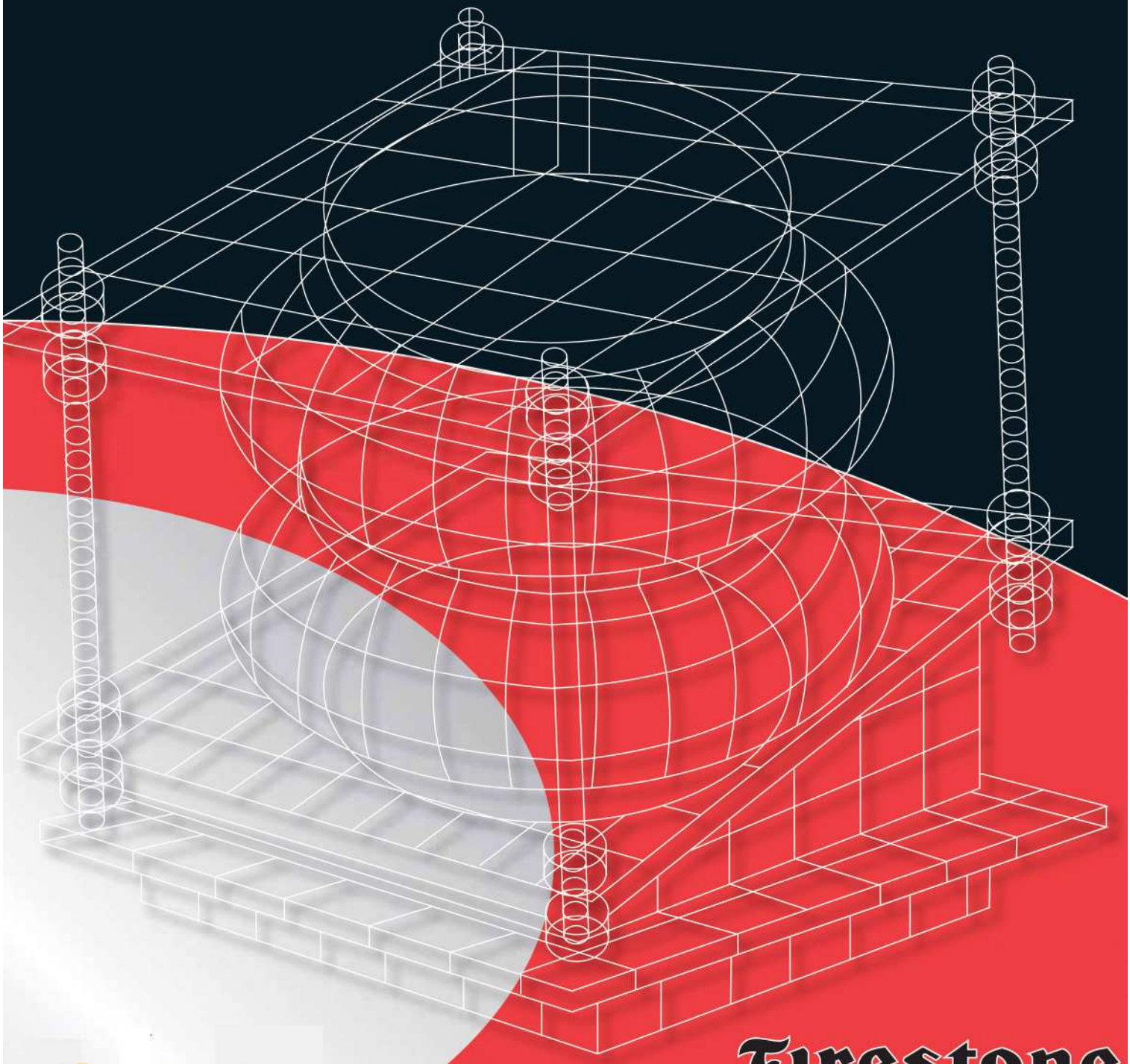
AIRSTROKE™ ACTUATORS

AIRMOUNT™ ISOLATORS

METRIC TRIPLE CONVOLUTION



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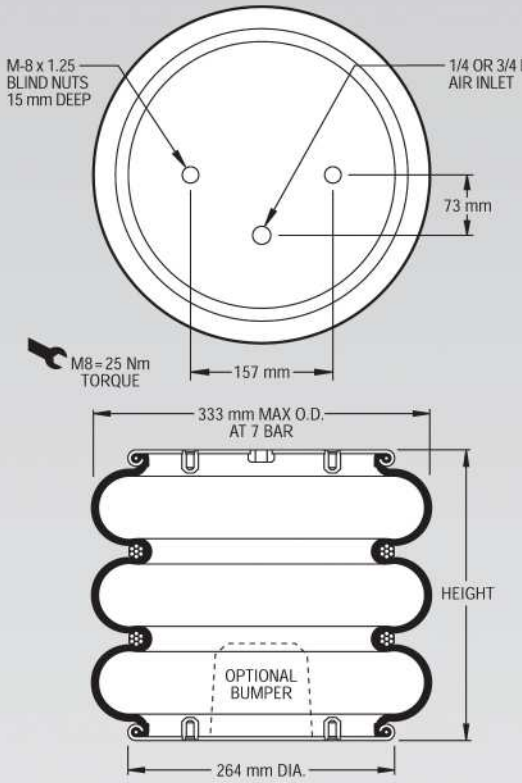
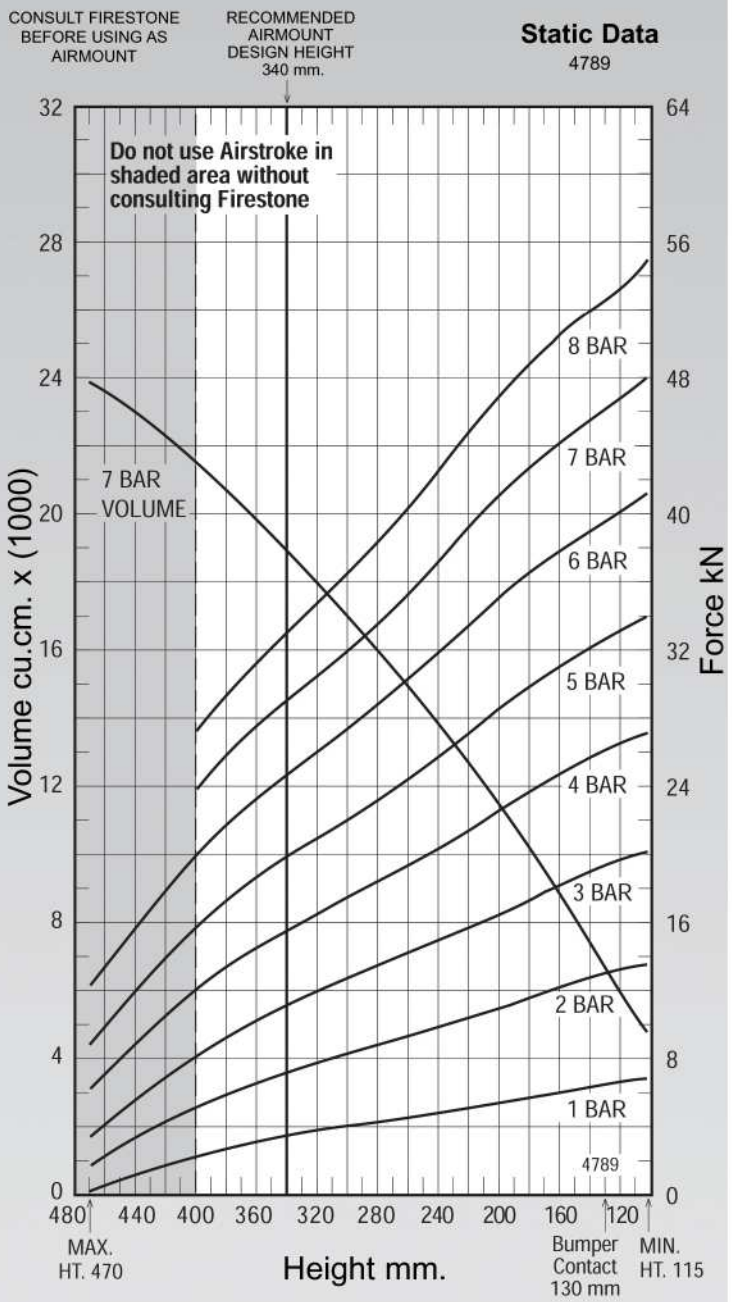
Firestone
World's Number 1 Air Spring.
FIRESTONE INDUSTRIAL PRODUCTS COMPANY

