

DADCO®

Micro Nitrogen Gas Springs

Micro Series

PED
2014/68/EU
COMPLIANT



Ideal for Coil Spring Replacement

DADCO®

DADCO produces top quality products at competitive prices and provides a superior level of customer service. Founded in 1958, DADCO is the highest volume producer of gas springs for press tools. DADCO's products are widely approved and used in global operations for many industries including metal stamping, automotive and plastic injection molding.

Advanced Technology

DADCO's revolutionary Micro Nitrogen Gas Springs provide unparalleled versatility in industrial tools. The patented design offers unmatched performance in high quality dies, molds and machines.

Nitrogen Gas Springs vs. Coil Springs

DADCO's Micro Nitrogen Gas Springs easily replace conventional coil springs. Micro Springs deliver more force in less space than coil springs and one Micro Spring can provide the force of several heavy-duty coil springs. See page 3 for Coil Spring conversion information.

Range of Micro Sizes

DADCO's Micro Nitrogen Gas Springs are available in eight models.

Model	Diameter	Maximum Force on Contact	Threaded Body
Micro 45®	12 mm (.472")	112 lb. (50 daN)	M16 x 1.5
			M16 x 2
			5/8"-11
Micro 70®	15 mm (.591")	154 lb. (68 daN)	N/A
Micro 90®	19 mm (.748")	200 lb. (89 daN)	M24 x 1.5
			1"-8
Micro 180®	25 mm (.984")	450 lb. (200 daN)	N/A
Micro 250®	32 mm (1.260")	701 lb. (313 daN)	N/A
SL.16	14 mm MAX (.551")	114 lb. (51 daN)	M16 x 1.5
E.16	12 mm (.472")	95 lb. (42 daN)	M16 x 1.5
			M16 x 2
E.24	21.5 mm (.846")	381 lb. (170 daN)	M24 x 1.5

The **Micro 45®**, **Micro 70®**, **Micro 90®**, **Micro 180®** and **Micro 250®** gas springs are color-coded for easy identification of force rating and are shipped ready to install. No additional equipment or previous experience with nitrogen is required.

DADCO offers adjustable force models that can be customized to meet individual force requirements. The adjustable model may be set to the desired pressure at the factory or in the field with appropriate charging equipment. See page 18 for more information on charging Micro Springs.

Threaded Body

DADCO's Threaded Body models are ideal part ejectors, replacing conventional coil spring stock lifters. The E.16, SL.16 and E.24 are designed with domed rods to further facilitate part removal during operation. DADCO provides a variety of hex tools, shown on page 17, that allow for easy installation and removal of the Threaded Body models.

Cost Effective

DADCO Micro Springs are inexpensive, easy to install, and provide a cost-effective solution to downtime problems associated with other springs.

No Preloading Required

DADCO Micro Springs deliver full rated force on contact with no preloading required. Occasionally, slight preloading is recommended, especially for stroke lengths from 150-200 mm, to prevent full spring travel where material thickness varies and parts can stick (i.e. stripper applications).

Rod Wiper Fights Draw Compound

DADCO's Duralene® Rod Wiper excludes most draw die compounds. For applications where an aggressive draw die compound is used contact DADCO for alternative wiper options.

Guaranteed Long Life

In factory testing and field experience, the service life of DADCO's Micro Springs consistently exceeds one million strokes. This is supported by DADCO's written One Year/One Million Stroke **Gold Guarantee**. Contact DADCO or your representative for more information.



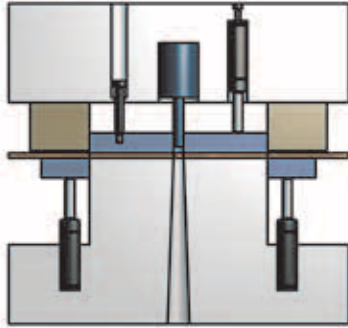
CAD Templates On-line

DADCO's entire product line is available on-line in solid models and 2D CAD formats. For more information, visit our website, www.dadco.net, or contact DADCO.

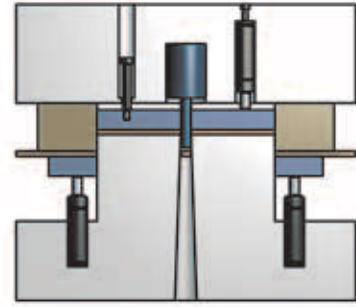
Application Examples

Blanking

INNER PRESSURE
PAD AND PUNCH
STRIPPER CLAMPS
STOCK

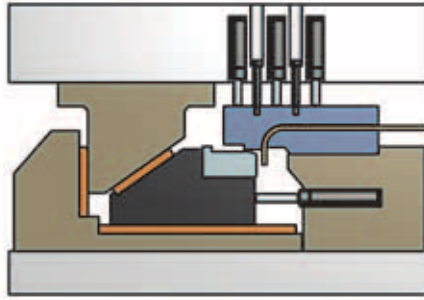


BLANKED PART
SHOWN WITH
BOTH PUNCH AND
TRIM STRIPPERS
COMPRESSED

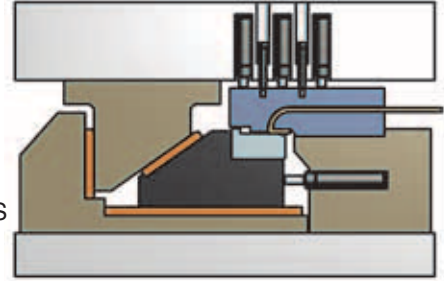


Bend and Flange

LEADING SPRING
PAD BENDS PART
BEFORE DIE
MOUNTED CAM
ENGAGES

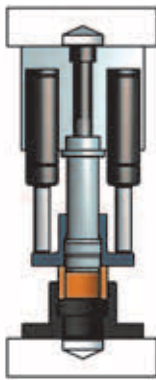


SPRING PAD
HOLDS PART
WHILE CAM
ACTION FLANGES
PART

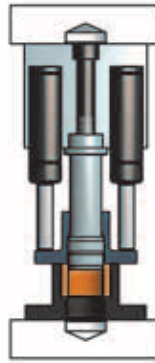


Bushing Installation and Sizing

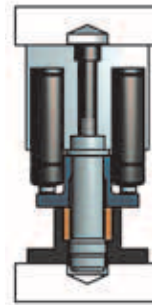
PART LOADED
AND MICRO
SPRING
PRESSING
BUSHING



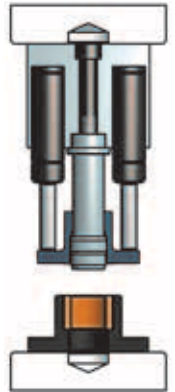
BUSHING
PRESSED
INTO PLACE



BUSHING
SIZED
AND
INSTALLED



PART
COMPLETE
UNLOAD



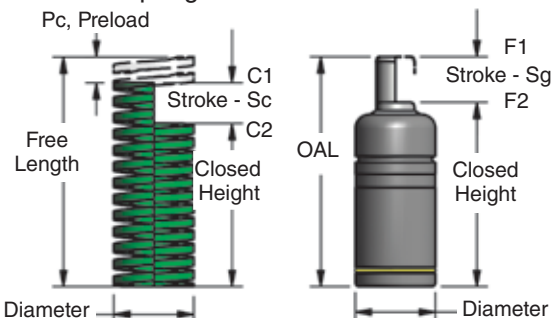
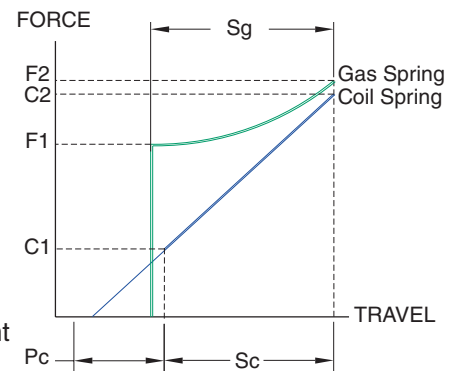
The above examples are conceptual and are not intended as engineering design for specific forces or applications. All tool designs must be individually engineered for their intended function. See pages 19-20 for recommendations and limitations for mounting and installation.

Coil Spring Conversion

Unlike coil springs, DADCO Micro Nitrogen Gas Springs provide full rated force on contact. This force is repeatable, eliminating scrap and maximizing productivity. One Micro Spring can provide the force of several heavy duty coil springs, and will outlast the coil springs.

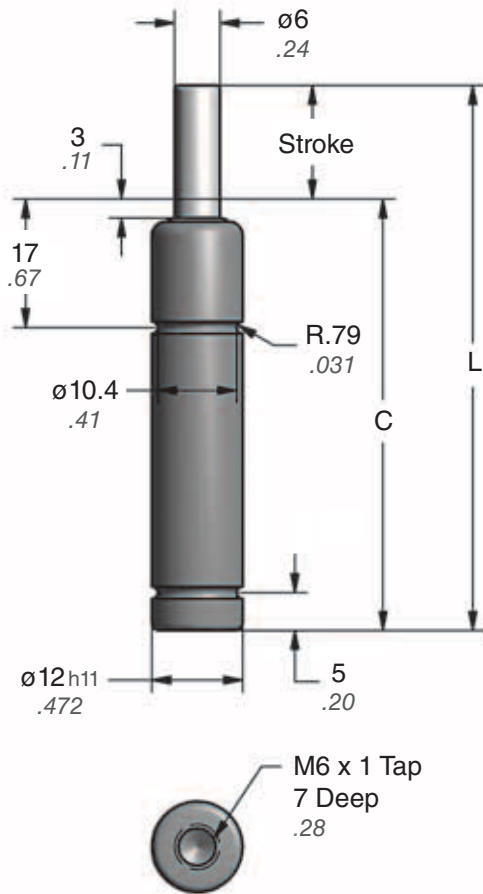
Most die springs have a limitation on compression, after which there is failure or severely reduced cycle life. Heavy and extra heavy duty die springs can only be compressed 15-20% of the closed height, after which there is failure or severely reduced cycle life.

