

DADCO®

Extreme Condition Solutions



Extended Temperature Range Nitrogen Gas Springs

DADCO offers a selection of Nitrogen Gas Springs with high temperature components for applications where temperatures will exceed standard operating temperature. The H1 model is well suited for applications up to 230°F (110°C) while the H2 model allows for applications up to 392°F (200°C). Other gas springs may be ordered as H1 or H2; contact DADCO for assistance assessing your specific application requirements.

Model	High Temp. Type	H1		H2	
	Max Charge Pressure:	135 bar 1950 psi		110 bar 1600 psi	
	Operating Temp:	20°C 68°F	110°C 230°F	20°C 68°F	200°C 392°F
	Piston Rod Area cm ² in ²	Force Cold daN lbf	Force at MAX Temp. daN lbf	Force Cold daN lbf	Force at MAX Temp. daN lbf
C.045	0.28 0.044	38.2 85	49.9 112	31.1 70	50.2 113
C.070	0.38 0.060	52.0 116	67.9 152	42.3 95	68.3 154
C.090	0.50 0.078	67.9 152	88.7 199	55.3 125	89.3 201
C.180	1.13 0.175	153 342	200 447	124 280	201 452
C.250	1.77 0.274	239 534	312 698	194 438	314 706
U.0175	0.95 0.147	128 287	168 375	105 236	169 380
U.0325	1.77 0.274	239 534	312 698	194 438	314 706
U.0400	1.99 0.308	268 600	350 784	218 492	353 794
U.0600	3.14 0.487	424 950	554 1241	346 779	558 1254
U.0800	4.91 0.761	663 1484	866 1939	540 1217	872 1960
U.1200	7.07 1.096	954 2136	1247 2793	778 1753	1255 2821
L.300	1.99 0.308	268 600	350 784	218 492	353 794
L.500	3.14 0.487	424 950	554 1241	346 779	558 1254
L.750	4.91 0.761	663 1484	866 1939	540 1217	872 1960
90.10.00500	3.14 0.487	424 950	554 1241	346 779	558 1254
90.10.00750	4.91 0.761	663 1484	866 1939	540 1217	872 1960
90.10.01500	10.18 1.578	1374 3077	1796 4022	1120 2524	1808 4065
90.10.03000	19.63 3.043	2651 5935	3465 7758	2160 4869	3487 7839
U/UX.1600	10.18 1.578	1374 3077	1796 4022	1120 2524	1808 4065
U/UX.2600	15.90 2.465	2147 4807	2807 6284	1749 3944	2824 6348
U/UX.4600	28.27 4.383	3817 8546	4990 11171	3110 7012	5021 11287

Note: UK, UH models available

Temperature Indicator Labels

DADCO heat sensitive labels provide indication that a maximum temperature has been reached when the circle is grayed out. Labels are not re-usable and circles will not undarken as temperature decreases.

H1
Part No. EZ88K13116

H2
Part No. EZ88K22104

Example:
Used H1 Label

Ordering Example:

U.0325. H1. 025. TO.

Model

High Temperature Option: H1 or H2

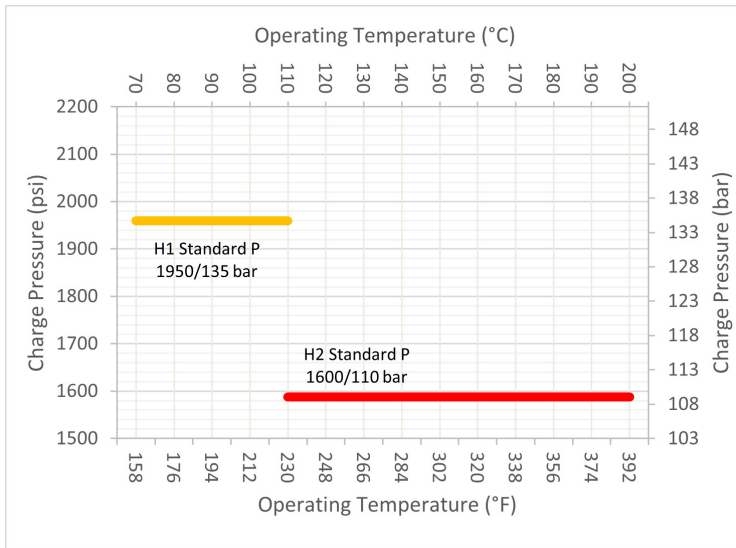
Stroke: Consult individual series for options

Charging Pressure: H1: 15-135max (220-1950psi). H2: 15-110max (220-1600psi). See page 3 for custom pressure calculation.

Mount Option: TO = Basic Model. When not specified default is TO.

Extended Temperature Options

Charging pressure for DADCO's H1/H2 High Temperature Nitrogen Gas Springs must be reduced from the normal charging pressure range due to increased operating temperature. The initial pressure in the gas spring will increase to a higher pressure at the increased operating temperature; therefore the same on-contact force will be achieved with a lower charging pressure. Linked H1/H2 gas springs require high temperature hoses and fittings.