NOTE: All Assembly Order Numbers are for bead plate parts unless noted otherwise.

	Description	Assembly Order No.
Style 352 Two Ply Bellows	Blind nuts, 1/4 BSP	W01-M58-6129
	Blind nuts, 3/4 BSP	W01-M58-6128
Assembly weight.....8.84 kg.		
Force to collapse to minimum height (@ 0 BAR) 900 N.		





NOTE: A bead plate part is shown. This part is also available with bead rings. See pages 8-10 for explanation.

See page 12 for instructions on how to use chart.

Dynamic Characteristics at 340 mm Design Height
(Required for Airmount isolator design only)

Gauge Pressure (BAR)	Load (kN)	Spring Rate (kN/m)	Natural Frequency Hz
3	11.29	94	1.44
4	15.70	115	1.35
5	20.02	140	1.32
6	24.85	165	1.28
7	29.14	188	1.27

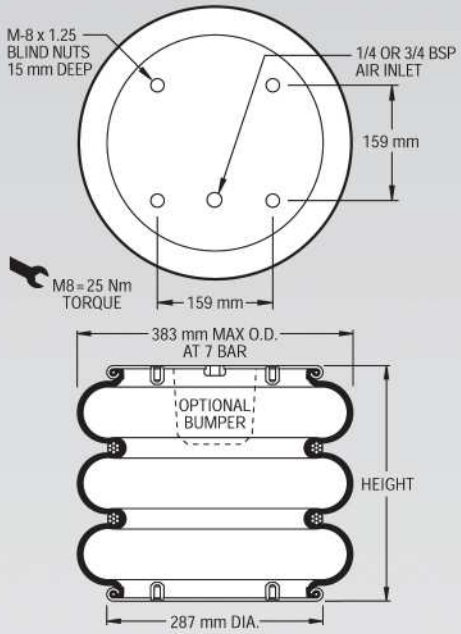
Force Table (Use for Airstroke™ actuator design)

Assembly Height (mm)	Volume @ 7 BAR (cu cm)	EFF Area @ 7 BAR (cm sq)	kN Force @ 3 BAR	@ 4 BAR	@ 5 BAR	@6 BAR	@7 BAR
380	20777	370	9.42	13.56	17.44	21.95	25.89
340	19038	416	11.29	15.70	20.02	24.85	29.14
300	17069	459	12.88	17.53	22.29	27.49	32.13
260	14972	508	14.35	19.46	24.70	30.43	35.55
220	12695	563	15.87	21.65	27.37	33.68	39.40
180	10161	614	17.50	23.87	30.03	36.76	42.96
140	7445	652	19.13	25.76	32.28	39.20	45.65

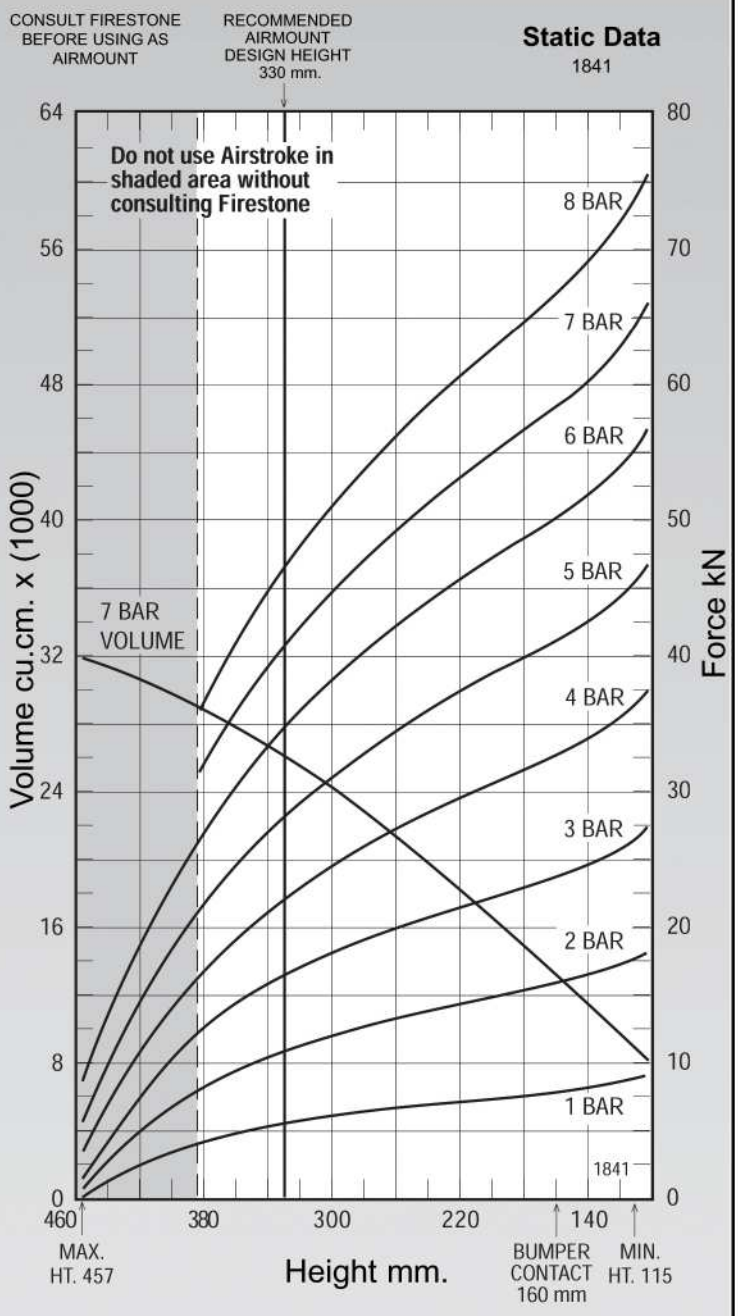
NOTE: All Assembly Order Numbers are for bead plate parts unless noted otherwise.

