Sectional Mounting Systems

SMS® and SMS-i®

Alternatives to Traditional Manifolds

PED 2014/68/EU COMPLIANT

Catalog No. C13106D
**SMS® and SMS-i®**

DADCO’s Sectional Mounting System (SMS®) is an established way to link DADCO nitrogen gas springs using a variety of available hose and fittings. Each system utilizes nitrogen gas springs mounted to a base plate, with the plumbing located on top of the plate, for unlimited mounting configurations. Each SMS® is assembled and tested at the factory to assure leak-free operation and is shipped ready to install.

### Features
- Unlimited design configurations
- Uniform pressure in system
- Cost effective
- Quick delivery
- Easy installation and removal
- Simplified maintenance

### SMS® Features

DADCO applies the following standards for Sectional Mounting System (SMS®) layouts unless otherwise specified.

<table>
<thead>
<tr>
<th>SMS® Layout</th>
<th>DADCO Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plate Thickness</td>
<td>25 mm (.98&quot;) Recommended +0/-0.13 mm (+.000/-0.005&quot;)</td>
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<tr>
<td>Plate Material</td>
<td>A36 HRS, Normalized Blanchard Ground</td>
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<td>Plate Edges</td>
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<tr>
<td>Fasteners</td>
<td>Metric SHCS</td>
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<td>Hose</td>
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<td>Hose Adapters</td>
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<td>Fittings</td>
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<td>Panel Mounting</td>
<td>DADCO riser blocks</td>
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<tr>
<td>Risers/Parallels</td>
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</table>

### Sample SMS® Layout

Send DADCO your new system specifications or your current manifold design to discover the advantages. When quoting a SMS®, please provide CAD files and detailed plate information including gas spring model, finished plate thickness, burnout dimensions, hole sizes, control panel, hose type, riser block requirements and any obstructions; refer to the sample provided below.
DADCO Gas Springs are grouped by two main classifications: Mini Springs with a M6 Port and Large Springs with a G 1/8 BSPP Port. DADCO recommends choosing control panels, fittings and hose type based on port style and application requirements. Refer to the Linked System Components Catalog for more information. To determine the force and pressure rise for your system use the DADCO Force Calculator from our website at www.dadco.net.

**Port Style**

### M6 Mini Port
- **Control Panels**
- **Distribution Blocks**

### G 1/8 Large Port
- **Surge Tanks**
- **Tools**

#### Gas Springs with M6 Port:
- U.0400 – U.2600
- LJ and L Series
- SCR Series
- 90.10.00170

#### Gas Springs with G 1/8 Port:
- U.4600 – U.20000
- UH Series
- UX Series
- 90.8 Series
- 90.10.00500 – 90.10.10000
- SCL.01000 – SCL.18300

### Compatible Fitting Styles
- **DADCO MINILink® (M8 x 1)**
- **D-24 Tapered (M12 x 1.5)**
- **Zip (C NOMO) (S12.65 x 1.5)**
- **O-Ring Face Seal (ORFS) (9/16-18)**

### Hose System
- **SMS® Preferred**
- 90.700 (Y-700) Hose
- 90.705 (Y-705) Hose
- 90.500 (Y-500) Hose
- 90.400 (Y-400) Hose
**SMS® and SMS-i®**

**SMS® Cylinder Mounting**

Cylinders must be secured to the base plate according to the proper torque specification indicated below. Use a serviceable thread locking compound when installing socket head cap screws.

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**SMS® Connection**

DADCO gas springs used in a SMS® are attached to the base plate with standard mounting hardware and piped through the side port. Refer to the port type of your springs to determine the best hose and fittings to use.

**Use a serviceable thread locking compound and lock washers when installing socket head cap screws.**

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**Thread Engagement**

Refer to the preferred engagement range when determining the length of SHCS.

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### SMS® Connection

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**SMS® Installation Specifications**

Refer to the preferred connection for the base plate with standard mounting hardware and hose and fittings to use.

**Thread Engagement Range**

Refer to the preferred engagement range when determining the length of SHCS.
Below are examples of SMS® layouts as guidelines for the different configurations that can maximize cost-savings. To determine the force and pressure rise for your system use the DADCO Force Calculator from our website at www.dadco.net.

**Standard System Configuration**

Cylinders are linked in series with hose and fittings to a single control panel for a clean design and uniform force. Provide details about obstructions in the die to help with the routing of the hose assemblies so they do not interfere with operation. Hose Straps may be used to help hold the hose assemblies in place. To avoid taut connections and kinks in the hose adhere to the recommended hose length and bend radius. The bend radius is measured to the inside of the hose bend, not the centerline of the hose. Refer to catalog C09118F for hose specifications.

