

# 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<br>(.472")     | 112 lb.<br>(50 daN)      | M16 x 1.5     |
|            |                      |                          | M16 x 2       |
|            |                      |                          | 5/8"-11       |
| Micro 70®  | 15 mm<br>(.591")     | 154 lb.<br>(68 daN)      | N/A           |
| Micro 90®  | 19 mm<br>(.748")     | 200 lb.<br>(89 daN)      | M24 x 1.5     |
|            |                      |                          | 1"-8          |
| Micro 180® | 25 mm<br>(.984")     | 450 lb.<br>(200 daN)     | N/A           |
| Micro 250® | 32 mm<br>(1.260")    | 701 lb.<br>(313 daN)     | N/A           |
| SL.16      | 14 mm MAX<br>(.551") | 114 lb.<br>(51 daN)      | M16 x 1.5     |
| E.16       | 12 mm<br>(.472")     | 95 lb.<br>(42 daN)       | M16 x 1.5     |
|            |                      |                          | M16 x 2       |
| E.24       | 21.5 mm<br>(.846")   | 381 lb.<br>(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

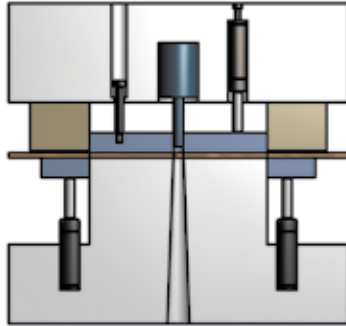


DADCO's entire product line is available on-line in solid models and 2D CAD formats. For more information, visit our website, [www.dadco.net](http://www.dadco.net), or contact DADCO.

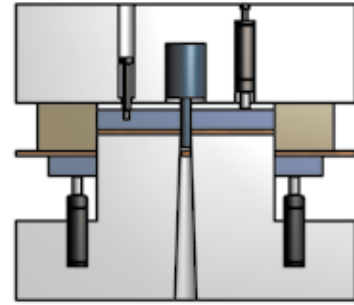
## Application Examples

### Blanking

INNER PRESSURE  
PAD AND PUNCH  
STRIPPER CLAMPS  
STOCK

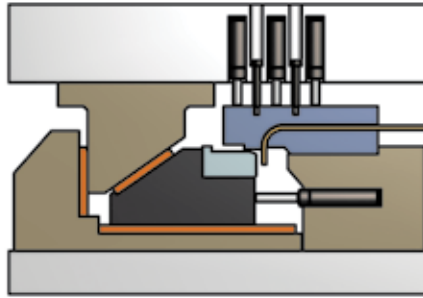


BLANKED PART  
SHOWN WITH  
BOTH PUNCH AND  
TRIM STRIPPERS  
COMPRESSED

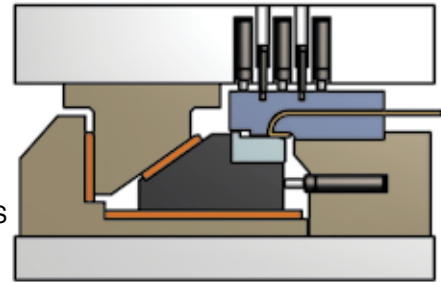


### Bend and Flange

LEADING SPRING  
PAD BENDS PART  
BEFORE DIE  
MOUNTED CAM  
ENGAGES

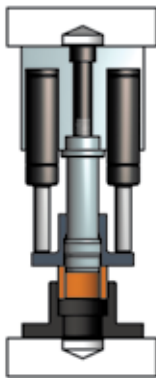


SPRING PAD  
HOLDS PART  
WHILE CAM  
ACTION FLANGES  
PART

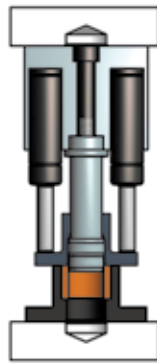


### Bushing Installation and Sizing

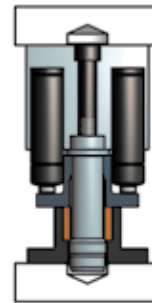
PART LOADED  
AND MICRO  
SPRING  
PRESSING  
BUSHING



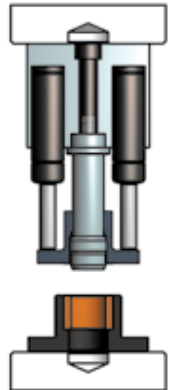
BUSHING  
PRESSED  
INTO PLACE



BUSHING  
SIZED  
AND  
INSTALLED



PART  
COMPLETE  
UNLOAD



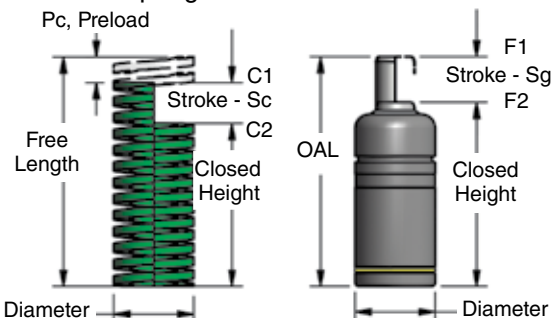
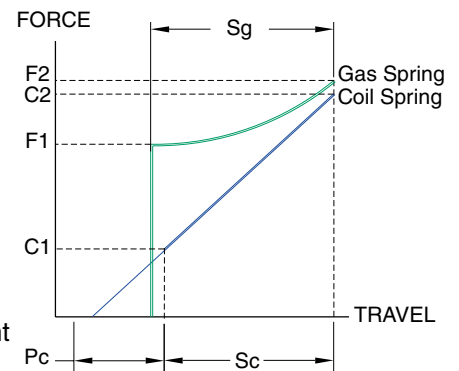
The above examples are conceptual and are not intended as engineering design for specific forces or applications. All tool designs must be individually engineered for their intended function. See pages 19-20 for recommendations and limitations for mounting and installation.

### 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.

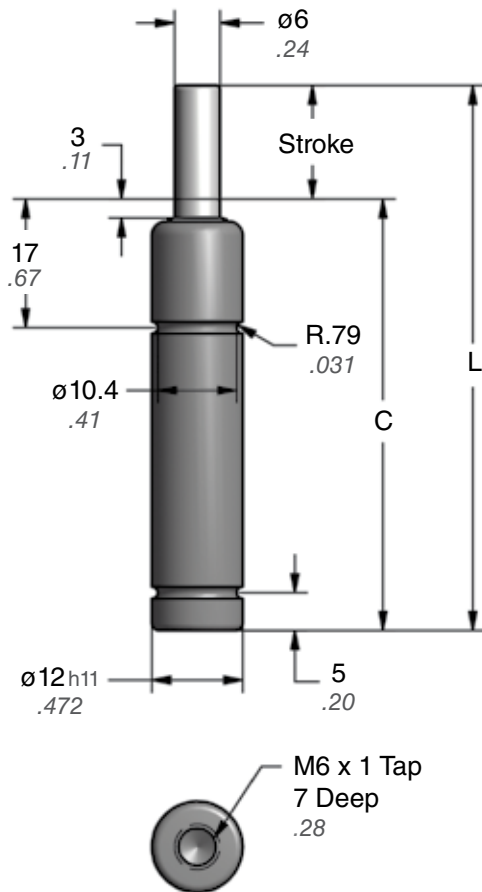
Most die springs have a limitation on compression, after which there is failure or severely reduced cycle life. Heavy and extra heavy duty die springs can only be compressed 15-20% of the closed height, after which there is failure or severely reduced cycle life.