	Description	Assembly Order No.
Style 313 Two Ply Bellows	Blind nuts, 1/4 BSP	W01-M58-6120
	Blind nuts, 1/4 BSP, bumper	W01-M58-6121
	Blind nuts, 3/4 BSP	W01-M58-6122
	Blind nuts, 3/4 BSP, bumper	W01-M58-6123
	Countersunk steel bead rings, 40 mm bolts, nuts, washers	W01-M58-7526
	Rubber bellows only	W01-358-7900
Assembly weight.....8.84 kg.		
Force to collapse to minimum height (@ 0 BAR) 205 N.		

Style 39 High Strength Bellows	Blind nuts, 1/4 BSP	W01-M58-6132
	Blind nuts, 3/4 BSP	W01-M58-6130
	Countersunk steel bead rings, 40 mm bolts, nuts, washers	W01-M58-7534



NOTE: This part is also available with bead rings (rather than bead plates.) SEE PAGE 8.



See page 12 for instructions on how to use chart.

Dynamic Characteristics at 330 mm Design Height
(Required for Airmount isolator design only)

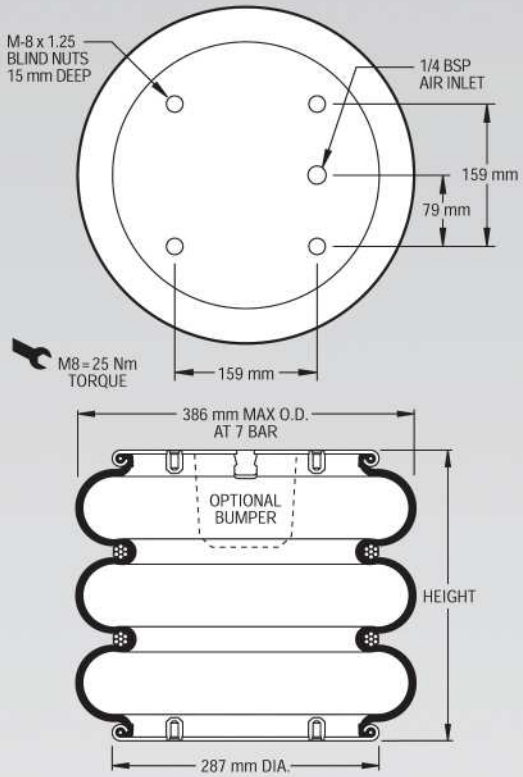
Gauge Pressure (BAR)	Load (kN)	Spring Rate (kN/m)	Natural Frequency Hz
3	16.03	137	1.46
4	21.87	177	1.42
5	27.79	216	1.39
6	34.37	258	1.37
7	40.27	296	1.35

Force Table (Use for Airstroke™ actuator design)

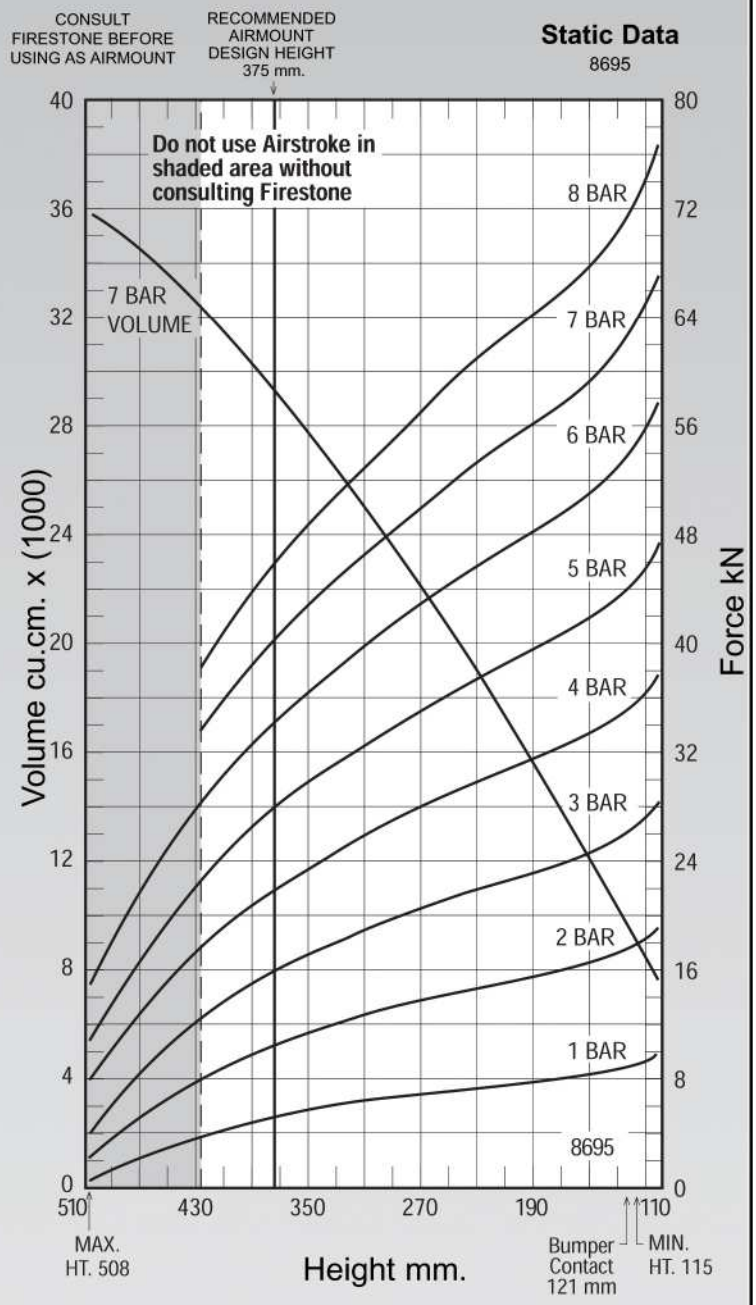
Assembly Height (mm)	Volume @ 7 BAR (cu cm)	EFF Area @ 7 BAR (cm sq)	kN Force @ 3 BAR	@ 4 BAR	@ 5 BAR	@6 BAR	@7 BAR
360	27730	507	13.81	18.98	24.25	30.20	35.45
320	25348	595	16.66	22.70	28.81	35.57	41.64
280	22676	666	18.89	25.65	32.47	39.90	46.59
240	19773	726	20.71	28.15	35.61	43.60	50.79
200	16583	778	22.22	30.33	38.33	46.80	54.44
160	13143	827	23.59	32.39	40.82	49.74	57.85
120	9602	890	25.58	35.07	44.05	53.55	62.29

NOTE: All Assembly Order Numbers are for bead plate parts unless noted otherwise.

