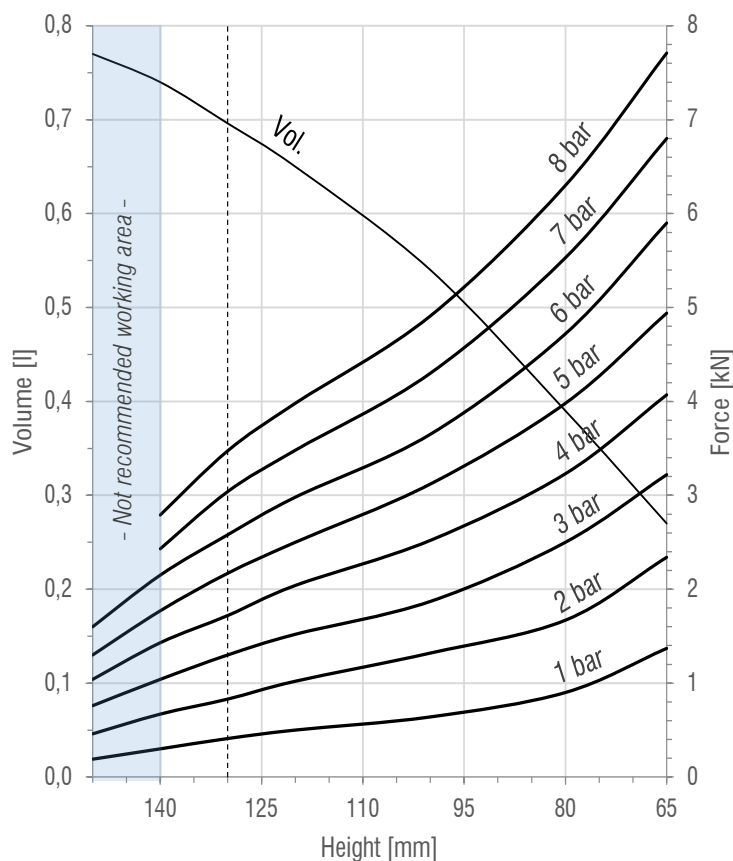
4½"x2

DOUBLE
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]	65
Static height [mm]	100
Design height [mm]	130
Max. usable height [mm]	140
Max. stroke [mm]	75
Force to compress to H_{min} at 0 bar [N]	140
Weight [kg]	0,95

REFERENCES

4x2_B	Rubber bellow only
4x2_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]	1,30	1,72	2,17	2,58	3,04	0,70
Spring rate [N/mm]	42	50	58	69	77	
Natural frequency [Hz]	2,84	2,70	2,59	2,58	2,52	
Isolation rate at 10 Hz	91,3%	92,1%	92,8%	92,9%	93,2%	

Values at recommended design height H: 130 mm -----

STATIC CHARACTERISTICS FOR USE AS ACTUATOR

Pressure [bar]		3	4	5	6	7	Vol. [l]
Height H [mm]	65	3,22	4,07	4,94	5,86	6,78	0,27
	80	2,60	3,30	4,10	4,79	5,62	0,39
	100	1,92	2,52	3,12	3,68	4,36	0,54
	120	1,43	1,90	2,38	2,80	3,32	0,65
	140	1.00	1,38	1,73	2,05	2,41	0,74

Force values [kN]

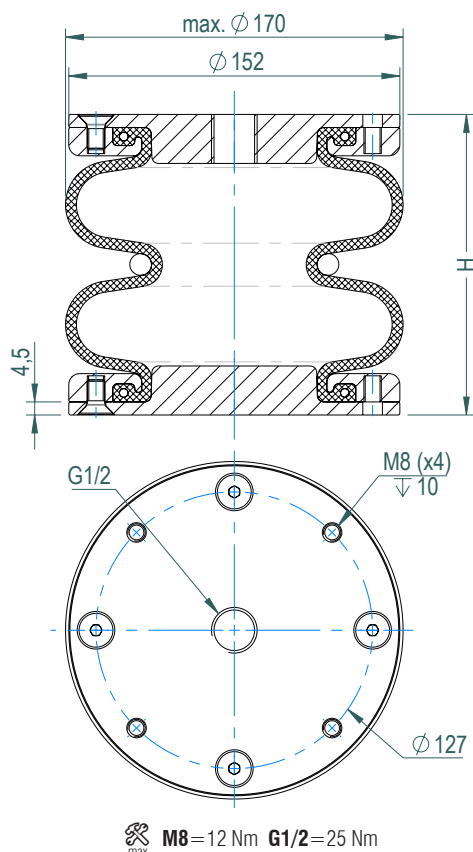
All Volume [l] values at 7 bar

D SERIES
Dismountable Design

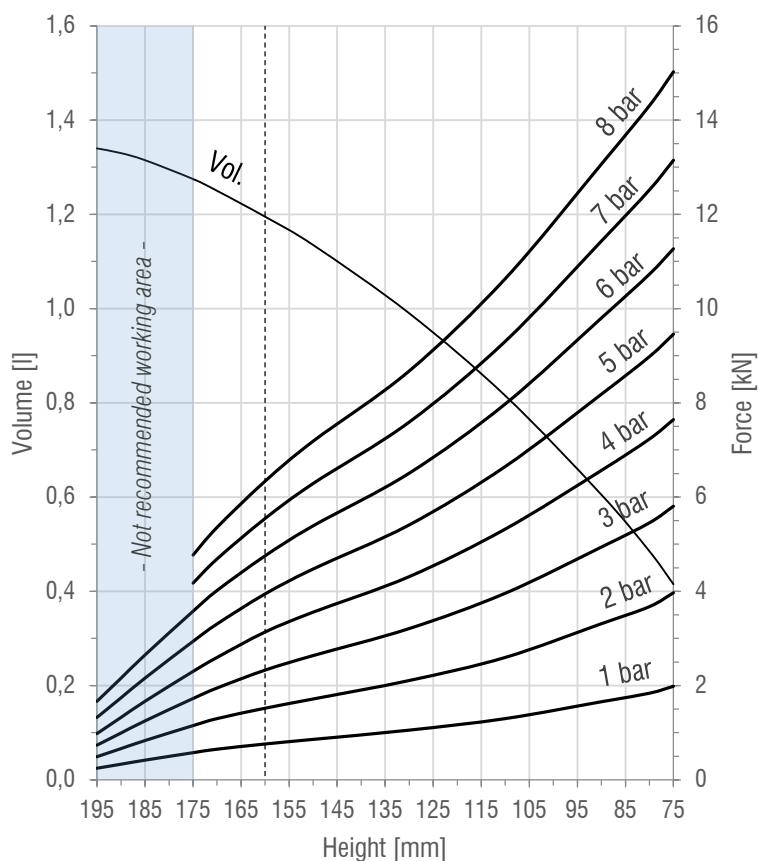
6"x2 AL

DOUBLE
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]	75
Static height [mm]	130
Design height [mm]	160
Max. usable height [mm]	175
Max. stroke [mm]	100
Force to compress to H_{min} at 0 bar [N]	170
Weight [kg]	1,8

