Nitrogen Gas Spring Linked System Components

Everything You Need to Construct a Linked System
Linked Systems

Introduction

Numerous Piping Options

Many customers recognize the benefits of linking nitrogen gas springs; linked systems allow users to easily monitor, control and adjust pressure from outside the die. In this catalog DADCO has brought together all of the components necessary to easily configure a linked system. Choose from the various types of fittings, hose, control panels and specialty components to design a linked system best suited for your application.

DADCO also offers ready-to-install complete linked systems built to customer specifications.

Complete Linked Systems from DADCO

For those instances where a customer prefers to have DADCO provide a finished system, DADCO offers several options. First is the Sectional Mounting System (SMS®) where DADCO will mount cylinders to a SMS® plate and link them using hose, fittings and a control panel based on a customer design. For more information on DADCO’s SMS® request catalog C13106B.

Another option, which is new from DADCO, is the Sectional Mounting System - Internal (SMS-i®). DADCO will mount cylinders to a plate that has been piped internally. DADCO recommends using the SMS-i® as an alternative to traditional manifold systems. For more information on DADCO’s SMS-i® request catalog C13106B.

DADCO gas springs used in a SMS-i® have a bottom port and are attached to the base plate with a sealing washer and standard mounting hardware.
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.

### Port Style

#### M6 Mini Port
- Micro Series
  - U.0175 – U.2600
- L Series
- SCR Series
- FCL Series
- 90.10.00170

#### G 1/8 Large Port
- UH Series
- UX Series
- 90.8 Series
- 90.10.00500 – 90.10.10000
- SC Series

### Compatible Fitting Styles

- **DADCO MINILink®** (M8 x 1)
  - See page 16
- **D-24 Tapered** (M12 x 1.5)
  - See page 15
- **Zip (CNOMO)** (S12.65 x 1.5)
  - See page 17
- **O-Ring Face Seal (ORFS)** (9/16-18)
  - See pages 12-14

### Hose System
- **90.700 (Y-700) Hose**
- **90.705 (Y-705) Hose**
  - Preferred
  - See page 11
- **90.500 (Y-500) Hose**
  - Preferred
  - See page 11
- **90.400 (Y-400) Hose**
  - See page 11
- **90.250 (Y-250) Hose**
  - See page 11
Converting from Self-Contained to Linked Mode

The following basic steps show how to easily convert DADCO gas springs from self-contained to linked mode. For more detailed instructions, refer to the relevant product catalog. *(Mini series gas spring with M6 port shown below.)*

1. **Remove Protective Screw**
2. **Safely Exhaust Gas Spring**
3. **Remove Valve**
4. **Install Port Adapter**

**CAUTION**
Always wear safety goggles when performing maintenance on nitrogen gas springs.

Recommendations for Linked Systems

- Allow ample space to secure hoses to plate. It is preferred that hoses rest side by side.
- Arrange gas springs to provide uniformity and balance within the die. Use multiple panels for large systems to allow faster filling and discharging.
- When linking cylinders allow for ample hose to avoid taut connections.

Torque Specifications

Tighten fittings to the following torque specifications to prevent damage and loosening from vibration during operation.

<table>
<thead>
<tr>
<th>Type</th>
<th>Thread</th>
<th>lb-in</th>
<th>lb·ft</th>
<th>N·m</th>
</tr>
</thead>
<tbody>
<tr>
<td>M6 Port Adapter</td>
<td>M6 x 1</td>
<td>25</td>
<td>2.1</td>
<td>3</td>
</tr>
<tr>
<td>MINILink® Hose Adapter</td>
<td>M8 x 1</td>
<td>25</td>
<td>2.1</td>
<td>3</td>
</tr>
<tr>
<td>G 1/8 Port Adapter</td>
<td>BSPP</td>
<td>168</td>
<td>14</td>
<td>19</td>
</tr>
<tr>
<td>ORFS Hose Adapter</td>
<td>9/16-18</td>
<td>204</td>
<td>17</td>
<td>23</td>
</tr>
<tr>
<td>D-24 Hose Adapter</td>
<td>M12 x 1.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zip Hose Adapter</td>
<td>S12.65 x 1.5</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Use two wrenches, one on the port adapter and one on the hose adapter, to avoid over-tightening. The drawings below depict the importance of torque specifications in common port and hose adapter combinations.

**NOTE:** It is important to adhere to these guidelines for the following fittings: 90.505.116 and 90.508.116.
The DADCO Convertible Control Panel is used to fill, drain and monitor the pressure of linked DADCO nitrogen gas springs from outside the die. The panel consists of four G 1/8 BSPP ports, a high pressure 63 mm diameter gauge, a quick disconnect fill valve, a bleed valve and a rupture disk to prevent overpressurization. For maximum versatility, the panel is available with a variety of fitting connections. See below for information on the riser blocks available for use with the control panel.