	Description	Assembly Order No.
Style 333 Two Ply Bellows	Blind nuts, 1/4 BSP	W01-M58-6136
	Blind nuts, 1/4 BSP, rubber bumper	W01-M58-6138
	Blind nuts, 3/4 BSP	W01-M58-6137
	Countersunk steel bead rings 40 mm bolts, nuts, washers	W01-M58-7535
	Rubber bellows only	W01-358-7019
Assembly weight.....11.16 kg.		
Force to collapse to minimum height (@ 0 BAR) 289 N.		



NOTE: A bead plate part is shown. This part is also available with bead rings. See pages 8-10 for explanation.



See page 12 for instructions on how to use chart.

Dynamic Characteristics at 375 mm Design Height
(Required for Airmount isolator design only)

Gauge Pressure (BAR)	Load (kN)	Spring Rate (kN/m)	Natural Frequency Hz
3	15.75	115	1.35
4	21.81	148	1.30
5	27.65	179	1.27
6	34.16	210	1.24
7	40.04	239	1.22

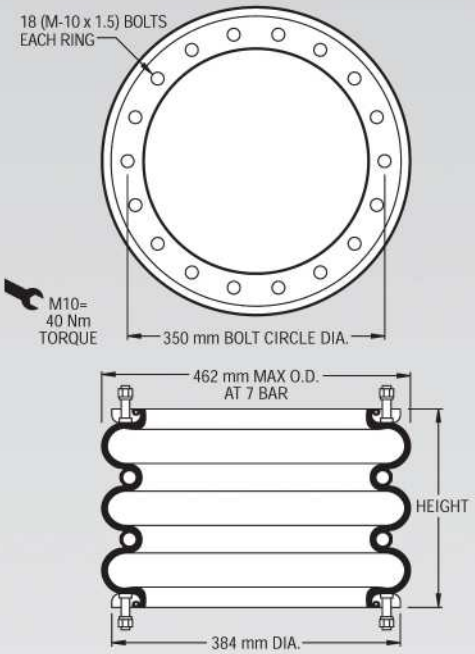
Force Table (Use for Airstroke™ actuator design)

Assembly Height (mm)	Volume @ 7 BAR (cu cm)	EFF Area @ 7 BAR (cm sq)	kN Force @ 3 BAR	@ 4 BAR	@ 5 BAR	@6 BAR	@7 BAR
420	31923	492	12.82	18.18	23.24	29.16	34.43
380	29684	565	15.48	21.47	27.24	33.69	39.51
340	27147	623	17.53	24.08	30.38	37.29	43.60
300	24321	676	19.30	26.37	33.16	40.53	47.32
260	21367	727	20.90	28.46	35.74	43.60	50.87
220	18224	773	22.32	30.31	38.06	46.41	54.12
180	14802	815	23.58	31.93	40.12	48.91	57.03
140	11225	864	25.14	33.87	42.56	51.89	60.49

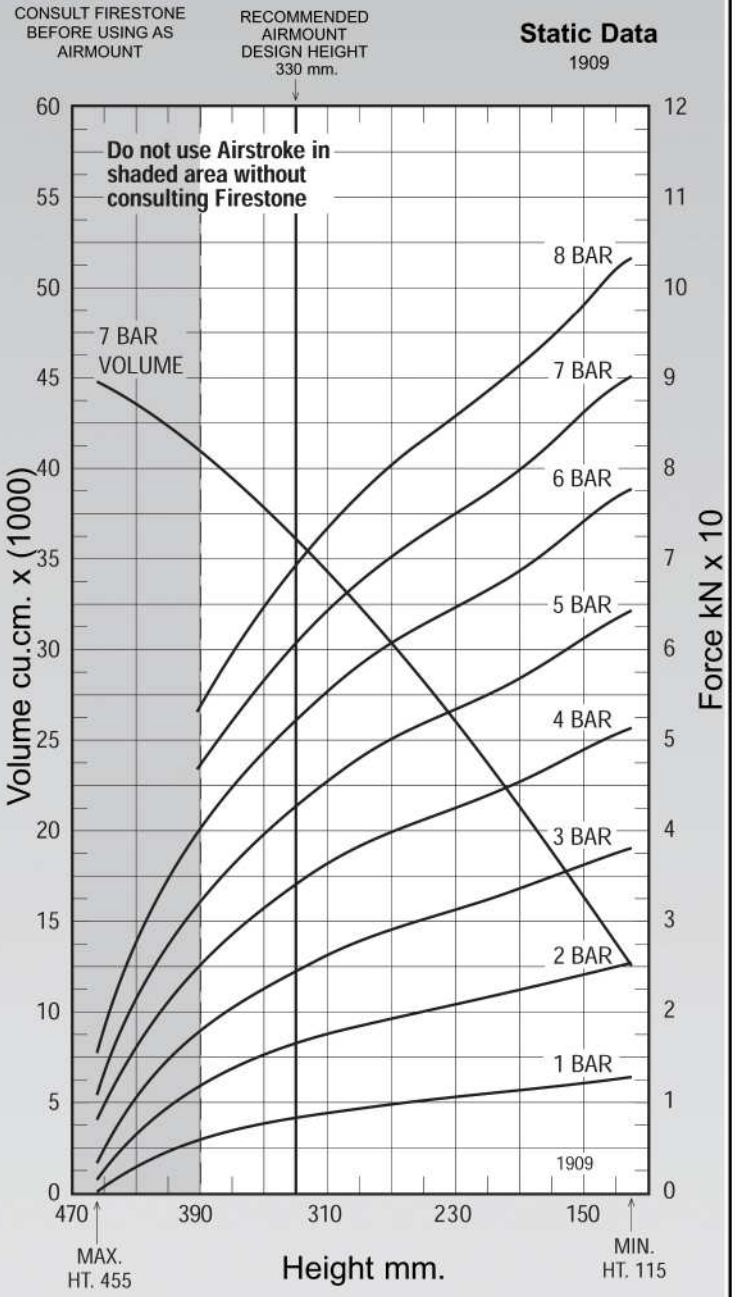
NOTE: All Assembly Order Numbers are for bead ring parts unless noted otherwise.