**Multiple Force Zones**

With the use of a Multi Panel, an SMS® can be designed to create different zones. Each color in the drawing represents a different force zone that is controlled by a different module. This type of layout can add additional versatility to the plate.

**Reduced Pressure Rise**

Link multiple cylinders to a surge tank to increase the volume of gas and reduce the pressure rise in the system. Use Y-400 hose and direct connections from each cylinder to the surge tank for optimum gas flow.

**Tight Configurations**

SMS® designs can utilize distribution blocks to create tight cylinder configurations and uniform force.
DADCO’s Sectional Mounting System - Internal (SMS-i®) is a popular alternative to conventional manifold systems. SMS-i® utilizes DADCO gas springs mounted to a base plate and all of the connecting passages are drilled within the plate, obviating the need for external hose and fittings. DADCO’s SMS-i® is less expensive, performs better and is easier to maintain than conventional manifold systems. Each SMS-i® is factory tested to assure leak-free operation and is shipped ready to install. Contact DADCO Engineering for a proposal.

### Features
- Simplifies design with internal plumbing
- Uniform pressure in system
- Cost effective
- Tight configurations possible
- Quick delivery
- Less machining in the die
- Easy maintenance and installation

DADCO applies the following standards for Sectional Mounting System - Internal (SMS-i®) layouts unless otherwise specified.

<table>
<thead>
<tr>
<th>SMS-i® Layout</th>
<th>DADCO Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plate Thickness*</td>
<td>25 mm (.98”) Minimum Recommended +0/-0.13 mm (+.000/-0.005”)</td>
</tr>
<tr>
<td>Plate Material</td>
<td>A36 HRS, Normalized Blanchard Ground</td>
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<td>Plate Edges</td>
<td>Burned out and Painted ±2 mm (±.08”)</td>
</tr>
<tr>
<td>Fasteners</td>
<td>Metric SHCS</td>
</tr>
</tbody>
</table>

*Varies by system configuration

### Sample SMS-i® Layout
Send DADCO your new system specifications or your current manifold design to discover the advantages. When quoting a SMS-i®, please provide CAD files and detailed plate information including gas spring model, finished plate thickness, burnout dimensions and hole sizes; refer to the sample provided below.

The SMS-i® facilitates filling, draining and monitoring from a control panel mounted directly to the plate or from outside the die. A pressure monitor may be included to alert press controllers of changes to the system pressure. Surge tanks increase the volume in the system thereby reducing the pressure rise, lowering the heat produced during operation and extending the life of the cylinders.
DADCO recommends following the guidelines below when designing SMS-i® layouts to maximize cost-savings. To determine the force and pressure rise for your system use the DADCO Force Calculator from our website at www.dadco.net.

**Recommended Layout**

- **Control Panel Location**
  - Mount the control panel to the plate using an existing port.

- **Thru-Hole / Feature Placement**
  - Make sure thru-holes and other plate features are clear of nitrogen ports.

- **Drill Location**
  - Drills should run completely through the plate or intersect another drilled port.

- **Gas Spring Arrangement**
  - Align gas springs where possible so they share G 1/8 ports.

- **Machining on Plate Sides**
  - Place ports on as few sides of the plate as possible to reduce machining requirements. Plates must be machined on every edge that contains a G 1/8 port.

**Items that Increase the Complexity of SMS-i® Machining**

- **Blind Holes**
  - Avoid drilling G 1/8 ports as blind holes since it makes clean-up and deburring difficult.

- **Control Panel Location**
  - Refrain from isolating a control panel to its own G 1/8 port to minimize cost and complexity.

- **Thru-Hole / Feature Placement**
  - Avoid interior burnouts, thru-holes and cylinder mounting holes where there is not adequate clearance around G 1/8 ports.

- **Machining on Plate Sides**
  - Adding G 1/8 ports to all four sides of the plate is costly. Plates must be machined on every edge that contains a G 1/8 port.

- **Gas Spring Arrangement**
  - Avoid offset placement of gas springs. It requires individual G 1/8 ports, increasing cost and complexity.

**Additional Recommendations**

- **Plate Thickness**
  - 25 mm (0.98”) Minimum Recommended

- **Maximum Drill Depth for G 1/8 Ports**
  - 42” per port
  - *(NOTE: For two G 1/8 ports drilled from opposite ends that meet in the middle, the combined port length becomes 84”)*

- **Control Panel Location**
  - Control panels can be mounted to a plate or piped externally using hose and fittings.