REFERENCES

6x2_B	Rubber bellow only
6x2_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]	2,3	3,1	3,9	4,8	5,5	1,2
Spring rate [N/mm]	57	74	90	106	123	
Natural frequency [Hz]	2,47	2,43	2,39	2,36	2,35	
Isolation rate at 10 Hz	93,5%	93,7%	93,9%	94,1%	94,1%	

Values at recommended design height H: 160 mm -----

STATIC CHARACTERISTICS FOR USE AS ACTUATOR

Pressure [bar]		3	4	5	6	7	Vol. [l]
Height H [mm]	75	5,8	7,6	9,5	11,3	13,1	0,4
	90	4,9	6,6	8,2	9,8	11,4	0,6
	110	4,0	5,3	6,6	8,0	9,3	0,8
	130	3,2	4,3	5,4	6,5	7,6	1,0
	150	2,6	3,6	4,5	5,4	6,3	1,1
	170	1,9	2,6	3,3	4,0	4,7	1,3

Force values [kN]

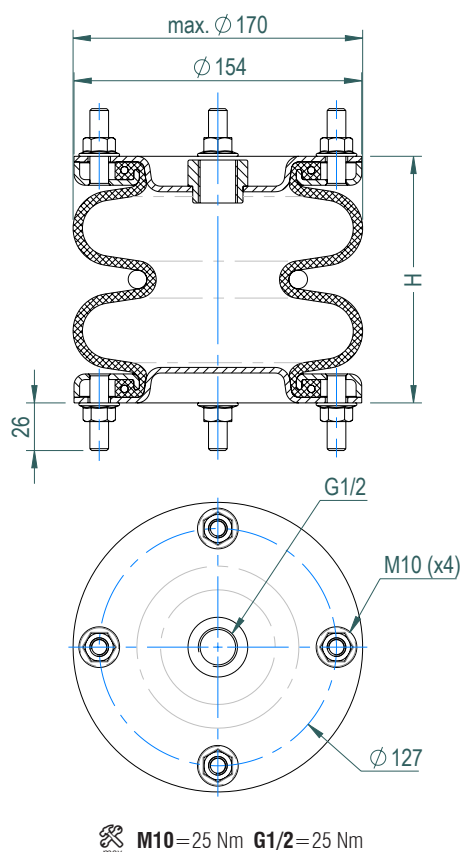
All Volume [l] values at 7 bar

D SERIES
Dismountable Design

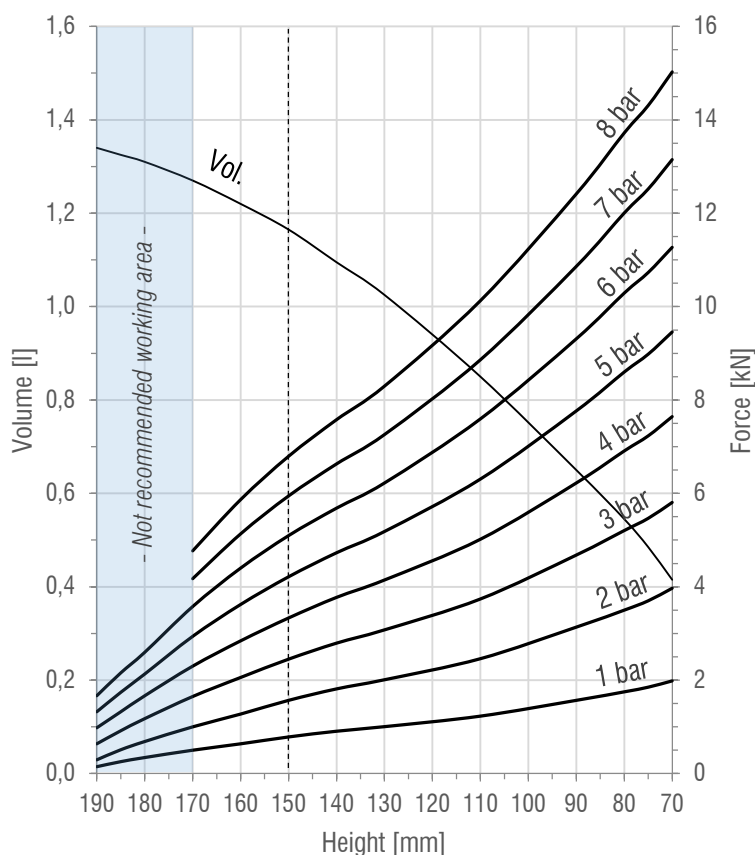
6"x2 ST

DOUBLE
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]	70
Static height [mm]	125
Design height [mm]	150
Max. usable height [mm]	170
Max. stroke [mm]	100
Force to compress to H_{min} at 0 bar [N]	170
Weight [kg]	2,2

REFERENCES

6x2_B	Rubber bellow only
6x2_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]	2,5	3,3	4,2	5,1	5,9	1,2
Spring rate [N/mm]	62	79	94	110	127	
Natural frequency [Hz]	2,51	2,43	2,36	2,32	2,31	
Isolation rate at 10 Hz	93,3%	93,7%	94,1%	94,3%	94,4%	

Values at recommended design height H: 150 mm -----

STATIC CHARACTERISTICS FOR USE AS ACTUATOR

Pressure [bar]		3	4	5	6	7	Vol. [l]
Height H [mm]	70	5,8	7,6	9,5	11,3	13,1	0,4
	90	4,7	6,2	7,8	9,3	10,9	0,7
	110	3,7	5,0	6,3	7,6	8,9	0,9
	130	3,1	4,1	5,2	6,2	7,3	1,0
	150	2,5	3,3	4,2	5,1	5,9	1,2
	170	1,7	2,3	2,9	3,6	4,2	1,3

Force values [kN]