	Description	Assembly Order No.
Style 312 Two Ply Bellows	Ribbed neck aluminum bead rings (equal spacing), 45 mm bolts, nuts, washers	W01-M58-7530
	Rolled plate assembly, 1/2 blind nuts, 3/4 BSP	SEE NOTE BELOW
	Rubber bellows only	W01-358-7914
Assembly weight.....11.25 kg.		
Force to collapse to minimum height (@ 0 BAR) 600 N.		

Style 314 High Strength Con-struction	Aluminum ribbed neck bead rings (equal spacing), 45 mm bolts, nuts, washers	W01-M58-6981
	Rolled plate assembly, 1/2 blind nuts, 3/4 BSP	SEE NOTE BELOW
	Rubber bellows only	W01-358-7926



NOTE: A bead ring part is shown. This part is also available with rolled plates. See page 11 for explanation.



See page 12 for instructions on how to use chart.

Dynamic Characteristics at 330 mm Design Height
(Required for Airmount isolator design only)

Gauge Pressure (BAR)	Load (kN)	Spring Rate (kN/m)	Natural Frequency Hz
3	24.56	204	1.44
4	33.97	270	1.40
5	42.68	328	1.38
6	51.90	385	1.36
7	60.40	438	1.34

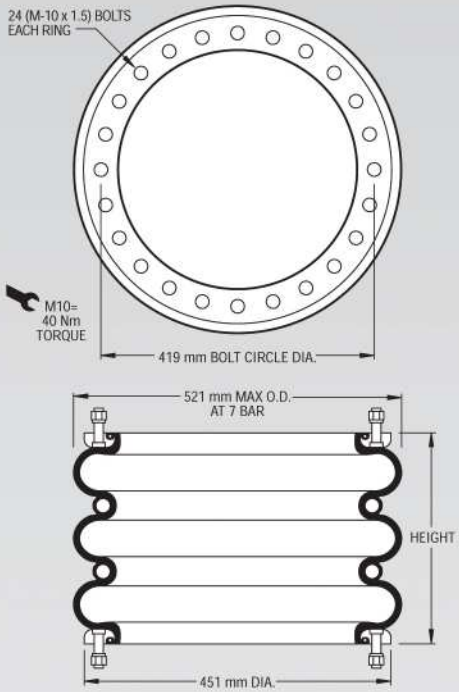
Force Table (Use for Airstroke™ actuator design)

Assembly Height (mm)	Volume @ 7 BAR (cu cm)	EFF Area @ 7 BAR (cm sq)	kN Force @ 3 BAR	@ 4 BAR	@ 5 BAR	@6 BAR	@7 BAR
360	38788	772	21.55	29.90	37.73	46.24	54.00
320	35273	890	25.42	35.13	44.10	53.57	62.30
280	31368	984	28.40	39.00	48.94	59.32	68.90
240	27154	1056	30.78	41.90	52.50	63.61	73.91
200	22558	1123	33.01	44.63	55.85	67.62	78.58
160	17629	1207	35.55	47.98	60.10	72.74	84.47
120	8017	1290	38.09	51.39	64.29	77.75	90.31

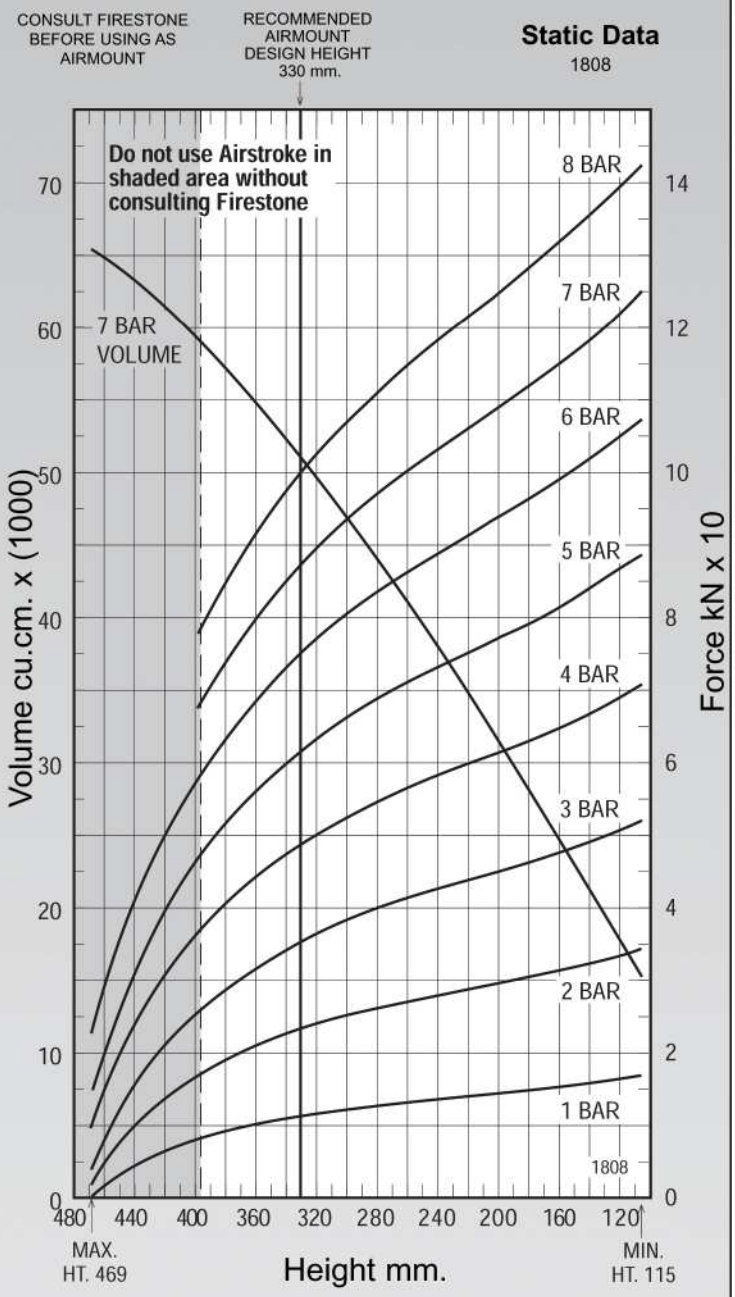
NOTE: All Assembly Order Numbers are for bead ring parts unless noted otherwise.

	Description	Assembly Order No.
Style 323 Two Ply Bellows	Ribbed neck aluminum bead rings (equal spacing), 45 mm bolts, nuts, washers	W01-M58-6980
	Rolled plate assembly, 1/2 blind nuts, 3/4 BSP	SEE NOTE BELOW
	Rubber bellows only	W01-358-7921
Assembly weight.....14.11 kg.		
Force to collapse to minimum height (@ 0 BAR) 311 N.		

Style 324 High Strength Con-struction	Ribbed neck aluminum bead rings (equal spacing), 45 mm bolts, nuts, washers	W01-M58-6968
	Rubber bellows only	W01-358-0324



NOTE: A bead ring part is shown. This part is also available with rolled plates. See page 11 for explanation.