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 ( $C_1$ ) 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 ( $C_1 - C_2$ ).

DADCO Micro Series Gas Springs have a much flatter curve that will not exceed 30% of the original force for any stroke size ( $F_1 - F_2$ ). 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<br>mm<br>inch | C             | L<br>±0.4<br>±0.015 |
|------------|----------------------|---------------|---------------------|
| •C.045.007 | 07<br>.28            | 49<br>1.93    | 56<br>2.205         |
| C.045.010  | 10<br>.39            | 52<br>2.05    | 62<br>2.441         |
| C.045.013  | 12.7<br>.50          | 54.7<br>2.15  | 67.4<br>2.654       |
| •C.045.015 | 15<br>.59            | 57<br>2.24    | 72<br>2.835         |
| C.045.019  | 19<br>.75            | 61<br>2.40    | 80<br>3.149         |
| •C.045.025 | 25<br>.98            | 67<br>2.64    | 92<br>3.622         |
| •C.045.038 | 38<br>1.50           | 80<br>3.15    | 118<br>4.646        |
| •C.045.050 | 50<br>1.97           | 92<br>3.62    | 142<br>5.591        |
| C.045.063  | 63.5<br>2.50         | 108.5<br>4.27 | 172<br>6.772        |
| C.045.080  | 80<br>3.15           | 125<br>4.92   | 205<br>8.071        |

• Preferred Sizes

### On-Contact Force – Adjustable Black Model

#### Imperial

#### Metric

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

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

| Pressure<br>(bar) | Force<br>(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**

Ø25 .984  
Ø36 1.42  
2 x M5 SHCS #10 SHCS

12.7 .50

8.5 .33

SLIDE INTO DESIRED LOCATION AND LOCK

**DADCO-LOK**

**NF C45-NF**

16 .63  
34 1.35  
2 x Ø6.6 .26  
24 .945

Stroke  
9 .35  
21.5 .85

Split wire ring included 90.55.045

**Narrow Flange**

**RF C45-RF**

Ø25 .984  
Ø36 1.42  
2 x Ø6.6 .26

Stroke  
9 .35  
21.5 .85

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

C

L

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

Stroke

5 .20

40 1.58

13.5 .53

C

TB3

|        | TB3     |
|--------|---------|
| Thread | M16 x 2 |

**Ordering Example:**

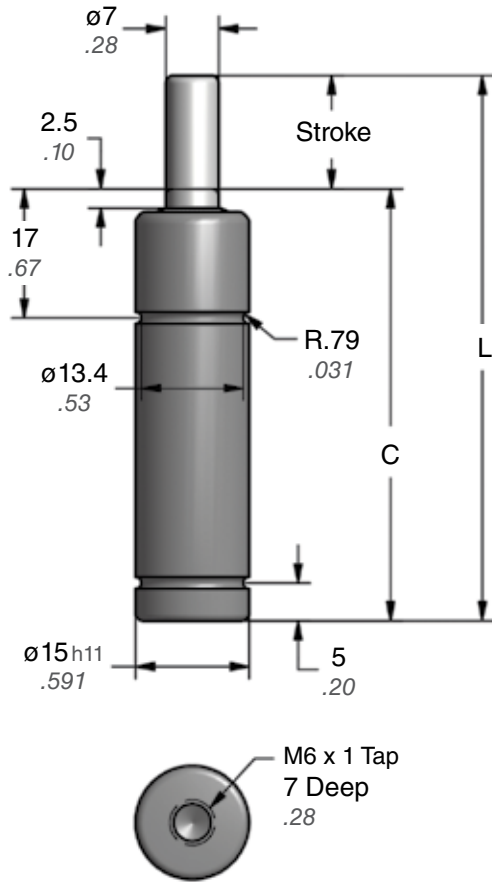
**C.045.007. TB1. GR**

**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.



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

• Preferred Sizes

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

### On-Contact Force – Adjustable Black Model

#### Imperial

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

#### Metric

| Pressure<br>(bar) | Force<br>(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

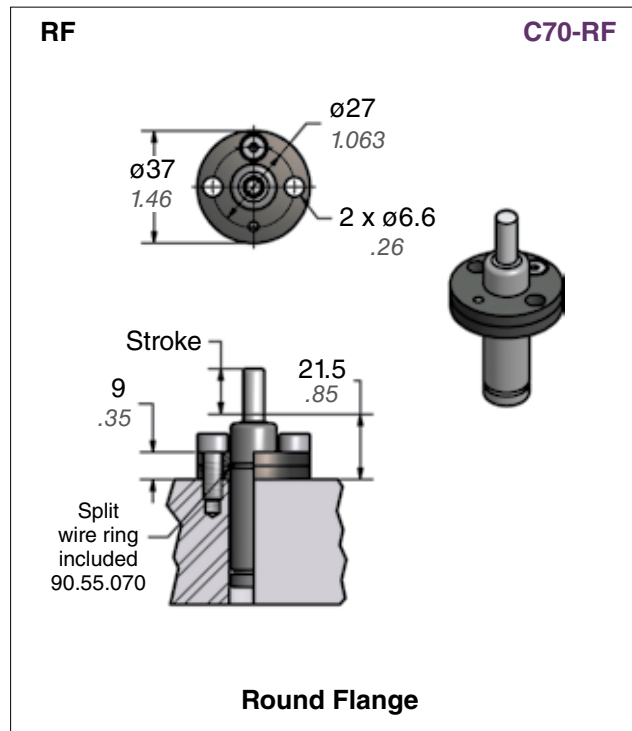
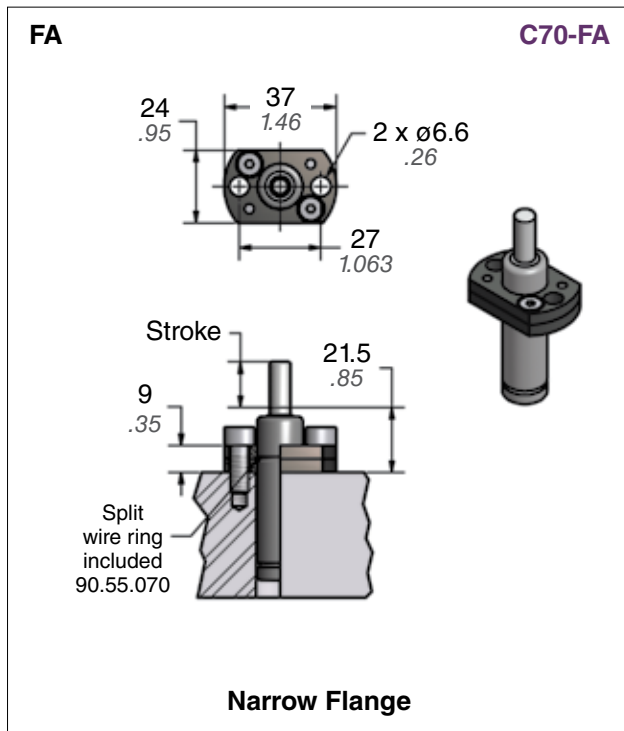
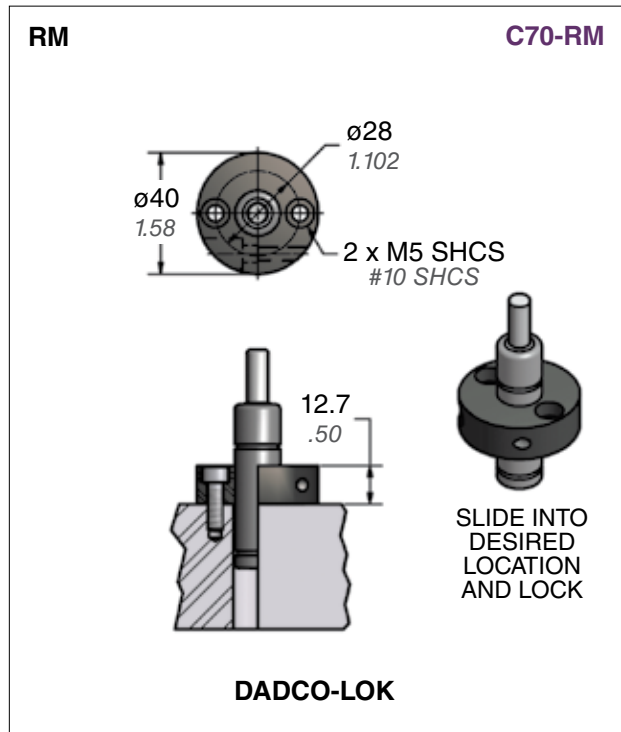
Force:

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

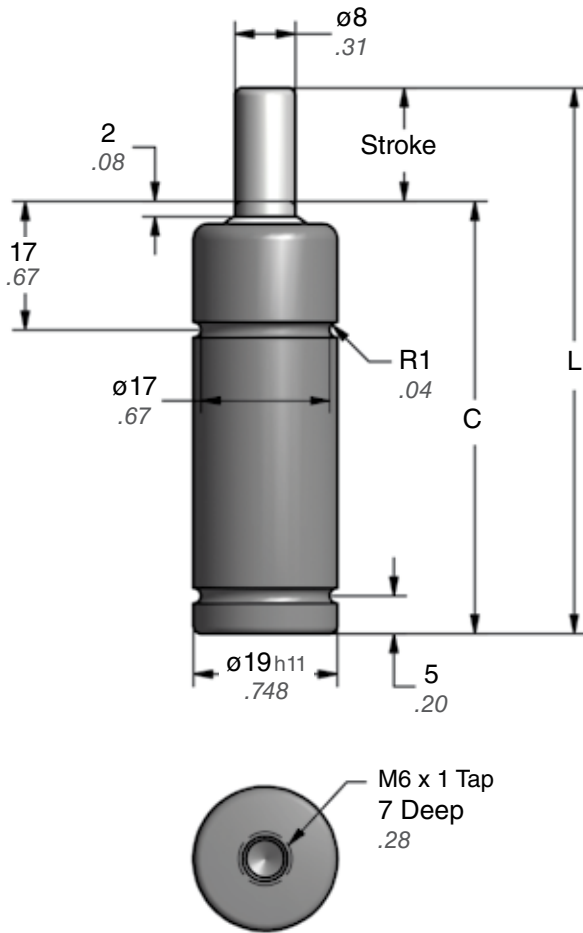
Mount Only Ordering Example: C70-RM

**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<br>mm<br>inch | C             | L<br>±0.4<br>±0.015 |
|------------|----------------------|---------------|---------------------|
| •C.090.007 | 07<br>.28            | 49<br>1.93    | 56<br>2.205         |
| C.090.010  | 10<br>.39            | 52<br>2.05    | 62<br>2.441         |
| C.090.013  | 12.7<br>.50          | 54.7<br>2.15  | 67.4<br>2.654       |
| •C.090.015 | 15<br>.59            | 57<br>2.24    | 72<br>2.835         |
| •C.090.025 | 25<br>.98            | 67<br>2.64    | 92<br>3.622         |
| •C.090.038 | 38<br>1.50           | 80<br>3.15    | 118<br>4.646        |
| •C.090.050 | 50<br>1.97           | 92<br>3.62    | 142<br>5.591        |
| C.090.063  | 63.5<br>2.50         | 108.5<br>4.27 | 172<br>6.772        |
| •C.090.080 | 80<br>3.15           | 125<br>4.92   | 205<br>8.071        |
| C.090.100  | 100<br>3.94          | 145<br>5.71   | 245<br>9.646        |
| C.090.125  | 125<br>4.92          | 170<br>6.69   | 295<br>11.614       |
| C.090.150  | 150<br>5.91          | 203<br>7.99   | 353<br>13.898       |
| C.090.160  | 160<br>6.30          | 213<br>8.39   | 373<br>14.685       |
| C.090.175  | 175<br>6.89          | 228<br>8.98   | 403<br>15.866       |
| C.090.200  | 200<br>7.87          | 253<br>9.96   | 453<br>17.835       |

•Preferred Sizes

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

### On-Contact Force – Adjustable Black Model

#### Imperial

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

#### Metric

| Pressure<br>(bar) | Force<br>(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).

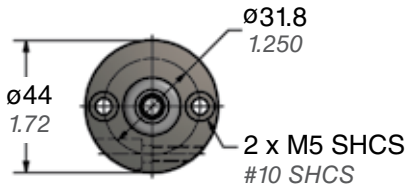
Ordering Example: C.090.007.BK.150



**Micro 90® Mounts**

**Attachable Mount Options**

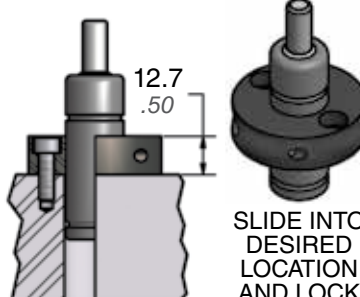
**RM C90-RM**



ø31.8  
1.250

ø44  
1.72

2 x M5 SHCS  
#10 SHCS

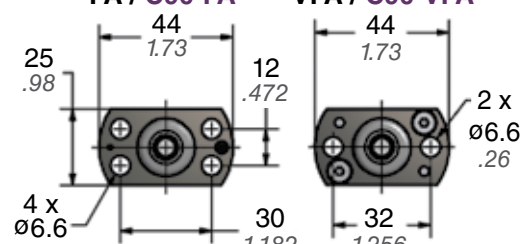


12.7  
.50

**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

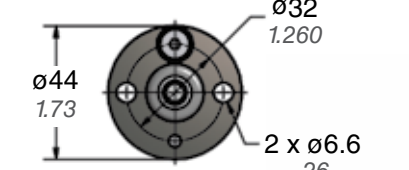
9  
.35

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

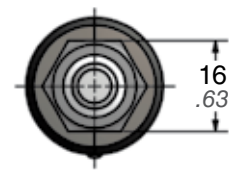
Split  
wire  
ring  
included  
90.55.090

**Round Flange**



**Threaded Body Styles**

**TB1 & TB2**



16  
.63

LOCKING  
ELEMENT

Stroke

20  
.79

40  
1.58

L

C

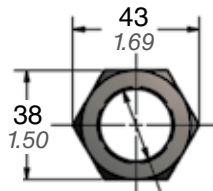
TB2

TB1

|        |           |      |
|--------|-----------|------|
|        | TB2       | TB1  |
| Thread | M24 x 1.5 | 1"-8 |

**Jam Nut**

**C90-JN1 (1"-8 Thd.)**



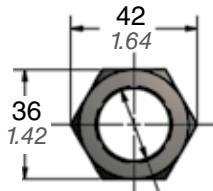
43  
1.69

38  
1.50

1"-8 Thd.