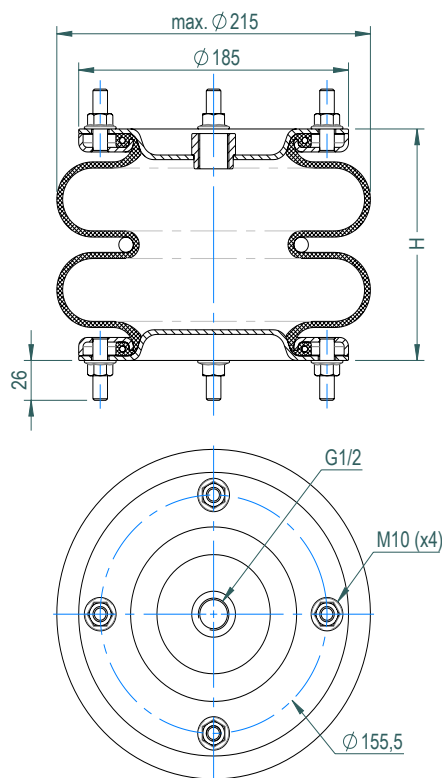
All Volume [l] values at 7 bar

D SERIES
Dismountable Design

8"x2

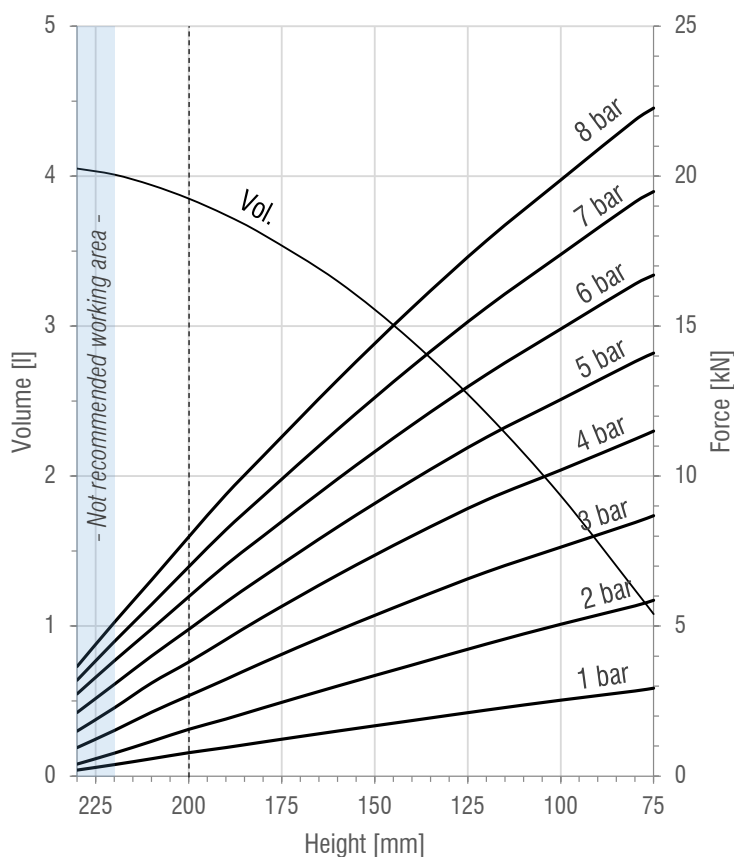
DOUBLE
CONVOLUTION

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]	75
Static height [mm]	145
Design height [mm]	200
Max. usable height [mm]	220
Max. stroke [mm]	145
Force to compress to H_{min} at 0 bar [N]	230
Weight [kg]	3,74

REFERENCES

8x2_B	Rubber bellow only
8x2_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]	2,7	3,8	4,9	6,0	7,0	3,9
Spring rate [N/mm]	68	90	111	133	154	
Natural frequency [Hz]	2,52	2,44	2,39	2,35	2,35	
Isolation rate at 10 Hz	93,2%	93,7%	94,0%	94,1%	94,2%	

Values at recommended design height H: 200 mm -----

STATIC CHARACTERISTICS FOR USE AS ACTUATOR

Pressure [bar]		3	4	5	6	7	Vol. [l]
Height H [mm]	80	8,5	11,2	13,8	16,4	19,1	1,2
	100	7,6	10,2	12,6	14,9	17,4	1,9
	120	6,8	9,2	11,3	13,4	15,6	2,4
	140	5,9	8,0	9,9	11,7	13,7	2,9
	160	4,9	6,7	8,3	9,9	11,6	3,3
	180	3,8	5,3	6,7	8,0	9,3	3,6
	200	2,7	3,8	4,9	6,0	7,0	3,9
	220	1,5	2,3	3,1	3,8	4,5	4,0

Force values [kN]

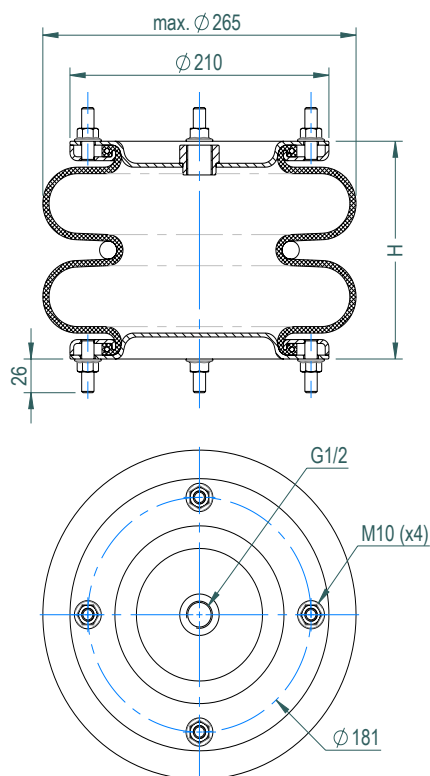
All Volume [l] values at 7 bar

D SERIES
Dismountable Design

10"x2

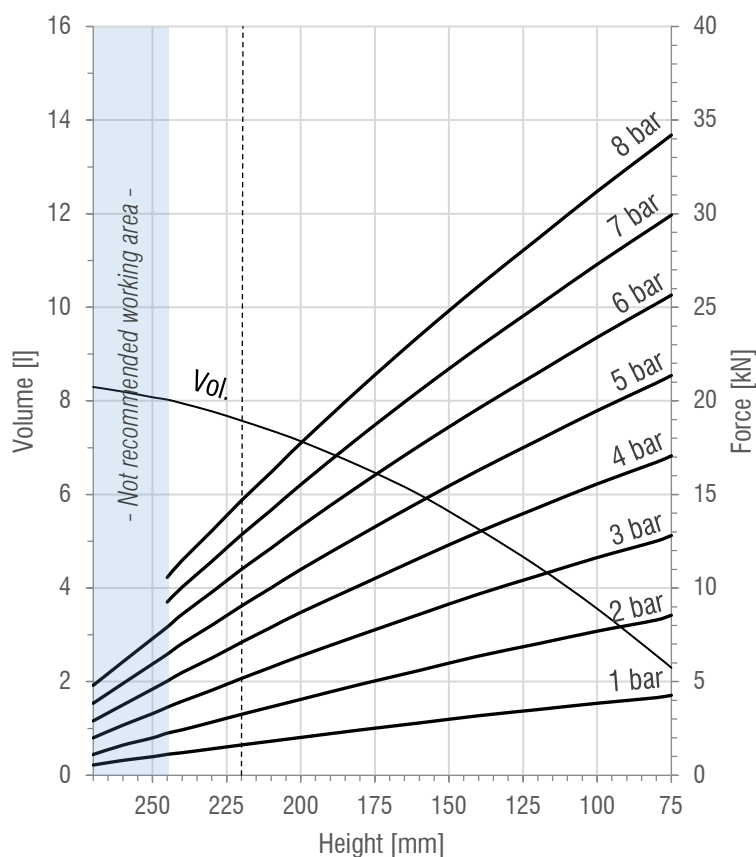
DOUBLE
CONVOLUTION

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]	75
Static height [mm]	150
Design height [mm]	220
Max. usable height [mm]	245
Max. stroke [mm]	170
Force to compress to H_{min} at 0 bar [N]	150
Weight [kg]	4,88