See page 12 for instructions on how to use chart.

Dynamic Characteristics at 330 mm Design Height
(Required for Airmount isolator design only)

Gauge Pressure (BAR)	Load (kN)	Spring Rate (kN/m)	Natural Frequency Hz
3	35.44	282	1.41
4	48.94	359	1.35
5	61.63	439	1.33
6	75.25	519	1.31
7	87.73	591	1.29

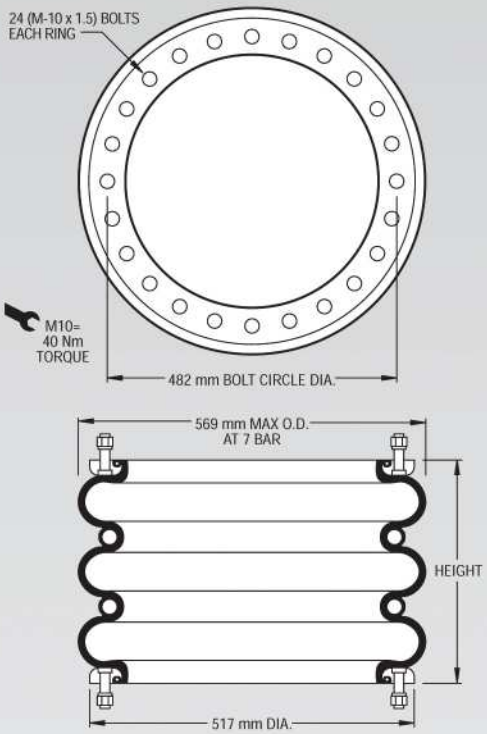
Force Table (Use for Airstroke™ actuator design)

Assembly Height (mm)	Volume @ 7 BAR (cu cm)	EFF Area @ 7 BAR (cm sq)	kN Force @ 3 BAR	@ 4 BAR	@ 5 BAR	@6 BAR	@7 BAR
390	58273	1014	27.34	38.66	49.98	60.53	70.98
350	53588	1185	33.11	46.04	58.01	71.01	82.92
310	48222	1314	37.50	51.49	64.81	79.00	91.98
270	42438	1416	40.88	55.72	70.14	85.30	99.14
230	36340	1503	43.49	59.18	74.48	90.52	105.18
190	29824	1585	45.86	62.40	78.51	95.46	110.96
150	22961	1676	48.67	66.06	83.04	100.93	117.33

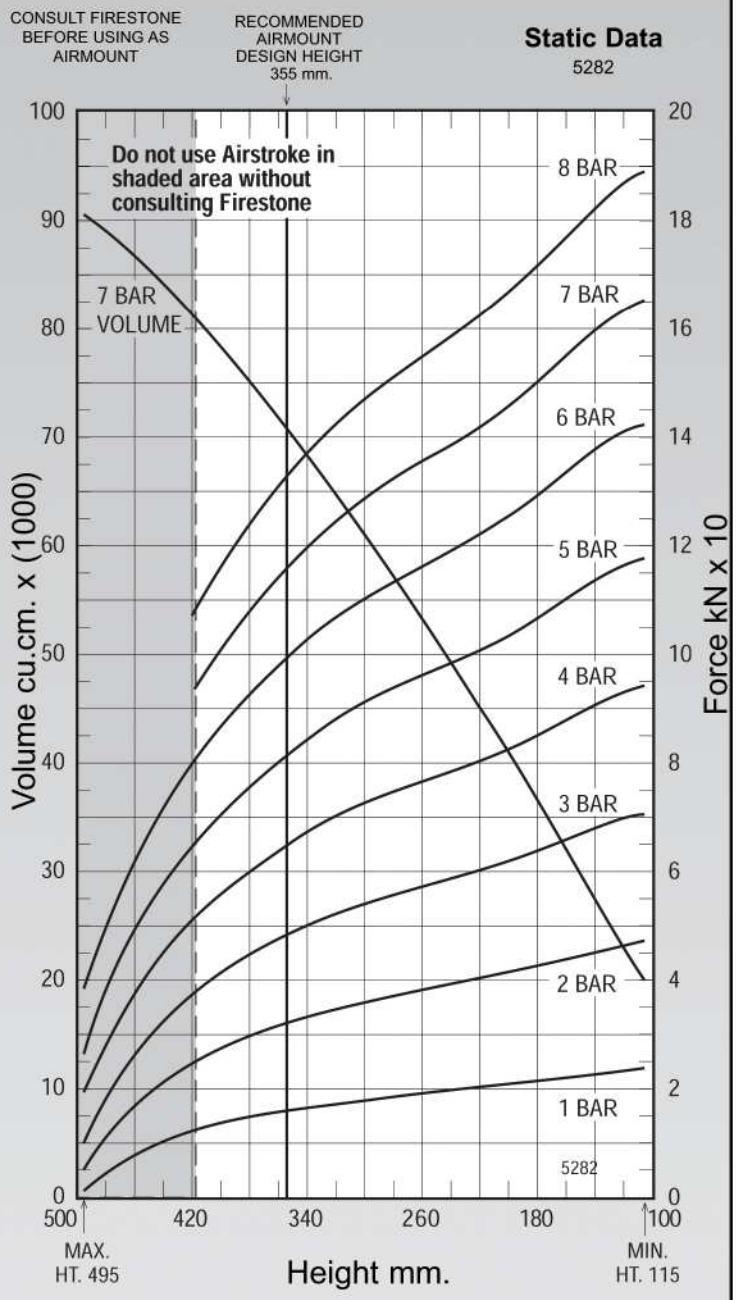
NOTE: All Assembly Order Numbers are for bead ring parts unless noted otherwise.

	Description	Assembly Order No.
Style 320 Two Ply Bellows	Ribbed neck aluminum bead rings (equal spacing), 45 mm bolts, nuts, washers	W01-M58-6983
	Rolled plate assembly, 1/2 blind nuts, 3/4 BSP	SEE NOTE BELOW
	Rubber bellows only	W01-358-0987
Assembly weight.....16.47 kg.		
Force to collapse to minimum height (@ 0 BAR) 400 N.		

Style 328 High Strength Con-struction	Ribbed neck aluminum bead rings (equal spacing), 45 mm bolts, nuts, washers	W01-M58-6976
	Rubber bellows only	W01-358-1002



NOTE: A bead ring part is shown. This part is also available with rolled plates. See page 11 for explanation.



See page 12 for instructions on how to use chart.