14  
.54

**C90-JN2 (M24 x 1.5 Thd.)**



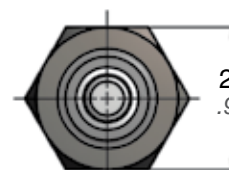
42  
1.64

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 |

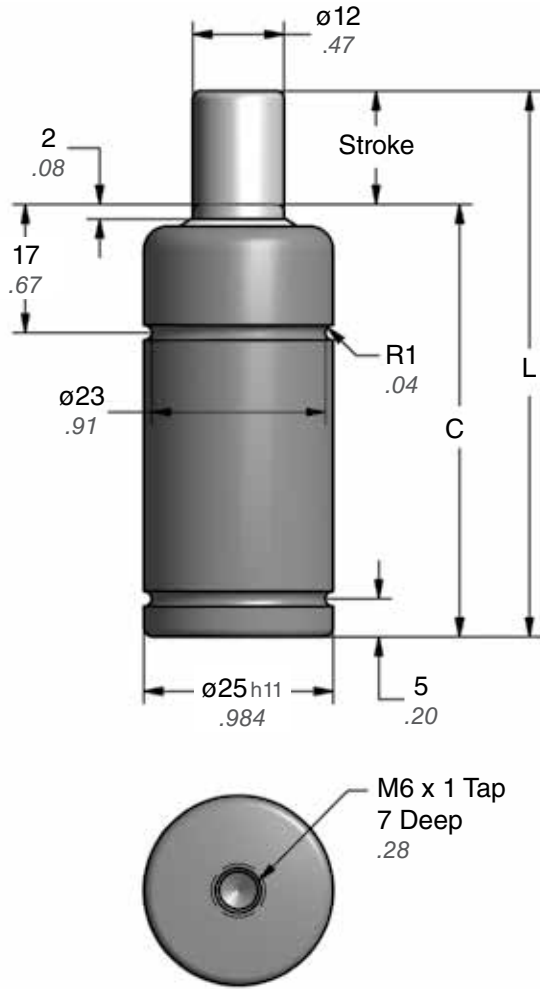
**Ordering Example:**

**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<br>mm<br>inch | C             | L<br>±0.4<br>±0.015 |
|------------|----------------------|---------------|---------------------|
| •C.180.007 | 07<br>.28            | 49<br>1.93    | 56<br>2.205         |
| C.180.010  | 10<br>.39            | 52<br>2.05    | 62<br>2.441         |
| C.180.013  | 12.7<br>.50          | 54.7<br>2.15  | 67.4<br>2.654       |
| •C.180.015 | 15<br>.59            | 57<br>2.24    | 72<br>2.835         |
| •C.180.025 | 25<br>.98            | 67<br>2.64    | 92<br>3.622         |
| •C.180.038 | 38<br>1.50           | 80<br>3.15    | 118<br>4.646        |
| •C.180.050 | 50<br>1.97           | 92<br>3.62    | 142<br>5.591        |
| C.180.063  | 63.5<br>2.50         | 108.5<br>4.27 | 172<br>6.772        |
| •C.180.080 | 80<br>3.15           | 125<br>4.92   | 205<br>8.071        |
| C.180.100  | 100<br>3.94          | 145<br>5.71   | 245<br>9.646        |
| C.180.125  | 125<br>4.92          | 170<br>6.69   | 295<br>11.614       |
| C.180.150  | 150<br>5.91          | 203<br>7.99   | 353<br>13.898       |
| C.180.160  | 160<br>6.30          | 213<br>8.39   | 373<br>14.685       |
| C.180.175  | 175<br>6.89          | 228<br>8.98   | 403<br>15.866       |
| C.180.200  | 200<br>7.87          | 253<br>9.96   | 453<br>17.835       |