REFERENCES

10x2_B	Rubber bellow only
10x2_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]	5,2	7,1	9,1	11,0	12,8	7,6
Spring rate [N/mm]	87	115	141	166	192	
Natural frequency [Hz]	2,06	2,02	1,97	1,94	1,93	
Isolation rate at 10 Hz	95,6%	95,8%	96,0%	96,1%	96,1%	

Values at recommended design height H: 220 mm -----

STATIC CHARACTERISTICS FOR USE AS ACTUATOR

Pressure [bar]		3	4	5	6	7	Vol. [l]
Height H [mm]	80	12,5	16,7	21,0	25,2	29,4	2,6
	100	11,6	15,6	19,5	23,4	27,3	3,6
	120	10,7	14,3	17,9	21,5	25,1	4,5
	140	9,7	13,0	16,3	19,6	22,9	5,3
	160	8,6	11,6	14,6	17,6	20,5	6,0
	180	7,5	10,2	12,8	15,5	18,1	6,6
	200	6,4	8,7	11,0	13,3	15,5	7,1
	220	5,2	7,1	9,1	11,0	12,8	7,6
	240	4,0	5,5	7,0	8,6	10,0	8,0

Force values [kN]

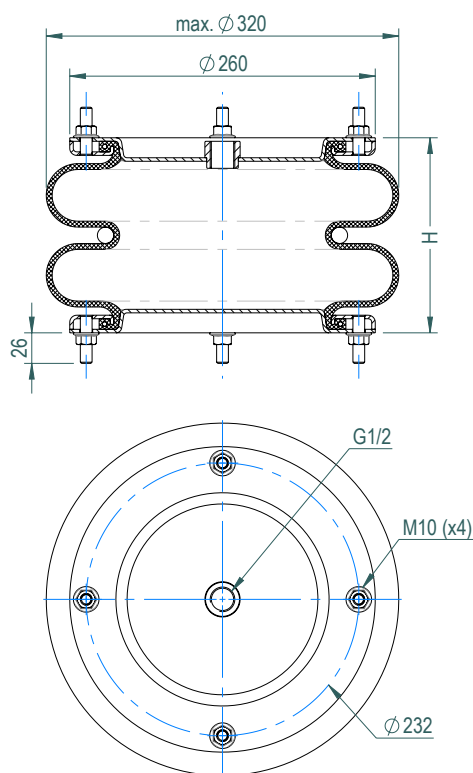
All Volume [l] values at 7 bar

D SERIES
Dismountable Design

12"x2

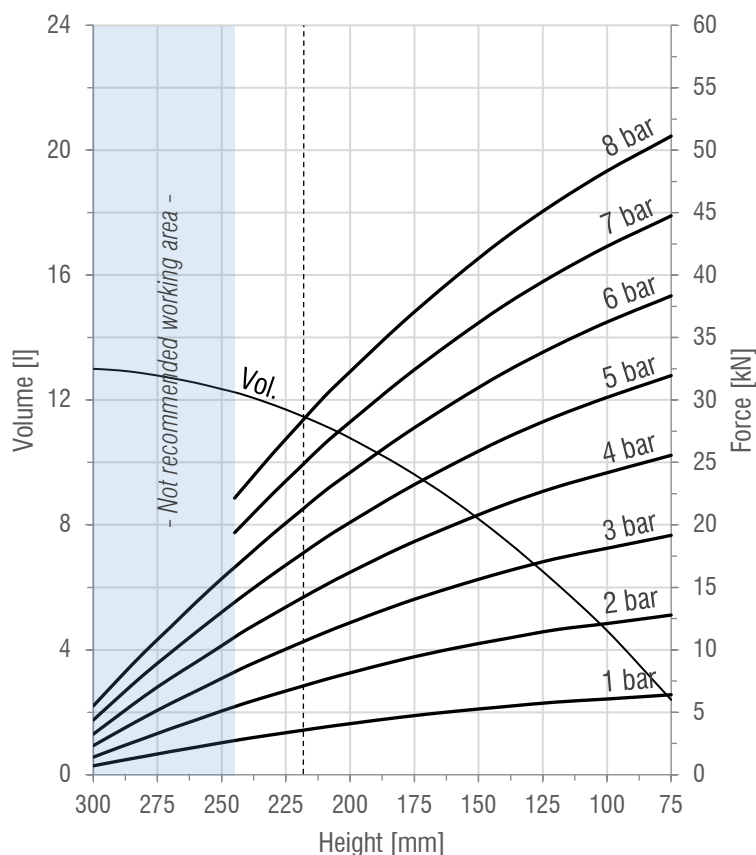
DOUBLE
CONVOLUTION

DRAWING



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

FORCE-HEIGHT CHART



TECHNICAL DATA

PRODUCT CHARACTERISTICS

Static diameter [mm]	305
Max. diameter [mm]	320
Required space diameter [mm]	340
Min. height [mm]	75
Static height [mm]	160
Design height [mm]	220
Max. usable height [mm]	245
Max. stroke [mm]	170
Force to compress to H_{min} at 0 bar [N]	120
Weight [kg]	6,9

REFERENCES

12x2_B	Rubber bellow only
12x2_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	14,0	17,5	21,0	24,5	11,5
Spring rate [N/mm]	144	186	228	269	312	
Natural frequency [Hz]	1,85	1,82	1,80	1,79	1,78	
Isolation rate at 10 Hz	96,4%	96,6%	96,6%	96,7%	96,7%	

Values at recommended design height H: 220 mm -----

STATIC CHARACTERISTICS FOR USE AS ACTUATOR

Pressure [bar]		3	4	5	6	7	Vol. [l]
Height H [mm]	80	19,0	25,3	31,6	37,9	44,2	2,9
	100	18,1	24,2	30,2	36,3	42,3	4,6
	120	17,3	23,0	28,7	34,3	40,1	6,2
	140	16,2	21,6	26,9	32,2	37,6	7,6
	160	15,0	20,0	24,9	29,8	34,7	8,8
	180	13,7	18,2	22,7	27,1	31,6	9,9
	200	12,2	16,2	20,2	24,2	28,2	10,8
	220	10,5	14,0	17,5	21,0	24,5	11,5
	240	8,7	11,7	14,6	17,5	20,4	12,1