Ordering Example:

Convertible Control Panel

Gauge Style
PSI/Bar Gauge (DPG-3RB) = P
Bar/MPa Gauge (DPG-3RM) = A
When not specified, default is P.

Guard
Top Guard = 1
Top and Bottom Guards = 2
When not specified, default is 1.

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

Riser Block for Convertible Control Panel

**Linked Systems**

**Components: Control Panels**

**Common Control Panel**

The DADCO Common Control Panel is used to fill and monitor the pressure of linked DADCO Nitrogen Gas Springs from outside the die. The panel consists of a high pressure gauge (MPa and bar), a quick disconnect fill valve, and a rupture disk to prevent overpressurization. This Control Panel conforms to the Toyota standard.

**Mini Convertible Control Panel**

The DADCO Mini Convertible Control Panel is used to fill, drain and monitor the pressure of linked DADCO nitrogen gas springs from outside the die. The panel is compatible with SMS-i® and traditional linked systems and has five M6 ports, a high pressure gauge, a quick disconnect fill valve, a bleed valve and a rupture disk to prevent overpressurization. To allow for maximum versatility when linking, the panel is available with a variety of fitting connections.

**Ordering Example:**

<table>
<thead>
<tr>
<th>Common Control Panel</th>
<th>90.416.</th>
<th>A 2 B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gauge Style</td>
<td>Bar/MPa Gauge = A</td>
<td>psi/bar Gauge = P</td>
</tr>
<tr>
<td>Fitting Connection</td>
<td>No Fitting = N</td>
<td>Zip Fitting = B</td>
</tr>
<tr>
<td>Guard Options</td>
<td>None = N</td>
<td>Top Only = 1</td>
</tr>
</tbody>
</table>

**Ordering Example:**

<table>
<thead>
<tr>
<th>Mini Control Panel</th>
<th>90.407.</th>
<th>P N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gauge Style</td>
<td>PSI/Bar Gauge = P</td>
<td></td>
</tr>
<tr>
<td>Fitting Connection</td>
<td>N = No Fitting Supplied, M = Manifold Seal, S = ORFS Fitting, D = D-24 Fitting, B = Zip Fitting, L = MINILink® Fitting</td>
<td></td>
</tr>
<tr>
<td>When not specified, default is N</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Components: Control Panels

**Compact Control Panel**

The smallest of our control panels, the DADCO Compact Control Panel is used to fill, drain and monitor the pressure of linked DADCO nitrogen gas springs from outside the die. The panel consists of two G 1/8 BSPP ports, a high pressure gauge, a quick disconnect fill valve, a bleed valve and a rupture disk to prevent overpressurization. To allow for connection to Electronic Pressure Monitors, the panel comes standard with a G 1/4 BSPP port. For Electronic Monitor options, see page 20.

![Compact Control Panel Diagram](image)

**Ordering Example:**

```
90.405. P N

Compact Control Panel
Gauge Style
PSI/Bar Gauge = P
Bar/MPa Gauge = A
When not specified, default is P.
```

**Pressure Monitor Sensor Options (optional)**
- EDS = Electronic Pressure Switch
- DSK = Piston Pressure Switch
- DPS = Dial Pressure Switch
- DPT = Electronic Pressure Transmitter

**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 90.407.11G**

— For Retrofit Only —

The DADCO 90.407.11G Mini Control Panel is used to fill, drain and monitor the pressure of linked DADCO nitrogen gas springs from outside the die. The panel consists of a high pressure gauge, a quick disconnect fill valve, a bleed valve and a rupture disk to prevent overpressurization. To allow for maximum versatility when linking, the panel also contains eleven different port locations.

![Mini Control Panel Diagram](image)

**Mounting Options**

![Mounting Options Diagram](image)
Multi Panel

The DADCO Multi Panel features modules that may be filled, monitored, adjusted and vented from outside the die, either commonly or individually. No other control panel offers the advantages of the DADCO Multi Panel. For replacement parts refer to bulletin B04105B.

Features
- Each module features a simple two position valve for easy operation.
- Three port locations on each module give maximum piping flexibility.
- Each module is supplied with a straight service fitting. (For unused ports, DADCO recommends closing the module off before filling or using tube end caps, 90.506.112, on the unused port.)
- The panel can be flush mounted on the bottom or back.
- An optional tilt-guard protects all control valves and gauges during operation.