Coil spring force is based on the spring rate of the coil spring. Spring rate is determined by the material, wire diameter, spring diameter, number of coils and height of the coil spring.



All coil springs require a preload to achieve a contact force ($C1$) larger than zero. For most spring applications the preload force is the force required to strip, hold, form or return the part. As a result of the spring rate, coil springs have a continuing increase in force after preload ($C1 - C2$).

DADCO Micro Series Gas Springs have a much flatter curve that will not exceed 30% of the original force for any stroke size ($F1 - F2$). When retrofitting coil springs calculate the total preloaded force required for the application. The number and color (load rating) of Micro Gas Springs can then be determined.



Part No.	Stroke	C	L ±0.4 ±0.015
	mm inch		
•C.045.007	07 .28	49 1.93	56 2.205
C.045.010	10 .39	52 2.05	62 2.441
C.045.013	12.7 .50	54.7 2.15	67.4 2.654
•C.045.015	15 .59	57 2.24	72 2.835
C.045.019	19 .75	61 2.40	80 3.149
•C.045.025	25 .98	67 2.64	92 3.622
•C.045.038	38 1.50	80 3.15	118 4.646
•C.045.050	50 1.97	92 3.62	142 5.591
C.045.063	63.5 2.50	108.5 4.27	172 6.772
C.045.080	80 3.15	125 4.92	205 8.071

• Preferred Sizes

On-Contact Force – Adjustable Black Model

Force Chart	Initial lb. daN	Final lb. daN	Pressure psi bar
Yellow - YW	112 50	166 74	2560 177
Red - RD	84 37	124 55	1920 132
Blue - BU	56 25	83 37	1280 88
Green - GR	28 12	41 18	640 44
Black - BK	See Charts		

Imperial	Metric
Pressure (psi)	Force (lb.-f)
2560	112
2200	96
2000	88
1750	77
1500	66
1000	44
500	22
260	11

Pressure (bar)	Force (daN)
177	50
150	42
125	35
100	28
75	21
50	14
35	10
18	5

$$P = F \div .044 \quad F = P \times .044$$

$$P = F \div .283 \quad F = P \times .283$$

Ordering Example:

C.045.007. GR

Part Number:

Includes Series, Model and Stroke Length

Force:

YW, RD, BU, GR

BK – Black adjustable model - specify pressure:
18 – 177 bar (260 – 2560 psi).

Ordering Example: C.045.007.BK.150

Micro 45® Mounts

Attachable Mount Options

RM C45-RM

2 x M5 SHCS #10 SHCS

12.7 .50

Stroke

9 .35

DADCO-LOK

SLIDE INTO DESIRED LOCATION AND LOCK

NF C45-NF

16 .63

34 1.35

2 x 6.6 .26

24 .945

Stroke

21.5 .85

9 .35

Split wire ring included 90.55.045

Narrow Flange

RF C45-RF

25 .984

36 1.42

2 x 6.6 .26

Stroke

21.5 .85

9 .35

Split wire ring included 90.55.045

Round Flange

Threaded Body Styles

TB1, TB2 & TB4

9.5 .37

LOCKING ELEMENT

8.5 .33

Stroke

40 1.58

L

C

TB2 TB1, TB4

	TB2	TB4	TB1
Thread	M16 x 1.5	M16 x 2	5/8"-11

Jam Nut

D

C

B Thd.

A

	C45-JN1	SL16-JN	C45-JN4
A	9 .36	8 .31	8 .31
B	5/8"-11	M16 x 1.5	M16 x 2
C	23.8 .938	24 .95	24 .95
D	27.5 1.08	28 1.10	28 1.10

TB3

17 .67

LOCKING ELEMENT

5 .20

Stroke

40 1.58

L

C

TB3

	TB3
Thread	M16 x 2

Ordering Example:

C.045.007. TB1. GR

Part Number:
Includes Series, Model and Stroke Length

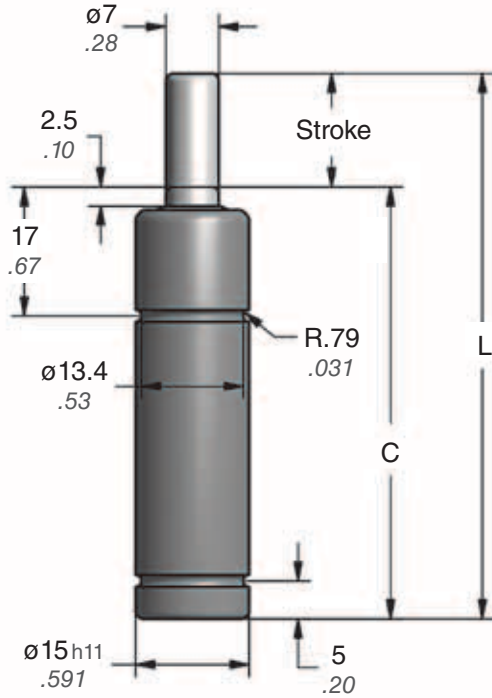
Mount Option:
RM, NF, RF, TB1, TB2, TB3, TB4
Mount Only Ordering Example: C45-RM

Force:
YW, RD, BU, GR
BK – Black adjustable model - specify pressure:
18 – 177 bar (260 – 2560 psi).
Ordering Example: C.045.007.TB1.BK.150

Refer to Bulletin #B04120 for GC.045.015.TB5 information.

Micro Series Nitrogen Gas Springs

Micro 70®



Part No.	Stroke	C	L ±0.4 ±0.015
	mm inch		
•C.070.007	07 .28	49 1.93	56 2.205
C.070.010	10 .39	52 2.05	62 2.441
C.070.013	12.7 .50	54.7 2.15	67.4 2.654
•C.070.015	15 .59	57 2.24	72 2.835
•C.070.025	25 .98	67 2.64	92 3.622
•C.070.038	38 1.50	80 3.15	118 4.646
•C.070.050	50 1.97	92 3.62	142 5.591
C.070.063	63.5 2.50	108.5 4.27	172 6.772
•C.070.080	80 3.15	125 4.92	205 8.071
C.070.100	100 3.94	145 5.71	245 9.646
C.070.125	125 4.92	170 6.69	295 11.614

•Preferred Sizes

Force Chart	Initial lb. daN	Final lb. daN	Pressure psi bar
Yellow - YW	154 68	208 93	2560 177
Red - RD	115 51	156 69	1920 132
Blue - BU	77 34	104 46	1280 88
Green - GR	38 17	52 23	640 44
Black - BK	See Charts		

On-Contact Force – Adjustable Black Model

Imperial

Pressure (psi)	Force (lb.-f)
2560	154
2200	132
2000	120
1750	105
1500	90
1000	60
500	30

Metric

Pressure (bar)	Force (daN)
177	68
150	57
125	48
100	38
75	29
50	19
35	13

$$P = F \div .060 \quad F = P \times .060$$

$$P = F \div 0.38 \quad F = P \times 0.38$$

Ordering Example:

C.070.007. GR

Part Number:

Includes Series, Model and Stroke Length

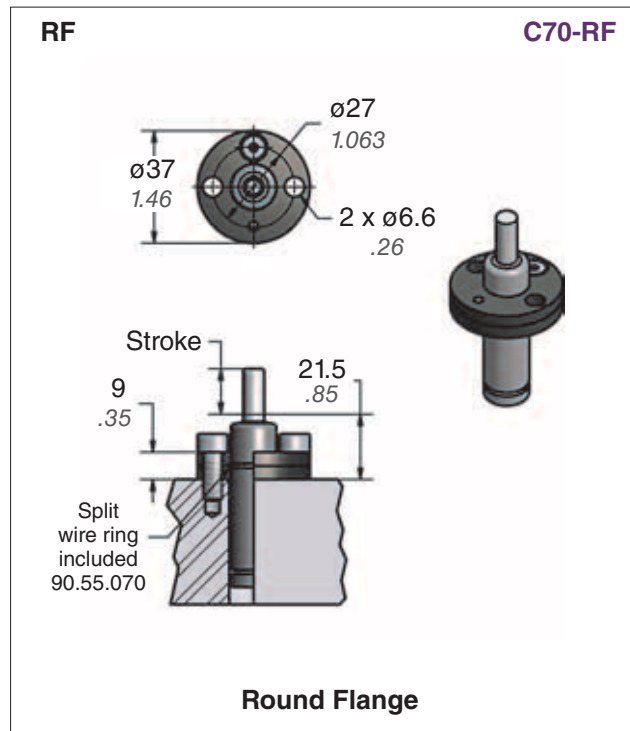
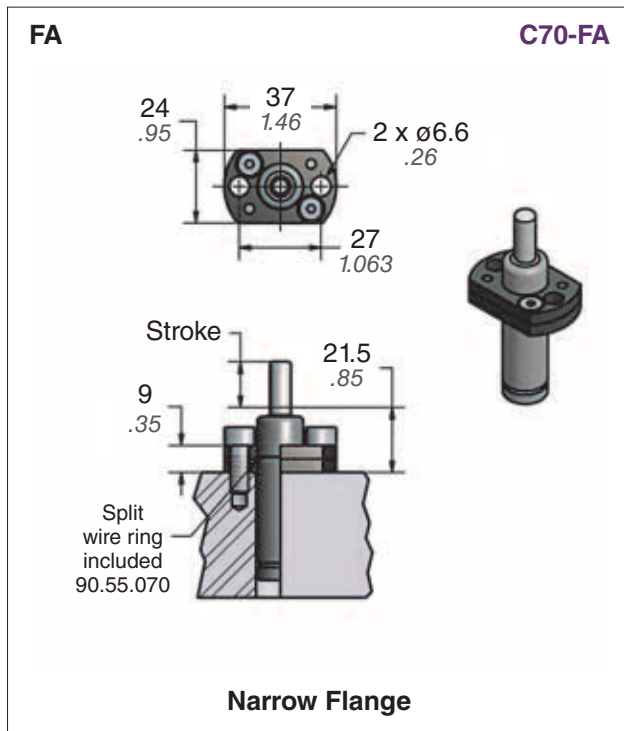
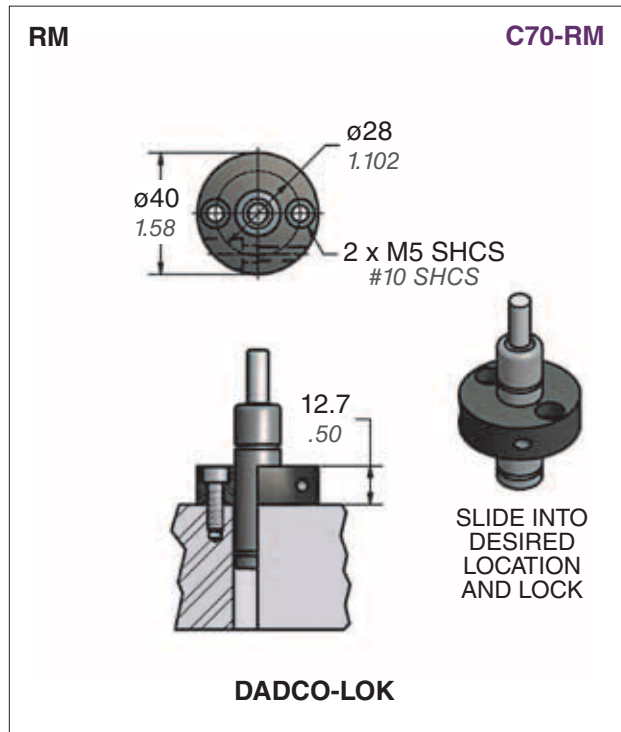
Force:

YW, RD, BU, GR

BK – Black adjustable model - specify pressure:
35 – 177 bar (500 – 2560 psi).

Ordering Example: C.070.007.BK.150

Micro 70® Mounts



Ordering Example:

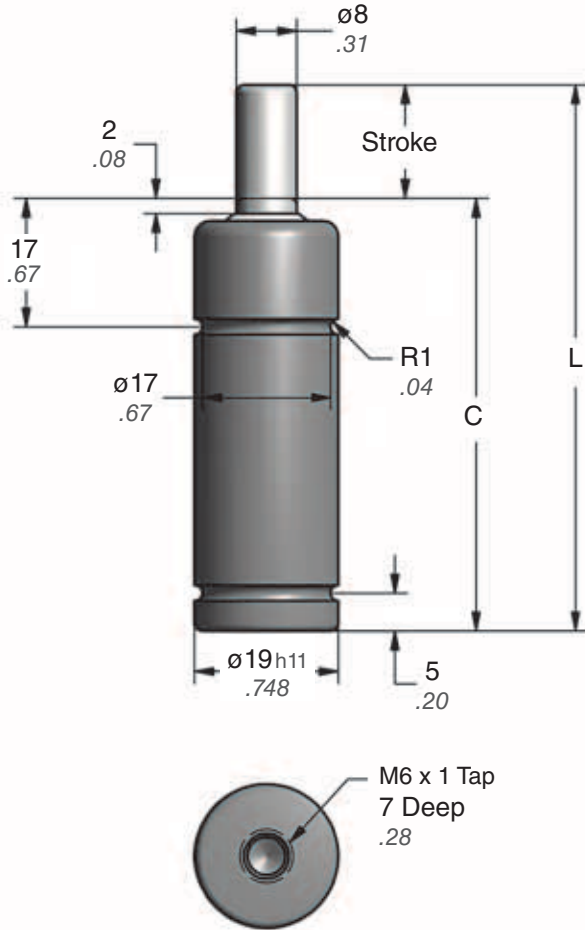
C.070.007. RM. GR

Part Number: _____
Includes Series, Model and Stroke Length

Mount Option: _____
RM, FA, RF

Mount Only Ordering Example: C70-RM

Force: _____
YW, RD, BU, GR
BK – Black adjustable model - specify pressure:
35 – 177 bar (500 – 2560 psi).
Ordering Example: C.070.007.RM.BK.150



Part No.	Stroke mm inch	C	L ±0.4 ±0.015
•C.090.007	07 .28	49 1.93	56 2.205
C.090.010	10 .39	52 2.05	62 2.441
C.090.013	12.7 .50	54.7 2.15	67.4 2.654
•C.090.015	15 .59	57 2.24	72 2.835
•C.090.025	25 .98	67 2.64	92 3.622
•C.090.038	38 1.50	80 3.15	118 4.646
•C.090.050	50 1.97	92 3.62	142 5.591
C.090.063	63.5 2.50	108.5 4.27	172 6.772
•C.090.080	80 3.15	125 4.92	205 8.071
C.090.100	100 3.94	145 5.71	245 9.646
C.090.125	125 4.92	170 6.69	295 11.614
C.090.150	150 5.91	203 7.99	353 13.898
C.090.160	160 6.30	213 8.39	373 14.685
C.090.175	175 6.89	228 8.98	403 15.866
C.090.200	200 7.87	253 9.96	453 17.835

• Preferred Sizes

Force Chart	Initial lb. daN	Final lb. daN	Pressure psi bar
Yellow - YW	200 89	256 114	2560 177
Red - RD	150 66	192 85	1920 132
Blue - BU	100 44	128 57	1280 88
Green - GR	50 22	64 28	640 44
Purple - PR	20 9	26 12	260 18
Orange - OR	10 5	13 6	130 9
Black - BK	See Charts		

On-Contact Force – Adjustable Black Model

Imperial

Pressure (psi)	Force (lb.-f)
2560	200
2200	172
2000	156
1750	136
1500	117
1000	78
500	39

Metric

Pressure (bar)	Force (daN)
177	89
150	75
125	63
100	50
75	38
50	25
35	17

$$P = F \div .078 \quad F = P \times .078$$

$$P = F \div 0.50 \quad F = P \times 0.50$$

Ordering Example:

C.090.007. GR

Part Number:

Includes Series, Model and Stroke Length
150 mm - 200 mm strokes; contact DADCO
for application evaluation.

Force:

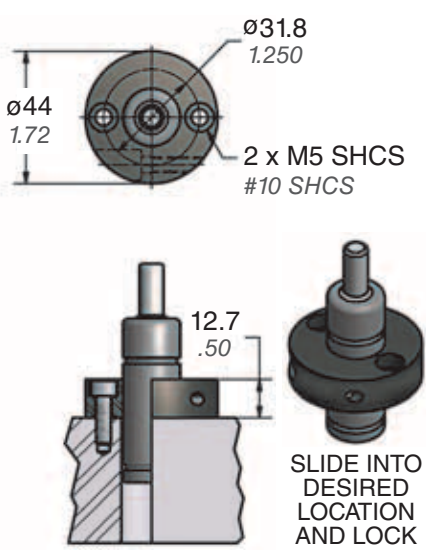
YW, RD, BU, GR, PR, OR
BK – Black adjustable model - specify pressure:
35 – 177 bar (500 – 2560 psi).