Force values [kN]

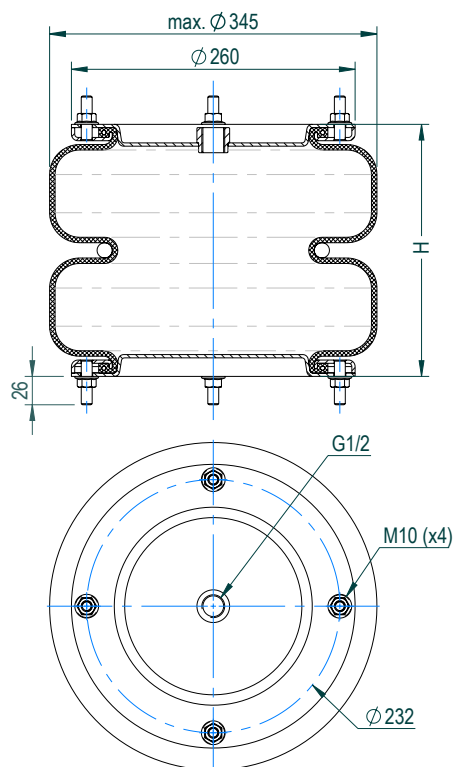
All Volume [l] values at 7 bar

D SERIES
Dismountable Design

12"x2-E

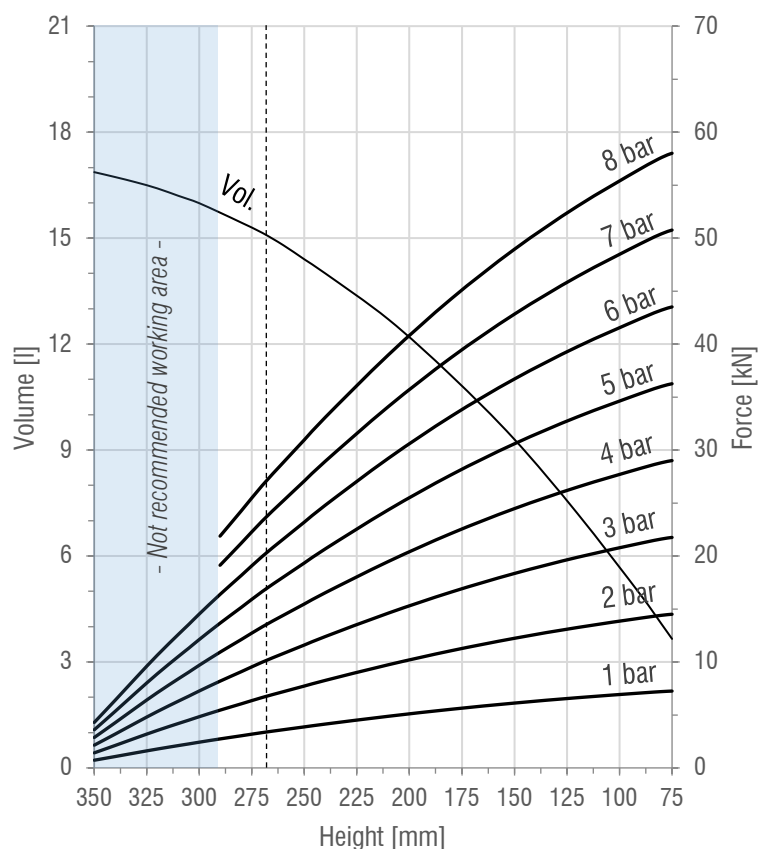
DOUBLE
CONVOLUTION

DRAWING



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

FORCE-HEIGHT CHART



TECHNICAL DATA

PRODUCT CHARACTERISTICS

Static diameter [mm]	305
Max. diameter [mm]	345
Required space diameter [mm]	370
Min. height [mm]	75
Static height [mm]	235
Design height [mm]	270
Max. usable height [mm]	290
Max. stroke [mm]	215
Force to compress to H_{min} at 0 bar [N]	180
Weight [kg]	7,2

REFERENCES

12x2-E_B	Rubber bellow only
12x2-E_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]	10,0	13,3	16,6	20,0	23,3	15,2
Spring rate [N/mm]	125	163	202	240	279	
Natural frequency [Hz]	1,77	1,75	1,74	1,73	1,73	
Isolation rate at 10 Hz	96,8%	96,8%	96,9%	96,9%	96,9%	

Values at recommended design height H: 270 mm -----

STATIC CHARACTERISTICS FOR USE AS ACTUATOR

Pressure [bar]		3	4	5	6	7	Vol. [l]
Height H [mm]	80	21,6	28,8	36,0	43,2	50,4	4,1
	120	19,9	26,5	33,1	39,8	46,4	7,2
	150	18,4	24,5	30,6	36,7	42,8	9,3
	180	16,6	22,1	27,7	33,2	38,7	11,1
	210	14,6	19,5	24,4	29,2	34,1	12,7
	240	12,4	16,5	20,7	24,8	28,9	14,0
	270	10,0	13,3	16,6	20,0	23,3	15,2
	300	7,3	9,7	12,1	14,5	0,0	16,0

Force values [kN]