Ordering Example:

Guard Location:
- Standard (No Guard) = 401, Top = 402,
- Bottom = 403, Both = 404

Number of Modules:
- 2-6, 8 or 10

Contact DADCO for pressure monitor options

Mounting Options

Top Guard – 90.402
Bottom Guard – 90.403
Both Guards – 90.404
Components: Distribution Blocks

DADCO’s distribution blocks are used with a control panel to simplify piping to multiple cylinders with a uniform system pressure. M6 and G 1/8 port options are available.

**Mini M6 Distribution Blocks**
The Mini Distribution Blocks feature four or eight M6 port locations. Plug unused ports with 90.607.110 Port Plug before charging the system.

**Compact G 1/8 Distribution Blocks**
The Compact Distribution Block has 6-12 G 1/8 ports. Plug unused ports with 90.505.110 Port Plug before charging the system.

**Standard G 1/8 Distribution Blocks**
90.411.04 / 90.411.10 / 90.411.12
The Standard Distribution Block features 4, 10 or 12 G 1/8 ports. Plug unused ports with 90.505.110 Port Plug before charging the system. Refer to bulletin B03142B for more information.
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 has multiple open ports supplied as standard for maximum flexibility when piping; M1– SMS-i® Model has 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, see B14102 or use the DADCO Force Calculator from our website, 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 not recommended for use with surge tanks due to restricted flow capability.

Components: Surge Tanks

Preferred Mounts for Surge Tanks. See the 90.10 / 90.8 Series Catalog for mount details.

SMS-i® Surge Tank Connection

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.

Ordering Example:

<table>
<thead>
<tr>
<th>Size:</th>
<th>ST. 30</th>
<th>50</th>
<th>75</th>
<th>100</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>3000</td>
<td>95</td>
<td>75</td>
<td>195</td>
</tr>
<tr>
<td>50</td>
<td>5000</td>
<td>100</td>
<td>150</td>
<td>178</td>
</tr>
<tr>
<td>75</td>
<td>7500</td>
<td>150</td>
<td>120</td>
<td>306</td>
</tr>
<tr>
<td>100</td>
<td>10000</td>
<td>100</td>
<td>150</td>
<td>344</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ST. 50</th>
<th>150</th>
<th>TO. F</th>
</tr>
</thead>
<tbody>
<tr>
<td>75</td>
<td>767</td>
<td>3.94</td>
</tr>
<tr>
<td>100</td>
<td>125</td>
<td>2.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Surge Tank</th>
<th>CYL</th>
<th>REF</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>J</th>
<th>K</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>95</td>
<td>3.74</td>
<td>50</td>
<td>2.95</td>
<td>4 x M10</td>
<td>25.4</td>
<td>38</td>
<td>50.5</td>
<td></td>
</tr>
<tr>
<td>50</td>
<td>120</td>
<td>3.59</td>
<td>90</td>
<td>4.72</td>
<td>4 x M10</td>
<td>25.4</td>
<td>38</td>
<td>78</td>
<td></td>
</tr>
<tr>
<td>75</td>
<td>150</td>
<td>3.99</td>
<td>120</td>
<td>4.72</td>
<td>4 x M10</td>
<td>25.4</td>
<td>38</td>
<td>85</td>
<td></td>
</tr>
<tr>
<td>100</td>
<td>184</td>
<td>5.91</td>
<td>150</td>
<td>4.72</td>
<td>4 x M10</td>
<td>25.4</td>
<td>38</td>
<td>85</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Charging Medium:</th>
<th>Nitrogen Gas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Temperature:</td>
<td>4°C – 71°C (40°F – 160°F)</td>
</tr>
</tbody>
</table>

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

734.207.1100 • fax 734.207.2222 • www.dadco.net
Components: Hose

**MINIFLEX® 90.700 (Y-700) Hose**

- Preferred
- Offers the smallest possible bend radius available for flexible hose
- Compatible with Mini, ORFS, D-24 and Zip style fittings
- Cannot be linked with a surge tank

**MINIFLEX® 90.705 (Y-705) Hose**

- Preferred
- Compatible with Mini, ORFS, D-24 and Zip style fittings
- High burst pressure
- Cannot be linked with a surge tank
- Large bend radius

**DADCOFLEX® 90.400 (Y-400) Hose**

- Can withstand high pressures while maintaining a good flow rate
- Can be linked with a surge tank
-Least flexible bend radius

**DADCOFLEX® 90.250 (Y-250) Hose**

- Preferred
- Assembly in field without additional tools using non-crimped adapters
- 190 bar (2750 psi) is maximum for surging pressure

**DADCOFLEX® 90.500 (Y-500) Hose**

- Preferred
- Higher working pressure than 90.250 (Y-250) without sacrificing bend radius or flow rate
- Compatible with ORFS and D-24 style fittings
- Can be linked with a surge tank

**DF Tubing**

- DF
  - Length (mm)
  - Extremely durable and compact
  - Dimensions critical, no flexibility
  - To order straight lengths of DF Tubing, use the part number above.
  - Attached to the DF tubing, it is necessary to provide a drawing. Refer to Bulletin B02118B for more information.