Ordering Example: C.090.007.BK.150

Micro 90® Mounts

Attachable Mount Options

RM C90-RM



ø31.8
1.250

ø44
1.72

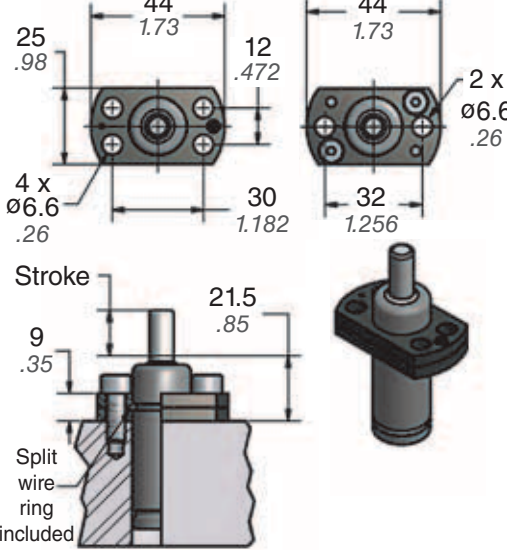
2 x M5 SHCS
#10 SHCS

12.7
.50

DADCO-LOK

SLIDE INTO
DESIRED
LOCATION
AND LOCK

FA / C90-FA VFA / C90-VFA



25
.98

44
1.73

12
.472

44
1.73

2 x
ø6.6
.26

4 x
ø6.6
.26

30
1.182

32
1.256

Stroke

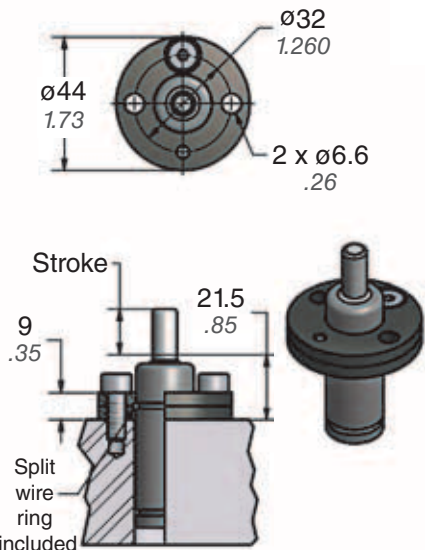
21.5
.85

9
.35

Split
wire
ring
included
90.55.090

Narrow Flange

RF C90-RF



ø32
1.260

ø44
1.73

2 x ø6.6
.26

Stroke

21.5
.85

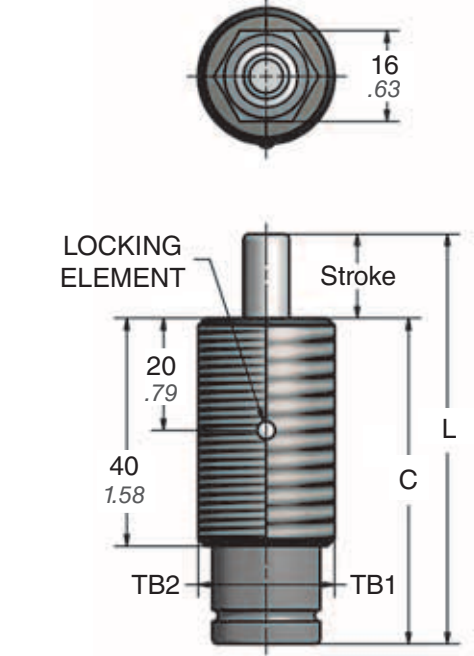
9
.35

Split
wire
ring
included
90.55.090

Round Flange

Threaded Body Styles

TB1 & TB2



16
.63

LOCKING
ELEMENT

Stroke

20
.79

40
1.58

L

C

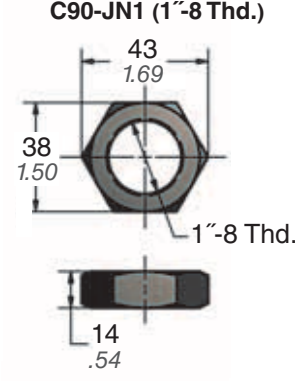
TB2

TB1

	TB2	TB1
Thread	M24 x 1.5	1"-8

Jam Nut

C90-JN1 (1"-8 Thd.)



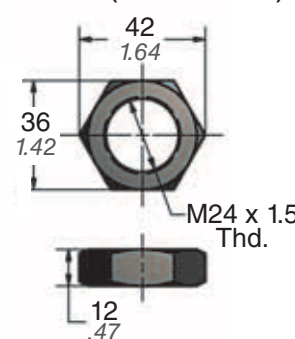
43
1.69

38
1.50

1"-8 Thd.

14
.54

C90-JN2 (M24 x 1.5 Thd.)



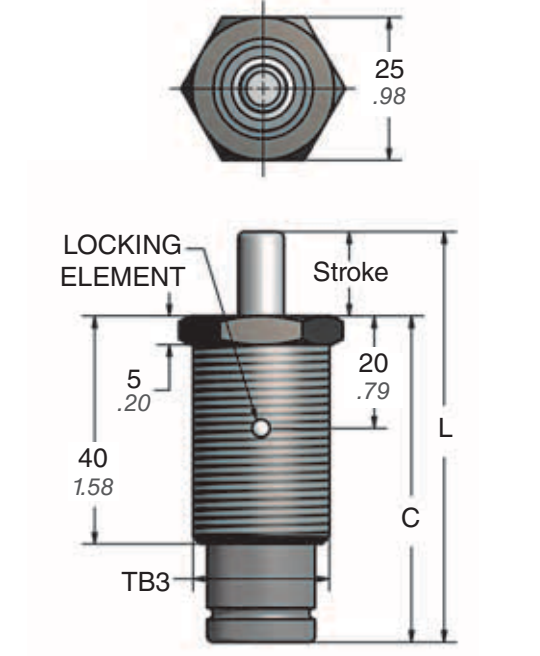
42
1.64

36
1.42

M24 x 1.5 Thd.

12
.47

TB3



25
.98

LOCKING
ELEMENT

Stroke

5
.20

20
.79

L

C

TB3

	TB3
Thread	M24 x 1.5

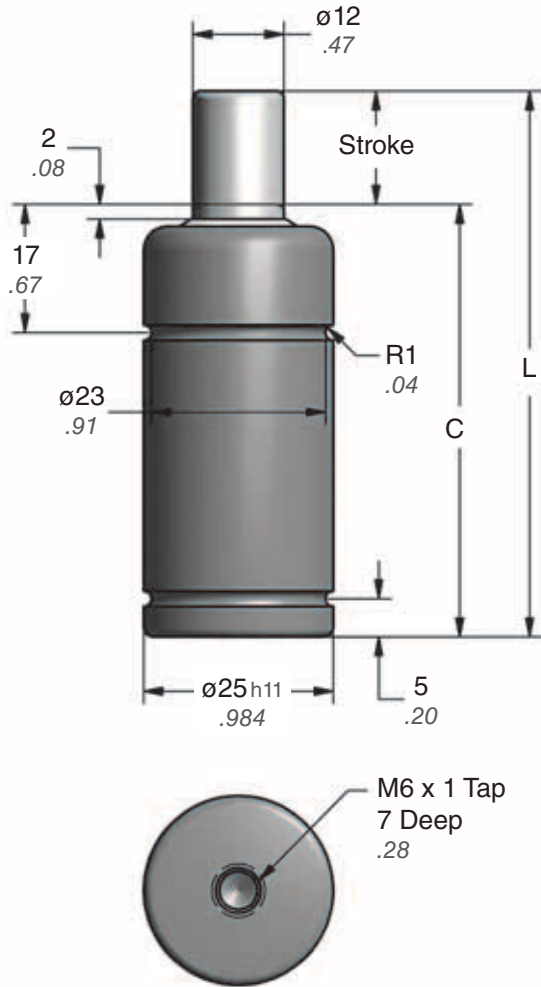
Ordering Example:

C.090.007. TB1. GR

Part Number:
Includes Series, Model and Stroke Length

Mount Option:
RM, FA, VFA, RF, TB1, TB2, TB3
Mount Only Ordering Example: C90-RM

Force:
YW, RD, BU, GR, PR, OR
BK – Black adjustable model - specify pressure:
35 – 177 bar (500 – 2560 psi).
Ordering Example: C.090.007.TB1.BK.150



Part No.	Stroke	C	L
	mm inch		±0.4 ±0.015
•C.180.007	07 .28	49 1.93	56 2.205
C.180.010	10 .39	52 2.05	62 2.441
C.180.013	12.7 .50	54.7 2.15	67.4 2.654
•C.180.015	15 .59	57 2.24	72 2.835
•C.180.025	25 .98	67 2.64	92 3.622
•C.180.038	38 1.50	80 3.15	118 4.646
•C.180.050	50 1.97	92 3.62	142 5.591
C.180.063	63.5 2.50	108.5 4.27	172 6.772
•C.180.080	80 3.15	125 4.92	205 8.071
C.180.100	100 3.94	145 5.71	245 9.646
C.180.125	125 4.92	170 6.69	295 11.614
C.180.150	150 5.91	203 7.99	353 13.898
C.180.160	160 6.30	213 8.39	373 14.685
C.180.175	175 6.89	228 8.98	403 15.866
C.180.200	200 7.87	253 9.96	453 17.835

•Preferred Sizes

On-Contact Force – Adjustable Black Model

Imperial

Pressure (psi)	Force (lb.-f)
2560	450
2200	387
2000	351
1750	307
1500	263
1000	175
500	88

$$P = F \div .175 \quad F = P \times .175$$

Metric

Pressure (bar)	Force (daN)
177	200
150	170
125	141
100	113
75	85
50	57
35	39

$$P = F \div 1.13 \quad F = P \times 1.13$$

Force Chart	Initial lb. daN	Final lb. daN	Pressure psi bar
Yellow - YW	450 200	612 272	2560 177
Red - RD	337 149	459 204	1920 132
Blue - BU	224 100	306 136	1280 88
Green - GR	112 50	153 68	640 44
Black - BK	See Charts		

Ordering Example:

C.180.007. GR

Part Number:

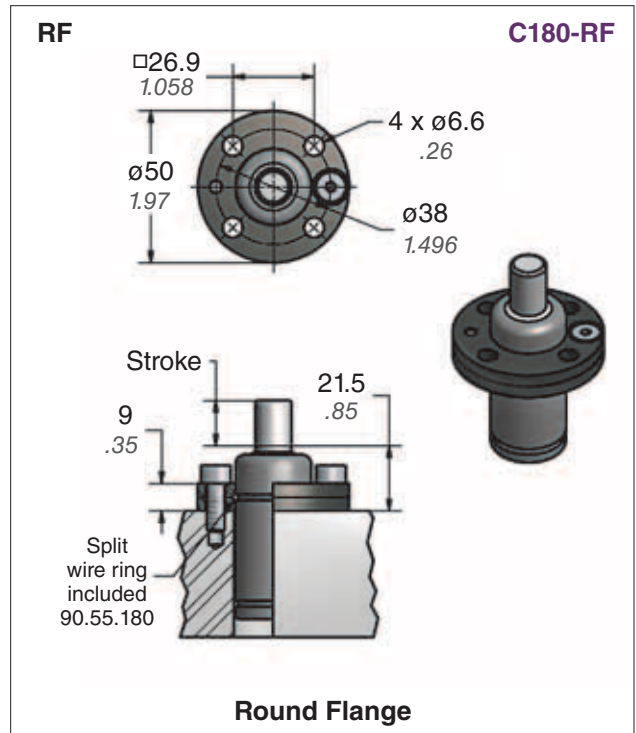
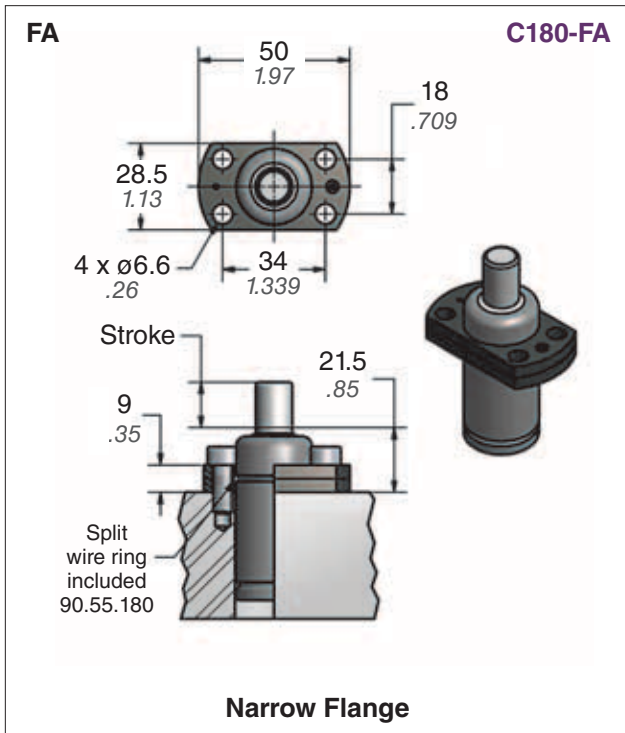
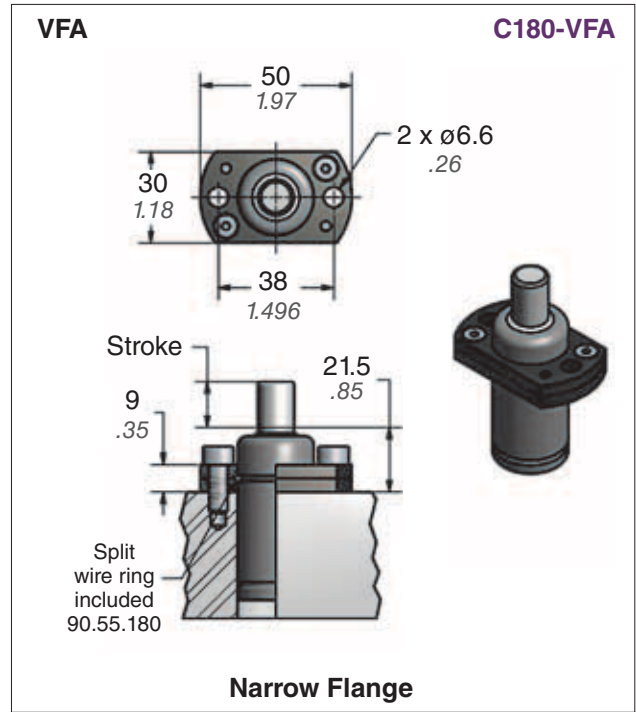
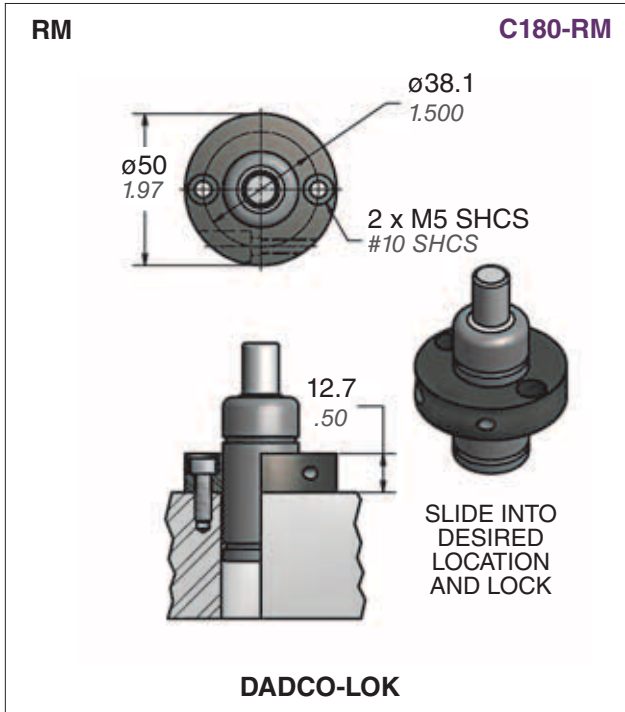
Includes Series, Model and Stroke Length
150 mm - 200 mm strokes; contact DADCO
for application evaluation.

Force:

YW, RD, BU, GR
BK – Black adjustable model - specify pressure:
35 – 177 bar (500 – 2560 psi).

Ordering Example: **C.180.007.BK.150**

Micro 180® Mounts



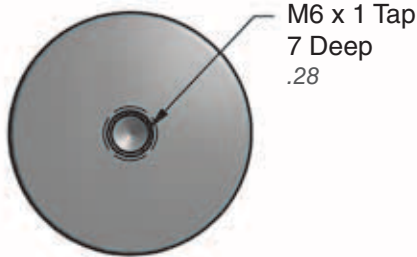
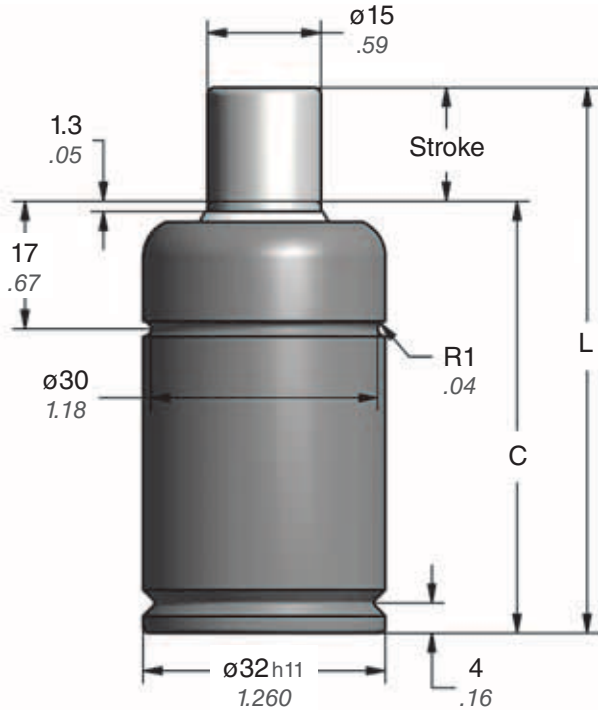
Ordering Example:

C.180.007. RM. GR

Part Number: _____
 Includes Series, Model and Stroke Length

Mount Option: _____
 RM, FA, VFA, RF
 Mount Only Ordering Example: C180-RM

Force: _____
 YW, RD, BU, GR
 BK – Black adjustable model - specify pressure:
 35 – 177 bar (500 – 2560 psi).
 Ordering Example: C.180.007.RM.BK.150



Part No.	Stroke		C	L ±0.4 ±0.015
	mm	inch		
•C.250.007	07	.28	49	56
C.250.010	10	.39	52	62
C.250.013	12.7	.50	54.7	67.4
•C.250.015	15	.59	57	72
•C.250.025	25	.98	67	92
•C.250.038	38	1.50	80	118
•C.250.050	50	1.97	92	142
C.250.063	63.5	2.50	108.5	172
•C.250.080	80	3.15	125	205
C.250.100	100	3.94	145	245
C.250.125	125	4.92	170	295

• Preferred Sizes

Force Chart	Initial lb. daN	Final lb. daN	Pressure psi bar
Yellow - YW	701 313	940 418	2560 177
Red - RD	526 233	705 314	1920 132
Blue - BU	351 156	470 209	1280 88
Green - GR	175 78	235 105	640 44
Black - BK	See Charts		

On-Contact Force – Adjustable Black Model

Imperial

Pressure (psi)	Force (lb.-f)
2560	701
2200	603
2000	548
1750	479
1500	411
1000	274
500	137

$$P = F \div .274 \quad F = P \times .274$$

Metric

Pressure (bar)	Force (daN)
177	313
150	265
125	221
100	177
75	133
50	88
35	60

$$P = F \div 1.77 \quad F = P \times 1.77$$

Ordering Example:

C.250.007. GR

Part Number:

Includes Series, Model and Stroke Length

Force:

YW, RD, BU, GR

BK – Black adjustable model - specify pressure:
35 – 177 bar (500 – 2560 psi).