•Preferred Sizes

### On-Contact Force – Adjustable Black Model

#### Imperial

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

### Ordering Example:

**C.180.007. GR**

#### Part Number:

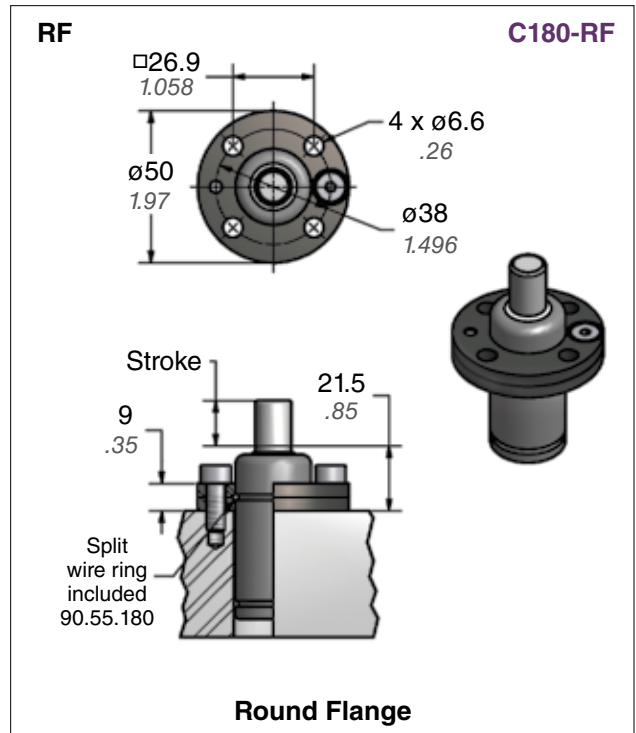
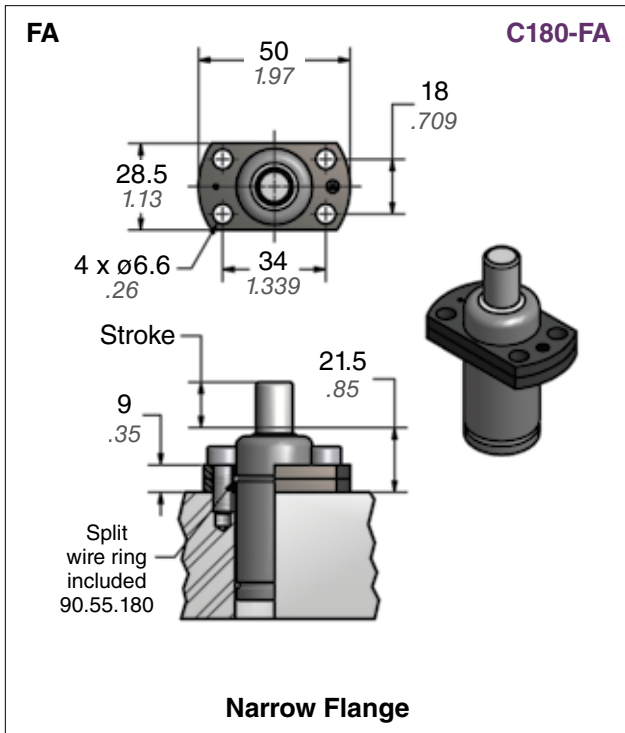
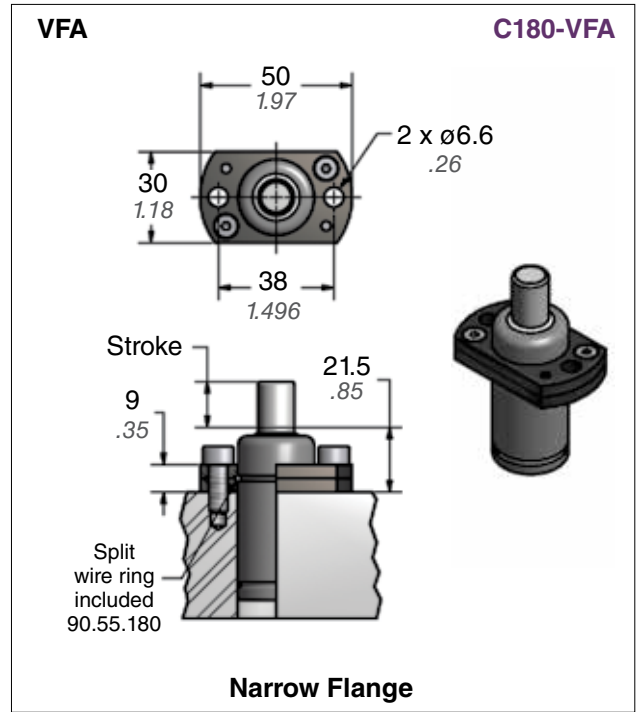
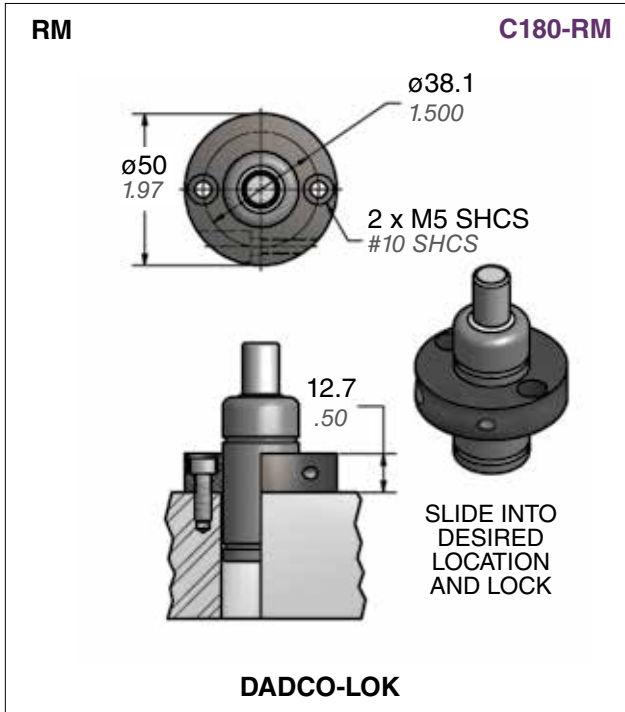
Includes Series, Model and Stroke Length  
150 mm - 200 mm strokes; contact DADCO  
for application evaluation.

#### 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

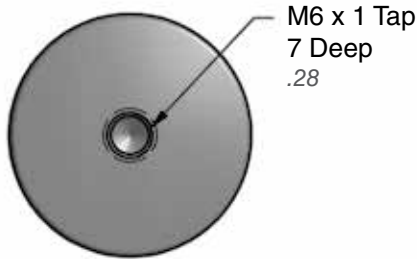
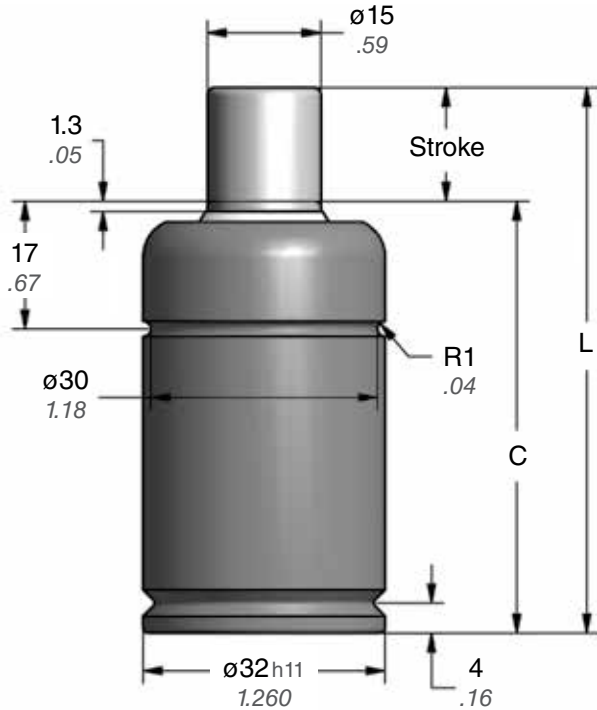
Mount Only Ordering Example: C180-RM

**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<br>mm<br>inch | C             | L<br>±0.4<br>±0.015 |
|------------|----------------------|---------------|---------------------|
| •C.250.007 | 07<br>.28            | 49<br>1.93    | 56<br>2.205         |
| C.250.010  | 10<br>.39            | 52<br>2.05    | 62<br>2.441         |
| C.250.013  | 12.7<br>.50          | 54.7<br>2.15  | 67.4<br>2.654       |
| •C.250.015 | 15<br>.59            | 57<br>2.24    | 72<br>2.835         |
| •C.250.025 | 25<br>.98            | 67<br>2.64    | 92<br>3.622         |
| •C.250.038 | 38<br>1.50           | 80<br>3.15    | 118<br>4.646        |
| •C.250.050 | 50<br>1.97           | 92<br>3.62    | 142<br>5.591        |
| C.250.063  | 63.5<br>2.50         | 108.5<br>4.27 | 172<br>6.772        |
| •C.250.080 | 80<br>3.15           | 125<br>4.92   | 205<br>8.071        |
| C.250.100  | 100<br>3.94          | 145<br>5.71   | 245<br>9.646        |
| C.250.125  | 125<br>4.92          | 170<br>6.69   | 295<br>11.614       |