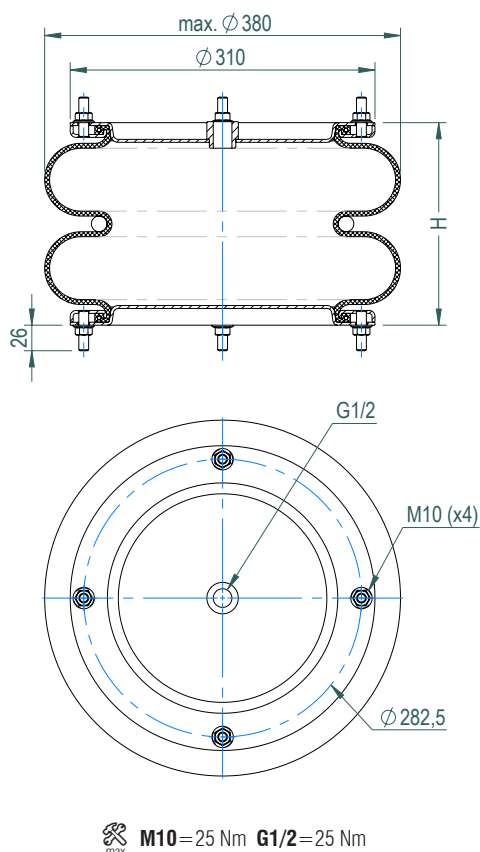
All Volume [l] values at 7 bar

D SERIES
Dismountable Design

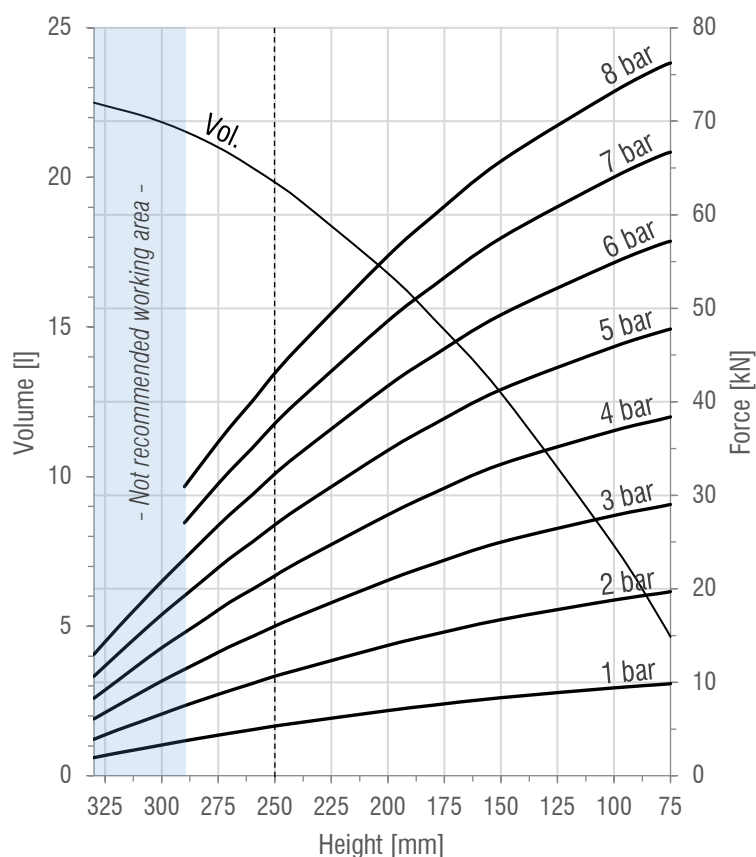
14½"x2

DOUBLE
CONVOLUTION

DRAWING



FORCE-HEIGHT CHART



TECHNICAL DATA

PRODUCT CHARACTERISTICS

Static diameter [mm]	365
Max. diameter [mm]	380
Required space diameter [mm]	405
Min. height [mm]	75
Static height [mm]	195
Design height [mm]	250
Max. usable height [mm]	290
Max. stroke [mm]	215
Force to compress to H_{min} at 0 bar [N]	120
Weight [kg]	9,4

REFERENCES

14x2_B	Rubber bellow only
14x2_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]	16,0	21,4	26,8	32,3	37,7	19,8
Spring rate [N/mm]	185	240	294	349	403	
Natural frequency [Hz]	1,70	1,67	1,66	1,64	1,64	
Isolation rate at 10 Hz	97,0%	97,1%	97,2%	97,2%	97,3%	

Values at recommended design height H: 250 mm -----

STATIC CHARACTERISTICS FOR USE AS ACTUATOR

Pressure [bar]		3	4	5	6	7	Vol. [l]
Height H [mm]	80	28,8	38,1	47,4	56,8	66,3	5,3
	100	27,9	36,9	45,9	54,9	64,0	7,7
	150	25,0	33,3	41,3	49,3	57,5	12,8
	180	22,7	30,2	37,6	44,9	52,4	15,3
	200	20,9	27,9	34,8	41,7	48,7	16,8
	240	17,1	22,8	28,6	34,3	40,0	19,3
	270	13,8	18,6	23,2	27,9	32,6	20,8
	290	11,4	15,3	19,3	23,2	27,1	21,6

Force values [kN]