Ordering Example: C.250.007.BK.150

Micro 250® Mounts

RM C250-RM

Stroke
12.7
.50

DADCO-LOK

SLIDE INTO
DESIRED
LOCATION
AND LOCK

FA / C250-FA VFA / C250-VFA

Stroke
21.5
.85

Narrow Flange

NOTE:
FOR USE WITH
TOP GROOVE
OF C.250
MODEL ONLY

RF C250-RF

Stroke
21.5
.85

Round Flange

NOTE:
FOR USE WITH
TOP GROOVE
OF C.250
MODEL ONLY

SF C250-SF

Stroke
7
.28

Split Flange

NOTE:
FOR USE WITH
BOTTOM GROOVE
OF C.250
MODEL ONLY

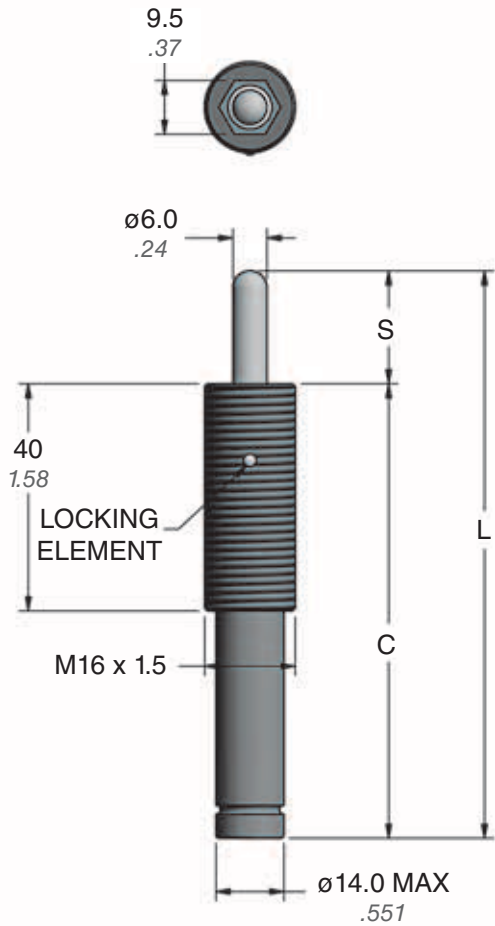
Ordering Example:

C.250.007. RM. GR

Part Number:
Includes Series, Model and Stroke Length

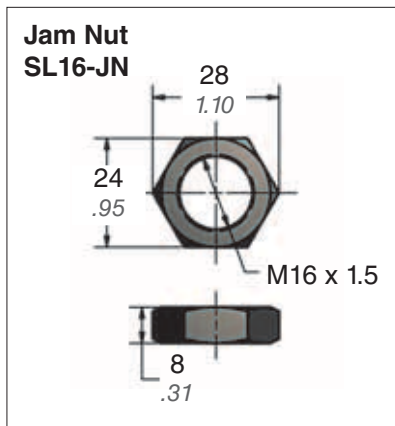
Mount Option:
RM, FA, VFA, RF, SF
Mount Only Ordering Example: C250-RM

Force:
YW, RD, BU, GR
BK – Black adjustable model - specify pressure:
35 – 177 bar (500 – 2560 psi).
Ordering Example: C.250.007.RM.BK.150



Part No.	Stroke	C	L ±0.4 ±0.015
	mm inch		
SL.16.010	10 .39	70 2.76	80 3.150
• SL.16.020	20 .79	80 3.15	100 3.937
SL.16.030	30 1.18	90 3.54	120 4.724
SL.16.040	40 1.57	100 3.94	140 5.512
• SL.16.050	50 1.97	110 4.33	160 6.299
SL.16.060	60 2.36	120 4.72	180 7.087
SL.16.070	70 2.76	130 5.12	200 7.874
• SL.16.080	80 3.15	140 5.51	220 8.661
SL.16.100	100 3.94	160 6.30	260 10.236

• Preferred Sizes



On-Contact Force

Imperial

Pressure (psi)	Force (lb.-f)
2611	114
2176	95
1088	48
580	25
290	13

$P = F \div .044 \quad F = P \times .044$

Metric

Pressure (bar)	Force (daN)
180	51
150	42
75	21
40	11
20	6

$P = F \div .283 \quad F = P \times .283$

Ordering Example:

SL.16.020. 150

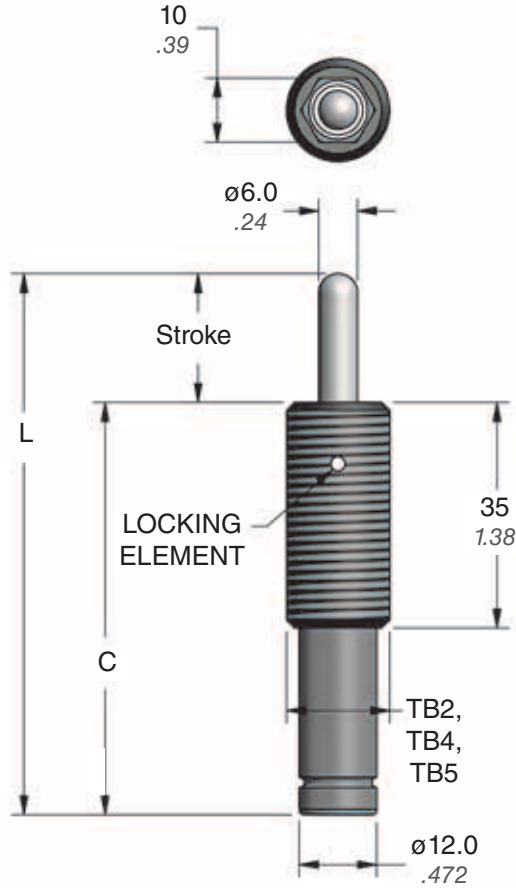
Part Number:

Includes Series, Model and Stroke Length

Charging Pressure:

Specify pressure: 20 – 180 bar (290 psi – 2611 psi).
When not specified, default is 150 bar.

E.16 Stock Lifter

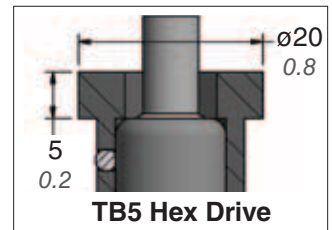
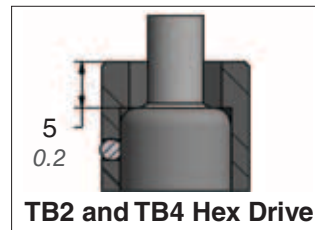


Part No.	Stroke	C	L
	mm inch		
E.16.015	15 .59	59 2.32	74 2.91
• E.16.020	20 .79	64 2.52	84 3.307
E.16.030	30 1.18	74 2.91	104 4.094
E.16.040	40 1.57	84 3.31	124 4.882
• E.16.050	50 1.97	94 3.70	144 5.669
E.16.060	60 2.36	107 4.21	167 6.575
E.16.070	70 2.76	117 4.61	187 7.362
• E.16.080	80 3.15	127 5.00	207 8.150

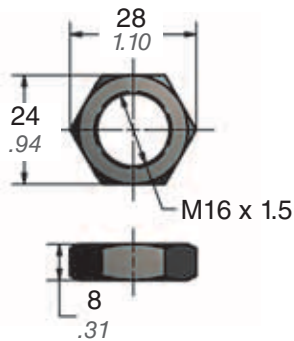
• Preferred Sizes

DADCO's E.16...TB2 Nitrogen Gas Stock Lifter matches the European VDI-BAK standard and the Ford WDX35-70 standard.

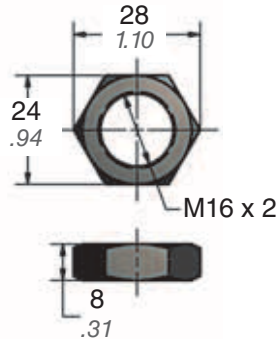
	TB2	TB4	TB5
Thread	M16 x 1.5	M16 x 2	M16 x 1.5



**Jam Nut
SL16-JN**



C45-JN4



On-Contact Force

Imperial

Pressure (psi)	Force (lb.-f)
2175	95
1088	48
820	36
580	25
290	13

Metric

Pressure (bar)	Force (daN)
150	42
75	21
57	16
40	11
20	6

$P = F \div .044$ $F = P \times .044$

$P = F \div .283$ $F = P \times .283$

Ordering Example:

E.16.020. TB2. 150

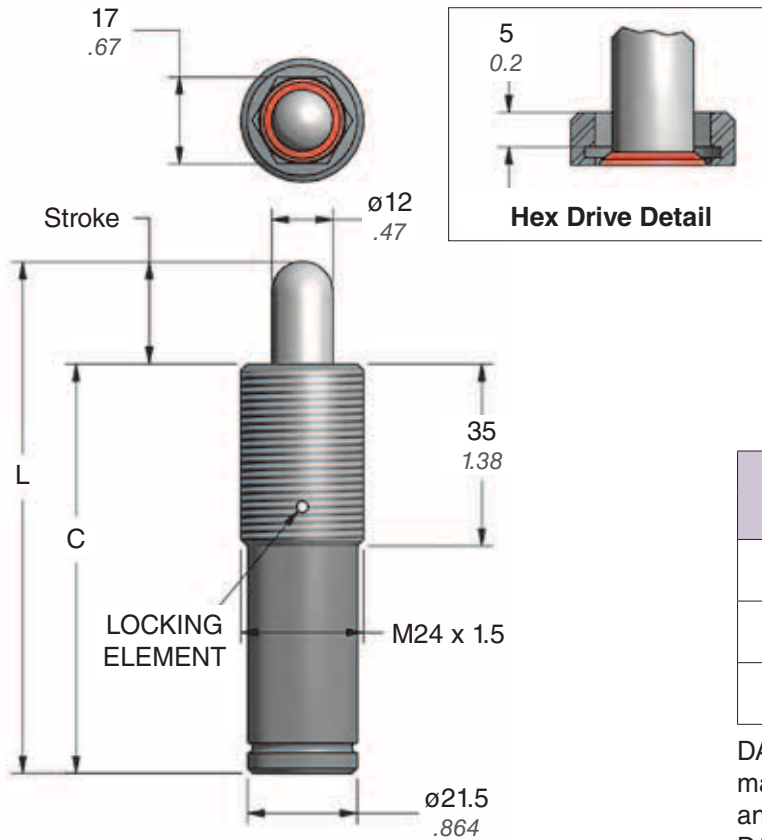
Part Number:
Includes Series, Model and Stroke Length

Thread Option:
TB2, TB4, and TB5.