• Preferred Sizes

### 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          |

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

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

### 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**

ø63  
2.48

ø50  
1.969

2 x M6 SHCS  
1/4 SHCS

12.7  
.50

**DADCO-LOK**

SLIDE INTO  
DESIRED  
LOCATION  
AND LOCK

**FA / C250-FA VFA / C250-VFA**

60  
2.36

37.5  
1.48

22  
.866

4 x ø6.6  
.26

40  
1.575

60  
2.36

50  
1.968

2 x ø6.6  
.26

Stroke

9  
.35

21.5  
.85

Split  
wire ring  
included  
90.55.250

**Narrow Flange**

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

**RF C250-RF**

□35.4  
1.394

ø60  
2.36

ø50  
1.969

4 x ø6.6  
.26

Stroke

9  
.35

21.5  
.85

Split  
wire ring  
included  
90.55.250

**Round Flange**

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

**SF C250-SF**

□50  
1.97

ø49.5  
1.949

4 x ø6.1  
.240

□35  
1.378

Stroke

7  
.28

**Split Flange**

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

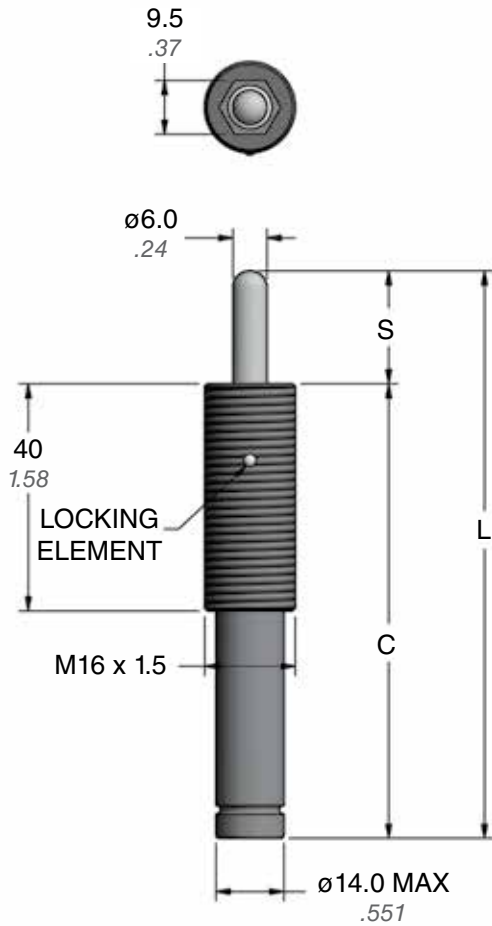
**Ordering Example:**

**C.250.007. RM. GR**

**Part Number:**  
Includes Series, Model and Stroke Length

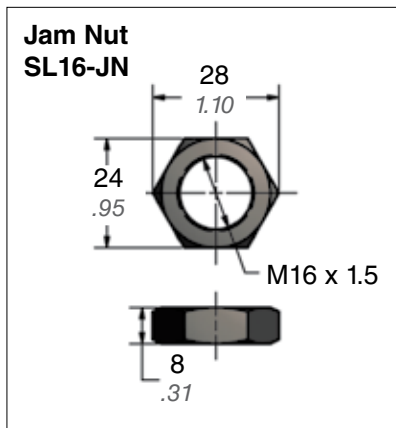
**Mount Option:**  
RM, FA, VFA, RF, SF  
Mount Only Ordering Example: C250-RM

**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<br>mm<br>inch | C           | L<br>±0.4<br>±0.015 |
|-------------|----------------------|-------------|---------------------|
| SL.16.010   | 10<br>.39            | 70<br>2.76  | 80<br>3.150         |
| • SL.16.020 | 20<br>.79            | 80<br>3.15  | 100<br>3.937        |
| SL.16.030   | 30<br>1.18           | 90<br>3.54  | 120<br>4.724        |
| SL.16.040   | 40<br>1.57           | 100<br>3.94 | 140<br>5.512        |
| • SL.16.050 | 50<br>1.97           | 110<br>4.33 | 160<br>6.299        |
| SL.16.060   | 60<br>2.36           | 120<br>4.72 | 180<br>7.087        |
| SL.16.070   | 70<br>2.76           | 130<br>5.12 | 200<br>7.874        |
| • SL.16.080 | 80<br>3.15           | 140<br>5.51 | 220<br>8.661        |
| SL.16.100   | 100<br>3.94          | 160<br>6.30 | 260<br>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**

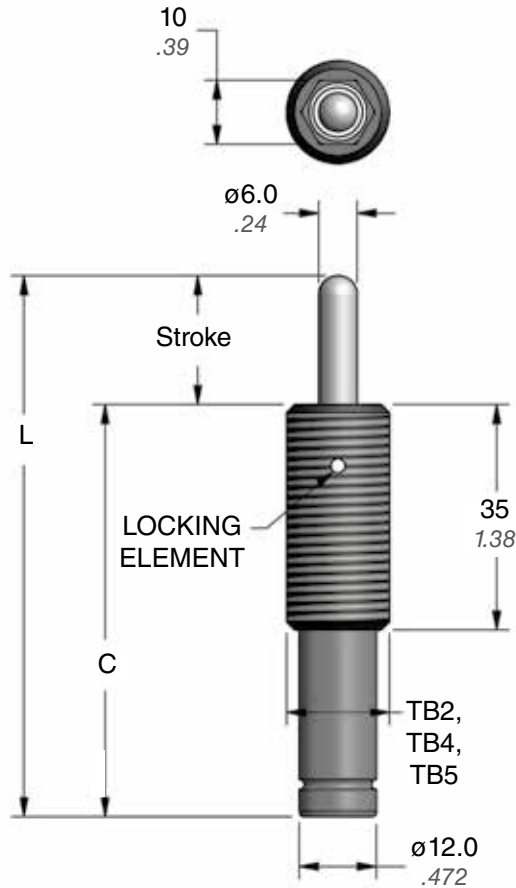
**Part Number:**

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**

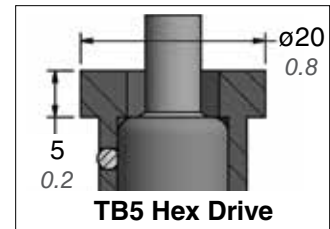
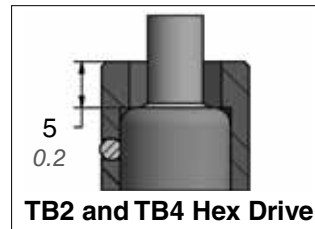


| Part No.   | Stroke<br>mm<br>inch | C           | L<br>±0.4<br>±0.015 |
|------------|----------------------|-------------|---------------------|
| E.16.015   | 15<br>.59            | 59<br>2.32  | 74<br>2.91          |
| • E.16.020 | 20<br>.79            | 64<br>2.52  | 84<br>3.307         |
| E.16.030   | 30<br>1.18           | 74<br>2.91  | 104<br>4.094        |
| E.16.040   | 40<br>1.57           | 84<br>3.31  | 124<br>4.882        |
| • E.16.050 | 50<br>1.97           | 94<br>3.70  | 144<br>5.669        |
| E.16.060   | 60<br>2.36           | 107<br>4.21 | 167<br>6.575        |
| E.16.070   | 70<br>2.76           | 117<br>4.61 | 187<br>7.362        |
| • E.16.080 | 80<br>3.15           | 127<br>5.00 | 207<br>8.150        |

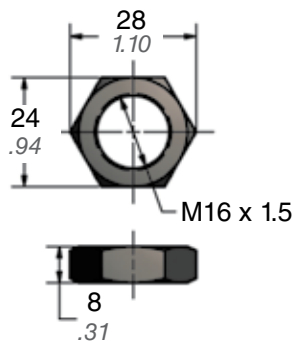
• Preferred Sizes

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

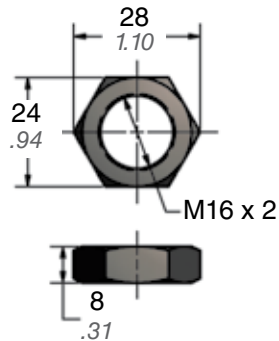
|        | TB2       | TB4     | TB5       |
|--------|-----------|---------|-----------|
| Thread | M16 x 1.5 | M16 x 2 | M16 x 1.5 |