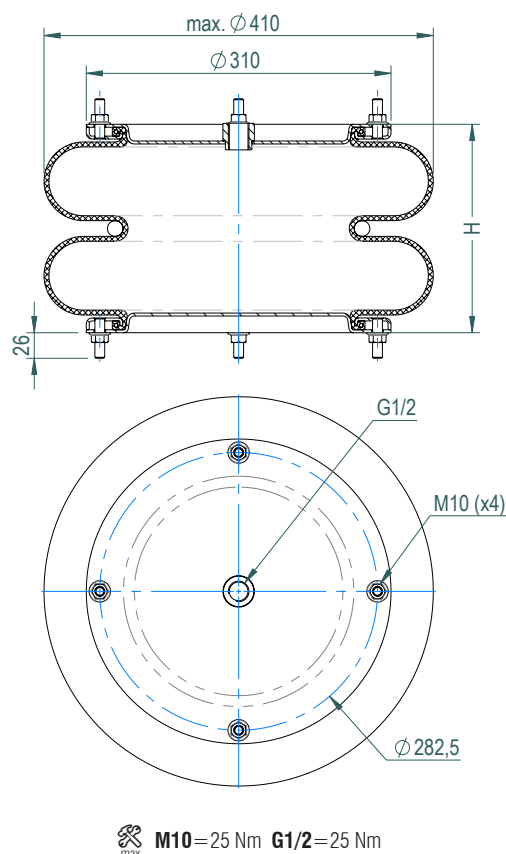
All Volume [l] values at 7 bar

D SERIES
Dismountable Design

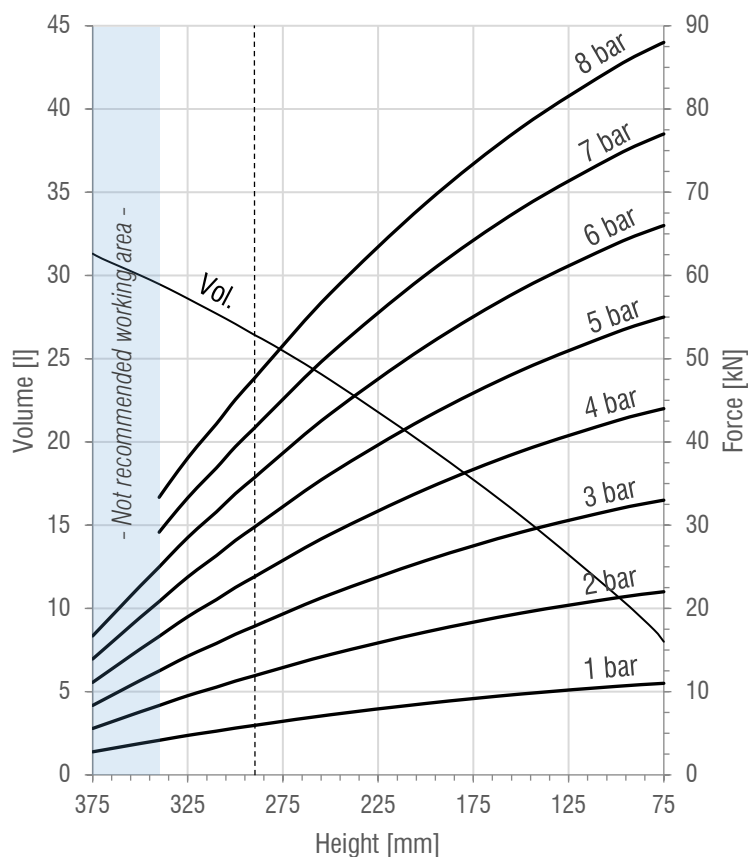
16"x2

DOUBLE
CONVOLUTION

DRAWING



FORCE-HEIGHT CHART



TECHNICAL DATA

PRODUCT CHARACTERISTICS

Static diameter [mm]	400
Max. diameter [mm]	410
Required space diameter [mm]	435
Min. height [mm]	75
Static height [mm]	195
Design height [mm]	290
Max. usable height [mm]	340
Max. stroke [mm]	265
Force to compress to H_{min} at 0 bar [N]	100
Weight [kg]	9,9

REFERENCES

16x2_B	Rubber bellow only
16x2_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]	17,9	23,8	29,8	35,7	41,7	26,4
Spring rate [N/mm]	177	230	282	334	387	
Natural frequency [Hz]	1,58	1,55	1,54	1,53	1,52	
Isolation rate at 10 Hz	97,5%	97,5%	97,6%	97,6%	97,6%	

Values at recommended design height H: 290 mm -----

STATIC CHARACTERISTICS FOR USE AS ACTUATOR

Pressure [bar]		3	4	5	6	7	Vol. [l]
Height H [mm]	75	33,0	44,0	55,0	66,0	77,0	8,0
	100	31,9	42,5	53,2	63,8	74,4	10,8
	150	29,2	38,9	48,6	58,3	68,0	15,6
	200	25,8	34,3	42,9	51,5	60,1	19,8
	250	21,7	28,9	36,2	43,4	50,6	23,7
	300	16,9	22,5	28,2	33,8	39,4	27,1
	350	11,4	15,1	18,9	22,7	-	30,0

Force values [kN]

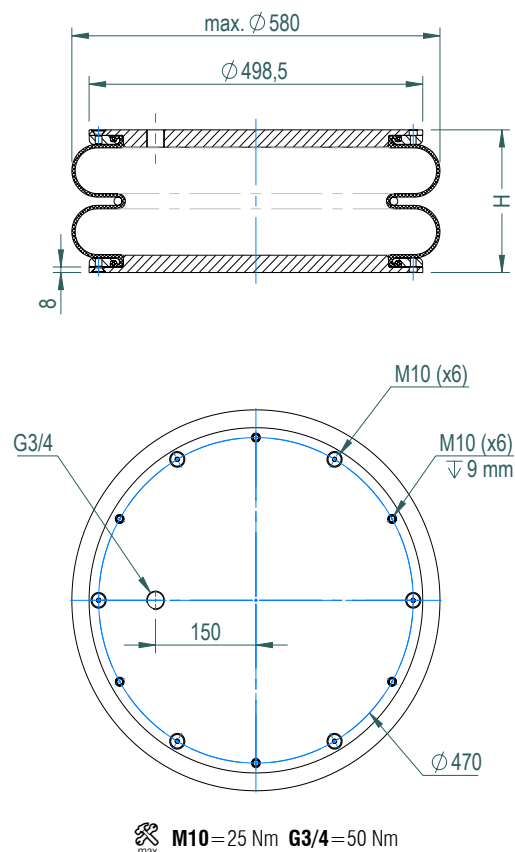
All Volume [l] values at 7 bar

D SERIES
Dismountable Design

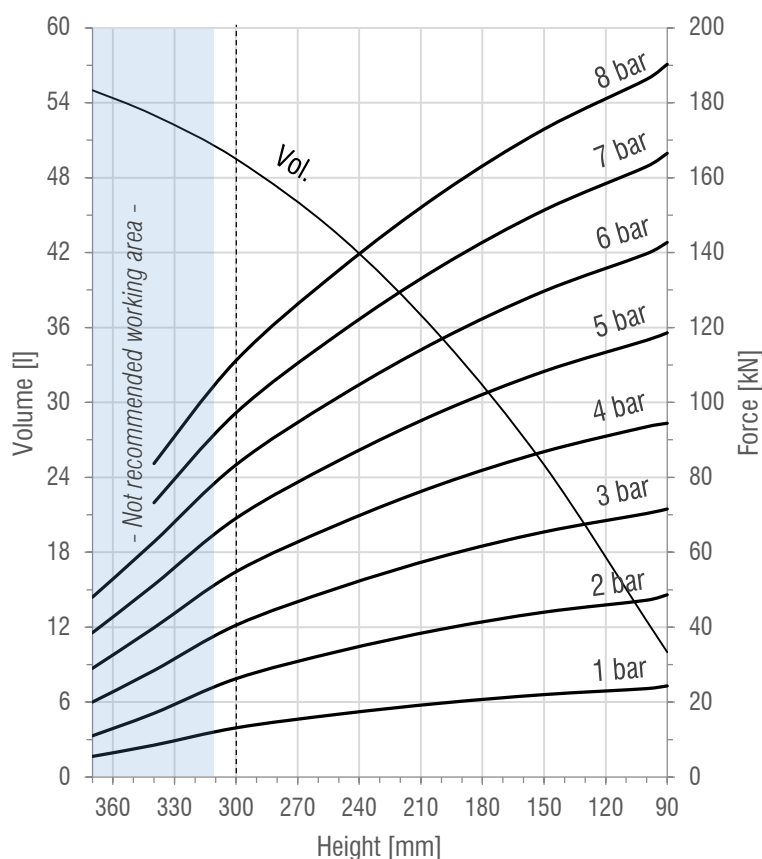
21½"x2

DOUBLE
CONVOLUTION

DRAWING



FORCE-HEIGHT CHART



TECHNICAL DATA

PRODUCT CHARACTERISTICS

Static diameter [mm]	546
Max. diameter [mm]	580
Required space diameter [mm]	630
Min. height [mm]	90
Static height [mm]	200
Design height [mm]	300
Max. usable height [mm]	310
Max. stroke [mm]	220
Force to compress to H_{min} at 0 bar [N]	70
Weight [kg]	20,6

REFERENCES

21x2_B	Rubber bellow only
21x2_D	With aluminium end closures

Designs available with stainless steel and high temperature rubber compounds. Ø601mm plate and additional designs on request.