Charging Pressure:
Specify pressure: 20–150 bar (290 psi – 2175 psi).
When not specified, default is 150 bar.

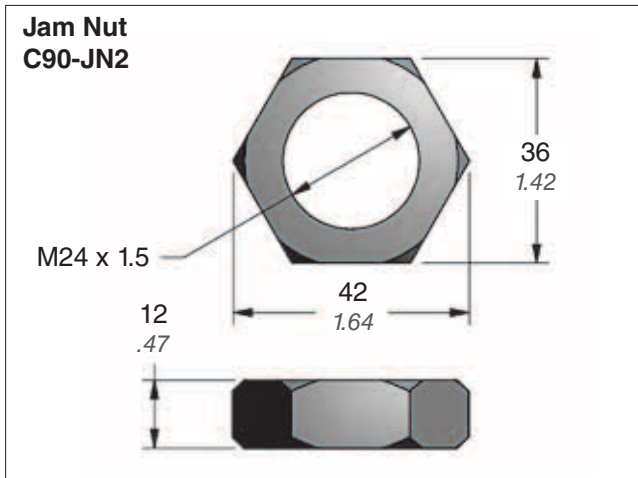
For more information on the TB5, reference B18120.

E.24 Stock Lifter



Part No.	Stroke mm inch	C	L ±0.4 ±0.015
E.24.020	20 .79	80 3.15	100 3.937
E.24.050	50 1.97	110 4.33	160 6.299
E.24.080	80 3.15	140 5.51	220 8.661

DADCO's E.24 Nitrogen Gas Stock Lifter matches the European VDI-BAK standard and the Ford WDX35-70 standard. Contact DADCO for additional stroke lengths.



On-Contact Force

Imperial

Pressure (psi)	Force (lb.-f)
2175	381
1088	191
580	102
290	51

$P = F \div .175$ $F = P \times .175$

Metric

Pressure (bar)	Force (daN)
150	170
75	85
40	45
20	23

$P = F \div 1.13$ $F = P \times 1.13$

Ordering Example:

E.24.020. 150

Part Number:

Includes Series, Model and Stroke Length

Charging Pressure:

Specify pressure: 20 – 150 bar (290 psi – 2175 psi).
When not specified, default is 150 bar.

Tools & Accessories

Micro Load Cell

90.300.____ (00045, 00090, 00180 or 00250)

Use the Micro Load Cell with a Micro Test Stand or arbor press to determine the force of a Micro Spring. Depress the micro rod 1/16" to read gas spring force from the color-coded gauge. Request Bulletin No. B07108C for additional information.



**Micro Test Stand
MTS-125**

Use the Micro Test Stand and Load Cell for precise measurement of gas spring force on contact. Request Bulletin No. B01127B for additional information.



RT-24-A (for use with E.24 and **Micro 90®** TB1 and TB2)
RT-90-A (for use with **Micro 90®** TB1 and TB2)

When placed over the piston rod, the installation and removal tool engages the hex socket for easy installation and removal of threaded body micros.



RT-Ratcheting Tool

Ratcheting tool with internal hex drive for easy installation and removal of threaded body Micros and stock lifters. For complete list of Ratcheting Tools refer to Bulletin No. B04139B.



Specialized Mounts

For customers with special applications that have space constraints or require return force, DADCO offers custom mount options. Contact DADCO for additional information.



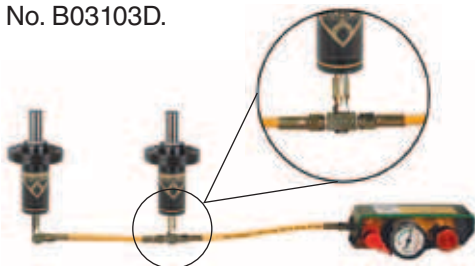
Micro Wiper Cap

For customers with applications where aggressive draw die compound is used, DADCO offers the Micro Wiper Cap. The wiper cap can be ordered in a variety of materials and is installed at the factory to guard against draw die contamination, request Bulletin No. B03102A. Alternatively, DADCO offers an internal wiper in different materials. Contact DADCO for additional information.



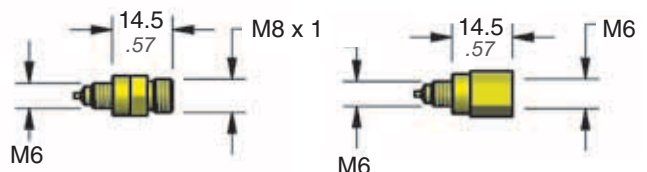
Linked Micro System

Typically DADCO Micro Series Nitrogen Gas Springs are operated self-contained, however they may also be linked. When operated as a linked system, adjustment, monitoring, draining and refilling can be performed from a central control panel mounted outside the die, request Bulletin No. B03103D.



Micro Series Port Adapters

DADCO's Micro Series Port Adapters are designed specifically to work with DADCO's Micro Series Nitrogen Gas Springs manufactured after August 1, 2003. These port adapters may be used with DADCO's *MINIFLEX®* Hose and Fittings, refer to Catalog No. C09118F.



**90.607.122
(L-122)**

Micro Service Fitting

**90.607.038
(L-38)**

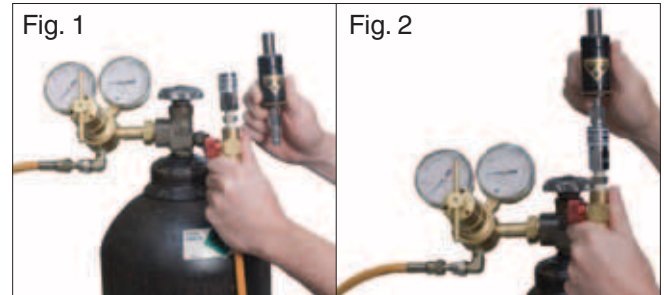
Micro Port Adapter Extension

CAUTION:

Always wear safety goggles when performing any maintenance work on gas springs.

Charging Micro Gas Springs

- When filling the Micro Spring, initially fill with low pressure (< 4 bar or 70 psi) to extend rod fully; then fill to desired pressure. Hold the spring vertically at all times during filling (Fig. 1).
- The Micro Spring charging pressure range varies by gas spring model. Verify range before charging.
- **All Micro Springs should be inspected before recharging.**
- **Do not recharge gas springs if damaged. Refer to discharging instructions below for proper disposal.**
- Use the Quick Disconnect Charging Nipple and the High Pressure Quick Disconnect Charging Assembly to charge the Micro Spring to the appropriate pressure (Fig. 2).



Quick Disconnect Charging Nipple 90.310.143

Use the DADCO Quick Disconnect Charging Nipple to charge the Micro Series Gas Spring. For more information contact DADCO.



DADCO Charging Adapter 90.315.5

Use the DADCO Charging Adapter to easily charge and discharge pressure in DADCO's Micro Series Gas Spring. *Not recommended for checking pressure due to small size of Micro Series Gas Springs.*



High Pressure Quick Disconnect Charging Assembly 90.310.044

Use the DADCO High Pressure Quick Disconnect Charging Assembly, 90.310.044, with the 90.310.143 Charging Nipple or 90.315.5 Charging Adapter to charge self-contained gas springs. The 90.310.044 includes the 90.310.205 Pressure Regulator, 90.310.252 Hose Assembly and the 90.310.340 Quick Disconnect Filling Assembly. *A standard pressure charging assembly, 90.310.040 is available for pressures below 2200 psi, for a CGA-580 tank. For more information contact DADCO.*



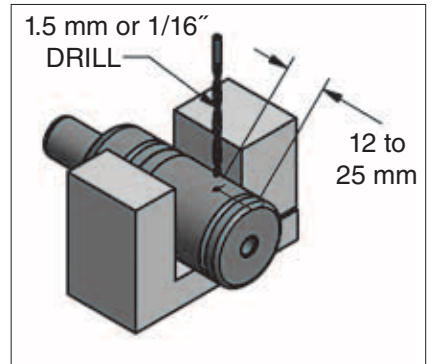
How to discharge a Micro Gas Spring before disposal

CAUTION: Before disposing of damaged or worn out gas springs be sure to discharge all pressure. Contact DADCO for additional information.