**Hose Assembly**

A DADC0 hose assembly consists of a length of hose with a hose adapter on each end. Refer to bulletin 99B105F for more information on ordering a hose assembly.

**Hose Assembly Ordering Example:**

- **Hose Type**
  - (700, 705, 500, 400 or 250)
- **Hose Adapters**
  - Sealing Type
    - ORFS
    - D-24
    - Mini
    - Zip
  - Example
    - S943
    - D843
    - L943
    - B943

Reference appropriate sealing type prefix (S, D, L or B).

**Hose Straps**

- **90.504.701 (HS-701)** for use with 90.700 and 90.705 hose types
- **90.504.700 (HS-700)** for use with 90.700 and 90.705 hose types
- **90.504.250 (HS-250)** for use with 90.500 and 90.250 hose types
- **90.504.500 (HS-500)** for use with 90.500 and 90.250 hose types
- **90.504.400 (HS-400)** for use with 90.500, 90.400 and 90.250 hose types
DADCO was the first gas spring manufacturer to offer 9/16-18 O-Ring Face Seals (ORFS). DADCO’s ORFS fittings prevent any loss of high pressure nitrogen gas by providing elastomeric seals at every joint. DADCO recommends using DADCO brand hoses featured on page 11 with the adapters shown throughout this catalog. If the length of hose required is less than the H Value, use DF Tubing (page 11) or Solid Hose Fittings (page 13). DADCO also offers a variety of stainless steel fittings to be paired with Y-705 or Y-500 hose for linked operation in extreme condition environments.

Crimped Hose Adapters for 90.700 or 90.705 (Y-700 or Y-705)

**H Value = 75 (2.95)**

90.504.943 (S-943) Straight Swivel

90.504.954 (S-954) 45° Swivel

90.504.959 (S-959) 90° Swivel

Crimped Hose Adapters for 90.500 (Y-500)

**H Value = 80 (3.15)**

90.504.843 (S-843) Compact Swivel

90.504.851 (S-851) Retractable Swivel

90.504.854 (S-854) 45° Female Face Seal

90.504.859 (S-859) Short Neck

90.504.858 (S-858) Long Neck

Crimped Hose Adapters for 90.250 or 90.400 (Y-250 or Y-400)

**H Value = 85 (3.35)**

90.504.743 (S-743) Compact Swivel

90.504.751 (S-751) Retractable Swivel

90.504.754 (S-754) 45° Female Face Seal

90.504.759 (S-759) Short Neck

90.504.758 (S-758) Long Neck

Non-Crimped Hose Adapters for 90.250 (Y-250)

**H Value = 85 (3.35)**

90.504.643 (S-643) Compact Swivel

90.504.651 (S-651) Retractable Swivel

90.504.654 (S-654) 45° Female Face Seal

90.504.659 (S-659) 90° Female Face Seal

---

DADCO was the first gas spring manufacturer to offer 9/16-18 O-Ring Face Seals (ORFS). DADCO’s ORFS fittings prevent any loss of high pressure nitrogen gas by providing elastomeric seals at every joint. DADCO recommends using DADCO brand hoses featured on page 11 with the adapters shown throughout this catalog. If the length of hose required is less than the H Value, use DF Tubing (page 11) or Solid Hose Fittings (page 13). DADCO also offers a variety of stainless steel fittings to be paired with Y-705 or Y-500 hose for linked operation in extreme condition environments.
Components: ORFS Fittings

Solid Hose Fittings
Solid hose fittings come in predetermined lengths and are ideal for limited space applications. They can replace traditional hose assemblies, particularly when the length of hose required is shorter than DADCO’s recommended minimum hose length (see H Values on page 12). For custom lengths of solid hose, see DF Tubing on page 11.

Metric

<table>
<thead>
<tr>
<th>Part No.</th>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>90.503.xxx</td>
<td>mm</td>
<td>A – 43.2</td>
</tr>
<tr>
<td>9075</td>
<td>75</td>
<td>31.8</td>
</tr>
<tr>
<td>9100</td>
<td>100</td>
<td>56.8</td>
</tr>
<tr>
<td>9120</td>
<td>120</td>
<td>76.8</td>
</tr>
<tr>
<td>9125</td>
<td>125</td>
<td>81.8</td>
</tr>
<tr>
<td>9130</td>
<td>130</td>
<td>86.8</td>
</tr>
<tr>
<td>9140</td>
<td>140</td>
<td>96.8</td>
</tr>
<tr>
<td>9150</td>
<td>150</td>
<td>106.8</td>
</tr>
</tbody>
</table>