- **Long Stroke Gas Springs**
  - Choose longer stroke gas springs mounted directly to the plate (over increased plate thickness) to achieve the desired contact point and to gain more volume in the system.
**SMS-i® Cylinder Mounting**

Cylinders must be secured to the base plate according to the proper torque specification indicated below. Use a serviceable thread locking compound when installing socket head cap screws. Contact DADCO for information on gas springs not listed below.

<table>
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<tr>
<th>Series</th>
<th>Model</th>
<th>SHCS</th>
<th>Torque</th>
<th>Preferred Thread Engagement Range</th>
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<td>.40 - .43</td>
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<td>M8</td>
<td>UMR08</td>
<td>15.3</td>
<td>.28 - .31</td>
<td>90.270 N/A</td>
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<td>UMR08</td>
<td>15.3</td>
<td>.24 - .28</td>
<td>90.270 N/A</td>
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<td>.24 - .28</td>
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<td>UMR10</td>
<td>6</td>
<td>.31 - .35</td>
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</tbody>
</table>

**U Series Mount Pattern for SMS-i® Gas Springs**

DADCO’s U.0600-U.1200 gas springs installed in a SMS-i® have additional bottom mounting holes used to attach to the base plate. Replacement springs ordered with the ‘TG’ mount option will have this mounting pattern.

**Replacement SMS-i® Gas Spring Ordering Example:**

- **Part Number:** Includes Series, Model and Stroke Length.
- **Mount Option:** TO = Basic Model or TG = Additional Mounting Holes (U.0600-U.1200 only).
- **Fitting Connection:**
  - M = SMS-i® (bottom port + sealing component).
  - M1 = SMS-i® (larger bottom port for increased flow + sealing component).

Reference the laser mark on the cylinder when ordering replacement springs.
Components: Control Panels

DADCO offers a variety of control panels that are used to fill, drain and monitor the pressure of linked nitrogen gas springs from outside the die. For a control panel that may be mounted directly to a SMS-i® plate order 90.406.P1M or 90.407.PM. Optionally, DADCO offers a variety of pressure monitors to alert controllers to changes in system pressure. Refer to the Linked System Components Catalog for detailed information on pressure monitors and more information on the control panels.

Convertible Control Panel

Ordering Example:

- **Convertible Control Panel**
  - **Gauge Style**
    - PSI/Bar Gauge (DPG-3RB) = P
    - Bar/MPa Gauge (DPG-3RM) = A
  - **Guard**
    - Top Guard = 1, Top and Bottom Guards = 2
  - **Fitting Connection**
    - N = No Fitting Supplied,
    - M = Manifold Seal,
    - S = ORFS Fitting,
    - D = D-24 Fitting,
    - B = Zip Fitting,
    - L = MINILink® Fitting
  - When not specified, default is N.

**NOTE:** The 90.406.P2S is a direct replacement of DADCO’s 90.406.03.

Compact Control Panel

Ordering Example:

- **Compact Control Panel**
  - **Gauge Style**
    - PSI/Bar Gauge = P
  - **Fitting Connection**
    - N = No Fitting Supplied,
    - S = ORFS Fitting,
    - D = D-24 Fitting,
    - B = Zip Fitting,
    - L = MINILink® Fitting
  - When not specified, default is N.

Mini Convertible Control Panel

Ordering Example:

- **Mini Convertible Control Panel**
  - **Gauge Style**
    - PSI/Bar Gauge = P
  - **Fitting Connection**
    - N = No Fitting Supplied,
    - S = ORFS Fitting,
    - D = D-24 Fitting,
    - B = Zip Fitting,
    - L = MINILink® Fitting
  - When not specified, default is N.

Mini Control Panel

Ordering Example:

- **Mini Control Panel**
  - **Gauge Style**
    - PSI/Bar Gauge = P
  - **Fitting Connection**
    - N = No Fitting Supplied,
    - M = Manifold Seal,
    - S = ORFS Fitting,
    - D = D-24 Fitting,
    - B = Zip Fitting,
    - L = MINILink® Fitting
  - When not specified, default is N.

Multi Panel

Ordering Example:

- **Guard Location**
  - Standard (No Guard) = 401, Top = 402, Bottom = 403, Both = 404
  - **Number of Modules**
    - 2-6, 8 or 10
  - For optional reversed mounting, add R.