Dynamic Characteristics at 355 mm Design Height
(Required for Airmount isolator design only)

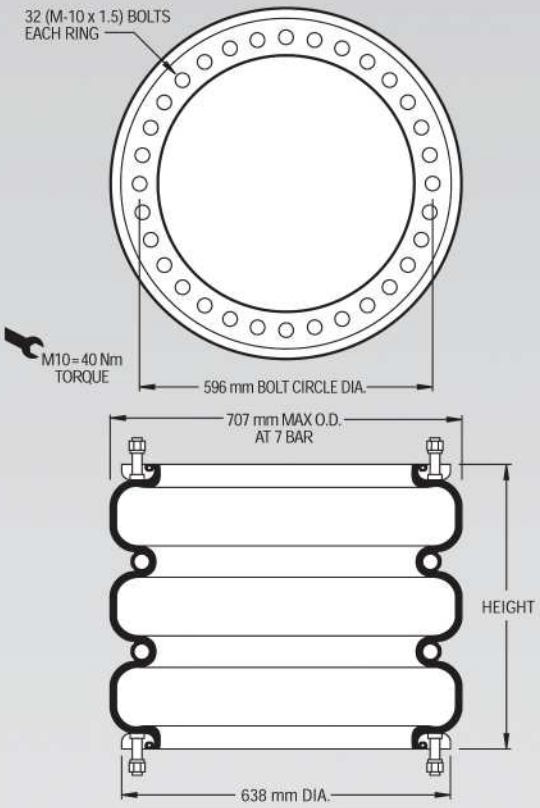
Gauge Pressure (BAR)	Load (kN)	Spring Rate (kN/m)	Natural Frequency Hz
3	48.24	346	1.34
4	64.83	443	1.30
5	81.41	537	1.28
6	99.02	630	1.26
7	115.27	717	1.24

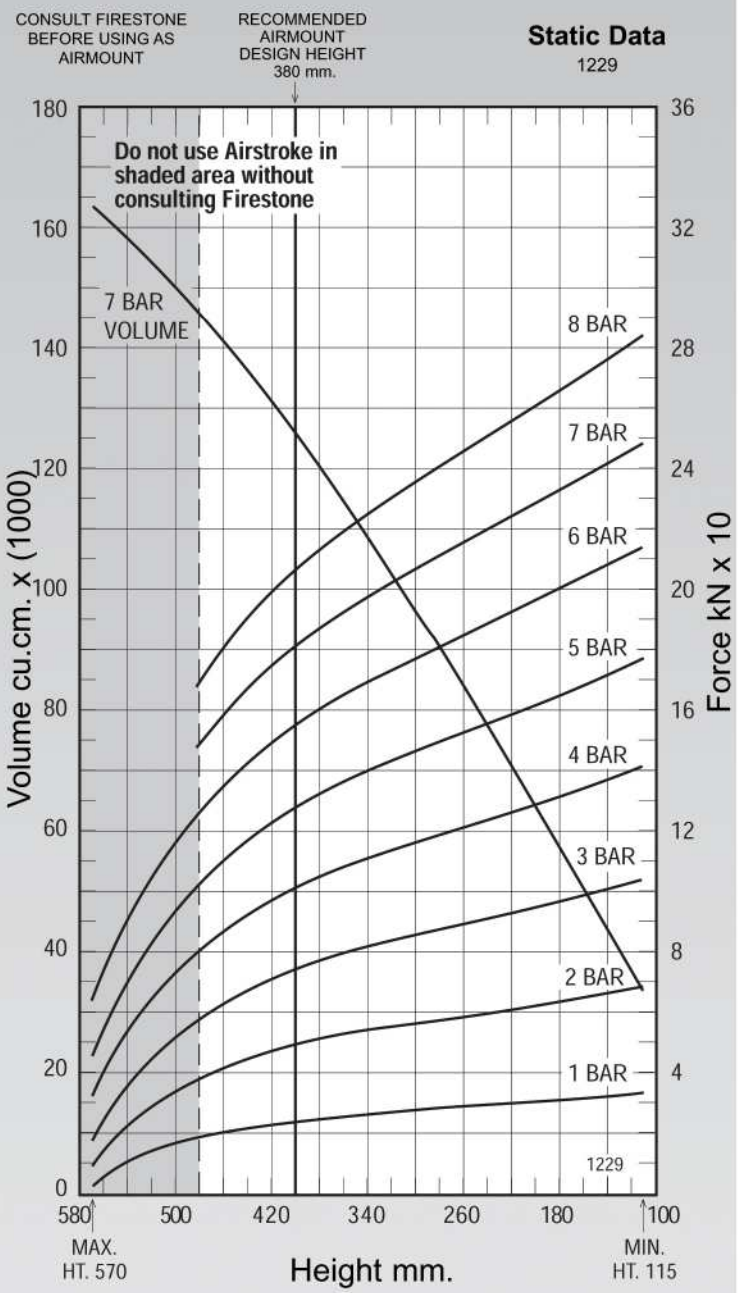
Force Table (Use for Airstroke™ actuator design)

Assembly Height (mm)	Volume @ 7 BAR (cu cm)	EFF Area @ 7 BAR (cm sq)	kN Force @ 3 BAR	@ 4 BAR	@ 5 BAR	@6 BAR	@7 BAR
390	76680	1494	43.07	58.16	73.24	89.57	104.53
350	70136	1667	48.89	65.68	82.46	100.23	116.64
310	62881	1800	53.25	71.41	89.51	108.46	126.01
270	55222	1905	56.54	75.68	94.82	114.81	133.36
230	47253	2001	59.44	79.34	99.42	120.50	140.03
190	38794	2109	62.84	83.60	104.80	127.04	147.64
150	29903	2239	67.09	89.06	111.57	135.01	156.73

NOTE: All Assembly Order Numbers are for bead ring parts unless noted otherwise.

	Description	Assembly Order No.
Style 321	Aluminum ribbed neck bead rings (equal spacing), 45 mm bolts, nuts, washers	W01-M58-6984
High Strength Con-struction	Rubber bellows only	W01-358-7919
Assembly weight.....23.2 kg.		
Force to collapse to minimum height (@ 0 BAR) 800 N.		





See page 12 for instructions on how to use chart.

Dynamic Characteristics at 380 mm Design Height
(Required for Airmount isolator design only)

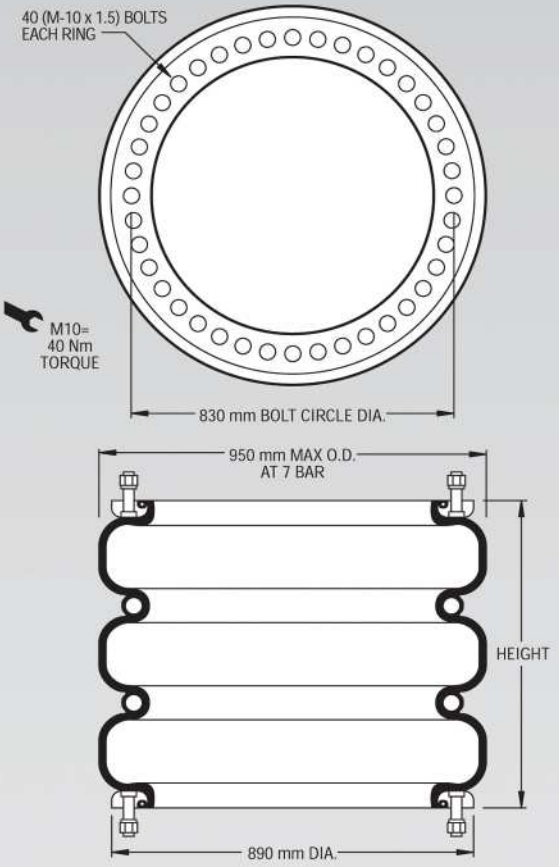
Gauge Pressure (BAR)	Load (kN)	Spring Rate (kN/m)	Natural Frequency Hz
3	77.48	465	1.22
4	104.95	592	1.18
5	132.00	716	1.16
6	160.98	839	1.14
7	187.60	954	1.12