English

<table>
<thead>
<tr>
<th>Part No.</th>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>90.503.xxx</td>
<td>in.</td>
<td>A – 1.70</td>
</tr>
<tr>
<td>830</td>
<td>3.00</td>
<td>1.30</td>
</tr>
<tr>
<td>832</td>
<td>3.25</td>
<td>1.55</td>
</tr>
<tr>
<td>835</td>
<td>3.50</td>
<td>1.80</td>
</tr>
<tr>
<td>837</td>
<td>3.75</td>
<td>2.05</td>
</tr>
<tr>
<td>840</td>
<td>4.00</td>
<td>2.30</td>
</tr>
<tr>
<td>845</td>
<td>4.50</td>
<td>2.80</td>
</tr>
<tr>
<td>850</td>
<td>5.00</td>
<td>3.30</td>
</tr>
<tr>
<td>855</td>
<td>5.50</td>
<td>3.80</td>
</tr>
<tr>
<td>860</td>
<td>6.00</td>
<td>4.30</td>
</tr>
</tbody>
</table>

Port Adapters

DADCO’s O-Ring Face Seal (ORFS) Fittings have elastomeric seals at every joint.

90.505.115  (S-115)
Straight

90.505.116  (S-116)
M6 → 9/16-18
Extended Straight

90.505.121  (S-121)
Swivel Straight

90.505.122  (S-122)
Straight

90.505.123  (S-123)
Swivel Straight

90.505.110  (G-109)
Flush Plug

90.505.438  (S-438)
Run Tee

90.505.330  (S-330)
45° Elbow

90.506.230  (S-230)
90°

90.506.439  (S-439)
Branch Tee

Refer to Page 4 Torque Specifications

Part No. | A  | \( \text{mm} \) | \( \text{in.} \)
90.505.115 | .55 |
90.505.116 | .55 |
90.505.121 | .44 |
90.505.122 | .44 |
90.505.123 | .44 |
90.505.110 | .87 |
90.505.438 | .87 |
90.505.330 | .87 |
90.506.230 | .87 |
90.506.439 | .87 |

\( \text{SS} \) = Stainless Steel Option Available

Components: ORFS Fittings

Linked Systems
Linked Systems

Components: ORFS Fittings

Fittings

90.506.112 (S-112) Tube End Cap
90.506.303 (S-303) Union
90.506.201 (S-201) Elbow
90.506.401 (S-401) Tee
90.506.501 (S-501) Cross

Standard Swivel Nut Fittings

90.506.221 (S-221) 90° Elbow
90.506.433 (S-433) Branch Tee
90.506.432 (S-432) Run Tee

Compact Swivel Nut Fittings

90.507.221 (SJ-221) 90° Elbow
90.507.433 (SJ-433) Branch Tee
90.507.321 (SJ-321) 45° Elbow

Retrofit Port Adapters

90.505.102 (S-102) Straight Port Adapter
90.505.202 (S-202) 90° Swivel Port Adapter
90.505.120 (S-120) Straight Port Adapter
90.505.104 (D-104) Flush Plug
Components: D-24 Tapered Fittings

D-24 Hose System with 90.700 or 90.705 (Y-700 or Y-705)

D-24 Hose System with 90.500 (Y-500)

Fittings

DADCO's D-24 Fittings have a 24° taper and o-ring.

DIN EN ISO 8434
24° Taper + O-Ring

Minimum recommended hose length (H) = 75 (2.95)

Minimum recommended hose length (H) = 80 (3.15)

Refer to Page 4 Torque Specifications

Part No. A

439    22 .87

449    36 1.42

459    43 1.69

Part No. A

230    22 .87

240    36 1.42

250    43 1.69

Part No. A

438    22 .87

448    36 1.42

458    43 1.69

Part No. A

539    22 .87

549    36 1.42

559    43 1.69
Components: MINILink® Fittings

MINIFLEX® Hose System with 90.700 or 90.705 (Y-700 or Y-705)