Ordering Example:

- **Multi Panel**
  - **Dimensions**
    - H = 76 mm, W = 44.5 x (N+1) mm, D = 94 mm
DADCO surge tanks are used with open-flow systems to increase the volume in the system thereby reducing the pressure rise when cylinders are stroked. The Surge Tank is offered in two Models: F – Free Flow Model with multiple open ports supplied as standard for maximum flexibility when piping; M1 – SMS-i® Model with a bottom port to attach to a base plate. Gauges and shut-off ball valves are available upon request. For assistance in determining appropriate surge tank size for your system, use the DADCO Force Calculator from our website at www.dadco.net.

90.400 (Y-400) hose is the preferred hose to use with surge tanks. 90.700 (Y-700) / 90.705 (Y-705) hose is generally not recommended for use due to restricted flow capability.

Components: Surge Tanks

DADCO surge tanks ordered with the M1 operating system are used in a SMS-i® and have a bottom port. These tanks are attached to the base plate with a sealing washer and standard mounting hardware.

Surge Tanks

<table>
<thead>
<tr>
<th>Surge Tank</th>
<th>CYL REF</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>J</th>
<th>K</th>
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<td>7500</td>
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<td>120</td>
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<td>10000</td>
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<td>100</td>
<td>3.94</td>
<td>150</td>
<td>5.91</td>
<td>150</td>
</tr>
</tbody>
</table>

**Surge Tank Recommendations**

**Charging Medium:** Nitrogen Gas

**Operating System:** F = Free Flow Fitting, M1 = SMS-i® (Bottom port + sealing component)

**Mount Option:** TO = Basic Model. When not specified, default is TO. Mount ordered with cylinder will be attached at factory.

**Charging Pressure Range:** 15 – 150 bar (220 – 2175 psi)

*Note: Surge Tank pressure should not exceed 264 bar (3828 psi) at maximum temperature.*

**Ordering Example:**

**Size:**

30, 50, 75, 100

**Length (Y):**

50, 100, 150, 200, 250, 300, 350, 400

**Charging Medium:** Nitrogen Gas

**Operating Temperature:** 4°C – 71°C (40°F – 160°F)
Accessories

Safety Plates for SMS® & SMS-i®
DADCO supplies a safety plate with every SMS® and SMS-i® to ensure proper handling of the cylinders. For information on the different plates available or to order a replacement refer to bulletin B01103C.

Shut-Off Valve
MV-3G
DADCO’s Shut-off Valve (MV-3G) is used with SMS-i® allowing for cut-off of nitrogen gas from the control panel while enabling the SMS-i® to remain charged. For more information refer to bulletin B14136.

Pressure Monitors
DADCO offers a variety of pressure monitor options to alert press controllers to changes in system pressure. Some models, including the 90.421.2D, are capable of shutting the press down if it drops below the minimum operating pressure. The new electronic pressure monitors are available in several configurations with different cable, base and fitting options to best suit the application. For more information refer to catalog C09118G.

Quick Disconnect Charging Assembly
Use the DADCO Quick Disconnect Charging Assembly, 90.310.040, with the 90.310.143 or 90.310.111 Charging Nipple or the 90.315.5 Pressure Analyzer to charge self-contained gas springs. The 90.310.040 can also be used with a DADCO control panel to charge linked systems.

The 90.310.044 Quick Disconnect Filling Assembly with self-venting capabilities releases residual pressure after charging self-contained or linked nitrogen gas spring systems for easy decoupling between the filling assembly and charging nipple or filler valve.

DADCO recommends using the 90.310.044 or the 90.310.041 High Pressure Charging Assembly to charge SCR Series and U.0400 nitrogen gas springs to maximum pressure. For more information refer to bulletin B16118B.

Compact Nitrogen Gas Booster
DGB.100
DADCO’s Compact Nitrogen Gas Booster System, DGB.100, is a lightweight, cost-effective way to extend the life of your nitrogen supply tanks. Using the DGB.100, tanks with low pressure can be boosted to a higher pressure suitable for gas spring charging. For more information refer to bulletin B13105.

Nitrogen Gas Booster System
DGB.150
DADCO’s Nitrogen Gas Booster System, DGB-150, is an all-in-one solution to the problems of low pressure supply tanks and lost nitrogen gas during discharge. For more information on the booster, refer to bulletin B07101.

90.310.040
Pressure Regulator
90.310.201
Hose Assembly
90.310.252
3 m / 10 ft
Quick Disconnect Filling Assembly - 90.310.338
Pressure Regulator
90.310.205
90.310.044 (Self-Venting)
Hose Assembly
90.310.252
3 m / 10 ft
Quick Disconnect Filling Assembly - 90.310.340*

*Not recommended with 90.416.A2B or 90.406.421