Force Table (Use for Airstroke™ actuator design)

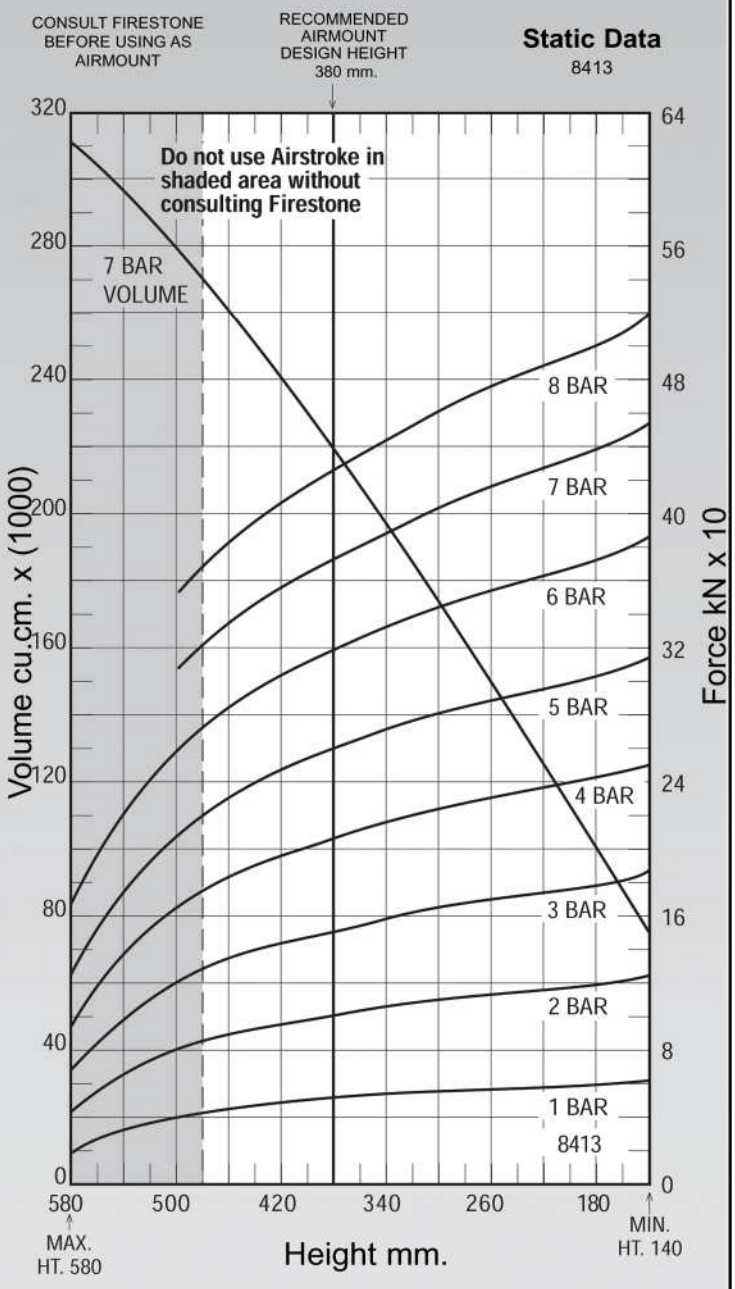
Assembly Height (mm)	Volume @ 7 BAR (cu cm)	EFF Area @ 7 BAR (cm sq.)	kN Force @ 3 BAR	@ 4 BAR	@ 5 BAR	@6 BAR	@7 BAR
440	135784	2394	67.39	92.19	116.52	143.26	167.54
400	125615	2596	74.50	101.14	127.36	155.70	181.66
360	114722	2757	80.12	108.37	136.16	165.72	192.94
320	102796	2897	84.65	114.48	143.61	174.35	202.76
280	90465	3026	88.33	119.71	150.09	182.12	211.80
240	77839	3151	91.63	124.49	156.08	189.54	220.56
200	64589	3277	95.16	129.35	162.19	197.05	229.36
160	50778	3407	99.35	134.85	168.98	204.99	238.43

NOTE: All Assembly Order Numbers are for bead ring parts unless noted otherwise.

	Description	Assembly Order No.
Style 348-3 High Strength Con-struction	Ribbed neck aluminum bead rings (equal spacing), 45 mm bolts, nuts, washers	W01-M58-6971
	Rubber bellows only	W01-358-1023
Assembly weight.....47.13 kg.		
Force to collapse to minimum height (@ 0 BAR).....1690 N.		



NOTE: The effective length of the 45 mm bolt is 23 mm in this bead ring.



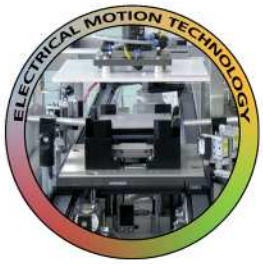
See page 12 for instructions on how to use chart.

Dynamic Characteristics at 380 mm Design Height
(Required for Airmount isolator design only)

Gauge Pressure (BAR)	Load (kN)	Spring Rate (kN/m)	Natural Frequency Hz
3	150.16	853	1.19
4	204.95	1110	1.16
5	258.67	1358	1.14
6	317.66	1614	1.12
7	371.47	1839	1.11

Force Table (Use for Airstroke™ actuator design)

Assembly Height (mm)	Volume @ 7 BAR (cu cm)	EFF Area @ 7 BAR (cm sq)	kN Force @ 3 BAR	@ 4 BAR	@ 5 BAR	@6 BAR	@7 BAR
480	270750	4561	127.37	173.02	217.83	270.35	319.21
440	250951	4919	138.66	188.24	237.29	292.98	344.32
400	230507	5189	146.63	199.91	252.25	310.21	363.21
360	208945	5418	153.57	209.53	264.45	324.50	379.23
320	185692	5635	160.48	217.86	274.75	337.23	394.37
280	161999	5837	166.81	225.16	283.33	348.39	408.53
240	138075	6014	171.63	231.86	290.68	357.85	420.92
200	113324	6165	175.04	238.45	297.89	366.36	431.46
160	87906	6334	180.41	245.13	306.87	377.11	443.32



We look forward to your application.

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