The graph shows the highest charging pressure of each type of spring. Lower charging pressures are preferred.

Charging Pressure Calculation

For those instances where the recommended or maximum charging pressures are not suitable for your application you can use the information below to determine the required charging pressure and resultant force for your application.

- P1** = Charging Pressure, **F1** = Charging Force (min),
- F2** = Operating Force at **T_{OP}**, **A** = Area of gas spring piston rod, (see table on page 2),
- T_{RM}** = Room Temperature, **T_{OP}** = Operating Temperature

Charging Pressure based On Contact Force:

psi	$P1 = (F2 / A) \times [(T_{RM} + 460) / (T_{OP} + 460)]$ where P1 = psi, A = in ² , T = °F
bar	$P1 = (F2 / A) \times [(T_{RM} + 273) / (T_{OP} + 273)]$ where P1 = bar, A = cm ² , T = °C

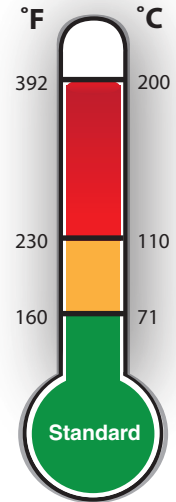
On Contact Force at Operating Temperature:

lbf	$F2 = P1 \times A \times [(T_{OP} + 460) / (T_{RM} + 460)]$ where P1 = psi, A = in ² , T = °F
daN	$F2 = P1 \times A \times [(T_{OP} + 273) / (T_{RM} + 273)]$ where P1 = bar, A = cm ² , T = °C

On Contact Force at Room Temperature:

lbf	$F1 = P1 \times A$ where P1 = psi, A = in ²
daN	$F1 = P1 \times A$ where P1 = bar, A = cm ²

Temperature		20° C Force TX
°F	°C	
392	200	1.61
374	190	1.58
356	180	1.55
338	170	1.51
320	160	1.48
302	150	1.44
284	140	1.41
266	130	1.38
248	120	1.34
230	110	1.31
212	100	1.27
194	90	1.24
176	80	1.20
158	70	1.17
140	60	1.14
122	50	1.10
104	40	1.07
86	30	1.03
68	20	1.00



TX = Force and pressure multiplier when cylinder temperature increases from **T_{RM}** = 20° C (68° F).

Example $F2 = F1 \times TX$ or $TX = P2/P1$, where **P2** = pressure at **T_{OP}**

Application Examples

H1 Option:

C.090.H1.050 requires 190 lbf on-contact force and will be installed in an operation with an operating temperature of 230° F.

Using the equation given, the C.090.H1.050 will need to be ordered with a charging pressure of **1871 psi**.

$$P1 = (F2 / A) \times [530 / (T_{OP} + 460)]$$

$$P1 = (190 / .078) \times [530 / (230 + 460)]$$

$$P1 = 1871 \text{ psi}$$

Order Code: C.090.H1.050.TO.BK.1871

H2 Option:

U.1200.H2.050 requires 1700 lbf on-contact force and will be installed in an operation that has an operating temperature of 300° F.

Using the equation given, the U.1200.H2.050 will need to be ordered with a charging pressure of **1081 psi**.

$$P1 = (F2 / A) \times [530 / (T_{OP} + 460)]$$

$$P1 = (1700 / 1.096) \times [530 / (300 + 460)]$$

$$P1 = 1081 \text{ psi}$$

Order Code: U.1200.H2.050.TO.1081

Other DADCO Products



Micro – C Series

- Five Models: **Micro 45[®]**, **Micro 70[®]**, **Micro 90[®]**, **Micro 180[®]** and **Micro 250[®]**
- Color-coded forces from 50 daN to 313 daN
- Full range of stroke lengths up to 200 mm
- Ideal for coil spring replacement



Mini – L / LJ Series

- 38 mm, 45 mm and 50 mm diameters
- Force models: 3 kN, 5 kN, 7.5 kN
- Full range of standard strokes up to 125 mm
- Common M6 port for linked operation



Ultra Force[®] – U Series

- 19 mm to 195 mm in diameter
- Forces up to 199 kN
- Full range of standard stroke lengths up to 125 mm
- **UltraPak[®]** cartridge for long life



UH Series

- 32 mm to 120 mm in diameter
- Forces up to 66 kN
- Full range of standard stroke lengths up to 125 mm
- Common G1/8 port for linked operation



ISO / 90.10 Series

- From 32 mm to 195 mm in diameter
- Forces up to 100 kN
- Full range of standard stroke lengths up to 300 mm
- Bolt-on or welded mounts available
- ISO Standards



Ultra Force Extended[®] – UX Series

- 25-55% more force on-contact than ISO Standard Nitrogen Gas Springs
- From 50 mm to 195 mm in diameter
- Forces up to 199 kN
- Full range of standard stroke lengths up to 200 mm
- Bolt-on or welded mounts available

DADCO[®]

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The global leader in nitrogen gas spring technology