**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           |

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

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

**Ordering Example:**

**E.16.020. TB2. 150**

**Part Number:**  
Includes Series, Model and Stroke Length

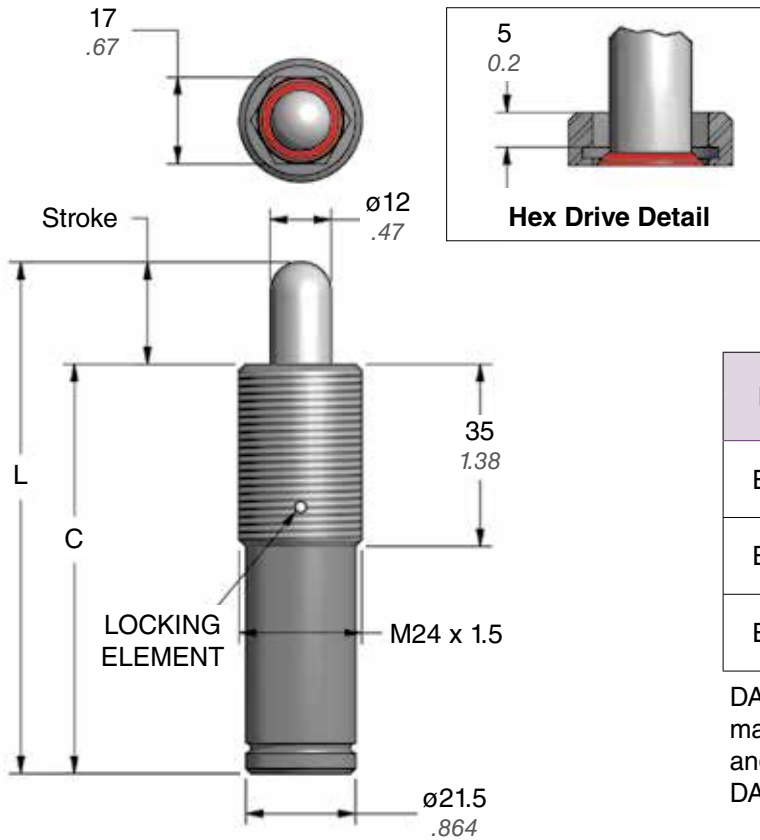
**Thread Option:**  
TB2, TB4, and TB5.

**Charging Pressure:**

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

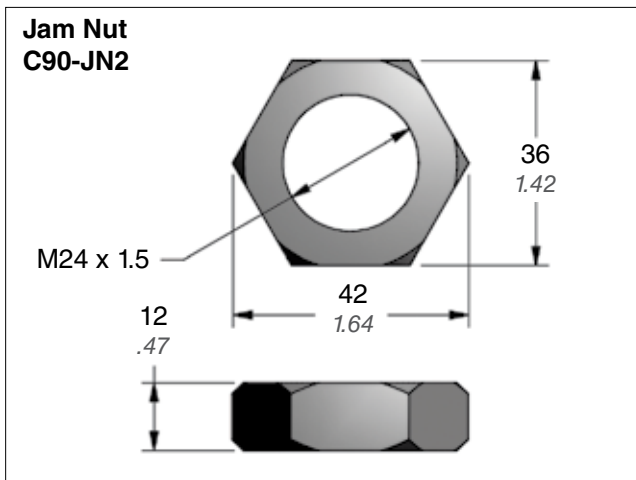
For more information on the TB5, reference B18120.

**E.24 Stock Lifter**



| Part No. | Stroke<br>mm<br>inch | C           | L<br>$\pm 0.4$<br>$\pm 0.015$ |
|----------|----------------------|-------------|-------------------------------|
| E.24.020 | 20<br>.79            | 80<br>3.15  | 100<br>3.937                  |
| E.24.050 | 50<br>1.97           | 110<br>4.33 | 160<br>6.299                  |
| E.24.080 | 80<br>3.15           | 140<br>5.51 | 220<br>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.



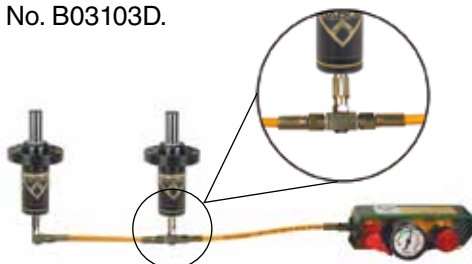
**Micro Wiper Cap**

For customers with applications where aggressive draw die compound is used, DADCO offers the Micro Wiper Cap. The wiper cap can be 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.



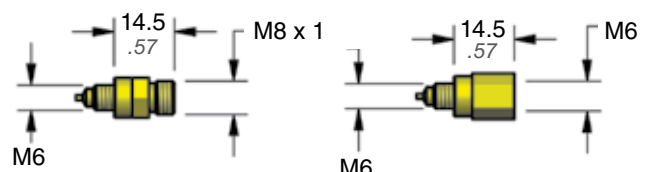
**Linked Micro System**

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)**

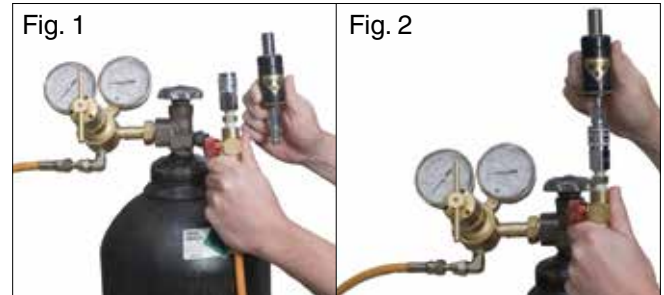
Micro Port Adapter Extension

### 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).



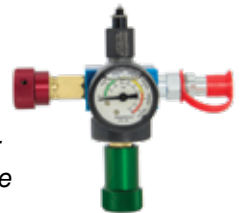
#### Quick Disconnect Charging Nipple 90.310.143

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.*



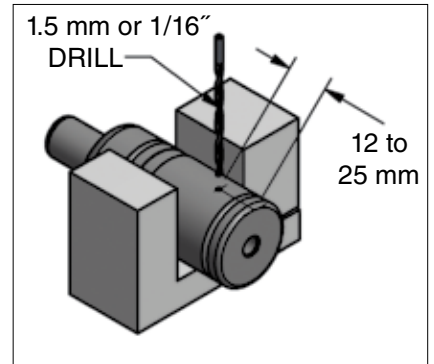
### How to discharge a Micro Gas Spring before disposal

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

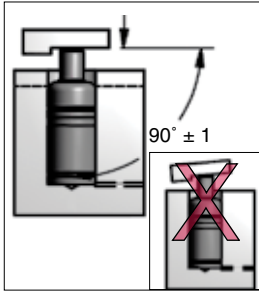
1. Discharge through the adjustable valve using the Valve Bleed Tool or Charging Adapter, 90.315.5.
2. If spring is damaged and cannot be discharged using the Valve Bleed Tool then drill a hole to discharge.