DYNAMIC CHARACTERISTICS FOR USE AS ISOLATOR

Pressure [bar]	3	4	5	6	7	Vol. [l]
Load [kN]	40,5	54,8	69,1	83,4	97,2	49,5
Spring rate [N/mm]	423	538	652	756	873	
Natural frequency [Hz]	1,62	1,57	1,54	1,51	1,50	
Isolation rate at 10 Hz	97,3%	97,5%	97,6%	97,7%	97,7%	

Values at recommended design height H: 300 mm -----

STATIC CHARACTERISTICS FOR USE AS ACTUATOR

Pressure [bar]		3	4	5	6	7	Vol. [l]
Height H [mm]	90	71,5	94,4	118,6	142,7	166,5	10,0
	100	70,4	93,5	116,6	139,7	163,0	12,5
	150	65,4	86,9	108,3	129,7	151,3	25,0
	200	58,8	78,2	97,6	116,9	136,4	35,2
	250	50,5	67,5	84,5	101,5	118,4	43,4
	300	40,5	54,8	69,1	83,4	97,2	49,5
	340	28,4	39,8	51,3	62,8	73,2	53,0

Force values [kN]

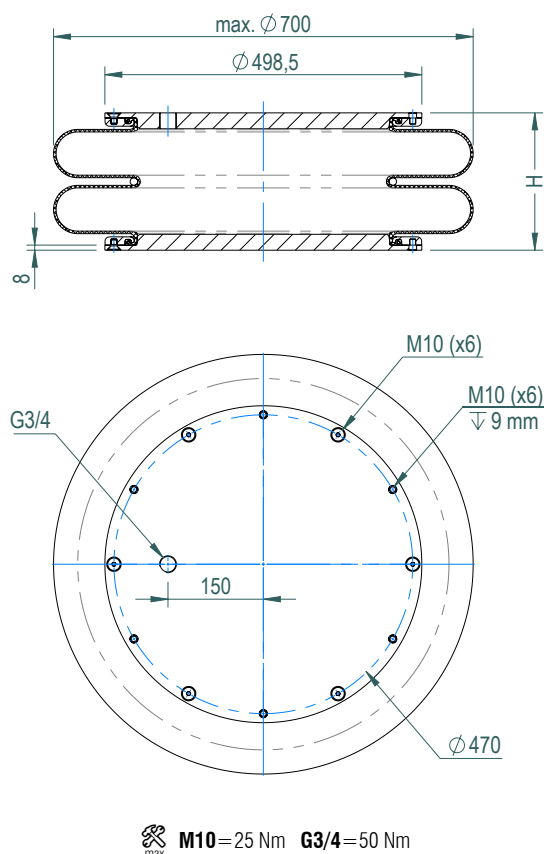
All Volume [l] values at 5 bar

D SERIES
Dismountable Design

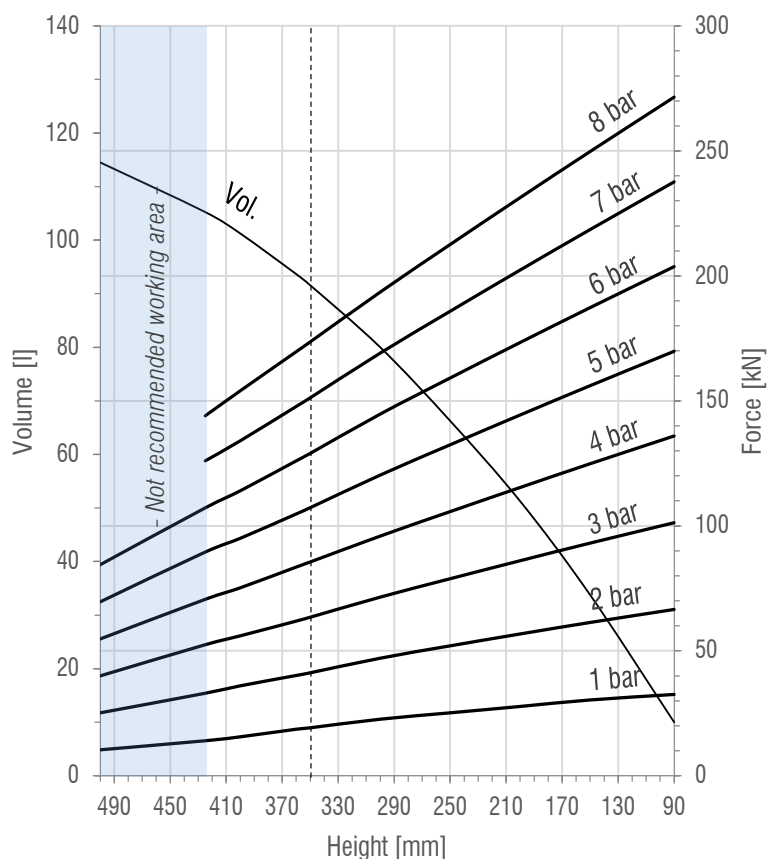
26"x2

DOUBLE
CONVOLUTION

DRAWING



FORCE-HEIGHT CHART



TECHNICAL DATA

PRODUCT CHARACTERISTICS

Static diameter [mm]	660
Max. diameter [mm]	700
Required space diameter [mm]	750
Min. height [mm]	90
Static height [mm]	200
Design height [mm]	350
Max. usable height [mm]	425
Max. stroke [mm]	335
Force to compress to H_{min} at 0 bar [N]	150
Weight [kg]	24,0

REFERENCES

26x2_B	Rubber bellow only
26x2_D	With aluminium end closures
26x2_D_ST	With steel end closures
26x2_R_TR	With threaded bead rings

Designs available with stainless steel and high temperature rubber compounds. $\varnothing$ 601mm plate and additional designs on request.

DYNAMIC CHARACTERISTICS FOR USE AS ISOLATOR

Pressure [bar]	3	4	5	6	7	Vol. [l]
Load [kN]	63,4	85,5	107,3	129,0	151,2	91,6
Spring rate [N/mm]	422	539	656	772	889	
Natural frequency [Hz]	1,29	1,26	1,24	1,22	1,21	
Isolation rate at 10 Hz	98,3%	98,4%	98,4%	98,5%	98,5%	

Values at recommended design height H: 350 mm -----

STATIC CHARACTERISTICS FOR USE AS ACTUATOR

Pressure [bar]		3	4	5	6	7	Vol. [l]
Height H [mm]	100	100,5	134,4	168,3	201,2	234,5	14,0
	150	93,1	124,9	156,1	187,3	218,5	33,8
	200	86,1	115,4	144,4	173,4	202,3	51,3
	250	78,9	105,7	132,4	159,2	185,9	66,3
	300	71,5	95,9	120,3	144,7	169,1	80,0
	350	63,4	85,5	107,3	129,0	151,2	91,6
	400	56,0	75,2	95,0	114,0	134,0	101,3

Force values [kN]

All Volume [l] values at 5 bar