MINILink® Fittings

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>90.607.122</td>
<td>Micro Service Fitting</td>
</tr>
<tr>
<td>90.607.120</td>
<td>Micro Port Adapter Extension</td>
</tr>
<tr>
<td>90.607.220</td>
<td>90° Port Adapter</td>
</tr>
<tr>
<td>90.607.429</td>
<td>Branch Tee Port Adapter</td>
</tr>
<tr>
<td>90.607.428</td>
<td>Run Tee Port Adapter</td>
</tr>
<tr>
<td>90.607.035</td>
<td>Port Adapter Extension</td>
</tr>
<tr>
<td>90.505.116</td>
<td>Reducer M6 → 9/16-18</td>
</tr>
<tr>
<td>90.607.201</td>
<td>Elbow</td>
</tr>
<tr>
<td>90.607.401</td>
<td>Union Tee</td>
</tr>
<tr>
<td>90.606.303</td>
<td>Union</td>
</tr>
<tr>
<td>90.607.055</td>
<td>Reducer 7/16-20 → M6</td>
</tr>
<tr>
<td>90.607.065</td>
<td>Reducer G 1/8 → M6</td>
</tr>
<tr>
<td>90.607.116</td>
<td>Straight M6 → G 1/8 Port Adapters</td>
</tr>
<tr>
<td>90.607.439</td>
<td>Branch Tee</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Part No.</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>116</td>
<td>33</td>
</tr>
<tr>
<td>126</td>
<td>46</td>
</tr>
</tbody>
</table>

Minimum recommended Hose Length (H) = 45 (1.77)
Components: Zip (CNOMO) Fittings

Zip Hose System with 90.700 or 90.705 (Y-700 or Y-705)

Minimum recommended hose length \( H = 75 \) (2.95)

90.804.943  
(B-943)  
Straight Hose Adapter

90.804.954  
(B-954)  
45° Hose Adapter

90.804.958  
(B-958)  
90° Short Neck Hose Adapter

90.804.959  
(B-959)  
90° Long Neck Hose Adapter

Fittings

90.805.115  
(B-115)  
Straight Port Adapter

90.805.122  
(B-122)  
Straight Port Adapter

90.805.190  
(B-190)  
Port Adapter with Valve

90.806.401  
(B-401)  
Tee

90.806.501  
(B-501)  
Cross

90.806.230  
(B-230)  
Angle Swivel Adapter

90.806.439  
(B-439)  
Two-Way Swivel Adapter

Part No. | A  
--- | ---  
230 | 22 .87  
240 | 36 1.42  
250 | 43 1.69  
439 | 22 .87  
449 | 36 1.42  
459 | 43 1.69
DADCO offers a variety of pressure monitor options to alert press controllers to changes in system pressure. The 90.421.1 and 90.421.2 models visually alert the user whether the pressure is at good standing or low while the 90.421.2D model is capable of shutting the press down if it drops below the minimum operating pressure.

### Pressure Monitors

**Components: Pressure Monitors**

**Model No.**  
<table>
<thead>
<tr>
<th>Supply Voltage</th>
<th>Switch Rating</th>
<th>Output</th>
<th>Electrical Connection</th>
<th>Pressure Range</th>
<th>Cable Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>90.421.1 (DPM-1)</td>
<td>120 VAC</td>
<td>–</td>
<td>Indicator Light</td>
<td>1/2 NPS</td>
<td>15 – 200 bar 220 – 3000 psi</td>
</tr>
<tr>
<td>90.421.2 (DPM-2)</td>
<td>24 VDC</td>
<td>–</td>
<td>Indicator Light</td>
<td>1/2 NPS</td>
<td>15 – 200 bar 220 – 3000 psi</td>
</tr>
</tbody>
</table>
|90.421.2D (DPM-2D)| 24 VDC| 0.4 A| Indicator Light + SPDT| 4-Pin Mini-Change Connector| 15 – 200 bar 220 – 3000 psi| AZ54MC4PM02 – 6 ft  
AZ54MC4PM04 – 12 ft|

**Pressure Monitors**

**Models:**

- **DPM-1**
  - Model No.: 90.421.1
  - Supply Voltage: 120 VAC
  - Switch Rating: –
  - Output: Indicator Light
  - Electrical Connection: 1/2 NPS
  - Pressure Range: 15 – 200 bar 220 – 3000 psi

- **DPM-2**
  - Model No.: 90.421.2
  - Supply Voltage: 24 VDC
  - Switch Rating: –
  - Output: Indicator Light
  - Electrical Connection: 1/2 NPS
  - Pressure Range: 15 – 200 bar 220 – 3000 psi

- **DPM-2D**
  - Model No.: 90.421.2D
  - Supply Voltage: 24 VDC
  - Switch Rating: 0.4 A
  - Output: Indicator Light + SPDT
  - Electrical Connection: 4-Pin Mini-Change Connector
  - Pressure Range: 15 – 200 bar 220 – 3000 psi
  - Cable Options: AZ54MC4PM02 – 6 ft  
AZ54MC4PM04 – 12 ft

**DPM-1 Circuit**

- **DPM-2 Circuit**

The DPM-1 and DPM-2 models both visually inform the press operator of their Nitrogen Gas Spring system’s pressure status. See table for supply voltage.