Valve Bleed Tool  
90.360.4



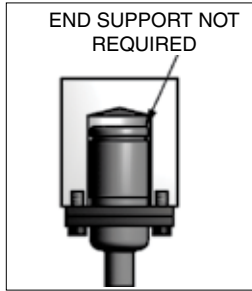
### General Recommendations



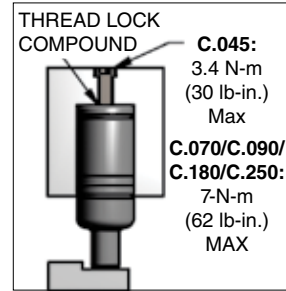
Side loading from axial or contact misalignment should be minimized,  $<1^\circ$ .



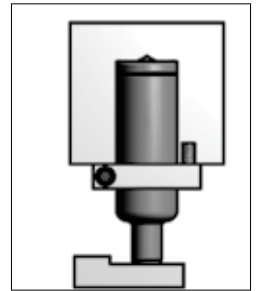
It is necessary to have a flat surface against the base of the spring in all circumstances. Incorrect pockets may cause structural damage or reduced life.



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

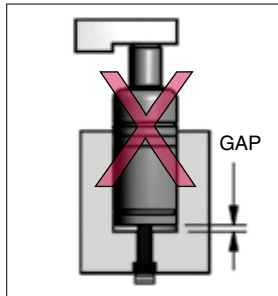


Retain inverted cylinders as shown with M6 cap screw. A close tolerance hole is required, depth  $> C/2$ .

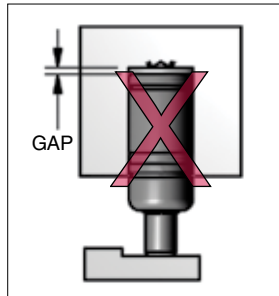


Mounts such as the DADCO-LOK may be used to retain the spring from rod end. If possible use a positive stop.

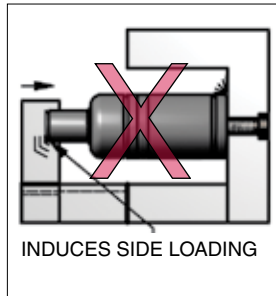
### Improper Installation Examples



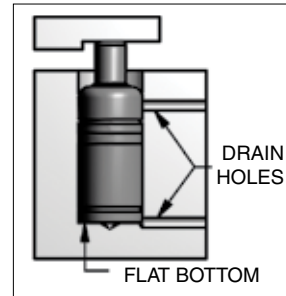
Verify the cap screw length.



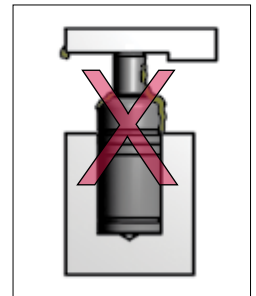
Avoid large gaps in the upper. Use the tapped hole in the base to secure and preload if possible.



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



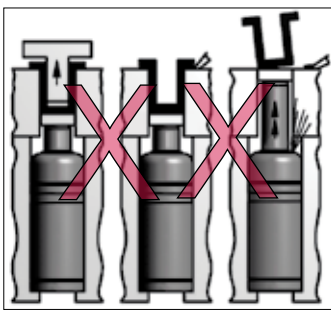
Provide adequate drainage in gas spring pockets. Direct contact with certain die lubricants and cleaners can be harmful to gas springs or may cause pressure increase.



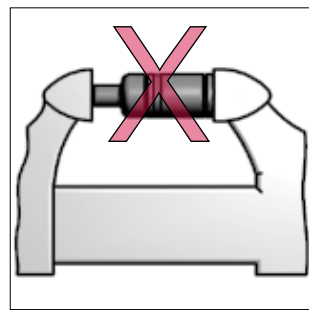
### Contaminants

### Uncontrolled Release

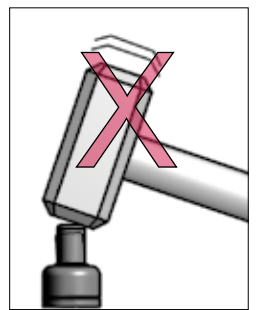
If parts are jamming, determine the root cause and repair it before production continues. Failure to repair the problem will cause failure or damage of the gas spring. Preloading the pad will prevent gas spring damage from "snap action" or sudden release. Restricting rod travel will help prevent spring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

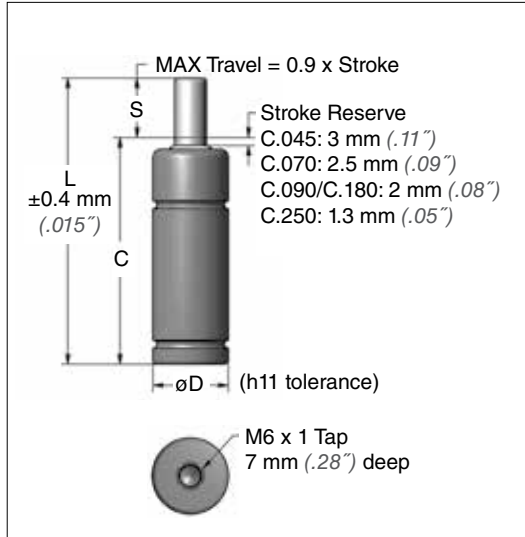


# Technical Data

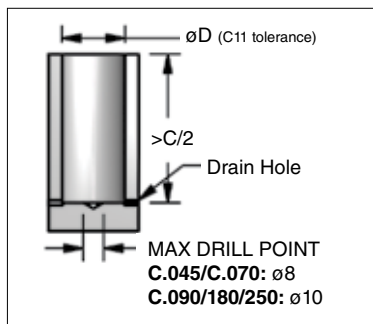
## Operating Specifications

|   |                        |                           |
|---|------------------------|---------------------------|
| 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) |
| <b>Micro 45® – Micro 250®:</b> 177 bar (2560 psi) | Maximum Speed:         | 1.6 m/sec (63 in/sec)     |
| SL.16: 180 bar (2600 psi)                         |                        |                           |

## General Information



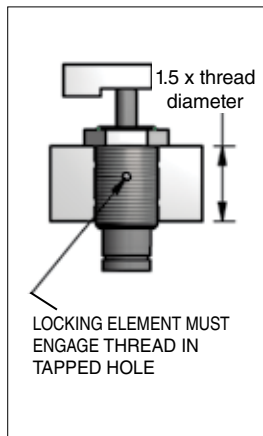
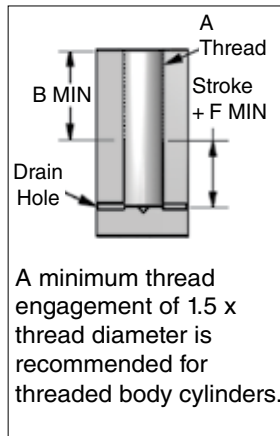
- DO NOT exceed 90% of stroke
- Stripping applications require a slight preload 0.5 mm – 1 mm
- Use enough force to strip the part
- Design adequate safety so spring is not over stroked



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

\*Based on strength of threads.

# DADCO®

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