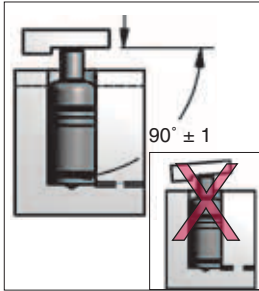
1. Discharge through the adjustable valve using the Valve Bleed Tool or Charging Adapter, 90.315.5.
2. If spring is damaged and cannot be discharged using the Valve Bleed Tool then drill a hole to discharge.



Valve Bleed Tool
90.360.4



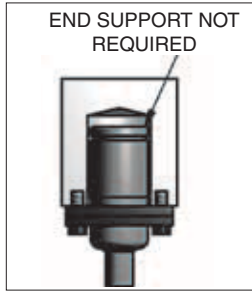
General Recommendations



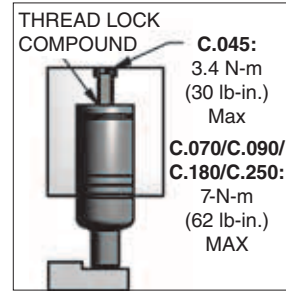
Side loading from axial or contact misalignment should be minimized, $<1^\circ$.



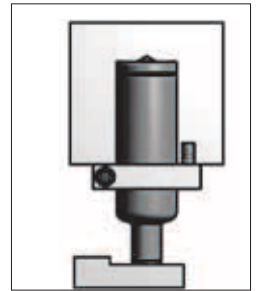
It is necessary to have a flat surface against the base of the spring in all circumstances. Incorrect pockets may cause structural damage or reduced life.



All properly installed mounts (RM, NF, FA, RF, TB) support the load. No back-up is required.

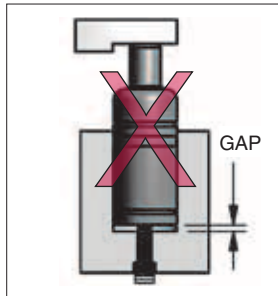


Retain inverted cylinders as shown with M6 cap screw. A close tolerance hole is required, depth $> C/2$.

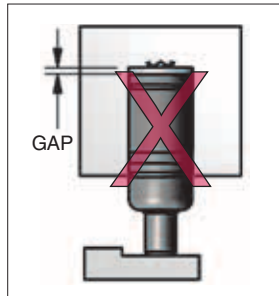


Mounts such as the DADCO-LOK may be used to retain the spring from rod end. If possible use a positive stop.

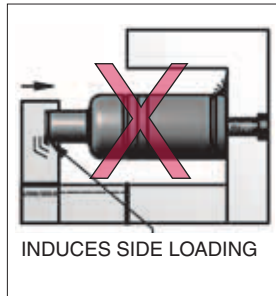
Improper Installation Examples



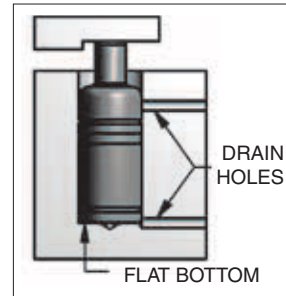
Verify the cap screw length.



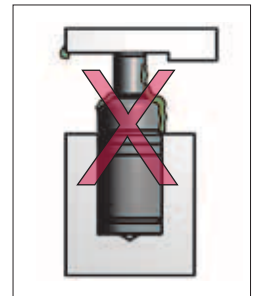
Avoid large gaps in the upper. Use the tapped hole in the base to secure and preload if possible.



Do not constrain the rod end. Do not use the bottom mount in an unsupported or open mounting application.

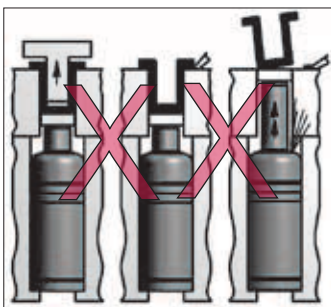


Provide adequate drainage in gas spring pockets. Direct contact with certain die lubricants and cleaners can be harmful to gas springs or may cause pressure increase.

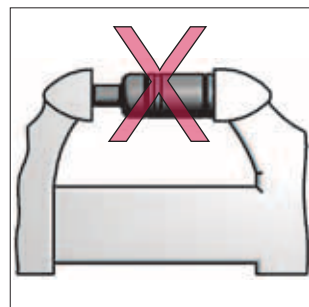


Uncontrolled Release

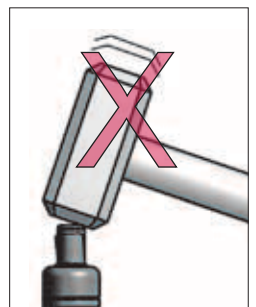
If parts are jamming, determine the root cause and repair it before production continues. Failure to repair the problem will cause failure or damage of the gas spring. Preloading the pad will prevent gas spring damage from "snap action" or sudden release. Restricting rod travel will help prevent spring damage.



Sudden release will cause the gas spring to exhaust.



Never compress the gas spring in a vice or clamp outside of the die. Never strike the rod with a hammer to test for pressure; damage can result.

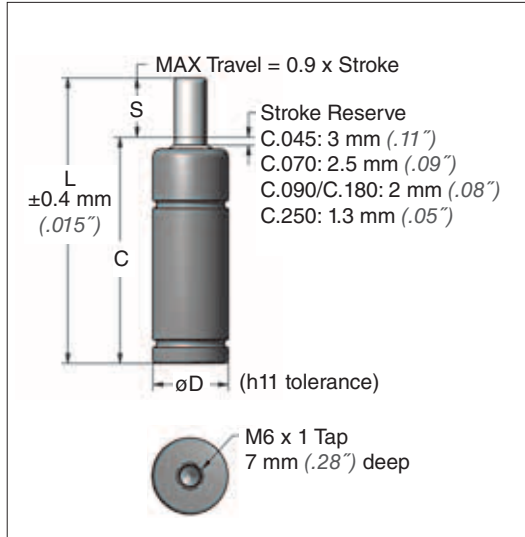


Technical Data

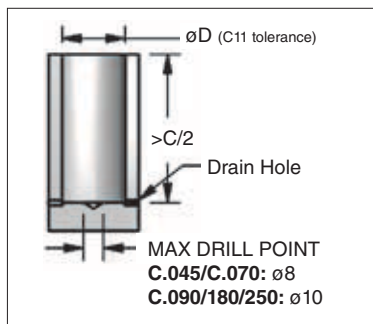
Operating Specifications

Maximum Charging Pressure	Charging Medium:	Nitrogen Gas
E.16 and E.24:	150 bar (2175 psi)	Operating Temperature: 4°C – 71°C (40°F – 160°F)
Micro 45® – Micro 250®:	177 bar (2560 psi)	Maximum Speed: 1.6 m/sec (63 in/sec)
SL.16:	180 bar (2600 psi)	

General Information



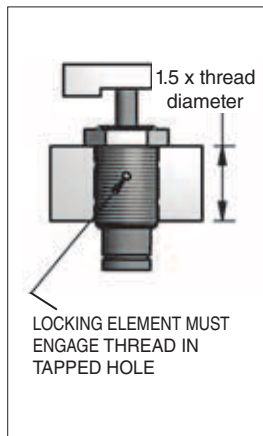
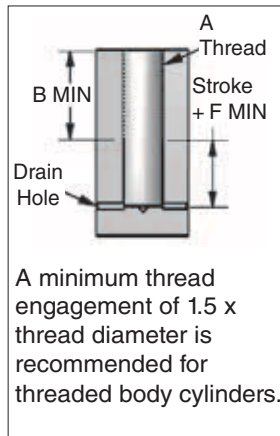
- DO NOT exceed 90% of stroke
- Stripping applications require a slight preload 0.5 mm – 1 mm
- Use enough force to strip the part
- Design adequate safety so spring is not over stroked



Stroke (mm)	SPM Limit
7-16	200
25-38	120
50-63	80
> 80	50

Travel 90% of nominal stroke.

Threaded Body Installation Recommendations



Model	A	B	F	Maximum Installation Torque*
E.16.__.TB2	M16 x 1.5	24 .94	12 .47	500 lb-in (56 N-m)
E.16.__.TB4	M16 x 2	24 .94	12 .47	300 lb-in (34 N-m)
E.16.__.TB5	M16 x 1.5	24 .94	12 .47	400 lb-in (45 N-m)
SL.16	M16 x 1.5	24 .94	20 .79	500 lb-in (56 N-m)
E.24	M24 x 1.5	35 1.38	25 .98	
C.045.__.TB1	5/8"-11	24 .94	5 .20	125 lb-in (14 N-m)
C.045.__.TB2	M16 x 1.5	24 .94	5 .20	500 lb-in (56 N-m)
C.045.__.TB3	M16 x 2	35 1.38	5 .20	300 lb-in (34 N-m)
C.045.__.TB4	M16 x 2	24 .94	5 .20	
C.090.__.TB1	1"-8	38 1.50	13 .51	500 lb-in (56 N-m)
C.090.__.TB2	M24 x 1.5	36 1.42	13 .51	
C.090.__.TB3	M24 x 1.5	35 1.38	13 .51	

*Based on strength of threads.

DADCO®

43850 Plymouth Oaks Blvd. • Plymouth, MI • 48170 • USA
 734.207.1100 • 800.323.2687 • fax 734.207.2222 • www.dadco.net

The global leader in nitrogen gas spring technology