**Ordering Example:**

- **Model Number:** 90.421.1, 90.421.2 or 90.421.2D
- **Connector:**
  - BH1 – Right (Gray)
  - BH2 – Left (Gray)
  - BH3 – Straight Connector
- **Fitting:** 90.505.102 – Straight  
90.505.202 – 90°
- **Backing Plate** (optional)

---

**DPM-2D Circuit**

- **Plug Pin-Out:**
  - (1) Black
  - (2) White
  - (3) Red
  - (4) Green
- **DPM-2D Circuit**

The DPM-2D model visually informs the press operator of the system status, and can be wired into the press controller to automatically shut down or alert the operator when pressure drops below a set point.
**Components: Pressure Monitors**

**Electronic Pressure Monitors**

DADCO offers two types of Electronic Pressure Monitors to monitor nitrogen gas pressure during operation: An Electronic Pressure Monitor Sensor or a Control Panel with Pressure Monitor. For maximum versatility both types have multiple configurations to best suit your application. Pressure Monitor sensor options are detailed on pages 20 – 21.

**Electronic Pressure Monitor Configuration**

To customize your Electronic Pressure Monitor, select the base, sensor and cable accessory that best suits your application.

<table>
<thead>
<tr>
<th>Pressure Monitor Sensor Options</th>
<th>Cable Accessory</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDS</td>
<td>90.454.M12.S___</td>
</tr>
<tr>
<td>DSK</td>
<td>90.454.M12.L___</td>
</tr>
<tr>
<td>DPS</td>
<td></td>
</tr>
<tr>
<td>DPT</td>
<td></td>
</tr>
<tr>
<td>Guard Option</td>
<td></td>
</tr>
<tr>
<td>GM specific option available,</td>
<td></td>
</tr>
<tr>
<td>reference bulletin B16106.</td>
<td></td>
</tr>
</tbody>
</table>

**Base Options**

- **CP**: Block with Bleed Valve, Filler Valve and Rupture Disk
- **JB**: Block only (Bleed Valve, Filler Valve and Rupture Disk not included)

**Fitting Connection**

- **N**: No Fitting Supplied, **S**: 90.505.115 (ORFS), **D**: 90.508.115 (D-24), **B**: 90.805.115 (Zip), **L**: MINILink® Fitting. Default is **N**.

**Ordering Example:**

```
Model Number 90.421. CP. S. EDS. G
Base Option
Guard Option
Pressure Monitor Sensor Options
EDS = Electronic Pressure Switch, DSK = Piston Pressure Switch, DPS = Dial Pressure Switch, DPT = Electronic Pressure Transmitter
Fitting Connection
```

Example shown:

90.421.CP.S.EDS.G
With 90.454.M12.S Cable
Electronic Pressure Monitor Sensors

The Electric Pressure Monitor has four sensor options available: EDS, DSK, DPS and DPT. Review the details provided below to select the correct option for your application.

**EDS – Electronic Pressure Switch**

The EDS switch features an LED digital display that reads pressure value in bar, psi or MPa. The EDS models display face rotates 270° while the body rotates 340° for added versatility, the sensor also features two switching outputs that can be easily set with face mounted push buttons. *Note: EDS uses 90.454.M12 style cable accessory.*

**DSK – Piston Pressure Switch**

The DSK switch uses a pressure input to operate a SPDT switch as the pressure rises or falls across a set value. The manually adjusted switch monitors a preset pressure. This switch can be set at the factory and wired to shut down a press operation or activate an alarm once pressure is above or below the set-point. *Note: DSK includes a DIN 43650 cable adapter.*

**DPS – Dial Pressure Switch**

The DPS switch features two manually adjustable dials. The upper dial is the set pressure and the lower dial is the reset pressure. When the system pressure increases to the set value, Output 1 (pin 4) turns on, and Output 2 (pin 2) turns off. When the system pressure decreases to the Reset Pressure, Output 1 turns off and Output 2 turns on. *Note: DPS uses 90.454.M12 style cable accessory.*
Components: Pressure Monitors

DPT – Electronic Pressure Transducer

DADCO’s DPT unit is a pressure transducer, emitting an analogue signal that provides a range of voltage. The DPT converts pressure input to a 0–10 V output, the voltage output can then be scaled by a press controller to read the pressure value. *Note: DPT uses 90.454.M12B style cable accessory.*

Features:
- Supply Voltage: 12 – 32 VDC
- Accuracy: 0.5% Full Scale
- Output Signal: Analog (0-10 Volts)
- Max Pressure Rating: 600 bar (8700 psi)
- Electrical Connection: 4 – Pin M12 x 1
- Current Consumption: < 15 mA

90.406.421 Control Panel with Pressure Monitor

The 90.406.421 Control Panel with Pressure Monitor is used to fill and monitor the pressure of linked nitrogen gas springs from outside the die. The panel is adjustable to read pressure in bar, psi or MPa and includes a digital pressure sensor with programmable output to signal if pressure drops below a preset level. This panel conforms to Toyota standard number D-PACPS-B.

DADCO
90.406.421
Digital Control Panel

Digital Pressure Display

M12 5P
Input/Output

100
3.93

ø11 Thru

152
.98

170
6.69

90.805.115
41 mm Dia.
DPG-3ML Gauge

90.310.110.CS
Filler Valve

RD-400G
Rupture Disc
(BP = 400 bar)

Cable Accessory

90.454.M12B.S.____
Attachment Orientation:
S = Straight

90.454.M12B.L.____
Attachment Orientation:
L = Elbow

Cable Length: 02 = 2 m, 05 = 5 m, 10 = 10 m

Ordering Example:
- Plate Style: B = English plate style
- Fitting Location: B, C, D, BD
- **Output:** SPST N.O. (Normally Open)
- **Max Pressure Rating:** 350 bar (5076 psi)
- **Supply Voltage:** 12 – 24 VDC, 80 – 130 VAC (50 – 60 Hz)
- **Electrical Connection:** M12 (B – Code), 5 Wire, Reverse Key

*For Japanese plate order 90.406.421.A._

This product is Listed to applicable UL Standards and requirements by UL.

Reference B10143 for additional information.
Tools for Hose Assembly Construction

DADCO carries a variety of tools for Hose Assembly Construction, please refer to bulletin B11110A for more information on the selection shown below.

**Mini Hose Cutter**

90.320.7

Used to cut hose to appropriate length. The 90.320.7 works with all hose sizes.

**Hose Assembly Clamp**

90.320.9

Used to secure hose while installing hose adapters. The 90.320.9 is for use with the 90.700 / 90.705 (Y-700 / Y-705) hoses, and the 90.320.6 is compatible with all hose sizes.

**Portable Crimping Unit**

90.720

Used with appropriate die ring to create permanent hose assemblies. For more information, request bulletin B04112B.

**Mini-Crimp**

90.710.8

Used in a crimping machine to construct hose assemblies using 90.700 / 90.705 (Y-700 / Y-705) hose.

**Crimp Dies**

Used in Portable Crimping Unit to construct hose assemblies. For information on constructing hose assemblies, refer to bulletin B00120D.

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Crimp Die</th>
<th>Crimp Diameter (mm / inch)</th>
</tr>
</thead>
<tbody>
<tr>
<td>90.700 / 90.705 (Y-700 / Y-705)</td>
<td>Mini-Crimp 90.710.8 No Ring Required</td>
<td>7.00 – 7.25 / .276 – .285</td>
</tr>
<tr>
<td>90.500 (Y-500)</td>
<td>80C-P03 Gray Die 82C-R01 Ring</td>
<td>12.19 – 12.70 / .480 – .500</td>
</tr>
<tr>
<td>90.400 (Y-400)</td>
<td>80C-P04 Red Die 82C-R01 Ring</td>
<td>14.22 – 14.73 / .560 – .580</td>
</tr>
<tr>
<td>90.250 (Y-250)</td>
<td>80C-P04J Red Die 82C-R01 Ring</td>
<td>13.59 – 14.10 / .535 – .555</td>
</tr>
</tbody>
</table>

**Using DADCO’s Mini-Crimp**

1. Place the Mini-Crimp 90.710.8 into the crimping machine. No die ring is required.

2. Insert the hose assembly from below through the center of the Mini-Crimp (F.1). For instructions on constructing a Mini Hose Assembly request bulletin B11110A.

3. Activate the hydraulic or pneumatic crimping machine to permanently crimp fitting to the hose (F.1).

4. As the DADCO Mini-Crimp begins to close, position the fitting to ensure the entire length of the ferrule is crimped (F.2).

5. Remove completed hose assembly from the Mini-Crimp.

6. Measure the crimped ferrule diameter across the flats to verify it is within the crimp dimension range (F.3).
Charging Accessories

Quick Disconnect Charging Hardware

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 also offers the 90.310.041 High Pressure Charging Assembly to charge Micro Series, SCR Series and U.0175 – U.0400 nitrogen gas springs to maximum pressure. For more information, reference B16118A.

Quick Disconnect Charging Nipple

90.310.143 (M6 Port)
90.310.111 (G 1/8 Port)

Use the appropriate Quick Disconnect Charging Nipple to charge DADCO Nitrogen Gas Springs.

Safety Plates

DADCO recommends customers identify tools containing high pressure nitrogen gas springs to ensure proper handling of the cylinders. DADCO offers several caution tags to meet specific application needs. For more information request bulletin B01130B.

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 that is suitable for charging the gas spring. 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.
Complete Linked System Solutions